

COMMONWEALTH OF VIRGINIA  
STATE AIR POLLUTION CONTROL BOARD  
REGULATIONS FOR THE CONTROL AND ABATEMENT OF AIR POLLUTION

9VAC5 CHAPTER 40.  
EXISTING STATIONARY SOURCES.

PART II.  
Emission Standards.

ARTICLE 57.

Emission Standards for Industrial Solvent Cleaning Operations in the Northern Virginia Volatile Organic Compound Emissions Control Area, 8-hour Ozone Standard (Rule 4-57).

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9VAC5-40-8510. Applicability and designation of affected facility.

A. Except as provided in subsections C and D of this section, the affected facility to which the provisions of this article apply is each facility that uses organic solvent for cleaning unit operations such as mixing vessels (tanks), spray booths, and parts cleaners and that emits, before consideration of controls, at least 6.8 kilograms per day (15 pounds per day) of volatile organic compounds (VOCs). Such operations include, but are not limited to, spray gun cleaning, spray booth cleaning, large manufactured components cleaning, parts cleaning, equipment cleaning, line cleaning, floor cleaning, tank cleaning, and small manufactured components cleaning.

B. The provisions of this article apply only to affected facilities located in the Northern Virginia VOC Emissions Control Area designated in subdivision 1 a of 9VAC5-20-206.

C. Exempted from the provisions of this article are solvent cleaning operations (i) for cleaning of electrical and electronic components; (ii) for cleaning of high precision optics and cleaning of cotton swabs to remove cottonseed oil before cleaning of high precision optics; (iii) for cleaning of numismatic dies; (iv) for cleaning of resin, coating, ink, and adhesive mixing, molding, and application equipment; (v) in research and development laboratories; (vi) in manufacturing medical devices or pharmaceutical products; and (vii) related to performance or quality assurance testing of coatings, inks, or adhesives.

D. The provisions of this article do not apply to the following:

1. Surface preparation and solvent cleaning operations associated with the surface coating, application of adhesive, sealants and their primers or printing operations subject to Article 26 (Large Appliance Coatings, 9VAC5-40-3560 et seq.), Article 28 (Automobile and Light Duty Truck Coating Applications, 9VAC5-40-3860 et seq.), Article 33 (Metal Furniture Coating Application Systems, 9VAC5-40-4610 et seq.), Article 34 (Miscellaneous Metal Parts/Products Coating Application, 9VAC5-40-4760), Article 35 (Flatwood Paneling Coating Application Systems, 9VAC5-40-4910 et seq.), Article 53 (Lithographic Printing Processes, 9VAC5-40-7800 et seq.), Article 56 (Letterpress Printing Operations, 9VAC5-40-8380 et seq.), Article 56.1 (Lithographic Printing Operations, 9VAC5-40-8420 et seq.), Article 58 (Miscellaneous Industrial Adhesive Application Processes, 9VAC5-40-8660 et seq.), and Article 59 (Miscellaneous Metal Parts and Products Coating Application Systems, 9VAC5-40-8810 et seq.) of 9VAC5-40 (Existing Stationary Sources).

2. The use of janitorial supplies used for cleaning offices, bathrooms, or other similar areas.

3. Stripping of cured inks, coatings, and adhesives.

4. Surface preparation and solvent cleaning operations associated with the surface coating, application of adhesive, sealants and their primers, or printing operations of the following product categories or processes: aerospace coatings, wood furniture coatings, shipbuilding and repair coatings, flexible packaging printing materials, paper film and foil coating, plastic parts coating, and fiberglass boat manufacturing materials.

5. Solvent metal cleaning operations subject to Article 47 (Emission Standards for Solvent Metal Cleaning Operations in the Northern Virginia Volatile Organic Compound Emissions Control Area, 9VAC5-40-6820 et seq.) of 9VAC5-40 (Existing Stationary Sources).

6. The use of cleaning solvent in a digital printing operation in which an electronic output device transfers variable data, in the form of an image, from a computer to a substrate.

9VAC5-40-8520. Definitions.

A. For the purpose of applying this article in the context of the Regulations for the Control and Abatement of Air Pollution and related uses, the words or terms shall have the meanings given them in subsection C of this section.

