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RULE 1130. GRAPHIC ARTS

(a) Purpose and Applicability

The purpose of this rule is to reduce Volatile Organic Compound (VOC) emissions from graphic arts operations. This rule applies to any person performing graphic arts operations or who supplies, sells, offers for sale, markets, manufactures, blends, repackages, stores at a worksite, distributes, applies or solicits the application of graphic arts materials for use in the District.

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) AEROSOL COATING PRODUCT is a pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable can for hand-held application, or for use in specialized equipment for ground marking and traffic marking applications.

(2) ALCOHOL is an organic compound that contains a hydroxyl (OH) group and is used in the fountain solution to reduce the surface tension and increase the viscosity of water to prevent piling (ink build-up). For purposes of this rule, alcohol includes, but is not limited to, isopropyl alcohol (isopropanol), n-propanol and ethanol.

(3) ALCOHOL SUBSTITUTE is an additive that contains VOCs but no alcohol and is used in the fountain solution to reduce the surface tension and increase the viscosity of water to prevent piling (ink build-up).

(4) COATING is a material which is applied to a surface in order to beautify, protect or provide a barrier to such surface in a relatively unbroken film.

(5) CAPTURE EFFICIENCY, in percent, is the ratio of the weight of the VOC in the effluent stream entering the control device to the weight of VOC emitted from graphic arts operations, both measured simultaneously, and can be calculated by the following equation:

$$\text{Capture Efficiency} = [W_c/W_e] \times 100$$

Where: W_c = weight of VOC entering control device

W_e = weight of VOC emitted

(6) CONTROL DEVICE EFFICIENCY, in percent, is the ratio of the weight of the VOC removed by the control device from the effluent stream entering the control device to the weight of the VOC in the effluent stream entering the control device, both measured simultaneously, and can be calculated by the following equation:

Control Device Efficiency = $[(W_c - W_a)/W_c] \times 100$

Where: W_c = Weight of VOC entering control device

W_a = Weight of VOC discharged from the control device

(7) END-USER is a person who performs graphic arts operations.

(8) ENERGY CURABLE COATINGS, INKS AND ADHESIVES are single-component reactive products that cure upon exposure to visible-light, ultra-violet light or to an electron beam. The VOC content of thin film Energy Curable Coatings, Inks And Adhesives may be determined by manufacturers using ASTM Test Method 7767-11 "Standard Test Method to Measure Volatiles from Radiation Curable Acrylate Monomers, Oligomers, and Blends and Thin Coatings Made from Them."

(9) EXEMPT COMPOUNDS (See Rule 102-Definition of Terms).

(10) FACILITY is any permit unit or grouping of permit units or other air-contaminant-emitting activities which are located on one or more contiguous properties within the District, in actual physical contact or separated solely by a public roadway or other public right-of-way, and are owned or operated by the same person (or by persons under common control). Such above-described groupings, if non-contiguous, but connected only by land carrying a pipeline, shall not be considered one facility.

(11) FLEXOGRAPHIC PRINTING is a printing method utilizing a flexible rubber or other elastomeric plate in which the image area is raised relative to the non-image area.

(12) FLUORESCENT INK is a printing ink that emits electromagnetic radiation as a result of the absorption of energy from radiation.

(13) FOUNTAIN SOLUTION is the solution used in offset lithographic printing which is applied to the image plate to maintain the hydrophilic properties of the non-image areas. It is primarily water and contains at least one of the following materials: etchants such as mineral salts; hydrophilic gums; or VOC additives to reduce the surface tension of the solution.

(14) GRAMS OF VOC PER LITER OF COATING (OR INK OR ADHESIVE), LESS WATER AND LESS EXEMPT COMPOUNDS, is the weight of VOC per combined volume of VOC and coating (or ink or adhesive) solids and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating (or Ink or Adhesive), Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where: W_s = weight of volatile compounds in grams

W_w = weight of water in grams

W_{es} = weight of exempt compounds in grams

V_m = volume of material in liters

V_w = volume of water in liters

V_{es} = volume of exempt compounds in liters

For coatings that contain reactive diluents, the grams of VOC per Liter of Coating (or ink or adhesive), Less Water and Less Exempt Compounds, shall be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating (or Ink or Adhesive), Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where: W_s = weight of volatile compounds evolved during curing and analysis in grams

