3745-21-10 **Compliance test methods and procedures.**

[Comment: For dates and availability of non-regulatory government publications, publications of recognized organizations and associations, federal rules, and federal statutory provisions referenced in this rule, see paragraph (JJ) of rule 3745-21-01 of the Administrative Code titled "referenced materials."]

(A) General provisions.

(1) The methods and procedures of this rule apply to sources governed by rule 3745-21-09 of the Administrative Code.

(2) Use of an alternative test method, in lieu of one of the USEPA's approved test methods or in lieu of other methods specified in this rule, shall be approved by the USEPA as a revision of the state implementation plan.

(3) The results of any compliance testing required by the director for tests conducted pursuant to paragraphs (C) to (F) and (L) of this rule shall not be accepted unless the Ohio EPA district office or local air agency has been notified of the intent to test in accordance with paragraph (A)(4) of this rule not less than thirty days before the proposed initiation of the testing.

(4) Any person notifying the Ohio EPA district office or local air agency of a proposed emissions compliance test shall include as part of the notification the following information:

(a) A statement indicating the purpose of the proposed test and the applicable paragraph of rule 3745-21-09 of the Administrative Code.

(b) A detailed description of the facility to be tested.

(c) A detailed description of the test procedures, equipment and sampling sites.

(d) A timetable, setting forth the dates on which the following will occur:

(i) The testing will be conducted.

(ii) The final test report will be submitted (not later than thirty days after completion of on-site sampling).

(5) For any source compliance determination, the owner or operator of the source shall be responsible for providing the following:

(a) Sampling ports, pipes, lines, or appurtenances for the collection of samples and data required by the test procedures.

(b) Safe access to the sample and data collection locations.

(c) Light, electricity, and other utilities required for sample and data collection.

(B) Method for the determination of volatile organic compound content, solids content, and density of surface coatings and inks.

(1) This method applies to coatings, inks or other coating materials employed in a coating line, printing line or other operation. For purposes of this method "coating" shall also mean "ink" or other coating material.

(2) Any determination of VOC content, solids content, or density of a coating shall be based on the coating as employed (as applied), including the addition of any thinner or viscosity reducer to the coating.

(3) When a sample of a coating is obtained for analysis by any of the procedures described in this method, the amount of the sample shall be at least one quart. The sample shall be placed in an air-tight container. When multiple package coatings are sampled, separate samples of each component shall be obtained.

(4) Using either the procedures set forth in USEPA method 24 (for coatings), ~~and~~ USEPA method 24A (for flexographic and rotogravure printing inks and related coatings) and 40 CFR Part 63, Subpart PPPP, Appendix A (for reactive adhesives), or the coating formulation data from the coating manufacturer and coating user, the following shall be determined, where appropriate:

D_C = density of coating, in pounds of coating per gallon of coating.

D_{VM} = density of volatile matter in coating, in pounds of volatile matter per gallon of volatile matter.

V_S = volume fraction of solids (nonvolatile matter) in coating, in gallon of solids per gallon of coating.

V_{VM} = volume fraction of volatile matter in coating, in gallon of volatile matter per gallon of coating.

V_W = volume fraction of water in coating, in gallon of water per gallon of coating.

W_S = weight fraction of solids (nonvolatile matter) in coating, in pound of solids per pound of coating.

W_{VM} = weight fraction of volatile matter in coating, in pound of volatile matter per pound of coating. If this weight fraction is determined by ASTM D2369-04, "Standard Test Method for Volatile Content of Coatings," the drying conditions shall be one hundred ten degrees Celsius for one hour, except where otherwise authorized by the director based on an alternate analytical procedure that is satisfactorily demonstrated to the director by the coating manufacturer to be more representative of the actual cure mechanism of the coating.

W_{W} = weight fraction of water in coating, in pound of water per pound of coating.

(5) If the coating contains a volatile matter other than VOC or water, the identity and content of such volatile matter may be determined using either standard gas chromatographic techniques or coating formulation data from the coating manufacturer and coating user. The density of such volatile matter may be determined using either the procedures set forth in ASTM D1475-98(2012) or data from reference texts. For purposes of this method, such volatile matter shall be referred to as exempt solvent. The following may be determined, where appropriate:

D_{ES} = density of exempt solvent, in pounds of exempt solvent per gallon of exempt solvent.

V_{ES} = volume fraction of exempt solvent in coating, in gallon of exempt solvent per gallon of coating.

W_{ES} = weight fraction of exempt solvent in coating, in pound of exempt solvent per pound of coating.

(6) The weight fraction W_{VOC} of VOC in a coating and the volume fraction V_{VOC} of VOC in a coating shall be calculated as follows, where appropriate:

$$W_{VOC} = W_{VM} - W_{W} - W_{ES}$$

$$V_{VOC} = V_{VM} - V_{W} - V_{ES}$$

(7) The VOC content of a coating can be expressed as follows:

$C_{VOC,1}$ = VOC content in pounds of VOC per gallon of coating.

