

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

9VAC5 CHAPTER 45  
CONSUMER AND COMMERCIAL PRODUCTS

Part II  
Emission Standards

Article 6  
Emission Standards for Adhesives and Sealants

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9VAC5-45-620. Applicability.

A. Except as provided in 9VAC5-45-630, the provisions of this article apply to any owner or other person who supplies, sells, offers for sale, or manufactures for sale any adhesive, sealant, adhesive primer or sealant primer that contains volatile organic compounds (VOC).

B. Except as provided in 9VAC5-45-630, the provisions of this article apply to any owner or other person who uses, applies for compensation, solicits the use of, requires the use of, or specifies the application of, any adhesive, sealant, adhesive primer or sealant primer that contains volatile organic compounds.

C. The provisions of this article apply only to owners or other persons in the Northern Virginia, Fredericksburg, and Richmond Volatile Organic Compound Emissions Control Areas designated in 9VAC5-20-206.

9VAC5-45-630. Exemptions.

A. The provisions of this article do not apply to a manufacturer or distributor who sells, supplies, or offers for sale an adhesive, sealant, adhesive primer or sealant primer that does not comply with the VOC standards specified in 9VAC5-45-650 A provided that such manufacturer or distributor makes and keeps records demonstrating (i) that the adhesive, sealant, adhesive primer or sealant primer is intended for shipment and use outside of the volatile organic compound emissions control areas designated in 9VAC5-45-620 C, and (ii) that the manufacturer or distributor has taken reasonable prudent precautions to assure that the adhesive, sealant, adhesive primer or sealant primer is not distributed to or within those applicable volatile organic compound emissions control areas. This exemption does not apply to any adhesive, sealant, adhesive primer or sealant primer that is sold, supplied, or offered for sale by any owner or other person to a retail outlet in those applicable volatile organic compound emissions control areas.

B. The provisions of this article do not apply to the sale or use of the following compounds:

1. Adhesives, sealants, adhesive primers or sealant primers being tested or evaluated in any research and development, quality assurance or analytical laboratory, provided records are maintained as required in 9VAC5-45-730 of this article;

2. Adhesives, sealants, adhesive primers and sealant primers that are subject to standards for volatile organic compounds pursuant to Article 3 (9VAC5-45-280 et seq.), Article 4 (9VAC5-45-400 et seq.) or Article 5 ( 9VAC5-45-520 et seq.) of this part;

3. Adhesives and sealants that contain less than 20 grams of VOC per liter of adhesive or sealant, less water and less exempt compounds, as applied;

4. Cyanoacrylate adhesives;

5. Adhesives, sealants, adhesive primers or sealant primers (except for plastic cement welding adhesives and contact adhesives) that are sold or supplied by the manufacturer or supplier in containers with a net volume of 16 fluid ounces or less, or a net weight of one pound or less; and

6. Contact adhesives that are sold or supplied by the manufacturer or supplier in containers with a net volume of one gallon or less.

C. The provisions of this article do not apply to the use of adhesives, sealants, adhesive primers, sealant primers, surface preparation and cleanup solvents as follows:

1. Tire repair operations, provided the label of the adhesive states "For tire repair only";

2. Assembly, repair and manufacturing operations for aerospace or

undersea-based weapon systems;

3. Medical equipment manufacturing operations; and

4. Plaque laminating operations in which adhesives are used to bond clear, polyester acetate laminate to wood with lamination equipment installed prior to July 1, 1992. Any owner or other person claiming exemption pursuant to this subdivision shall record and maintain monthly operational records sufficient to demonstrate compliance with this exemption in accordance with 9VAC5-45-730 of this article.

D. Except for the requirements listed in subdivisions 1 and 2 of this subsection, the provisions of this article do not apply if the total VOC emissions from all adhesives, sealants, adhesive primers and sealant primers used at the stationary source are less than 200 pounds per calendar year, or an equivalent volume.

1. The following requirements still apply:

a. 9VAC5-45-620 (Applicability);

b. 9VAC5-45-650 A (concerning prohibition from selling, supplying, offering for sale, or manufacturing for sale, noncompliant adhesives, sealants, adhesive primers or sealant primers);

c. 9VAC5-45-690 (Compliance); and

d. 9VAC5-45-700 (Compliance schedules).

2. Any owner or other person claiming exemption pursuant to this subsection shall record and maintain monthly operational records sufficient to demonstrate compliance and in accordance with 9VAC5-45-730 of this article.

