

Environmental Protection Agency

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and existing sources. An owner or operator must perform the applicability assessment procedures and methods for process vents specified in § 63.1104, excluding paragraphs (b)(1), (d), (g), (h), (i), (j), (l)(1), and (n). General compliance, recordkeeping, and reporting requirements are specified in §§ 63.1108 through 63.1112. Minimization of emis-

sions from startup, shutdown, and malfunctions must be addressed in the startup, shutdown, and malfunction plan required by § 63.1111; the plan must also establish reporting and recordkeeping of such events. Procedures for approval of alternate means of emission limitations are specified in § 63.1113.

TABLE 10 TO § 63.1103(H)—WHAT ARE MY REQUIREMENTS IF I OWN OR OPERATE A SPANDEX PRODUCTION PROCESS UNIT AT A NEW OR EXISTING SOURCE?

If you own or operate . . .	And if . . .	Then you must . . .
(a) A storage vessel (as defined in § 63.1101) that stores liquid containing organic HAP.	(1) The maximum true vapor pressure of the organic HAP is \geq 3.4 kilopascals; and the capacity of the vessel is \geq 47 cubic meters.	(i) Comply with the requirements of subpart WW of this part; or (ii) Reduce emissions of organic HAP by 95 weight-percent by venting emissions in through a closed vent system to any combination of control devices meeting the requirements of subpart SS of this part, as specified in § 63.982(a)(1).
(b) A process vent	Reduce emissions of organic HAP by 95 weight-percent, or reduce organic HAP or TOC to a concentration of 20 parts per million by volume, whichever is less stringent, by venting emissions through a closed vent system to any combination of control devices meeting the requirements of § 63.982(a)(2).
(c) A fiber spinning line	Operate the fiber spinning line such that emissions are captured and vented through a line closed vent system to a control device that complies with the requirements of § 63.982(a)(2). If a control device other than a flare is used, HAP emissions must be reduced by 95 weight-percent, or total organic HAP or TOC must be reduced to a concentration of 20 parts per million by volume, whichever is less stringent.

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§ 63.1104 Process vents from continuous unit operations: applicability assessment procedures and methods.

(a) *General.* The provisions of this section provide calculation and measurement methods for criteria that are required by § 63.1103 to be used to determine applicability of the control requirements for process vents from continuous unit operations. The owner or operator of a process vent is not required to determine the criteria specified for a process vent that is being controlled (including control by flare) in accordance with the applicable

weight-percent, TOC concentration, or organic HAP concentration requirement in § 63.1103.

(b) *Sampling sites.* For purposes of determining process vent applicability criteria, the sampling site shall be located as specified in (b)(1) through (4) of this section, as applicable.

(1) *Sampling site location if TRE determination is required.* If the applicability criteria specified in the applicable table of § 63.1103 includes a TRE index value, the sampling site for determining volumetric flow rate, regulated

organic HAP concentration, total organic HAP or TOC concentration, heating value, and TRE index value, shall be after the final recovery device (if any recovery devices are present) but prior to the inlet of any control device that is present, and prior to release to the atmosphere.

(2) *Sampling site location if TRE determination is not required.* If the applicability criteria specified in the applicable table of §63.1103 does not include a TRE index value, the sampling site for determining volumetric flow rate, regulated organic HAP concentration, total organic HAP or TOC concentration, and any other specified parameter shall be at the exit from the unit operation before any control device.

(3) *Sampling site selection method.* Method 1 or 1A of 40 CFR part 60, appendix A, as appropriate, shall be used for selection of the sampling site. No traverse site selection method is needed for process vents smaller than 0.10 meter (0.33 foot) in nominal inside diameter.

(4) *Sampling site when a halogen reduction device is used prior to a combustion device.* An owner or operator using a scrubber to reduce the process vent halogen atom mass emission rate to less than 0.45 kilograms per hour (0.99 pound per hour) prior to a combustion control device in compliance with §63.1103 (as appropriate) shall determine the halogen atom mass emission rate prior to the combustion device according to the procedures in paragraph (i) of this section.

