### Section 1: General Standards for All Closed-Vent Systems and Control Devices

A. The closed-vent system and control device are operated whenever emissions are vented to it.  

664.1033(13)

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B. Testing is conducted to determine if the control device is operating with no detectable emissions (<500 ppmv) according to ALL of the following:  
664.1034(2)

1. The daily calibration procedures of the detection instrument are conducted according to Method 21 in appendix A of 40 CFR part 60.  
2. The monitoring and performance criteria are according to Method 21 in appendix A of 40 CFR part 60.  
3. The background levels and potential leak interfaces are determined according to Method 21.  
4. Calibration gases consist of zero air with <10 ppm hydrocarbons and a mixture of <10,000 ppm methane or n-hexane in air.  
5. The arithmetic difference between the maximum instrument reading and background level is compared to 500 ppm to determine compliance.  

664.1033(11)(a)

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C. If performance tests were conducted on a vapor incinerator designed and operated to achieve a total organic compound concentration of 20 ppmv, the total organic compound concentrations and mass flow rates entering and exiting the control device were determined according to ALL of the following:  
664.1034(3)

1. Velocity and volumetric flow rate were determined using Method 2 in appendix A of 40 CFR part 60.  
2. Organic content was determined using Method 18 in appendix A of 40 CFR part 60.  
3. Each performance test consists of 3 separate runs at least one hour each, under the highest load or capacity expected.  
4. Total organic mass flow rate and annual total organic emission rate are calculated correctly.  
5. The total organic emissions from all affected units are calculated by adding the hourly total organic mass emission rates and by adding the annual total organic mass emission rates.  

664.1034(3)

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D. The facility maintains information indicating that the following performance testing facilities were made available.  
664.1034(3)

1. Sampling ports adequate for the required test methods.  
2. A safe sampling platform.  
3. Safe access to the sampling platform.  
4. Utilities for sampling and testing equipment.  
5. All process information, including representative conditions used during the performance test, are recorded.  

664.1034(3)

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E. The time-weighted average of the results from 3 runs is used to determine compliance.  

664.1034(3)

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F. The control device is equipped with a flow indicator that is calibrated, maintained and operated so it provides a record of the vent stream flow from each affected unit to the control device at least once every hour.  

664.1033(6)(a)

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G. Readings from each monitoring device are inspected at least once each operating day to check the operation of the control devices.  

664.1033(6)(c)

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H. If necessary, corrective measures are taken immediately to ensure the control device is adequately recovering organic vapors.  

664.1033(6)(c)
### Section 1: General Standards for All Closed-Vent Systems and Control Devices

J. The closed vent system is operated according to EITHER of the following:
1. With no detectable emissions as indicated by an instrument reading of < 500 ppmv above background and by visual inspection.
2. At negative pressure with a pressure gauge or other pressure measuring device readily available to verify operation at a negative pressure.

K. If the closed-vent system is designed to operate with no detectable emissions (instrument reading < 500 ppmv), proper operation is ensured by ALL of the following:
1. Conduct initial leak detection monitoring on or before the date the system was subject to subch. AA or BB to demonstrate the unit operates with no detectable emissions.
2. At least annually, visually inspect closed-vent system joints, seams or other connections that are permanently or semi-permanently sealed for defects that could result in air pollutant emissions.
3. Monitor components or connections after repair or replacement to demonstrate they are operating without detectable emissions.
4. Monitor other components or connections annually, unless they are designated as unsafe to monitor.

L. If components are designated as unsafe to monitor, the exposure to an immediate danger has been documented and a written plan for monitoring during safe-to-monitor times is followed.

M. A closed-vent system designed to operate at negative pressure was visually inspected for defects that could result in air pollutant emissions by the date the system was subject to subch. AA or BB and annually thereafter.

N. If a defect is detected, the first attempt at repair is made within 5 calendar days and repair is corrected as soon as possible, but no later than 15 calendar days after the emissions are detected, unless repair is delayed.

O. Repair is delayed to the end of the next process unit shutdown because repair is technically infeasible without a process unit shutdown and emissions from immediate repair would be greater than those resulting from delay of repair.

P. If an alternate operational or process parameter is monitored, the facility demonstrated that the alternate parameter will ensure the control device is operating in conformance with these standards and the control device design specifications.