E. The provisions of 9VAC5-45-650 B and 9VAC5-45-650 D do not apply to the use of any adhesives, sealants, adhesive primers, sealant primers, cleanup solvents and surface preparation solvents, provided that the total volume of noncompliant adhesives, sealants, primers, cleanup and surface preparation solvents applied facility-wide does not exceed 55 gallons per calendar year. Any owner or other person claiming exemption pursuant to this subsection shall record and maintain monthly operational records sufficient to demonstrate compliance with this exemption in accordance with 9VAC5-45-730.

F. The provisions of 9VAC5-45-650 A do not apply to the sale of any adhesive, sealant, adhesive primer or sealant primer to an owner or other person using add-on air pollution control equipment pursuant to the provisions of 9VAC5-45-660 to comply with the requirements of this article, provided that the seller makes and keeps records in accordance with 9VAC5-45-730 E.

9VAC5-45-640. 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. As used in this article, all terms not defined herein shall have the meanings given them in 9VAC5-10 (General Definitions) unless otherwise required by context.

C. Terms Defined.

"Acrylonitrile-butadiene-styrene or ABS welding adhesive" means any adhesive intended by the manufacturer to weld acrylonitrile-butadiene-styrene pipe, which is made by reacting monomers of acrylonitrile, butadiene and styrene.

"Adhesive" means any chemical substance that is applied for the purpose of bonding two surfaces together other than by mechanical means.

"Adhesive primer" means any product intended by the manufacturer for application to a substrate, prior to the application of an adhesive, to provide a bonding surface.

"Aerosol adhesive" means an adhesive packaged as an aerosol product in which the spray mechanism is permanently housed in a nonrefillable can designed for handheld application without the need for ancillary hoses or spray equipment.

"Aerospace component" means for the purposes of this article, the fabricated part, assembly of parts or completed unit of any aircraft, helicopter, missile, or space vehicle, including passenger safety equipment.

"Architectural sealant or primer" means any sealant or sealant primer intended by the manufacturer to be applied to stationary structures, including mobile homes, and their appurtenances. Appurtenances to an architectural structure include, but are not limited to, hand railings, cabinets, bathroom and kitchen fixtures, fences, rain gutters and downspouts, and windows.

"ASTM" means the American Society for Testing and Materials.

"Automotive glass adhesive primer" means an adhesive primer labeled by the manufacturer to be applied to automotive glass prior to installation of the glass using an adhesive/sealant. This primer improves the adhesion to pinch weld and blocks ultraviolet light.

"CARB" means the California Air Resources Board.

"Ceramic tile installation adhesive" means any adhesive intended by the manufacturer for use in the installation of ceramic tiles.

"Chlorinated polyvinyl chloride plastic" or "CPVC plastic" means a polymer of the vinyl chloride monomer that contains 67% chlorine and is normally identified with a CPVC marking.

"Chlorinated polyvinyl chloride welding adhesive" or "CPVC welding adhesive" means an adhesive labeled for welding of chlorinated polyvinyl chloride plastic.

"Cleanup solvent" means a VOC-containing material used to remove a loosely held uncured (i.e., not dry to the touch) adhesive or sealant from a substrate, or clean equipment used in applying a material.

"Computer diskette jacket manufacturing adhesive" means any adhesive intended by the manufacturer to glue the fold-over flaps to the body of a vinyl computer diskette jacket.

"Contact bond adhesive" means an adhesive that: (i) is designed for application to both surfaces to be bonded together, (ii) is allowed to dry before the two surfaces are placed in contact with each other, (iii) forms an immediate bond that is impossible, or difficult, to reposition after both adhesive-coated surfaces are placed in contact with each other, and (iv) does not need sustained pressure or clamping of surfaces after the adhesive-coated surfaces have been brought together using sufficient momentary pressure to establish full contact between both surfaces. Contact bond adhesive does not include rubber cements that are primarily intended for use on paper substrates. Contact bond adhesive also does not include vulcanizing fluids that are designed and labeled for tire repair only.

"Cove base" means a flooring trim unit, generally made of vinyl or rubber, having a concave radius on one edge and a convex radius on the opposite edge that is used in forming a junction between the bottom wall course and the floor or to form an inside corner.

"Cove base installation adhesive" means any adhesive intended by the manufacturer to be used for the installation of cove base or wall base on a wall or vertical surface at floor level.

"Cyanoacrylate adhesive" means any adhesive with a cyanoacrylate content of at least 95% by weight.

"Dry wall installation" means the installation of gypsum dry wall to studs or solid surfaces using an adhesive formulated for that purpose.

