

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

RULE 4607 -- GRAPHIC ARTS

(Adopted April 11, 1991; Amended September 19, 1991; Amended December 17, 1992; Amended March 31, 1993; Amended May 19, 1994; Amended September 17, 1997; Amended December 20, 2001)

1.0 Purpose

The purpose of this rule is to limit VOC emissions from graphic arts printing operations, and paper or fabric coating operations, and from the organic solvent cleaning and the storage and disposal of solvents and waste solvent materials associated with such operations. The rule also specifies the administrative requirements for recording and measuring the emissions, and a compliance schedule.

2.0 Applicability

This rule is applicable to any graphic arts printing operation, to any paper or fabric coating operation, to the organic solvent cleaning, and to the storage and disposal of solvents and waste solvent materials associated with such operations as defined in Section 3.0 of this rule.

3.0 Definitions

- 3.1 Aerosol Adhesive: an adhesive that is dispensed from a hand-held self-pressurized container by means of propellant induced force.
- 3.2 Aerosol Product: a hand-held, non-refillable container that expels a pressurized solvent-containing product by means of a propellant-induced force.
- 3.3 Application Equipment: a device, including, but not limited to, a spray gun, brush, roller, and a printing press, used to apply adhesives, coatings, or inks.
- 3.4 Application Process: any process where surface coatings are applied and/or cured to paper or fabric on a coating line. Such coating line shall include coating applicators, heating or drying ovens, any dryers, and other equipment where VOC emissions occur.
- 3.5 Blanket: a synthetic rubber mat used in offset-lithography to transfer or "offset" an image from a planographic printing plate to paper or other substrate.
- 3.6 Blanket Repair Material: the material used in offset printing to correct low spots in the press blanket.
- 3.7 Blanket Wash: a solvent used to remove ink from the blanket of a press.

- 3.8 Coating: the application of a uniform layer of material across the entire width of a substrate. Those machines which have both coating and printing units should be considered as performing a printing operation.
- 3.9 Composite Vapor Pressure: the sum of the partial pressure of each pure volatile organic compound in a blended solvent. VOC composite partial pressure is calculated as follows:

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

Where:

- W_i = Weight of the “i”th VOC compound, in grams
 W_w = Weight of water, in grams
 W_e = Weight of the “e”th exempt compound, in grams
 MW_e = Molecular weight of the “e”th exempt VOC compound, in grams per gram-mole
 MW_i = Molecular weight of the “i”th VOC compound, in grams per gram-mole
 MW_w = Molecular weight of water, in grams per gram-mole
 PP_c = VOC composite vapor pressure at 20°C, in mm Hg
 VP_i = Vapor pressure of the “i”th VOC compound at 20°C, in mm Hg

- 3.10 Control Device: equipment such as an incinerator or adsorber, or cooler/condenser filtration used to prevent air pollutants from being emitted into the atmosphere.
- 3.11 Converting Operation: coating, waxing, laminating, extrusion coating, or printing, to fabricate base materials which are then used to produce wraps, bags, and other pre-formed packages.
- 3.12 Cured Adhesive, Cured Coating, or Cured Ink: an adhesive, coating, or ink that is dry to the touch.
- 3.13 Degreaser: a tank, tray, drum or other container in which objects to be cleaned are exposed to a solvent or solvent vapor in order to remove contaminants. The objects to be cleaned include, but are not limited to, parts, products, tools, machinery, and equipment. An enclosed spray application equipment cleaning system is not a degreaser.
- 3.14 Die Coater (or Slit Coater): a type of application equipment that coats an object by flowing coatings through a slit directly onto the object moving past the slit.

- 3.15 Dip Coater: a type of application equipment that coats an object by submerging the object in a vat of coating, and subsequently withdrawing the object and draining off the excess coating.
- 3.16 Dissolver: an organic solvent that is added to an adhesive, coating, or ink in order to melt or to liquefy solid particles.
- 3.17 Doctor Blade: a steel blade used to scrape excess ink from a printing plate or inking cylinder.
- 3.18 Dryer: a hot air, high velocity system used to dry inks on printed or coated substrate.
- 3.19 Electrostatic Application: a method of applying coating whereby atomized paint droplets are charged and subsequently deposited on the substrate by electrostatic attraction.
- 3.20 Exempt Organic Compounds: all organic compounds not classified as VOCs, as listed in Rule 1020 (Definitions).
- 3.21 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:
- 3.21.1 more than two years of outdoor exposure; or
 - 3.21.2 exposure to industrial-grade chemicals, solvents, acids, or detergents, oil products, cosmetics, temperatures exceeding 170°F, vacuum-forming, embossing or molding.
- 3.22 Fabric Coating: any decorative or protective coating or reinforcing material applied or impregnated into textile fabric, vinyl coated textile fabric, or vinyl sheets.
- 3.23 Fine Arts Painting: any unique visual representation, consisting of paint, ink, or other media, hand applied to a substrate of canvas, wood, paper, metal, or other material.
- 3.24 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.
- 3.25 Flexographic Printing: the application of words, designs, or pictures to a substrate by means of a roll printing technique in which the pattern is applied to an image carrier made of rubber or other elastomeric materials. As compared to gravure (intaglio) printing, the image to be printed via flexography is raised above the carrier surface, while in the gravure process the image to be printed is sunk below the surface.

