REGULATION IV
PROHIBITIONS

RULE 433 ORGANIC SOLVENT CLEANING

(Adopted 6-15-94; Revised 3-26-97 and 1-17-01.)

PART 1 GENERAL

1.1 Purpose

The purpose of this Rule is to limit emissions of volatile organic compounds (VOC) during solvent cleaning and degreasing operations.

1.2 Applicability

The provisions of this Rule shall apply to the operation of all cleaning devices using volatile organic compounds for solvent cleaning and degreasing. Other standards,

such as the Halogenated Solvents National Emissions Standards for Hazardous Air Pollutants, may also regulate the usage of such compounds as trichloroethylene.

1.3 Exemptions

1.3.1 Solvent cleaning operations using solvent (including emulsions) containing no more than 2 percent of volatile organic compounds by weight (as determined by EPA Method 24) shall not be subject to the requirements of this Rule.

1.3.2 Cold cleaners with less than 1 square foot (929 square centimeters) of evaporative surface area are exempt from the equipment requirements of Section 3.2 of this Rule, except for the requirement that the cleaners be covered when work is not being processed.

1.3.3 Batch loaded vapor cleaners with less than 10.8 square feet (1 square meter) of evaporative surface area are exempt from the requirements of Section 3.2.4.6 of this Rule.

1.3.4 Conveyorized vapor cleaners with less than 21.5 square feet (2 square meter) of evaporative surface area are exempt from the requirements of Section 3.2.6.7 of this Rule.

1.4 Effective Dates

This Rule as most recently revised is effective on January 17, 2001.

1.5 References

The requirements of this Rule arise from the provisions of Section 182(b)(2) of the federal Clean Air Act as amended (Title 42 United States Code Section 7401 *et seq.*)

PART 2 DEFINITIONS

2.1 Air-Vapor Interface

For vapor solvent cleaners, the top of the solvent-vapor layer, and the air touching

this layer. The effective top of the vapor layer may be determined as the maximum height at which condensation occurs on a cold metal object lowered into the vapor zone.

2.2 Batch-loaded

Material placed in a non-conveyorized container for cleaning which is removed after cleaning is complete.

2.3 Cold Cleaner

Any cleaner using solvent which is maintained below the initial boiling point temperature. Such cleaners include, but are not limited to, spray sinks and batch-loaded dip tanks.

2.4 Condenser

A device, such as cooling coils, used to condense (liquify) solvent vapor.

2.5 Condenser Flow Switch

A safety switch connected to a thermostat which shuts off the sump heater if the condenser coolant is either not circulating or exceeds its designed operating temperature.

2.6 Conveyorized Solvent Cleaner

Any cleaner which uses a continuous, mechanical system for moving materials or parts to be cleaned into and out of a solvent liquid or vapor cleaning zone.

2.7 Emissions Control Device

A device which removes or destroys emissions of VOC to the atmosphere from the exhaust stream of a process.

2.8 Emulsion

A suspension of small droplets of one liquid in a second liquid.

2.9 Evaporation

To change into a vapor from a liquid state.

2.10 Evaporative Surface Area (for Cold Cleaner)

The surface area of the top of the solvent. For a remote reservoir cold cleaner, the surface area of the solvent sink or work area.

2.11 Evaporative Surface Area (for Vapor Solvent Cleaner)

The surface area of the top of the solvent vapor-air interface.

2.12 Evaporative Surface Area (for Conveyorized Solvent Cleaner)

2.12.1 Cold Cleaner: The surface area of the top of the solvent.

2.12.2 Vapor Solvent Cleaner: The surface area of the top of the solvent vapor-air interface.

2.13 Exempt Compounds

As defined in District Rule 101 (Definitions).

2.14 Freeboard Height

2.14.1 For Cold Cleaners: The vertical distance from the top of the solvent, or the solvent drain of a remote reservoir cold cleaner, to the top of the cold cleaner.