$C_{VOC,2}$ = VOC content in pounds of VOC per gallon of coating, excluding water and exempt solvents.

$C_{VOC,3}$ = VOC content in pounds of VOC per gallon of solids.

$C_{VOC,4}$ = VOC content in pounds of VOC per pound of solids.

$C_{VOC,5}$ = VOC content in percentage VOC by volume of the coating, excluding water and exempt solvents.

$C_{VOC,6}$ = VOC content in percentage VOC by volume of the volatile matter.

$C_{VOC,7}$ = VOC content in percentage VOC by weight of the coating.

(8) The VOC content of a coating shall be calculated as follows, where appropriate:

$C_{VOC,1} = (D_C)(W_{VOC})$

$C_{VOC,2} = (D_C)(W_{VOC}) / (V_S + V_{VOC})$

$C_{VOC,3} = (D_C)(W_{VOC}) / V_S$

$C_{VOC,4} = W_{VOC} / W_S$

$C_{VOC,5} = (100)(V_{VOC}) / (V_S + V_{VOC})$

$C_{VOC,6} = (100)(V_{VOC}) / V_{VM}$

$C_{VOC,7} = (100)(W_{VOC})$

(9) The weighted average VOC content of the coatings employed during a specified time period t shall be calculated as follows, where appropriate:

$$(C_{VOC,1})_A = \frac{\sum_{i=1}^{n} C_{VOC,1i} L_{Ci}}{\sum_{i=1}^{n} L_{Ci}}$$

$$(C_{VOC,2})_A = \frac{\sum_{i=1}^{n} C_{VOC,2i} L_{Ci} (V_{Si} + V_{VOCi})}{\sum_{i=1}^{n} L_{Ci} (V_{Si} + V_{VOCi})}$$

$$(C_{VOC,3})_A = \frac{\sum_{i=1}^{n} C_{VOC,3i} L_{Ci} V_{Si}}{\sum_{i=1}^{n} L_{Ci} V_{Si}}$$

$$(C_{VOC,4})_A = \frac{\sum_{i=1}^{n} C_{VOC,4i} L_{Ci} D_C W_{Si}}{\sum_{i=1}^{n} L_{Ci} D_C W_{Si}} \quad \text{or} \quad = \frac{\sum_{i=1}^{n} C_{VOC,4i} M_{Ci}}{\sum_{i=1}^{n} M_{Ci}}$$

$$(C_{VOC,5})_A = \frac{\sum_{i=1}^{n} C_{VOC,5i} L_{Ci} (V_{Si} + V_{VOCi})}{\sum_{i=1}^{n} L_{Ci} (V_{Si} + V_{VOCi})}$$

$$(C_{VOC,6})_A = \frac{\sum_{i=1}^{n} C_{VOC,6i} L_{Ci} V_{VMi}}{\sum_{i=1}^{n} L_{Ci} V_{VMi}}$$

$$(C_{VOC,7})_A = \frac{\sum_{i=1}^{n} C_{VOC,7i} L_{ci} D_{ci}}{\sum_{i=1}^{n} L_{ci} D_{ci}} \quad \text{or} \quad = \frac{\sum_{i=1}^{n} C_{VOC,7i} M_{ci}}{\sum_{i=1}^{n} M_{ci}}$$

where:

A = subscript denoting that the indicated VOC content is a weighted average of the coatings employed during time period t.

L_C = liquid volume of coating employed during time period t, in gallons of coating.

M_C = mass (weight) of coating employed during time period t, in pounds of coating.

i = subscript denoting a specific coating employed during time period t.

n = total number of coatings employed during time period t.

t = time period specified for the weighted average VOC content.

(10) The density of the VOC content of a coating may be determined using either the procedures set forth in ASTM D1475-98(2012) or data from reference texts. If ASTM D1475-98(2012) is employed, the density shall be the arithmetic average of three determinations.

(11) In the event of a dispute between coating formulation data and data obtained by analytical procedures, the data obtained by analytical procedures shall be employed, except as otherwise provided in paragraph (B)(12) of this rule.

(12) If a VOC content value obtained by analytical procedures is higher than a VOC content value obtained by formulation data due to any VOC that is formed during baking or curing (i.e., cure volatiles), then the VOC content of the portion of the coating not subject to curing or baking shall be based on formulation data and the VOC content of the portion of the coating subject to curing or baking shall be based on analytical procedures. The portion of the coating subject to curing or baking shall be equal to the measured transfer efficiency for the coating applicator and object being coated. The approach described in this paragraph for determining the VOC content of a coating may be used only when the applicable VOC limitation is expressed in terms of pounds of VOC per gallon of deposited solids and the transfer efficiency test method is specified in this rule or rule 3745-21-09 of the Administrative Code. Also, in cases where analytical results and formulation data are combined for a waterborne coating, the interlaboratory precision adjustments specified in the analytical procedures shall not be applied to the analytical results.