- 3.26 Flow Coater: a type of application equipment that coats an object by flowing a stream of coating over the object and draining off any excess coating.
- 3.27 Foam Coater: a type of application equipment that coats an object by flowing foam through holes or a slit directly onto the object moving underneath it.
- 3.28 Fountain Solution: solution composed mainly of water, gum arabic, and other additives, which is applied to the lithographic plate to maintain the hydrophilic properties of the non-image areas.
- 3.29 Fugitive Emissions: emissions of VOC from any portion of the printing, coating, or laminating operation other than from the dryer.
- 3.30 Grams of VOC Per Liter of Ink, Coating, Adhesive, or Wash Primer Less Water and Less Exempt Compounds: the weight of VOC per combined volume of VOC and coating solids, and can be calculated by the following equation:

$$\begin{array}{l} \text{Grams of VOC per Liter of Ink,} \\ \text{Coating, Adhesive, or Wash Primer} \\ \text{Less Water and Less Exempt Compounds} \end{array} = \frac{W_s - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

Where:

- W_s = weight of 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
- V_{ec} = volume of exempt compounds, in liters
- V_w = volume of water, in liters

- 3.31 Grams of VOC Per Liter of Material: the weight of VOC per volume of material and can be calculated by the following equation:

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

Where:

- W_s = weight of volatile compounds, in grams
- W_w = weight of water, in grams
- W_{ec} = weight of exempt compounds, in grams
- V_m = volume of materials, in liters

- 3.32 Graphic Arts Coating: the application of a uniform layer of material across the entire width of a substrate. Those machines which have both coating and printing units should be considered as performing a printing operation.

- 3.33 Graphic Arts Printing Operations: those operations employing gravure, flexography, letterpress, lithography, screen, or any coating or laminating process to produce published products and packages. Organic solvent cleaning operations performed in order to produce published products and packages are considered to be part of Graphic Arts Printing Operations.
- 3.34 Gravure Printing: an intaglio printing operation in which the ink is transferred from minute etched wells on a cylinder to the substrate which is supported by an impression roller with excess ink removed from the cylinder by a doctor blade.
- 3.35 Hand Application Method: a method of applying a coating to a substrate using manually held, non-mechanically operated equipment. Such equipment includes paint brushes, hand rollers, caulking guns, trowels, spatulas, syringe daubers, rags, and sponges.
- 3.36 Heating Oven: a device into which paper or fabric is put to dry or cure the applied coating by applying heat.
- 3.37 Heatset Ink: a quick-drying ink in which the solvents are vaporized by passing the printed surface through a heater or oven.
- 3.38 High-Volume, Low-Pressure (HVLP) Spray Equipment: equipment used to apply materials by means of a spray gun which is designed and intended to be operated, and which is operated, between 0.1 and 10.0 psig of air atomizing pressure.
- 3.39 Intaglio Printing: printing done from a plate or cylinder in which the image is sunk below (etched or engraved into) the surface.
- 3.40 Letterpress Printing: a method where the image area is raised relative to the non-image area and the ink is transferred to the paper directly from the image.
- 3.41 Line: the minimum equipment which is required for the application and/or drying of inks and/or curing of ultraviolet coatings of inks, or coatings on a substrate, including the ink and/or coating applicators and drying systems, and associated ink and coating agitation and delivery systems.
- 3.42 Liquid Leak: a visible solvent leak from a container at a rate of more than three drops per minute, or a visible liquid mist.
- 3.43 Lithographic Printing: a plane-o-graphic method in which the image and non-image areas are on the same plane.
- 3.44 Maintenance Cleaning: a solvent cleaning operation or activity carried out to keep tools, machinery, equipment (excluding ink, coating, or adhesive application equipment) or general work areas in clean and good operational condition.
- 3.45 Manufacturing Process: the process of making goods or articles by hand or by machine.

