OFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK
TITLE 6. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAPTER III. AIR RESOURCES
SUBCHAPTER A. PREVENTION AND CONTROL OF AIR CONTAMINATION AND AIR POLLUTION
PART 234: GRAPHIC ARTS

(Statutory authority: Environmental Conservation Law, §§ 1-0101, 3-0301, 19-0103, 19-0105, 19-0301, 19-0305; Federal Clean Air Act §§ 172[c][1], 182[b][2][A], [1][B])

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§234.1 General applicability and exemptions

(a) The owner or operator of a graphic arts facility is subject to all requirements of this Part, as specified, if the facility is located in a severe ozone non-attainment area or emits total actual annual volatile organic compound (VOC) graphic arts emissions of three tons or more on a 12-month rolling basis.

(b) The owner or operator of a graphic arts facility is subject only to sections: 234.5 Prohibition of sale or specification; 234.6 Handling storage and disposal of VOC; 234.7 Recordkeeping; and 234.8 Opacity if the facility is located outside a severe ozone non-attainment area and emits total actual annual VOC graphic arts emissions less than three tons on a 12-month rolling basis.

(c) A printing process that is subject to the provisions of this Part will remain subject to these provisions even if the emission of VOC from the facility or printing press later falls below the applicability criteria.

(d) This Part does not apply to:

(1) digital printing presses;

(2) screen printing processes that only use conductive ink to produce electronic circuits that permit electric current flow through the printed line or pattern;

(3) screen printing processes that only use sterilization indicating ink to monitor the sterilization of medical instruments, autoclave efficiency, and the thermal processing of foods for the prevention of spoilage;

(4) proof presses; or

(5) the use of specialty ink, coating or adhesive where the facility's total actual annual usage of all specialty ink, coating and adhesive is no more than 55 gallons, on a 12-month rolling basis, provided that each specialty ink, coating and adhesive excluded from the requirements are recorded in accordance with section 234.7 of this Part.

§234.2 Definitions

(a) For the purpose of this Part, the general definitions of Part 200 of this Title apply.

(b) For the purpose of this Part, the following definitions also apply:

(1) *Alcohol*. Ethanol, n-propanol, and isopropanol.

(2) *Alcohol substitute*. A non-alcohol additive that contains VOC and is used in a fountain solution to reduce the surface tension of water or to prevent piling (ink build-up).

(3) *As applied*. The VOC concentration of ink, coating, or adhesive at the time it is applied to a substrate; or the alcohol (or alcohol substitute) concentration of a fountain solution at the time it is applied to lithographic press plates.

(4) *Capture system*. All equipment including, but not limited to, hoods, ducts, fans, booths, ovens, or dryers that contain, collect, and transport an air pollutant to control equipment.

(5) *Cleaning materials*. A liquid solvent or solution used to remove ink and debris from the operating surfaces of the printing press and its parts. For purposes of this rule, cleaning solutions include, but are not limited to blanket wash, roller wash, metering roller cleaner, plate cleaner, impression cylinder washes, rubber rejuvenators, and other cleaners used for cleaning a press, press parts, or to remove dried ink or coating from areas around the press.

(6) *Cold-set printing process or non-heatset printing process*. A printing process that uses absorption, oxidation, ultraviolet light, electron bean or other non-heat method to cure the printing ink.

(7) *Composite partial vapor pressure*. The sum of the partial pressure of the compounds defined as VOCs. VOC composite partial vapor pressure is calculated as follows:

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

Where:

Wi = Weight of the "i"th VOC compound, in grams

Ww = Weight of water, in grams

Wc = Weight of exempt compound, in grams

Mwi = Molecular weight of the "i"th VOC compound, in g/g-mole

MWw = Molecular weight of water, in g/g-mole

MWc = Molecular weight of exempt compound, in g/g-mole

PPc = VOC composite partial vapor pressure at 20°C (68°F), in mm Hg

Vpi = Vapor pressure of the "i"th VOC compound at 20°C (68°F), in mm Hg

(8) *Control equipment*. The equipment used to destroy or remove VOC emissions from graphic art printing processes.