(c) *Applicability assessment requirement.* The TOC or organic HAP concentrations, process vent volumetric flow rates, process vent heating values, process vent TOC or organic HAP emission rates, halogenated process vent determinations, process vent TRE index values, and engineering assessments for process vent control applicability assessment requirements are to be determined during maximum representative operating conditions for the process, except as provided in paragraph (d) of this section, or unless the Administrator specifies or approves alternate operating conditions. Operations during periods of startup, shutdown, and malfunction shall not con-

stitute representative conditions for the purpose of an applicability test.

(d) *Exceptions.* For a process vent stream that consists of at least one process vent from a batch unit operation manifolded with at least one process vent from a continuous unit operation, the TRE shall be calculated during periods when one or more batch emission episodes are occurring that result in the highest organic HAP emission rate (in the combined vent stream that is being routed to the recovery device) that is achievable during the 6-month period that begins 3 months before and ends 3 months after the TRE calculation, without causing any of the situations described in paragraphs (d)(1) through (3) to occur.

(1) Causing damage to equipment;

(2) Necessitating that the owner or operator make product that does not meet an existing specification for sale to a customer; or

(3) Necessitating that the owner or operator make product in excess of demand.

(e) *TOC or Organic HAP concentration.* The TOC or organic HAP concentrations shall be determined based on paragraph (e)(1), (e)(2), or (k) of this section, or any other method or data that have been validated according to the protocol in Method 301 of appendix A of 40 CFR part 63. For concentrations needed for comparison with the appropriate control applicability concentrations specified in §63.1103, TOC or organic HAP concentration shall be determined based on paragraph (e)(1), (e)(2), or (k) of this section or any other method or data that has been validated according to the protocol in method 301 of appendix A of this part. The owner or operator shall record the TOC or organic HAP concentration as specified in paragraph (1)(3) of this section.

(1) *Method 18.* The procedures specified in paragraph (e)(1)(i) and (ii) of this section shall be used to calculate parts per million by volume concentration using method 18 of 40 CFR part 60, appendix A:

(i) The minimum sampling time for each run shall be 1 hour in which either an integrated sample or four grab samples shall be taken. If grab sampling is used, then the samples shall be taken

at approximately equal intervals in time, such as 15-minute intervals during the run.

(ii) The concentration of either TOC (minus methane and ethane) or regulated organic HAP emissions shall be calculated according to paragraph (e)(1)(ii)(A) or (B) of this section, as applicable.

(A) The TOC concentration (C_{TOC}) is the sum of the concentrations of the individual components and shall be computed for each run using Equation 1:

$$C_{\text{TOC}} = \frac{\sum_{i=1}^x \left(\sum_{j=1}^n C_{ji} \right)}{x} \quad [\text{Eq. 1}]$$

Where:

C_{TOC} = Concentration of TOC (minus methane and ethane), dry basis, parts per million by volume.

C_{ji} = Concentration of sample component j of the sample i , dry basis, parts per million by volume.

n = Number of components in the sample.

x = Number of samples in the sample run.

(B) The regulated organic HAP or total organic HAP concentration (C_{HAP}) shall be computed according to Equation 1 in paragraph (e)(1)(ii)(A) of this section except that only the regulated or total organic HAP species shall be summed, as appropriate.

(2) *Method 25A.* The procedures specified in paragraphs (e)(2)(i) through (vi) of this section shall be used to calculate parts per million by volume concentration using Method 25A of 40 CFR part 60, appendix A.

(i) Method 25A of 40 CFR part 60, appendix A shall be used only if a single organic HAP compound comprises greater than 50 percent of total organic HAP or TOC, by volume, in the process vent.

(ii) The process vent composition may be determined by either process knowledge, test data collected using an appropriate Environmental Protection Agency method or a method or data validated according to the protocol in Method 301 of appendix A of part 63. Examples of information that could constitute process knowledge include calculations based on material balances, process stoichiometry, or pre-

vious test results provided the results are still relevant to the current process vent conditions.

(iii) The organic compound used as the calibration gas for Method 25A of 40 CFR part 60, appendix A shall be the single organic HAP compound present at greater than 50 percent of the total organic HAP or TOC by volume.