- 3.46 Non-Absorbent Container: a container made of non-porous material that does not allow the migration of solvents through it.
- 3.47 Non-Atomized Solvent Flow: solvents in the form of a liquid stream without the introduction of any propellant.
- 3.48 Non-heatset Ink: an ink which dries by oxidation and absorption into the substrate without use of heat from dryers or ovens.
- 3.49 Non-Leaking Container: a container without liquid leak.
- 3.50 Non-porous Substrate: any substrate whose surface prevents penetration by water, including but not limited to foil, polyethylene, polypropylene, cellophane, metallized polyester, nylon, and polyethylene terephthalate (mylar), paper or paperboard coated with non-porous surface. 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.
- 3.51 Offset Lithographic Printing: a plane-o-graphic method in which the image and non-image areas are on the same plane and the ink is offset from a plate to a rubber blanket, and then from the blanket to the substrate.
- 3.52 On-Press Component: a part, component, or accessory of a press that is cleaned while still being physically attached to the press.
- 3.53 Organic Solvent: the same as "Solvent."
- 3.54 Organic Solvent Cleaning: as defined in Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal).
- 3.55 Packaging Gravure: gravure printing on paper, paperboard, foil, film, or other substrates which are to be used to produce containers or packages.
- 3.56 Pantone Ink: a printing ink created for color matching by combination of process inks.
- 3.57 Paper Coating: any coating applied on or impregnated into paper, including, but not limited to, adhesive tapes and labels, book covers, post cards, office copier paper, drafting paper, and pressure sensitive tapes.
- 3.58 Plastisizer: a material used to keep plastic material soft and viscous.
- 3.59 Plastisol: a coating that is a liquid dispersion of small particles of resins and plastisizers that are fused to become a plastic.

- 3.60 Porous Substrate: a substrate whose surface does not prevent penetration by water, including but not limited to, paper, paperboard, and any paper product which is coated with a porous material.
- 3.61 Process Ink: in printing, the hues: yellow, magenta, and cyan, plus black in the four-color print process.
- 3.62 Proof Press: a press used only for printing a sample copy of a graphic art product to check the quality of print, color reproduction and editorial content.
- 3.63 Propellant: any gas, including air, in a pressure container for expelling the contents when the pressure is released.
- 3.64 Publication Gravure: gravure printing on paper which is subsequently formed into books, magazines, catalogs, brochures, directories, newspaper supplements or other types of printed material.
- 3.65 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.
- 3.66 Repair Cleaning: a solvent cleaning operation or activity carried out during a repair process.
- 3.67 Repair Process: the process of returning a damaged object or an object not operating properly to good condition.
- 3.68 Resist: inks that are screen printed to: form the required patterns, alphabets, numerals, designs, or symbols on the surface of the substrate; protect the screen printed or covered surface from the subsequent application of etching or plating solution; and are later removed from the substrate by a resist stripper. Resist applications include, but are not limited to, etched electronic circuits, display screens, chemical milling of parts, nameplates and signage.
- 3.69 Roll Coater: a type of application equipment in which a series of mechanical rollers form a thin coating film on the surface of a roller, which is subsequently applied to a substrate by moving the substrate underneath the roller.
- 3.70 Roller Wash: a solvent used to remove ink from the rollers of a press.
- 3.71 Screen Printing: a commercial and industrial printing technique which involves the passage of a printing medium, such as ink, through a taut web or fabric to which refined form of stencil has been applied. The stencil openings determine the form and dimension of the imprint.
- 3.72 Screen Printing Metallic Ink: an ink used in screen printing that contains greater than 50 grams of elemental metal per liter (0.4 lb/gal) of ink as applied.

