

RULE 451 SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS

Adopted 6-19-79

(Amended 1-11-80, 12-14-82, 4-5-83, 11-29-83, 8-27-85, 9-29-87, 2-23-93, 9-5-96, 10-02-97)

INDEX**100 GENERAL**

- 101 PURPOSE
- 102 APPLICABILITY
- 103 SEVERABILITY
- 110 EXEMPTION, LOW USAGE OF MATERIALS EXCEEDING VOC CONTENT LIMITS
- 111 EXEMPTION, SPECIFIC OPERATIONS AND COATINGS
- 112 EXEMPTION, AEROSOL CONTAINERS
- 113 EXEMPTION, APPLICATION EQUIPMENT

200 DEFINITIONS

- 201 ADHESIVE
- 202 AEROSOL CONTAINER
- 203 AIR-DRIED COATING
- 204 ALUMINUM COATING FOR WINDOW FRAMES AND DOOR FRAMES
- 205 APPURTENANCES
- 206 APPLICATION EQUIPMENT
- 207 BAKED COATINGS
- 208 CAMOUFLAGE COATINGS
- 209 CLEANUP MATERIAL
- 210 CLOSED CONTAINER
- 211 COATING
- 212 COATING REMOVER (STRIPPER)
- 213 CONFORMAL COATING
- 214 DIP COAT
- 215 ELECTRICAL INSULATING COATING
- 216 ENCLOSED GUN CLEANER
- 217 END USER
- 218 EXEMPT COMPOUND
- 219 EXTREME HIGH GLOSS COATING
- 220 EXTREME PERFORMANCE COATING
- 221 FLOW COAT
- 222 HAND APPLICATION EQUIPMENT
- 224 HEAT RESISTANT COATING
- 225 HIGH-VOLUME LOW-PRESSURE APPLICATION EQUIPMENT
- 226 LOW-VOLUME LOW-PRESSURE APPLICATION EQUIPMENT
- 227 MAGNETIC DATA STORAGE DISC
- 228 METALLIC/IRIDESCENT COATING
- 229 MISCELLANEOUS METAL PARTS AND PRODUCTS
- 230 NON-COMPLIANT COATING
- 231 NON-SKID COATING
- 232 PRE-FABRICATED ARCHITECTURAL COMPONENT
- 233 PRETREATMENT WASH PRIMER
- 234 REPAIR COATING
- 235 ROLL COATER
- 236 SAFETY-INDICATING COATING
- 237 SHOP ENVIRONMENT
- 238 SILICONE RELEASE COATING
- 239 SOLAR ABSORBENT COATING
- 240 STATIONARY SOURCE
- 241 STENCIL COATING
- 242 SURFACE PREPARATION MATERIAL
- 243 TEXTURED FINISH
- 244 TOUCH-UP COATING

- 245 VOLATILE ORGANIC COMPOUND (VOC)
- 246 VOLATILE ORGANIC COMPOUND (VOC) AS APPLIED

300 STANDARDS

- 301 VOC CONTENT OF COATINGS FOR MISCELLANEOUS METAL PARTS AND PRODUCTS
- 302 VOC CONTENT FOR COATING REMOVERS (STRIPPERS)
- 303 APPLICATION EQUIPMENT REQUIREMENTS
- 304 SURFACE PREPARATION, CLEANUP, AND STORAGE REQUIREMENTS
- 305 EMISSION CONTROL SYSTEM REQUIREMENTS

400 ADMINISTRATIVE REQUIREMENTS

- 401 LOW USAGE EXEMPTION SUBMITTAL
- 402 PRODUCT INFORMATION REQUIREMENTS FOR SELLERS
- 403 CALCULATION FOR DETERMINING VOC CONTENT OF COATINGS, LESS WATER AND EXEMPT COMPOUNDS
- 404 CALCULATION FOR DETERMINING VOC CONTENT OF COATING REMOVERS (STRIPPERS) AND SURFACE PREPARATION AND CLEANUP MATERIAL
- 405 CALCULATION FOR PERCENT CONTROL EFFICIENCY AND VOC MASS EMISSION RATE
- 406 CALCULATION FOR DETERMINING OVERALL SYSTEM EFFICIENCY
- 407 OPERATION AND MAINTENANCE PLAN