(9) *Digital printing press*. A printing press that transfers electronic files from a computer to an electronically driven output device that prints the image directly on a substrate. Also known as direct-to-media printing.

(10) *Excluded compound*. A compound expressly excluded from the definition of VOC in section 200.1 of this Title.

(11) *Flexographic printing process*. A printing process that raises the image to be applied above the non-image area and uses an image carrier made of rubber or other elastomeric materials.

(12) *Fountain solution*. A solution of water, VOC, gum arabic, and surfactants used for wetting lithographic press plates.

(13) *Graphic arts*. Packaging rotogravure, publication rotogravure, flexographic, offset lithographic, letterpress and screen printing processes.

(14) *Heat-set printing process*. A printing process that uses heat to evaporate ink oils from the printing ink. Hot air dryers are used to deliver the heat.

(15) *Letterpress printing process*. A printing process in which the image is raised relative to the non-image and a paste ink is transferred from the image surface directly to the substrate.

(16) *Maximum permitted pounds of VOC per gallon of ink, coating or adhesive, minus water and excluded compounds, at application*. The permissible quantity of VOC per gallon of ink, coating or adhesive minus water and excluded compounds; calculated as follows:

(VOC)a = (Dc)a ((Wv)a - (Ww)a - (We)a) / 1 - ((Vw)a + (Ve)a)

where:

(VOC)a = VOC content of ink, coating or adhesive as applied, expressed as a mass of VOC, in pounds, per volume of coating, in gallons, minus water and excluded compounds

(Dc)a = ink, coating or adhesive density as applied, in pounds per gallon

(Wv)a = the weight fraction of total VOC in the ink, coating or adhesive as applied

(Ww)a = the weight fraction of water in the ink, coating or adhesive as applied

(Vw)a = the volume fraction of water in the ink, coating or adhesive as applied

(We)a = the weight fraction of excluded compounds in the ink, coating or adhesive as applied

(Ve)a = the volume fraction of excluded compounds in the ink, coating or adhesive as applied.

(17) *Offset lithographic printing process*. A planographic printing process that chemically differentiates the image and non-image areas and uses a lithographic plate to transfer the image to an intermediate surface which in turn transfers the image to the substrate.

(18) *Overall removal efficiency*. The total reduction in VOC emissions considering the efficiency of both the capture system and subsequent destruction or removal of these emissions by the control equipment prior to their release into the atmosphere.

(19) *Packaging rotogravure printing process.* A rotogravure printing process upon substrates that are subsequently formed into wallpaper, packaging products, or labels for articles to be sold.

(20) *Printing press*. The equipment used to apply words, pictures, or designs to either a web, or a sheet. A web is a continuous substrate of paper, plastic, or other material that is unwound from a roll, passed through ink or coating applicators and any associated drying areas. The press includes all ink and coating applicators and drying areas between unwind and rewind of the continuous substrate. A sheet consists of paper, plastic, or other material that is fed through the press sequentially and carried through the process on a moving belt. The press includes all ink and coating applicators and drying operations from the time that the sheet is put on the moving belt until it is taken off.

(21) *Printing process*. Any of the various ways a printing press is operated.

(22) *Proof press*. A printing press used only to check the quality of print color and editorial content.

(23) *Publication rotogravure printing process*. A rotogravure printing process used to produce books, magazines, catalogs, brochures, directories, newspaper supplements and similar types of printed material.

(24) *Rotogravure printing process*. An intaglio printing process that transfers the inked image from minute etched or engraved wells on a plate or cylinder to the substrate that is supported by an impression roller.

(25) *Screen printing process*. A printing process that delivers ink through a woven mesh fitted with an ink blocking stencil. The stencil and mesh openings determine the form and dimensions of the imprint. Screen printing processes where the ink is applied by a hand held squeegee are excluded from this definition.

(26) *Serigraph.* Fine art created or reproduced using a screen printing press.

