06- DEPARTMENT OF ENVIRONMENTAL PROTECTION

096 BUREAU OF AIR QUALITY CONTROL

CHAPTER 130: SOLVENT CLEANERS

SUMMARY: This regulation establishes requirements for testing, evaluating and limiting volatile organic compounds (VOCs), from solvent cleaning machines (solvent cleaners) and sets minimum requirements for equipment and operation standards in order to reduce VOC emissions.

1. Scope/Applicability.

A. Source applicability. This regulation shall apply to all new and existing solvent cleaners including, but not limited to, remote reservoir cold cleaning machines, cold cleaning machines, batch vapor cleaning machines and in-line vapor cleaning machines.

Sources that also use Halogenated Solvents (containing Hazardous Air Pollutant(s) HAPs) for cleaning may also be subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for halogenated solvent cleaning. Maine accepted delegation of this NESHAP from the federal government. (See Maine DEP, Air Quality Control Regulation Chapter 144 National Emission Standards for Hazardous Air Pollutant (NESHAP) 3A(14) effective August 23, 2001) The HAP standards are found in the Code of Federal Regulations, 40 CFR Part 63 Subpart T: National Emission Standards for Halogenated Solvent Cleaning.

B. Exemptions. The following are exempt from the requirements of this Chapter:

(1) A solvent cleaner using less than two liters (68 oz) of cleaning solvent with a vapor pressure of 1.00 mm Hg, or less, at 20º C (68º F);

(2) Wipe cleaning; and

(3) Cold cleaning machines using solvents containing less than or equal to 5% VOCs by weight.

2. Definitions.

In addition to the terms that are defined in Chapter 100, as amended, of the Department's regulations, the following words, terms, and abbreviations

when used in this Chapter shall have the following meanings: See also Chapter 100: Definitions Regulation.

A. Airless cleaning system. "Airless cleaning system" means a solvent cleaning machine that is automatically operated and seals at a differential pressure of 0.50 pounds per square inch gauge (psig) or less, prior to the introduction of solvent or solvent vapor into the cleaning chamber and maintains differential pressure under vacuum during all cleaning and drying cycles.

B. Airtight cleaning system. "Air-tight cleaning system" means a solvent cleaning machine that is automatically operated and seals at a differential pressure no greater than 0.50 psig, prior to the introduction of solvent or solvent vapor into the cleaning chamber and during all cleaning and drying cycles.

C. Batch vapor cleaning machine. "Batch vapor cleaning machine" a vapor cleaning machine in which individual parts or a set of parts move through the entire cleaning cycle before new parts are introduced into the cleaning machine. The term includes solvent cleaning machines, such as Ferris wheel cleaners or cross rod machines, that clean multiple loads simultaneously and are manually loaded. The term does not include machines that do not have a solvent/air interface, such as airless and airtight cleaning systems.

D. Carbon adsorber. "Carbon adsorber" means a bed of activated carbon into which an air/solvent gas-vapor stream is routed and which adsorbs the solvent on the carbon.

E. Cleaning capacity. "Cleaning capacity" means the interior volume of the cleaning chamber.

F. Cold cleaning machine. "Cold cleaning machine" means a device or piece of equipment, containing and/or using an unheated liquid where parts are placed to remove dirt, grease, oil or other contaminants and coatings, from the surfaces of the parts or to dry the parts. The term does not include machines that do not have a solvent/air interface, such as airless and airtight cleaning systems.

G. Dwell. "Dwell" means holding parts within the freeboard area of a solvent cleaning machine but above the solvent vapor zone. Dwell occurs after cleaning to allow solvent to drain from the parts or parts baskets back into the solvent cleaning machine.

H. Dwell time. "Dwell time" means the period of time between when a parts basket is placed in the vapor zone of a batch vapor or in-line vapor cleaning machine and when solvent dripping ceases. Dwell time is determined by placing

a basket of parts in the vapor zone and measuring the amount of time between when the parts are placed in the vapor zone and dripping ceases.

I. Freeboard ratio. "Freeboard ratio" means, for a cold cleaning machine, the distance from the liquid solvent to the top edge of the cold cleaning machine divided by the length of the shortest side of the cold cleaning machine; for an operating batch vapor cleaning machine or an in-line vapor cleaning machine, the distance from the top of the solvent vapor layer to the top edge of the vapor cleaning machine divided by the length of the shortest side of the vapor cleaning machine.

J. Freeboard refrigeration device. "Freeboard refrigeration device" means a set of secondary coils mounted in the freeboard area of a solvent cleaning machine that carries a refrigerant or other chilled substance to provide a chilled air blanket above the solvent vapor. A solvent cleaning machine primary condenser, which is capable of maintaining a temperature in the center of the chilled air blanket at not more than 30 percent of the solvent boiling point, is both a primary condenser and a freeboard refrigeration device.

K. Immersion cold cleaning machine. "Immersion cold cleaning machine" means a cold cleaning machine in which the parts are immersed in the solvent when being cleaned.