500 MONITORING AND RECORDS

- 501 RECORDKEEPING FOR END USERS
- 502 TESTING PROCEDURES

100 **GENERAL**

- 101 **PURPOSE:** To limit the emission of volatile organic compounds from the application of coatings, coating removers (strippers), surface preparation material, and cleanup material to miscellaneous metal parts and products in a shop environment.
- 102 **APPLICABILITY:** The provisions of this rule shall apply within the District to the coating of miscellaneous metal parts and products including coating removal (stripping), surface preparation and cleanup operations by any person, as defined in this rule. The requirements of Rule 441, ORGANIC SOLVENTS, shall not apply to operations subject to this rule.
- 103 **SEVERABILITY:** If any section, subsection, sentence, clause, phrase, or portion of this rule is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions thereof.
- 110 **EXEMPTION, LOW USAGE OF MATERIALS EXCEEDING VOC CONTENT LIMITS:**
- 110.1 The requirements of Section 301, 302, and 304.5 shall not apply to the use of materials exceeding the VOC content limits specified in Sections 301, 302, and 304.5 in a total volume less than 55 gallons per calendar year, per stationary source, provided the requirements in Section 401 and 501 are satisfied, except as provided in Sections 110.2 and 110.3.
- 110.2 The requirements of Section 301 shall not apply to the use of any aluminum coating for window frames and door frames exceeding the VOC content limit specified in Section 301, in a volume less than 200 gallons per calendar year, per stationary source, provided the requirements in Section 401 and 501 are satisfied
- 110.3 The requirements of Section 301 shall not apply to the use of any pretreatment wash primer that exceeds the VOC content limits, as specified in Section 301, in a volume of less than 200 gallons per calendar year, per stationary source, provided the requirements in Section 401 and 501 are satisfied
- 111 **EXEMPTION, SPECIFIC OPERATIONS AND COATINGS:** Except as required by Section 501 the requirements of this rule shall not apply to:
- 111.1 Coating of prefabricated architectural components or structures not coated in a shop environment which are regulated by Rule 442 - Architectural Coatings.
- 111.2 Motor vehicles including automotive, truck or heavy equipment finishing or refinishing, excluding radiators, drive trains, differentials, and engine components which are regulated by Rule 459 - Automotive, Truck and Heavy Equipment Refinishing Operations.
- 111.3 Aircraft or aerospace vehicles, components and tooling which are regulated by Rule 456 - Aerospace Assembly and Component Coating Operations.
- 111.4 Cans, coils, or magnetic wire which are regulated by Rule 452 - Can Coating.
- 111.5 Adhesives and other materials which are regulated by Rule 460 - Adhesives and Sealants.
- 111.6 Magnetic data storage discs.
- 111.7 Safety-indicating coatings.
- 111.8 Stencil coatings.
- 111.9 Conformal Coatings.
- 111.10 Hand Lettering.
- 112 **EXEMPTION, AEROSOL CONTAINERS:** The provisions of this rule shall not apply to coatings and coating removers (strippers) sold in non-refillable aerosol containers having a capacity of one liter (1.1 quarts) or less.

- 113 **EXEMPTION, APPLICATION EQUIPMENT:** The requirements of Section 303 do not apply to the following:
- 113.1 Touch-up coating and repair coating operations.
 - 113.2 The application of coatings producing a textured finish.