2.14.2 For Batch-loaded Vapor Solvent Cleaners: The vertical distance from the top of the solvent vapor-air interface to the bottom of the lowest opening in the solvent cleaner where vapors can escape.

2.14.3 For Conveyorized Solvent Cleaners:

2.14.3.1 For non-boiling solvent, the vertical distance from the top of the solvent to the bottom of the lowest opening in the solvent cleaner where vapors can escape.

2.14.3.2 For boiling solvent, the vertical distance from the top of the solvent vapor-air interface to the bottom of the lowest opening in the solvent cleaner where vapors can escape.

2.15 Freeboard Ratio

The freeboard height divided by the smaller of the inside length or the inside width of the solvent cleaner evaporative area.

2.16 Initial Boiling Point

The boiling point of a solvent as defined by ASTM D-1078-86, or its successors as amended.

2.17 Leak

A volatile organic compound-containing liquid leak from the degreaser at a rate of three (3) or more drops per minute.

2.18 Lip Exhaust

A system which collects solvent vapors escaping from the top of a cleaner.

2.19 Low Volatility Solvent

A solvent with an initial boiling point which is greater than 248°F (120°C) and with a temperature as used, at least 180°F (100°C) below the initial boiling point.

2.20 Make-up Solvent

That solvent added to the solvent cleaning operation to replace solvent lost through evaporation or other means.

2.21 Refrigerated Freeboard Chiller

A secondary cooling coil mounted above the primary condenser which provides a chilled air blanket above the solvent vapor air-interface to cause the condensation of additional solvent vapor.

2.22 Remote Reservoir Cold Cleaner

A cold cleaner connected to a tank which is completely enclosed except for a solvent return opening no larger than 15.5 square inches (100 square centimeters) which allows used solvent to drain into it from a separate solvent sink or work area and which is not accessible for soaking workloads.

2.23 Solvent

Compounds, excluding water, which are used as diluents, thinners, dissolvers, viscosity reducers, cleaning agents, degreasing agents or for other similar uses.

2.24 Spray Safety Switch

A manually reset switch which shuts off the spray pump if the vapor level drops more than 4 inches (10 cm).

2.25 Ultrasonics

Enhancement of the cleaning process by agitation of liquid solvents with high frequency sound wave vibrations.

2.26 Vapor Level Control Thermostat

A manually reset safety switch which turns off the sump heater if the thermostat senses the temperature rising above the designed operating level at the air-vapor interface.

2.27 Vapor Solvent Cleaner

Any solvent cleaner that cleans through the condensation of hot solvent vapor on colder workloads.

2.28 Volatile Organic Compound (VOC)

As defined in District Rule 101 (Definitions).

2.29 Volatile Solvent

Any solvent that is not a low volatility solvent (refer to Section 2.19 for definition of low volatility solvent).

2.30 Waste Solvent Residue

Material which may contain dirt, oil, metal particles, and/or other waste products concentrated after distillation of the waste solvent either in the solvent cleaner itself or after distillation in a separate still.

2.31 Wipe Cleaning

That method of cleaning which utilizes a material such as a rag wetted with a solvent, coupled with physical rubbing to remove contaminants from surfaces.

2.32 Workload

The objects put in a cleaner for the purpose of removing oil, grease, soil, coating, dirt or other undesirable matter from the surface of the objects.

2.33 Workload Area

The plane geometric surface area of the top of the submerged parts basket, or the combined plane geometric surface area(s) displaced by the submerged workload, if no basket is used.

PART 3 REQUIREMENTS AND STANDARDS

3.1 Operational Requirements

3.1.1 All Cleaners

3.1.1.1 Cleaners shall not be operated when a leak is present in the system.

3.1.1.2 All solvent, including waste solvent and waste solvent residues, shall be stored in closed containers at all times. The containers shall have a label indicating the name of the solvent/material they contain.

