

RULE 239 GRAPHIC ARTS OPERATIONS

Adopted 11-03-94
(Amended 6-08-95, 2-13-97, 8-14-97, 04-08-04, 10-11-12)

CONTENTS

100 GENERAL

- 101 PURPOSE
- 102 APPLICABILITY
- 103 SEVERABILITY
- 104 EXEMPTIONS

200 DEFINITIONS

- 201 ADHESIVE
- 202 AEROSOL ADHESIVE
- 203 ALCOHOL
- 204 APPLICATION EQUIPMENT
- 205 BLANKET
- 206 BLANKET REPAIR MATERIAL
- 207 BLANKET WASHES
- 208 CLOSED CONTAINER
- 209 COATING
- 210 COLD BENDING
- 211 CONTROL DEVICE
- 212 CONVERTING OPERATION
- 213 CURED INK, CURED COATING, OR CURED ADHESIVES
- 214 DRYING OVEN
- 215 ELECTRONIC CIRCUIT
- 216 EMBOSSING
- 217 EXEMPT COMPOUNDS
- 218 EXTREME PERFORMANCE INK/COATING
- 219 FLEXIBLE PACKAGING INDUSTRY
- 220 FLEXOGRAPHIC PRINTING
- 221 FOUNTAIN SOLUTION
- 222 FUGITIVE EMISSIONS
- 223 GRAPHIC ARTS OPERATIONS
- 224 GRAVURE PRINTING
- 225 HEATER or DRYER
- 226 HEAT BENDING
- 227 HEATSET INK
- 228 INK JET
- 229 INFLATING
- 230 LAMINATING OPERATIONS
- 231 LETTERPRESS PRINTING
- 232 LINE
- 233 LITHOGRAPHIC PRINTING
- 234 MAINTENANCE CLEANING
- 235 MATERIAL
- 236 MECHANICALLY FORMED PRODUCTS
- 237 METALLIC INK
- 238 METERING ROLLER
- 239 NONCOMPLIANT MATERIAL
- 240 NON-HEATSET INK

- 241 NON-POROUS SUBSTRATE
- 242 OFFSET PRINTING
- 243 OVERLAY
- 244 PREPRESS OPERATIONS
- 245 PRINTING
- 246 PRINTING INK
- 247 PROOF PRESS
- 248 REFRIGERATED CHILLER
- 249 REMOVABLE PRESS COMPONENT
- 250 REPAIR CLEANING
- 251 ROLLER WASH
- 252 SCREEN PRINTING
- 253 SIGN INK/COATING
- 254 SOLVENT CLEANING
- 255 SPECIALTY FLEXOGRAPHIC PRINTING
- 256 STANDARD INDUSTRIAL CLASSIFICATION (SIC)
- 257 STATIONARY SOURCE
- 258 STRIPPING
- 259 SUBSTRATE
- 260 ULTRAVIOLET INK
- 261 VACUUM-FORMING
- 262 VOC COMPOSITE PARTIAL PRESSURE
- 263 VOLATILE ORGANIC COMPOUNDS (VOC)
- 264 VOC CONTENT
- 265 WATER SLIDE DECALS
- 266 WEB
- 267 WEB-FEED
- 268 WIPE CLEANING

300 STANDARDS

- 301 VOC CONTENT LIMITS FOR MATERIALS USED IN GRAPHIC ARTS OPERATIONS
- 302 EMISSION CONTROL EQUIPMENT
- 303 CLEANING AND STORAGE REQUIREMENTS
- 304 PROHIBITION OF SALE
- 305 SURFACE PREPARATION AND REPAIR AND MAINTENANCE SOLVENT CLEANING

400 ADMINISTRATIVE REQUIREMENTS

- 401 PRODUCT INFORMATION REQUIREMENTS FOR SELLERS
- 402 CALCULATION FOR DETERMINING PERCENT CONTROL EFFICIENCY AND VOC MASS EMISSION RATE
- 403 CALCULATION FOR DETERMINING VOC EMISSIONS FOR STATIONARY SOURCES INCLUDING THOSE EXEMPT PURSUANT TO SECTIONS 104.1

500 MONITORING AND RECORDS

- 501 RECORDKEEPING
- 502 TEST METHODS

100 GENERAL

101 PURPOSE: To limit the emissions of volatile organic compounds from graphic arts operations.

102 APPLICABILITY: The provisions of this rule apply to all graphic arts operations within the District; or any person who supplies, sells, offers to sell, applies, or manufactures, within the District, any graphic arts materials.

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.

104 EXEMPTIONS:

104.1 General:

The requirements of this rule, with the exception of Sections 303 and 501.1 to 501.3, shall not apply to any graphic arts operation at a stationary source which either:

104.1.1 Has total VOC emissions of less than or equal to 60 pounds per calendar month from all graphic arts operations and cleaning materials; or

104.1.2 Receives a permit that limits the potential to emit, as calculated pursuant to Rule 502, NEW SOURCE REVIEW, to less than or equal to 175 pounds of volatile organic compounds per calendar month from all graphic arts operations and cleaning materials.

