

2.49 Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry

2.49.1 Applicability and Designation of Affected Facility

- (a) (1) The provisions of this source category apply to affected facilities in the synthetic organic chemicals manufacturing industry.
- (2) The group of all equipment within a process unit is an affected facility.
- (b) Any affected facility under paragraph (a) of this section, unless exempted, that commences construction or modification after January 5, 1981, shall be subject to the requirements of this source category. Affected facilities under paragraph (a) of this section which commenced construction or modification on or before January 5, 1981 are subject to the provisions of this source category when required by the Director.

2.49.2 Test Methods and Procedures

- (a) In conducting the performance tests required in Section 1.2, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of this part or other methods and procedures as specified in this section, except as provided in Section 1.2(b).
- (b) The owner or operator shall determine compliance with the regulations or standards as follows:
 - (1) Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used:
 - (i) Zero air (less than 10 ppm of hydrocarbon in air); and
 - (ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane.
- (c) The owner or operator shall determine compliance with the no detectable emission regulations or standards as follows:
 - (1) The requirements of paragraph (b) shall apply.
 - (2) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicates by the instrument and the background level is compared with 500 ppm for determining compliance.
- (d) The owner or operator shall test each piece of equipment unless he demonstrates that a process unit is not in VOC series, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used:
 - (1) Procedures that conform to the general methods in ASTM E-260, E-168, E-169 (incorporated by reference--see Section 1.6) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment.
 - (2) Organic compounds that are considered by the Director to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid.
 - (3) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Director disagrees with the judgment, paragraphs (d)(1) and (2) of this section shall be used to resolve the disagreement.
- (e) The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply:
 - (1) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20°C.

Standard reference texts or ASTM D-2879 (incorporated by reference--see Section 1.6) shall be used to determine the vapor pressures.

- (2) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 20 percent by weight.
 - (3) The fluid is a liquid at operating conditions.
- (f) Samples used in conjunction with paragraphs (d), (e), and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare.
- (g) The owner or operator shall determine compliance with the standards of flares as follows:
- (1) Method 22 shall be used to determine visible emissions.
 - (2) A thermocouple or any other equivalent device shall be used to monitor the presence of a pilot flame in the flare.
 - (3) The maximum permitted velocity (V_{\max}) for air-assisted flares shall be computed using the following equation:

$$V_{\max} = 8.706 + 0.7084 H_T$$

Where:

V_{\max} = maximum permitted velocity, m/sec.

H_T = net heating value of the gas being combusted, MJ/scm.

- (4) The net heating value (H_i) of the gas being combusted in a flare shall be computed as follows:

$$H_T = K \sum_{i=1}^n C_i H_i$$

Where:

K = conversion constant, 1.740×10^7 [(g-mole) (MJ)] / [(ppm) (scm) (kcal)].

C_i = concentration of sample component "i", ppm.

H_i = net heat of combustion of sample component "i" at 25°C and 760 mm Hg, kcal/g-mole.

- (5) Method 18 and ASTM D 2504-67 (incorporated by reference--see Section 1.6) shall be used to determine the concentration of sample component "i".
- (6) ASTM D 2382-76 (incorporated by reference--see Section 1.6) shall be used to determine the net heat of combustion of component "i" if published values are not available or cannot be calculated.
- (7) Method 2, 2A, 2C, or 2D, as appropriate, shall be used to determine the actual exit velocity of a flare. If needed, the unobstructed (free) cross-sectional area of the flare tip shall be used.