

**RULE 452 CAN COATING**

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- 100 GENERAL**  
101 PURPOSE  
[102 APPLICABILITY](#)  
[103 SEVERABILITY](#)
- 200 DEFINITIONS**  
201 COATING LINE  
202 CAN COATING  
[203 DIP COAT](#)  
[204 ELECTROSTATIC SPRAY](#)  
~~203~~5 END SEALING COMPOUNDS  
~~204~~6 EXEMPT COMPOUND  
~~205~~7 EXTERIOR BASE COATING  
[208 FLOW COAT](#)  
[209 FOOD/BEVERAGE CAN](#)  
[210 HAND APPLICATION EQUIPMENT](#)  
[211 HIGH-VOLUME LOW-PRESSURE APPLICATION EQUIPMENT](#)  
~~206~~12 INTERIOR BASE COATING  
~~207~~13 INTERIOR BODY SPRAY  
[214 LOW-VOLUME LOW-PRESSURE APPLICATION EQUIPMENT](#)  
~~208~~15 OVERVARNISH  
[216 ROLL COATER](#)  
~~209~~17 THREE PIECE CAN SIDE-SEAM SPRAY  
~~210~~8 TWO PIECE CAN EXTERIOR END COATING  
~~214~~9 VOLATILE ORGANIC COMPOUND (VOC)
- 300 STANDARDS**  
301 VOC LIMITATION  
302 EQUIVALENT CONTROL METHODS  
303 SOLVENT USAGE  
[304 APPLICATION EQUIPMENT REQUIREMENTS](#)
- 400 ADMINISTRATIVE REQUIREMENTS**  
401 OPERATION AND MAINTENANCE PLAN  
402 CALCULATION FOR DETERMINATION OF VOC CONTENT PER VOLUME OF COATING  
[403 CALCULATION FOR DETERMINATION OF VOC CONTENT OF CLEANUP MATERIAL](#)  
[404 CALCULATION FOR DETERMINING PERCENT CONTROL EFFICIENCY AND VOC MASS EMISSION RATE](#)  
[405 CALCULATION FOR DETERMINING OVERALL SYSTEM EFFICIENCY](#)
- 500 MONITORING AND RECORDS**  
501 TESTING PROCEDURES  
502 COATING RECORDS  
503 SOLVENT RECORDS  
504 RECORD RETENTION  
505 CONTROL EQUIPMENT

**100 GENERAL**

101 **PURPOSE:** To limit emissions of volatile organic compounds from can coating operations. Coating operations subject to this Rule shall be exempt from the requirements of Rule 441.

102 **APPLICABILITY:** The provisions of this rule shall apply to can coating operations.

103 **SEVERABILITY:** If a court of competent jurisdiction issues an order that any provision of this rule is invalid, it is the intent of the Board of Directors of the District that other provisions of this rule remain in full force and effect, to the extent allowed by law.

**200 DEFINITIONS**

201 **COATING LINE:** An operation or process for applying, drying, baking and/or curing surface coatings, together with associated equipment including a coating applicator, flash-off area and oven.

202 **CAN COATING:** A coating applied or intended for application by spray, roller, or other means onto the interior and/or exterior surfaces of formed metal cans, or to the surface of flat metal sheets, strips, rolls, or coils intended for can construction.

203 **DIP COAT:** A coating method which is applied by dipping an object into a vat of coating material and allowing any excess coating material to drain off.

204 **ELECTROSTATIC SPRAY:** The spray application of coatings where an electrostatic potential is created between the part to be coated and the coating particles.

~~203~~5 **END SEALING COMPOUND:** A coating applied to can ends and which functions as a gasket when the end is assembled onto the can.

~~204~~6 **EXEMPT COMPOUND:** For the purposes of this rule, "exempt compound" has the same meaning as in Rule 101—GENERAL PROVISIONS AND DEFINITIONS.

~~205~~7 **EXTERIOR BASE COATING:** A coating applied to the exterior of a can to provide protection to the metal or to provide background for any lithographic or printing operation.

208 **FLOW COAT:** A coating method which is applied by flowing a stream of coating over an object and allowing any excess coating material to drain off.

209 **FOOD/BEVERAGE CAN:** Any metal container intended for packaging food or beverages.