### Section 2: Vapor Incinerators

A. The control device is a vapor incinerator. If NO, go to Section 3.

B. The vapor incinerator is designed and operated to result in ANY of the following:
1. Reduce the organic emissions by 95 weight percent or greater.
2. Achieve a total organic compound concentration of 20 ppmv, expressed as the sum of actual compounds on a dry basis corrected to 3% oxygen.
3. Provide a minimum residence time of 0.50 seconds at a minimum temperature of 760°C.
**Section 2: Vapor Incinerators**

C. If performance tests were conducted on a vapor incinerator designed and operated to achieve the standards in Question 2.B., the total organic compound concentrations and mass flow rates entering and exiting the control device were determined according to ALL of the following:

1. Velocity and volumetric flow rate are determined by Method 2 in appendix A of 40 CFR part 60.
2. Organic content is determined by Method 18 in appendix A of 40 CFR part 60.
3. Each performance test consists of 3 separate runs at least one hour each, under the highest load or capacity expected.
4. Total organic mass flow rate and annual total organic emission rate are correctly calculated.
5. Total organic emissions from all affected units are calculated by adding the hourly total organic mass emission rates and by adding the annual total organic mass emission rates.

D. The facility maintains information indicating the following performance testing facilities were made available:

1. Sampling ports adequate for the required test methods.
2. A safe sampling platform.
3. Safe access to the sampling platform.
4. Utilities for sampling and testing equipment.

E. All process information, including representative conditions, used during the performance test are recorded.

F. The time-weighted average of the results from 3 runs is used to determine compliance.

G. A temperature monitoring device with a continuous recorder is maintained and operated to continuously monitor the operation of the thermal or catalytic vapor incinerator.

H. If engineering calculations are used for a thermal vapor incinerator, the design analysis addresses BOTH of the following:

1. Considers the vent stream composition, constituent concentrations, and flow rate.
2. Establishes the design minimum, the average temperature in the combustion zone, and the combustion zone residence time.

I. For a thermal vapor incinerator, the operating record includes the date, time and duration of each period when ANY of the following occur:

1. The combustion temperature is below 760°C when the incinerator is designed to operate with a minimum residence time of 0.50 seconds and minimum temperature of 760°C.
2. The combustion zone temperature is more than 28°C below the design average temperature when the incinerator is designed to operate with an organic emission reduction efficiency of at least 95 weight percent.

J. If engineering calculations are used for a catalytic vapor incinerator, the design analysis addresses BOTH of the following:

1. Considers the vent stream composition, constituent concentrations, and flow rate.
2. Establishes the design minimum and average temperatures across the catalyst bed inlet and outlet.

K. For a catalytic vapor incinerator, the operating record includes the date, time and duration of each period when ANY of the following occur:

1. The temperature of the vent stream at the catalyst bed inlet is more than 28°C below the average temperature of the inlet vent stream.
2. The temperature difference across the catalyst bed is less than 80% of the design average temperature difference.
### Section 3: Condensers

A. The control device is a condenser. If NO, go to Section 4.

B. The condenser is designed and operated to recover the organic vapors according to EITHER of the following:
   1. The efficiency of recovery is \( \geq 95 \) weight percent.
   2. If the efficiency is <95 weight percent, total organic emissions of 3 lb/hr and 3.1 tons/yr are attained.

C. If engineering calculations are used for a condenser, the design analysis addresses BOTH of the following:
   1. Considers the vent stream composition, constituent concentrations, flow rate, relative humidity and temperature.
   2. Establishes the design outlet organic compound concentration level, design average temperature of the condenser exhaust vent stream, and design average temperatures of the coolant fluid at the condenser inlet and outlet.

D. One of the following devices is maintained and operated to continuously monitor the operation of the condenser:
   1. A monitoring device with a continuous recorder to measure the organic compound concentration level in the exhaust vent stream from the condenser.
   2. A temperature monitoring device with a continuous recorder.

E. For a condenser with a concentration monitoring device, the operating record includes the date, time and duration of each period when the organic compound concentration level is more than 20% greater than the design outlet organic compound concentration level.

