PLACER COUNTY
AIR POLLUTION CONTROL DISTRICT

STAFF REPORT

RULE 239

GRAPHIC ARTS OPERATIONS

PROPOSED RULE AMENDMENTS

September 11, 2012

BACKGROUND

The Placer County Air Pollution Control District (District) jurisdiction is Placer County. Placer County is located in northern California, bordering Sacramento County to the west and the State of Nevada on the east. Placer County is divided into three different air basins: the Sacramento Valley Air Basin (SVAB); the Mountain Counties Air Basin (MCAB); and the Lake Tahoe Air Basin (LTAB). The portions of Placer County in the SVAB and MCAB are included in the Sacramento Federal Ozone Non-Attainment Area (SFONA). The SFONA has been classified as "severe" non-attainment for the National Ambient Air Quality Standard (NAAQS) for eight-hour ozone, as well as non-attainment with the State of California Ambient Air Quality Standard for ozone. The U.S. Environmental Protection Agency's (EPA) Phase 2 Ozone Rule – contained in 40 CFR 51.912 and 70 FR 71612, in accordance with Clean Air Act (CAA) Amendments of 1990, Sections 182(b)(2) and 182(f) – requires that areas that are classified as moderate non-attainment or higher must demonstrate in a State Implementation Plan (SIP) that their rules fulfill Reasonably Available Control Technology (RACT) requirements for volatile organic compound (VOC) and nitrogen oxides (NOx) which are ozone precursors. The implementation of RACT requires, at a minimum, District rules covering source categories with RACT guidance documents, which include all EPA-issued Control Technique Guidelines (CTG's), where there are such sources that operate in the District.

District Rule 239, Graphic Arts Operations, limits VOC emissions from graphic art operations in the District. The rule was originally adopted on November 3, 1994. It has been subsequently amended four times, with the latest on April 8, 2004. This latest version has not been SIP-approved. The most recent SIP approval was on November 13, 1998 (63 FR 63410) for the rule amended on February 13, 1997.

In September 2006, the EPA issued a CTG for graphic arts operations ("Control of Volatile Organic Compound Emissions from Offset Lithographic and Letterpress Printing", EPA-453/R-06-002). The current District Rule 239, adopted on April 8, 2004, does not fully address these requirements. Thus, the District is proposing amendments to Rule 239 to meet RACT SIP obligations through implementation of all CTG requirements.

The District has eight (8) permitted non-major sources in the category of graphic arts operations. The business names for these sources are:

- Auburn Journal
- Auburn Printers
- GKM Corporation
- J & M Printing
- Master Color
- Paul Baker Printing Company
- Sir Speedy Printing

This Staff Report addresses amendments that are proposed to Rule 239.

DISCUSSION

Rule 239 amendments were made based on a review of the CTG, and to establish consistency with local Air District rules. We reviewed local Air District rules including:

- Sacramento Metro AQMD Rule 450, Graphic Arts Operations, last amended on October 23, 2008.

- San Joaquin Valley APCD Rule 4607, Graphic Arts and Paper, Film, Foil and Fabric Coatings, last amended on December 18, 2008.

- El Dorado, Rule 231, Graphic Arts Operations, last amended on September 27, 1994.

Also reviewed were rules from other Air Districts including:

- South Coast AQMD Rule 1130, Graphic Arts, last amended on October 8, 1999
- Bay Area AQMD Regulation 8, Rule 20, Graphic Arts Printing and Coating Operations, last amended on November 19, 2008.
- San Diego County APCD, Rule 67.16, Graphic Arts Operations, last amended on May 9, 2012.
- Ventura County APCD, Rule 74.19, Graphic Arts, last amended on June 14, 2011.

These Districts are designated as non-attainment areas for the Federal national ambient air quality standard for ozone. Thus, they also are required to implement CTGs in their rules.

Proposed Rule amendments, in underline/strikeout format, are shown in Attachment #1. Specific changes to the Rule include:

Section 100. General

Section 102. Applicability. Subsections 102.1 and 102.2 provisions are combined into one section.

Section 104. Exemptions. Changes to the section include:

Section 104.1. General. Section 104.1.1 expired on April 8, 2005, thus it is deleted. The phrase "after April 8, 2005" contained in Subsection 104.1.2 no longer applied and is removed.

Section 104.2. Proof Presses and/or Research and Test Development Operations. This section expired on April 8, 2005, thus it is deleted.

Section 104.7. Aerosol Adhesives – Graphic Arts Operations. For clarification, "other than screen printing" is added to specify that this exemption for aerosol adhesives is only applicable to graphic arts operations other than screen printing.

Section 104.2. Stripping of Cured Inks, Coatings, or Adhesives. A specific exemption is added for strippers, as contained in other District rules. This is consistent with (no change from) the requirements of the current existing rule which indirectly exempts strippers from VOC limits because there are no specific limits stated for strippers and strippers are not included in the Solvent Cleaner sub-categories.

Section 104.8. Fountain Solutions. As recommended by the CTG and contained in other District rules, an exemption from VOC content limits for fountain solutions is added when facility wide total potential to emit VOC emissions before control is less than 450 lb/month.

Section 104.5. Prepress Operations. For clarification, the cleaning or processing of color scanners, plate processors, film cleaning and plate developers is added to this exemption.

Section 104.9. Blanket Repair Materials. A small quantity exemption is added for blanket repair materials when used in containers of four ounces or less, as contained in other District rules.