W_w = weight of water evolved during curing and analysis in grams

W_{es} = weight of exempt compounds evolved during curing and analysis in grams

V_m = volume of material prior to reaction in liters

V_w = volume of water evolved during curing and analysis in liters

V_{es} = volume of exempt compounds evolved during curing and analysis in liters

(15) GRAMS OF VOC PER LITER OF MATERIAL is the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{W_s - W_w - W_{es}}{V_m}$$

Where: W_s = weight of volatile compounds in grams

W_w = weight of water in grams

W_{es} = weight of exempt compounds in grams

V_m = volume of material in liters

(16) GRAPHIC ARTS OPERATIONS are gravure, letterpress, flexographic, and offset lithographic printing processes or related coating or laminating processes.

(17) GRAPHIC ARTS MATERIALS are any inks, coatings, or adhesives, including added thinners or retarders, used in printing or related coating or laminating processes.

(18) GRAVURE PRINTING is an intaglio printing process in which the ink is carried in minute etched or engraved wells on a roll or cylinder, excess ink being removed from the surface by a doctor blade.

(19) HEATSET INK is an offset lithographic printing ink used on continuous web-fed printing presses that are equipped with hot air high velocity dryers. The ink dries or sets by heat induced evaporation of the ink oils and subsequent chilling of the ink by chill rolls.

(20) LAMINATION is a process of composing two or more layers of material to form a single, multiple-layer sheet by using an adhesive.

(21) LETTERPRESS PRINTING is a printing process in which the image area is raised relative to the non-image area and the ink is transferred to the substrate directly from the image surface.

(22) MATTE FINISH INK is a flexographic printing ink which is used on non-porous substrates in flexographic printing operations and contains at least five (5) percent by weight silicon dioxide flattening agent.

(23) METALLIC INK is a flexographic printing ink which is used on non-porous substrates in flexographic printing operations and contains at least 28 percent by weight elemental metal particles.

(24) NON-HEATSET INK is an offset lithographic printing ink that sets and dries by absorption into the substrate, and hardens by ambient air oxidation that may be accelerated by the use of infrared light sources. For the purposes of this definition energy curable inks are examples of non-heatset inks.

(25) NON-POROUS SUBSTRATE is a substrate whose surface prevents penetration by water, including but not limited to foil, polyethylene, polypropylene, cellophane, paper or paperboard coated with a non-porous material, metalized polyester, nylon, and mylar.

(26) OFFSET LITHOGRAPHIC PRINTING is a planographic printing process in which the image and non-image areas are on the same plane of a thin lithographic plate and are chemically differentiated. The ink film is transferred from the lithographic plate to an intermediary surface, a rubber covered cylinder called a blanket, which, in turn, transfers the ink to the substrate. This printing process differs from other printing processes where the image is typically printed from a raised or recessed surface.

(27) OVERALL CONTROL EFFICIENCY (C.E.), in percent, is the ratio of the weight of the VOC removed by the emission control system from the effluent stream entering the control device to the total VOC emitted from graphic arts operations, both measured simultaneously, and can be calculated by the following equations:

$$C.E. = [(W_c - W_a)/W_e] \times 100$$

$$C.E. = [(\text{Capture Efficiency}) \times (\text{Control Device Efficiency})/100]$$

Where: W_c = Weight of VOC entering control device

W_a = Weight of VOC discharged from the control device

W_e = Weight of VOC emitted

(28) PACKAGING GRAVURE is gravure printing on paper, paperboard, foil, film or other substrates used to produce containers or packages.

(29) POROUS SUBSTRATE is a substrate whose surface does not prevent the penetration by water, including but not limited to paper, paperboard, and any paper product that is coated with a porous material.

(30) POTENTIAL TO EMIT is the maximum capacity of a stationary source to emit a regulated air pollutant based on its physical or operational design. Any physical or operational limitation on the capacity of the stationary

source to emit a pollutant, including air pollution control equipment and restrictions on hours of operations or on the type of material combusted, stored, or processed, shall be treated as part of the design only if the limitation is federally enforceable.

(31) PRINTING in the graphic arts is any operation that imparts color, design, alphabet, or numerals on a substrate.

(32) PRINTING INK is a pigmented fluid or viscous material used in printing.