(C) Method for the determination of VOC concentration, VOC mass emission rate and VOC control equipment efficiency.

(1) The provisions of this paragraph are generally applicable to the test methods employed to determine the VOC concentration and VOC mass emission rate for a gas stream or exhaust vent and the collection or control efficiency for any control equipment designed, installed, and operated for the purpose of reducing the emission of VOC. For purposes of this paragraph, "vapor collection system" also means capture system and "vapor control system" also means control system or control device.

(2) The concentration of VOC in a gas stream or exhaust vent shall be determined by utilizing the following methods:

(a) USEPA method 25 or USEPA method 25A, as appropriate, for sources specified in paragraphs (C) to (L), (P), (R), (S), (U), (W) to (Y), (FF), (GG), (LL) to (NN) [if the control efficiency compliance option in (LL), (MM) or (NN) is chosen] and, (PP), (SS), (VV)(2), (XX)(1), (YY), (ZZ)(1)(a), (AAA)(1), and (BBB) of rule 3745-21-09 of the Administrative Code; or

(b) USEPA method 18 or USEPA method 25A, as appropriate, for sources specified in paragraphs (O)(3)(c)(iv), (O)(4)(a)(ii), (CC) to (EE), and (LL) to (NN) [if the ppmv compliance option in (LL), (MM) or (NN) is chosen] of rule 3745-21-09 of the Administrative Code.

(3) The following procedures shall be included in any source testing or determination where applicable:

(a) The source shall be operated at or near maximum operating capacity during any testing and the measurement of the operating rate shall be made in a manner acceptable to the Ohio EPA.

(b) The VOC content of any coatings employed shall be sampled and analyzed in accordance with paragraph (B) of this rule.

(c) The capture efficiency of any vapor collection system used to transport the VOC emissions from their point of origin to the vapor control system shall be determined in accordance with USEPA methods 204 to 204F or the alternative capture efficiency testing protocols specified in the USEPA, Office of Air Quality Planning and Standards document entitled "Guidelines for determining capture efficiency."

(d) The control efficiency of any vapor control system used to reduce the emission of VOC shall be based upon an emissions test or a recovery test. For a vapor control system that destroys VOC (e.g., an incineration system), either the streams entering and leaving the vapor control system shall be tested or, if acceptable to the director, the amount of VOC employed shall be measured and the gas stream leaving the vapor control system shall be tested. For a vapor control system that recovers VOC (e.g., a carbon adsorption system), either the gas streams entering and leaving the vapor control system shall be tested or, if acceptable to the director, the amounts of VOC employed and recovered or, employed and emitted, shall be measured or tested.

(e) For the testing of a gas stream vented to a vapor control system, samples shall be taken simultaneously at the inlet and the outlet of the vapor control system.

(f) For the testing of a gas stream, the sampling location, volumetric flow rate, molecular weight, carbon dioxide and oxygen contents, excess air, and water vapor content shall be determined in accordance with USEPA methods 1, 1A, 2, 2A, 2C, 2D, 3 and 4.

(g) For gas streams tested by USEPA method 25 or 25A, the VOC emission rate shall be based upon the average of three test runs. Each run shall have a minimum duration of one hour and a minimum sample volume of .003 dry standard cubic meter, except that shorter sampling times or smaller volumes, when necessitated by process variables, may be found acceptable.

(h) The control efficiency of the vapor control system shall be the per cent reduction in mass emissions of VOC between the inlet and the outlet of the vapor control system. If this efficiency is based upon an emissions test utilizing USEPA method 25 or 25A, the mass emissions of VOC as carbon shall be employed in the efficiency determination.

(i) The capture efficiency of the vapor collection system shall be the per cent of total mass emissions of VOC emitted from the source which are vented to the vapor control system. If this efficiency is based upon an emissions test utilizing USEPA method 25 or 25A, the mass emissions of VOC as carbon shall be employed in the efficiency determination.

(j) The overall control efficiency (in per cent) of any control equipment for VOC emissions shall be the vapor capture efficiency multiplied by the vapor control efficiency and divided by one hundred.

(k) The total mass emission rate of VOC from a source equipped with control equipment shall be the sum of VOC emissions from the vapor control system, VOC emissions not collected by the vapor collection system and VOC emissions from any losses associated with the vapor collection system and vapor control system.