200 DEFINITIONS

- 201 **ADHESIVE:** Any substance that is used to bond one surface to another surface by attachment.
- 202 **AEROSOL CONTAINER:** A hand-held, nonrefillable container which expels pressurized product ingredients by means of a propellant-induced force.
- 203 **AIR-DRIED COATING:** Any coating which is not heated above 90°C (194°F) for the purpose of curing or drying.
- 204 **ALUMINUM COATING FOR WINDOW FRAMES AND DOOR FRAMES:** A coating which is applied in a shop environment and is used to protect prefabricated aluminum window frames, window walls, and door frames and which is required to meet the specifications of Architectural Aluminum Manufacturers Association AAMA 605.2-1980.
- 205 **APPURTENANCES:** Accessories to a stationary structure, including, but not limited to: hand railings, cabinets, bathroom and kitchen fixtures, fences, rain-gutters and down-spouts, window screens, lamp-posts, heating and air conditioning equipment, other mechanical equipment, large fixed stationary tools and concrete forms.
- 206 **APPLICATION EQUIPMENT:** A device used to apply coatings or used in preparing a coating material such as stir sticks or funnels.
- 207 **BAKED COATING:** Any coating which is heated above 90°C (194°F) for the purpose of curing or drying.
- 208 **CAMOUFLAGE COATING:** A coating applied as a topcoat on equipment to conceal such equipment from detection.
- 209 **CLEANUP MATERIAL:** A VOC-containing material used to clean parts and application equipment used in miscellaneous metal parts and products coating operations.
- 210 **CLOSED CONTAINER:** A container which has a cover where the cover meets with the main body of the container without any visible gaps between the cover and the main body of the container.
- 211 **COATING:** A material applied to a surface to identify, beautify, protect, convey a message, or minimize detection of such surface.
- 212 **COATING REMOVER (STRIPPER):** A material applied to the surface of any miscellaneous metal part or product to completely remove maskants, coatings or coating residues. A coating remover (stripper) is not a surface preparation material or cleanup material. Material used for the removal of overspray is not considered a coating remover.
- 213 **CONFORMAL COATING:** A coating applied to electronic circuit boards or the assembled components for the purpose of moisture resistance, corrosion resistance, bacteria resistance, or fungi resistance.
- 214 **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.

- 215 **ELECTRICAL INSULATING COATING:** A coating which is applied to electrical components expressly for the purpose of electrical insulation.
- 216 **ENCLOSED GUN CLEANER:**
- 216.1 A device that is used for the cleaning of spray guns, pots, cups and hoses, that has an enclosed solvent container, is not open to the ambient air when in use, and has a mechanism to force the cleanup material through the gun while the cleaner is in operation; or
- 216.2 A device that is used for the cleaning of spray guns, pots, cups and hoses, that has an enclosed solvent container, uses non-atomized solvent flow to flush the spray equipment and collects and returns the discharged solvent to the enclosed container.
- 217 **END USER:** Any person applying any coating, coating remover (stripper), surface preparation material, or cleanup material subject to this rule.
- 218 **EXEMPT COMPOUND:** For the purposes of this rule, “exempt compound” has the same meaning as in Rule 101—GENERAL PROVISIONS AND DEFINITIONS.
- 219 **EXTREME HIGH GLOSS COATING:** A coating which, when tested by American Society for Testing Materials test method D-523 adopted in 1980, shows a 75% reflectance on a 60° meter.
- 220 **EXTREME PERFORMANCE COATING:** A coating that is used on a metal surface where the coated surface, in it’s intended use, is acutely or chronically exposed to salt water, corrosives, caustics, acids, oxidizing agents, wind or ocean driven debris or electromagnetic pulse.
- 221 **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.
- 222 **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. .
- 223 **HAND LETTERING:** A method utilizing hand application equipment to add letters and/or numbers on a substrate.
- 224 **HEAT RESISTANT COATING:** A coating used on a metal surface where the coated surface must withstand a temperature of at least 400 °F during normal use.
- 225 **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.
- 226 **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.
- 227 **MAGNETIC DATA STORAGE DISC:** A flat film or plate with a magnetic coating on which digital information can be stored by selective magnetization of portions of the flat surface.
- 228 **METALLIC/IRIDESCENT COATING:** Any coating which contains more than 5.0 g/l (0.042 lb/gal) of metal or iridescent particles, as applied, where such particles are visible in the dried film.