104.2 Stripping of Cured Inks, Coatings, or Adhesives: The requirements of Section 303.1 shall not apply to materials used for the stripping of cured inks, cured coatings, or cured adhesives.

104.3 Exemption from Rule 219: The provisions of Rule 219, ORGANIC SOLVENTS, shall not apply to Graphic Arts Operations as defined in Rule 239, Section 223.

104.4 Business and Personal Printers: This rule shall not apply to business and personal printers such as ink jets, bubble jets, and laser jets.

104.5 Prepress Operations: This rule shall not apply to prepress operations associated with printing plate making including the cleaning or processing of film photo processors, color scanners, plate processors, film cleaning, and plate photo developers.

104.6 Aerosol Adhesives – Screen Printing: The requirements in Section 301 of this rule shall not apply to aerosol adhesives used by screen printing operations provided that the aerosol adhesives comply with the VOC limits for aerosol adhesives in Rule 235, ADHESIVES.

104.7 Aerosol Adhesives – Graphic Arts Operations: The requirements of this rule shall not apply to aerosol adhesives used by graphic arts operations other than screen printing provided that the VOC emissions from the facility are less than 660 pounds per calendar month from all graphic arts operations and provided

that the aerosol adhesives comply with the VOC limits for aerosol adhesives in Rule 235, ADHESIVES.

- 104.8 Fountain Solutions: The requirements of Sections 301.2 and 301.4 shall not apply to fountain solutions provided that the total VOC emissions from all offset lithographic printing operations including related cleaning activities at a stationary source prior to controls do not exceed 450 pounds per calendar month.
- 104.9 Blanket Repair Materials: The requirements of this rule shall not apply to blanket repair materials used in containers of four ounces or less.
- 104.10 Heatset Web Offset Lithographic Printing and Heatset Web Letterpress Printing:
- 104.10.1 The requirements of Section 302.1 shall not apply to a heatset web offset lithographic printing press or a heatset web letterpress printing press with potential to emit from the drying oven, prior to emissions control equipment, less than 25 tons per year of VOC from heatset inks.
- 104.10.2 The requirements of Section 302.1 shall not apply heatset web offset lithographic printing press or a heatset web letterpress printing press used for book printing or to a press with maximum web width of 22 inches or less.

200 DEFINITIONS

- 201 ADHESIVE:** Any substance that is applied for the purpose bonding two surfaces together other than by mechanical means.
- 202 AEROSOL ADHESIVE:** An adhesive packaged as an aerosol product in which the spray mechanism is permanently housed in a non-refillable can designed for handheld application without the need for ancillary hoses or spray equipment. Aerosol adhesives include special purpose spray adhesives, mist spray adhesives, and web spray adhesives, as defined in the California Air Resources Board consumer products regulation found in Title 17 of the California Code of Regulations, beginning at Section 94507.
- 203 ALCOHOL:** An organic chemical known as a monohydric alcohol, in which one hydroxyl (OH) group is attached to a carbon atom in place of a hydrogen atom. Common examples include, and are not limited to, methanol, ethanol, isopropyl alcohol, and pentanol.
- 204 APPLICATION EQUIPMENT:** A device used to apply adhesive, coating, or ink materials.
- 205 BLANKET:** Any rubber or synthetic rubber mat used in offset-lithography to transfer or "offset" an image from a planographic printing plate to paper or other substrate.
- 206 BLANKET REPAIR MATERIAL:** The material used in offset printing to correct low spots in the press blanket.
- 207 BLANKETWASHES:** Cleaning materials used to clean the rubber-surface fabric used to transfer the image from the plate to the substrate.

- 208 CLOSED CONTAINER:** A container which has a cover that meets with the main body of the container without any visible gaps between the cover and the main body of the container.
- 209 COATING:** A layer of material, excluding adhesives, applied across the entire width of a substrate. Examples in printing, are an emulsion, varnish or lacquer applied over a printed surface, and, in platemaking, the light-sensitive polymer or mixture applied to a metal plate.
- 210 COLD BENDING:** A process which subjects the printed color, design, alphabet, symbol, or numeral on a printed object to permanent bending through the application of force.
- 211 CONTROL DEVICE:** Equipment such as an incinerator or adsorber used to prevent air pollutants from reaching the ambient air.
- 212 CONVERTING OPERATION:** Coating, waxing, laminating, extrusion coating and printing, for fabrication of base materials. The base materials are then used to produce wraps, bags, and other preformed packages.
- 213 CURED INK, CURED COATING, OR CURED ADHESIVES:** An ink, coating, or adhesive, which is dry to the touch.
- 214 DRYING OVEN:** An oven used to hasten the process of drying printed or coated material.
- 215 ELECTRONIC CIRCUIT:** A product, which consists of a substrate and circuitry, created by screen printing a conductive ink on the substrate.
- 216 EMBOSSING:** A process performed after printing to stamp a raised or depressed image (artwork or type) into the surface of the paper, using engraved metal embossing dies, extreme pressure and heat.
- 217 EXEMPT COMPOUNDS:** For the purposes of this rule, Exempt Compounds are as defined in Rule 102, DEFINITIONS.
- 218 EXTREME PERFORMANCE INK/COATING:** An ink or coating, used in screen printing on a non-porous substrate that is designed to resist or withstand any of the following:
- 218.1 Five or more years of outdoor exposure;
 - 218.2 Exposure to industrial-grade chemicals, solvents, acids, detergents, oil products (including fuels), cosmetics, temperatures exceeding 76°C (170°F), vacuum forming, embossing or molding.
- 219 FLEXIBLE PACKAGING INDUSTRY:** Establishments that convert materials consisting of light gauge papers, plastic films, cellulosic films such as cellophane, thin gauge metal sheets such as aluminum foil or steel foil, and combinations thereof into a variety of product packages.
- 220 FLEXOGRAPHIC PRINTING:** A printing operation utilizing a flexible rubber or other elastomeric plate in which the image area is raised relative to the nonimage area.
- 221 FOUNTAIN SOLUTION:** The solution applied to the image plate to maintain the hydrophilic properties of the nonimage areas and to keep the nonimage area free from