(iv) The span value for Method 25A of 40 CFR part 60, appendix A shall be equal to the appropriate control applicability concentration value specified in the applicable table(s) presented in § 63.1103 of this subpart.

(v) Use of Method 25A of 40 CFR part 60, appendix A is acceptable if the response from the high-level calibration gas is at least 20 times the standard deviation of the response from the zero calibration gas when the instrument is zeroed on the most sensitive scale.

(vi) The owner or operator shall demonstrate that the concentration of TOC including methane and ethane measured by Method 25A of 40 CFR part 60, appendix A is below one-half the appropriate control applicability concentration specified in the applicable table for a subject source category in § 63.1103 in order to qualify for a low organic HAP concentration exclusion.

(f) *Volumetric flow rate.* The process vent volumetric flow rate (Q_s), in standard cubic meters per minute at 20 °C, shall be determined as specified in paragraph (f)(1) or (2) of this section and shall be recorded as specified in § 63.1109(d).

(1) Use Method 2, 2A, 2C, 2D, 2F, or 2G of 40 CFR part 60, appendix A, as appropriate. If the process vent tested passes through a final steam jet ejector and is not condensed, the stream volumetric flow shall be corrected to 2.3 percent moisture; or

(2) The engineering assessment procedures in paragraph (k) of this section can be used for determining volumetric flow rates.

(g) *Heating value.* The net heating value shall be determined as specified in paragraphs (g)(1) and (2) of this section, or by using the engineering assessment procedures in paragraph (k) of this section.

(1) The net heating value of the process vent shall be calculated using Equation 2:

$$H_T = K_1 \left(\sum_{j=1}^n D_j H_j \right) \quad [\text{Eq. 2}]$$

Where:

H_T = Net heating value of the sample, megaJoule per standard cubic meter, where the net enthalpy per mole of process vent is based on combustion at 25° C and 760 millimeters of mercury, but the standard temperature for determining the volume corresponding to 1 mole is 20° C, as in the definition of Q_s (process vent volumetric flow rate).

K_1 = Constant, 1.740×10^{-7} (parts per million)⁻¹(gram-mole per standard cubic meter) (megaJoule per kilocalorie), where standard temperature for (gram-mole per standard cubic meter) is 20° C.

D_j = Concentration on a wet basis of compound j in parts per million, as measured by procedures indicated in paragraph (e)(2) of this section. For process vents that pass through a final steam jet and are not condensed, the moisture is assumed to be 2.3 percent by volume.

H_j = Net heat of combustion of compound j , kilocalorie per gram-mole, based on combustion at 25° C and 760 millimeters mercury.

(2) The molar composition of the process vent (D_j) shall be determined using the methods specified in paragraphs (g)(2)(i) through (iii) of this section:

(i) Method 18 of 40 CFR part 60, appendix A to measure the concentration of each organic compound.

(ii) American Society for Testing and Materials D1946-90 to measure the concentration of carbon monoxide and hydrogen.

(iii) Method 4 of 40 CFR part 60, appendix A to measure the moisture content of the stack gas.

(h) *TOC or Organic HAP emission rate.* The emission rate of TOC (minus methane and ethane) (E_{TOC}) and the emission rate of the regulated organic HAP or total organic HAP (E_{HAP}) in the process vent, as required by the TRE index value equation specified in paragraph (j) of this section, shall be calculated using Equation 3:

$$E = K_2 \left(\sum_{j=1}^n C_j M_j \right) Q_s \quad [\text{Eq. 3}]$$

Where:

E = Emission rate of TOC (minus methane and ethane) (E_{TOC}) or emission rate of the

regulated organic HAP or total organic HAP (E_{HAP}) in the sample, kilograms per hour.

K_2 = Constant, 2.494×10^{-6} (parts per million)⁻¹ (gram-mole per standard cubic meter) (kilogram/gram) (minutes/hour), where standard temperature for (gram-mole per standard cubic meter) is 20° C.

n = Number of components in the sample.