Section 104.10. Heatset Web Offset Lithographic Printing and Heatset Web Letterpress Printing. This new section exempts these specific operations from needing add-on control requirements contained in new Section 302.1 when potential to emit VOC emissions are less than 25 tons per year.

Section 200. Definitions

Definitions that are eliminated include: lithographic and letter press printing, other cleaning, Volatile organic compound (VOC) as supplied, Volatile organic compound (VOC) as applied.

Definitions that are added include: Adhesive, Aerosol Adhesive, Alcohol, Blanket, Blanket repair material, Cured ink, cured coating, or cured adhesives, , Heater or dryer, Ink jet, Removable press component, Stripping, Roller wash, VOC content.

Definitions that are amended include: Blanket and roller washes, Fugitive emissions, Graphic arts operations, Gravure printing, Lithographic printing, Metering roller, Noncompliant material , Offset printing, Prepress operations.

Section 300. Standards

Section 301. General Requirements. This section is deleted since it is redundant to other sections already contain in the rule.

Section 301. VOC Content Limits for Materials used in Graphic Arts Operations. This section was previously numbered Section 302. Additional changes to the section include:

- Section 301.1, VOC Content for Inks, Coatings, and Adhesives, The VOC content limit for the Sign Ink/Coating subcategory was reduced to from 500 g/l to 400 g/l. The VOC content limit for the Extreme Performance Ink/Coating subcategory was reduced from 800 g/l to 400 g/l. These changes are based on EPA recommendations and other Air District rules.

- Section 301.2, VOC Content for Fountain Solution Materials. Fountain solution category and subcategories are modified, and applicable VOC content limits are lowered, based on the CTG recommendations.

- Section 301.4. A new section that prohibits the use of fountain solutions containing alcohol on coldset web offset lithographic presses is added based on the CTG recommendations.

Section 303. Emission Control Equipment. This section has been renumbered to Section 302. Other changes to the section include:

- Section 302.1. Heatset Web Offset Lithographic or Letterpress. Add-on control requirements for this category are added to meet the CTG recommendations.

- Section 302.2. Alternative Emissions Control Equipment. A title is added to the section for clarification. Subsections 303.2.2 through 303.2.4 are added to specify combined overall capture and control system efficiency requirements rather than separate control and capture efficiency requirements, as required by the CTG.

Subsections 303.2.1 and 303.2.1, which contained the current capture and control methods are deleted.

Section 304. Cleaning and Storage Requirements. This section is renumbered to Section 303. Changes to this section include:

- Section 303.1. For cleaning solvents, for a couple of subcategories, VOC content limits and VOC composite partial vapor pressure limits are lowered to 670 g/l and 10 mm Hg respectively. This is to meet CTG recommendations of VOC content of less than 70% by weight (equivalent to a VOC concentration of 670 g/l) and partial pressure of less than 10 mm Hg.

- Section 304.2. Lithographic and Letter Press Printing, Other Cleaning. This section, which restricts the quantity of monthly usage of "other" cleaning solutions in comparison to blanket and roller wash usage, is eliminated. This requirement effectively produces no benefit since the VOC content limit in g/l for "other" cleaners is identical to the limit for blanket and roller washes.

Section 400. Administrative Requirements

Section 401. Operation and Maintenance Plan. This section is moved to Section 302.2.5.

Section 402. Product Information Requirements for Sellers. The title of this section is changed to Labeling Requirements, and a new provision has been added to this section.

Section 403. Calculation for Determining VOC Composite Partial Pressure. This section is moved to Section 262.

Section 404. Calculation for Determining VOC content of Material Excluding Water and Exempt compounds. This section is moved to Section 264.1.

Section 405. Calculation for Determining VOC Content of Material Including Water and Exempt Compounds. This section is moved to Section 264.2.

Section 407. Calculation for Determining VOC Emissions for Stationary Sources Including those exempt pursuant to section 104.1, 104.2 and 104.7, Sections 104.2 is eliminated from the title since it expired on April 8, 2005.

Section 500. Monitoring and Record

Section 501. Recordkeeping. Recordkeeping requirement of the percentage of Lithographic and Letter Press, Other Cleaning materials requirement is deleted since it is no longer required by the Rule. Also, Subsections 501.3.3 and 501.3.4 are added to ensure adequate usage records.

Section 502. Test methods. Section 502.3, Determination VOC Composite Partial Pressure, and Section 502.4, Determination of Control Efficiency, were deleted.

Further, applicable test methods references are updated to the most approved current versions.

Miscellaneous

Additional miscellaneous changes were made for readability and conformance with the CTG which have no impact on the compliance requirements of the Rule.

ANALYSIS

The following Analysis and the subsequent Findings are intended to address the requirements set forth in the Health and Safety Code relating to adoption of a new or amended District Rule, as well as other State statutes referenced herein.

1. Cost-Effectiveness of a Control Measure

California Health & Safety Code (H&S) Section 40703 requires a District to consider and make public "the cost-effectiveness of a control measure". The compliance costs are associated with replacing existing graphic arts and cleaning products with VOC content that meets the amended rule limits, as well as new work practice and recordkeeping requirements. Graphics arts products that meet proposed VOC content limits are well-established to be readily available at the same price points as products that will become non-complaint when the proposed amendments will become effective on October 11, 2013. The cost effectiveness has been determined to be acceptable by the EPA and other Air Districts that have already implemented the CTG requirements. EPA concluded that CTG requirements actually produce a cost saving ranging from $700 to $1,500 per year for each printing operation. The graphic arts operations located within the District are not expected to be significantly affected (no adverse impacts on the profitably of business) by the proposed rule changes.