L. In-line vapor cleaning machine. "In-line vapor cleaning machine" means a vapor cleaning machine that uses an automated parts handling system, typically a conveyor, to automatically provide a supply of parts to be cleaned. In-line vapor cleaning machines are fully enclosed except for the conveyor inlet and exit portals.

M. Reduced room draft. "Reduced room draft" means decreasing the flow or movement of air across the top of the freeboard area of a solvent cleaning machine to less than 50 feet per minute (15.2 meters per minute) by methods including redirecting fans and/or air vents, moving a machine to a corner where there is less room draft, or constructing a partial or complete enclosure.

N. Remote reservoir cold cleaning machine. "Remote reservoir cold cleaning machine" means a machine in which liquid solvent is pumped to a sink-like work area that immediately drains solvent back into an enclosed container while parts are being cleaned, allowing no solvent to pool in the work area.

O. Solvent/air interface. "Solvent/air interface" means the location of contact between the concentrated solvent vapor layer and the air. This location of contact is defined as the mid-line height of the primary condenser coils. For a cold

cleaning machine, it is the location of contact between the liquid solvent and the air.

P. Solvent cleaning machine. "Solvent cleaning machine" means a device or piece of equipment that uses solvent liquid or vapor to remove contaminants, such as dirt, grease, oil, and coatings, from the surfaces of materials. Types of solvent cleaning machines include batch vapor cleaning machines, in-line vapor cleaning machines, immersion cold cleaning machines, remote reservoir cold cleaning machines, airless cleaning systems and air-tight cleaning systems.

Q. Solvent cleaning machine automated parts handling system. "Solvent cleaning machine automated parts handling system" means a mechanical device that carries all parts and parts baskets at a controlled speed from the initial loading of soiled or wet parts through the removal of the cleaned or dried parts.

R. Solvent cleaning machine down time. "Solvent cleaning machine down time" means the period when a solvent cleaning machine is not cleaning parts and the sump heating coils, if present, are turned off.

S. Solvent cleaning machine idle time. "Solvent cleaning machine idle time" means the period when a solvent cleaning machine is not actively cleaning parts and the sump heating coil, if present, is turned on.

T. Special and extreme solvent metal cleaning. "Special and extreme solvent metal cleaning" means the use of cold cleaning machines:

(1) To clean metal parts in the manufacturing and rework of electronic parts, assemblies, boxes, wiring harnesses, sensors, and connectors used in aerospace service; or

(2) To clean metal parts used in the manufacturing of ozone, nitrous oxide, fluorine, chlorine, bromine, halogenated compounds, or oxygen in concentrations greater than 23 percent;

(3) To clean metal parts exposed to ozone nitrous oxide, fluorine, chlorine, bromine, halogenated compounds, or oxygen in concentrations greater than 23 percent.

U. Superheated vapor system. "Superheated vapor system" means a system that heats the solvent vapor to a temperature 10 degrees Fahrenheit or more above the solvent's boiling point. Parts are held in the superheated vapor before exiting the machine to evaporate the liquid solvent on the parts.

V. Vapor cleaning machine. "Vapor cleaning machine" means a solvent cleaning machine that boils liquid solvent, generating a vapor, or that heats liquid solvent that is used as part of the cleaning or drying cycle. The term does not include machines that do not have a solvent/air interface, such as airless and airtight cleaning systems.

W. Vapor cleaning machine primary condenser. "Vapor cleaning machine primary condenser" means a series of circumferential cooling coils on a vapor cleaning machine through which a chilled substance is circulated or recirculated to provide continuous condensation of rising solvent vapors, and thereby, create a concentrated vapor zone.

X. Vapor up control switch. "Vapor up control switch" means a thermostatically controlled switch, which shuts off or prevents condensate from being sprayed when there is no vapor. On in-line vapor cleaning machines the switch also prevents the conveyor from operating when there is no vapor.

Y. Wipe cleaning. "Wipe cleaning" means the removal of residue or contaminants from surfaces by rubbing surfaces with rags or disposable wipes.

Z. Working mode cover. "Working mode cover" means any cover or solvent cleaning machine design that allows the cover to shield the cleaning machine openings from outside air disturbances while parts are being cleaned in the cleaning machine. A cover that is used during the working mode is opened only during parts entry and removal.

3. Cold Cleaning Machines. This section applies to all cold cleaning machines that process metal parts. (See 1B Exemptions.) The provisions of this Section shall not apply if the owner and operator of the cold cleaning machine demonstrates and the Department approves in writing that compliance with the Section will result in unsafe operating conditions.

A. Immersion cold cleaning machines shall have a freeboard ratio of 0.75 or greater unless the machines are equipped with covers that are kept closed except when parts are being placed into or being removed from the machine.

B. Immersion cold cleaning machines and remote reservoir cold cleaning machines shall:

(1) Have a permanent, conspicuous label summarizing the operating requirements in Subsection 3 below.