- 3.73 Solvent: as defined in Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal).
- 3.74 Sign Ink/Coating: an 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.
- 3.75 Solvent Flushing: the use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of equipment by flushing solvent, by a non-atomized solvent flow, through the equipment.
- 3.76 Specialty Flexographic Printing: a flexographic printing on polyethylene or polypropylene food packaging, fertilizer bags, or liquid-tight food containers.
- 3.77 Specialty Gravure Printing: printing that uses the gravure process for production of wall and floor covering, decorated household paper products such as towels and tissues, cigarette filter tips, vinyl upholstery, woodgrains, and a wide variety of other products.
- 3.78 Specialty Ink: an ink that is applied only on non-porous substrates in flexographic printing operations, and is either:
- 3.78.1 a metallic ink that contains at least 28 percent elemental metallic powder, by weight; or
 - 3.78.2 a matte finish ink containing at least 5 percent silicon dioxide flattening agent, by weight.
- 3.79 Stationary Source: as defined in Rule 2201 (New and Modified Stationary Source Review Rule).
- 3.80 Stereolithography: a type of printing process that employs a system using a light to solidify photocurable resins in a desired configuration in order to produce a 3-dimensional object.
- 3.81 Stripping: the use of solvent to remove material such as cured adhesives, cured inks, cured or dried paint, cured or dried paint residue or temporary protective coating.
- 3.82 Substrate Retention Factor: a fraction, expressed in percent, of VOCs in lithographic inks which is retained in the substrate when the inks dry by adsorption or absorption.

- 3.83 Surface Preparation: the removal of contaminants from a surface prior to the application of coatings, inks, or adhesives or before proceeding to the next step of a manufacturing process.
- 3.84 Thinner: a solvent that is added to an adhesive, coating, or ink to make it more fluid.
- 3.85 Ultraviolet (UV) Ink: an ink which dries by polymerization reaction by ultraviolet or electron beam radiation.
- 3.86 Viscosity Reducer: an organic solvent which is added to an adhesive, coating or ink to make it more fluid.
- 3.87 Volatile Organic Compounds (VOCs): as defined in Rule 1020 (Definitions).
- 3.88 Wash Primer: a material used to clean and/or to activate surfaces of paper or fabric and may contain no more than 5 percent, by weight, solid materials.
- 3.89 Waste Solvent Material: any solvent which may contain dirt, oil, metal particles, sludge, and/or waste products, or wiping material containing VOCs including, but not limited to, paper, cloth, sponge, rag, or cotton swab used in organic solvent cleaning.
- 3.90 Web: a continuous sheet of substrate.
- 3.91 Web Feed: an automatic system which supplies substrates from a web.
- 3.92 Web Splicing Adhesive: an adhesive used to join two continuous rolls of substrate materials.
- 3.93 Wipe Cleaning: a solvent cleaning activity performed by hand rubbing an absorbent material such as a rag, paper, sponge, brush, or cotton swab containing solvent.

4.0 Exemptions

- 4.1 The requirements of this rule, except for Section 6.1, shall not apply to any graphic arts printing operation which emits less than 400 pounds of VOC per calendar month. Once a graphic arts printing operation exceeds this exemption threshold it shall become subject to the requirements of this rule. This exemption shall not apply to paper or fabric coating operations as defined in Section 3.0.
- 4.2 The requirements of this rule shall not apply to:
 - 4.2.1 Proof presses;
 - 4.2.2 Blanket repair materials used in containers of four (4) fluid ounces or less;

- 4.2.3 Aerosol adhesives;
 - 4.2.4 The application of coatings and use of cleaning solvents in creating fine arts paintings;
 - 4.2.5 Stripping of cured coatings, cured adhesives, and cured inks, except the stripping of such materials from spray application equipment; and
 - 4.2.6 Cleaning operations in printing pre-press or graphic arts pre-press areas, including the cleaning of film processors, color scanners, plate processors, film cleaning, and plate cleaning.
- 4.3 The provisions of Section 5.4 shall not apply to the application of coatings via aerosol containers.

5.0 Requirements

5.1 Graphic Arts Printing Operation

Any person operating a graphic arts printing operation not subject to Section 5.2, 5.3, or 5.4 shall not use graphic arts materials in excess of the VOC content limits, as applied, in Table 1.

Table 1
VOC Content Limits for Ink, Coating, Adhesive and Fountain Solution

Material	Grams of VOC per liter (lb/gal), less water and less exempt compounds		
	Effective 9/19/91		Effective 9/17/99
Ink	300 (2.5)		300 (2.5)
Coating	300 (2.5)		300 (2.5)
Adhesive	300 (2.5)		150 (1.25)
Web Splicing Adhesive	--		300 (2.5)
Percent VOC by Volume			
Fountain Solution	Effective 9/19/91	Effective 9/17/98	Effective 9/17/2000
	15	10	8

5.2 Flexographic Specialty Ink

Effective September 17, 1998, any person operating a flexographic printing operation shall not use a specialty ink in excess of the VOC content limits, as applied, in Table 2, and shall not use more than 2 gallons of specialty inks in a calendar day and 120 gallons of specialty inks in a calendar year.