- 229 **MISCELLANEOUS METAL PARTS AND PRODUCTS:** Any metal part or product except for those specified in Section 111.
- 230 **NON-COMPLIANT COATING:** A coating or surface preparation material that exceeds the VOC content limits specified in Section 301, 302 or 304.5 and the usage is in excess of allowable volumes per Section 110.
- 231 **NON-SKID COATING:** Any coating which has, as its primary purpose, the creation of traction to prevent slippage.
- 232 **PREFABRICATED ARCHITECTURAL COMPONENT:** Prefabricated metal parts and products which are to be used as architectural appurtenances or structures and which are coated in a shop environment, not including window frames and door frames.
- 233 **PRETREATMENT WASH PRIMER:** A coating which contains at least ½ percent acid by weight, as determined in Section 502.2, and is applied directly to metal surfaces to provide surface etching and corrosion resistance or adhesion of subsequent coatings. A Pretreatment Wash Primer is not a Surface Preparation Material as defined in Section 242.
- 234 **REPAIR COATING:** A coating used to recoat portions of a product which has sustained mechanical damage to the coating following normal coating operations.
- 235 **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.
- 236 **SAFETY-INDICATING COATING:** A coating which is designed to have a color change when it is exposed to an unsafe condition such as a high temperature or an unsafe concentration of gas.
- 237 **SHOP ENVIRONMENT:** A commercial, governmental, or educational stationary source where coatings are applied, excluding those locations at which coatings subject to Rule 442, Architectural Coatings, are applied.
- 238 **SILICONE RELEASE COATING:** A coating which contains silicone resin and is intended to prevent a substance from sticking to metal surfaces such as baking pans.
- 239 **SOLAR ABSORBENT COATING:** A coating which has, as its primary purpose, the absorption of solar radiation.
- 240 **STATIONARY SOURCE:** Any building, structure, facility, or emissions unit which emits or may emit any affected pollutant directly or as a fugitive emission.
- 240.1 Building, structure, facility, or emissions unit includes all pollutant emitting activities which:
- a. Belong to the same industrial grouping, and
 - b. Are located on one property, or two or more contiguous properties, and
 - c. Are under the same or common ownership, operation, or control, or which are owned or operated by entities which are under common control.
- 240.2 Pollutant emitting activities shall be considered as part of the same industrial grouping if:
- a. They belong to the same two-digit Standard Industrial Classification (SIC) code, or
 - b. They are part of a common production process, which includes industrial processes, manufacturing processes and any connected processes involving a common material.
- 241 **STENCIL COATING:** An ink or a coating which is applied by a template or stamp in order to add designs, letters and/or numbers to the product.

- 242 **SURFACE PREPARATION MATERIAL:** A VOC containing material applied to the surface of any miscellaneous metal part or product prior to the application of coatings to clean the substrate or to promote adhesion of subsequent coatings.
- 243 **TEXTURED FINISH:** A rough surface produced by spraying large drops of coating onto a substrate or previously applied coating.
- 244 **TOUCH-UP COATING:** A coating used to cover minor coating imperfections appearing after the main coating operation.
- 245 **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.
- 246 **VOLATILE ORGANIC COMPOUND (VOC) AS APPLIED:** For the purpose of this rule, VOC as applied means the VOC content including thinners, reducers, hardeners, retarders, catalysts and additives calculated pursuant to Sections 403 or 404 as applicable.

300 STANDARDS

- 301 **VOC CONTENT OF COATINGS FOR MISCELLANEOUS METAL PARTS AND PRODUCTS:** Except as provided in Sections 110, 111, 112, or 305, a person shall not apply to any miscellaneous metal part or product any coating that exceeds the following VOC content limits. The VOC content of the coating shall be determined in accordance with Section 502.1.

