

$$E_h = (0.0416 \times 10^{-6}) Q_{sd} \sum_{i=1}^n (C_i \times MW_i) \quad (\text{Eq. 1})$$

Where:

$E_h$  = Total organic mass flow rate, kg/h;

$Q_{sd}$  = Volumetric flow rate of gases entering or exiting control device (or exiting the process vent if no control device is used), as determined by Method 2 of 40 CFR part 60, appendix A, dscm/h;

$n$  = Number of organic compounds in the vent gas;

$C_i$  = Organic concentration in ppm, dry basis, of compound  $i$  in the vent gas, as determined by Method 18 of 40 CFR part 60, appendix A;

$MW_i$  = Molecular weight of organic compound  $i$  in the vent gas, kg/kg-mol;

(ii) Determine compliance with the annual total organic emissions rate using Equation 2 of this section as follows:

$$E_A = E_h \times H \quad (\text{Eq. 2})$$

Where:

$E_A$  = Total organic mass emissions rate, kilograms per year;

$E_h$  = Total organic mass flow rate for the process vent, kg/h;

$H$  = Total annual hours of operation for the affected unit, h.

(iii) Determine compliance with the total organic emissions limit from all affected process vents at the facility by summing the total hourly organic mass emissions rates ( $E_h$  as determined in Equation 1 of this section) and summing the total annual organic mass emissions rates ( $E_A$ , as determined in Equation 2 of this section) for all affected process vents at the facility.

(5) Determine compliance with the 95 percent reduction limit in § 63.7890(a)(2)(i) for the combination of all affected process vents at the facility using Equations 3 and 4 of this section to calculate control device inlet and outlet concentrations and Equation 5 of this section to calculate control device emission reductions for process vents as follows:

$$E_i = K_2 \left( \sum_{j=1}^n C_{ij} M_{ij} \right) Q_i \quad (\text{Eq. 3})$$

$$E_o = K_2 \left( \sum_{j=1}^n C_{oj} M_{oj} \right) Q_o \quad (\text{Eq. 4})$$

Where:

$C_{ij}$ ,  $C_{oj}$  = Concentration of sample component  $j$  of the gas stream at the inlet and outlet of the control device, dry basis, parts per million by volume. For uncontrolled vents,  $C_{ij} = C_{oj}$  and equal the concentration exiting the vent;

$E_i$ ,  $E_o$  = Mass rate of total organic compounds (TOC) (minus methane and ethane) or total HAP, from Table 1 of this subpart, at the inlet and outlet of the control device, respectively, dry basis, kilogram per hour. For uncontrolled vents,  $E_i = E_o$  and equal the concentration exiting the vent;

$M_{ij}$ ,  $M_{oj}$  = Molecular weight of sample component  $j$  of the gas stream at the inlet and outlet of the control device, respectively, gram/gram-mole. For uncontrolled vents,  $M_{ij} = M_{oj}$  and equal the gas stream molecular weight exiting the vent;

$Q_i$ ,  $Q_o$  = Flowrate of gas stream at the inlet and outlet of the control device, respectively, dry standard cubic meters per minute (dscm/min). For uncontrolled vents,  $Q_i = Q_o$  and equals the flowrate exiting the vent;

$K_2$  = Constant,  $2.494 \times 10^{-6}$  (parts per million)<sup>-1</sup> (gram-mole per standard cubic meter) (kilogram/gram)(minute/hour, where standard temperature (gram-mole per standard cubic meter) is 20°C);

$n$  = the number of components in the sample.

$$R_v = \frac{\sum_{j=1}^n E_i - \sum_{j=1}^n E_o}{\sum_{j=1}^n E_i} \times 100 \quad (\text{Eq. 5})$$

Where:

$R_v$  = Overall emissions reduction for all affected process vents, percent

$E_i$  = Mass rate of TOC (minus methane and ethane) or total HAP, from Table 1 of this subpart, at the inlet to the control device, or exiting the vent for uncontrolled vents, as calculated in this section, kilograms TOC per hour or kilograms HAP per hour;

$E_o$  = Mass rate of TOC (minus methane and ethane) or total HAP, from Table 1 of this subpart, at the outlet to the control device, or exiting the vent for uncontrolled vents, as calculated in this section, kilograms TOC per hour or kilograms HAP per

hour. For vents without a control device,  $E_o = E_i$ ;

$n$  = number of affected source process vents.

(c) If you use a carbon adsorption system, condenser, vapor incinerator, boiler, or process heater to meet an emission limit in this subpart, you may choose to perform a design evaluation to demonstrate initial compliance instead of a performance test. You must perform a design evaluation according to the general requirements in § 63.693(b)(8) and the specific requirements in § 63.694(d)(2)(ii) for a carbon adsorption system (including establishing carbon replacement schedules and associated requirements), § 63.694(e)(2)(ii) for a condenser, § 63.694(f)(2)(ii) for a vapor incinerator, or § 63.694(g)(2)(i)(B) for a boiler or process heater.

(d) During the performance test or design evaluation, you must collect the appropriate operating parameter monitoring system data, average the operating parameter data over each test run, and set operating limits, whether a minimum or maximum value, based on the average of values for each of the three test runs. If you use a control device design analysis to demonstrate control device performance, then the minimum or maximum operating parameter value must be established based on the control device design analysis and supplemented, as necessary, by the control device manufacturer recommendations or other applicable information.

(e) If you control air emissions from an affected source by introducing the vent stream into the flame zone of a boiler or process heater according to the requirements in § 63.693(g)(1)(iii), you must conduct a performance test or design evaluation to demonstrate that the boiler or process heater meets the applicable emission limit while operating at a residence time of 0.5 seconds or greater and at a combustion zone temperature of 760°C or higher.

(f) You must conduct a performance evaluation for each continuous monitoring system according to the requirements in § 63.8(e).

(g) If you are required to conduct a visual inspection of an affected source, you must conduct the inspection according to the procedures in § 63.906(a)(1) for Tank Level 1 controls, § 63.1063(d) for Tank Level 2 controls, § 63.946(a) for a surface impoundment equipped with a floating membrane