(2) Be equipped with a cover that shall be closed at all times except

during cleaning of parts or the addition or removal of solvent. For remote reservoir cold cleaning machines which drain directly into the solvent storage reservoir, a perforated drain with a diameter of not more than six inches shall constitute an acceptable cover.

(3) Cold cleaning machines shall be operated in accordance with the following procedures:

(a) Waste solvent shall be collected and stored in closed containers. The closed containers may contain a device that allows pressure relief, but does not allow liquid solvent to drain from the container;

(b) Cleaned parts shall be drained at least 15 seconds or until dripping ceases, whichever is longer. Parts having cavities or blind holes shall be tipped or rotated while the part is draining. During the draining, tipping or rotating, the parts shall be positioned so that solvent drains directly back to the cold cleaning machine;

(c) Flushing of parts using a flexible hose or other flushing device shall be performed only within the freeboard area of the cold cleaning machine. The solvent spray shall be a solid fluid stream, not an atomized or shower spray at a pressure that does not exceed 10 pounds per square inch gauge (psig);

(d) The owner or operator shall ensure that, when the cover is open, the cold cleaning machine is not exposed to drafts greater than 40 meters per minute (132 feet per minute), as measured between 1 and 2 meters (3.3 and 6.6 feet) upwind and at the same elevation as the tank lip;

(e) Sponges, fabric, wood, leather, paper products and other absorbent materials shall not be cleaned in the cold cleaning machine;

(f) When a pump-agitated solvent bath is used, the agitator shall be operated to produce a rolling motion of the solvent with no observable splashing of the solvent against the tank walls or the parts being cleaned. Air agitated solvent baths may not be used;

(g) Spills during solvent transfer and use of the cold cleaning machine shall be cleaned up immediately, and the wipe rags or other sorbent material shall be immediately stored in covered

containers for disposal or recycling;

(h) Work area fans shall be located and positioned so that they do not blow across the opening of the degreaser unit; and

(i) The owner or operator shall ensure that the solvent level does not exceed the fill line.

C. On and after May 1, 2005, a person who sells or offers for sale any solvent containing volatile organic compounds for use in a cold cleaning machine shall provide to the purchaser the following written information:

(1) The name and address of the solvent supplier;

(2) The type of solvent including the product or vendor identification number;

(3) The vapor pressure of the solvent measured in mm Hg at 20º C (68º F); and

(4) Percent VOC content by weight.

D. A person who operates a cold cleaning machine shall maintain for not less than two years and shall provide to the Maine Department of Environmental Protection or EPA, on request, the information specified in Subsection 3C. An invoice, bill of sale, certificate that corresponds to a number of sales, Material Safety Data Sheet (MSDS), or other appropriate documentation acceptable to the Department and EPA may be used to comply with this Section.

E. On, or after, May 1, 2005, each cold cleaning machine must use a solvent with a vapor pressure of 1.00 mm Hg, or less, at 20º C (68º F). This paragraph does not apply to cold cleaning machines:

(1) Used in special and extreme solvent metal cleaning;

(2) For which the owner or operator has received Department approval of a demonstration that compliance with the requirement of a solvent with a vapor pressure of 1.0 mm Hg, or less, at 20º C will result in unsafe operating conditions; or

(3) That are located in a permanent total enclosure having control equipment that is designed and operated with an overall VOC removal efficiency of 90 percent or greater.

4. Batch Vapor Cleaning Machines. This Section applies to batch vapor cleaning machines that process metal parts.

A. Batch vapor cleaning machines shall be equipped with:

(1) Either a fully enclosed design or a working and downtime mode cover that completely covers the cleaning machine openings when in place, is free of cracks, holes and other defects, and can be readily opened or closed without disturbing the vapor zone. If the solvent cleaning machine opening is greater than 10 square feet, the cover must be powered. If a lip exhaust is used, the closed cover shall be below the level of the lip exhaust;

(2) Sides that result in a freeboard ratio greater than or equal to 0.75;

(3) A safety switch (thermostat and condenser flow switch) which shuts off the sump heat if the coolant is not circulating;

(4) A vapor up control switch which shuts off the spray pump if vapor is not present;

(5) An automated parts handling system which moves the parts or parts baskets at a speed of 11 feet (3.4 meters) per minute or less when the parts are entering or exiting the vapor zone. If the parts basket or parts being cleaned occupy more than 50% of the solvent/air interface area, the speed of the parts basket or parts shall not exceed 3 feet per minute;

(6) A device that shuts off the sump heat if the sump liquid solvent level drops to the sump heater coils;

(7) A vapor level control device that shuts off the sump heat if the vapor level in the vapor cleaning machine rises above the height of the primary condenser;

(8) Each vapor cleaning machine shall have a primary condenser;

(9) Each vapor cleaning machine that uses a lip exhaust shall be designed and operated to route all collected solvent vapors through a properly operated and maintained carbon adsorber such that the concentration of organic solvent in the exhaust does not exceed 25 parts per million; and

(10) A permanent, conspicuous label summarizing the operating procedures found in Subsection 4D, below.