2. Socioeconomic Impact

H&S Section 40728, in relevant part, requires the Board to consider the socioeconomic impact of any new or amended rule if air quality or emission limits are significantly affected. Numerous existing graphic arts shop operations are already operating in compliance with the amended rule standards.

3. Environmental Review and Compliance

California Public Resources Code Section 21159 requires an environmental analysis of the reasonably foreseeable methods of compliance should be conducted. Compliance of the proposed rule amendment is expected to be achieved by the replacement of current graphic arts products with compliant compounds. Application of these compliant compounds will generally result in less VOC emissions from the graphic arts activities. Therefore, the proposed rule amendment will reduce emissions from sources and will not cause any significant adverse effects on the environment. Staff has concluded that no adverse environmental impacts will be caused by compliance with the proposed rule amendment.

According to the above conclusion, Staff finds that the proposed rule amendment is exempt from the California Environmental Quality Act (CEQA) because: (1) it can be seen with certainty that there is no possibility that the activity in question may have a significant adverse effect on the environment (CEQA Guidelines §15061(b)(3)), and (2) it is as an action by a regulatory agency for protection of the environment (Class 8 Categorical Exemption, CEQA Guidelines §15308).

FINDINGS

A. **Necessity**: The adoption of proposed amended Rule satisfies the objective of the District to implement "Suggested Control Measures" for the reduction of VOCs to achieve attainment with ambient air standards for ozone, and meets the District's requirements to implement "every feasible measure" and "Best Available Retrofit Control Technology" as required under California Health and Safety Code Sections 40919 and 40914.

B. **Authority**: California Health and Safety Code, Sections 40000, 40001, 40701, 40702, 40716, 41010, and 41013, are provisions of law that provide the District with the authority to adopt this proposed amended Rule.

C. **Clarity:** There is no indication, at this time, that the proposed amended Rule is written in such a manner that persons affected by the Rule cannot easily understand them.

D. **Consistency:** The proposed amended Rule is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations.

E. **Non-duplication:** The proposed amended Rule does not impose the same requirements as an existing state or federal regulation.

F. **Reference:** All statutes, court decisions, and other provisions of law used by the District in interpreting this proposed amended Rule are incorporated into this analysis and this finding by reference.

SUMMARY

Rule 239, Graphic Arts Operations, has been amended to address the control guidance contained in the U.S. EPA's CTG for Graphic Arts issued in September 2006 (EPA-453/R-06-002).

ATTACHMENT #1

Subject:

Proposed Amended Rule 239, Graphic Arts Operations

(Strikeout copy)

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
~~203~~204 APPLICATION EQUIPMENT
205 BLANKET
206 BLANKET REPAIR MATERIAL
~~204~~207 BLANKET ~~AND ROLLER~~ WASHES
~~205~~208 CLOSED CONTAINER
~~206~~209 COATING
~~207~~210 COLD BENDING
~~208~~211 CONTROL DEVICE
~~209~~212 CONVERTING OPERATION
213 CURED INK, CURED COATING, OR CURED ADHESIVES
~~210~~214 DRYING OVEN
~~211~~215 ELECTRONIC CIRCUIT
~~212~~216 EMBOSSING
~~213~~217 EXEMPT COMPOUNDS
~~214~~218 EXTREME PERFORMANCE INK/COATING
~~215~~219 FLEXIBLE PACKAGING INDUSTRY
~~216~~220 FLEXOGRAPHIC PRINTING
~~217~~221 FOUNTAIN SOLUTION
~~218~~222 FUGITIVE EMISSIONS
~~219~~223 GRAPHIC ARTS OPERATIONS
~~220~~224 GRAVURE PRINTING
225 HEATER or DRYER
~~221~~226 HEAT BENDING
~~222~~227 HEATSET INK
228 INK JET
~~223~~229 INFLATING
~~224~~230 LAMINATING OPERATIONS
~~225~~231 LETTERPRESS PRINTING
~~226~~232 LINE
~~227~~233 LITHOGRAPHIC PRINTING
~~228 LITHOGRAPHIC AND LETTER PRESS PRINTING, OTHER CLEANING~~
~~229~~234 MAINTENANCE CLEANING
~~230~~235 MATERIAL
~~231~~236 MECHANICALLY FORMED PRODUCTS
~~232~~237 METALLIC INK
~~233~~238 METERING ROLLER
~~234~~239 NONCOMPLIANT MATERIAL
~~235~~240 NON-HEATSET INK
~~236~~241 NON-POROUS SUBSTRATE

~~237~~242 OFFSET PRINTING
~~238~~243 OVERLAY
~~239~~244 PREPRESS OPERATIONS
~~240~~245 PRINTING
~~241~~246 PRINTING INK
~~242~~247 PROOF PRESS
~~243~~248 REFRIGERATED CHILLER
249 REMOVABLE PRESS COMPONENT
~~244~~250 REPAIR CLEANING
251 ROLLER WASH
~~245~~252 SCREEN PRINTING
~~246~~253 SIGN INK/COATING
~~247~~254 SOLVENT CLEANING
~~248~~255 SPECIALTY FLEXOGRAPHIC PRINTING
~~249~~256 STANDARD INDUSTRIAL CLASSIFICATION (SIC)
~~250~~257 STATIONARY SOURCE
258 STRIPPING

