§ 63.4965 How do I determine the add-on control device emission destruction or removal efficiency?

You must use the procedures and test methods in this section to determine the add-on control device emission destruction or removal efficiency as part of the performance test required by §63.4960. You must conduct three test runs as specified in §63.7(e)(3), and each test run must last at least 1 hour.

(a) For all types of add-on control devices, use the test methods specified in paragraphs (a)(1) through (5) of this section.

(1) Use Method 1 or 1A of appendix A to 40 CFR part 60, as appropriate, to select sampling sites and velocity traverse points.

(2) Use Method 2, 2A, 2C, 2D, 2F, or 2G of appendix A to 40 CFR part 60, as appropriate, to measure gas volumetric flow rate.

(3) Use Method 3, 3A, or 3B of appendix A to 40 CFR part 60, as appropriate, for gas analysis to determine dry molecular weight. You may also use as an alternative to Method 3B, the manual method for measuring the oxygen, carbon dioxide, and carbon monoxide content of exhaust gas in ANSI/ASME PTC 19.10–1981, “Flue and Exhaust Gas Analyses [Part 10, Instruments and Apparatus]” (incorporated by reference, see §63.14).

(4) Use Method 4 of appendix A to 40 CFR part 60 to determine stack gas moisture.

(5) Methods for determining gas volumetric flow rate, dry molecular weight, and stack gas moisture must be performed, as applicable, during each test run.

(b) Measure total gaseous organic mass emissions as carbon at the inlet and outlet of the add-on control device simultaneously, using either Method 25 of appendix A to 40 CFR part 60.
§ 63.4966 How do I establish the emission capture system and add-on control device operating limits during the performance test?

During the performance test required by §63.4960 and described in §§63.4963, 63.4964, and 63.4965, you must establish the operating limits required by §63.4892 according to this section, unless you have received approval for alternative monitoring and operating limits under §63.8(f) as specified in §63.4892.

(a) Thermal oxidizers. If your add-on control device is a thermal oxidizer, establish the operating limits according to paragraphs (a)(1) and (2) of this section.

(1) During the performance test, you must monitor and record the combustion temperature at least once every 15 minutes during each of the three test runs. You must monitor the temperature in the firebox of the thermal oxidizer or immediately downstream of

\[ M_f = \frac{Q_{sd} C_c (12)(0.0416)}{10^{-6}} \]  
\[ \text{(Eq. 1)} \]

Where:

- \( M_f \) = Total gaseous organic emissions mass flow rate, kg/per hour (hr).
- \( Q_{sd} \) = Volumetric flow rate of gases entering or exiting the add-on control device, as determined by Method 2, 2A, 2C, 2D, 2F, or 2G, dry standard cubic meters/hour (dscm/h).
- \( C_c \) = Concentration of organic compounds as carbon in the vent gas, as determined by Method 25 or Method 25A, parts per million by volume (ppmv), dry basis.
- 0.0416 = Conversion factor for molar volume, kg-moles per cubic meter (mol/m³) (@ 293 Kelvin (K) and 760 millimeters of mercury (mmHg)).

(e) For each test run, determine the add-on control device organic emissions destruction or removal efficiency, using Equation 2 of this section:

\[ \text{DRE} = \frac{M_{fi} - M_{fo}}{M_{fi}} \]  
\[ \text{(Eq. 2)} \]

Where:

- DRE = Organic emissions destruction or removal efficiency of the add-on control device, percent.
- \( M_{fi} \) = Total gaseous organic emissions mass flow rate at the inlet(s) to the add-on control device, using Equation 1 of this section, kg/h.
- \( M_{fo} \) = Total gaseous organic emissions mass flow rate at the outlet(s) of the add-on control device, using Equation 1 of this section, kg/h.

(f) Determine the emission destruction or removal efficiency of the add-on control device as the average of the efficiencies determined in the three test runs and calculated in Equation 2 of this section.

§ 63.4966 How do I establish the emission capture system and add-on control device operating limits during the performance test?

During the performance test required by §63.4960 and described in §§63.4963, 63.4964, and 63.4965, you must establish the operating limits required by §63.4892 according to this section, unless you have received approval for alternative monitoring and operating limits under §63.8(f) as specified in §63.4892.

(a) Thermal oxidizers. If your add-on control device is a thermal oxidizer, establish the operating limits according to paragraphs (a)(1) and (2) of this section.

(1) During the performance test, you must monitor and record the combustion temperature at least once every 15 minutes during each of the three test runs. You must monitor the temperature in the firebox of the thermal oxidizer or immediately downstream of

\[ M_f = \frac{Q_{sd} C_c (12)(0.0416)}{10^{-6}} \]  
\[ \text{(Eq. 1)} \]

Where:

- \( M_f \) = Total gaseous organic emissions mass flow rate, kg/per hour (hr).
- \( Q_{sd} \) = Volumetric flow rate of gases entering or exiting the add-on control device, as determined by Method 2, 2A, 2C, 2D, 2F, or 2G, dry standard cubic meters/hour (dscm/h).
- \( C_c \) = Concentration of organic compounds as carbon in the vent gas, as determined by Method 25 or Method 25A, parts per million by volume (ppmv), dry basis.
- 0.0416 = Conversion factor for molar volume, kg-moles per cubic meter (mol/m³) (@ 293 Kelvin (K) and 760 millimeters of mercury (mmHg)).

(e) For each test run, determine the add-on control device organic emissions destruction or removal efficiency, using Equation 2 of this section:

\[ \text{DRE} = \frac{M_{fi} - M_{fo}}{M_{fi}} \]  
\[ \text{(Eq. 2)} \]

Where:

- DRE = Organic emissions destruction or removal efficiency of the add-on control device, percent.
- \( M_{fi} \) = Total gaseous organic emissions mass flow rate at the inlet(s) to the add-on control device, using Equation 1 of this section, kg/h.
- \( M_{fo} \) = Total gaseous organic emissions mass flow rate at the outlet(s) of the add-on control device, using Equation 1 of this section, kg/h.

(f) Determine the emission destruction or removal efficiency of the add-on control device as the average of the efficiencies determined in the three test runs and calculated in Equation 2 of this section.