B. In addition to the requirements of Subsection A., the operator of a batch vapor cleaning machine with a solvent/air interface area of 13 square feet or less shall implement one of the following options:

(1) A working mode cover, freeboard ratio of 1.0 or greater, and a superheated vapor system;

(2) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point and a superheated vapor system ;

(3) A working mode cover and a freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point;

(4) Reduced room draft, freeboard ratio of 1.0 or greater, and a superheated vapor system;

(5) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point and reduced room draft;

(6) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point and a freeboard ratio of 1.0 or greater;

(7) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point and dwell. Dwell shall be not less than 35 percent of the dwell time determined for the part or parts;

(8) Reduced room draft, dwell and a freeboard ratio of 1.0 or greater. Dwell shall be not less than 35 percent of the dwell time determined for the part or parts;

(9) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point and a carbon adsorber which reduces solvent emissions in the exhaust to a level not to exceed 25 ppm at any time; or

(10) A freeboard ratio of 1.0 or greater, a superheated vapor system and a carbon adsorber which reduces solvent emissions in the exhaust to a level not to exceed 25 ppm at any time.

C. In addition to the requirements of Subsection A, the operator of a batch vapor cleaning machine with a solvent/air interface area of greater than 13 square feet shall use one of the following devices or strategies:

(1) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point, a freeboard ratio of 1.0 or greater, and a superheated vapor system;

(2) Dwell, a freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point, and reduced room draft. Dwell shall be not less than 35 percent of the dwell time determined for the part or parts;

(3) A working mode cover and a freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point and superheated vapor system;

(4) Reduced room draft, freeboard ratio of 1.0 or greater, and a superheated vapor system;

(5) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point, reduced room draft and superheated vapor system;

(6) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point, reduced room draft and a freeboard ratio of 1.0 or greater; or

(7) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point, superheated vapor, and a carbon adsorber which reduces solvent emissions in the exhaust to a level not to exceed 25 ppm at any time.

D. Batch vapor cleaning machines shall be operated in accordance with the following procedures:

(1) Waste solvent, still bottoms and sump bottoms shall be collected and stored in closed containers. The closed containers may contain a device that allows pressure relief, but does not allow liquid solvent to drain from the container;

(2) Cleaned parts shall be drained at least 15 seconds or until dripping ceases, whichever is longer. Parts having cavities or blind holes shall be

tipped or rotated while the part is draining. A superheated vapor system shall be an acceptable alternate technology;

(3) Parts baskets or parts shall not be removed from the batch vapor cleaning machine until dripping has ceased;

(4) Flushing or spraying of parts using a flexible hose or other flushing device shall be performed within the vapor zone of the batch vapor cleaning machine or within a Section of the machine that is not exposed to the ambient air. The solvent spray shall be a solid fluid stream, not an atomized or shower spray;

(5) When the cover is open, the batch vapor cleaning machine shall not be exposed to drafts greater than 40 meters per minute (132 feet per minute), as measured between 1 and 2 meters (3.3 and 6.6 feet) upwind and at the same elevation as the tank lip;

(6) Sponges, fabric, wood, leather, paper products and other absorbent materials shall not be cleaned in the batch vapor cleaning machine;

(7) Spills during solvent transfer and use of the batch vapor cleaning machine shall be cleaned up immediately. Wipe rags or other sorbent material shall be immediately stored in covered containers for disposal or recycling;

(8) Work area fans shall be located and positioned so that they do not blow across the opening of the batch vapor cleaning machine;

(9) During startup of the batch vapor cleaning machine the primary condenser shall be turned on before the sump heater;

(10) During shutdown of the batch vapor cleaning machine, the sump heater shall be turned off and the solvent vapor layer allowed to collapse before the primary condenser is turned off;

(11) When solvent is added to or drained from the batch vapor cleaning machine, the solvent shall be transferred using threaded or other leakproof couplings and the end of the pipe in the solvent sump shall be located beneath the liquid solvent surface;

(12) The working and downtime covers shall be closed at all times except during parts entry and exit from the machine, during maintenance of the machine when the solvent has been removed, and during addition of

solvent to the machine; and

(13) If a lip exhaust is used on the open top vapor degreaser, the ventilation rate shall not exceed 20 $m^3/min/m^2$ (65 $ft^3/min/ft^2$) of degreaser open area, unless a higher rate is necessary to meet OSHA requirements.

