2.51　　　　　**Beverage Can Coating**

2.51.1　　　　Applicability and Designation of Affected Facility

(a)　　　　The provisions of this source category apply to the following affected facilities in a beverage can surface coating lines: each exterior base coat operation, each overvarnish coating operation, and each inside spray coating operation.

2.51.2　　　Definitions and Symbols

All symbols used in this source category not defined below are given the meaning in the Clean Air Act of 1970 (as amended) or the Georgia Air Quality Act (as amended) or in published regulations pertaining thereto.

B_w　　　=　　　the proportion of the coating which is water (fraction by volume)

C_a　　　=　　　the VOC concentration in each gas stream leaving the control device and entering the atmosphere (parts per million by volume, as carbon)

C_b　　　=　　　the VOC concentration in each gas stream entering the control device (parts per million by volume, as carbon)

D_c　　　=　　　density of each coating, as received (kilograms per liter)

D_d　　　=　　　density of each VOC-solvent added to coatings (kilograms per liter)

D_r　　　=　　　density of VOC-solvent recovered by an emission control device (kilograms per liter)

E　　　=　　　VOC destruction efficiency of the control device (fraction)

F　　　=　　　the proportion of total VOC's emitted by an affected facility that enters the control device (fraction)

G　　　=　　　the volume-weighted average of VOC's in coatings consumed in a calendar month per unit volume of coating solids applied (kilograms per liter)

G_{c-w}　　　=　　　the volume-weighted average mass of VOC's consumed per unit volume of coating excluding water (kilograms per liter)

H_e　　　=　　　the fraction of VOC emitted at the coater and flash-off areas captured by a collection system

H_h　　　=　　　the fraction of VOC emitted at the cure oven captured by a collection system

L_c　　　=　　　the volume of each coating consumed, as received (liters)

L_{c-w}　　　=　　　the volume of each coating consumed less water (liters)

L_d　　　=　　　the volume of VOC-solvent added to coatings (liters)

L_r　　　=　　　the volume of VOC-solvent recovered by an emission control device (liters)

L_s　　　=　　　the volume of coating solids consumed (liters)

M_d　　　=　　　the mass of VOC-solvent added to coatings (kilograms)

M_o　　　=　　　the mass of VOC-solvent in coatings consumed, as received (kilograms)

M_r　　　=　　　the mass of VOC-solvent recovered by an emission control device (kilograms)

N　　　=　　　the volume-weighted average mass of VOC emissions to the atmosphere per unit volume of coating solids applied (kilograms per liter)

Q_a　　　=　　　the volumetric flow rate of each gas stream leaving the control device and entering the

atmosphere (dry standard cubic meters per hour)

Q_b = the volumetric flow rate of each gas stream entering the control device (dry standard cubic meters per hour)

R = the overall VOC emission reduction efficiency for an affected facility (fraction)

S_e = the fraction of VOC in coating and diluent VOC-solvent emitted at the coater and flash-off areas for a coating operation

S_h = the fraction of VOC in coating and diluent solvent emitted at the cure oven for a coating operation

V_s = the proportion of solids in each coating, as received (fraction by volume)

W_o = the proportion of VOC in each coating, as received (fraction by weight)

2.51.3   Performance Tests and Compliance Provisions

(a)   The provisions of paragraph 6 and 8 of Section 1.2 of this text do not apply to the required performance tests.

(b)   The owner or operator of an affected facility shall conduct an initial performance test as required under Section 1.2 according to procedures in this section; and, thereafter, procedures in this section shall be used to conduct the required periodic (e.g., daily, monthly, etc.) performance tests to demonstrate compliance with the applicable Georgia Regulations for Air Quality Control or Federal New Source Performance Standards.

(c)   The owner or operator shall use the following procedures for determining monthly volume-weighted average emissions of VOC's in kilograms per liter (kg/ℓ) of coating solids applied (G).

(1)   An owner or operator shall use the following procedures for each affected facility that does not use a capture system and control device to comply with the applicable emission limit. The owner or operator shall determine the composition of the coatings by formulation data supplied by the manufacturer of the coating or by an analysis of each coating, as received, using Reference Method 24. The Director may require the owner or operator who uses formulation data supplied by the manufacturer of the coating to determine the VOC content of coatings using Reference Method 24 or an equivalent or alternate method. The owner or operator shall determine, from company records, the volume of coating and the mass of VOC-solvent added to the coatings. If a common coating distribution system serves more than one affected facility, the owner or operator shall estimate the volume of coating used at each affected facility by using the average dry weight of coating, number of cans, and size of cans being processed by each affected facility or by other procedures acceptable to the Director.

(i)   Calculate the volume-weighted average of the total mass of VOC per volume of coating solids used during the calendar month for each affected facility, except as otherwise provided by the applicable regulation. The volume-weighted average of the total mass of VOC per volume of coating solids used each calendar month will be determined by the following procedures.