B. Unless otherwise required by context, all terms not defined in this section shall have the meanings given them in 9VAC5-170 (Regulation for General Administration), 9VAC5-10 (General Definitions), or commonly ascribed to them by recognized authorities, in that order of priority.

C. Terms defined.

"Aerospace coatings" means materials that are applied to the surface of an aerospace vehicle or component to form a decorative, protective, or functional solid film, or the solid film itself at a facility that produces, reworks, or repairs in any amount any commercial, civil, or military aerospace vehicle or component.

"Electrical and electronic components" means components and assemblies of components that generate, convert, transmit, or modify electrical energy. Electrical and electronic components include, but are not limited to, wires, windings, stators, rotors, magnets, contacts, relays, printed circuit boards, printed wire assemblies, wiring boards, integrated circuits, resistors, capacitors and transistors but does not include the cabinets in which electrical and electronic components are housed.

"Fiberglass boat manufacturing materials" means materials utilized at facilities that manufacture hulls or decks of boats from fiberglass, or build molds to make fiberglass boat hulls or decks. Fiberglass boat manufacturing materials are not materials used at facilities that manufacture solely parts of boats (such as hatches, seats, or lockers) or boat trailers, but do not (i) manufacture hulls or decks of boats from fiberglass or (ii) build molds to make fiberglass boat hulls or decks.

"Flexible packaging printing materials" means materials used in the manufacture of any package or part of a package the shape of which can be readily changed. Flexible packaging includes, but is not limited to, bags, pouches, liners, and wraps utilizing paper, plastic, film, aluminum foil, metalized or coated paper or film, or any combination of these materials.

"High precision optics" means an optical element used in an electro-optical device and is designed to sense, detect, or transmit light energy, including specific wavelengths of light energy and changes in light energy levels.

"Industrial cleaning solvents" means products used to remove contaminants such as adhesives, inks, paint, dirt, soil, oil, and grease from parts, products, tools, machinery, equipment, vessels, floors, walls, and other work production related work areas for reasons such as safety, operability, and to avoid product

contamination. The cleaning solvents used in these operations may be generally available bulk solvents that are used for a multitude of applications in addition to cleaning, such as for paint thinner, or as an ingredient used in the manufacture of a coating, such as paint.

"Medical device" means an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent or other similar article, including any component or accessory that is (i) intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of diseases; or (ii) intended to affect the structure or any function of the body.

"Paper, film and foil coating" means coating that is applied to paper, film, or foil surfaces in the manufacturing of several major product types for the following industry sectors: pressure sensitive tape and labels (including fabric coated for use in pressure sensitive tapes and labels); photographic film; industrial and decorative laminates; abrasive products (including fabric coated for use in abrasive products) and flexible packaging (including coating of non-woven polymer substrates for use in flexible packaging). Paper and film coating also includes coatings applied during miscellaneous coating operations for several products including: corrugated and solid fiber boxes; die-cut paper paperboard, and cardboard; converted paper and paperboard not elsewhere classified; folding paperboard boxes, including sanitary boxes; manifold business forms and related products; plastic aseptic packaging; and carbon paper and inked ribbons.

"Pharmaceutical product" means a preparation or compound, which includes any drug, analgesic, decongestant, antihistamine, cough suppressant, vitamin, mineral or herb supplement intended for human or animal consumption and used to cure, mitigate or treat disease or improve or enhance health.

"Plastic parts coating" means a coating that is applied to the surfaces of a varied range plastic parts and products. Such parts or products are constructed either entirely or partially from metal or plastic. These parts include, but are not limited to, metal and plastic components of the following types of products as well as the products themselves: fabricated metal products, molded plastic parts, small and large farm machinery, commercial and industrial machinery and equipment, automotive or transportation equipment, interior or exterior automotive parts, construction equipment, motor vehicle accessories, bicycles and sporting goods, toys, recreational vehicles, pleasure craft (recreational boats), extruded aluminum structural components, railroad cars, heavier vehicles, lawn and garden equipment, business machines, laboratory and medical equipment, electronic equipment, steel drums, metal pipes, and numerous other industrial and household products.