F. For a condenser with a temperature monitoring device, the operating record includes the date, time and duration of each period when ANY of the following occurs:
   1. Temperature of the exhaust vent stream from the condenser is more than 6º C above the design average exhaust vent stream temperature.
   2. Temperature of the coolant fluid exiting the condenser is more than 6 ºC above the design average coolant fluid temperature at the condenser outlet.

### Section 4: Boiler or Process Heaters

A. The control device is a boiler or process heater. If NO, go to Section 5.

B. The boiler or process heater is designed and operated to result in ANY of the following:
   1. Reduce the organic emissions by 95 weight percent or greater.
   2. Achieve a total organic compound concentration of 20 ppmv, expressed as the sum of actual compounds on a dry basis corrected to 3% oxygen.
   3. Provide a minimum residence time of 0.50 seconds at a minimum temperature of 760°C.
Section 4: Boiler or Process Heaters

C. If performance tests were conducted on a boiler or process heater designed and operated to achieve the standards in Question 4.B., the total organic compound concentrations and mass flow rates entering and exiting the control device were determined according to ALL of the following:
1. Velocity and volumetric flow rate were determined using Method 2 in appendix A of 40 CFR part 60.
2. Organic content was determined using Method 18 in appendix A of 40 CFR part 60.
3. Each performance test consists of 3 separate runs at least one hour each, under the highest load or capacity expected.
4. Total organic mass flow rate and annual total organic emission rate are calculated correctly.
5. The total organic emissions from all affected units are calculated by adding the hourly total organic mass emission rates and by adding the annual total organic mass emission rates.

D. The facility maintains information indicating the following performance testing facilities were made available.
1. Sampling ports adequate for the required test methods.
2. A safe sampling platform.
3. Safe access to the sampling platform.
4. Utilities for sampling and testing equipment.

E. All process information, including representative conditions, used during the performance test are recorded.

F. The time-weighted average of the results from 3 runs is used to determine compliance.

G. If a boiler or process heater has a design heat input capacity <44 megawatts, it is continuously monitored with a temperature monitoring device and continuous recorder.

H. If the boiler or process heater has a design heat input capacity of >= 44 megawatts, it is equipped with a continuous monitoring device and continuous recorder that measures a parameter indicating good combustion operating practices.

I. If engineering calculations are used for a boiler or process heater, the design analysis addresses the following:
1. Considers the vent stream composition, constituent concentrations, and flow rate.
2. Establishes the design minimum and average flame zone temperatures; and, the combustion zone residence time.
3. Describes the method and location where the vent or equipment stream is introduced into the combustion zone.

J. The operating record includes the date, time and duration of each period when ANY of the following occur:
1. Flame zone temperature is more than 28º C below the design average flame zone temperature.
2. Position where the vent stream is introduced to the combustion zone changes from the established location.

Section 5: Flares

A. The control device is a flare. If NO, go to Section 6.
Section 5: Flares

B. The flare is designed and operated with no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.  
664.1033(4)

C. The flame is present at all times.  
664.1033(4)

D. The flare is steam-assisted, air-assisted or non-assisted.  
664.1033(4)

E. If the flare is steam or air-assisted, the net heating value of the gas being combusted is >= 300 Btu/scf.  
664.1033(4)

F. If the flare is non-assisted, the net heating value of the gas being combusted is >= 200 Btu/scf.  
664.1033(4)

G. The exit velocity for a steam-assisted or non-assisted flare is ANY of the following:  
   1. Less than 60 ft/sec.  
   2. Between 60 ft/sec and 400 ft/sec if the net heating value of the gas is >1,000 Btu/scf.  
   3. Less than the maximum velocity, Vmax and less than 400 ft/sec.  
664.1033(4)

H. The exit velocity for an air-assisted flare is less than Vmax.  
664.1033(4)

I. Compliance with the visible emissions requirement has been determined using Method 22 in appendix A of 40 CFR part 60.  
664.1033(5)

J. The net heating value of the gas being combusted, the actual exit velocity, and the maximum allowed velocity or Vmax have been calculated correctly.  
664.1033(5)

K. A heat sensing monitoring device and continuous recorder indicate the continuous ignition of the pilot flame.  
664.1033(6)(b)3