"Fiberglass" means a material consisting of extremely fine glass fibers.

"Flexible vinyl" means nonrigid polyvinyl chloride plastic with at least 5.0% by weight plasticizer content.

"Indoor floor covering installation adhesive" means any adhesive intended by the manufacturer for use in the installation of wood flooring, carpet, resilient tile, vinyl tile, vinyl backed carpet, resilient sheet and roll, or artificial grass. Adhesives used to install ceramic tile and perimeter bonded sheet flooring with vinyl backing onto a nonporous substrate, such as flexible vinyl, are excluded from this category.

"Laminate" means a product made by bonding together two or more layers of material.

"Low-solids adhesive, sealant or primer" means any product that contains 120 grams or less of solids per liter of material.

"Marine deck sealant" or "marine deck sealant primer" means any sealant or sealant primer labeled for application to wooden marine decks.

"Medical equipment manufacturing" means the manufacture of medical devices, such as, but not limited to, catheters, heart valves, blood cardioplegia machines, tracheostomy tubes, blood oxygenators, and cardiatory reservoirs.

"Metal to urethane/rubber molding or casting adhesive" means any adhesive intended by the manufacturer to bond metal to high density or elastomeric urethane or molded rubber materials, in heater molding or casting processes, to fabricate products such as rollers for computer printers or other paper handling equipment.

"Multipurpose construction adhesive" means any adhesive intended by the manufacturer for use in the installation or repair of various construction materials, including but not limited to, drywall, subfloor, panel, fiberglass reinforced plastic (FRP), ceiling tile, and acoustical tile.

"Nonmembrane roof installation/repair adhesive" means any adhesive intended by the manufacturer for use in the installation or repair of nonmembrane roofs and that is not intended for the installation of prefabricated single-ply flexible roofing membrane, including, but not limited to, plastic or asphalt roof cement, asphalt roof coating, and cold application cement.

"Outdoor floor covering installation adhesive" means any adhesive intended by the manufacturer for use in the installation of floor covering that is not in an enclosure and that is exposed to ambient weather conditions during normal use.

"Ozone season" means the period beginning May 1 of a calendar year and ending on September 30 of the same year, inclusive.

"Panel installation" means the installation of plywood, predecorated hardboard (or tileboard), fiberglass reinforced plastic, and similar predecorated or nondecorated panels to studs or solid surfaces using an adhesive formulated for that purpose.

"Perimeter bonded sheet flooring installation" means the installation of sheet flooring with vinyl backing onto a nonporous substrate using an adhesive designed to be applied only to a strip of up to four inches wide around the perimeter of the sheet flooring.

"Plastic cement welding adhesive" means any adhesive intended by the manufacturer for use to dissolve the surface of plastic to form a bond between mating surfaces.

"Plastic cement welding adhesive primer" means any primer intended by the manufacturer for use to prepare plastic substrates prior to bonding or welding.

"Plastic foam" means foam constructed of plastics.

"Plasticizer" means a material, such as a high boiling point organic solvent, that is incorporated into a vinyl to increase its flexibility, workability, or distensibility.

"Plastics" means synthetic materials chemically formed by the polymerization of organic (carbon-based) substances. Plastics are usually compounded with modifiers, extenders, and/or reinforcers and are capable of being molded, extruded, cast into various shapes and films or drawn into filaments.

"Polyvinyl chloride plastic" or "PVC plastic" means a polymer of the chlorinated vinyl monomer that contains 57% chlorine.

"Polyvinyl chloride welding adhesive" or "PVC welding adhesive" means any adhesive intended by the manufacturer for use in the welding of PVC plastic pipe.

"Porous material" means a substance that has tiny openings, often microscopic, in which fluids may be absorbed or discharged, including, but not limited to, wood, paper, and corrugated paperboard.

"Propellant" means a fluid under pressure that expels the contents of a container when a valve is opened.

"Reactive diluent" means a liquid that is a reactive organic compound during application and one in that, through chemical and/or physical reactions, such as polymerization, 20% or more of the reactive organic compound becomes an integral part of a finished material.

"Roadway sealant" means any sealant intended by the manufacturer for application to public streets, highways and other surfaces, including but not limited to, curbs, berms, driveways, and parking lots.

"Rubber" means any natural or manmade rubber substrate, including but not limited to, styrene-butadiene rubber, polychloroprene (neoprene), butyl rubber, nitrile rubber, chlorosulfonated polyethylene and ethylene propylene diene terpolymer.