C_j = Concentration on a dry basis of organic compound j in parts per million as measured by method 18 of 40 CFR part 60, appendix A as indicated in paragraph (e) of this section. If the TOC emission rate is being calculated, C_j includes all organic compounds measured minus methane and ethane; if the total organic HAP emission rate is being calculated, only organic HAP compounds are included; if the regulated organic HAP emission rate is being calculated, only regulated organic HAP compounds are included.

M_j = Molecular weight of organic compound j , gram/gram-mole.

Q_s = Process vent flow rate, dry standard cubic meter per minute, at a temperature of 20° C.

(i) *Halogenated process vent determination.* In order to determine whether a process vent is halogenated, the mass emission rate of halogen atoms contained in organic compounds shall be calculated according to the procedures specified in paragraphs (i)(1) and (2) of this section. A process vent is considered halogenated if the mass emission rate of halogen atoms contained in the organic compounds is equal to or greater than 0.45 kilograms per hour.

(1) The process vent concentration of each organic compound containing halogen atoms (parts per million by volume, by compound) shall be determined based on one of the procedures specified in paragraphs (i)(1)(i) through (iv) of this section:

(i) Process knowledge that no halogen or hydrogen halides are present in the process vent, or

(ii) Applicable engineering assessment as discussed in paragraph (k) of this section, or

(iii) Concentration of organic compounds containing halogens or hydrogen halides as measured by Method 26 or 26A of 40 CFR part 60, appendix A, or

(iv) Any other method or data that have been validated according to the applicable procedures in method 301 of appendix A of this part.

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(2) Equation 4 shall be used to calculate the mass emission rate of halogen atoms:

$$E = K_2 Q \left(\sum_{j=1}^n \sum_{i=1}^m C_j * L_{j,i} * M_{j,i} \right) \quad [\text{Eq. 4}]$$

Where:

- E = Mass of halogen atoms, dry basis, kilogram per hour.
- K₂ = Constant, 2.494 × 10⁻⁶ (parts per million)⁻¹ (kilogram-mole per standard cubic meter) (minute per hour), where standard temperature is 20° C.
- Q = Flow rate of gas stream, dry standard cubic meters per minute, determined according to paragraph (f)(1) or (f)(2) of this section.
- n = Number of halogenated compounds j in the gas stream.
- j = Halogenated compound j in the gas stream.
- m = Number of different halogens i in each compound j of the gas stream.
- i = Halogen atom i in compound j of the gas stream.
- C_j = Concentration of halogenated compound j in the gas stream, dry basis, parts per million by volume.
- L_{ji} = Number of atoms of halogen i in compound j of the gas stream.
- M_{ji} = Molecular weight of halogen atom i in compound j of the gas stream, kilogram per kilogram-mole.

(j) *TRE index value.* The owner or operator shall calculate the TRE index value of the process vent using the equations and procedures in this paragraph, as applicable, and shall maintain records specified in paragraph (1)(1) or (m)(2) of this section, as applicable.

(1) *TRE index value equation.* The equation for calculating the TRE index value is Equation 5:

$$\text{TRE} = \frac{1/E_{\text{HAP}} * [A + B(Q_s) + C(H_T) + D(E_{\text{TOC}})]}{[\text{Eq. 5}]}$$

Where:

- TRE = TRE index value.
- A, B, C, D = Coefficients presented in table 1 of this section.
- E_{HAP} = Emission rate of total organic HAP, kilograms per hour, as calculated according to paragraph (h) or (k) of this section.
- Q_s = process vent flow rate, standard cubic meters per minute, at a standard temperature of 20 °C, as calculated according to paragraph (f) or (k) of this section.
- H_T = process vent net heating value, megaJoules per standard cubic meter, as calculated according to paragraph (g) or (k) of this section.
- E_{TOC} = Emission rate of TOC (minus methane and ethane), kilograms per hour, as calculated according to paragraph (h) or (k) of this section.

