DEPARTMENT OF ENVIRONMENTAL QUALITY

AIR QUALITY DIVISION

PART 10. INTERMITTENT TESTING AND SAMPLING

R 336.2040 Method for determination of volatile organic compound emissions from coating lines and graphic arts lines.

Rule 1040. (1) The methods described in this rule shall be used for the determination of volatile organic compound emissions from coating lines and graphic arts lines for the purpose of determining compliance, during the specified averaging period, with an emission limit contained in any of the following:

(a) These rules.

(b) A permit to install.

(c) A permit to operate.

(d) A voluntary agreement.

(e) A performance contract.

(f) A stipulation.

(g) An order of the department.

For emission limits expressed as pounds of volatile organic compounds per gallon of coating, minus water, as applied, the phrase "minus water" shall also include compounds which are used as organic solvents and which are excluded from the definition of volatile organic compound. Concentrations of volatile organic compounds in coatings and inks shall be determined by excluding water and compounds which are used as organic solvents and which are excluded from the definition of volatile organic compound from both the volume of volatiles in the coatings and inks and the volume of the coatings and inks as applied.

(2) Unless otherwise specified in these rules or in a legally enforceable permit, order, or contract as described in subrule (1) of this rule, for a particular coating line or graphic arts line, the applicable method for the determination of volatile organic emissions from coating lines and graphic arts lines is based upon the form of the specified emission limit as follows:

(a) For coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating, minus water, as applied, use the method described in subrule (12)(a) of this rule.

(b) For coating lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating, minus water, as applied, use the method described in subrule (12)(b) of this rule.

(c) For coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating solids, as applied, use the method described in subrule (12)(c) of this rule.

(d) For coating lines with 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating solids, as applied, use the method described in subrule (12)(d) of this rule.

(e) For coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per gallon of applied coating solids, use the method described in subrule (12)(e) of this rule.

(f) For coating lines that have 1 or more add-on emissions control devices for which emission

limits are expressed in pounds of volatile organic compounds per gallon of applied coating solids, use the method described in subrule (12)(f) of this rule.

(g) For graphic arts lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per pound of solids, as applied, use the method described in subrule (12)(g) of this rule.

(h) For graphic arts lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per pound of solids, as applied, use the method described in subrule (12)(h) of this rule.

(i) For flatwood paneling coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per 1,000 square feet of coated finished product, use the method described in subrule (12)(i) of this rule.

(j) For flatwood paneling coating lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per 1,000 square feet of coated finished product, use the method described in subrule (12)(j) of this rule.

(3) The following nomenclature applies to the equations described in this rule:

(a) a = An individual duct through which gases containing volatile organic compounds are ducted to an add-on emissions control device.

(b) B = Modified emission limit, converted from pounds of volatile organic compounds per gallon of coating, minus water, as applied, to pounds of volatile organic compounds per gallon of coating solids as applied.

(c) C_{im} = Concentration of volatile organic compounds, as measured by the applicable method, in the effluent gas flowing through stack "m" leaving the add-on emissions control device (parts per million by volume).

(d) Cza = Concentration of volatile organic compounds, as measured by the applicable method, in the influent gas flowing through duct "a" entering the add-on emissions control device (parts per million by volume).

(e) D_{ci} = Density of each ink or coating "i" as received from the ink or coating supplier (pounds per gallon of ink or coating).

(f) D_{sj} = Density of each volatile organic compound dilution solvent "j" added to the coating (pounds per gallon of solvent, minus water).

(g) DE = Volatile organic compound destruction efficiency of the add-on emissions control device.

(h) E = Emission limit expressed in pounds of volatile organic compounds per gallon of coating, minus water, as applied.

(i) G_T = Total volume of all coatings "z" used during the averaging period (gallons of coating, minus water, as applied).

(j) i = An individual coating used during the averaging period that belongs to the coating category for which a compliance determination is being made pursuant to the provisions of this rule. For a graphic arts line, "i" is an individual ink or coating used during the averaging period.