(A)   Calculate the mass of VOC used (M_o+M_d) during the calendar month for each affected facility by the following equation or as provided in Appendix G of this text:

$$M_o + M_d = \sum_{i=1}^{n} L_{ci} D_{ci} W_{oi} + \sum_{i=1}^{m} L_{dj} D_{dj}$$

(1)

($\sum L_{dj} D_{dj}$ will be **0** if no VOC solvent is added to the coatings, as

received.)

Where: **n** is the number of different coatings used during the calendar month and **m** is the number of different diluent VOC-solvents added to coatings used during the calendar month.

(B) Calculate the total volume of coating solids used (L_s) in the calendar month for each affected facility by the following equation:

$$L_s = \sum_{i=1}^{n} L_{ci} V_{si} \qquad (2)$$

Where: **n** is the number of different coatings used during the calendar month.

(C) Calculate the volume-weighted average mass of VOC per volume of solids used during the calendar month for the affected facility by the following equation:

$$G = \frac{M_o + M_d}{L_s}$$

$$(3)$$

(ii) Calculate the volume-weighted average of VOC emissions to the atmosphere (N) during the calendar month for each affected facility by the following equation:

$$N = G \qquad (4)$$

(2) An owner or operator shall use the following procedures for each affected facility that uses a capture system and a control device that destroys VOC (e.g., incinerator) to comply with the applicable emission limit.

(i) Determine the overall reduction efficiency (R) for the capture system and control device. For the initial performance test the overall reduction efficiency (R) shall be determined as prescribed in (c)(2)(i) (A), (B), and (C) of this section. In subsequent months, the owner or operator may use the most recently determined overall reduction efficiency (R) for the performance test providing control device and capture system operating conditions have not changed. The procedure in paragraphs (c)(2)(i) (A), (B), and (C) of this section, shall be repeated when directed by the Director or when the owner or operator elects to operate the control device or capture system at conditions different from the initial performance test.

(A) Determine the fraction (F) of total VOC used by an affected facility that enters the control device using the following equation:

$$F = S_e H_e + S_h H_h \qquad (5)$$

Where: H_e and H_h shall be determined by a method that has been previously approved by the Director. The owner or operator may use the values of S_e and S_h specified in Table 1 or other values determined by a method that has been previously approved by the Director.

TABLE 1. DISTRIBUTION OF VOC EMISSIONS

Coating Operation	Emission Distribution	

	Coater/Flashoff (S_e)	Curing Oven (S_h)
Two-piece aluminum or steel can:		
Exterior basecoat operation.........	0.75	0.25
Overvarnish coating operation.....	0.75	0.25
Inside spray coating operation.....	0.80	0.20

(B) Determine the destruction efficiency of the control device (E) using values of the volumetric flow rate of each of the gas streams and the VOC content (as carbon) of each of the gas streams in and out of the device by the following equation:

$$E = \frac{\sum_{i=1}^{n} Q_{bi} C_{bi} - \sum_{j=1}^{m} Q_{aj} C_{aj}}{\sum_{i=1}^{n} Q_{bi} C_{bi}} \qquad (6)$$

Where:

n is the number of gas streams entering the control device, and

m is the number of gas streams leaving the control device.

(C) Determine overall reduction efficiency (R) using the following equation:

$$R = EF \qquad (7)$$

(ii) Calculate the volume-weighted average of the total mass of VOC per volume of coating solids (G) used during the calendar month for the affected facility using equations (1), (2) and (3).

(iii) Calculate the volume-weighted average of VOC emissions discharged to the atmosphere (N) during the calendar month by the following equation:

$$N = G(1 - R) \qquad (8)$$

(3) An owner or operator shall use the following procedure for each affected facility that uses a capture system and a control device that recovers the VOC (e.g., carbon absorber) to comply with the applicable emission limit.

(i) Calculate the volume-weighted average of the total mass of VOC per unit volume of coating solids applied (G) used during the calendar month for the affected facility using equations (1), (2), and (3).

(ii) Calculate the total mass of VOC recovered (M_r) during each calendar month using the following equation:

$$M_r = L_r D_r \qquad (9)$$

(iii) Calculate overall reduction efficiency of the control device (R) for the calendar month for the affected facility using the following equation:

$$R = \frac{M_r}{M_o + M_d}$$

$$(10)$$

(iv)   Calculate the volume-weighted average mass of VOC discharged to the atmosphere (N) for the calendar month for the affected facility using equation (8).

(4)   [Reserved]

(d)   An owner or operator shall use the following procedures for determining daily volume-weighted average emissions of VOC in units of pounds VOC per gallon of coating excluding water.

