

Rule 229 Solvent Cleaning Operations (Degreasing)

1.0 General

1.1 Applicability

This rule shall apply to operations in portions of the Northern Sierra Air Quality Management District (AQMD) that are designated as Non-attainment for any federal ambient air quality standard for ozone and which use organic solvents for cleaning of metal and non-metallic parts and products. There shall be no solvent cleaning of porous or absorbent materials (e.g. cloth, leather, wood, rope, etc.) in any degreasing operation.

1.2 Exemptions

1.2.1 Requirements of this Rule shall not apply to operations resulting in potential emissions, in aggregate, of less than 15 lbs in any one day of VOCs, as determined by the APCO.

1.2.2 Requirements of this Rule shall not apply to wipe cleaning.

1.2.3 Requirements of this Rule shall not apply to cold solvent cleaners having reservoir capacities of 5.0 gallons or less or having an evaporative area of less than 1.0 ft² (0.09 m²) as long as the reservoir is covered when not in use.

1.2.4 Open-top and conveyorized vapor degreasers which have an air-vapor interface area less than 1.0 m² (10.7 ft²) are exempt from Sections 3.7.2(2) and 3.7.2(4).

2.0 Definitions

2.1 Cold Cleaner: Any batch loaded, non-boiling solvent degreaser.

2.2 Conveyorized Degreaser: Any continuously loaded, conveyorized solvent degreaser, either boiling or non-boiling.

2.3 Freeboard Height: For cold cleaning tanks, freeboard height means the distance from the top of the solvent or solvent drain to the top of the tank. For vapor degreasing tanks, freeboard height means the distance from the solvent vapor-air interface to the top of the degreaser.

2.4 Freeboard Ratio: The freeboard height divided by the width of the degreaser.

2.5 Make-up Solvent: A solvent lost through evaporation, carryout, splashing, leakage, or disposal.

2.6 Open-top Vapor Degreaser: Any batch loaded, boiling degreaser.

2.7 Refrigerated Freeboard Chiller: Any equipment mounted above the condenser equipment which carries a refrigerant (typically in the range -30 to 5°C) to provide a chilled air blanket above the solvent vapor, to reduce emissions from a vapor degreaser.

2.8 Remote Reservoir: A liquid solvent container which is completely enclosed except for a drain opening which allows used non-boiling solvent to drain into it from a separate solvent sink or work area and which is not accessible for immersing parts.

2.9 Solvent: Any organic compound or combination of organic compounds used for the purpose of dissolving oils, grease, waxes, tars, or other substances.

2.10 Ultrasonics: Enhancement of the cleaning process by vibrating the solvent with high frequency sound waves, causing the implosion of microscopic vapor cavities within the liquid solvent.

2.11 VOC: Volatile Organic Compound, as defined in the Federal Register.

2.12 Wipe Cleaning: A method of cleaning which utilizes a material such as a rag wetted with a solvent, coupled with a physical rubbing process to remove contaminants from metal surfaces.

3.0 Equipment Requirements

Any person who employs solvent cleaning (degreasing), shall utilize, unless otherwise exempted by this rule, a device for such cleaning, which includes the following:

3.1. Container

A container (degreaser) for the solvent and the articles being cleaned.

3.2 Cover

An apparatus or cover which prevents the solvent from evaporating when not processing work in the degreaser.

3.2.1 For cold solvent cleaning, if the initial boiling point of the solvent as defined by ASTM D-1078-78 is less than 248°F (120°C) or if the solvent is heated, or if the solvent is agitated, then the cover must be designed so that it can be opened and closed easily with one hand.

3.2.2 For open-top vapor degreasers, the cover shall be designed such that it can be opened and closed easily without disturbing the vapor zone.

3.2.3 For conveyORIZED degreasers, covers shall be provided for closing off the entrance and exit during shutdown hours.

3.3 Solvent Return Mechanism

A facility for draining cleaned parts such that the drained solvent is returned to the container.

3.4 Label

A permanent and conspicuous label, which lists the appropriate operating requirements contained in Section 4.

3.5 Cold Solvent Cleaning – General Equipment

For cold solvent cleaning, if the initial boiling point of the solvent as defined by ASTM D-1078-78 is less than 248°F (120°C) or if the solvent is heated above 50°C, then one of the following control devices shall be used:

3.5.1 A freeboard such that the freeboard ratio is greater than or equal to 0.75.

3.5.2 A water cover if the solvent is insoluble in and heavier than water.

3.5.3 For cold cleaning degreasing, if the solvent initial boiling point as defined by ASTM D-1078-78 is less than 248°F (120°C) then the drainage facility must be internal so that the parts are enclosed under the cover while draining. The drainage facility may be external for applications where an internal type cannot fit the cleaning system.

3.6 Cold Solvent Cleaning – Remote Reservoir Equipment

Remote reservoir cold cleaners shall be equipped with the following:

3.6.1 A tank or sink-like work area which is sloped sufficiently to preclude pooling of solvent.

3.6.2 A single drain hole, less than 100 square centimeters (15.5 square inches) in area, for the solvent to flow from the sink into the enclosed reservoir.