COATING CATEGORY	VOC CONTENT: Grams/Liter (Lbs/Gal) less water and exempt compounds					
			APRIL 1, 1998		OCTOBER 1, 1998	
	AIR DRIED	BAKED	AIR DRIED	BAKED	AIR DRIED	BAKED
Aluminum Coating for Window Frames and Door Frames	750 (6.3)	750 (6.3)	600 (5.0)	600 (5.0)	420 (3.5)	420 (3.5)
Camouflage	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)
Electrical Insulating	340 (2.8)	275 (2.3)	340 (2.8)	275 (2.3)	340 (2.8)	275 (2.3)
Extreme High Gloss	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)
Extreme Performance	750 (6.3)	750 (6.3)	420 (3.5)	420 (3.5)	420 (3.5)	420 (3.5)
Heat Resistant	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)
Metallic/Iridescent	-----	-----	420 (3.5)	420 (3.5)	420 (3.5)	420 (3.5)
Non-Skid	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)
Prefabricated Architectural Component	-----	-----	420 (3.5)	275 (2.3)	420 (3.5)	275 (2.3)
Pretreatment Wash Primer	780 (6.5)	780 (6.5)	420 (3.5)	420 (3.5)	420 (3.5)	420 (3.5)
Silicone Release Coating	762 (6.4)	762 (6.4)	420 (3.5)	420 (3.5)	420 (3.5)	420 (3.5)
Solar Absorbent	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)	420 (3.5)	360 (3.0)
All Other Coatings	340 (2.8)	275 (2.3)	340 (2.8)	275 (2.3)	340 (2.8)	275 (2.3)

- 302 **VOC CONTENT FOR COATING REMOVERS (STRIPPERS):** Effective **October 1, 1998**, a person shall not use a stripper on miscellaneous metal parts and products which contains more than 200 grams of VOC per liter of material (1.7 pounds per gallon).
- 303 **APPLICATION EQUIPMENT REQUIREMENTS:** A person shall not apply to any miscellaneous metal part or product any coating unless one of the following application methods is used:
- 303.1 Roll Coater
 - 303.2 Dip Coat
 - 303.3 Electrostatic Spray
 - 303.4 Flow Coat
 - 303.5 High-Volume Low-Pressure (HVLP) Application Equipment
 - 303.6 Low-Volume Low-Pressure (LVLP) Application Equipment
 - 303.7 Hand Application Equipment, such as brush or roller
 - 303.9 Any other equivalent method which has been approved in writing by the Air Pollution Control Officer and the U.S. Environmental Protection Agency
- 304 **SURFACE PREPARATION, CLEANUP AND STORAGE REQUIREMENTS:** Any person subject to this rule shall comply with the following requirements:
- 304.1 Closed containers shall be used for the disposal of cloth, paper, or sponges used for surface preparation, cleanup, and coating removal.
 - 304.2 VOC-containing materials shall be stored in containers, which are closed when not in use, and shall be disposed of in a manner that the VOC are not emitted into the atmosphere.
 - 304.3 Except for electrostatic spray guns, a person shall not use VOC-containing materials for the cleanup of application equipment used in miscellaneous metal parts and products coating operations, unless the equipment is cleaned in an enclosed gun cleaner, or the VOC content of the material used does not exceed 72 grams per liter (0.6 pounds per gallon).
 - 304.4 Spray gun nozzles only, may be soaked in solvent-based materials for cleaning, provided the container (not to exceed five (5) gallons in size) is kept tightly covered at all times except when accessing the container.
 - 304.5 Effective **October 1, 1998**, a person shall not perform product cleaning or surface preparation with a material containing VOC in excess of 72 grams per liter (0.6 pounds per gallon).
- 305 **EMISSION CONTROL SYSTEM REQUIREMENTS:** As an alternative to Section 301, 302 304.3 and 304.5, a person may use air pollution control equipment subject to the approval of the Air Pollution Control Officer, that provides an overall system efficiency, as determined by Section 406, of not less than 85%.