5. In-line Vapor Cleaning Machines. This Section applies to in-line vapor cleaning machines.

A. In-line vapor cleaning machines shall be equipped with:

(1) Either a fully enclosed design or a working and downtime mode cover that completely covers the cleaning machine openings when in place, is free of cracks, holes and other defects, and can be readily opened or closed without disturbing the vapor zone;

(2) A switch (thermostat and condenser flow switch) which shuts off the sump heat if the coolant is not circulating;

(3) Sides which result in a freeboard ratio greater than or equal to 0.75;

(4) A vapor up control switch;

(5) An automated parts handling system which moves the parts or parts baskets at a speed of 11 feet (3.4 meters) per minute or less when the parts are entering or exiting the vapor zone. If the parts basket or parts being cleaned occupy more than 50% of the solvent/air interface area, the speed of the parts basket or parts shall not exceed 3 feet per minute;

(6) A device that shuts off the sump heat if the sump liquid solvent level drops to the sump heater coils;

(7) A vapor level control device that shuts off the sump heat if the vapor level in the vapor cleaning machine rises above the height of the primary condenser;

(8) A permanent, conspicuous label summarizing the operating procedures contained in Subsection 5C, below;

(9) A primary condenser; and

(10) Each machine that uses a lip exhaust shall be designed and operated to route all collected solvent vapors through a properly operated and

maintained carbon adsorber such that the concentration of organic solvent in the exhaust does not exceed 25 parts per million.

B. In addition to the requirements of Section A, the operator of an in-line vapor cleaning machine shall use one of the following devices or strategies:

(1) A freeboard ratio of 1.0 or greater and a superheated vapor system;

(2) A freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point and a freeboard ratio of 1.0 or greater;

(3) Dwell and a freeboard refrigeration device operated to ensure that the chilled air blanket temperature is no greater than 30 percent of the solvent's boiling point. Dwell shall be not less than 35 percent of the dwell time determined for the part or parts; or

(4) Dwell and a carbon adsorber which reduces solvent emissions in the exhaust to a level not to exceed 25 ppm at any time. Dwell shall be not less than 35 percent of the dwell time determined for the part or parts.

C. In-line vapor cleaning machines shall be operated in accordance with the following procedures:

(1) Waste solvent, still bottoms, and sump bottoms shall be collected and stored in closed containers. The closed containers may contain a device that allows pressure relief, but does not allow liquid solvent to drain from the container;

(2) Parts shall be oriented so that the solvent drains freely from the parts. Cleaned parts shall be drained at least 15 seconds or until dripping ceases, whichever is longer. Parts having cavities or blind holes shall be tipped or rotated while the part is draining;

(3) Parts baskets or parts shall not be removed from the in-line vapor cleaning machine until dripping has ceased;

(4) Flushing or spraying of parts using a flexible hose or other flushing device shall be performed within the vapor zone of the in-line vapor cleaning machine or within a Section of the machine that is not exposed to the ambient air. The solvent spray shall be a solid fluid stream, not an atomized or shower spray;

(5) Sponges, fabric, wood, leather, paper products and other absorbent materials shall not be cleaned in the in-line vapor cleaning machine;

(6) Spills during solvent transfer and use of the in-line vapor cleaning machine shall be cleaned up immediately, and the wipe rags or other sorbent material shall be immediately stored in covered containers for disposal or recycling;

(7) Use no workplace fans near the degreaser opening, and ensure that exhaust ventilation does not exceed 20 $m^3/min/m^2$ of degreaser opening, unless a higher rate is necessary to meet OSHA requirements;

(8) During startup of the in-line vapor cleaning machine the primary condenser shall be turned on before the sump heater;

(9) During shutdown of the in-line vapor cleaning machine, the sump heater shall be turned off and the solvent vapor layer allowed to collapse before the primary condenser is turned off;

(10) Spraying operations shall be done in the vapor zone or within a Section of the machine that is not exposed to the ambient air;

(11) When solvent is added to or drained from the in-line vapor cleaning machine, the solvent shall be transferred using threaded or other leakproof couplings and the end of the pipe in the solvent sump shall be located beneath the liquid solvent surface; and

(12) Minimize openings during operation so that entrances and exits silhouette workloads with an average clearance between the parts and the edge of the degreaser opening of less than 10 cm (4 in) or less than 10 percent of the width of the opening.

6. Airless Cleaning Machines and Airtight Cleaning Machines. This Section applies to airless cleaning machines and airtight cleaning machines that process metal parts.

A. The operator of each machine shall maintain a log of solvent additions and deletions for each machine including the weight of solvent contained in activated carbon or other sorbent material used to control emissions from the cleaning machine.

B. The operator of each machine shall demonstrate that the emissions from each machine, on a three-month rolling average, are equal to or less than the allowable

limit determined by the use of Table 1 or the following equation if the volume of the cleaning machine exceeds 2.95 cubic meters:

$$EL = 330\ (vol)^{0.6}$$

where:
EL = the three-month rolling average monthly emission limit (kilograms/month).
vol = the cleaning capacity of machine (cubic meters).