(4) The VOC mass emissions rate for a gas stream tested by USEPA method 18 shall be calculated as follows:

$$E_S = KQ_S \sum_{i=1}^{n} C_i M_i$$

where:

E_s = VOC mass emission rate for the gas stream, in kilograms of VOC per hour (kg VOC/hr).

$K = 2.494 \times 10^{-6}$ (gram mole-kilogram-minute per standard cubic meter-gram-ppmv-hour).

where the standard temperature for gram-mole per standard cubic meter is twenty degrees Celsius.

Q_s = volumetric flow rate of gas stream, in dry standard cubic meters per minute , at a standard temperature of twenty degrees Celsius.

C_i = concentration of sample component i, in ppmv, dry basis.

M_i = molecular weight of sample component i, in grams per gram-mole.

i = subscript denoting a specific sample component, which is a VOC, in the gas stream.

n = total number of sample components, which are VOC, in the gas stream.

(5) The mass emission rate of VOC as carbon for a gas stream tested by USEPA method 25 shall be calculated as follows:

$E_s = K\, C_s Q_s$

where:

E_s = mass emission rate of VOC as carbon for the gas stream, in kilograms of carbon per hour (kg C/hr).

K = 1 × 10^{-6} kilograms per milligram.

C_s = concentration of VOC as carbon in the gas stream, in milligrams of carbon per dry standard cubic meter.

Q_s = volumetric flow rate of the gas stream, in dry standard cubic meters per hour.

(6) To convert a mass emission rate from kilograms per hour to pounds per hour, multiply the mass emission rate in kilograms per hour by 2.2046.

(7) To convert a mass emission value from VOC as carbon to VOC, divide the mass emission value of VOC as carbon by the weight fraction of carbon in the average molecular weight of the VOC emission. The determination of this weight fraction of carbon may be based on standard analytical techniques or material formulation data.

(D) Method for the determination of VOC emissions from solvent metal cleaning:

(1) This method is applicable to determining VOC emissions from solvent metal cleaning equipment.

(2) The purpose of this method is to quantify, by material balance, the amount of solvent input into a degreaser over a sufficiently long period of time so that an average emission rate can be computed.

(3) The following procedure shall be followed to perform a material balance test:

(a) Clean the degreaser sump before testing.

(b) Record the amount of initial and make-up solvent added to the tank with a flow meter or other means.

(c) Record the type and amount or weight of work load degreased each day.

(d) At the end of the test run, pump out the used solvent and measure the amount with a flow meter or other means. Also, estimate the volume of metal chips and other material remaining in emptied sump, if significant.

(e) Bottle a sample of the used solvent and analyze it to find the per cent that is oil and other contaminants. The oil and solvent proportions can be estimated by weighing samples of used solvent before and after boiling off the solvent. Compute the volume of oils in the used solvent. The volume of solvent displaced by this oil along with the volume of make-up solvent added during operations is equal to the amount of VOC emissions.

(4) The following procedure can be followed to perform a material balance test in lieu of the procedure in paragraph (D)(3) of this rule:

(a) Clean the degreaser sump before testing.

(b) Record the amount of initial and make-up solvent added to the tank as measured with a flow meter or other means.

(c) Record the type and amount or weight of work load degreased over the period of the test.

(d) Record the amount of used solvent pumped out of the tank for disposal as measured with a flow meter or other means.

(e) Bottle a sample of the used solvent and analyze it to find the per cent that is oil and other contaminants.

(f) The VOC emissions from solvent metal cleaning equals the total solvent added to the tank minus the solvent contained in the used solvent being disposed.

(E) Method for the determination of VOC emissions from bulk gasoline terminals.

(1) This method is applicable to determining the VOC emission rates at a bulk gasoline terminal employing a vapor collection system and either a continuous or intermittent vapor control system at a loading rack.

(2) The VOC emission rates shall be determined in accordance with the methods and procedures contained in 40 CFR 60.503(b), (c), (e) and (f) of "Subpart XX - Standards of Performance for Bulk Gasoline Terminals~~;~~." ~~except that the gasoline throughput during any test shall be not less than ninety per cent of the maximum throughput of the loading rack and not less than eighty thousand gallons.~~

(3) During any test, all loading racks shall be open for each product line which is controlled by the system under test. Simultaneous use of more than one loading rack shall occur to the extent that such use would normally occur.

(4) Simultaneous use of more than one dispenser on each loading rack shall occur to the extent that such use would normally occur.

(5) Dispensing rates shall be set at the maximum rate at which the equipment is typically operated. Automatic product dispensers are to be used according to normal operating practices.

(6) Applicable operating parameters of the vapor control system shall be monitored to demonstrate that the control unit is operating at design levels. Delivery devices shall be leak free.

(7) For each gasoline tank truck loaded during the test period, all potential sources of leaks shall be checked in accordance with the method specified in paragraph (K) of this rule. The tank identification number, the latest leak check certification date, and the location and highest detector reading for each incident of leakage shall be recorded.