ink. Fountain solution is primarily water, and contains at least one of the following materials:

217.1 Etchants such as mineral salts

221.2 Hydrophilic gums

221.3 VOC additives to reduce the surface tension of the solution.

222 FUGITIVE EMISSIONS: Uncollected emissions of VOC from any portion of Graphic Arts Operations as defined in Section 223, other than the drying oven.

223 GRAPHIC ARTS OPERATIONS: Any gravure, screen printing, flexographic, lithographic, or letterpress printing operation, or any coating or laminating operation that manufactures flexible packaging material for the packaging industry. Equipment which has both coating and printing units is considered to be performing a graphic arts operation. Coating operations, which are performed by a machine having only coating units and no printing units, are not graphic arts operations except for flexographic printing operations.

224 GRAVURE PRINTING: An intaglio printing operation in which the image area is etched below the surface of the printing plate and is transferred directly to the substrate when the substrate is pressed against the plate by an impression roller.

225 HEATER or DRYER: A hot air, high velocity system used to dry inks on printed or coated substrate.

226 HEAT BENDING: A process, which subjects the printed color, design, alphabet, symbol, or numeral on a printed object to permanent bending through the application of heat and force.

227 HEATSET INK: A printing ink used on continuous web-feed printing presses that are equipped with dryers or ovens. The ink dries or sets by heat induced evaporation of the ink oils and subsequent chilling of the ink by chill rolls.

228 INK JET: A digital printing technology in which ink is ejected through printheads onto a substrate to create an image.

229 INFLATING: A process of filling a printed object with air or gas which results in the swelling of the printed area.

230 LAMINATING OPERATIONS: A process of composing two or more layers of material to form a single multiple-layer sheet by using adhesive as the bonding agent.

231 LETTERPRESS PRINTING: A printing operation in which the image area is raised relative to the non-image area and the ink is transferred to the paper directly from the image surface.

232 LINE: The minimum equipment which is required for the application and/or curing of inks and/or coatings on a substrate, including the ink and/or coating applicators and heating oven(s) and associated ink and coating mixing equipment.

233 LITHOGRAPHIC PRINTING: A printing operation in which the image and non-image areas exist in the same plane. The non-image area is treated chemically so that only the image areas will be printed onto the substrate. This printing process differs from

other printing processes where the image is typically printed from a raised or recessed surface.

- 234 MAINTENANCE CLEANING:** A solvent cleaning operation or activity carried out to keep tools, machinery, or general work areas in clean and good operational condition.
- 235 MATERIAL:** Any material containing VOC including but not limited to coating, adhesive, inks (e.g., printing ink, metallic ink, ultraviolet ink), fountain solutions, thinners, reducers, catalysts, colorants, or solvents used in cleaning.
- 236 MECHANICALLY FORMED PRODUCTS:** Screen printed products made of plastic substrates, which are subjected to vacuum-forming, embossing, inflating, heat bending, or cold bending processes after the screen printing operation.
- 237 METALLIC INK:** An ink that contains greater than 50 grams of metal per liter (0.4 lb/gal) of ink.
- 238 METERING ROLLER:** A roller to transfer and meter fountain solution to maintain hydrophilic properties.
- 239 NONCOMPLIANT MATERIAL:** A material that:
- 239.1 Exceeds the VOC content limits specified in Section 301, and is not exempt pursuant to Section 104, and does not use emission control equipment pursuant to Section 302; or
 - 239.2 Exceeds the VOC content limit and/or composite vapor pressure limit, as applicable, in Section 303.
- 240 NON-HEATSET INK:** An ink that sets and dries by absorption into the substrates, and hardens by ambient air oxidation that may be accelerated by the use of infrared light sources. For purposes of this definition ultraviolet and electron-beam curable inks are examples of non-heatset inks
- 241 NON-POROUS SUBSTRATE:** Any substrate whose surface prevents penetration by water, including but not limited to foil, polyethylene, polypropylene, cellophane, paper or paperboard coated with a non-porous metalized polyester, nylon and polyethylene terephthalate (mylar). Clay-coated printing paper as defined by the American Paper Institute Classification System, and paperboard coated with clay to prevent water penetration shall be considered non-porous substrates.
- 242 OFFSET PRINTING:** A lithographic printing operation in which the image area is transferred, or offset, to another surface, and then printed onto the substrate. Typically, the ink is offset from a plate to a rubber blanket, and then from the blanket to the substrate.
- 243 OVERLAY:** A screen printed product made of polycarbonate, polyester, or clear vinyl plastic substrate which activates the circuitry on an electronic circuit underneath it when pressed against the electronic circuit. Overlays and electronic circuits are used in membrane switches of products such as computer keyboards, calculators, control panels, and home appliances.
- 244 PREPRESS OPERATIONS:** Operations associated with printing plate making including but not limited to, film photo processors and plate photo processors, color scanners, film cleaning, or plate developers.