Table 2
VOC Content Limits for Flexographic Specialty Ink

Material	Grams of VOC per liter (lb/gal), less water and less exempt compounds
Metallic Ink	485 (4.1)
Matte Finish Ink	535 (4.5)

5.3 Screen Printing Operation

A person operating a screen printing operation shall not use graphic arts materials in excess of the VOC content limits, as applied, in Table 3.

Table 3
VOC Content Limits for Screen Printing Ink, Coating, and Adhesive

Material	Grams of VOC per liter (lb/gal), less water and less exempt compounds	
	Effective 9/17/98	Effective 9/17/99
Ink	400 (3.3)	400 (3.3)
Coating	400 (3.3)	400 (3.3)
Adhesive	300 (2.5)	150 (1.25)
Extreme Performance Ink/ Coating	800 (6.7)	400 (3.3)
Metallic Ink	600 (5.0)	400 (3.3)
Sign Ink/Coating	500 (4.2)	400 (3.3)
Resists	600 (5.0)	600 (5.0)

5.4 Paper or Fabric Coating Operation

A person operating a paper or fabric coating operation shall not use any coating or wash primer in excess of the VOC content limits, as applied, in Table 4.

Table 4
VOC Content Limits of Paper or Fabric Coating and Wash Primer

Material	VOC Content Limit, Effective 11/19/95
Coating	265 gm/liter (2.2 lb/gal) of coating, less water and exempt compounds
Wash Primer	265 gm/liter (2.2 lb/gal) of material

5.5 Approved Emission Control System

In lieu of compliance with Sections 5.1, 5.2, 5.3, or 5.4 operators may use an emission control system. An emission control system is a system for reducing emissions of VOC consisting of collection and control devices, which is approved in writing by the APCO, and includes the following:

- 5.5.1 During continuous operation not to exceed 24 hours, the emission control system shall have a combined collection and control efficiency of at least 75 percent for publication gravure, 67 percent for other types of graphic arts printing operations, and 86 percent for paper or fabric coating operations, by weight;
- 5.5.2 The collection system shall vent all drying oven exhaust to the control device and shall have one or more inlets for collection of fugitive emissions; and
- 5.5.3 The control system shall reduce VOC emission, at all times, to a level that is not greater than the emission which would have been achieved through the use of compliant materials in Section 5.1, 5.2, 5.3, or 5.4.

The minimum required control efficiency of an emission control system at which an equivalent or greater level of VOC reduction will be achieved shall be calculated by the following equation:

$$CE = \left[1 - \left(\frac{VOC_{LWc}}{VOC_{LWn,Max}} \times \frac{1 - (VOC_{LWn,Max} / D_{n,Max})}{1 - (VOC_{LWc} / D_c)} \right) \right] \times 100$$

Where:

- CE = Control Efficiency, percent
- VOC_{LWc} = VOC Limit, less water and less exempt compounds
- VOC_{LWn,Max} = Maximum VOC content of noncompliant ink (or coating or adhesive) used in conjunction with a control device, less water and less exempt compounds
- D_{n,Max} = Density of solvent, reducer, or thinner contained in the noncompliant ink (or coating or adhesive), containing the maximum VOC content of the multi-component ink (or coating, or adhesive) printing line
- D_c = Density of corresponding solvent, reducer, or thinner used in the compliant ink (or coating, or adhesive) system = 880 gm/liter.

- 5.6 No person shall apply coatings unless coatings are applied with equipment operated according to manufacturer's specifications, and only by the use of flow coater, roll coater, dip coater, foam coater, die coater, hand application methods, or high volume low pressure (HVLV) spray for air dried coatings.
 - 5.6.1 For HVLV spray guns manufactured prior to January 1, 1996, the end user shall demonstrate that the gun meets HVLV spray equipment standards. Satisfactory proof will be either in the form of manufacturer's published technical material or by a demonstration using a certified air

pressure tip gauge, measuring the air atomizing pressure dynamically at the center of the air cap and at the air horns.

5.6.2 A person shall not sell or offer for sale for use within the District any HVLP spray gun without a permanent marking denoting the maximum inlet air pressure in psig at which the gun will operate within the parameters specified in section 3.0.

5.6.3 Sections 5.6.1 and 5.6.2 shall be effective on and after November 15, 2002.

5.7 Evaporative Loss Minimization:

5.7.1 Graphic Arts Printing Operation

Effective September 17, 1998, a person shall not use any solvent to perform surface preparation or cleanup which exceeds the VOC content and composite vapor pressure limits in Table 5.