"SCAQMD" means the South Coast Air Quality Management District, a part of the California Air Resources Board, which is responsible for the regulation of air quality in the state of California.

"Sealant" means any material with adhesive properties that is formulated primarily to fill, seal, waterproof or weatherproof gaps or joints between two surfaces. Sealants include sealant primers and caulks.

"Sealant primer" means any product intended by the manufacturer for application to a substrate, prior to the application of a sealant, to enhance the bonding surface.

"Sheet-applied rubber installation" means the process of applying sheet rubber liners by hand to metal or plastic substrates to protect the underlying substrate from corrosion or abrasion. These operations also include laminating sheet rubber to fabric by hand.

"Single-ply roof membrane" means a prefabricated single sheet of rubber, normally ethylene propylene diene terpolymer, that is field applied to a building roof using one layer of membrane material.

"Single-ply roof membrane installation and repair adhesive" means any adhesive labeled for use in the installation or repair of single-ply roof membrane. Installation includes, as a minimum, attaching the edge of the membrane to the edge of the roof and applying flashings to vents, pipes and ducts that protrude through the membrane. Repair includes gluing the edges of torn membrane together, attaching a patch over a hole and reapplying flashings to vents, pipes or ducts installed through the membrane.

"Single-ply roof membrane adhesive primer" means any primer labeled for use to clean and promote adhesion of the single-ply roof membrane seams or splices prior to bonding.

"Single-ply roof membrane sealant" means any sealant labeled for application to single-ply roof membrane.

"Solvent" means organic compounds that are used as diluents, thinners,



dissolvers, viscosity reducers, cleaning agents or other related uses.

"Structural glazing adhesive" means any adhesive intended by the manufacturer to apply glass, ceramic, metal, stone or composite panels to exterior building frames.

"Subfloor installation" means the installation of subflooring material over floor joists, including the construction of any load bearing joists. Subflooring is covered by a finish surface material.

"Surface preparation solvent" means a solvent used to remove dirt, oil and other contaminants from a substrate prior to the application of a primer, adhesive or sealant.

"Thin metal laminating adhesive" means any adhesive intended by the manufacturer for use in bonding multiple layers of metal to metal or metal to plastic in the production of electronic or magnetic components in which the thickness of the bond line is less than 0.25 mils.

"Tire repair" means a process that includes expanding a hole, tear, fissure or blemish in a tire casing by grinding or gouging, applying adhesive, and filling the hole or crevice with rubber.

"Tire tread adhesive" means any adhesive intended by the manufacturer for application to the back of precure tread rubber and to the casing and cushion rubber. Tire tread adhesive may also be used to seal buffed tire casings to prevent oxidation while the tire is being prepared for a new tread.

"Traffic marking tape" means preformed reflective film intended by the manufacturer for application to public streets, highways and other surfaces, including but not limited to curbs, berms, driveways, and parking lots.

"Traffic marking tape adhesive primer" means any primer intended by the manufacturer for application to surfaces prior to installation of traffic marking tape.

"Undersea-based weapons systems components" means the fabrication of parts, assembly of parts or completed units of any portion of a missile launching system used on undersea ships.

"Volatile organic compound" or "VOC" means volatile organic compound as defined in 9VAC5-10-20.

"Waterproof resorcinol glue" means a two-part resorcinol-resin-based adhesive designed for applications where the bond line must be resistant to conditions of continuous immersion in fresh or salt water.

9VAC5-45-650. Standard for volatile organic compounds.

A. Except as provided in 9VAC5-45-630 and subsection H of this section, no owner or other person shall (i) sell, supply or offer for sale any adhesive, sealant, adhesive primer or sealant primer manufactured on or after the applicable compliance date specified in 9VAC5-45-700, or (ii) manufacture for sale any adhesive, sealant, adhesive primer, or sealant primer on or after the date specified in 9VAC5-45-700, which contains volatile organic compounds in excess of the limits specified in Table 45-6A.