~~251~~259 SUBSTRATE
~~252~~~~605~~~~9~~60 ULTRAVIOLET INK
~~253~~26~~10~~1 VACUUM-FORMING
~~254~~26~~1~~2 VOC COMPOSITE PARTIAL PRESSURE
~~255~~26~~22~~3 VOLATILE ORGANIC COMPOUNDS (VOC)
~~256 VOLATILE ORGANIC COMPOUND (VOC) AS APPLIED~~
~~257 VOLATILE ORGANIC COMPOUND (VOC) AS SUPPLIED~~
26~~33~~4 VOC CONTENT
~~258~~26~~44~~5 WATER SLIDE DECALS
~~259~~26~~55~~6 WEB
~~260~~26~~66~~7 WEB-FEED
~~261~~26~~77~~8 WIPE CLEANING

300 STANDARDS

~~301 GENERAL REQUIREMENTS~~
~~302~~301 VOC CONTENT LIMITS FOR MATERIALS USED IN GRAPHIC ARTS OPERATIONS
~~303~~302 EMISSION CONTROL EQUIPMENT
~~304~~303 CLEANING AND STORAGE REQUIREMENTS
~~305~~304 PROHIBITION OF SALE
~~306~~305 SURFACE PREPARATION AND REPAIR AND MAINTENANCE SOLVENT CLEANING

400 ADMINISTRATIVE REQUIREMENTS

~~401 OPERATION AND MAINTENANCE PLAN~~
~~402~~401 PRODUCT INFORMATION REQUIREMENTS FOR SELLERS
~~403 CALCULATION FOR DETERMINING VOC COMPOSITE PARTIAL PRESSURE~~
~~404 CALCULATION FOR DETERMINING VOC CONTENT OF MATERIAL EXCLUDING WATER AND EXEMPT COMPOUNDS~~
~~405 CALCULATION FOR DETERMINING VOC CONTENT OF MATERIAL INCLUDING WATER AND EXEMPT COMPOUNDS~~
~~406~~402 CALCULATION FOR DETERMINING PERCENT CONTROL EFFICIENCY AND VOC MASS EMISSION RATE
~~407~~403 CALCULATION FOR DETERMINING VOC EMISSIONS FOR STATIONARY SOURCES INCLUDING THOSE EXEMPT PURSUANT TO SECTIONS 104.1 ~~AND 104.2~~

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.

~~102.1 Geographic: The provisions of this rule apply to all graphic arts operations located in Placer County.~~

~~102.2 Operations: Except for the operations listed in Section 104, EXEMPTIONS, the provisions of this rule apply to all GRAPHIC ARTS OPERATIONS as defined in Section 219 and to any person who manufactures, sells, offers to sell, or supplies any graphic arts materials listed in Sections 301, 302, 304 and 305, STANDARDS. (GRAPHIC ARTS OPERATIONS are typically categorized under the Standard Industrial Classification (SIC) Codes of 27xx).~~

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:

~~104.1.1 Until April 8, 2005, the requirements of this rule, with the exception of Sections 302 and 501.1 to 501.3, shall not apply to any graphic arts operation at a stationary source which emits less than 660 pounds of volatile organic compounds per calendar month from all graphic arts operations, including cleaning materials, and excluding operations addressed in Section 104.2.~~

~~104.1.2 After April 8, 2005,~~ T~~t~~he requirements of this rule, with the exception of Sections ~~302~~ 303 and 501.1 to 501.3, shall not apply to any graphic arts operation at a stationary source which either:~~;~~

104.1~~.2~~.1 H~~h~~as ~~actual~~ total VOC emissions of less than or equal to 60 pounds per calendar month ~~of volatile organic compounds~~ from all graphic arts operations and cleaning materials; or

104.1~~.2~~.2 R~~r~~eceives 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.

~~104.2 Proof Presses and/or Research and Test Development Operations: Until April 8, 2005, this rule, with the exception of Sections 302 and 501.1-3, shall not apply to any graphic arts operations used exclusively for research, laboratory analysis or determination of product quality and commercial acceptance, such as proof presses or other proofing systems, provided that total VOC emissions~~

~~from all such equipment do not exceed 300 pounds per calendar month per stationary source. As noted above, this exemption shall expire April 8, 2005.~~

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~~19~~.

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~~processors~~.

104.6 Aerosol Adhesives – Screen Printing: The requirements in Section ~~302~~ 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 ~~under Section 300, Standards,~~ 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 ~~under Section 300, Standards,~~ 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 ~~used to~~that is applied for the purpose bonding ~~one~~ two ~~surface~~ surfaces ~~to another surface by attachment~~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.

~~An adhesive consisting of a mixture of rubber, resins, liquid and /or gaseous solvents, and propellants packaged in a hand-held, pressurized, non-refillable container. The container expels the pressurized aerosol materials in a finely divided spray when a valve on the container is depressed.~~

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.

~~203~~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.

~~204~~207 **BLANKET ~~AND ROLLER~~ WASHES:** Cleaning materials ~~, which are~~ used to ~~remove~~ clean the ~~printing inks, oils, and paper pieces~~rubber-surface fabric used to transfer the image from the plate to the substrate.~~ from the blankets and rollers excluding metering rollers and plates.~~

~~205~~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.

~~206~~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.