TABLE 1 OF § 63.1104(J)(1)—COEFFICIENTS FOR TOTAL RESOURCE EFFECTIVENESS^A

Existing or new?	Halogenated vent stream?	Control device basis	Values of coefficients			
			A	B	C	D
Existing	Yes	Thermal Incinerator and Scrubber.	3.995	5.200×10 ⁻²	-1.769×10 ⁻³	9.700×10 ⁻⁴
	No	Flare	1.935	3.660×10 ⁻¹	-7.687×10 ⁻³	-7.333×10 ⁻⁴
		Thermal Incinerator 0 Percent Recovery.	1.492	6.267×10 ⁻²	3.177×10 ⁻²	-1.159×10 ⁻³
New	Yes	Thermal Incinerator 70 Percent Recovery.	2.519	1.183×10 ⁻²	1.300×10 ⁻²	4.790×10 ⁻²
		Thermal Incinerator and Scrubber.	1.0895	1.417×10 ⁻²	-4.822×10 ⁻⁴	2.645×10 ⁻⁴
	No	Flare	5.276×10 ⁻¹	9.98×10 ⁻²	-2.096×10 ⁻³	2.000×10 ⁻⁴
		Thermal Incinerator 0 Percent Recovery.	4.068×10 ⁻¹	1.71×10 ⁻²	8.664×10 ⁻³	-3.162×10 ⁻⁴
		Thermal Incinerator 70 Percent Recovery.	6.868×10 ⁻¹	3.209×10 ⁻³	3.546×10 ⁻³	1.306×10 ⁻²

^A Use according to procedures outlined in this section. MJ/scm = Mega Joules per standard cubic meter. scm/min = Standard cubic meters per minute.

(2) *Nonhalogenated process vents.* The owner or operator of a nonhalogenated process vent shall calculate the TRE

index value by using the equation and appropriate nonhalogenated process

vent parameters in table 1 of this section for process vents at existing and new sources. The lowest TRE index value is to be selected.

(3) *Halogenated process vents.* The owner or operator of a halogenated process vent stream, as determined according to procedures specified in paragraph (i) or (k) of this section, shall calculate the TRE index value using the appropriate halogenated process vent parameters in table 1 of this section for existing and new sources.

(k) *Engineering assessment.* For purposes of TRE index value determinations, engineering assessments may be used to determine process vent flow rate, net heating value, TOC emission rate, and total organic HAP emission rate for the representative operating condition expected to yield the lowest TRE index value. Engineering assessments shall meet the requirements of paragraphs (k)(1) through (4) of this section. If a process vent flow rate or process vent organic HAP or TOC concentration is being determined for comparison with the applicable flow rate or concentration value presented in the tables in §63.1103 to determine control requirement applicability, engineering assessment may be used to determine the flow rate or concentration for the representative operating conditions expected to yield the highest flow rate or concentration.

(1) If the TRE index value calculated using such engineering assessment and the TRE index value equation in paragraph (j) of this section is greater than 4.0, then the owner or operator is not required to perform the measurements specified in paragraphs (e) through (i) of this section.

(2) If the TRE index value calculated using such engineering assessment and the TRE index value equation in paragraph (j) of this section is less than or equal to 4.0, then the owner or operator is required either to perform the measurements specified in paragraphs (e) through (i) of this section for control applicability assessment or comply with the requirements (or standards) specified in the tables presented in §63.1103 (as applicable).

(3) Engineering assessment includes, but is not limited to, the examples

specified in paragraphs (k)(3)(i) through (iv) of this section:

(i) Previous test results, provided the tests are representative of current operating practices at the process unit.

(ii) Bench-scale or pilot-scale test data representative of the process under representative operating conditions.

(iii) Maximum flow rate, TOC emission rate, organic HAP emission rate, organic HAP or TOC concentration, or net heating value limit specified or implied within a permit limit applicable to the process vent.

(iv) Design analysis based on accepted chemical engineering principles, measurable process parameters, or physical or chemical laws or properties. Examples of analytical methods include, but are not limited to those specified in paragraphs (k)(3)(iv)(A) through (k)(3)(iv)(D) of this section:

(A) Use of material balances based on process stoichiometry to estimate maximum TOC or organic HAP concentrations,

(B) Estimation of maximum flow rate based on physical equipment design such as pump or blower capacities,

(C) Estimation of TOC or organic HAP concentrations based on saturation conditions, and

(D) Estimation of maximum expected net heating value based on the stream concentration of each organic compound or, alternatively, as if all TOC in the stream were the compound with the highest heating value.