L. The heat sensing monitoring device is maintained and operated to continuously monitor the operation of the flare.  
664.1033(6)(b)3

M. If engineering calculations are used for a flare, the design analysis considers the vent stream composition, constituent concentrations, flow rate, and design and operation standards (no visible emissions).  
664.1035(2)(d)3.d

N. The operating record includes the date, time and duration of each period when the pilot flame is not ignited.  
664.1035(3)(d)5

Section 6: Carbon Adsorption Units

A. The control device is a carbon adsorption unit. If NO, go to Section 7.  

Section 6: Carbon Adsorption Units

B. The carbon adsorption unit is designed and operated to recover the organic vapors according to EITHER of the following:
   1. The efficiency of recovery is 95 weight percent or greater.
   2. If the efficiency is less than 95 weight percent, total organic emissions of 3 lb/hr and 3.1 tons/yr are attained.

C. If the facility uses a fixed-bed carbon adsorption system that regenerates the carbon bed in the control device, the carbon is replaced with fresh carbon at regular, pre-determined time intervals that are shorter than the carbon service life.

D. If the carbon bed is not regenerated in the control device, the existing carbon is replaced with fresh carbon on a regular basis using EITHER of the following procedures:
   1. The concentration level of organic compounds in the exhaust vent stream is monitored and the existing carbon is immediately replaced when carbon breakthrough is indicated.
   2. The existing carbon is replaced at a regular predetermined time interval that is less than the design carbon replacement interval.

E. If the concentration level of organic compounds in the exhaust vent stream is monitored, the monitoring frequency is either daily or at an interval no more than 20% of the time required to consume the total carbon working capacity, whichever is longer.

F. The facility documents that carbon removed from the carbon adsorption system is managed as a hazardous waste by ANY of the following methods:
   1. Regenerated in a thermal treatment unit licensed or permitted as a miscellaneous unit; or, in a unit in compliance with NR 665 subch. AA, BB, CC or Clean Air Act requirements.
   2. Incinerated in a licensed or permitted hazardous waste incinerator.
   3. Burned in a licensed or permitted boiler or industrial furnace.

G. EITHER of the following devices is maintained and operated to continuously monitor the operation of a carbon adsorption system that regenerates the carbon bed in the control device:
   1. A monitoring device equipped with a continuous recorder to measure the organic compound concentration level in the exhaust vent stream from the carbon bed.
   2. A monitoring device equipped with a continuous recorder to measure a parameter indicating the carbon bed is regenerating on a regular predetermined time cycle.

H. If engineering calculations are used for a carbon adsorption system that regenerates the carbon bed in the control device, the design analysis considers the vent stream composition, constituent concentrations, flow rate, relative humidity and temperature.

I. If engineering calculations are used for a carbon adsorption system that regenerates the carbon bed in the control device, the design analysis establishes:
   1. The design exhaust vent stream organic compound concentration level.
   2. Number and capacity of carbon beds.
   3. Type and working capacity of activated carbon used for carbon beds.
   4. Design total steam flow over the period of each complete carbon bed regeneration cycle.
   5. Duration of the carbon bed steaming and cooling or drying cycles.
   6. Design carbon bed temperature after regeneration.
   7. Design carbon bed regeneration time.

J. If engineering calculations are used for a carbon adsorption system that does not regenerate the carbon bed in the control device, the design analysis considers the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature.
Section 6: Carbon Adsorption Units

K. If engineering calculations are used for a carbon adsorption system that does not regenerate the carbon bed in the control device, the design analysis establishes ALL of the following:
1. The design outlet organic concentration level.
2. Capacity of carbon bed
3. Type and working capacity of activated carbon used for carbon bed and design carbon replacement interval, based on the total carbon working capacity of the control device and source operating schedule.

L. For a carbon adsorption system that regenerates the carbon bed in the control device, the operating record includes the date, time and duration of each period when the following occur:
1. For units measuring organic compound concentrations, the period when the organic compound concentration level in the exhaust vent stream from the carbon bed is more than 20% greater than the design exhaust vent stream organic compound concentration level.
2. For units measuring regeneration of the carbon bed, the period when the vent stream continues to flow through the control device beyond the predetermined carbon bed regeneration time.