~~207~~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.

~~208~~211 **CONTROL DEVICE:** Equipment such as an incinerator or adsorber used to prevent air pollutants from reaching the ambient air.

~~209~~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.

~~210~~214 DRYING OVEN: An oven used to hasten the process of drying printed or coated material.

~~211~~215 ELECTRONIC CIRCUIT: A product, which consists of a substrate and circuitry, created by screen printing a conductive ink on the substrate.

~~212~~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.

~~213~~217 EXEMPT COMPOUNDS: For the purposes of this rule, Exempt Compounds are as defined in Rule 102, Definitions.

~~214~~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:

~~214.1~~ 218.1 five or more years of outdoor exposure;

~~214.2~~218.2 exposure to industrial-grade chemicals, solvents, acids, detergents, oil products (including fuels), cosmetics, temperatures exceeding 76 ^{o}C (170 ^{o}F), vacuum forming, embossing or molding.

~~215~~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.

~~216~~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

~~217~~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

~~217~~221.2 hydrophilic gums

~~217~~221.3 VOC additives to reduce the surface tension of the solution.

~~218~~222 FUGITIVE EMISSIONS: Uncollected e~~E~~missions of VOC from any portion of Graphic Arts Operations as defined in Section 223~~19~~, other than the drying oven.

~~219~~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. ~~Processing equipment~~ 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.

~~220~~224 **GRAVURE PRINTING:** ~~A~~ An intaglio printing operation ~~using a plate~~ 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~~or engraved onto the surface~~.

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

~~221~~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.

~~222~~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.

~~223~~229 **INFLATING:** A process of filling a printed object with air or gas which results in the swelling of the printed area.

~~224~~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.

~~225~~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.

~~226~~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.

~~227~~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.

~~228 **LITHOGRAPHIC AND LETTER PRESS PRINTING, OTHER CLEANING:** Cleaning of metering rollers and printing plates.~~

~~229~~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.

~~230~~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.

~~231~~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.

~~232~~237 **METALLIC INK:** An ink that contains greater than 50 grams of metal per liter (0.4 lb/gal) of ink.

~~233~~238 **METERING ROLLER:** A roller to transfer and meter fountain solution ~~water~~ to maintain hydrophilic properties.

~~234~~239 **NONCOMPLIANT MATERIAL:** A material that:

~~234~~239.~~2~~ 1 E~~e~~xceeds the VOC content limits specified in Section ~~302~~301, and is not exempt pursuant to Section 104, and does not use emission control equipment pursuant to Section ~~303~~302; or

~~234~~239.2 E~~e~~xceeds the VOC content limit and/or composite vapor pressure limit, as applicable, in Section ~~302~~303~~, and does not use emission control equipment pursuant to Section 303~~.

~~235~~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

~~236~~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 metallized 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.

~~237~~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.

~~238~~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.

~~239~~244 **PREPRESS OPERATIONS:** Operations associated with printing plate making ~~using film photo~~ including but not limited to, film photo processors and plate photo processors, color scanners, film cleaning, or plate developers.

~~240~~245 **PRINTING:** Any graphic arts operation that imparts color, design, alphabet, or numerals on a substrate.

~~241~~246 **PRINTING INK:** A pigmented fluid or viscous material used in printing.

~~242~~247 **PROOF PRESS:** A press used exclusively to check the quality of print, color reproduction, and editorial content.

~~243~~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.

~~244~~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.

~~245~~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.

~~246~~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.

~~247~~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.

~~248~~255 **SPECIALTY FLEXOGRAPHIC PRINTING:** Flexographic printing on polyethylene, polyester and foil substrates for food packaging, health care products, fertilizer bags, or liquid-tight containers.

~~249~~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.

~~250~~257 **STATIONARY SOURCE:** Any building, structure, facility, or emissions unit which emits or may emit any affected pollutant directly or as a fugitive emission.

~~250~~257.1 Building, structure, facility, or emissions unit includes all pollutant emitting activities which:

~~250~~257.1.1 Belong to the same industrial grouping, and

~~250~~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~~0~~.2.1 They belong to the same two-digit Standard Industrial Classification (SIC) code, or

257~~0~~.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.

~~251~~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.

~~252~~260 **ULTRAVIOLET INK:** Ink which dries by polymerization reaction induced by ultraviolet energy.

~~253~~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.

~~254~~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 ^oC, 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^oC, in mm Hg, as determined by Section 502.7 of this rule.

~~VOC composite partial pressure is calculated pursuant to Section 403.~~

~~255~~263~~3~~ **VOLATILE ORGANIC COMPOUNDS (VOC):** Any chemical compound containing at least one atom of carbon except for the Exempt Compounds listed in Rule 102, Definitions.

263~~4~~ VOC CONTENT:

263~~4~~.1 VOC Regulatory Content: The weight of VOC per combined volume of VOC and material, calculated with the following equation:

VOC Regulatory Content = (Ws – Ww – Wec) / (Vm – Vw – Vec)

263~~4~~.2 VOC Actual Content: The weight of VOC per volume of material, calculated with the following equation:

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:

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

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

~~256 **VOLATILE ORGANIC COMPOUND (VOC) AS APPLIED:** A VOC as applied means the VOC content of the material as applied including thinners, reducers, hardeners, retarders, catalysts and additives calculated pursuant to Section 502.1.~~

~~257 **VOLATILE ORGANIC COMPOUND (VOC) AS SUPPLIED:** A VOC as supplied means the VOC content of the original material as supplied by the manufacturer calculated pursuant to Section 502.1.~~

~~258~~ 2645 **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.