3.1.1.3 Solvent cleaners, except remote reservoir cold cleaners using low volatility solvent, shall be covered except to process work or to perform maintenance.

3.1.1.4 Solvent carry-out shall be minimized by the following methods, as applicable:

3.1.1.4.1 Use a device whereby pools of solvent can be drained.

3.1.1.4.2 Limit the vertical speed of a powered hoist, if one is used, to not more than 11 feet per minute (3.3 meters per minute).

3.1.1.4.3 In vapor degreasers, maintain the workload below the air-vapor interface until condensation ceases.

3.1.1.4.4 For manual operation, tip out any pools of solvent remaining on the cleaned parts before removing them from the cleaner, and

3.1.1.4.5 Do not remove parts from the solvent cleaner until visually dry and all dripping ceases. This requirement does not apply to emulsion cleaner workload that is rinsed with water within the cleaner immediately after cleaning.

3.1.1.5 Solvent agitation shall be achieved using pump recirculation, a mixer, or ultrasonics. Air agitation shall not be used.

3.1.1.6 Solvent spray shall only be a continuous fluid stream. An atomized or

shower type spray shall not be used. In conveyorized cleaners, a shower type spray may be used provided that the spray is conducted in a totally confined space that is separated from the atmosphere.

3.1.1.7 Any solvent spray system shall not be used in a manner such that liquid solvent splashes outside the container.

3.1.1.8 For those cleaners equipped with water separators, no water shall be visually detectable in the solvent exiting the water separator.

3.1.1.9 Wipe cleaning materials containing solvent shall be kept in closed containers at all times, except during use.

3.1.1.10 A cleaner shall not be located where drafts of air are directed across the cleaner.

3.1.1.11 Drain cleaned material, within the freeboard area, so that the drained solvent is returned to the container.

3.1.2 Additional Operational Requirements for Batch-loaded and Conveyorized Vapor Cleaners

In addition to the operational requirements for all cleaners specified above in Section 3.1.1, the following operating requirements shall apply:

3.1.2.1 The workload area shall not occupy more than half the evaporative surface area of the solvent cleaner.

3.1.2.2 Any spray must be kept below the top of the air-vapor interface.

3.2 Equipment Requirements

3.2.1 All cleaners shall be equipped with the following:

3.2.1.1 Except for remote reservoir cold cleaners using low volatility solvents, an apparatus or cover(s) to reduce solvent evaporation.

3.2.1.2 A permanent, conspicuous label summarizing the applicable operating requirements contained in Section 3.1.

3.2.1.3 A device for draining cleaned parts which permits the drained solvent to be

returned to the cleaner solvent tank.

3.2.2 Additional Equipment Requirements for Remote Reservoir Cold Cleaners:

In addition to the equipment requirements for all cleaners specified above in Section 3.2.1, 3.2.2, remote reservoir cold cleaners shall be equipped with the following:

3.2.2.1 A sink or work area which is sloped sufficiently towards the drain to prevent pooling of solvent.

3.2.2.2 A single drain hole, not larger than 15.5 square inches (100 square centimeters) in area, for the solvent to flow from the sink into the enclosed reservoir.

3.2.2.3 Except for remote reservoir cold cleaners using low volatility solvents, a drain plug or a cover for placement over the top of the sink, when the equipment is not in use.

3.2.3 Additional Equipment Requirements for Cold Cleaners:

In addition to the equipment requirements for all cleaners specified above in Section 3.2.1, 3.2.2, Cold Cleaners shall be equipped with the following:

3.2.3.1 For cold cleaners using volatile solvents, a cover that is a sliding, rolling or guillotine (bi-parting) type which is designed to easily open and close.

3.2.3.2 A permanent, conspicuous mark locating the maximum allowable solvent level conforming to the applicable freeboard requirements.

3.2.3.3 Freeboard Requirement:

3.2.3.3.1 Cold cleaners using solvents which are agitated, heated above 120°F (50°C) or volatile solvents, shall operate with a freeboard ratio equal to or greater than 0.75.