(k) j = An individual dilution solvent used during the averaging period that is used in conjunction with a coating "i".

(l) k = An individual method of application of coating solids.

(m) L_{ci} = Volume of each coating "i" used during the averaging period (gallons of coating, minus water, as applied).

(n) L_{di} = Volume of each ink or coating "i" as received from the ink or coating supplier and used during the averaging period (gallons of ink or coating).

(o) L_{ik} = Volume of each coating "i" used by each application method "k" during the averaging period (gallons of coating, minus water, as applied).

(p) L_{sj} = Volume of each volatile organic compound dilution solvent "j" added to the coating during the averaging period (gallons of solvent, minus water).

(q) M = Total weight of volatile organic compounds in all coatings "z" used during the averaging period for a coating line or a graphic arts line (pounds).

(r) m = An individual stack through which gases containing volatile organic compounds are ducted to the ambient air from an add-on emissions control device.

(s) M_r = Total weight of volatile organic compounds recovered from a recovery-type add-on emissions control device during the averaging period (pounds).

(t) N = Fraction, by weight, of the total volatile organic compounds emitted from an operation which is captured and enters the add-on emissions control device (pound per pound).

(u) NT_r = Fraction, by weight, of the total volatile organic compounds in all coatings "z" used during the averaging period for a coating line or a graphic arts line which is controlled by an add-on emissions control device "r" (pound per pound).

(v) P = For an individual coating "i," pounds of volatile organic compounds per gallon of coating, minus water, as applied.

(w) Ps = For an individual coating "i," pounds of volatile organic compounds, minus water, as received from the ink or coating supplier.

(x) P_a = As used in subrule (12)(a) of this rule for coating lines that do not have an add-on emissions control device, volume- weighted average pounds of volatile organic compounds per gallon of coating, minus water, as applied, for a single coating category during the averaging period.

(y) P_b = As used in subrule (12)(b) of this rule for coating lines that have 1 or more add-on emissions control devices, volume-weighted average pounds of volatile organic compounds per gallon of coating, minus water, as applied, for a single coating category during the averaging period.

(z) P_c = As used in subrule (12)(c) of this rule for coating lines that do not have an add-on emissions control device, volume- weighted average pounds of volatile organic compounds per gallon of coating solids, as applied, for a single coating category during the averaging period.

(aa) P_d = As used in subrule (12)(d) of this rule for coating lines that have 1 or more add-on emissions control devices, volume-weighted average pounds of volatile organic compounds per gallon of coating solids, as applied, for a single coating category during the averaging period.

(bb) P_e = As used in subrule (12)(e) of this rule for coating lines that do not have an add-on emissions control device, volume- weighted average pounds of volatile organic compounds per gallon of applied coating solids for a single coating category during the averaging period.

(cc) P_f = As used in subrule (12)(f) of this rule for coating lines that have 1 or more add-on emissions control devices, volume-weighted average pounds of volatile organic compounds per gallon of applied coating solids for a single coating category during the averaging period.

(dd) P_g = As used in subrule (12)(g) of this rule for graphic arts lines that do not have an add-on emissions control device, average pounds of volatile organic compounds per pound of solids, as applied, for all inks and coatings used during the averaging period.

(ee) P_h = As used in subrule (12)(h) of this rule for graphic arts lines that have 1 or more add-on emissions control devices, average pounds of volatile organic compounds per pound of solids, as applied, for all inks and coatings used during the averaging period.

(ff) P_i = As used in subrule (12)(i) of this rule for flatwood paneling coating lines that do not

have an add-on emissions control devices, volume-weighted average pounds of volatile organic compounds per 1,000 square feet of coated finished product for a single-coating category during the averaging period.

(gg) P_j = As used in subrule (12)(j) of this rule for flatwood paneling coating lines that have 1 or more add-on emissions control devices, volume-weighted average pounds of volatile organic compounds per 1,000 square feet of coated finished product for a single-coating category during the averaging period.