(33) PROOF PRESS is a press used only to check the quality of print, color reproduction, and editorial content.

(34) PUBLICATION GRAVURE is gravure printing on paper subsequently formed into books, magazines, catalogues, brochures, directories, newspaper supplements or other types of printed materials not classified as packaging gravure.

(35) REACTIVE DILUENT is a liquid which is a VOC during application and one in which, through chemical reaction or physical actions, such as adsorption or retention in the substrate, 20 percent or more of the VOC becomes an integral part of a finished product.

(36) REFRIGERATED CHILLER is a device that continuously maintains and supplies fountain solution to a holding tray at a temperature of 55 degrees Fahrenheit or less measured at the supply tank, thereby reducing evaporative emissions of VOCs in fountain solutions.

(37) SOLVENT CLEANING is as defined in Rule 1171 – Solvent Cleaning Operations.

(38) STERILIZATION INDICATING INKS are inks that change color to indicate that sterilization has occurred. Such inks are used to monitor the sterilization of medical instruments, autoclave efficiency, and the thermal processing of foods for prevention of spoilage.

(39) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102 – Definition of Terms.

(40) WEB-FED is an automatic system which supplies substrate from a continuous roll, or from an extrusion process.

(c) Requirements

(1) VOC Content of Graphic Arts Materials

No person shall supply, sell, offer for sale, market, manufacture, blend, package, repackage, distribute, apply or solicit the application of any

graphic arts material, including any VOC-containing materials added to the original graphic arts materials, for use in the District, which contains VOC in excess of the VOC content limits set-forth in the Table of Standards I below:

TABLE OF STANDARDS I

VOC CONTENT LIMITS Grams of VOC Per Liter of Coating, Ink, and Adhesive, Less Water And Less Exempt Compounds	
GRAPHIC ART MATERIAL	Current Limit (g/L)
Adhesive	150
Coating	300
Flexographic Fluorescent Ink	300
Flexographic Ink: Non-Porous Substrate	300
Flexographic Ink: Porous Substrate	225
Gravure Ink	300
Letterpress Ink	300
Offset Lithographic Ink	300

(2) VOC Content of Fountain Solution

(A) No person shall apply any fountain solution, including any VOC-containing materials added to the original fountain solution for use in a graphic arts operation within the District unless the VOC content in the fountain solution, as applied, complies with the applicable VOC limits set-forth in the Table of Standards II below.

TABLE OF STANDARDS II

VOC CONTENT LIMITS Grams of VOC Per Liter of Material		
FOUNTAIN SOLUTION	1/1/2000 g/L	7/1/2014 g/L
Heatset Web-Fed		
Using Alcohol without Refrigerated Chiller	80	16
Using Alcohol with Refrigerated Chiller	100	30
Using Alcohol Substitute	80	50
Sheet-Fed		
Using Alcohol without Refrigerated Chiller	80	50
Using Alcohol with Refrigerated Chiller	100	85
Using Alcohol Substitute	80	50
Non-Heatset Web-Fed		
Using Alcohol Substitute without Refrigerated Chiller	80	50
Using Alcohol Substitute with Refrigerated Chiller		

(B) The use of alcohol containing fountain solutions is prohibited for use in non-heatset web-fed operations.

(3) Solvent Cleaning Operations; Storage and Disposal of VOC-containing Materials

Solvent cleaning operations and the storage and disposal of VOC-containing materials used in cleaning operations are subject to the provisions of Rule 1171 - Solvent Cleaning Operations.

(4) Prohibition of Storage

Effective July 1, 2014, a person shall not store any graphic arts material at a worksite for use in the District which contains VOC in the excess of the VOC-content limits specified in paragraph (c)(1).

(5) Approved Emission Control System

A person may comply with the provisions of paragraph (c)(1) or (c)(2) by using an emission control system to reduce VOC emissions provided such system is first approved in writing by the Executive Officer and meets the following requirements:

(A) The control device reduces VOC emissions from an emissions collection system by at least 95 percent, by weight, or the output of the air pollution control device is no more than 50 PPM by volume calculated as carbon with no dilution; and

(B) The owner/operator demonstrates that the emission collection system collects at least 90 percent, by weight, of the VOC emissions generated by the sources of emissions.