400 ADMINISTRATIVE REQUIREMENTS

- 401 **LOW USAGE EXEMPTION SUBMITTAL:** Effective January 31, 1999, and annually thereafter, the total previous calendar year usage records, as specified in Section 501.3a(3), for all coatings exceeding the VOC limits specified in Sections 301, 302 and 304.5 shall be submitted to the Air Pollution Control Officer by January 31.
- 402 **PRODUCT INFORMATION REQUIREMENTS FOR SELLERS:** Any person who sells any coating, coating remover (stripper), surface preparation or cleanup material subject to this rule shall provide the following information on material data sheets made available to the purchaser at the time of sale:
- 402.1 The material type by name/code/manufacturer
 - 402.2 For coating material, the maximum VOC content of the material, as applied, after any mixing or thinning as recommended by the manufacturer. VOC content shall be displayed as grams of VOC per liter of coating (or pounds of VOC per gallon), excluding water and exempt compounds, pursuant to Section 403.

- 402.3 For coating removers (strippers), surface preparation and cleanup material, the maximum VOC content of the material, as applied, after any mixing or thinning as recommended by the manufacturer. VOC content shall be displayed as grams of VOC per liter of coating (or pounds of VOC per gallon), including water and exempt compounds, pursuant to Section 404.
- 402.4 For all material, recommendations regarding thinning, reducing, or mixing with any VOC containing material, as defined in Section 245.
- 402.5 For all material, VOC content may be calculated using product formulation data, or may be determined using the test method in Section 502.1.

- 403 **CALCULATION FOR DETERMINING VOC CONTENT OF COATINGS, LESS WATER AND EXEMPT COMPOUNDS:** 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 weight of VOC per combined volume of VOC and coating solids shall be calculated by the following equation;

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

- Where: G_1 = Weight of VOC per total volume of coating, less water and exempt compounds, in grams per liter
- W_v = Weight of all volatile compounds including any volatile materials added to the original coating supplied by the manufacturer, in grams
- W_w = Weight of water, in grams
- W_{ec} = Weight of exempt compounds as listed in Section 218, in grams
- V_m = Volume of coating material, in liters
- V_w = Volume of water, in liters
- V_{ec} = Volume of exempt compounds as listed in Section 218, in liters

- 404 **CALCULATION FOR DETERMINING VOC CONTENT OF COATING REMOVERS (STRIPPERS) AND SURFACE PREPARATION AND 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 218, in grams
- V_m = Volume of material, in liters

- 405 **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.

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.

406 **CALCULATION FOR DETERMINING OVERALL SYSTEM EFFICIENCY:** The overall system is calculated as follows:

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

Where: SE = system efficiency.
 CLE = collection efficiency, as determined by Section 502.3
 CE = control efficiency, as determined by 502.4

407 **OPERATION AND MAINTENANCE PLAN:** Any person using an approved emission control device pursuant to Section 305 as a means of complying with this rule, as provided in Section 301, 302, 304.3 and 304.5, must submit, with the application for Authority to Construct, pursuant to Rule 201, General Permit Requirements, 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 501.4 and 501.5. The Plan shall be implemented upon approval of the Air Pollution Control Officer.

500 MONITORING AND RECORDS

501 **RECORDKEEPING FOR END USERS:** In addition to any existing permit conditions issued pursuant to Rule 201, any person within the District subject to this rule, including operations claiming exemption under Sections 110, shall comply with the following requirements:

501.1 **LIST OF MATERIALS:** A list shall be maintained of currently used coatings, coating removers (strippers), surface preparation materials, cleanup materials, and other VOC containing materials including, but not limited to thinners, reducers, hardeners, retarders, catalysts, etc. The list shall contain all such materials that are currently used and stored on site and shall include the following information:

- a. The material type by name/code/manufacture and the appropriate category as designated by the coating categories in Sections 301, 302, 304, or "exempt", as specified by Section 111, as applicable.
- b. The actual VOC content of the material, as applied, pursuant to Section 245. VOC content as provided by the manufacturer, pursuant to Section 402 is acceptable, if following manufacturer's recommended mix ratio.
- c. The actual mixing ratio used for the material, as applied.
- d. The substrate to which the material is applied.

