

# *EPA's Degreasing NESHAPs*

## *Companies Have 36 Months to Comply With New Requirements*

By Stephen P. Risotto, Executive Director, Center for Emissions Control

**O**n December 2, 1994, the U.S. Environmental Protection Agency (EPA) issued final national emission standards for hazardous air pollutants (NESHAPs) for new and existing halogenated solvent cleaning operations. The standards cover both vapor degreasing and immersion (cold) cleaning with trichloroethylene, perchloroethylene, and methylene chloride.<sup>1</sup> They were developed under the requirements of Title III (Hazardous Air Pollutants) of the federal Clean Air Act, as amended. Under the new standards, companies operating existing equipment have until December 1997 (36 months) to comply with the requirements.

In developing the standards, EPA focused on equipment and work practice requirements achieving a level of control between 50 and 70 percent. The standards give solvent cleaning sources operating batch or in-line degreasers three options for compliance:

- Installing one of several combinations of emission control equipment and implementing automated parts-handling and specified work practices;
- Meeting an idling mode emission limit, in conjunction with parts-handling and work practice requirements; or
- Meeting a limit on total emissions.

The multiple compliance options in the NESHAPs recognize the vast number of different industries and operating schedules associated with the use of halogenated solvent cleaners. EPA's standards allow companies considerable flexibility in complying with the control requirements. The alternative idling and total emissions limits allow the use of new and innovative technologies that can achieve a level of control equivalent to available equipment combinations.

### **Significant Changes From The November 1993 Proposal**

EPA made several changes to the degreasing standards since they were proposed in November 1993. Most of the changes were made to clarify the requirements of the standards. Other significant changes include the following:

- The addition of a table and equation for calculating emission rates and compliance for new cleaning machine designs that do not have a solvent/air interface;
- Modification of the allowable equipment combinations to add carbon adsorbers and to eliminate redundant or overlapping controls;
- Inclusion of additional equipment options for batch cold-cleaning equipment;
- Revision of monitoring requirements for hoist speed and reduced room draft; and
- Extension of several compliance and reporting deadlines.

*Companies have 36 months to comply with the new standards.*

Companies operating halogenated solvent cleaning equipment have 36 months to comply with the new standards, instead of the 24 months originally contained in the November 1993 proposal. In addition, the deadline for submitting an initial notification report was extended to 270 days (August 29, 1995) from the 90 days originally proposed.

### **Compliance Requirements**

Under the new standards, companies are required to submit an initial notification report for each solvent cleaning machine by August 29, 1995. This report should include the name of the company, the location of the machine, a description of the machine

(type, solvent/air interface area, existing controls), the installation date, the company's anticipated compliance approach, and an estimate of the annual solvent consumption.

Companies operating existing equipment are then required to implement a compliance approach before December 1997, and to submit an initial report of compliance by March 1998. Cleaning machines that began operations after November 29, 1993 (the date of proposal) are required to comply with the standards immediately upon startup. An initial compliance notification for these new machines is required within 150 days of startup or by May 1, 1995, whichever is later.

After submitting an initial notification of compliance, companies (except those operating only batch cold-cleaning machines) are required to submit an annual compliance report. If the equipment has violated its compliance requirements, however, an exceedance report must be submitted quarterly. Operators of batch vapor and in-line machines are required to obtain an operating permit from the state or EPA.

Compliance with one of the control combination options (see Table 1) for batch or in-line vapor equipment is demonstrated by periodic monitoring of each of the control systems chosen. Measurement of hoist speed is required monthly for the first year and annually thereafter, provided the part movement has not exceeded 11 feet

<sup>1</sup>The standards also apply to 1,1,1-trichloroethane, carbon tetrachloride, and chloroform. Production of 1,1,1-trichloroethane and carbon tetrachloride will be prohibited after December 31, 1995, under the requirements of the stratospheric ozone protection provisions (Title VI) of the Clean Air Act.