Table 5
Solvents Limits for Graphic Arts Printing Operation

	VOC Content Limit gm/liter (lb/gal) of material,	Composite Vapor Pressure Limit in mm Hg @ 68°F (20°C)
Surface Preparation	450 (3.8)	33
Repair and Maintenance	900 (7.5)	25
Coatings and Adhesives Application Equipment	900 (7.5)	25
Ink Application Equipment:		
Lithographic and Letterpress	900 (7.5)	25
Flexographic and Gravure	450 (3.8)	33
Specialty Flexographic Printing	810 (6.8)	21
Screen Printing	1070 (8.9)	5
Ultraviolet inks, except screen printing	900 (7.5)	25
Other, not listed	200 (1.7)	33

5.7.2 Paper or Fabric Coating Operation

Any surface preparation or cleaning of equipment involved in paper or fabric coating operations using VOC containing materials shall be performed according to the following requirements:

- 5.7.2.1 The cleaning material contains no more than 200 grams of VOC per liter of material; or
- 5.7.2.2 The cleaning material has a composite vapor pressure of 45 mm of Hg or less at 68°F (20°C).
- 5.7.3 A person shall not perform cleaning operations unless one of the following devices or methods is used:
 - 5.7.3.1 A cleaning equipment system that totally encloses the component parts being cleaned during the washing, rinsing, and draining process. The solvent container shall remain closed at all times, except when depositing and removing objects to be cleaned. If a solvent flow method is used, the solvent shall not be atomized. If a solvent flushing method is used, the solvent shall be flushed through the system by pumping. The requirement for the solvent container to remain closed at all times shall not apply when performing repair and maintenance to the cleaning equipment; or
 - 5.7.3.2 A remote reservoir cold cleaner which meets the requirements of Rule 4662 (Organic Solvent Degreasing Operations); or
 - 5.7.3.3 Wipe cleaning; or
 - 5.7.3.4 Spray bottles or containers with a maximum capacity of 32 fluid ounces from which solvents are applied without propellant-induced force.
- 5.7.4 A person shall not use open containers for the storage or disposal of cloth or paper impregnated with VOCs that is used for surface preparation or cleanup.
- 5.7.5 A person shall not store spent or fresh VOC-containing materials to be used for surface preparation or cleanup in open containers.
- 5.7.6 Containers and mixing tanks for VOC containing materials shall be free from liquid leaks and shall be covered except when adding or removing materials, cleaning, or when the container is empty.
- 5.7.7 Section 5.7 shall remain in effect until November 14, 2002.
- 5.8 Organic Solvent Cleaning, Storage and Disposal Requirements
 - 5.8.1 Section 5.8 shall be effective on and after November 15, 2002, unless otherwise indicated.

- 5.8.2 From November 15, 2002, through November 14, 2003, an owner or operator shall not use organic solvents for cleaning operations that exceed the VOC content limits and composite partial pressure limits specified as being “Effective November 15, 2002 through November 14, 2003” in Table 6.
- 5.8.3 On and after November 15, 2003, an owner or operator shall not use organic solvents for cleaning operations that exceed the VOC content limits specified as being “Effective November 15, 2003” in Table 6. On and after November 15, 2003, the composite partial pressure of solvents used for cleaning operations will not be regulated.

Table 6
VOC Limits for Organic Solvents Used in Cleaning Operations

Type of Solvent Cleaning Operation	Effective November 15, 2002 through November 14, 2003		Effective November 15, 2003
	VOC Content Limit Grams of VOC/liter of material (lb/gal)	VOC Composite Partial Pressure Limit, mm Hg at 20°C (68°F)	VOC Content Limit Grams of VOC/liter of material (lb/gal)
A. Product Cleaning During Manufacturing Process or Surface Preparation for Ink Application 1. General	70 (0.58)	no limit	50 (0.42)
B. Repair and Maintenance Cleaning 1. General	50 (0.42)	no limit	50 (0.42)
C. Cleaning of Coating or Adhesive Application Equipment 1. General 2. Graphic Arts Coating or Adhesive Operations	950 (7.9) 900 (7.5)	35 25	550 (4.6) 550 (4.6)
D. Cleaning of Ink Application Equipment 1. General 2. Flexographic Printing 3. Gravure Printing 3.1 Publication 3.2 Packaging 4. Lithographic or Letterpress Printing 4.1 Roller Wash-Step 1 4.2 Roller Wash-Step 2, Blanket Wash, and On-Press Components 4.3 Removable Press Components 5. Screen Printing 6. Ultraviolet Inks (except screen printing) 7. Specialty Flexographic Printing	100 (0.83) 100 (0.83) 450 (3.8) 100 (0.83) 900 (7.5) 900 (7.5) 900 (7.5) 1070 (8.9) 800 (6.7) 810 (6.8)	3 3 25 3 10 10 10 5 33 21	50 (0.42) 50 (0.42) 450 (3.8) 50 (0.42) 600 (5.0) 800 (6.7) 50 (0.42) 750 (6.3) 800 (6.7) 600 (5.0)