(hh) Q_{im} = Volumetric flow rate of the effluent gas flowing through stack "m" leaving the add-on emissions control device (dry standard cubic feet per hour).

(ii) Q_{za} = Volumetric flow rate of the influent gas flowing through duct "a" entering the add-on emissions control device (dry standard cubic feet per hour).

(jj) Q_{3n} = Volumetric flow rate of the effluent gas leaving an uncontrolled stack "n" (dry standard cubic feet per hour).

(kk) r = An individual add-on emissions control device.

(ll) R_r = Reduction efficiency of a single add-on emissions control device.

(mm) R_t = Overall reduction efficiency of all add-on emissions control devices used for a coating line or a graphic arts line.

(nn) s = The total number of different add-on control devices "r" on a coating line or graphic arts line.

(oo) Sq = The total surface area of coated finished product for a single-coating category for a flatwood paneling coating line during the averaging period (square feet).

(pp) T = Overall transfer efficiency for all coatings "i" for a single-coating category on a coating line for the averaging period.

(qq) t = The total number of stacks "m" leaving an add-on emissions control device "r".

(rr) T_i = Transfer efficiency for application of coating "i" (%).

(ss) u = Total number of ducts "a" entering an add-on emissions control device "r".

(tt) U_{ci} = For representative colors and parts that are tested for transfer efficiency, "Uci" is the volume of each representative color of coating that is applied to each representative part on a coating line during the averaging period.

(uu) V = For a coating line, the volume of solids in all coatings used "zc" during the averaging period (gallons).

(vv) V_{ci} = Proportion of solids by volume in each coating "i" (gallon of solids per gallon of coating, minus water, as applied).

(ww) W = For a graphic arts line, the weight of solids in all inks and coatings used "zg" during the averaging period (pounds).

(xx) W_{ci} = Proportion of volatiles (volatile organic compounds, water, and exempt compounds) by weight in each ink or coating "i" as received from the ink or coating supplier (pound of volatiles per pound of coating).

(yy) x = The total number of different application methods "k."

(zz) y = The total number of different dilution solvents "j."

(aaa) z = The total number of different coatings "i" used on a coating line or different number of inks and coatings "i" used on a graphic arts line during the averaging period. "z" is used generically in the equations specified in this rule for "zc" when the calculation is made for a coating line and for "zg" when the calculation is made for a graphic arts line.

(bbb) zc = The total number of different coatings "i" in the same coating category used during the averaging period.

(ccc) zg = The total number of different inks and coatings "i" used during the averaging period.

(4) The following provisions apply to the calculations for a coating line or graphic arts line made pursuant to the methods described in this rule:

(a) When carrying out calculations, carry not less than 5 significant digits in intermediate calculations. Round off figures after the final calculation, rounding off calculated emission numbers to not less than 2, but not more than 3, significant figures.

(b) The calculations for a coating line shall include all of the coatings which are in the same coating category and which are used during the averaging period as specified in the applicable emission limit.

(c) Except as specified in R 336.1624(5)(d), the calculations for a graphic arts line shall include all of the inks and coatings that are used during the averaging period as specified in the applicable emission limit.

(5) The volatile organic compound content of an ink or coating, minus water, as applied, "P," shall be determined using any of the following methods:

(a) The volatile organic compound content of an ink or coating, minus water, as applied, "P," shall be determined according to all of the following provisions:

(i) The volatile organic compound content, minus water, as applied, shall be determined as follows:

(A) For a coating used on a coating line or a coating used on a graphic arts line, the volatile organic compound content, minus water, as applied, shall be determined using federal reference method 24 or federal reference method 24a, as applicable to the coating, as described in R 336.2004, or an alternate method approved by the department.

(B) For an ink that is used on a graphic arts line, the volatile organic compound content, minus water, as applied, shall be determined using federal reference method 24a, as described in R 336.2004.

(ii) The ink or coating sample shall be taken at a point where the sample will be representative of the ink or coating material as applied.