Table 1

EMISSION LIMITS FOR CLEANING MACHINES WITHOUT A SOLVENT/AIR INTERFACE					
Cleaning capacity (cubic meters)	3-Month rolling average monthly emission limit (kilograms/month)	Cleaning capacity (cubic meters)	3-Month rolling average monthly emission limit (kilograms/month)	Cleaning capacity (cubic meters)	3-Month rolling average monthly emission limit (kilograms/month)
0.00	0	1.00	330	2.00	500
0.05	55	1.05	340	2.05	508
0.10	83	1.10	349	2.10	515
0.15	106	1.15	359	2.15	522
0.20	126	1.20	368	2.20	530
0.25	144	1.25	377	2.25	537
0.30	160	1.30	386	2.30	544
0.35	176	1.35	395	2.35	551
0.40	190	1.40	404	2.40	558
0.45	204	1.45	412	2.45	565
0.50	218	1.50	421	2.50	572
0.55	231	1.55	429	2.55	579
0.60	243	1.60	438	2.60	585
0.65	255	1.65	446	2.65	592
0.70	266	1.70	454	2.70	599
0.75	278	1.75	462	2.75	605
0.80	289	1.80	470	2.80	612
0.85	299	1.85	477	2.85	619
0.90	310	1.90	485	2.90	625
0.95	320	1.95	493	2.95	632

C. The operator of each machine equipped with a carbon adsorber shall measure and record the concentration of solvent in the exhaust of the carbon adsorber weekly with a colorimetric detector tube designed to measure a concentration of 100 ppm by volume of solvent to air at an accuracy of +/- 25 ppm by volume. This test shall be conducted while the solvent cleaning machine is in the working mode and is venting to the adsorber.

D. The operator of each machine equipped with a carbon adsorber shall maintain and operate the machine and adsorber system so that emissions from the adsorber exhaust do not exceed 25 ppm by volume measured while the solvent cleaning machine is in the working mode and is venting to the adsorber.

E. The machine shall be equipped with a permanent, conspicuous label summarizing the operating requirements in Subsection F below.

F. Airless cleaning machines and air-tight cleaning machines shall be operated in accordance with the following procedures:

(1) Waste solvent, still bottoms, and sump bottoms shall be collected and stored in closed containers. The closed containers may contain a device that allows pressure relief, but does not allow liquid solvent to drain from the container;

(2) Parts shall be oriented so that the solvent drains freely from the parts. Cleaned parts shall be drained at least 15 seconds or until dripping ceases, whichever is longer. Parts having cavities or blind holes shall be tipped or rotated while the part is draining;

(3) Parts baskets or parts shall not be removed from the in-line vapor cleaning machine until dripping has ceased;

(4) Sponges, fabric, wood, leather, paper products and other absorbent materials shall not be cleaned in the airless cleaning machines and air-tight cleaning machines;

(5) Spills during solvent transfer and use of the airless cleaning machines and air-tight cleaning machines shall be cleaned up immediately, and the wipe rags or other sorbent material shall be immediately stored in covered containers for disposal or recycling;

(6) Work area fans shall be located and positioned so that they do not blow across the airless cleaning machine and air-tight cleaning machine;

(7) Spraying operations shall be done in the vapor zone or within a Section of the machine that is not exposed to the ambient air; and

(8) When solvent is added to or drained from the airless cleaning machine and air-tight cleaning machine, the solvent shall be transferred using threaded or other leakproof couplings and the end of the pipe in the solvent sump shall be located beneath the liquid solvent surface.

7. Alternative Compliance Demonstration. As an alternative to complying with the provisions of Sections 4 through 6 above the operator of a solvent cleaning machine may demonstrate compliance with Subsection A or B below. The operator shall maintain records sufficient to demonstrate compliance. The records shall include, at a minimum, the quantity of solvent added to and removed from the solvent cleaning machine, the dates of the addition and removal and shall be maintained for not less than 2 years.

A. If the cleaning machine has a solvent/air interface, the owner or operator shall:

(1) Maintain a log of solvent additions and deletions for each solvent cleaning machine; and

(2) Ensure that emissions from each solvent cleaning machine are equal to or less than the applicable emission limit presented in Table 2.

Table 2

EMISSION LIMITS FOR BATCH VAPOR AND IN-LINE SOLVENT CLEANING MACHINES WITH A SOLVENT/AIR INTERFACE

Solvent cleaning machine	3-month rolling average monthly emission limit	
	kg/m^2/month	lb/ft^2/month
Batch vapor solvent cleaning machines	150	30.7
Existing in-line solvent cleaning machines	153	31.3
New in-line solvent cleaning machines	99	20.2

B. If the cleaning machine is a batch vapor cleaning machine and does not have a solvent/air interface, the owner or operator shall:

(1) Maintain a log of solvent additions and deletions for each solvent cleaning machine; and

(2) Ensure that the emissions from each solvent cleaning machine are

equal to or less than the appropriate limits as described in Subsections C and D of this Section. Each owner or operator of a batch vapor or in-line cleaning machine complying with Section 7 shall demonstrate compliance with the applicable 3-month rolling average monthly emission limit on a monthly basis.

C. For cleaning machines with a cleaning capacity that is less than or equal to 2.95 cubic meters, the emission limit shall be determined using the Table 1 or the equation in Subsection D. If the table is used, and the cleaning capacity of the cleaning machine falls between two cleaning capacity sizes, then the lower of the two emission limits applies.

