

**AGENCY OF NATURAL RESOURCES**

**Waterbury, Vermont**

**ENVIRONMENTAL PROTECTION REGULATIONS**

**CHAPTER 5**

**AIR POLLUTION CONTROL**

**Subchapter II. Prohibitions**

**Subsection 5-253.14 Solvent Metal Cleaning**

- (a) **Applicability.** This subsection applies to all solvent metal cleaning sources with the following exemptions:
- (1) Any open-top vapor degreasing operation with an open area smaller than 10.8 square feet (ft<sup>2</sup>) is exempt from paragraphs (c)(2)(iii)(B) and (c)(2)(iii)(D) of this subsection, and
  - (2) Any conveyORIZED degreaser with an air/solvent interface smaller than 21.5 ft<sup>2</sup> is exempt from paragraph (c)(3)(ii) of this subsection.
- (b) **Definitions.** For the purposes of this subsection, the following definitions apply, in addition to those of Section 5-101.

"Air/solvent interface" means the surface area defined by points of contact between the solvent liquid or vapor in the cleaner/degreaser and the surrounding air.

"Cold cleaning" means the batch process of cleaning and removing soils from a metal surface by spraying, brushing, flushing, or immersion while maintaining the solvent below its boiling point. Wipe cleaning is not included in this definition.

"ConveyORIZED degreasing" means the process of cleaning and removing soils from a continuous stream of metal parts using either cold or vaporized solvents.

"Freeboard height" means, for a cold cleaner, the distance from the liquid solvent level in the degreaser tank to the lip of the tank. For an open-top vapor degreaser, it is the distance from the vapor level in the tank during idling to the lip of the tank. For a vapor-conveyORIZED degreaser, it is the distance from the vapor level to the bottom of the

entrance or exit opening, whichever is lower. For a cold-conveyorized degreaser, it is the distance from the liquid solvent level to the bottom of the entrance or exit opening, whichever is lower.

"Freeboard ratio" means the freeboard height divided by the smaller interior dimension (length, width, or diameter) of the degreaser tank.

"Open-top vapor degreaser" means the process using condensation of hot solvent vapor to clean and remove soils from a batch of metal parts.

"Refrigerated chiller" means a device mounted above both the water-jacket and the primary condenser coils consisting of secondary coils which carries a refrigerant that provides a chilled air blanket above the solvent vapor, thereby reducing emissions from the degreaser bath. The chilled air blanket temperature, measured at the centroid of the degreaser at the coldest point, shall be no greater than thirty percent of the solvent's boiling point in degrees fahrenheit.

"Solvent metal cleaning" means the process of cleaning soils from metal surfaces by cold cleaning, open-top vapor degreasing, or conveyorized degreasing.

(c) Standards.

(1) Cold cleaning operations. The owner or operator of a cold cleaning operation shall:

(i) Equip the cleaner with a cover that is easily operated with one hand, if:

(A) The solvent true vapor pressure is greater than 0.3 pounds per square inch (psi) measured at 100<sup>0</sup>F by ASTM D323-89;

(B) The solvent is agitated: or

(C) The solvent is heated;

(ii) Equip the cleaner with an internal drainage facility so that parts are enclosed under the cover while draining if the solvent true vapor pressure is greater than 0.6 psi measured at 100<sup>0</sup>F by ASTM D323-89, except that the drainage facility may be external for applications where an internal type cannot fit into the cleaning system;

(iii) Implement one of the following control measures if the solvent true vapor pressure is greater than 0.6 psi measured at 100<sup>0</sup>F by ASTM D323-89, or if the solvent is heated above 120<sup>0</sup>F:

- (A) Freeboard that gives a freeboard ratio greater than or equal to 0.7;
  - (B) Water cover at least 1 in. in depth (solvent shall be insoluble in and heavier than water); or
  - (C) Another system of equivalent control, equal to that of a refrigerated chiller or a carbon adsorber, approved by the Air Pollution Control Officer by order or permit.
- (iv) Provide a permanent, legible, conspicuous label, summarizing the operating requirements;
  - (v) Store waste solvent in covered containers;
  - (vi) Close the cover whenever parts are not being handled in the cleaner;
  - (vii) Drain the cleaned parts until dripping ceases;
  - (viii) Supply a solvent spray, if used, that ensures a solid fluid stream at a pressure that does not exceed 10 pounds per square inch gauge; and
  - (ix) Degrease only materials that are neither porous nor absorbent.
  - (x) Cease operation of the unit upon the detection of any visible solvent leak until such solvent leak is repaired.
- (2) Open top vapor degreasers. Except as provided under paragraph (a)(1) of this subsection, the owner or operator of an open top vapor degreaser shall:
- (i) Equip the vapor degreaser with a cover that can be opened and closed easily without disturbing the vapor zone;
  - (ii) Provide the following safety switches:
    - (A) A vapor level thermostat that shuts off the sump heat if the condenser coolant is either not circulating or too warm or if the vapor level rises above the height of the primary condenser; and
    - (B) A spray safety switch that shuts off the spray pump if the vapor level drops more than 4 inches below the lowest condensing coil;
  - (iii) Implement one of the following control measures:

- (A) Freeboard ratio greater than or equal to 0.75 and a powered cover;
  - (B) Refrigerated chiller;
  - (C) Enclosed design (cover or door opens only when the dry part is actually entering or exiting the degreaser);
  - (D) Carbon adsorption system, with a ventilation rate greater than or equal to 50 cubic feet per minute per square foot ( $\text{ft}^3/\text{min}/\text{ft}^2$ ) of air/solvent interface (when cover is open), and exhausting less than 25 parts per million (ppm) of solvent averaged over one complete adsorption cycle, or 24 hours, whichever is less; or
  - (E) A control system, demonstrated to have a control efficiency equivalent to or greater than any of the above and approved by the Air Pollution Control Officer by permit or order.
- (iv) Keep the cover closed at all times except when processing a workload through the degreaser;
  - (v) Minimize solvent carryout by:
    - (A) Racking parts so that solvent drains freely and is trapped;
    - (B) Moving parts in and out of the degreaser at less than 11 feet per minute;
    - (C) Holding the parts in the vapor zone for at least 30 seconds or until condensation ceases, whichever is longer;
    - (D) Tipping out any pools of solvent on the cleaned parts before removal from the vapor zone; and
    - (E) Allowing parts to dry within the degreaser for at least 15 seconds or until visually dry, whichever is longer;
  - (vi) Degrease only materials that are neither porous nor absorbent;
  - (vii) Occupy no more than one-half of the degreaser's open-top area with a workload
  - (viii) Always spray within the vapor level;

- (ix) Repair solvent leaks immediately, or shut down the degreaser;
  - (x) Store waste solvent only in covered containers;
  - (xi) Operate the cleaner so that water cannot be visually detected in solvent exiting the water separator;
  - (xii) Use no ventilation fans near the degreaser opening;
  - (xiii) When the cover is open, not expose the open-top vapor degreaser to drafts greater than 131 ft/min, as measured between 3 and 6 feet upwind and at the same elevation as the tank lip;
  - (xiv) If a lip exhaust is used on the open top vapor degreaser, not use a ventilation rate that exceeds 65 ft<sup>3</sup>/min/ft<sup>2</sup> of degreaser open area, unless a higher rate is needed to meet VOSHA requirements;
  - (xv) Provide a permanent, conspicuous label, summarizing the operating procedures of paragraphs (c)(2)(iv) through (c)(2)(xiv) of this subsection;
  - (xvi) Not load the degreasing unit to the point where the vapor level would drop more than 4 inches when the workload is removed from the vapor zone; and
  - (xvii) Locate the top cover below the lip exhaust if the open top degreaser is equipped with a lip.
- (3) Conveyorized degreasing. Except as provided in paragraph (a)(2) of this subsection, the owner or operator of a conveyorized degreaser shall:
- (i) Not use work place fans near the degreaser opening, and ensure that exhaust ventilation does not exceed 65 ft<sup>3</sup>/min/ft<sup>2</sup> of degreaser opening, unless a higher rate is necessary to meet VOSHA requirements;
  - (ii) Install one of the following control devices:
    - (A) Refrigerated chiller;
    - (B) Carbon adsorption system, with a ventilation rate greater than or equal to 50 ft<sup>3</sup>/min/ft<sup>2</sup> of air/solvent interface (when downtime covers are open), and exhausting less than 25 ppm of solvent by volume averaged per one complete adsorption cycle, or 24 hours, whichever is less; or

- (C) A control system, demonstrated to have a control efficiency equivalent to or greater than any of the above and approved by the Air Pollution Control Officer by permit or order.
- (iii) Equip the cleaner with equipment, such as a drying tunnel or rotating (tumbling) basket, sufficient to prevent cleaned parts from carrying out solvent liquid or vapor;
- (iv) Provide the following safety switches:
  - (A) A condenser flow switch and vapor level control thermostat that shut off the sump heat if the condenser coolant is either not circulating or if the vapor level rises above the height of the primary coil;
  - (B) A spray safety switch that shuts off the spray pump or the conveyor if the vapor level drops more than 4 inches below the lowest condensing soil.
- (v) 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 4 in. or less than 10 percent of the width of the opening;
- (vi) Provide downtime covers for closing off the entrance and exit during shutdown hours;
- (vii) Minimize carryout emissions by:
  - (A) Racking parts so that solvent drains freely from parts and is not trapped; and
  - (B) Maintaining the vertical conveyor speed at less than 11 ft/min;
- (viii) Repair solvent leaks immediately, or shut down the degreaser;
- (ix) Store waste solvent only in covered containers;
- (x) Operate the cleaner so that water cannot be visually detected in solvent exiting the water separator;
- (xi) Place downtime covers over entrances and exits of the conveyORIZED degreaser at all times when the conveyors and exhausts are not being

operated; and

- (xii) Degrease only materials that are neither porous nor absorbent.
- (d) Testing and record keeping. The Air Pollution Control Officer may require the owner or operator of any source subject to this subsection to perform such testing, keep such records and furnish such reports as necessary to demonstrate continuing compliance with this subsection.
- (e) Compliance. A source which is subject to the requirements of this subsection shall achieve compliance on or before November 15, 1994.