210 **HAND APPLICATION EQUIPMENT:** Manually held equipment such as brushes, rollers, trowels, spatulas, daubers, rags, sponges, and mechanically or pneumatically driven syringes that do not atomize the applied products.

211 **HIGH-VOLUME LOW-PRESSURE APPLICATION EQUIPMENT:** Equipment used to apply coatings by means of a gun which is designed to be operated and which is operated between 0.1 and 10 psig air pressure measured dynamically at the center of the air cap and at the air horns.

~~206~~12 **INTERIOR BASE COATING:** A coating applied to the interior of a can to provide a protective lining between the product and the can.

~~207~~13 **INTERIOR BODY SPRAY:** A coating sprayed on the interior of the can body to provide a protective lining between the product and the can.

- 214 **LOW-VOLUME LOW-PRESSURE APPLICATION EQUIPMENT:** Spray coating application equipment with air pressure between 0.1 and 10.0 pounds per square inch gauge (psig) and air volume less than 15.5 cfm per spray gun and which operates at a maximum fluid delivery pressure of 50 psig.
- ~~208~~15 **OVERVARNISH:** A coating applied directly over a design coating to reduce the coefficient of friction, to provide gloss and to protect the finish against abrasion and corrosion.
- 216 **ROLL COATER:** A series of mechanical rollers that forms a thin coating film on the surface of the roller, which is applied to a substrate by moving the substrate underneath the roller.
- ~~209~~17 **THREE-PIECE CAN SIDE-SEAM SPRAY:** A coating sprayed on the interior and/or exterior of a welded, cemented or soldered seam to protect the exposed metal.
- ~~210~~8 **TWO-PIECE CAN EXTERIOR END COATING:** A coating applied to the exterior end of a can to provide protection to the metal.
- ~~214~~9 **VOLATILE ORGANIC COMPOUND (VOC):** For the purposes of this rule, "volatile organic compound" has the same meaning as in Rule 101—GENERAL PROVISIONS AND DEFINITIONS.

### 300 STANDARDS

- 301 **VOC LIMITATION:** Except as provided in Section 302, a person shall not use or apply any coating on any coating line of the type designated below which contain volatile organic compounds in excess of the following limits:

Coating Category	Grams of VOC/liter of coating as applied, excluding water and exempt compounds
Interior Base Coating	225
Interior Base Coating Overvarnish	225
Exterior Base Coating	225
Exterior Base Coating Overvarnish	225
Two Piece Can Exterior Base Coating	250
Two Piece Can Exterior Base Coating Overvarnish	250
Two Piece Can Interior Body Spray	<del>440</del> <u>420</u>
Three Piece Can Interior Body Spray	<del>540</del> <u>360</u>
Two Piece Can Exterior End Coating	250
Three Piece Can Side Seam Spray	660
End Sealing Compound <u>for Food/Beverage Cans</u>	<del>440</del> <u>20</u>
<u>End Sealing Compound for Non-Food Containers</u>	<u>0</u>

- 302 **EQUIVALENT CONTROL METHODS:** Use or application of coatings which contain volatile organic compounds in excess of the limits specified in Section 301 shall not be allowed unless:
- 302.1 An emissions control device achieving ~~90% capture efficiency and 95% control device~~ an overall system efficiency, as determined by Section 405, of not less than 90% is used, ~~as determined by the methods specified in Section 501.2 and 501.3,~~
- 302.2 An Operation and Maintenance Plan is approved by the Air Pollution Control Officer, and

- 302.3 Daily emissions do not exceed the level which would be achieved from the equivalent use of coatings which comply with the limits specified in Section 301, as calculated by the following equation:

$$\left[ 1 - \left( \frac{CE}{100} \right) \left( \frac{CL}{100} \right) \right] \sum_{i=1}^n ACT_i (U_i) \leq \sum_{i=1}^n LIM_i (U_i)$$

Where: CE = Control device efficiency, % by mass  
CL = Collection efficiency, % by mass  
ACT<sub>i</sub> = Actual VOC content of material "i," grams per liter  
LIM<sub>i</sub> = Applicable VOC limit for material "i" in Section 301, grams per liter  
U<sub>i</sub> = Usage of material "i," liters per day