- 5.8.4 The provisions of Table 6 shall not apply to the following applications:
 - 5.8.4.1 Cleaning in laboratory tests and analyses, or bench scale or research and development projects.
 - 5.8.4.2 Until June 30, 2005, the cleaning of photocurable resins from stereolithography equipment and models.
 - 5.8.4.3 Until June 30, 2005, the cleaning of ultraviolet lamps used for the curing of ultraviolet ink.
- 5.8.5 The provisions of Sections 5.8.6 through 5.8.8 of this rule shall only apply to an owner or operator that uses any solvent containing more than 50 grams of VOC per liter of material for organic solvent cleaning.
- 5.8.6 Cleaning activities that use solvents shall be performed by one or more of the following methods:
 - 5.8.6.1 Wipe cleaning; or
 - 5.8.6.2 Application of solvent from hand-held spray bottles from which solvents are dispensed without a propellant-induced force; or
 - 5.8.6.3 Non-atomized solvent flow method in which the cleaning solvent is collected in a container or a collection system which is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container; or
 - 5.8.6.4 Solvent flushing method in which the cleaning solvent is discharged into a container that is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container. The discharged solvent from the equipment must be collected into containers without atomizing into the open air. The solvent may be flushed through the system by air or hydraulic pressure, or by pumping.
- 5.8.7 Solvent shall not be atomized into the open air unless it is vented to a VOC emission control system that complies with Section 5.5. This provision shall not apply to printing operations where the roller or blanket wash is applied automatically and the cleaning of nozzle tips of automated spray equipment systems, except for robotic systems, and cleaning with spray bottles or containers described in Section 5.8.6.2.
- 5.8.8 An owner or operator shall not use VOC-containing materials to clean spray equipment used for the application of coatings, adhesives, or ink, unless an enclosed system or equipment that is proven to be equally

effective at controlling emissions is used for cleaning. If an enclosed system is used, it must totally enclose spray guns, cups, nozzles, bowls, and other parts during washing, rinsing and draining procedures, and it must be used according to the manufacturer's recommendations and must be closed when not in use.

- 5.8.9 An owner or operator shall store or dispose of fresh or spent solvents, waste solvent cleaning materials such as cloth, paper, etc., coatings, adhesives, catalysts, thinners, and ink in closed, non-absorbent and non-leaking containers. The containers shall remain closed at all times except when depositing or removing the contents of the containers or when the container is empty.

6.0 Administrative Requirements

6.1 Recordkeeping

Any person subject to the provisions of this rule including stationary sources exempt pursuant to Section 4.1, shall comply with the following requirements:

- 6.1.1 Maintain a current file of coatings, inks, adhesives, fountain solutions, wash primers, and solvents in use and in storage. The file shall include a material data sheet or product data sheet showing the material name, manufacturer's name, VOC content as applied, specific mixing instruction, density, and if required, composite vapor pressure
- 6.1.2 If only compliant materials in Sections 5.1, 5.3, 5.4, 5.7, or 5.8 are used to comply with the rule:
 - 6.1.2.1 Record, on a monthly basis, the type and amount of all inks used according to one of the following methods:
 - 6.1.2.1.1 Group the quantity of all inks used and identify the maximum VOC content and use the minimum density of 1010 gm/liter (8.44 lb/gal); or
 - 6.1.2.1.2 Report process inks and pantone inks separately and use specific VOC content and density value for each process ink, and the highest VOC content and the minimum density of 1010 gm/liter (8.44 lb/gal) for pantone inks; or
 - 6.1.2.1.3 Report process inks and pantone inks separately and use the maximum VOC content and minimum density value for both process and pantone inks, or use the density of 1010 gm/liter (8.44 lb/gal) for pantone inks; or