(iii) The sample shall be stored in an enclosed container that is not less than 1 pint in volume.

(iv) By using a procedure that is acceptable to the department, the amount of any compound in the sample that is excluded from the definition of volatile organic compound may be quantified and subtracted from the total amount of volatiles in the sample as determined by federal reference method 24, federal reference method 24a, or an alternate method that is approved by the department. In this case, the volume of any excluded compound in the sample shall also be subtracted from the volume of the ink or coating sample.

(b) Upon written approval by the department, the volatile organic compound content of an ink or coating may be determined from formulation data, which includes batch composition information from the ink or coating manufacturer and the amount of volatile organic compound dilution solvent added to the ink or coating before application. In this case, "P" shall be calculated using the following equation:

$$P = \frac{L_{di}\ \ Ps + L_{sj}\ \ D_{sj}}{L_{di} + L_{sj}}$$

(c) If a coating or ink is tested by a federal reference method 24 or 24a analysis or by an alternate method approved by the department and the results are different than calculated through formulation data review, then the test method results shall be used for determining compliance

with the emission limit.

(6) The weight of volatile organic compounds that are used during the averaging period shall be calculated using the following equation, where "z" is the total number of coatings used:

$$M = \sum_{i=1}^{z} L_{ci} \ P$$

(7) The total volume of coating solids that are used during the averaging period shall be calculated using the following equation, where "z" is the total number of coatings used:

$$V = \sum_{i=1}^{z} L_{ci} \ V_{ci}$$

(8) The total weight of ink and coating solids that are used during the averaging period shall be calculated using the following equation, where "zg" is the total number of inks and coatings used during the averaging period:

$$W = \sum_{i=1}^{zg} L_{di} \ D_{ci} \ (1 - W_{ci})$$

(11) The overall reduction efficiency of add-on emissions control devices shall be determined using 1 or more of the following methods, as applicable:

(a) When a destructive-type add-on emissions control device is used, the reduction efficiency for the add-on emissions control device shall be determined by using the following method:

(i) The destruction efficiency of the add-on emissions control device is calculated by using the following equation, where "u" is the total number of ducts entering the control device and "t" is the total number of stacks leaving the control device:

$$DE = \frac{\sum_{a=1}^{u} Q_{za} \ C_{za} - \sum_{n=1}^{t} Q_{im} \ C_{im}}{\sum_{a=1}^{u} Q_{za} \ C_{za}}$$

(ii) Using the destruction efficiency as determined in paragraph (i) of this subdivision, the reduction efficiency of the add-on emissions control device is calculated by using the following equation:

$$R_r = (DE)N$$

(iii) If there is only 1 add-on emissions control device used on a coating line or graphic arts line, use the value calculated for "Rr" pursuant to paragraph (ii) of this subdivision as the value for RT in subsequent calculations.

(iv) The concentration of volatile organic compound emissions entering and exiting the add-on emissions control device shall be determined by using federal reference methods 25 or 25a, federal reference method 18 if approved by the department, the alternate version of federal reference method 25 incorporating the Byron analysis, or an alternate method that is acceptable to the department. Federal reference methods 1, 2, 3, and 4 shall be used for the determination of the volumetric flow rate in the effluent gas. Alternate federal reference method 1A, 2A, 2C, or 2D shall be used where appropriate.

(b) When an add-on emissions control device is used that recovers volatile organic compounds, the reduction efficiency of the device shall be determined by using 1 of the following methods:

(i) A mass balance of the products used and the products recovered, using the following equation:

$$R_r = \frac{M_r}{M}$$

(ii) An alternate method that is acceptable to the department.

(iii) If there is only 1 add-on emissions control device used on a coating line or a graphic arts line, use the value calculated for "R_r" pursuant to paragraph (i) or (ii) of this subdivision as the value for R_T in subsequent calculations.