- 303 **SOLVENT USAGE:** Any person using solvents ~~after December 1, 1990:~~
- 303.1 Prior to (one year after date of adoption), S shall not use VOC containing materials which contain more than 200 grams of VOC per liter of material for cleanup of container assembly equipment, including slitters, bodymakers, bead-ers, end seamers, flangers, and testers, excluding side seam spray application equipment,
- 303.2 Effective (one year after date of adoption), shall not use VOC containing materials which contain more than 25 grams of VOC per liter of material for cleanup of container assembly equipment, including slitters, bodymakers, bead-ers, end seamers, flangers, and testers, excluding side seam spray application equipment.
- 303.23 Shall not store unused or waste solvent in open containers, and
- 303.34 Shall not store or dispose of fabric, paper, or any other waste materials used for cleanup or surface preparation in open containers.
- 304 APPLICATION EQUIPMENT REQUIREMENTS: A person shall not apply any coating unless one of the following application methods is used:
- 304.1 Roll Coater
- 304.2 Dip Coat
- 304.3 Electrostatic Spray
- 304.4 Flow Coat
- 304.5 High-Volume Low-Pressure (HVLP) Application Equipment
- 304.6 Low-Volume Low-Pressure (LVLP) Application Equipment
- 304.7 Hand Application Equipment, such as brush or roller
- 304.8 Any other equivalent method which has been approved in writing by the Air Pollution Control Officer and the U.S. Environmental Protection Agency
- 304.9 In lieu of complying with the requirements in Sections 304.1 through 304.8, a person may control emissions from application equipment with a VOC emissions control device with an overall system efficiency, as determined by Section 405, of not less than 85.5%. An Operation and Maintenance Plan for the emissions control device must be approved by the Air Pollution Control Officer.

#### 400 ADMINISTRATIVE REQUIREMENTS

- 401 **OPERATION AND MAINTENANCE PLAN:** Any facility using an emission control device as a means of complying with this rule, as provided in Sections 302 or 304.9, must submit with the application for Authority to Construct and resubmit annually, upon completion of construction of the emission control device, an Operation and Maintenance Plan for the emission control device to the Air Pollution Control Officer for approval. The Plan shall specify operation and maintenance procedures which will demonstrate continuous operation of the emission control device during periods of emissions-producing operations. The Plan shall also specify which records must be kept to document these operation and maintenance procedures. These

records shall comply with the requirements of Sections 504 and 505. The Plan shall be implemented upon approval of the Air Pollution Control Officer.

- 402 **CALCULATION FOR DETERMINATION OF VOC CONTENT PER VOLUME OF COATING:** The volume of coating material is defined as the volume of the original coating, plus any VOC-containing material added to the original coating. The original coating is the coating before any VOC-containing material such as solvent is added for purposes of mixing or thinning. The weight of VOC per combined volume of VOC and coating solids shall be calculated by the following equation:

$$\frac{(W_v - W_w - W_{ec})}{(V_m - V_w - V_{ec})}$$

- Where:  $W_v$  = weight of all volatile compounds.  
 $W_w$  = weight of water.  
 $W_{ec}$  = weight of compounds listed as exempt in Section 2046 from the definition of VOC.  
 $V_m$  = volume of coating material.  
 $V_w$  = volume of water.  
 $V_{ec}$  = volume of compounds listed as exempt in Section 2046 from the definition of VOC.

403 **CALCULATION FOR DETERMINATION OF VOC CONTENT OF CLEANUP**

**MATERIAL:** The volume of material is defined as the volume of the original material, plus any VOC-containing material added to the original material. The weight of VOC per total volume of material shall be calculated by the following equation;

$$G_1 = \frac{(W_v - W_w - W_{ec})}{V_m}$$

- Where:  $G_1$  = Weight of VOC per total volume of material, in grams per liter  
 $W_v$  = Weight of all volatile compounds, in grams  
 $W_w$  = Weight of water, in grams  
 $W_{ec}$  = Weight of exempt compounds as listed in Section 206, in grams  
 $V_m$  = Volume of material, in liters

404 **CALCULATION FOR DETERMINING PERCENT CONTROL EFFICIENCY AND VOC**

**MASS EMISSION RATE:** The VOC mass emission rate shall be calculated both upstream and downstream of the emissions control device based on the respective VOC mass concentration and volumetric flowrate, pursuant to Section 502.4 and the following equation;

$$M = (Q)(C)(60 \text{ min/hr})$$

- Where:  $M$  = VOC mass emission rate, in lb/hr.  
 $Q$  = the volumetric flowrate of the exhaust stack, in scfm.  
 $C$  = the VOC mass concentration, in lb/scf, as measured by EPA Method 25 or 25A.