(4) All data, assumptions, and procedures used in the engineering assessment shall be documented. The owner or operator shall maintain the records specified in paragraphs (1)(1) through (4) of this section, as applicable.

(1) *Applicability assessment record-keeping requirements*—(1) *TRE index value records.* The owner or operator shall maintain records of measurements, engineering assessments, and calculations performed to determine the TRE index value of the process vent according to the procedures of paragraph (j) of this section, including those records associated with halogen vent stream determination. Documentation of engineering assessments shall include all data, assumptions, and

procedures used for the engineering assessments, as specified in paragraph (k) of this section. As specified in paragraph (m) of this section, the owner or operator shall include this information in the Notification of Compliance Status report required by § 63.1110(a)(4).

(2) *Flow rate records.* The owner or operator shall record the flow rate as measured using the sampling site and flow rate determination procedures (if applicable) specified in paragraphs (b) and (f) of this section or determined through engineering assessment as specified in paragraph (k) of this section. As specified in paragraph (m) of this section, the owner or operator shall include this information in the Notification of Compliance Status report required by § 63.1110(a)(4).

(3) *Concentration records.* The owner or operator shall record the regulated organic HAP or TOC concentration (if applicable) as measured using the sampling site and regulated organic HAP or TOC concentration determination procedures specified in paragraphs (e)(1) and (2) of this section, or determined through engineering assessment as specified in paragraph (k) of this section. As specified in paragraph (m) of this section, the owner or operator shall include this information in the Notification of Compliance Status report required by § 63.1110(a)(4).

(4) *Process change records.* The owner or operator shall keep up-to-date, readily accessible records of any process changes that change the control applicability for a process vent. Records are to include any recalculation or measurement of the flow rate, regulated organic HAP or TOC concentration, and TRE index value.

(m) *Applicability assessment reporting requirements—(1) Notification of Compliance Status.* The owner or operator shall submit, as part of the Notification of Compliance Status report required by § 63.1110(a)(4), the information recorded in paragraph (1)(1) through (3) of this section.

(2) *Process change.* (i) Whenever a process vent becomes subject to control requirements under this subpart as a result of a process change, the owner or operator shall submit a report within 60 days after the performance test or applicability assessment, whichever is

sooner. The report may be submitted as part of the next Periodic Report required by § 63.1110(a)(5). The report shall include the information specified in paragraphs (m)(2)(i)(A) through (C) of this section.

(A) A description of the process change;

(B) The results of the recalculation of the TOC or organic HAP concentration, flow rate, and/or TRE index value required under paragraphs (e), (f), and (j), and recorded under paragraph (1); and

(C) A statement that the owner or operator will comply with the requirements specified in § 63.1103 by the schedules specified in that section for the affected source.

(ii) If a performance test is required as a result of a process change, the owner or operator shall specify that the performance test has become necessary due to a process change. This specification shall be made in the performance test notification to the Administrator, as specified in § 63.999(a)(1).

(iii) If a process change does not result in additional applicable requirements, then the owner or operator shall include a statement documenting this in the next Periodic Report required by § 63.1110(a)(5) after the process change was made.

(n) *Parameter monitoring of certain process vents.* An owner or operator who maintains a TRE index value (if applicable) in the applicable TRE index value monitoring range as specified in an applicable table presented in § 63.1103 of this subpart without using a recovery device shall report a description of the parameter(s) to be monitored to ensure the process vent is operated in conformance with its design or process and achieves and maintains the TRE index value above the specified level, and an explanation of the criteria used to select parameter(s). An owner or operator who maintains a TRE index value (if applicable) in the applicable TRE index monitoring range as specified in an applicable table presented in § 63.1103 of this subpart by using a recovery device shall comply with the requirements of § 63.993(c).

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