~~259~~2656 **WEB:** A continuous sheet of substrate that is printed on web-fed printing presses.

~~260~~2667 **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.

~~261~~2678 **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 **GENERAL REQUIREMENTS:** Any person operating equipment for GRAPHIC ARTS OPERATIONS as defined in Section 219, shall comply with one of the following requirements:~~

~~301.1 Use only low VOC (Volatile Organic Compounds) inks, coatings, adhesives, and fountain solutions as specified in Section 302, of this rule; or~~

~~301.2 Install and operate on the line, approved emission control equipment pursuant to Section 303, with a control device efficiency of at least 95 percent on a mass basis, and a collection efficiency of at least 70% on a mass basis. (Note that the use of an approved emission control system does not eliminate the need to comply with the provisions of Section 304 of this rule.)~~

~~302~~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.

~~302~~301.1 VOC Content for Inks, Coatings, and Adhesives:

Material Type	VOC Regulatory Content g~~m~~/l (lb/gal) ~~Less water and exempt compounds~~
General	
Printing Ink	300 (2.5)
Adhesive	150 (1.25)
Coating	300 (2.5)
Screen Printing	
~~g~~	400 (3.3)
Printing Ink	150 (1.25)
Adhesive	400 (3.3)
Coating	800 (6.7)
Electronic Circuit	~~800~~ 400 (~~6.7~~3.3)
Extreme Performance	400 (3.3)
Ink/Coating	~~500~~ 400 (~~4.1~~3.3)
Metallic Ink	
Sign Ink/Coating	800 (6.7)
Mechanically Formed Products	800 (6.7)
Overlays	300 (2.5)
Web-Fed Wallpaper	800 (6.7)
Water Slide Decals	

~~302~~301.2 VOC Content for Fountain Solution Materials:

Material Type	VOC Content (% by Weight) ~~VOC CONTENT gm/l (lb/gal) Including water and exempt compounds~~	
	~~Effective 8/14/97~~	~~Effective April 8, 2005~~
~~Fountain Solutions – Chilled Using Refrigerated Chiller~~	~~116 (0.97)~~	~~100 (0.83)~~
~~Fountain Solutions – Non-Chilled~~	~~116 (0.97)~~	~~80 (0.67)~~
Heatset Web Offset Lithographic Containing alcohol Chilled using refrigerator chiller Non-chilled C~~Heatset Web Offset Lithographic – c~~ontaining no alcohol		3 1.6 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 Other		8.5 5

October 11, 2012~~April 8, 2004~~

All Other Presses Chilled using refrigerator chiller Non-chilled	 10 8

~~302~~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 ^{o}F or less.

30~~2~~1.~~3~~4 Coldset Web Offset Lithographic Fountain Solution: Fountain solutions containing alcohol shall not be used in coldest web offset lithographic printing operations.

~~303~~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 ~~to~~ Section~~s~~ 301~~ and 302~~, a person may use air pollution control equipment provided the following conditions are met:~~ing it satisfies the following:~~

~~303~~302.2.1 The air pollution control equipment is approved by the Air Pollution Control Officer pursuant to Rule 501, General Permit Requirements.~~; and~~,

~~303~~302.2.2 During any period of continuous operation, not to exceed 24 hours, t~~T~~he 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~~; and~~.

~~is designed and operated with~~

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~~; and~~.

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.

~~303.2.1 A control device efficiency of at least 95 percent on a mass basis, as determined pursuant to Sections 406 and 502.4, and~~

~~303.2.2 An emission collection efficiency of at least 70 percent on a mass basis, as determined pursuant to Section 502.5.~~

302.2.5~~401 OPERATION AND MAINTENANCE PLAN:Any person using existing emission control equipment pursuant to Section 302, as a means of complying with this rule, as provided in Section 301, must~~ Submit an Operation and Maintenance Plan ~~for the emission control equipment~~ 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~~for approval~~. ~~A person proposing to install new emission control equipment as a means of complying with this rule shall submit in addition to an Operation and Maintenance Plan, an application for an Authority to Construct, pursuant to Rule 501, General Permit Requirements.~~ 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 ~~in addition to an Operation and Maintenance Plan,~~ an application for an Authority to Construct, pursuant to Rule 501, General Permit Requirements.

~~304.1~~ **~~304~~303 CLEANING AND STORAGE REQUIREMENTS:** Any person using cleanup solvents for graphic arts operations shall comply with the following requirements:

30~~3~~4.1 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.