The percent control efficiency is calculated as follows:

$$\%CE = [(M_U - M_D) / M_U] \times 100$$

Where: CE = control efficiency.  
 $M_U$  = the upstream VOC mass emission rate, in lb/hr.  
 $M_D$  = the downstream VOC mass emission rate, in lb/hr.

**405 CALCULATION FOR DETERMINING OVERALL SYSTEM EFFICIENCY:** To verify compliance with Section 302, the overall system efficiency is calculated as follows:

$$\%SE = [\%CLE \times \%CE] / 100$$

Where: SE = system efficiency.  
 CLE = capture efficiency, as determined by Section 501.3  
 CE = control efficiency, as determined by Sections 404 and 501.2

## 500 MONITORING AND RECORDS

**501 TESTING PROCEDURES:** A result by any of the below listed test methods which shows non-compliance with any provision of the rule shall constitute a violation of the rule.

**501.1 VOC CONTENT:** Measurement of volatile organic compounds in coatings and solvents shall be conducted and reported in accordance with EPA Reference Method 24 (40 CFR 60, Appendix A) and Sections 402, [403](#), and 501.4 of this rule.

**501.2 CONTROL DEVICE:** Control efficiency and emission rates from control devices shall be determined by EPA Method 25 [or 25A](#), ~~and~~ ARB Method 422, [and Section 404](#).

**501.3 ~~DETERMINATION OF COLLECTION CAPTURE EFFICIENCY:~~** ~~Collection efficiency shall be determined in accordance with EPA Guidelines for Developing Capture Efficiency Protocols, 55 Federal Register 26865, June 29, 1990. Capture efficiency shall be determined in accordance with the U.S. EPA technical guideline document, "Guidelines for Determining Capture Efficiency," dated January 9, 1995. Individual capture efficiency test runs subject to U.S. EPA technical guidelines shall be determined by:~~

a. [Applicable U.S. EPA Methods 204, 204A, 204B, 204C, 204D, 204E, and/or 204F; or](#)

b. [Any other method approved by the U.S. EPA, the California Air Resources Board, and the Air Pollution Control Officer.](#)

**501.4 DETERMINATION OF COMPOUNDS EXEMPT FROM VOC DEFINITION:** Compounds exempted from the VOC definition, as listed in Section 2046 of this rule, shall be determined in accordance with ASTM D 4457-~~85~~[02 \(2008\)](#) or ARB Method 432. If any of the perfluorocarbons are being claimed as exempt compounds, the person making the claim must state in advance which compounds are present, and the EPA-approved test method used to make the determination of these compounds.

**501.5 MULTIPLE TEST METHODS:** [When more than one test method or set of test methods is specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of this rule.](#)

**502 COATING RECORDS:** A person subject to this rule shall maintain the following daily records for each coating line:

**502.1** Coating type, the amount of coating applied daily, and description of the substrate coated.

**502.2** Manufacturer's name and product code or equivalent for each coating type and the coating category as specified in Section 301.

**502.3** VOC content of the coatings, as applied, in grams per liter, excluding water and exempt compounds.

- 503 **SOLVENT RECORDS:** A person subject to this rule shall maintain the following daily records for each container assembly line:  
503.1 Amount of solvents used.  
503.2 VOC content of each solvent.
- 504 **RECORD RETENTION:**  
a. Prior to (three years after date of adoption), A person required to maintain records specified in Sections 502, 503, and 505 shall retain such records on-site for two years and make such records available for review by the Air Pollution Control Officer upon request.  
b. Effective (three years after date of adoption), a person required to maintain records specified in Sections 502, 503, and 505 shall retain such records on-site for five years and make such records available for review by the Air Pollution Control Officer upon request.
- 505 **CONTROL EQUIPMENT:** Any person using an emission control system pursuant to Section 302 as a means of complying with this rule shall maintain such records as required by the Operation and Maintenance Plan in Section 401 on a daily basis.