<sup>2</sup>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.

<sup>3</sup>Proper dwell time for parts to remain in the freeboard area above the vapor zone is defined by EPA as no less than 35 percent of the time required for the parts (at room temperature) to cease dripping, once placed in the vapor zone.

(3.4 meters) per minute. Monthly visual inspection of covers (e.g., working-mode) and enclosures is required to ensure their integrity.<sup>2</sup> Monthly measurement of dwell time is required, if dwell is part of the machine's compliance approach.<sup>3</sup> If freeboard refrigeration devices and superheated vapor systems are used, weekly monitoring of air blanket temperature (with a thermometer or thermocouple) is required to ensure proper operation. For carbon adsorption systems, companies must measure the exhaust concentration weekly to ensure that it is below 100 parts per million (ppm). Compliance with the reduced room draft provisions requires quarterly monitoring of the wind speed at the top of the freeboard area to ensure that it does not exceed 50 feet (15.2 meters) per minute. Weekly monitoring of the room parameters used to achieve the reduced room draft also is required.

Work-practice standards also have been set to reduce emissions associated with operating solvent cleaners. Rather than require direct monitoring of work practice compliance, however, EPA has developed a qualification test included as an appendix to the standard. The test is to be completed by the operator during inspection, if requested.

Companies choosing to comply with the alternative idling emission standard (see Table 1) are required to demonstrate initial compliance by using EPA's idling reference test method 307. Data from the equipment manufacturer may be used, provided the unit tested is the same as the one for which the report has been submitted. Installation of an automated parts-handling system and compliance with the work-practice requirements also are required. In addition, the companies must show that the frequency and types of parameters monitored on the solvent cleaning machine are sufficient to demonstrate continued compliance with the idling standard.

Complying with the alternative total emissions limit requires that the company maintain monthly records of solvent addition and removal. Using mass-balance calculations, it must then show that the total emissions from the cleaning machine, based on a

<sup>4</sup>EL = 330 x (Vol)<sup>0.6</sup> where: EL=the three-month rolling average emission limit in kg/month (1 kg = 2.2 lbs)  
Vol=the cleaning capacity of the machine in cubic meters (1 cubic meter = 35.289 cubic ft)

**Table 1**  
**Control Equipment Combinations and Idling Limits**

|   | Control Equipment Combination Options <sup>1, 2</sup>   | Alternative Idling Limit <sup>2, 3</sup> (lb/ft <sup>2</sup> -hr) |
|---|---|---|
| Batch Vapor <sup>4</sup> (≤13 ft <sup>2</sup> ) | 1: FBR=1.0, FRD<br>2: FRD, RRD<br>3: FRD, DWL<br>4: FRD, WMC<br>5: FRD, SHV<br>6: FRD, CA<br>7: FBR=1.0, RRD, DWL<br>8: FBR=1.0, RRD, SHV<br>9: FBR=1.0, WMC, SHV<br>10: FRD=1.0, SHV, CA | 0.045   |
| Batch Vapor <sup>4</sup> (>13 ft <sup>2</sup> ) | 1: FBR=1.0, FRD, RRD<br>2: FBR=1.0, FRD, SHV<br>3: FBR=1.0, RRD, SHV<br>4: FRD, DWL, RRD<br>5: FRD, RRD, SHV<br>6: FRD, WMC, SHV<br>7: FRD, SHV, CA                                       | 0.045   |
| In-Line <sup>5</sup> (Existing)                 | 1: FBR=1.0, FRD<br>2: FBR=1.0, SHV<br>3: FRD, DWL<br>4: DWL, CA   | 0.021   |
| In-Line <sup>5</sup> (New)                      | 1: FRD, SHV<br>2: FRD, CA<br>3: SHV, CA   | 0.021   |
| Batch Cold Cleaning                             | 1: CVR, Water Layer<br>2: FBR=0.75, CVR <sup>6</sup>  | n/a   |

<sup>1</sup> FBR – freeboard ratio, FRD – freeboard refrigeration device, RRD – reduced room draft, WMC – working mode cover, DWL – dwell, SHV – superheated vapor, CA – carbon adsorption, CVR – manual cover.