~~(Table Continued on Next Page)~~

VOC CONTENT OF SOLVENT CLEANING MATERIALS ~~Note: Where VOC limits are shown as both grams/liter and composite vapor pressure, either may be used as the content limit for the specific application shown.~~			
Material Type	**Actual VOC Content g~~m~~/l (lb/gal) ~~Including Water and Exempt Compounds~~**		**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			
~~1.~~ General (not specifically listed below)	100 (0.83)	AND	3
~~2.~~ Lithographic and Letter Press Printing, Blanket and Roller Washes, and Other On-Press Components	300 (2.5)	OR	10
~~3.~~ Lithographic and Letter Press Printing, Other Cleaning	300 (2.5)	OR	~~25~~10
~~4.~~ Screen Printing			
~~5.~~ Flexographic Printing	300 (2.5)	OR	10
~~6.~~ Specialty Flexographic Printing	100 (0.83)	AND	3
~~7.~~ Ultraviolet Inks (Except Screen Printing)	~~810 (6.8)~~670 (5.6)	AND	~~21~~10
	~~800 (6.7)~~670 (5.6)	AND	~~33~~10

~~304.2 Lithographic and Letter Press Printing, Other Cleaning: The total usage for this cleaning category shall not exceed 15 percent (by volume) of the total monthly usage of the Lithographic and Letter Press Printing, Blanket and Roller Washes category. The percentage of the solvents used for Lithographic and Letter Press Printing, Other Cleaning shall be calculated as follows:~~

$$\% Usage = \frac{G}{Y} * 100\%$$

Where: G = Total usage for Lithographic and Letter Press Printing, Other Cleaning materials (gal/month)

Y = Total material usage for Lithographic and Letter Press Printing, Blanket and Roller Washes (gal/month

303.2304.3 Closed containers shall be used for the disposal of all VOC-containing cloth, sponges, papers, or other materials used for solvent cleaning.

304.4 303.3 All VOC-materials shall be stored in closed containers when not in use.

303.4304.5 These cleanup solvent cleaning material limits shall supercede the requirements of Rule 240, Surface Preparation and Cleanup, for the cleaning of application equipment.

305304 PROHIBITION OF SALE: A person shall not supply, sell, solicit, or offer for sale, any noncompliant material as defined in Section 234 239 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.

306305 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 OPERATION AND MAINTENANCE PLAN: Any person using existing emission control equipment pursuant to Section 303, as a means of complying with this rule, as provided in Section 301 and 302, must submit, an Operation and Maintenance Plan for the emission control equipment to the Air Pollution Control Officer for approval. A person proposing to install new emission control equipment as a means of complying with this rule shall submit in addition to an Operation and Maintenance Plan, an application for an Authority to Construct, pursuant to Rule 501, General Permit Requirements. 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 also 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.

402401 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:

402401.1 The material type by name, product /code identification number, and /manufacturer;

402401.2 For materials subject to Section 302301.1: The maximum VOC regulatory content of the material (adhesive, ink and coating), as supplied. ,

~~The VOC content shall be displayed as~~expressed in grams ~~of VOC~~ per liter ~~of material (~~or pounds of ~~VOC~~ per gallon as determined pursuant to Section 502.1;~~), excluding water and exempt compounds;~~

~~402~~401.3 For materials subject to Section ~~302~~301.2: The maximum weight percentage of VOC ~~content~~ of the fountain solution~~, as supplied. The VOC content shall be displayed as grams per liter of material (or pounds of VOC per gallon), including water and exempt compounds~~ as determined pursuant to Section 264.3~~502.1~~;

~~402~~401.4 For materials subject to Section ~~304~~303.1: The maximum VOC content and the total VOC composite partial pressure of the material~~ as supplied.~~ The VOC content shall be ~~displayed~~ expressed as grams ~~of VOC~~ per liter ~~of material (~~or pounds ~~of VOC~~ per gallon~~, including water and exempt compounds~~ 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~~7~~; and

~~402~~401.5 For all materials subject to Sections 301~~2~~ and ~~304~~303.1: Recommendations regarding thinning, reducing, or mixing with any material.

~~**403 CALCULATION FOR DETERMINING VOC COMPOSITE PARTIAL PRESSURE:** VOC composite partial pressure shall be calculated by the following equation:~~

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

~~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.~~

~~**404 CALCULATION FOR DETERMINING VOC CONTENT OF MATERIAL EXCLUDING WATER AND EXEMPT COMPOUNDS:** For the VOC content as applied, the volume of material is defined as the volume of the original material plus any material (e.g., thinners, reducers, or catalysts) added to the original material. For the VOC content as supplied, the volume of material is defined as the volume of the original material. The weight of VOC per combined volume of VOC and material solids shall be calculated by the following equation:~~

$$\cancel{G_1 = \frac{W_v - W_w - W_{ec}}{V_m - V_w - V_{ec}}}$$

~~Where: G_1 = Weight of VOC per volume of material, less water and exempt compounds, in grams per liter~~

~~W_v = Weight of all volatile compounds, including any volatile materials added to the original material supplied by the manufacturer when calculating the VOC content as applied, in grams~~

~~W_w = Weight of water, in grams~~

~~W_{ec} = Weight of exempt compounds, in grams~~

~~V_m = Volume of material, in liters~~

~~V_w = Volume of water, in liters~~

~~V_{ec} = Volume of exempt compounds, in liters~~

~~**405 CALCULATION FOR DETERMINING VOC CONTENT OF MATERIAL INCLUDING WATER AND EXEMPT COMPOUNDS:** For the VOC content as applied, the volume of material is defined as the volume of the original material, plus any material added to the original material (e.g., thinners or reducers). For the VOC content as supplied, the volume of material is defined as the volume of the original material. The weight of VOC per total volume of material shall be calculated by the following equation:~~

$$\cancel{G_2 = \frac{W_v - W_w - W_{ec}}{V_m}}$$

~~Where: G_2 = 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, in grams~~

~~V_m = Volume of material, in liters~~

~~406~~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:

~~406~~402.1 VOC Mass Emission Rate:

$$M = (Q) * (C) * (60 \frac{\text{min}}{hr})$$ (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.

~~406~~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.