- 6.1.2.1.4 Itemize each ink and pantone ink and use the specific VOC content and density value for each.
 - 6.1.2.2 Record, on a monthly basis, the type and amount of each coating, adhesive, fountain solution, wash primer, and solvent used.
 - 6.1.3 If noncompliant materials are used, and compliance with the rule is achieved through Section 5.5, the operator shall:
 - 6.1.3.1 Record, on a daily basis, the type and amount of all inks, coatings, adhesives, fountain solutions, wash primers, and solvents used.
 - 6.1.3.2 Maintain daily records of key system operating and maintenance parameters which will demonstrate continuous operation and compliance of the emission control device during periods of emission producing activities. Key system operating parameters are those necessary to ensure compliance with VOC content of coating requirements such as temperature, pressures, and flowrates.
 - 6.1.4 If flexographic specialty inks are used pursuant to Section 5.2, record, on a daily basis, the type and amount of each specialty ink used.
 - 6.1.5 All records shall be retained for a period of two (2) years and shall be made available for inspection by the APCO upon request.
 - 6.1.6 Effective on and after November 15, 2002, all records shall be retained for a period of five (5) years and shall be made available for inspection by the APCO upon request.
- 6.2 Compliance Statement Requirement: Effective September 17, 1998, the manufacturer of inks, coatings, adhesives, fountain solutions, wash primers, and solvents which are sold for use in graphic arts printing operations, and paper or fabric coating operations within the District shall include a designation in the material data sheet or product data sheet to include the material name, manufacturer's name, specific mixing instruction, VOC content, density, and if required, composite vapor pressure.
- 6.3 Determination of VOC Emissions from Inks Used in a Lithographic Printing Operation: For the purposes of determining compliance with emissions limits which are a condition of a permit to operate, and determining eligibility for exemption under Section 4.1 of this rule, the amount of VOC emitted from heatset and non-heatset inks used shall be discounted by the following substrate retention factors: 20 percent for heatset inks and 95 percent for non-heatset inks. These substrate retention factors shall not be used when determining compliance of inks with applicable VOC content limits specified in this rule, and heatset and non-heatset lithographic inks shall meet the VOC content limits specified in Section 5.1, Table 1.

6.4 Test Methods

- 6.4.1 Except for UV inks, the VOC content of printing inks, adhesives, fountain solutions, solvents and coatings shall be determined by using USEPA Method 24 or 24A as applicable.
- 6.4.2 The VOC content of UV inks shall be determined by using the latest revision of ASTM D5403 (Test Methods for Volatile Content of Radiation Curable Materials).
- 6.4.3 The content of silicon dioxide as a flattening agent in a matte finish ink shall be determined by using the latest revision of ASTM D717 (Standard Test Methods for Analysis of Magnesium Silicate Pigment).
- 6.4.4 The emission control system efficiency of any air pollution control equipment shall be determined using USEPA Methods 2, 2A, or 2D for measuring flow rates and USEPA Methods 25 or 25A for measuring total gaseous organic concentrations at the inlet and outlet of the control device. The calculation of control system efficiency shall be determined only during periods of continuous printing or coating operations and shall be averaged over the duration of the printing or coating operations not to exceed 24 hours.
- 6.4.5 CARB Test Method 432 shall apply for quantification of halogenated compounds exempted by this rule.
- 6.4.6 The metal content of metallic inks shall be determined by South Coast Air Quality Management District Test Method 318, (Determination of Weight Percent Elemental Metal In Coatings by X-Ray Diffraction).
- 6.4.7 Capture efficiency of the emission collection system shall be determined according to USEPA's technical document "Guidelines for Determining Capture Efficiency," January 9, 1995. An equivalent alternate test method for determination of capture efficiency may be used provided it has been approved in writing by the APCO, CARB, and the USEPA.
- 6.4.8 The composite vapor pressure of a blended solvent shall be determined by quantifying the amount of each VOC in the blend using gas chromatographic analysis (the latest revision of ASTM D2306) and by calculating the composite vapor pressure of the solvent by summing the product of the vapor pressure of each pure VOC component and its molar fraction. For the purpose of this calculation, the blended solvent shall be assumed to be an ideal solution where Raoult's Law applies. The vapor pressure of each pure VOC component shall be obtained from published reference manuals or handbooks.

7.0 Compliance Schedule

- 7.1 Except as specified in this rule, all provisions of this rule remain in effect on and after September 17, 1997.
- 7.2 An operator who loses an exempt status in Section 4.0 shall be in full compliance with this rule within 12 months after the date of losing the exemption.

This page intentionally blank.