(6) Alternative Emission Control Plan

A person may comply with the provisions of paragraphs (c)(1) or (c)(2) by means of an approved Alternative Emission Control Plan pursuant to Rule 108 - Alternative Emission Control Plans.

(d) Prohibition of Specification and Sale

(1) No person shall solicit from, or require any other person to use in the District any graphic arts material which, when applied as supplied or thinned or reduced according to the manufacturer's recommendation for application, does not meet the applicable VOC limits in paragraph (c)(1) or subparagraph (i)(4)(C) for the specific application.

(2) No person shall supply, offer for sale, sell, market, blend, package, repackage, manufacture or distribute, to an end-user any graphic arts material for use in the District which, when applied as supplied or thinned or reduced according to the manufacturer's recommendation for application, does not meet the applicable VOC limits in paragraph (c)(1) or subparagraph (i)(4)(C) for the specific application.

(3) The prohibition of sales and use as specified in paragraphs (d)(1) and (d)(2) shall not apply to any manufacturer of graphic arts materials, provided that the manufacturer has complied with the labeling requirements of Rule 443.1 – Labeling of Materials Containing Organic Solvents, and the product is not sold directly to a user located in the District, or the product was sold to an independent distributor or a sales outlet located in the District that is not a subsidiary of, or under the control of the manufacturer, and was informed in writing by the manufacturer about the compliance status of the product with Rule 1130.

(e) Recordkeeping and Reporting Requirements

Records shall be maintained pursuant to Rule 109. For emissions reporting purposes, the following substrate retention factors shall be applied to the lithographic oil content of the inks: 20 percent retention for heatset inks and 95 percent retention for non-heatset inks.

(f) Rule 442 Applicability

Any graphic arts operations exempted from all or a portion of the VOC limits of this rule shall comply with the provisions of Rule 442 – Usage of Solvents.

(g) Emission Reduction Credits

Facilities that use matte finish and metallic inks shall not receive emission reduction credit(s) pursuant to SCAQMD Rule 1309 above those emission reduction credit(s) that the facility would have received if it was operated with coatings having a VOC content of no more than 300 grams per liter, less water and less exempt compounds irrespective of the VOC limits specified in paragraph (i)(4)(C).

(h) Test Methods

(1) VOC Content of Graphic Arts Materials

The VOC content of graphic arts materials except publication rotogravure inks shall be determined by:

(A) United States Environmental Protection Agency (U.S. EPA) Reference Test Method 24, (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings, Code of Federal Regulations, Title 40, Part 60, Appendix A). The exempt compounds' content shall be determined by South Coast Air Quality Management's (SCAQMD) Laboratory Test Method 302 (Distillation of Solvents from Paints, Coatings and Inks) and 303 (Determination of Exempt Compounds) contained in SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual; or

(B) SCAQMD Test Method 304 [Determination of Volatile Organic Compounds (VOCs) in Various Materials] contained in SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual.

(2) VOC Content and Density of Publication Rotogravure Ink:

The VOC content and density of publication rotogravure inks shall be determined by:

(A) U.S. EPA Reference Test Method 24A, (Determination of Volatile Matter Content and Density of Publication Rotogravure Inks and Related Publication Rotogravure Coatings, Code of Federal Regulations Title 40, Part 60, Appendix A). The exempt compounds' content shall be determined by SCAQMD's Laboratory Test Method 303 (Determination of Exempt Compounds) contained in SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual; or

(B) SCAQMD Test Method 304 [Determination of Volatile Organic Compounds (VOCs) in Various Materials] contained in SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual.

(3) Exempt Perfluorocarbon Compounds

The following classes of compounds:

Cyclic, branched, or linear, completely fluorinated alkanes;

Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

Cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

Sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine,

will be analyzed as exempt compounds for compliance with subdivision (c) and subparagraph (i)(4)(C), only when manufacturers specify which individual compounds are used in the ink and coating formulations. In addition, the manufacturers must identify U.S. EPA, CARB, and SCAQMD approved test methods, which can be used to quantify the amount of each exempt compound.