- 245 PRINTING:** Any graphic arts operation that imparts color, design, alphabet, or numerals on a substrate.
- 246 PRINTING INK:** A pigmented fluid or viscous material used in printing.
- 247 PROOF PRESS:** A press used exclusively to check the quality of print, color reproduction, and editorial content.
- 248 REFRIGERATED CHILLER:** A device that continuously maintains and supplies fountain solution to a holding tray at a temperature of 55 degrees Fahrenheit or less when measured at the supply tank, thereby reducing evaporative emissions of VOCs in fountain solution.
- 249 REMOVABLE PRESS COMPONENT:** A part, component, or accessory of a press that is physically attached to the press but is disassembled and removed from the press prior to being cleaned. Rollers, blankets, metering rollers, fountains, impression cylinders and plates shall not be considered as removable press components.
- 250 REPAIR CLEANING:** Cleaning of equipment parts as part of a repair operation or as part of a scheduled maintenance procedure during which the parts are not removed from the equipment and power to the printing equipment has been turned off and secured.
- 251 ROLLER WASH:** Solvent used to clean the metal ink rollers on a printing press.
- 252 SCREEN PRINTING:** A printing operation in which the printing ink passes through a refined form of stencil to a web or fabric. The stencil openings determine the form and dimension of the imprint.
- 253 SIGN INK/COATING:** A printing ink or coating used in screen printing indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.
- 254 SOLVENT CLEANING:** The removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants including, but not limited to, dirt, soil, and grease from equipment, substrate, and general work areas.
- 255 SPECIALTY FLEXOGRAPHIC PRINTING:** Flexographic printing on polyethylene, polyester and foil substrates for food packaging, health care products, fertilizer bags, or liquid-tight containers.
- 256 STANDARD INDUSTRIAL CLASSIFICATION (SIC):** Number codes created by the U. S. Government Office of Management and Budget (OMB) to classify establishments by type of economic activity.
- 257 STATIONARY SOURCE:** Any building, structure, facility, or emissions unit which emits or may emit any affected pollutant directly or as a fugitive emission.
- 257.1 Building, structure, facility, or emissions unit includes all pollutant emitting activities which:
- 257.1.1 Belong to the same industrial grouping, and
- 257.1.2 Are located on one property, or two or more contiguous properties, and

257.1.3 Are under the same or common ownership, operation, or control, or which are owned or operated by entities which are under common control.

257.2 Pollutant emitting activities shall be considered as part of the same industrial grouping if:

257.2.1 They belong to the same two-digit Standard Industrial Classification (SIC) code, or

257.2.2 They are part of a common production process, which includes industrial processes, manufacturing processes and any connected processes involving a common material.

258 STRIPPING: The removal of cured inks, cured coatings, or cured adhesives.

259 SUBSTRATE: The surface to which a printed image is applied. Substrates include, but are not limited to, paper, plastic, metal, wood, ceramic, and fabric.

260 ULTRAVIOLET INK: Ink which dries by polymerization reaction induced by ultraviolet energy.

261 VACUUM-FORMING: A process which imparts a desired shape to a printed object by subjecting the screen printed area of the object to a vacuum.

262 VOC COMPOSITE PARTIAL PRESSURE: The sum of the partial pressures of the compounds defined as VOCs. VOC composite partial pressure shall be calculated by the following equation:

$$PP_c = \frac{\sum_{i=1}^n \frac{(W_i)(VP_i)}{MW_i}}{\frac{W_w}{MW_w} + \sum_{e=1}^n \frac{W_e}{MW_e} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

- Where: PP_C = VOC composite partial pressure at 20°C, in mm Hg.
 W_i = Weight of the "i"th VOC compound, in grams, as determined by ASTM E 260-96.
 W_w = Weight of water, in grams as determined by ASTM D 3792-99.
 W_e = Weight of the "e"th exempt compound, in grams, as determined by ASTM E 260-96.
 MW_i = Molecular weight of the "i"th VOC compound, in grams per g-mole, as given in chemical reference literature.
 MW_w = Molecular weight of water, 18 grams per g-mole.
 MW_e = Molecular weight of the "e"th exempt compound, in grams per g-mole, as given in chemical reference literature.
 VP_i = Vapor pressure of the "i"th VOC compound at 20°C, in mm Hg, as determined by Section 502.7 of this rule.

