

**Section 35 - Manufacture of Synthesized Pharmaceutical Products.**

11/29/94

a. Applicability. This Section applies to the following sources of volatile organic compounds (VOCs) at all synthesized pharmaceutical manufacturing facilities:

1. Reactors.
2. Distillation operations.
3. Crystallizers.
4. Centrifuges.
5. Vacuum dryers.
6. Air dryers.
7. Production equipment exhaust systems.
8. Rotary vacuum filters and other filters.
9. In-process tanks.
10. Leaks.

b. Definitions. As used in this Section, all terms not defined herein shall have the meaning given them in the November 15, 1990 Clean Air Act Amendments (CAAA), or in Section 2 of this regulation.

"Production equipment exhaust system" means a device for collecting and directing out of the work area VOC fugitive emissions from reactor openings, centrifuge openings, and other vessel openings to protect workers from excessive VOC exposure.

"Reactor" means a vat or vessel, which may be jacketed to permit temperature control, designed to contain chemical reactions.

"Separation operation" means a process that separates a mixture of compounds and solvents into two or more components. Specific mechanisms include extraction, centrifugation, filtration, and crystallization.

"Synthesized pharmaceutical manufacturing" means manufacture of pharmaceutical products and intermediates by chemical synthesis. The production and recovery of

materials produced via fermentation, extraction of organic chemicals from vegetative materials or animal tissues, and formulation and packaging of the product are not considered synthesized pharmaceutical manufacturing.

c. Standards.

1. Reactors, distillation operations, crystallizers, centrifuges, and vacuum dryers.  
The owner or operator of a synthesized pharmaceutical manufacturing facility subject to this Section shall control the VOC emissions from all vents from reactors, distillation operations, crystallizers, centrifuges, and vacuum dryers at the facility that emit 6.8 kilograms per day (kg/day) (15 pounds per day [lb/day]) or more of VOC as determined by the procedure in "Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products," **Appendix B**, EPA-450/2-78-029, December 1978.

Surface condensers or equivalent controls shall be used, provided that:

- i. If surface condensers are used, the condenser outlet gas temperature shall not exceed the allowable temperature limit described for each associated vapor pressure in the following table:

Allowable condenser outlet gas temperature, °C (°F)	VOC vapor pressure at 20°C, kPa (psi)
-25 (-13)	>40.01 (5.8)
-15 (5)	>20.0 (2.9)
0 (32)	>10.0 (1.5)
10 (50)	>7.0 (1.0)
25 (77)	>3.5 (0.5)

- ii. If equivalent controls such as carbon absorption or incineration are used, the VOC emissions shall be reduced by at least as much as they would be by using a surface condenser. The owner or operator shall calculate the efficiency equivalent to a condenser in accordance with the procedures specified on pages 4-2 through 4-6 in "Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products," **Appendix B**, EPA-450/2-78-029, December 1978.

2. Air dryers and production equipment exhaust systems. The owner or operator of a synthesized pharmaceutical manufacturing facility subject to this Section shall reduce the VOC emissions from all air dryers and production equipment exhaust systems either:
  - i. By at least 90 weight percent if emissions are 150 kg/day (330 lb/day) or more of VOC before controls.
  - ii. To 15.0 kg/day (33 lb/day) or less if emissions are less than 150 kg/day (330 lb/day) of VOC.
3. Storage tanks. The owner or operator of a synthesized pharmaceutical manufacturing facility subject to this Section shall reduce the VOC emissions from storage tanks by:
  - i. Providing a vapor balance system or equivalent control that is at least 90 percent effective by weight in reducing emissions from truck or railcar deliveries to storage tanks with capacities greater than 7,500 liters (L) (2,000 gallons [gal]) that store VOC with vapor pressures greater than 28.0 kiloPascals (kPa) (4.1 pounds per square inch [psi]) at 20°C (68°F).
  - ii. Installing pressure/vacuum conservation vents set at  $\pm 0.2$  kPa (0.03 psi) on all storage tanks that store VOC with vapor pressures greater than 10.0 kPa (1.5 psi) at 20°C (68°F).
4. Centrifuges, rotary vacuum filters, and other filters. The owner or operator of a synthesized pharmaceutical facility subject to this Section shall enclose all centrifuges, rotary vacuum filters, and other filters having an exposed liquid surface where the liquid contains VOC and exerts a total VOC vapor pressure of 3.50 kPa (0.5 psi) or more at 20°C (68°F).
5. In-process tanks. The owner or operator of a synthesized pharmaceutical facility subject to this Section shall install covers on all in-process tanks that contain VOC at any time. These covers shall remain closed, unless production, sampling, maintenance, or inspection procedures require operator access.
6. Leaks. The owner or operator of a synthesized pharmaceutical manufacturing facility subject to this Section shall repair all leaks from which a liquid containing VOC can be observed running or dripping. The repair shall be completed as soon as practicable but no later than 15 calendar days after the leak is found. If the leaking component cannot be repaired until the process is shut down, the leaking component shall then be repaired before the process is restarted.

- d. Testing. The owner or operator of any facility containing sources subject to this Section shall comply with the testing requirements in **Appendix "E"** of this regulation.
- e. Monitoring for air pollution control equipment.
1. At a minimum, continuous monitors for the following parameters shall be installed on air pollution control equipment used to control sources subject to this Section:
    - i. Destruction device combustion temperature.
    - ii. Temperature rise across a catalytic incinerator bed.
    - iii. VOC concentration on a carbon adsorption unit to determine breakthrough.
    - iv. Outlet gas temperature of a refrigerated condenser.
    - v. Temperature of a nonrefrigerated condenser coolant supply system.
  2. Each monitor shall be equipped with a recording device.
  3. Each monitor shall be calibrated quarterly.
  4. Each monitor shall operate at all times while the associated control equipment is operating.
- f. Recordkeeping.
1. The owner or operator of a pharmaceutical manufacturing facility subject to this Section shall maintain the following records:
    - i. Parameters listed in paragraph (e) of this Section shall be recorded.
    - ii. For sources subject to this Section, the solvent true vapor pressure as determined by ASTM D323-89 shall be recorded for every process.
  2. For any leak subject to paragraph (c)(6) of this Section, which cannot be readily repaired within 1 hour after detection, the following records shall be kept:

- i. The name of the leaking equipment.
- ii. The date and time the leak is detected.
- iii. The action taken to repair the leak.
- iv. The date and time the leak is repaired.

g. Reporting. The owner or operator of any facility containing sources subject to this Section shall comply with the requirements in Section 5 of this regulation.