(8) During each test, all potential sources of leaks in the vapor collection and control systems shall be monitored in accordance with the method specified in paragraph (K) of this rule. The location and highest detector reading for each incident of leakage shall be recorded.

(F) Method for the detection of leaks of VOC from petroleum refinery equipment and organic chemical manufacturing equipment.

(1) This method is applicable to the detection of leaks of VOC into the ambient air from petroleum refinery equipment and any chemical manufacturing equipment subject to paragraph (T) or (DD) of rule 3745-21-09 of the Administrative Code.

(2) The detection of leaks shall be determined in accordance with the test procedure set forth in USEPA method 21.

(3) The calibration gases shall conform to the following:

(a) Zero air, which consists of less than ten ppmv of hydrocarbon in air.

(b) A mixture of air and methane or n-hexane at a concentration of approximately, but less than, ten thousand ppmv of methane or n-hexane.

(4) The leak detection instrument shall be calibrated before use on each day of its use.

(G) Standard method for the determination of the leak tightness of gasoline tank trucks (method G).

(1) This method is applicable to determining the leak tightness of gasoline tank trucks which are equipped with piping, hoses and other devices for the collection or

return of gasoline vapors during the transfer of gasoline at a gasoline dispensing facility, bulk gasoline plant or bulk gasoline terminal.

(2) The leak tightness of a gasoline tank truck shall be determined in accordance with the test procedure set forth in USEPA method 27. For the pressure test, the initial pressure shall be 18.0 inches of water. For the vacuum test, the initial vacuum shall be 6.0 inches of water.

(3) If any gasoline tank truck or compartment of a gasoline tank truck sustains either a pressure decrease greater than 3.0 inches of water over five consecutive minutes for the pressure test or a pressure increase greater than 3.0 inches of water over five consecutive minutes for the vacuum test, the tank truck is not leak tight. If not leak tight, repair the tank truck as necessary and repeat the entire test procedure specified in paragraph (G)(2) of this rule until the gasoline tank truck or compartment passes the test.

(H) [Reserved.]

(I) Method for the determination of seal gaps in an external floating roof tank.

(1) This method is applicable to determining the width and area of any gaps between the wall of an external floating roof tank and a seal which is around the circumference of the external floating roof.

(2) The width of any seal gap is the distance between the seal and the tank wall. It is determined by using probes of various widths to accurately measure the actual distance from the seal to the tank wall.

(3) The area of any seal gap is determined by multiplying the width of the seal gap, as determined in paragraph (I)(2) of this rule, by the circumferential length of the gap.

(4) The total seal gap area is the accumulated area of all gaps which are greater than 0.125 inch in width.

(J) Method for the determination of the perchloroethylene content of wastes at a dry cleaning facility which uses perchloroethylene.

(1) The method is applicable to determining the perchloroethylene content in per cent by weight for waste at a dry cleaning facility from any distillation operation which distills perchloroethylene and from any diatomaceous earth filter which filters perchloroethylene.

(2) The perchloroethylene content of the waste in per cent by volume is determined in accordance with the procedure in ASTM D322-97(2012), and is calculated as the diluent content in that procedure.

(3) The density of the waste is determined by weighing a known volume of the waste and is calculated as the net weight of the waste in pounds divided by the volume of the waste in gallons.

(4) The perchloroethylene content of the waste in per cent by weight is calculated as the product of the waste diluent content and 13.55, divided by the waste density.

(K) Method for the detection of leaks of gasoline vapors from vapor control systems, vapor collection systems, vapor balance systems, gasoline barges and gasoline tank trucks.

(1) This method is applicable to the detection of leaks of gasoline vapors into the ambient air from the following:

(a) Vapor control systems, vapor collection systems, and vapor balance systems at barge loading facilities (for gasoline), bulk gasoline terminals, bulk gasoline plants, and gasoline dispensing facilities.

(b) Gasoline barges and gasoline tank trucks during loading, providing the vapor control system, vapor collection system, or vapor balance system which is connected to the gasoline barge or gasoline tank truck does not create a back pressure greater than eighteen inches of water gauge pressure.

(2) This method describes the procedures to be followed for detecting leaks of gasoline vapors by means of a portable hydrocarbon gas analyzer, which is calibrated to read in per cent of the lower explosive limit as propane.

(3) The following equipment are to be used:

(a) A liquid manometer, or equivalent device, capable of measuring up to twenty-five inches of water gauge pressure with a precision of plus or minus 0.1 inch of water.

(b) A portable hydrocarbon gas analyzer which conforms to the following:

(i) Is equipped with a sampling line of sufficient length for easy maneuverability during testing and a sampling probe having an internal diameter of 0.25 inch.