- e. Identification of each material type exceeding the VOC limits specified in Sections 301, 302 and 304.5.
- 501.2 **PRODUCT INFORMATION:** A data sheet applicable to each material type shall be maintained on site and made available to the Air Pollution Control Officer on request. The data sheet shall be provided by the supplier to the end user, pursuant to Section 402, and shall include the following information:
- a. The material type by name/code/manufacturer
 - b. For coating material: the maximum VOC content of the coating material, as applied, after any mixing or thinning as recommended by the manufacturer. VOC content shall be displayed as grams of VOC per liter of coating (or pounds of VOC per gallon), excluding water and exempt compounds, pursuant to Section 403.
 - c. For coating removers (strippers), surface preparation and cleanup material: the maximum VOC content of the material, as applied, after any mixing or thinning as recommended by the manufacturer. VOC content shall be displayed as grams of VOC per liter of coating (or pounds of VOC per gallon), including water and exempt compounds, pursuant to Section 404.
 - d. For all material, recommendations regarding thinning, reducing, or mixing with any VOC containing material, as defined in Section 245.
 - e. For all material, VOC content may be calculated using product formulation data, or may be determined using the test method in Section 502.1.
- 501.3 **USAGE RECORDS:** Any person within the District using materials regulated by this rule shall update and maintain the records as follows:
- a. Monthly:
 - 1. Records of total applied volume for each coating, coating remover (stripper), surface preparation and cleanup material, specified by category as listed in Sections 301, 302 and 304.
 - 2. The method of application, specified by coating category as listed in Sections 301 and 302, including a designation for touch-up and repair operations, as applicable.
 - 3. Records of total applied volume for each material type exceeding the VOC limits specified in Sections 301, 302, and 304.5 by name/code/manufacturer and coating category.
 - b. Daily:
 - 1. If, pursuant to Section 305, an emission control device is used as a means of complying with this rule, records of the material type by name/code/manufacturer and the total applied volume of each material.
 - 2. For non-compliant coatings, as defined in Section 230, records regarding the use, including the lack of use, of each material type by name/code/ and the total applied volume of each material.
- 501.4 **CONTROL EQUIPMENT:** Any person using an emission control device pursuant to Section 305 as a means of complying with this rule shall maintain such records as required by the Operation and Maintenance Plan in Section 407 on a daily basis.
- 501.5 **DURATION OF RECORDS:** Such records shall be maintained on-site for three years and made available for review by the Air Pollution Control Officer upon request.
- 502 **TESTING PROCEDURES:**
- 502.1 **DETERMINATION OF VOC CONTENT:** VOC content of coatings, coating removers (strippers), and surface preparation and cleanup material shall be determined using EPA Reference method 24 and Sections 403 and 404 of this rule and Section 502.5 of this rule.
- 502.2 **DETERMINATION OF ACID CONTENT:** Measurement of acid content shall be determined in accordance with ASTM D-1613-85.

- 502.3 **DETERMINATION OF COLLECTION EFFICIENCY:** Collection efficiency shall be determined using
- 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.
- 502.4 **DETERMINATION OF CONTROL EFFICIENCY:** Efficiency of control equipment shall be determined in accordance with EPA Method 18, 25, 25A, EPA Method 2 or 2C (whichever is applicable), and Section 405
- 502.5 **DETERMINATION OF COMPOUNDS EXEMPT FROM VOC DEFINITION:** Compounds exempted from VOC definition, as listed in Section 216, shall be determined in accordance with ASTM D 4457-85 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.
- 502.6 **DETERMINATION OF METAL CONTENT:** Measurement of metal content shall be conducted and reported in accordance with the South Coast Air Quality Management District's Method 318, "Determination of Weight Percent Elemental Metals in Coatings by X-ray Diffraction".