263 VOLATILE ORGANIC COMPOUNDS (VOC): Any chemical compound containing at least one atom of carbon except for the Exempt Compounds listed in Rule 102, DEFINITIONS.

264 VOC CONTENT:

264.1 VOC Regulatory Content: The weight of VOC per combined volume of VOC and material, calculated with the following equation:

$$\text{VOC Regulatory Content} = (Ws - Ww - Wec) / (Vm - Vw - Vec)$$

264.2 VOC Actual Content: The weight of VOC per volume of material, calculated with the following equation:

$$\text{VOC Actual Content} = (Ws - Ww - Wec) / Vm$$

Where:

- Ws = Weight of volatile compounds in grams
- Ww = Weight of water in grams
- Wec = Weight of exempt compounds in grams
- Vm = Volume of material in liters
- Vw = Volume of water in liters
- Vec = Volume of exempt compounds, as defined in Rule 102, DEFINITIONS, in liters

264.3 Percent of VOC by Weight: The ratio of the weight of the VOC to the weight of the material, expressed as a percent. The percent of VOC by weight shall be calculated as follows:

$$\text{Percent of VOC by Weight} = \frac{W_{voc}}{W_p} \times 100$$

- Where: Wvoc = Weight of VOCs in grams
- Wp = Weight of material in grams.

265 WATER SLIDE DECALS: Decals which are screen printed onto treated paper stock, and are removable from the stock by the dissolution of an underlying, water-soluble adhesive or a similar carrier.

266 WEB: A continuous sheet of substrate that is printed on web-fed printing presses.

267 WEB-FEED: An automatic system on a printing press, which supplies a web substrate for printing from a continuous roll or web or from an extrusion conversion process.

268 WIPE CLEANING: The method of cleaning a surface by physically rubbing the surface with a material such as a rag, paper, or a sponge moistened with a solvent.

300 STANDARDS

301 VOC CONTENT LIMITS FOR MATERIALS USED IN GRAPHIC ARTS OPERATIONS: Except for graphic arts operations exempt pursuant to Section 104, no person shall apply any material with a VOC content in excess of the limits specified below. The VOC content of the material as applied (including thinners, reducers, hardeners, retarders, catalysts, and additives) shall be determined pursuant to Section 502.1.

301.1 VOC Content for Inks, Coatings, and Adhesives:

Material Type	VOC Regulatory Content g/l (lb/gal)
General	
Printing Ink	300 (2.5)
Adhesive	150 (1.25)
Coating	300 (2.5)
Screen Printing	
Printing Ink	400 (3.3)
Adhesive	150 (1.25)
Coating	400 (3.3)
Electronic Circuit	800 (6.7)
Extreme Performance Ink/Coating	400 (3.3)
Metallic Ink	400 (3.3)
Sign Ink/Coating	400 (3.3)
Mechanically Formed Products	800 (6.7)
Overlays	800 (6.7)
Web-Fed Wallpaper	300 (2.5)
Water Slide Decals	800 (6.7)

301.2 VOC Content for Fountain Solution Materials:

Material Type	VOC Content (% by Weight)
Heatset Web Offset Lithographic	
Containing alcohol	
Chilled using refrigerator chiller	3
Non-chilled	1.6
Containing no alcohol	5
Coldset Web Offset Lithographic	5
Sheet-fed Offset Lithographic (with maximum sheet size greater than 11 x 17 inches)	
Containing alcohol and chilled using refrigerator chiller	8.5
Other	5
All Other Presses	
Chilled using refrigerator chiller	10
Non-chilled	8

301.3 Temperature Gauge Requirements Refrigerated Chiller: The refrigerated chiller shall be equipped with a temperature gauge. The temperature of the fountain solution shall be maintained at 55°F or less.

301.4 Coldset Web Offset Lithographic Fountain Solution: Fountain solutions containing alcohol shall not be used in coldest web offset lithographic printing operations.