(ii) Is certified as safe for operation in explosive atmospheres.

(iii) Has a minimum range of zero to one hundred per cent of the lower explosive limit as propane.

(iv) Has a response time for full-scale deflection of less than eight seconds with sampling line and probe attached.

(4) The portable hydrocarbon gas analyzer is calibrated with 2.2 per cent propane by volume in air (or equivalent calibration gas) for one hundred per cent of the lower explosive limit according to the procedures and frequency specified by the manufacturer.

(5) The test procedures for detecting leaks are the following:

(a) Connect the liquid manometer to a pressure tap in the vapor control system, vapor collection system, or vapor balance system as close as possible to the connection with the gasoline barge or gasoline tank truck.

(b) Record the pressure periodically during loading of the gasoline barge or gasoline tank truck.

(c) Check with the portable hydrocarbon gas analyzer all potential leak sources on the gasoline barge or gasoline tank truck during loading and on the vapor control system, vapor collection system, or vapor balance system by doing the following:

(i) Maintaining the probe's inlet about one inch from the potential leak source in the path of (parallel to) the vapor flow from a leak.

(ii) Moving the probe slowly around the periphery of the potential leak source to locate the point of highest meter response.

(iii) Blocking as much as possible the wind from the area being monitored.

(d) Record the location of leakage and the highest detector reading for each incidence of leakage.

(L) Method for the determination of the emission of volatile organic compounds from a dryer at a petroleum dry cleaning facility.

(1) This method is applicable to determining the volatile organic compound emission rate of a dryer containing articles cleaned in petroleum solvent at a dry cleaning facility.

(2) The dryer shall be tested under normal operating conditions for at least thirty dryer loads that total not less than four thousand pounds dry weight of articles cleaned. The dryer loads shall represent a normal range of variations in fabrics, solvents, load weights, temperatures, flow rates, and process deviations. Each dryer load shall be tested in accordance with paragraph (L)(3) or (L)(4) of this rule.

(3) For each dryer load the following shall be conducted and recorded:

(a) Determine the average stack gas dry volumetric flow rate V (in dry standard cubic feet per hour) in accordance with USEPA methods 1 and 2.

(b) Determine the average organic concentration C in the stack (in ppmv as propane) in accordance with USEPA method 25A in which the flame ionization analyzer is calibrated with propane standards.

(c) Determine the ratio R of the flame ionization analyzer's response to a given parts per million by volume concentration of propane to its response to the same parts per million by volume concentration of the volatile organic compounds present in the stack gas.

(d) Determine the molecular weight M (in pounds per pound-mole) of the volatile organic compounds present in the stack gas. Such determination shall be based on data from the manufacturer of the cleaning solvent or on standard analytical techniques.

(e) Measure and record the weight W_a (in pounds dry weight) of the articles to be cleaned.

(f) Calculate the weight W_{voc} (in pounds) of the volatile organic compounds emitted into the ambient air using the following equation:

$$W_{voc} = V \times C \times R \times M$$

(4) For each dryer load the following shall be conducted and recorded:

(a) All weights shall be measured to the nearest 0.5 pound or less on a scale that is accurate to 0.5 pound at weights of up to two hundred pounds.

(b) Measure and record the weight W_a (in pounds) of the articles to be cleaned.

(c) Measure and record the initial weight W_i (in pounds) of the articles to be dried after the washing cycle.

(d) Measure and record the final weight W_f (in pounds) of the articles removed from the dryer after the drying cycle.

(e) Measure and record the weight W_r (in pounds) of any recovered liquid materials.

(f) Calculate the weight W_{VOC} (in pounds) of the volatile organic compounds emitted into the ambient air using the following equation:

$$W_{VOC} = W_i - W_f - W_r$$

(5) The dryer's volatile organic compound emission rate (in pounds per one hundred pounds dry weight of articles cleaned) shall be calculated for the combined dryer loads tested under this method as equal to one hundred multiplied by the sum total of W_{VOC} and divided by the sum total of W_a.

(M) Method for the determination of the amount of volatile organic compounds contained in filtration waste at a petroleum dry cleaning facility.

(1) This method is applicable to determining the amount of volatile organic compounds contained in the waste from a solvent filter used to filter petroleum solvent at a dry cleaning facility.

(2) The solvent filter shall be tested under normal operating conditions for at least three time periods according to the procedures specified in paragraph (M)(3) of this rule.

(3) The test procedures for each time period are as follows:

(a) A time period consists of the time immediately after the removal of waste from the solvent filter up to the next removal of waste.

(b) Record the date and time of the start of the time period.

(c) Record during the time period the weight of articles being cleaned in any washer connected to the solvent filter.

(d) Record the weight of the waste from the solvent filter at the end of the time period, in pounds.