Section 7: General Recordkeeping Requirements

A. If more than one unit is subject to subch. AA or BB, the facility keeps one recordkeeping system that identifies each record by each hazardous waste management unit.

B. Records include up-to-date information and data identifying ALL of the following:
1. All process vents or equipment subject to subch. AA or BB requirements.
2. Annual throughput and operating hours of each affected unit.
3. Estimated emission rates for each affected unit and for the overall facility.
4. Facility map showing the approximate location of each affected unit.
5. Determinations of vent emissions and emission reductions achieved by add-on control devices based on engineering calculations or source tests.

C. Determinations of vent emissions and emission reductions are made using operating parameter values that represent the conditions when maximum organic emissions occur.

D. If test data is used to determine the organic removal efficiency or total organic compound concentration achieved by the control device, the facility has a performance test plan that includes ALL of the following:
1. A description of how it is determined that the planned test is conducted when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur.
2. Estimated or design flow rate and organic content of each vent or equipment stream.
3. Definition of the acceptable operating ranges of key processes and control device parameters.
4. Detailed engineering description of the closed-vent system and control device, including the manufacture’s name and model number of the control device; type, dimensions and equipment capacity; and, construction materials.
5. Detailed description of sampling and monitoring procedures, including the equipment used; sampling and monitoring locations in the system; frequency of sampling and monitoring; and, planned analytical procedures.
Section 7: General Recordkeeping Requirements

E. If a design analysis is used, records include ALL of the following design documentation for the closed-vent and control devices:

1. List of all information references and sources used in preparing the documentation.
2. Records, including the date, for each compliance test showing that the closed vent system operates with no detectable emissions.
3. Statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis represent the conditions that exist when the unit is operating at the highest load reasonably expected to occur.
4. Statement certifying that the control device is designed to operate at >= 95% efficiency; or, the total organic emissions are reduced to < 3 lb/hr and 3.1 tons/yr if the efficiency is < 95%.
5. The certification of efficiency is signed and dated by the owner or operator; or, the manufacturer or vendor certified that the control equipment meets design specifications.
6. If performance tests are used to demonstrate compliance, all of the test results.
7. Design analysis, specifications, drawings, schematics, piping and instrument diagrams prepared by the owner or operator or provided by the manufacturer or vendor that describes the control device design information.

F. The operating record includes ALL of the following for each closed-vent system and control device:

1. Description and date of each modification made to the unit design.
2. Identification of operating parameters, description of monitoring devices and diagram of monitoring sensor locations.
3. Monitoring, operating and inspection information.
4. Explanation of the cause for the control device operating parameters to exceed the design value and the measures implemented to correct the control device operation for each exceedance period.
5. For all carbon adsorption systems, the date when existing carbon is replaced with fresh carbon.
6. For a carbon adsorption system where the carbon bed is not regenerated on-site, the date and time when the control device is monitored for carbon breakthrough and the monitoring device reading.
7. Date of each control device startup and shutdown.
8. Identification of each of the closed-vent system components that are designated as unsafe to monitor, why the unit is unsafe to monitor, and the plan for monitoring each component.

G. ALL of the following information is recorded in the operating record when a leak is detected:

1. The instrument ID number; the closed-vent system component ID number; and, the operator name, initials or ID number.
2. The date the leak was detected and the date of the first attempt to repair.
3. The date the leak was successfully repaired.
4. The maximum instrument reading after the leak is successfully repaired or determined to be nonrepairable.
5. A notation of "repair delayed" and the reason for delay if the leak is not repaired within 15 days.

H. Records of monitoring, operating and inspection information for the closed vent system and control device are kept for 3 years from the date of each occurrence.

I. If an alternative control device is used, there is sufficient information to describe its operation and identify the process parameters that indicate proper operation and maintenance.
Section 7: General Recordkeeping Requirements

J. If the control device operated outside of the design specifications for more than 24 hours or the flare operated with visible emissions for more than 5 minutes during any 2 consecutive hours, the facility submitted a semi-annual report containing ALL of the following to the department by the specified date:

1. The EPA ID number, name and address of the facility.
2. For each month, the dates the control device exceeded or operated outside of the design specifications.
3. The duration and cause of each exceedance or visible emission.
4. Corrective measures that were taken.

664.1036