302 EMISSION CONTROL EQUIPMENT:

302.1 Heatset Web Offset Lithographic or Letterpress: A person using heatset web offset lithographic or letterpress printing operation that prior to controls has a potential to emit of greater than 25 tons of VOC emissions per year shall use an add-on control device, on the dryers, that satisfies the following:

- 302.1.1 The air pollution control equipment is approved by the Air Pollution Control Officer, pursuant to Rule 501, GENERAL PERMIT REQUIREMENTS, and
- 302.1.2 The air pollution control equipment is designed and operated with an overall (control and capture) efficiency, as determined in Sections 502.4 and 502.5 that satisfies one of the following conditions, whichever is applicable:
 - 302.1.2.1 90% overall control and capture efficiency, by weight, if the heatset web offset Lithographic or Letterpress printing control device installed prior to October 11, 2012.
 - 302.1.2.2 95% overall control and capture efficiency, by weight, if the if the heatset web offset Lithographic or letterpress printing control device installed after October 11, 2012.
- 302.1.3 As an alternative to Section 302.1.2, the mass concentration at the outlet of the air pollution control equipment, determined pursuant to Section 502.4, is less than or equal to 20 ppmv as hexane on a dry basis.
- 302.2 Alternative Emissions Control Equipment: As an alternative of complying with the VOC content limit of Section 301, a person may use air pollution control equipment provided the following conditions are met:
 - 302.2.1 The air pollution control equipment is approved by the Air Pollution Control Officer pursuant to Rule 501, GENERAL PERMIT REQUIREMENTS.
 - 302.2.2 During any period of continuous operation, not to exceed 24 hours, the air pollution control equipment shall have an overall capture and control efficiency of at least 80 percent, by weight, for flexible packaging printing, and at least 70 percent, by weight, for other types of printing operations.
 - 302.2.3 The capture system shall vent all drying oven exhaust to the control device and shall have one or more inlets for collection of fugitive emissions.
 - 302.2.4 The air pollution control system shall reduce VOC emissions, at all the times, to a level that is not greater than the VOC emissions limits which would have been achieved through the use of complaint materials as per Sections 301.
 - 302.2.5 Submit an Operation and Maintenance Plan to the Air Pollution Control Officer at least 90 days in advance of the date on which VOC emission control system is to be used in lieu of compliance with VOC limitations. The plan shall specify operation and maintenance procedures that demonstrate continuous operation and compliance of the emissions control equipment during periods of emissions-producing operations. The Plan shall specify key system operating parameters such as temperatures, pressures,

and/or flow rates, as necessary to determine compliance with this rule and shall describe detailed procedures to maintain the approved emission control equipment. The Plan shall specify which records must be kept to document these operating 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.

302.2.6 Submit an application for an Authority to Construct, pursuant to Rule 501, General Permit Requirements.

303 CLEANING AND STORAGE REQUIREMENTS: Any person using cleanup solvents for graphic arts operations shall comply with the following requirements:

303.1 Materials used for solvent cleaning shall not exceed the VOC and/or composite vapor pressure limits specified in the table below. The VOC content of the material as applied shall be determined pursuant to Section 502.1. The composite partial pressure shall be determined using Section 502.6.

VOC CONTENT OF SOLVENT CLEANING MATERIALS			
Material Type	Actual VOC Content g/l (lb/gal)		VOC Composite Partial Pressure Millimeters of Mercury at 20°C (68°F)
General (e.g., maintenance, repair, solvent, wipe) Cleaning	72 (0.60)		
Application Equipment Cleaning			
General (not specifically listed below)	100 (0.83)	AND	3
Lithographic and Letter Press Printing, Blanket and Roller Washes, and Other On-Press Components	300 (2.5)	OR	10
Lithographic and Letter Press Printing, Other Cleaning	300 (2.5)	OR	10
Screen Printing	300 (2.5)	OR	10
Flexographic Printing	100 (0.83)	AND	3
Specialty Flexographic Printing	670 (5.6)	AND	10
Ultraviolet Inks (Except Screen Printing)	670 (5.6)	AND	10

303.2 Closed containers shall be used for the disposal of all VOC-containing cloth, sponges, papers, or other materials used for solvent cleaning.

303.3 All VOC-materials shall be stored in closed containers when not in use.

303.4 These cleanup solvent cleaning material limits shall supercede the requirements of Rule 240, SURFACE PREPARATION AND CLEANUP, for the cleaning of application equipment.

304 PROHIBITION OF SALE: A person shall not supply, sell, solicit, or offer for sale, any noncompliant material as defined in Section 239 for use in graphic arts operations. The prohibition in this section shall apply to any graphic arts material which will be applied at any physical location within the District.

305 SURFACE PREPARATION AND REPAIR AND MAINTENANCE SOLVENT CLEANING: Solvents used to clean substrates during the manufacturing process, or used for surface preparation before coating, adhesive, or ink application, and solvents used for repair or maintenance cleaning, are subject to the requirements of Rule 240, SURFACE PREPARATION AND CLEANUP.

400 ADMINISTRATIVE REQUIREMENTS

401 PRODUCT INFORMATION REQUIREMENTS FOR SELLERS: Any person who sells any material subject to this rule shall make available to the purchaser at the time of sale the following information:

401.1 The material type by name, product code identification number, and manufacturer;

401.2 For Materials Subject to Section 301.1: The maximum VOC regulatory content of the material (adhesive, ink and coating), expressed in grams per liter or pounds of per gallon as determined pursuant to Section 502.1;

401.3 For Materials Subject to Section 301.2: The maximum weight percentage of VOC of the fountain solution as determined pursuant to Section 264.3;

401.4 For Materials Subject to Section 303.1: The maximum VOC content and the total VOC composite partial pressure of the material. The VOC content shall be expressed as grams per liter or pounds per gallon) as determined pursuant to Section 502.1. The composite vapor pressure shall be displayed in millimeters of mercury at 20°C (68°F) as determined pursuant to Section 502.6; and

401.5 For all materials subject to Sections 301 and 303.1: Recommendations regarding thinning, reducing, or mixing with any material.