(c) If there is more than 1 add-on emissions control device used on a coating line or a graphic arts line, calculate the overall reduction efficiency by using the following equation:

$$R_T = \sum_{r=1}^{s} R_r \, (NT_r)$$

(12) Compliance with the specified emission limit shall be determined using 1 of the following methods, as applicable, based upon the form of the emission limit:

(a) For coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating, minus water, as applied, use either of the following methods:

(i) If only 1 coating is used on the coating line during the averaging time, use the following method:

(A) Determine the volatile organic compound content of the coating, minus water, as applied, "P," by using the method described in subrule (5) of this rule.

(B) If "P" is less than or equal to the specified emission limit, the coating line meets the emission limit.

(ii) If more than 1 coating of the same coating category is used on the coating line during the averaging period, use the following method:

(A) Determine the volatile organic compound content of each coating, minus water, as applied, that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(B) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(C) Determine the total volume of coatings used on the coating line during the averaging period "G_T" using the following equation:

$$G_T = \sum_{i=1}^{z} L_{ci}$$

(D) Determine the volume-weighted average weight of volatile organic compounds per gallon, minus water, as applied, by using the following equation:

$$P_a = \frac{M}{G_T}$$

(E) If "P_a" is less than or equal to the specified emission limit, the coating line meets the emission limit.

(b) For coating lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating, minus water, as applied, use the following method:

(i) Convert the specified emission limit to a modified emission limit "B" expressed in pounds of volatile organic compounds per gallon of coating solids, as applied, by using the following equation:

$$B = \frac{E}{1 - \frac{E}{7.36}}$$

(ii) Determine the volatile organic compound content of each coating, minus water, as applied, that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(iii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iv) Determine the total volume of coating solids used during the averaging period "V" by using the method described in subrule (7) of this rule.

(v) Determine the overall capture efficiency "N" by using the method described in subrule (10) of this rule.

(vi) Determine the overall reduction efficiency "R_T" by using the method described in subrule (11) of this rule.

(vii) Determine the volume-weighted average weight of volatile organic compounds per gallon of coating solids, as applied, "P_b," by using the following equation:

$$P_b = \frac{M}{V}(1 - R_T)$$

(viii) If "P_b" is less than or equal to the modified limit "B," the coating line meets the emission limit.

(c) For coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating solids, as applied, use the following method:

(i) Determine the volatile organic compound content of each coating, minus water, as applied, that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the total volume of coating solids used during the averaging period "V" by using the method described in subrule (7) of this rule.

(iv) Determine the volume-weighted average weight of volatile organic compounds per gallon of coating solids, as applied, "Pc," by using the following equation:

$$P_c = \frac{M}{V}$$

(v) If "P_c" is less than or equal to the specified limit, the coating line meets the emission limit.

(d) For coating lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per gallon of coating solids, as applied, use the following method:

(i) Determine the volatile organic compound content of each coating, minus water, as applied, that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the total volume of coating solids used during the averaging period "V" by using the method described in subrule (7) of this rule.

(iv) Determine the overall capture efficiency "N" by using the method described in subrule (10) of this rule.

(v) Determine the overall reduction efficiency "R_T" by using the method described in subrule (11) of this rule.

(vi) Determine the volume-weighted average weight of volatile organic compounds per gallon of coating solids, as applied, "P_d," by using the following equation:

$$P_d = \frac{M}{V}(1 - R_T)$$

(vii) If "P_d" is less than or equal to the specified limit, the coating line meets the emission limit.

(e) For coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per gallon of applied coating solids, use the following method:

(i) Determine the volatile organic compound content of each coating, minus water, as applied, that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the total volume of coating solids used during the averaging period "V" by using the method described in subrule (7) of this rule.

(iv) Determine the overall transfer efficiency "T" by using the method described in subrule (9) of this rule.

(v) Determine the volume-weighted average weight of volatile organic compounds per gallon of applied coating solids "P_e" by using the following equation:

$$P_e = \frac{M}{V\,\frac{(T)}{100}}$$

(vi) If "P_e" is less than or equal to the specified limit, the coating line meets the emission limit.