(e) Collect in a sealed container, which is impervious to petroleum solvent, about two pounds of the waste from the solvent filter at the end of the time period.

(f) Record the date and time of the end of the time period.

(g) Conduct a laboratory analysis of the waste collected in the sealed container according to the procedures specified in paragraph (M)(4) of this rule.

(4) The procedures for the laboratory analysis of the collected filtration waste are as follows:

(a) Determine the weight W_s (in grams of a sample of approximately fifty milliliters of the filtration waste).

(b) Determine the volume V_s (in milliliters) of the diluent content of that sample in accordance with ASTM D322-97(2012).

(c) Calculate the sample's diluent content D_s (fraction diluent by weight) using the following equation:

$$D_s = \frac{0.78 \times V_s}{W_s}$$

where 0.78 is the typical density of petroleum solvent in grams per milliliter.

(5) For the test conducted under paragraphs (M)(2), (M)(3) and (M)(4) of this rule, the amount of VOCs contained in the filtration waste is calculated using the following equation:

$$X = \frac{W_1 D_1 + W_2 D_2 + W_3 D_3}{A_1 + A_2 + A_3} \times 100$$

where:

X = amount of VOCs in the filtration waste, in pounds of VOC per one hundred pounds dry weight of articles cleaned.

A = total weight of articles cleaned during the time period indicated, in pounds dry weight.

D = diluent content of the sample of filtration waste for the time period indicated, in fraction diluent by weight (pounds of diluent per pound of filtration waste).

W = total weight of filtration waste for the time period indicated.

Subscripts 1, 2, and 3 identify the time period of the test.

(N) Method for the determination of the length of time to operate the recovery cycle of a solvent recovery dryer at a petroleum dry cleaning facility.

(1) This method is applicable to determining the length of time for operating the solvent recovery cycle of a solvent recovery dryer at a petroleum dry cleaning facility in order to assure that the flow rate of recovered petroleum solvent at the termination of solvent recovery cycle is no greater than fifty milliliters per minute.

(2) The dryer shall be tested under normal operating conditions for a duration of no less than two weeks during which no less than one-half of the dryer loads shall be monitored for their final recovered solvent flow rate.

(3) The suggested point for measuring the flow rate of recovered solvent is from the outlet of the solvent-water separator. Near the end of the recovery cycle, the entire flow of recovered solvent is diverted to a graduated cylinder. As the recovered solvent collects in the graduated cylinder, the elapsed time is monitored and recorded in periods greater than or equal to one minute. At the same time, the volume of solvent in the graduated cylinder is monitored and recorded to determine the volume of recovered solvent that is collected during each time period. The recovered solvent flow rate is calculated by dividing the volume of solvent collected per period by the length of time elapsed during the period and converting the result with appropriate factors into units of milliliters per minute. The recovery cycle and the monitoring procedure is continued until the flow rate of solvent is less than or equal to fifty milliliters per minute. The date, the type of articles cleaned, and the total length of the recovery cycle shall be recorded for each dryer load being monitored.

(O) Method for the determination of equipment in VOC service and in light liquid service.

(1) This method is applicable to equipment at a petroleum refinery or a process unit subject to paragraph (T) or (DD) of rule 3745-21-09 of the Administrative Code.

(2) Any piece of equipment is presumed to be in VOC service, unless the owner or operator demonstrates that the piece of equipment is not in VOC service according to the following provisions:

(a) The piece of equipment is considered not in VOC service if it can be determined that the VOC content of the process fluid, which is contained in or contacts the piece of equipment, can be reasonably expected never to exceed ten per cent by weight.

(b) For purposes of determining the VOC content of a process fluid, procedures that conform to the general methods described in ASTM E168-06, ASTM E169-04(2009), and ASTM E260-96(2011) shall be used.

(c) The owner or operator may use engineering judgment rather than the procedures contained in paragraph (O)(2)(b) of this rule to demonstrate that the VOC content of a process fluid does not exceed ten per cent by weight, provided the VOC content clearly does not exceed ten per cent by weight. In the event the Ohio EPA or the USEPA has a disagreement with an engineering judgment, paragraph (O)(2)(b) of this rule shall be used to resolve the disagreement.

(3) A piece of equipment is in light liquid service if it contains or is in contact with a process fluid that meets all of the following conditions:

(a) The process fluid is a liquid at operating conditions.

(b) The vapor pressure of one or more of the pure components within the process fluid is greater than 0.04 pound per square inch at sixty-eight degrees Fahrenheit. Vapor pressures may be obtained from standard reference texts or may be determined by the method in ASTM D2879-10.

(c) The total concentration of the pure components having a vapor pressure greater than 0.04 pound per square inch at sixty-eight degrees Fahrenheit is equal to or greater than twenty per cent by weight.