(27) *Solvent*. A substance that is liquid at standard conditions and is used to dissolve or dilute another substance; this term includes, but is not limited to, organic materials used as dissolvers, viscosity reducers, degreasing agents, or cleaning agents. An excluded compound is not a solvent.

§234.3 Control requirements

(a) (1) A packaging rotogravure, publication rotogravure, or flexographic printing process that uses ink, coating or adhesive containing VOC shall not operate if it: is located in a severe ozone non-attainment area; has an annual potential to emit VOC of 25 tons per year or more; or is located in a facility that has an annual potential to emit VOC of 50 tons per year or more, unless the printing process uses one of the following strategies to control VOCs.

(i) ink, coating or adhesive with low VOC content equal to or less than:

(*a*) 0.8 kilogram of VOC per kilogram of solids as applied (0.8 kg VOC/ kg solids as applied); or

(*b*) 0.16 kilogram of VOC per kilogram of ink, coating and adhesive as applied (0.16 kg VOC/ kg material as applied);

VOC content limits can be met by averaging the VOC content of materials used on a single press (*i.e.*, within a line).

(ii) a capture system and control equipment that provides for overall removal efficiency of at least:

(*a*) 75 percent for a publication rotogravure printing process, unless a higher overall removal efficiency is required by clause *e* of this subparagraph;

(*b*) 65 percent for a printing process that was first installed prior to March 14,1995, and that is controlled by an add-on capture system and air cleaning equipment that was first installed prior to the effective date of this regulation;

(*c*) 70 percent for a printing process that was first installed prior to March 14,1995, and that is controlled by an add-on air capture system and air cleaning equipment that was first installed on or after the effective date of this regulation;

(*d*) 75 percent overall removal efficiency for a printing process that was first installed on or after March 14,1995, and that is controlled by an add-on capture system and air cleaning equipment that was first installed prior to the effective date of this regulation; or

(*e*) 80 percent for a printing process that was first installed on or after March 14, 1995, and that is controlled by an add-on capture system and air cleaning equipment that was first installed on or after the effective date of this regulation.

(2) Radiation cured material via ultra-violet light or electron beam printing processes are not subject to the control requirements of this subdivision.

(b) (1) A heat-set web offset lithographic printing process or heat-set letterpress printing process that uses ink, coating or adhesive containing VOC shall not operate if it: is located in a severe ozone non-attainment area; has an annual potential to emit VOC of 25 tons per year or more; or is located at a facility that has an annual potential to emit VOC of 50 tons per year or more, unless the control equipment provides for an:

(i) overall removal efficiency of 90 percent or greater for control equipment that was first installed prior to the effective date of this regulation;

(ii) overall removal efficiency of 95 percent or greater for control equipment that was first installed on or after the effective date of this regulation; or

(iii) outlet concentration of VOC from the emission control equipment equal to or less than 20 parts per million by volume (20 ppmv) as hexane on a dry basis.

(2) The following printing processes are not subject to the control requirements of this subdivision:

(i) heat-set web offset lithographic printing processes used for printing books;

(ii) heat-set web offset lithographic printing processes with a maximum web width of 22 inches;

(iii) cold-set offset lithographic printing processes;

(iv) cold-set letterpress printing processes;

(v) sheet-fed or coldset web varnishes; and

(vi) radiation cured material via ultra-violet light or electron beam.

(c) (1) An offset lithographic or letterpress printing process that uses cleaning materials containing VOC shall not operate if it is located in a severe ozone non-attainment area or at a facility with total actual annual VOC graphic arts emissions of three tons or more on a 12-month rolling basis, unless:

(i) the cleaning material, as applied, contains less than 70 percent by weight VOC (70 percent by weight VOC); or

(ii) the cleaning material, as applied, has a composite vapor pressure of less than or equal to 10 millimeters mercury at 20 degrees Celsius (10 mm Hg at 20°C).

(2) One hundred and ten gallons of cleaning material per year on a 12-month rolling basis are excluded from the requirements of this subdivision provided that the use and quantity of the cleaning material excluded from the requirements are recorded in accordance with section 234.7 of this Part.