D. For cleaning machines with a cleaning capacity that is greater than 2.95 cubic meters, the emission limit shall be determined using the following equation.

$$EL = 330\ (vol)^{0.6}$$

where:

EL = the 3-month rolling average monthly emission limit (kilograms/month).
vol = the cleaning capacity of machine (cubic meters).

E. Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with Section 7 shall demonstrate compliance with the applicable 3-month rolling average monthly emission limit on a monthly basis. If the applicable 3-month rolling average emission limit is not met, an exceedance has occurred. All exceedances shall be reported to the Department within 30 days of the determination of the exceedance.

8. Batch Vapor or In-line Solvent Cleaning Machine Complying with 7. Alternative Compliance Demonstration. The owner or operator of a batch vapor or in-line solvent cleaning machine complying with Section 7 shall maintain records and determine compliance with the applicable provisions in accordance with the following.

A. On the first operating day of every month ensure that the solvent cleaning machine system contains only clean liquid solvent. This includes, but is not limited to, fresh unused solvent, recycled solvent and used solvent that have been cleaned of soils. A fill line must be indicated during the first month the measurements are made. The solvent level within the machine must be returned to the same fill-line each month, immediately prior to calculating monthly emissions as specified in Section 8. The solvent cleaning machine does not have to be emptied and filled with fresh unused solvent prior to the calculations.

B. Using the records of all solvent additions and deletions for the previous monthly reporting period, determine solvent emissions (E) using one of the following equations:

For cleaning machines with a solvent/air interface:

$$E = \frac{SA-LSR-SSR}{AREA}$$

where:

E = the total VOC solvent emissions from the solvent cleaning machine during the most recent monthly reporting period (kilograms of solvent per square meter of solvent/air interface area per month);

SA = the total amount of VOC liquid solvent added to the solvent cleaning machine during the most recent monthly reporting period (kilograms of solvent per month);

LSR = the total amount of VOC liquid solvent removed from the solvent cleaning machine during the most recent monthly reporting period (kilograms of solvent per month);

SSR = the total amount of VOC solvent removed from the solvent cleaning machine in solid waste during the most recent monthly reporting period (kilograms of solvent per month) determined from tests conducted using 40 CFR Part 60 Appendix A Method 25D or by engineering calculations included in the compliance report; and

AREA = the solvent/air interface area of the solvent cleaning machine (square meters).

For cleaning machines without a solvent/air interface:

$$E = SA - LSR - SSR$$

where:

E = the total VOC solvent emissions from the solvent cleaning machine during the most recent monthly reporting period 1, (kilograms of solvent per month);

SA = the total amount of VOC liquid solvent added to the solvent cleaning machine during the most recent monthly reporting period (kilograms of solvent per month);

LSR = the total amount of VOC liquid solvent removed from the solvent cleaning

machine during the most recent monthly reporting period (kilograms of solvent per month); and

SSR = the total amount of VOC solvent removed from the solvent cleaning machine in solid waste during the most recent monthly reporting period (kilograms of solvent per month) determined from tests conducted using EPA reference method 25d or by engineering calculations included in the compliance report.

C. Determine the monthly rolling average, EA, for the 3-month period ending with the most recent reporting period using one of the following equations:

For cleaning machines <u>with</u> a solvent/air interface:

$$EA = (E_1 + E_2 + E_3) / 3$$

where:

EA = the average VOC solvent emissions over the preceding 3 monthly reporting periods, (kilograms of solvent per square meter of solvent/air interface area per month).

E = VOC solvent emissions for each month (E_1, E_2, E_3) for the most recent 3 monthly reporting periods (kilograms of solvent per square meter of solvent/air interface area).

E_1 = the most recent monthly reporting period.

E_2 = the monthly reporting period immediately prior to E_1.

E_3 = the monthly reporting period immediately prior to E_2.

For cleaning machines <u>without</u> a solvent/air interface

$$EA = (E_1 + E_2 + E_3) / 3$$

where:

EA = the average VOC solvent emissions over the preceding 3 monthly reporting periods (kilograms of solvent per month).

E = VOC solvent emissions for each month (E_1, E_2, E_3) for the most recent 3 monthly reporting periods (kilograms of solvent per month).

E_1 = the most recent monthly reporting period.

E_2 = the monthly reporting period immediately prior to E_1.

E_3 = the monthly reporting period immediately prior to E_2.