3.6.3 A freeboard height of at least six inches (14 cm).

3.6.4 A cover for the drain when no work is being processed in the degreaser.

3.7 Open Top Vapor Degreasers and Conveyorized Degreasers

If open-top vapor degreasing or conveyorized degreasing are employed, then the following equipment shall be utilized:

3.7.1 All of the following safety devices:

1. A device which shuts off the sump heat if either the condenser coolant stops circulating or becomes warmer than specified and an operating temperature indicator.
2. For degreasers of the spray type, a device which prevents spray pump operation unless the solvent vapor level is at the designed operating level.
3. A device (of the manual reset type) which shuts off the sump heat if the solvent vapor level rises above the designed operating level.

3.7.2 At least one of the following major control methods or devices:

1. Freeboard with freeboard ratio greater than or equal to 0.75.
2. A freeboard chiller where the chilled air blanket temperature measured in degrees F at the coldest point on the vertical axis in the center of the solvent cleaner shall be no greater than 30% of the initial boiling point of the solvent or 41°F (5°C).
3. A carbon adsorption system which ventilates the air vapor interface at a minimum rate of 15 m³/min/m², but not greater than 20 m³/min/m², and with a solvent vapor concentration exiting the exhaust duct of the carbon absorber less than 25 ppm solvent average over one complete adsorption cycle.
4. Where add-on control equipment is utilized collection efficiency shall be determined by the EPA document "Guidelines for Developing Capture Efficiency Protocols," 55 Federal Register 26865, June 29, 1990.

3.7.3 For conveyorized degreasers, both of the following devices:

1. A drying tunnel, or another means such as a rotating basket, sufficient to prevent cleaned parts from carrying out solvent liquid or vapor.
2. Minimized opening: entrances and exits should silhouette work loads so that the average clearance between parts and the edge of the degreaser opening is either less than 4 inches (10 cm) or less than 10 percent of the width of the opening.

3.7.4 Workplace fans shall not be used in a manner that disturbs the air/vapor interface.

4.0 Operating Requirements

Any person who employs solvent metal cleaning (degreasing) must conform, unless otherwise exempted by this rule to the following operating requirements:

4.1 Operate and maintain the degreasing equipment and emission control equipment in proper working order.

4.2 Do not allow any solvent to leak from any portion of the degreasing equipment.

Liquid solvent leaks shall be repaired immediately or the equipment shall be shut down.

4.3 Do not store or dispose of any solvent, including waste solvent, in such a manner as will cause or allow its evaporation into the atmosphere.

4.4 Do not remove or open any device designed to close the degreaser unless processing work in the degreaser or performing maintenance on the degreaser.

- 4.5 Drain cleaned parts for at least 15 seconds after cleaning or until dripping ceases (applies to cold solvent cleaning only).
- 4.6 If using a solvent flow, use only a continuous, fluid stream (not a fine, atomized, or shower type spray) at a pressure which does not cause liquid solvent to splash outside of the solvent container.
- 4.7 Perform solvent agitation, where necessary, through pump recirculation, ultrasonics, or by means of a mixer, rather than through bubbling or air agitation of the solvent bath.
- 4.8 For open-top vapor degreasers:
- 4.8.1. Rack parts to facilitate drainage.
 - 4.8.2. Move parts in and out of the degreaser at less than 10.8 ft (3.3 m)/min.
 - 4.8.3. Degrease the work load in the vapor zone at least 30 seconds or until condensation ceases.
 - 4.8.4. Allow parts to dry within the degreaser until visually dry. Minimize carryout in open-top vapor degreasers by tipping out any pools of solvent on the cleaned parts before removal.
 - 4.8.5. Work loads shall not occupy more than half of the degreaser's open-top area.
 - 4.8.6. All solvent spraying shall be done at least 4 inches (10 cm) below the top of the vapor level.
 - 4.8.7. The vapor level shall not drop more than 4 inches (10 cm) when a work load enters the vapor zone.
- 4.9 For conveyorized degreasers:
- 4.9.1. Rack parts to facilitate drainage.
 - 4.9.2. Maintain vertical conveyor speed at less than 10.8 ft (3.3 m)/min.
 - 4.9.3. The down-time cover must be placed over entrances and exits immediately after the conveyor and exhaust are shut down and removed immediately before they are started up.
- 4.10 For both open-top vapor and conveyorized degreasers: water shall not be visibly detected in solvent exiting the water separator.

5.0 Record Keeping Requirement

Any facility or operator subject to the requirements of this rule shall keep records on a facility-wide, quarterly basis showing the types and total amount of solvent used in all solvent cleaning operations. Records shall be maintained and available for AQMD inspection, for two years.

6.0 Test Methods

5.1 Determination of Capture Efficiency

The efficiency of carbon adsorption systems or alternative control systems shall be determined by EPA Reference Method 25.

5.2 Determination of VOC Content

The volatile organic compound content of solvents used, less water, shall be determined by at least one of the following methods:

- 5.2.1 Measuring the volatile content of the solvent shall be determined by the procedures outlined in ASTM D-86.

5.2.2 Calculation of the volatile organic compound per liter of solvent shall be by the procedures outlined in ASTM D 3960, Section 8.2.4.

5.3 Determination of Boiling Point

Initial boiling points of solvents shall be determined by ASTM D-1078-78.

5.4 Determination of Ventilation Rates

Ventilation rates shall be determined by one of the following EPA Reference Methods, as appropriate: EPA Reference Method 2, 2A, 2C or 2D.