402 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 VOC mass concentration and volumetric flowrate, pursuant to Section 502.5 and the equations on the following page:

402.1 VOC Mass Emission Rate:

$$M = (Q) * (C) * (60 \frac{\text{min}}{\text{hr}}) \text{ (calculated upstream and downstream)}$$

Where:

M = VOC mass emission rate (upstream and downstream, in lb/hr.

Q = the volumetric flowrate at the inlet (upstream) or exhaust stack outlet (downstream), in standard cubic feet per minute as determined by Section 502.4.

C = the VOC mass concentration at the inlet (upstream) or outlet (downstream), in pounds per standard cubic feet, as determined pursuant to Section 502.4.

402.2 The percent control efficiency is calculated as follows:

$$\%CE = \left(\frac{M_u - M_d}{M_u} \right) * 100$$

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.

403 CALCULATION FOR DETERMINING VOC EMISSIONS FOR STATIONARY SOURCES INCLUDING THOSE EXEMPT PURSUANT TO SECTION 104.1

403.1 The total VOC emissions from materials shall be determined as follows:

$$E = \sum (E_1 + E_2)$$

Where:

E = Total VOC emissions (lbs-VOCs/month)

E₁ = VOC emissions from ink usage ((lbs-VOCs/month), as calculated in Section 403.2

E₂ = VOC emissions from material (except Inks) usage (lbs-VOCs/month), as calculated in Section 403.3

403.2 VOC Emissions from Ink Usage:

$$E_1 = U_1 * P_1 * (1 - R)$$

Where:

E₁ = VOC emissions from ink usage (lbs-VOCs/month)

U₁ = ink usage as applied (gallons/month). This equals the ink usage in pounds per month divided by the density of the ink.

P₁ = VOC content (lbs-VOC/gallon), applied as, determined pursuant to Section 502.1

R = ink retention factor (20% for heat-set lithographic printing, 95% for non-heat set lithographic printing, and 0% for all other printing operations)

403.3 VOC Emissions from Material (except Inks) Usages:

$$E_2 = \sum_{i=1}^n (U_i) * (V_i)$$

Where:

- E₂ = VOC emissions from materials (except inks) used (lbs-VOCs/month)
- U_i = material usage, as applied, (gallons/month)
- V_i = VOC content in the material (lbs-VOC/gal), as applied, as determined pursuant to Section 502.1

500 MONITORING AND RECORDS

501 RECORDKEEPING: In addition to any existing permit conditions issued pursuant to Rule 501, GENERAL PERMIT REQUIREMENTS, any person subject to this rule, including operations claiming exemption under Section 104.1, shall comply with the following requirements:

501.1 List of Materials: A list shall be maintained of all materials currently used and/or stored at the site. The list shall include the following information:

- 501.1.1 Material type (e.g., adhesive, coating, ink, fountain solution, extreme performance ink/coating, or cleanup solvent) by name, product code identification number, and manufacturer, and the appropriate material type category as designated in Sections 301 and 303.1 as applicable.
- 501.1.2 The VOC regulatory content of the materials (e.g., adhesive, coating, or ink) listed in Section 301.1, expressed in grams per liter or pounds per gallon.
- 501.1.3 The weight percentage of volatiles of the fountain solution listed in Section 301.2
- 501.1.4 The VOC actual content of the cleaning materials listed in Section 303, expressed in grams per liter or pounds per gallon.
- 501.1.5 The VOC composite partial pressure for materials listed in Section 303.1, if applicable. The composite partial pressure shall be calculated pursuant to Section 262.
- 501.1.6 The actual mixing ratio used for the material, as applied.
- 501.1.7 For inks, the density of the ink in lbs/gallon.
- 501.1.8 For aerosol adhesives exempt pursuant to Section 104.7, records of VOC content in the aerosol adhesive. The VOC content shall be recorded as percent by weight. The record shall also include the type of operation (i.e., substrate, purpose) for which the aerosol adhesive is used.
- 501.1.9 Identification of each material type exceeding the VOC limits specified in Sections 301 and 303.1. or the composite vapor pressure specified in Section 303.1.