3.2.3.3.2 A water cover at least 1 inch deep may be used as an acceptable control method to meet the freeboard requirement, if the solvent is insoluble in water and has a specific gravity greater than 1.

3.2.4 Additional Equipment Requirements for Batch-loaded Vapor Cleaners:

In addition to the equipment requirements for all cleaners specified above in Section 3.2.1, 3.2.2, Batch-loaded Vapor Cleaners shall be equipped with the following:

3.2.4.1 A cover that is a sliding, rolling or guillotine (biparting) type which is designed to easily open and close without disturbing the vapor zone.

3.2.4.2 A vapor level control thermostat.

3.2.4.3 A condenser flow switch.

3.2.4.4 A spray safety switch.

3.2.4.5 A primary condenser.

3.2.4.6 In addition to the above, cleaners with an evaporative surface area greater than or equal to 10.8 square feet (1 square meter), shall be equipped with one of following:

3.2.4.6.1 A refrigerated freeboard chiller for which the chilled air blanket temperature (expressed in °F) at the coldest point on the vertical axis in the center of the air-vapor interface shall be no greater than 30 percent of the initial boiling point (expressed in °F) of the solvent used or no greater than 40°F. If the chiller operates below the freezing temperature of water, it shall be equipped with an automatic defrost.

3.2.4.6.2 A freeboard ratio greater than or equal to 0.75.

3.2.4.6.3 An enclosed design in which the cover or door opens only when the dry part is actually entering or exiting the cleaner.

3.2.5 Additional Equipment Requirements for Conveyorized Cold Cleaners:

In addition to the equipment requirements for all cleaners specified above in Section 3.2.1, 3.2.2, Conveyorized Cold Cleaners shall be equipped with the following:

3.2.5.1 A rotating basket or other method, to prevent cleaned parts from carrying out solvent liquid.

3.2.5.2 Minimized entrance and exit openings which silhouette the work loads such

that the average clearance between material and the edges of the cleaner openings is less than 4 inches (10 centimeters) or less than 10 percent of the opening width.

3.2.5.3 Cleaners using solvents which are either agitated, heated above 120°F (50°C) or are volatile, shall operate with a freeboard ratio equal to or greater than 0.75.

3.2.5.4 A water cover at least 1 inch deep may be used as an acceptable control method to meet the freeboard requirement of Section 3.2.5.3, if the solvent is insoluble in water and has a specific gravity greater than 1.

3.2.6 Additional Equipment Requirements for Conveyorized Vapor Cleaners:

In addition to the equipment requirements for all cleaners specified above in Section 3.2.1, 3.2.2, Conveyorized Vapor Cleaners shall be equipped with the following:

3.2.6.1 An enclosed drying tunnel or other method, such as a rotating basket, sufficient to prevent cleaned parts from carrying out solvent liquid.

3.2.6.2 Minimized entrance and exit openings which silhouette the work loads such that the average clearance between material and the edges of the cleaner openings is less than 4 inches(10 centimeters) or less than 10 percent of the opening width.

3.2.6.3 A primary condenser.

3.2.6.4 A vapor level control thermostat.

3.2.6.5 A condenser flow switch.

3.2.6.6 A spray safety switch.

3.2.6.7 In addition to the above, cleaners with an evaporative surface area greater than or equal to 21.5 square feet (2 square meters), shall be equipped with one of the following:

3.2.6.7.1 A freeboard ratio greater than or equal to 0.75.

3.2.6.7.2 A refrigerated freeboard chiller for which the chilled air blanket temperature (expressed in °F) at coldest point on the vertical axis in

center of the air-vapor interface shall be greater than 30 percent of the initial boiling point (expressed in °F) of the solvent used or no greater than 40°F. If the chiller operates below freezing temperature of water, it shall equipped with an automatic defrost.