(d) (1) An offset lithographic printing process that uses fountain solutions containing VOC shall not operate if it is located in a severe ozone non-attainment area or is located at a facility with total actual annual VOC graphic arts emissions of three tons or more on a 12-month rolling basis, unless:

(i) For heat-set web offset lithographic printing processes:

(*a*) the fountain solution as applied contains no more than 1.6 percent alcohol by weight or equivalent;

(*b*) the fountain solution as applied contains no more than three percent alcohol by weight when the fountain solution is refrigerated to less than 60°F or 15.5°C); or

(*c*) the fountain solution as applied contains no more than a five0 percent alcohol substitute by weight and no alcohol.

(ii) For sheet-fed offset lithographic printing processes:

(*a*) the fountain solution as applied contains no more than five percent alcohol by weight or equivalent;

(*b*) the fountain solution as applied contains no more than 8.5 percent alcohol by weight when the fountain solution is refrigerated to less than 60°F or 15.5°C; or

(*c*) the fountain solution as applied contains no more than five percent alcohol substitute by weight and no alcohol.

(iii) For cold-set web offset lithographic printing presses the fountain solution as applied contains no more than five percent alcohol substitute by weight and no alcohol.

(2) Sheet-fed offset lithographic presses with a sheet size of 11 inches by 17 inches or smaller or any press with a fountain solution reservoir of less than one gallon are not subject to the requirements of this subdivision.

(e) (1) A screen printing process that uses ink, coating or adhesive containing VOC shall not operate if it is located in a severe ozone non-attainment area, or is located in a facility that has an annual potential to emit VOC of 50 tons per year or more, unless the printing process uses one of the following strategies to control VOC.

(i) the maximum permitted pounds of VOC per gallon of ink, coating or adhesive, minus water and excluded compounds, at application is:

(*a*) 3.3 pounds as applied to paper, glass, metal, plastic, vinyl, reflective sheeting, textile/imprinted garments or pressure sensitive decals; or

(*b*) 5.0 pounds as applied for serigraph;

(ii) A capture system and control equipment that provides a minimum overall removal efficiency of 80.0 percent.

(2) Screen printing ink, coating or adhesive which is applied by a hand-held squeegee (a squeegee that is not propelled through the use of mechanical conveyance and is not an integral part of the screen printing process) are not subject to the control requirements of this subdivision.

(f) The department may allow printing processes to operate with a lesser degree of control than is required by this section provided that a process specific reasonably available control technology (RACT) demonstration has been made to the satisfaction of the department. Such process specific RACT demonstrations will be submitted by the department to the United States Environmental Protection Agency as a revision to the State Implementation Plan and must address the technical and economic feasibility of using:

(1) low VOC content ink, coating or adhesive;

(2) demonstrated and proven emission control technologies that will achieve the required overall removal efficiency as required by this section;

(3) demonstrated and proven emission control technologies that will achieve a degree of overall removal efficiency less than required by this section; and

(4) demonstrated and proven production modifications methods that will result in real, documented, and enforceable reductions in the VOC emissions from the printing process.

(g) Facilities with printing processes subject to this Part with an annual potential to emit less than five tons of VOC are only required to comply with paragraphs (f)(1) and (4) of this section in order to demonstrate that a lesser degree of control is RACT for these processes.

(h) For printing processes subject to this Part, the department may allow sources that use control equipment with natural gas fired afterburners to shut down the natural gas fired afterburners from November 1st through March 31st for the purposes of natural gas conservation, provided that the commissioner has determined that this action will not jeopardize air quality.

§234.4 Testing and monitoring

(a) Printing processes that use control equipment to comply with the provisions of this Part must test and monitor the control equipment to ensure the overall removal efficiency. Test methods included in this section must be used to demonstrate the overall removal efficiency.

(1) For control equipment that uses VOC/solvent recovery, overall removal efficiency must be demonstrated using methods described in paragraphs (b)(1) and (2) of this section.