"Shipbuilding and repair coating" means material that can be applied as a thin layer to a substrate and which cures to form a continuous solid film, and is used in the building, repair, repainting, converting, or alteration of ships.

"Solvent cleaning operation" means the employment of industrial cleaning solvents to remove of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants, which include, but are not limited to, dirt, soil, and grease, from parts, products, tools, machinery, equipment, and general work areas and includes but is not limited to activities such as wipe cleaning, solvent flushing, or spraying. Each distinct method of cleaning in a cleaning process, which consists of a series of cleaning methods, constitute a separate solvent cleaning operation.

"Solvent flushing" means the use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of the equipment by flushing solvent through the equipment.

"Surface preparation" means the cleaning of surfaces prior to coating, further treatment, sale, or intended use.

"VOC" means volatile organic compound.

"Wipe cleaning" means the method of cleaning a surface by physically rubbing it with a material such as a rag, paper, sponge or a cotton swab moistened with a solvent.

"Wood furniture coatings" means protective, decorative, or functional films applied in thin layers to a surface used in the manufacture of wood furniture or wood furniture components. Such coatings include, but are not limited to, paints, topcoats, varnishes, sealers, stains, washcoats, basecoats, enamels, inks, and temporary protective coatings.

9VAC5-40-8530. Standard for volatile organic compounds.

A. No owner or other person shall cause or permit to be discharged into the atmosphere any VOC emissions from any solvent cleaning operation employing industrial cleaning solvents in excess of both of the following limits:

1. A VOC content limit of 50 grams per liter (0.42 pounds per gallon) of industrial cleaning solvent shall apply unless emissions are controlled by an emission control system with an overall control efficiency of at least 85%; and

2. A composite vapor pressure limit of eight millimeters of mercury at 20°C.

B. VOC emissions from the use, handling, storage, and disposal of industrial cleaning solvents and shop towels shall be controlled by the following work practices:

1. Open containers and used applicators shall be covered.

2. Air circulation around cleaning operations shall be minimized.

3. Used solvent and shop towels shall be disposed of properly.

4. Equipment practices that minimize emissions (including but not limited to keeping arts cleaners covered, and maintaining cleaning equipment to repair solvent leaks) shall be implemented.

C. In lieu of complying with the requirements in subsections A and B of this section, a manufacturer of coatings, inks, resin, or adhesives may comply with the following requirements:

1. Clean portable or stationary mixing vats, high dispersion mills, grinding mills, tote tanks and roller mills by one or more of the following methods:

a. Use a cleaning solvent that either contains less than 1.67 pounds per gallon of VOC or has a composite vapor pressure no more than eight mm Hg at 20°C;

b. Comply with the following work practices:

(1) Equipment being cleaned shall be maintained leak free;

(2) VOC-containing cleaning materials shall be drained from the cleaned equipment upon completion of cleaning;

(3) VOC-containing cleaning materials, including waste solvent, shall not be stored or disposed of in such a manner that will cause or allow evaporation into the atmosphere; and

(4) All VOC-containing cleaning materials shall be stored in closed containers.

c. Collect and vent the emissions from equipment cleaning to a VOC emission control system that has an overall capture and control efficiency of at least 80%, by weight, for the VOC emissions. Where such reduction is achieved by incineration, at least 90% of the organic carbon shall be oxidized to carbon dioxide.

d. Use organic solvents other than those allowed in subdivision C 1 a of this section provided no more than 60 gallons of fresh solvent shall be used per month. Organic solvent that is reused or recycled (either on-site or off-site), for further use in equipment cleaning or the manufacture of coating, ink, or adhesive shall not be included in this limit. All VOC-containing cleaning materials shall be stored in closed containers.

2. When using solvent for wipe cleaning, the owner (i) shall not use open containers for the storage or disposal of cloth or paper impregnated with organic

compounds that is used for cleanup, or coating, ink, or adhesive removal; and (ii) shall not store spent or fresh organic compounds to be used for cleanup or coating, ink, resin, or adhesive removal in open containers.

3. Any manufacturer of coatings, inks, resin, or adhesives that complies with subdivision C 1 d of this section shall record the following information each month for each cleaning material and shall maintain the information at the facility for a period of five years: (i) the total volume of fresh cleaning solvent material used for equipment cleaning; and (ii) the total volume of cleaning solvent material recovered for either on-site or off-site recycling.