3.3 Alternative Control Requirements

A system to collect emissions which are vented to an emissions control device may be used to satisfy the requirements of Sections 3.2.3.3, 3.2.4.6, 3.2.5.3, 3.2.6.7, provided that the combined efficiency (the capture efficiency multiplied by the control efficiency) of the total system shall not be less than 81 percent by weight in reducing total non-methane hydrocarbons as determined by EPA Method 25. The collection system shall have a ventilation rate not greater than 65 cubic feet per minute per square foot (20 cubic meters per minute per square meter) over the total area of the solvent cleaner openings unless the rate must be changed to meet Federal or State Occupational Safety and Health Administration requirements.

3.4 Prohibitions

3.4.1 A lip exhaust system shall not be added to any cleaner, unless it is vented to a control device, as described in Section 3.3.

3.4.2 No person shall install or operate any solvent cleaning or degreasing equipment that does not conform with the provisions of this Rule.

3.4.3 The cleaning of porous or absorbent materials such as cloth, leather, wood or rope is prohibited.

PART 4 ADMINISTRATIVE REQUIREMENTS

4.1 Record Keeping

4.1.1 The operator of any equipment subject to this Rule shall maintain the following dated records:

4.1.1.1 On a monthly basis, record the facility-wide total volume of make-up solvent used, and waste solvent disposed of or recycled, for all cleaners,

except for remote reservoir cold cleaners which are serviced by an independent contractor. For such remote reservoir cold cleaners, evidence of service shall be required instead.

4.1.1.2 All records shall be retained for a minimum of five (5) years from the date of each entry. All records shall be made available to the Air Pollution Control Officer upon request.

4.2 Record Keeping Requirements for Emission Control Devices

Any person using an emission control system as a means of complying with this Rule shall maintain daily records of key operating and maintenance procedures which will demonstrate continuous operation and compliance of the emission control device during periods of emission producing activities. Key system operating parameters are those necessary to ensure compliance with the percent reduction requirements such as temperatures, pressures and flow rates.

4.3 Test Methods

4.3.1 Initial Boiling Point of Solvent

The initial boiling point of the solvent shall be determined by ASTM D-1078-86, or its successors as amended.

4.3.2 Capture Efficiency

The capture efficiency of an emissions control device shall be determined according to EPA's technical document, "Guidelines for Determining Capture Efficiency," January 9, 1995.

4.3.3 Control Efficiency

The control efficiency of an emissions control device shall be determined using EPA Methods 2, 2A, 2C, or 2D for measuring flow rates and EPA Methods 25, 25A, or 25B for measuring the total gaseous organic concentrations at the inlet and outlet of the emissions control device as contained in 40 Code of Federal Regulations Part 60, Appendix A.

4.3.4 Volumetric Flow Rate

Volumetric flow rate shall be determined by EPA Methods 2, 2A, 2C and 2D.

4.3.5 Exempt Compounds Content

4.3.5.1 The quantity of exempt compounds and water in water-based solvents subject to this Rule shall be determined using Bay Area Air Quality Management District Method 31 (Determination of Volatile Organic Compounds in Paint Strippers, Solvent Cleaners and Low-Solids Coatings).

4.3.5.2 The quantity of exempt compounds in any other class of solvents subject to this Rule shall be performed in accordance with ASTM D-4457-85 (Solvents and Coatings), or its successors as amended, and be consistent with the provisions set forth in the Federal Register (FR, Vol. 56, No. 52, March 18, 1991).

4.3.6 Volatile Organic Compounds Content

4.3.6.1 The VOC content of any water-based solvent subject to this Rule shall be determined using Bay Area Air Quality Management District Method 31 (Determination of Volatile Organic Compounds in Paint Strippers, Solvent Cleaners and Low-Solids Coatings).

4.3.6.2 The VOC content of any other solvent subject to this Rule shall be determined using EPA Method 24 (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings) in 40 Code of Federal Regulations Part 60, Appendix A.

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