- 501.2 Product Information: The information listed under Sections 401.1 through 401.5 shall be maintained on-site and made available to the Air Pollution Control Officer upon request.
- 501.3 Usage Records: Any person within the District using materials regulated by this rule shall update and maintain the calendar monthly records as required by this rule as follows:
- 501.3.1 Records of total applied volume in gallons or weight in pounds (weight allowed for ink only) for each material (including thinners, reducers, hardeners, retarders, catalysts, fountain solutions and cleaning materials), specified by material type as listed in Sections 301 and 303.1, and VOC emissions from each material type.
 - 501.3.2 For graphic arts operations exempt pursuant to Sections 104.1, or 104.7, records of total VOC emissions from all materials (including thinners, reducers, hardeners, retarders, and catalysts) used for each calendar month in pounds. The records shall be determined using emission calculations specified in Section 403.
 - 501.3.3 For graphic arts operations exempt pursuant to Section 104.8, records of total VOC emissions from all offset lithographic printing operations, including related cleaning activities.
 - 501.3.4 For graphic arts operations exempt pursuant to Section 104.10, records of total VOC emissions from heatset web offset lithographic printing and heatset web letterpress printing.
 - 501.3.5 Records of total applied volume for each material exceeding the VOC limits specified in Sections 301 and 303.1 by name, product code identification number, manufacturer, and material type.
- 501.4 Emission Control Equipment: Any person using emission control equipment pursuant to Section 302 as a means of complying with this rule shall maintain on a daily basis:
- 501.4.1 Such records as required by the Operation and Maintenance Plan in Section 302.2.5; and
 - 501.4.2 Records of applied volume in gallon or by weight in pounds (weight allowed for ink only); and
 - 501.4.3 Records of test reports conducted pursuant to Section 502.
- 501.5 Duration of Records: All records required by this rule shall be retained on-site for at least two years, except for sources subject to Rule 507, FEDERAL OPERATING PERMIT PROGRAM, which shall be retained for at least five years. Such records shall be made available to the Air Pollution Control Officer upon request.

502 TEST METHODS

- 502.1 Determination of VOC Content: VOC content of the material (except as provided for in Section 502.2), as applied including thinners, reducers, hardeners, retarders, and catalysts, shall be determined in accordance with EPA Method 24, Section 264.1 and Section 502.3, for VOC regulatory content, or with EPA Method 24 and Section 264.2, for VOC actual content.

- 502.2 Analysis of Samples, Non-Heatset Polymerizing Lithographic Or Letterpress Inks: Measurement of the volatile content shall be made in accordance with EPA Method 24. All components of the sample must be weighed in the proper proportion into the analysis container and mixed together, with the mixture then being allowed to stand for at least one hour, but no more than 24 hours, prior to being oven-dried at 110°C for 1 hour.
- 502.3 Determination of Exempt Compounds: Compounds exempt pursuant to Section 213, shall be determined in accordance with ASTM D4457-91, "Test Method for Determination of Dichloromethane and 1,1,1-trichloroethane in Paints and Coatings by Direct Injection into a Gas Chromatograph", or CARB Method 432, "Determination of Dichloromethane and 1,1,1-trichloroethane in Paints and Coatings". 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.
- 502.4 Determination of Control Equipment Efficiency: Efficiency of the emission control equipment shall be based upon test measurements made in accordance with:
- 502.4.1 USEPA Method 18, 25 or 25A, for VOC concentration, and
- 502.4.2 USEPA Method 2 or 2C for flow rates, as applicable, and calculated in accordance with Section 402.
- 502.5 Determination of Capture Efficiency: Capture efficiency shall be determined in accordance with U.S. EPA technical guideline Document, *Guidelines for Developing Capture Efficiency dated January 9, 1995*.
- Individual capture efficiency test runs subject to U.S. EPA technical guidelines shall be determined by:
- 502.5.1 Applicable U.S. EPA methods 204, 204A, 204B, 204C, 204D, 204E, and/or 204F; or
- 502.5.2 Any other method approved by the U.S. EPA, the California Air Resources Board, and the Air Pollution Control Officer.
- 502.6 Determination of VOC Composite Partial Pressure: VOC composite partial pressure shall be determined in accordance with Section 262 and Section 502.7.
- 502.7 Determination of Vapor Pressure: Vapor pressure of a VOC shall be determined in accordance with ASTM Method D2879-97, "Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope", or may be obtained from the most current edition of a published source, including, but not limited to:
- 502.7.1 *The Vapor Pressure of Pure Substances*, Boublik, Fried, and Hala; Elsevier Scientific Publishing Company, New York.
- 502.7.2 *Perry's Chemical Engineer's Handbook*, McGraw-Hill Book Company.

502.7.3 *CRC Handbook of Chemistry and Physics*, Chemical Rubber Publishing Company.

502.7.4 *Lange's Handbook of Chemistry*, John Dean, editor, McGraw-Hill Book Company.

Notwithstanding the provisions of this section, the Air Pollution Control Officer may require the use of a vapor pressure determined in accordance with ASTM Method D2879-97 for determining compliance with this rule.

502.8 Determination of Metal Content in Inks: The metal content of metallic inks shall be determined 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". Use of this method for determining the content of metals other than aluminum in metallic inks shall be subject to approval by the U.S. EPA, the California Air Resources Board, and the Air Pollution Control Officer.

This Page Intentionally Left Blank