D. The control requirements for screen printing shall be either use of solvent technology at 4.2 pounds of VOC per gallon, or the use of a product with a vapor pressure of eight mm Hg.

9VAC5-40-8540. Standard for visible emissions.

The provisions of Article 1 (9VAC5-40-60 et seq.) of Part II of 9VAC5-40 (Existing Stationary Sources) apply.

9VAC5-40-8550. Standard for fugitive dust/emissions.

The provisions of Article 1 (9VAC5-40-60 et seq.) of Part II of 9VAC5-40 (Existing Stationary Sources) apply.

9VAC5-40-8560. Standard for odor.

The provisions of Article 2 (9VAC5-40-130 et seq.) of Part II of 9VAC-40 (Existing Stationary Sources) apply.

9VAC5-40-8570. Standard for toxic pollutants.

The provisions of Article 4 (9VAC5-60-200 et seq.) of Part II of 9VAC5-60 (Hazardous Air Pollutant Sources) apply.

9VAC5-40-8580. Compliance.

The provisions of 9VAC5-40-20 (Compliance) apply.

9VAC5-40-8590. Compliance schedule.

The owner shall comply with the provisions of this article as expeditiously as possible but in no case later than February 1, 2017.

9VAC5-40-8600. Test methods and procedures.

A. The provisions of 9VAC5-40-30 (Emission testing) apply.

B. The composite vapor pressure of organic compounds in cleaning materials shall be determined by quantifying the amount of each compound in the blend using ASTM "Standard Practice for Packed Column Gas Chromatography" for organics and ASTM "Standard Test Method for Water Content of Coatings by Direct Injection Into a Gas Chromatograph" for water content (see 9VAC5-20-21), as applicable, and the following equation:

$$Pp_c = \frac{\sum_{i=1}^n (W_i)(VP_i) / M_{W_i}}{W_w / M_{W_w} + \sum_{i=1}^n W_e / M_{W_e} + \sum_{i=1}^n W_i / M_{W_i}}$$

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 "Standard Practice for Packed Column Gas Chromatography" (see 9VAC5-20-21).

$W_w$  = Weight of water, in grams as determined by ASTM "Standard Test Method for Water Content of Coatings by Direct Injection Into a Gas Chromatograph" (see 9VAC5-20-21).

$W_e$  = Weight of the "i"th exempt compound, in grams, as determined by ASTM "Standard Practice for Packed Column Gas Chromatography" (see 9VAC5-20-21).

$M_{W_i}$  = Molecular weight of the "i"th VOC compound, in grams per g-mole, as given in chemical reference literature.

$M_{W_w}$  = Molecular weight of water, 18 grams per g-mole.

$M_{W_e}$  = Molecular weight of the "i"th exempt compound, in grams per gmole, 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 subsection C of this section.

C. The vapor pressure of each single component compound may be determined from ASTM "Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope" (see 9VAC5-20-21), from chemical reference literature, or from additional sources acceptable to the board.

9VAC5-40-8610. Monitoring.

The provisions of 9VAC5-40-40 (Monitoring) apply.

9VAC5-40-8620. Notification, records and reporting.

The provisions of 9VAC5-40-50 (Notification, records and reporting) apply.

9VAC5-40-8630. Registration.

The provisions of 9VAC5-20-160 (Registration) apply.

9VAC5-40-8640. Facility and control equipment maintenance or malfunction.

The provisions of 9VAC5-20-180 (Facility and control equipment maintenance or malfunction) apply.

9VAC5-40-8650. Permits.

A permit may be required prior to beginning any of the activities specified below if the provisions of 9VAC5-50 (New and Modified Stationary Sources) and 9VAC5-80 (Permits for Stationary Sources) apply. Owners contemplating such action should review those provisions and contact the appropriate regional office for guidance on whether those provisions apply.

1. Construction of a facility.
2. Reconstruction (replacement of more than half) of a facility.
3. Modification (any physical change to equipment) of a facility.
4. Relocation of a facility.
5. Reactivation (re-startup) of a facility.
6. Operation of a facility.

HISTORICAL NOTES:

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