(P) Method for the determination of the net heating value of a gas, the actual exit velocity for a flare, and the maximum permitted velocity for an air-assisted flare.

(1) This method is applicable to the following:

(a) Any flare subject to paragraph (DD) of rule 3745-21-09 of the Administrative Code.

(b) Any process vent stream subject to paragraph (EE) of rule 3745-21-09 of the Administrative Code.

(2) The net heating value of gas being combusted in a flare or being vented from a process vent stream shall be calculated using the following equation:

where:

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

H_T = net heating value of the sample, in mega joules per standard cubic meter (MJ/scm), where the net enthalpy per mole of offgas is based on combustion at twenty-five degrees Celsius and seven hundred sixty millimeters of mercury, but the standard temperature for determining the volume corresponding to one mole is twenty degrees Celsius.

k = constant, 1.740×10^{-7} (megajoule-gram mole per parts per million-standard cubic meter-kilocalorie), where the standard temperature for gram-mole per standard cubic meter (g mole/scm) is twenty degrees Celsius.

C_i = concentration of sample component i in ppmv, as measured by the procedures in USEPA method 18, and ASTM D1946-90(2011) reported on a wet basis.

H_i = net heat of combustion of sample component i, in kilocalories per gram-mole. The heat of combustion may be determined using the procedures in ASTM D2382-76 if published values are not available or cannot be calculated.

i = subscript denoting a specific component in the sample.

n = total number of components within the sample.

(3) The actual exit velocity of a flare shall be calculated by dividing the volumetric flow rate (in units of standard temperature and pressure) of the flare header or headers that feed the flare, as determined by USEPA methods 2, 2A, 2C, or 2D as appropriate, by the unobstructed (free) cross-sectional area of the flare tip, as determined by design and engineering principles.

(4) The maximum permitted velocity of an air-assisted flare shall be determined by the following equation:

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

where:

V_{max} = maximum permitted velocity of an air-assisted flare, in meters per second (m/sec).

H_T = the net heating value as determined in paragraph (P)(2) of this rule.

(5) To express the net heating value of a gas in Btu per standard cubic foot, multiply H_T by 26.84.

(6) To express a velocity in feet per second, multiply the velocity in meters per second by 3.281.

(Q) Method for the detection of leaks of gasoline vapors from a vapor control system installed at a gasoline dispensing facility (static leak test).

(1) This method is applicable to quantifying the vapor tightness of a vapor balance system or a vacuum assist control system installed at a gasoline facility.

(2) This method describes the procedures to be followed for detecting leaks of gasoline vapors by pressurizing the entire vapor recovery control system to two inches of water column and then allowing the system pressure to decay for five minutes. The acceptability of the final pressure is based upon the vapor system volume or ullage space. The allowable five minute final pressure is based upon the gasoline tank ullage, pressure decay equations, and the number of affected nozzles.

(3) The equipment, procedures, and pressure decay leak criteria are specified in appendix A to this rule.

(R) Method for the determination of the dynamic pressure performance for a vapor control system installed at a gasoline dispensing facility (dynamic pressure performance test).

(1) This method is applicable to determining the dynamic pressure at known dispensing flow rates for a vapor control system installed at a gasoline dispensing facility. This method is used to quantify the back pressure and detect liquid obstructions in the vapor path leading from the dispensing nozzle to the gasoline storage tank.

(2) This method describes the procedures to be followed in simulating the dynamic back pressures associated with known gasoline dispensing rates and liquid

blockages by passing nitrogen through the vapor control system at three flow rates after liquid gasoline has been introduced into the vapor return piping.

(3) The equipment, procedures, and dynamic pressure performance criteria are identified in appendix B to this rule. The post test inspection form, as required by paragraph (DDD)(2)(c) of rule 3745-21-09 of the Administrative Code, is contained in appendix C to this rule.

(S) Inspection and maintenance requirements for catalytic incinerators. An inspection and maintenance plan shall be developed, maintained on-site, and made readily available upon the request of the appropriate Ohio EPA district office or local air agency. At a minimum, the plan shall include the following:

(1) Annual sampling and analysis of the catalyst activity (i.e., conversion efficiency) following the manufacturer's or catalyst supplier's recommended procedures.

(2) Monthly inspection of the oxidizer system including the burner assembly and fuel supply lines for problems.

(3) Annual internal and monthly external visual inspection of the catalyst bed to check for channeling, abrasion, and settling. If problems are found, corrective action consistent with the manufacturer's recommendations shall be implemented and a new performance test to determine destruction efficiency in accordance with paragraph (C) of this rule shall be conducted.

(4) Records, and a description of the results of each inspection and catalyst activity analysis.

Effective:

Five Year Review (FYR) Dates: 7/13/2020

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Certification

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Date

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