(f) For coating lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per gallon of applied coating solids, use the following method:

(i) Determine the volatile organic compound content of each coating, minus water, as

applied, that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the total volume of coating solids used during the averaging period "V" by using the method described in subrule (7) of this rule.

(iv) Determine the overall transfer efficiency "T" by using the method described in subrule (9) of this rule.

(v) Determine the overall capture efficiency "N" by using the method described in subrule (10) of this rule.

(vi) Determine the overall reduction efficiency "R_T" by using the method described in subrule (11) of this rule.

(vii) Determine the volume-weighted average weight of volatile organic compounds per gallon of applied coating solids "P_f" by using the following equation:

$$P_f = \frac{M}{V\,\frac{(T)}{100}}(1 - R_T)$$

(viii) If "P_f" is less than or equal to the specified limit, the coating line meets the emission limit.

(g) For graphic arts lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compounds per pound of solids, as applied, use the following method:

(i) Determine the volatile organic compound content of each ink and coating, minus water, as applied, "P," used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the weight of ink and coating solids used during the averaging period "W" by using the method described in subrule (8) of this rule.

(iv) Determine the average pounds of volatile organic compound per pound of solids, as applied, "P_g," by using the following equation:

$$P_g = \frac{M}{W}$$

(v) If "P_g" is less than or equal to the specified limit, the graphic arts line meets the emission limit.

(h) For graphic arts lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per pound of solids, as applied, use the following method:

(i) Determine the volatile organic compound content of each ink and coating, minus water, as applied, "P," used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the weight of ink and coating solids used during the averaging period "W" by using the method described in subrule (8) of this rule.

(iv) Determine the overall capture efficiency "N" by using the method described in subrule (10) of this rule.

(v) Determine the overall reduction efficiency "R_t" by using the method described in subrule (11) of this rule.

(vi) Determine the average pounds of volatile organic compound per pound of solids, as applied, "P_h," by using the following equation:

$$P_h = \frac{M}{W}(1 - R_T)$$

(vii) If "P_h" is less than or equal to the specified limit, the graphic arts line meets the emission limit.

(i) For flatwood paneling coating lines that do not have an add-on emissions control device for which emission limits are expressed in pounds of volatile organic compound per 1,000 square feet of coated finished product, use the following method:

(i) Determine the volatile organic compound content of each coating, minus water, as applied that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the total surface area of coated finished product for the coating category during the averaging period "sq".

(iv) Determine the volume-weighted average pounds of volatile organic compounds per 1,000 square feet of coated finished product "Pi" by using the following equation:

$$P_i = \frac{\frac{M}{sq}}{1{,}000}$$

Where the units for the term 1,000 are square feet.

(v) If "P_i" is less than or equal to the specified limit, the coating line meets the emission limit.

(j) For flatwood paneling coating lines that have 1 or more add-on emissions control devices for which emission limits are expressed in pounds of volatile organic compounds per 1,000 square feet of coated finished product, use the following method:

(i) Determine the volatile organic compound content of each coating, minus water, as applied, that belongs to the same coating category "P" used during the averaging period by using the method described in subrule (5) of this rule.

(ii) Determine the weight of volatile organic compounds used during the specified averaging period "M" by using the method described in subrule (6) of this rule.

(iii) Determine the total surface area of coated finished product for the coating category during the averaging period "sq".

(iv) Determine the overall capture efficiency "N" by using the method described in subrule (10) of this rule.

(v) Determine the overall reduction efficiency "RT" by using the method described in subrule (11) of this rule.

(vi) Determine the volume-weighted average pounds of volatile organic compounds per 1,000 square feet of coated finished product "P_j" by using the following equation:

$$P_j = \frac{\frac{M}{sq}}{1{,}000}(1 - R_T)$$

Where the units for the term 1,000 are square feet.

(vii) If "P_j" is less than or equal to the specified limit, the coating line meets the emission limit.

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