~~407~~403 CALCULATION FOR DETERMINING VOC EMISSIONS FOR STATIONARY SOURCES INCLUDING THOSE EXEMPT PURSUANT TO SECTION~~S~~ 104.1 ~~, 104.2 AND 104.7.~~

~~407~~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)
E_1 = VOC emissions from ink usage ((lbs-VOCs/month), as calculated in Section 403.2
E_2 = VOC emissions from material (except Inks) usage (lbs-VOCs/month), as calculated in Section 403.3

~~407~~403.2 VOC Emissions from Ink Usage:

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

Where:

E_1 = VOC emissions from ink usage (lbs-VOCs/month)
U_1 = ink usage as applied (gallons/month). This equals the ink usage in pounds per month divided by the density of the ink.
P_1 = 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)

~~407~~403.3 VOC Emissions from Material (except Inks) Usages:

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

Where:

E_2 = 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~~, 104.2, and 104.7~~, 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 ~~302~~ 301 and ~~304~~303.1 as applicable.

501.1.2 The ~~actual~~ VOC regulatory content of the materials (e.g., adhesive, coating, or ink) listed in Section ~~302~~301.1, expressed in grams per liter or pounds per gallon.~~as applied excluding water and exempt compounds.~~

501.1.3 The ~~actual~~ weight percentage of ~~VOC content of~~volatiles of the fountain solution listed in Section ~~302~~301.2~~ as applied, including water and exempt compounds in grams per liter or pounds per gallon. The VOC content as provided by the manufacturer may be acceptable if the fountain solution is used as supplied~~

501.1.4 The ~~actual~~ VOC actual content of the cleaning materials listed in Section ~~304~~303, ~~as applied including water and exempt compounds~~ expressed in grams per liter or pounds per gallon.

501.1.5 The VOC composite partial pressure for materials listed in Section ~~304~~303.1, if applicable. The composite partial pressure shall be calculated pursuant to Section~~s 403 and 502.7.~~ 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~~6~~, 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 ~~302~~ 301 and ~~304~~303.1. or the composite vapor pressure specified in Section ~~304.1~~303.1.

501.2 Product Information: The information listed under Sections ~~402~~401.1 through ~~402~~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 Monthly:~~

501.3.1~~.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 ~~302~~ 301 and ~~304~~303.1, and VOC emissions from each material type.

501.3.~~1.2~~2 For graphic arts operations exempt pursuant to Sections 104.1~~, 104.2~~, 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 ~~407~~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.~~1.3~~5 Records of total applied volume for each material exceeding the VOC limits specified in Sections ~~302~~ 301 and ~~304~~303.1 by name, product ~~/~~code identification number, ~~/~~manufacturer, and material type.

~~501.3.1.4 Records showing the percentage of Lithographic and Letter Press, Other Cleaning materials (i.e., metering rollers and plates) as calculated pursuant to Section 304.2.~~

501.4 Emission Control Equipment: Any person using emission control equipment pursuant to Section ~~303~~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 ~~401~~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 ~~404~~ 264.1 and Section 502.3, for VOC regulatory content~~if less water and exempt compounds~~, or with EPA Method 24 and Section ~~404~~264.2, for VOC actual content.~~if including water and exempt compounds~~.

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-^{o}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-tricholoethane in Paints and Coatings by Direct Injection into a Gas Chromatograph", or CARB Method 432, "Determination of Dichloromethane and 1,1,1-tricholoethane 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 Efficiency: Control efficiency of the control equipment shall be determined in accordance with applicable EPA Methods 18, 25, 25A, EPA Method 2 or 2C; and Section 406. (1) U.S. EPA Method 18, 25 or 25A, for VOC concentration, and (2) U.S. EPA Method 2 or 2C for flow rates, as applicable, and calculated in accordance with Section 406.~~

~~502.5~~502.4 Determination ~~Of~~ of Control Equipment Efficiency: Efficiency of the emission control equipment shall be based upon test measurements made in accordance with:

502.~~5~~4.1 USEPA Method 18, 25 or 25A, for VOC concentration, and

502.~~5~~4.2 USEPA Method 2 or 2C for flow rates, as applicable, and calculated in accordance with Section ~~406~~402.

502.~~6~~5 Determination of ~~Collection~~ Capture Efficiency: ~~Collection~~ 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.~~6~~5.1 Applicable U.S. EPA methods 204, 204A, 204B, 204C, 2~~4~~04D, 204E, and/or 204F; or

502.~~6~~5.2 Any other method approved by the U.S. EPA, the California Air Resources Board, and the Air Pollution Control Officer.

502.~~7~~6 Determination of VOC Composite Partial Pressure: VOC composite partial pressure shall be determined in accordance with Section ~~403~~ 262 and Section 502.~~8~~7.

502.~~8~~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 Isoteniescope", or may be obtained from the most current edition of a published source, including, but not limited to:

502.~~8~~7.1 *The Vapor Pressure of Pure Substances*, Boublik, Fried, and Hala; Elsevier Scientific Publishing Company, New York.

502.~~8~~7.2 *Perry's Chemical Engineer's Handbook*, McGraw-Hill Book Company.

502.~~8~~7.3 *CRC Handbook of Chemistry and Physics*, Chemical Rubber Publishing Company.

502.~~8~~7.4 *Lange's Handbook of Chemistry*, John Dean, editor, McGraw-Hill Book Company.

Not withstanding 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.~~9~~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.

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