<sup>2</sup> Compliance with the proposed equipment or idling emission standard also requires automated parts-handling and work practices.

<sup>3</sup> 0.045 lb/ft<sup>2</sup> = 0.22 kg/m<sup>2</sup>; 0.021 lb/ft<sup>2</sup> = 0.10 kg/m<sup>2</sup>.

<sup>4</sup> New and existing equipment; 13 ft<sup>2</sup> = 1.21 m<sup>2</sup>.

<sup>5</sup> Vapor and cold cleaning.

<sup>6</sup> Compliance also requires work practices.

**Table 2**  
**Total Emissions Limits for Cleaning Machine With a Solvent/Air Interface**

|                              | Average Emission <sup>1, 2</sup> (lb/ft <sup>2</sup> -month) |
|------------------------------|--|
| Batch Vapor (existing & new) | 30.7   |
| In-Line (existing)           | 31.4   |
| In-Line (new)                | 20.3   |
| Batch Cold Cleaning          | n/a  |

<sup>1</sup> 3-month rolling average.

<sup>2</sup> 30.7 lb/ft<sup>2</sup> = 150 kg/m<sup>2</sup>; 31.4 lb/ft<sup>2</sup> = 153 kg/m<sup>2</sup>; 20.2 lb/ft<sup>2</sup> = 99 kg/m<sup>2</sup>.

three-month rolling average, are equal to or less than the established limit for the cleaner (see Table 2). For new machine designs without a solvent/air interface, EPA has established a compliance formula, based on cleaning capacity.<sup>4</sup>

Companies meeting the total emission limits do not need to conduct monitoring of equipment parameters, but must maintain records of their solvent usage and removal of solvent as waste. According to EPA,

this compliance option provides an incentive for innovative emissions control strategies to limit solvent use. For some cleaning machines, EPA calculates that the alternative total emission limit could be more stringent than the equipment specifications. In particular, EPA expects that this alternative standard will be more difficult to meet for larger machines, for machines operating for more than one shift, and for machines cleaning parts with difficult configurations.

## Next Steps

The standards for halogenated solvent cleaners were published in the *Federal Register* on December 2, 1994. They are available for computer downloading from EPA's Technology Transfer Network by calling 919/541-5742. (The file is listed under the Clean Air Act Amendments, or CAAA, bulletin board under Recently Signed Rules.) Copies of the standards also are available from the Center by calling 800/835-5520.

EPA has developed a brochure and guidance document explaining the new standards. These documents will be available from EPA in early 1995.

How is your I.Q. on solvent cleaning procedures? Take the test provided by Steve Risotto that appears on the following page. Answers are shown upside down at the end of the test. ○

## About the Author

*Steve Risotto is the executive director of the Center for Emissions Control, Washington, DC, a nonprofit information clearinghouse and joint R&D venture, established in October 1990 to assist users of chlorinated solvents in evaluating emissions control options and/or alternative equipment and technology. The center was a recipient of a 1993 Stratospheric Ozone Protection Award for its work to promote the replacement of methyl chloroform in solvent cleaning applications.*

*Risotto served as director of communications for the Halogenated Solvents Industry Alliance—a Washington-based trade association of users, distributors, recyclers, and producers of these solvents—for five years. During that time he gained considerable knowledge of the impact of environmental compliance on business operations.*

*Risotto holds a BS in biology from Cornell University and an MS in marine science from Louisiana State University. After graduating from LSU, he spent three years with the U.S. Department of Commerce, and two years as a consultant to the Department of the Interior.*

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# Test of Solvent Cleaning Procedures

## General Questions

\_\_\_\_ 1. What is the maximum allowable speed for parts entry and removal?