(2) For control equipment other than VOC/solvent recovery, the chosen demonstration method must include provisions to determine the overall removal efficiency.

(b) The owner or operator of a printing process subject to this Part must follow notification requirements and test procedures in Subpart 202-1 of this Title.

(1) One of the following test methods from appendix A of 40 CFR 60 (see Table l, section 200.9 of this Title) must be used to measure the VOC concentration of a gas stream at the inlet and outlet of the control equipment:

(i) method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography;

(ii) method 25, Determination of Total Gaseous Non-methane Organic Emissions as Carbon; or

(iii) method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer.

(iv) methods not listed above must be approved in advance by the Department and the United States Environmental Protection Agency.

(2) Acceptable analytical methods for determining the VOC content, water content, density, volume of solids and weight of solids of surface coatings and printing inks are presented in appendix A, methods 24 and 24A (as appropriate), of 40 CFR 60 (see Table l, section 200.9 of this Title). Alternate analytical methods for surface coating and printing ink analysis must be approved by the department and the United States Environmental Protection Agency. Instead of analytical methods, the department may accept the manufacturer's certification of VOC content of ink coating or adhesives, if supported by actual batch records.

(c) Continuous control equipment monitors for the following parameters must be installed, periodically calibrated, and operated at all times that the associated control equipment is operated:

(1) combustion zone temperature of all oxidizers;

(2) inlet temperature at the catalytic oxidizer bed;

(3) break-through of VOC on a carbon adsorption unit; and

(4) any other continuous monitoring or recording device required by the department.

§234.5 Prohibition of sale or specification

(a) A person shall not sell, specify, or require the application of a coating, ink or adhesive on a substrate if such activity is prohibited by any of the provisions of this Part. The prohibition of this section shall apply to all written or oral contracts under the terms of which a coating, ink or adhesive is to be applied to a substrate. This prohibition shall not apply to the following:

(1) ink, coating, or adhesive used in printing processes where control equipment has been installed to demonstrate compliance with this Part; or

(2) ink, coating, or adhesive used in printing processes that have been granted variances for reasons of technological and economic feasibility per section 234.3(f) of this Part.

(b) A person selling an ink, coating, or adhesive used in a printing process subject to this Part must, upon request, provide the buyer with certification of the VOC content of the coating, ink or adhesive supplied.

§234.6 Handling, storage and disposal of volatile organic compounds (VOC)

An owner or operator of a facility subject to this Part shall not:

(a) use open containers to store or dispose of cloth or paper impregnated with VOC or solvents that are used for surface preparation, cleanup or the removal of ink, coating or adhesive;

(b) use open containers to store or dispose of spent or fresh VOC or solvents used for surface preparation, cleanup or the removal of ink, coating or adhesive;

(c) use open containers to store, dispose or dispense ink, coating or adhesive unless production, sampling, maintenance or inspection procedures require operational access. This provision does not apply to the actual device or equipment designed for the purposes of applying an ink, coating or adhesive to a substrate.

§234.7 Recordkeeping

(a) Purchase, use, and production records of ink, coating, adhesive, VOCs, solvent, fountain solution and cleaning material must be maintained in a format acceptable to the department, and upon request, submitted to the department. Any other information required to determine compliance with this Part must be provided to the department in an acceptable format. Records must be maintained at the facility for five years.

(b) The results of an analysis or other procedure used to establish compliance with this Part must be provided to the department. Department representatives shall be permitted, during reasonable business hours, to obtain ink, coating, adhesive, cleaning material and fountain solution samples to determine compliance with this Part.

(c) The owner or operator of a graphic art facility which is not subject to the control requirements of this Part because its annual potential to emit VOC or its total actual VOC emissions, whichever applies is below the applicability criteria, must maintain records in a format acceptable to the department that verify the facility's annual

potential to emit VOC or its total actual VOC emissions. Upon request, these records must be submitted to the department.

§234.8 Opacity

A person shall not cause or allow emissions having an average opacity of 10 percent or greater for any consecutive six minute period from any emission source subject to this Part into the outdoor atmosphere.