9. Monitoring and Record Keeping. The owner or operator of a solvent cleaning machine shall maintain a monthly record of the amount of solvent added to the unit and keep such records for a period of two years. In addition, the operator of a solvent cleaning machine subject to the provisions of Sections 4 though 6 of this Chapter shall conduct monitoring and record keeping as outlined below. These records shall be maintained for a period of six years:

A. If a freeboard refrigeration device is used to comply with these standards, the owner or operator shall use a thermometer or thermocouple to measure the temperature at the center of the air blanket during the idling mode. Measurements and recordings shall be made weekly;

B. If a superheated vapor system is used to comply with these standards, the owner or operator shall use a thermometer or thermocouple to measure the temperature at the center of the superheated solvent vapor zone while the solvent cleaning machine is in the idling mode. Measurements and recordings shall be made weekly;

C. If a cover (working-mode, downtime-mode, and/or idling-mode cover) is used to comply with these standards, the owner or operator shall conduct a visual inspection to determine if the cover is opening and closing properly, completely covers the cleaning machine openings when closed, and is free of cracks, holes, and other defects. Observations and recordings shall be made weekly;

D. If dwell is used, the owner or operator shall determine the actual dwell time by measuring the period of time that parts are held within the freeboard area of the solvent cleaning machine after cleaning. Observations and recordings shall be made monthly;

E. The owner or operator shall determine the hoist speed by measuring the time it takes for the hoist to travel a measured distance. The speed is equal to the distance in meters divided by the time in minutes (meters per minute). Measurements and recordings shall be made monthly;

F. The owner or operator of a batch vapor or in-line solvent cleaning machine complying using reduced room draft, maintained by controlling room parameters

(i.e., redirecting fans, closing doors and windows, etc.), shall conduct monitoring and record the results as follows:

(1) Initially measure the windspeed within 6 inches above the top of the freeboard area of the solvent cleaning machine in accordance with the following:

(a) Determine the direction of the wind current by slowly rotating a velometer or similar device until the maximum speed is located;

(b) Orient a velometer in the direction of the wind current at each of the four corners of the machine;

(c) Record the reading for each corner; and

(d) Average the values obtained at each corner and record the average wind speed.

(2) Record the room parameters established during the initial compliance test to achieve the reduced room draft;

(3) Quarterly monitor of the windspeed in accordance with paragraph (1); and

(4) Weekly monitoring of the room parameters established during the initial compliance test to achieve the reduced room draft.

G. If an enclosure (full or partial) is used to achieve reduced room draft, the owner or operator shall conduct an initial monitoring test and, thereafter, monthly monitoring tests of the windspeed within the enclosure by slowly rotating a velometer inside the entrance to the enclosure until the maximum speed is located and record the maximum wind speed. The owner or operator shall also conduct a monthly visual inspection of the enclosure to determine if it is free of cracks, holes and other defects.

H. The owner or operator using a carbon adsorber to comply with this Chapter shall measure and record the concentration of VOC solvent in the exhaust of the carbon adsorber weekly with a colorimetric detector tube. This test shall be conducted while the solvent cleaning machine is in the working mode and is venting to the carbon adsorber. The exhaust concentration shall be determined using a colorimetric detector tube designed to measure a concentration of 25 parts per million by volume of solvent in air to an accuracy of plus or minus 25 parts per million by volume or as approved by the DEP and EPA. The concentration

shall be determined through a sampling port for monitoring within the exhaust outlet that is easily accessible and located at least 2 stack or duct diameters upstream or downstream from any flow disturbance such as a bend, expansion, contraction, or outlet and downstream from no other inlet, or as approved by DEP and EPA.

I. All records shall be made available to the Department or EPA upon request.

10. **Compliance Schedule.** Unless otherwise noted, the owner or operator of a solvent cleaning machine subject to the requirements of this Chapter shall be in compliance with all of the applicable provisions of this Chapter upon the effective date of the regulation."

AUTHORITY:	38 M.R.S.A. Section 585-A
EFFECTIVE DATE:	February 10, 1993 Amended June 28, 2004

BASIS STATEMENT FOR FEBRUARY 10, 1993

In the State of Maine, nine counties are classified as nonattainment for the federal ozone air quality standard. Ground-level ozone formation is caused in part by solvent metal cleaning operations that emit volatile organic compounds (VOC).

This regulation of solvent degreasers minimizes VOC emissions through equipment and operation standards. Under Section 184 of the Clean Air Act Amendments of 1990, the State of Maine must submit plans to control VOC from all sources covered by a Control Technique Guideline (CTG) issued before November 15, 1990.

In addition to the Basis Statement above, the Department has filed with the Secretary of State its response to comments received during the comment period.

BASIS STATEMENT FOR AMENDMENT OF JUNE 17, 2004

Maine approved a Memorandum of Understanding with other OTC states to increase ozone control measures. It has revised its current Solvent Cleaner rule to be consistent with the OTC Model Rule. As a result Maine expects to reduce its statewide emissions of VOCs by another 6 tons per summer day.

Maine is required to adopt and submit this revised rule as part of the settlement in a consent decree: *Sierra Club, et al. v. Leavitt*, U.S. District Court for the District of Columbia, Case No.: 1:00CV02206.

Users of cleaning machines that use Hazardous Air Pollutants (HAPs) are put on notice that they are likely to be subject to 40 CFR Part 63 Subpart T " National Emissions Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning."

In addition to the Basis Statement above, the Department has filed with the Secretary of State its Supplementary Basis Statement consisting of response to comments received during the comment period.