- A. 8.5 meters per minute (28 feet per minute).
- B. 3.4 meters per minute (11 feet per minute).
- C. 11 meters per minute (36 feet per minute).
- D. No limit.

\_\_\_\_ 2. How do you ensure that parts enter and exit the solvent cleaning machine at the speed required in the regulation?

- A. Program on computerized hoist monitors speed.
- B. Can judge the speed by looking at it.
- C. Measure the time it takes the parts to travel a measured distance.

\_\_\_\_ 3. Identify the sources of air disturbances.

- A. Fans
- B. Open doors
- C. Open windows
- D. Ventilation vents
- E. All of the above

\_\_\_\_ 4. What are the three operating modes?

- A. Idling, working and downtime
- B. Precleaning, cleaning, and drying
- C. Startup, shutdown, off
- D. None of the above

\_\_\_\_ 5. When can parts or parts baskets be removed from the solvent cleaning machine?

- A. When they are clean
- B. At any time
- C. When dripping stops
- D. Either A or C is correct

\_\_\_\_ 6. How must parts be oriented during cleaning?

- A. It does not matter, as long as they fit in the parts basket.
- B. So that the solvent pools in the cavities where the dirt is concentrated.

C. So that solvent drains from them freely.

\_\_\_\_ 7. During startup, what must be turned on first, the primary condenser or the sump heater?

- A. Primary condenser
- B. Sump heater
- C. Turn both on at same time
- D. Either A or B is correct

\_\_\_\_ 8. During shutdown, what must be turned off first, the primary condenser or the sump heater?

- A. Primary condenser
- B. Sump heater
- C. Turn both off at same time
- D. Either A or B is correct

\_\_\_\_ 9. In what manner must solvent be added to and removed from the solvent cleaning machine?

- A. With leak proof couplings
- B. With the end of the pipe in the solvent sump below the liquid solvent surface.
- C. So long as the solvent does not spill, the method does not matter.
- D. A and B

\_\_\_\_ 10. What must be done with waste solvent and still and sump bottoms?

- A. Pour down the drain
- B. Store in closed container
- C. Store in a bucket
- D. A or B

\_\_\_\_ 11. What types of materials are prohibited from being cleaned in solvent cleaning machines using halogenated HAP solvents?

- A. Sponges
- B. Fabrics
- C. Paper
- D. All of the above

## Control Device Specific Questions

### Freeboard Refrigeration Device

\_\_\_\_ 1. What temperature must the FRD achieve?

- A. Below room temperature
- B. 50 °F
- C. Below the solvent boiling point
- D. 30 percent below the solvent boiling point

## Working-Mode Cover

\_\_\_\_ 2. When can a cover be open?

- A. While parts are in the cleaning machine
- B. During parts entry and removal
- C. During maintenance
- D. During measurements for compliance purposes
- E. A and C
- F. B, C, and D

\_\_\_\_ 3. Covers must be maintained in what condition?

- A. Free of holes
- B. Free of cracks
- C. So that they completely seal cleaner opening
- D. All of the above

## Dwell

\_\_\_\_ 4. Where must the parts be held for the appropriate dwell time?

- A. In the vapor zone
- B. In the freeboard area above the vapor zone
- C. Above the cleaning machine
- D. In the immersion sump

| Answers                           |           |
|-----------------------------------|-----------|
| General Questions                 | 1. B      |
|                                   | 2. A or C |
|                                   | 3. E      |
|                                   | 4. A      |
|                                   | 5. C      |
|                                   | 6. C      |
| Control Device Specific Questions | 1. D      |
|                                   | 2. F      |
|                                   | 3. D      |
|                                   | 4. B      |
|                                   | 5. D      |
|                                   | 6. B      |
|                                   | 7. A      |
|                                   | 8. B      |
|                                   | 9. D      |
|                                   | 10. B     |
|                                   | 11. D     |