(1)   An owner or operator shall use the following procedures for any affected facility which does not use a capture system and control device to comply with the applicable emission limit. The owner or operator shall determine the composition of the coatings by formulation data supplied by the manufacturer of the coating or by an analysis of each coating, as received, using Reference Method 24. The Director may require the owner or operator who uses formulation data supplied by the manufacturer of the coating to determine the VOC content of the coatings using Reference Method 24. The owner or operator shall determine, from company records, the volume of coating on a daily basis. If a common coating distribution system serves more than one affected facility, the owner or operator shall estimate the volume of coating used at each facility by using the average dry weight of coating number of cans, and size of cans being processed by each affected facility or by other procedures acceptable to the Director.

(i)   Calculate the volume-weighted average of the total mass of VOC consumed per unit volume of coating excluding water during the calendar day for each affected facility, except as provided under paragraph (d) (2).   Each daily calculation is considered a performance test. The volume-weighted average of the total mass of VOC consumed per unit volume of coating excluding water for each calendar day will be determined by the following procedures.

(A)   Calculate the mass of VOC used ($M_o + M_d$) during each calendar day for each affected facility by the following equation:

$$M_o + M_d = \sum_{i=1}^{n} L_{ci} D_{ci} W_{oi} + \sum_{j=1}^{m} L_{dj} D_{dj}$$

(11)

($\sum L_{dj} D_{dj}$ will be 0 if no VOC is added to the coatings, as received.)

Where **n** is the number of different coatings used during the calendar day and **m** is the number of different diluent VOC-solvents used during the calendar day.

(B)   Calculate the total volume of coating used excluding water, $L_{c\text{-}w}$, in the calendar day for each affected facility by the following equation:

$$L_{c\text{-}w} = \sum_{i=1}^{n} L_{ci} (1 - B_{wi})$$

(12)

Calculate   the daily volume-weighted average emissions of VOC per volume of coating as follows:

Metric Units--

$$G_{c\text{-}w} = \frac{M_o + M_d}{L_{c\text{-}w}}$$

English Units--

(2) Follow the procedure of paragraph (c)(2) and (c)(3) of this

$$G_{c\text{-}w}(english) = G_{c\text{-}w}(metric) \ x \ 1.717$$

section for any affected facility which uses a control device which either destroys (e.g., incinerator) or recovers (e.g., carbon adsorption) the VOC to comply with the applicable emission limit, except substitute $G_{c\text{-}w}$ as calculated in paragraph (d)(1) for G wherever it occurs, use the averaging period specified instead of the monthly averaging period, and paragraph (c)(2)(i)(A) does not apply for calculation of F, but instead use the procedures of Appendix G to this text.

2.51.4   Monitoring of Emissions and Operations

The owner or operator of an affected facility that uses a capture system and an incinerator to comply with the emission limits specified under §60.492˙ shall install, calibrate, maintain, and operate temperature measurement devices as prescribed below.

(a) Where thermal incineration is used, a temperature measurement device shall be installed in the firebox. Where catalytic incineration is used, temperature measurement devices shall be installed in the gas stream immediately before and after the catalyst bed.

(b) Each temperature measurement device shall be installed, calibrated, and maintained according to the manufacturer's specifications. The device shall have an accuracy the greater of ± 0.75 percent of the temperature being measured expressed in degrees Celsius or $\pm 2.5°C$.

(c) Each temperature measurement device shall be equipped with a recording device so that a permanent continuous record is produced.

2.51.5   Test Methods and Procedures

(a) The reference methods in Appendix A of this text, except as provided under Section 1.2, shall be used to determine compliance with the applicable standards as follows:

(1) Reference Method 24, or an equivalent or alternative method approved by the Director, or manufacturers formulation for data from which the VOC content of the coatings used for each affected facility can be calculated. In the event of dispute, Reference Method 24 shall be the referee method. When VOC content of water-borne coatings, determined from data generated by Reference Method 24, is used to determine compliance of affected facilities, the results of the Method 24 analysis shall be adjusted as described in section 4.4 of Method 24.

(2) Reference Method 25 or an equivalent or alternative method for the determination of the VOC concentration in the effluent gas entering and leaving the control device for each stack equipped with an emission control device. The owner or operator shall notify the Director 30 days in advance of any test using Reference Method 25. The following reference methods are to be used in conjunction with Reference Method 25:

(i) Method 1 for sample and velocity traverses,

(ii) Method 2 for velocity and volumetric flow rate,

(iii) Method 3 for gas analysis, and

(iv) Method 4 for stack gas moisture.

(b) For Reference Method 24, the coating sample must be a 1-litre sample collected in a 1-litre container at a point where the sample will be representative of the coating material.

(c) For Reference Method 25, the sampling time for each of three runs must be at least 1 hour. The minimum sample volume must be 0.003 dscm except that shorter sampling times or smaller volumes, when necessitated by process variables or other factors, may be approved by the

Director. The Director will approve the sampling of representative stacks on a case-by-case basis if the owner or operator can demonstrate to the satisfaction of the Director that the testing of representative stacks would yield results comparable to those that would be obtained by testing all stacks.

(d)   The protocols and methods of Appendix G shall be used to determine the capture efficiency.

e of Federal Regulations, Title 40, Part 60.