(4) Determination of Efficiency of Emission Control Systems

(A) The capture efficiency of an emission control system as specified in paragraph (b)(5) shall be determined by the procedures presented in U.S. EPA technical guideline document, "Guidelines for Determining Capture Efficiency, January 9, 1995". Notwithstanding the test methods specified by the Guidelines, any

other method approved by the U.S. EPA, CARB and the SCAQMD Executive Officer may be substituted.

(B) The efficiency of the control device of the emission control system as specified in paragraph (b)(6) and the VOC content in the control device exhaust gases, measured and calculated as carbon, shall be determined by U.S. EPA Test Methods 25, 25A, SCAQMD Method 25.1 (Determination of Total Gaseous Non-Methane Organic Emissions as Carbon) or SCAQMD Method 25.3 (Determination of Low Concentration Non-Methane Non-Ethane Organic Compound Emissions from Clean Fueled Combustion Sources) as applicable. U.S. EPA Test Method 18, or CARB Method 422 shall be used to determine emissions of exempt compounds.

(5) Equivalent Test Methods

Other test methods determined to be equivalent by the Executive Officer, CARB, and the U.S. EPA, and approved in writing by the District Executive Officer may also be used.

(6) Multiple Test Methods

When more than one test method or set of test methods are specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of the rule.

(7) Test Methods Dates

All test methods referenced in this subdivision shall be the most recently approved version by the appropriate governmental entities.

(i) Exemptions

(1) The provisions of this rule shall not apply to:

(A) Fountain solutions used on proof presses.

(B) Coating operations subject to other rules of Regulation XI.

(C) Solar-control window film.

(D) Heat-applied transfer decals.

(E) Graphic arts on ceramic materials.

(F) Circuitry printing.

(G) Blanket repair material used in containers of four ounces or less.

(H) Sterilization indicating inks.

(I) Aerosol coating products.

(J) Graphic arts materials that have a VOC content of no more than 10 g/L or its equivalent, less water and less exempt compounds, as applied.

(2) The prohibition specified in paragraphs (d)(1) or (d)(2) shall not apply to persons offering graphic arts materials for sale to, selling graphic arts materials to, distributing graphic arts materials to, or requiring the use of graphic arts materials from, persons who are operating an approved emission control system under paragraph (c)(5), or complying under paragraph (c)(6), or operating pursuant to paragraphs (i)(1), (i)(4), (i)(5) or (i)(6).

(3) The prohibition specified in subdivision (d) shall not apply to graphic arts materials which will be used solely outside of the District.

(4) The provisions of paragraph (c)(1) shall not apply to metallic and matte finish inks provided that:

(A) The usage of matte finish or metallic inks each as supplied shall not exceed two (2) gallons on any one day and 125 gallons per calendar year at a facility; and

(B) The potential to emit and the actual VOC emissions from a facility which applies matte finish or metallic inks does not exceed ten (10) tons per calendar year from all VOC emission sources; and

(C) The VOC content of matte finish and metallic inks do not exceed 535 and 460 grams per liter (less water and less exempt compounds) respectively, including any VOC containing materials added to the original ink, as applied; and

(D) The owner or operator of the facility certifies in writing to the Executive Officer that they shall not emit VOCs in excess of ten (10) tons per calendar year. Such a certification shall be considered an agreement by the facility to limit the facility's potential to emit.

(5) Facilities operating under the provisions of paragraph (i)(4) whose actual emissions exceed ten (10) tons in any calendar year shall:

(A) henceforth be subject to the requirements of paragraph (c)(1).

(B) In addition to the requirements of subdivision (e), facilities shall retain records of purchase orders and invoices of VOC-containing materials for a minimum of five (5) years.

(6) The provision of paragraph (c)(4) shall not apply to a worksite that stores graphic arts materials provided such graphic arts materials are vented exclusively to printing systems equipped with an approved emission control system pursuant to the requirements of paragraph (c)(5).

(7) The provisions of paragraph (c)(1) shall not apply to postal cancellation inks provided the VOC emissions from these inks, at a facility, do not exceed 60 pounds per calendar month.

(8) The provisions of paragraph (c)(2) shall not apply to sheet-fed offset presses that have a sheet size no larger than 11 inches by 17 inches, or any offset press if the total solution reservoir capacity is one gallon or less, provided the VOC content of the fountain solution used contains no more than 80 grams per liter of material, as applied, or if using a refrigerated chiller, no more than 100 grams per liter of material, as applied.