Table 45-6A

VOC Content Limits for Adhesives, Sealants, Adhesive Primers, Sealant Primers and Adhesives Applied to Particular Substrates

Adhesive, sealant, adhesive primer or sealant primer category	VOC content limit (grams VOC per liter*)
Adhesives	
ABS welding	400
Ceramic tile installation	130
Computer diskette jacket manufacturing	850
Contact bond	250
Cove base installation	150
CPVC welding	490
Indoor floor covering installation	150
Metal to urethane/rubber molding or casting	850
Multipurpose construction	200
Nonmembrane roof installation/repair	300
Other plastic cement welding	510
Outdoor floor covering installation	250
PVC welding	510
Single-ply roof membrane installation/repair	250
Structural glazing	100
Thin metal laminating	780
Tire retread	100
Perimeter bonded sheet vinyl flooring installation	660

Waterproof resorcinol glue	170
Sheet-applied rubber installation	850
Sealants	
Architectural	250
Marine deck	760
Nonmembrane roof installation/repair	300
Roadway	250
Single-ply roof membrane	450
Other	420
Adhesive Primers	
Automotive glass	700
Plastic cement welding	650
Single-ply roof membrane	250
Traffic marking tape	150
Other	250
Sealant Primers	
Non-porous architectural	250
Porous architectural	775
Marine deck	760
Other	750
Adhesives Applied to the Listed Substrate	
Flexible vinyl	250
Fiberglass	200
Metal	30
Porous material	120
Rubber	250
Other substrates	250

\*The VOC content is determined using the weight of volatile compounds, less water and exempt compounds, as specified in 9VAC5-45-710 of this article.

B. Except as provided in 9VAC5-45-630 B through E, in subsection G of this section, and in 9VAC5-45-660, no person shall use, or apply for compensation, any

adhesive, sealant, adhesive primer or sealant primer in excess of the applicable VOC content limits specified in Table 45-6A.

C. The VOC content limits in Table 45-6A for adhesives applied to particular substrates shall apply as follows.

1. If an owner or other person uses an adhesive or sealant subject to a specific VOC content limit for such adhesive or sealant in Table 45-6A, such specific limit is applicable rather than an adhesive-to-substrate limit.

2. If an adhesive is used to bond dissimilar substrates together, the applicable substrate category with the highest VOC content shall be the limit for such use.

D. No owner or other person shall use a surface preparation or cleanup solvent containing VOC unless:

1. The VOC content of the surface preparation solvent is less than 70 grams per liter, except as provided for single-ply roofing in subdivision 2 of this subsection;

2. The composite vapor pressure, excluding water and exempt compounds, of the surface preparation solvent used for applying single-ply roofing does not exceed 45 mm Hg at 20°C;

3. The composite vapor pressure of the solvent used for the removal of adhesives, sealants, or adhesive or sealant primers from surfaces other than spray application equipment is less than 45 mm Hg at 20°C, except as provided in subdivision 4 of this subsection; and

4. For the removal of adhesives, sealants, adhesive primers or sealant primers from parts of spray application equipment, the removal is performed as follows:

a. In an enclosed cleaning system, or equivalent cleaning system as determined by the test method identified in 9VAC5-45-710 I;

b. Using a solvent with a VOC content less than or equal to 70 grams of VOC per liter of material; or

c. Parts containing dried adhesive may be soaked in a solvent if (i) the composite vapor pressure of the solvent, excluding water and exempt compounds, is less than or equal to 9.5 mm Hg at 20°C, and (ii) the parts and solvent are in a closed container that remains closed except when adding parts to or removing parts from the container.

E. Any owner or other person using adhesives, sealants, adhesive primers,

sealant primers, surface preparation or clean-up solvents subject to the provisions of this article shall store or dispose of all absorbent materials, such as cloth or paper, that are moistened with adhesives, sealants, primers or solvents subject to the provisions of this article, in nonabsorbent containers that shall be closed except when placing materials in or removing materials from the container.

F. No owner or other person shall solicit the use, require the use or specify the application of any adhesive, sealant, adhesive primer, sealant primer, surface preparation or clean-up solvent if such use or application results in a violation of the provisions of this article. This prohibition shall apply to all written or oral contracts under which any adhesive, sealant, adhesive primer, sealant primer, surface preparation or clean-up solvent subject to this article is to be used at any location within the areas designated in 9VAC5-45-620 C.

G. The standards for single-ply roof membrane installation and repair adhesive, single-ply roof membrane sealant, and single-ply roof membrane adhesive primer in Table 45-6A shall only apply as follows:

1. In the Northern Virginia and Fredericksburg VOC Emissions Control Areas: during the ozone seasons, or portions thereof, between August 1, 2010 and September 30, 2011, and on and after January 1, 2012; and

2. In the Richmond VOC Emissions Control Area: during the ozone season, or portion thereof, between March 1, 2014, and September 30, 2014, and after January 1, 2015.

H. The provisions of subsection A of this section and the provisions of 9VAC5-45-730 E do not apply to the sale, supply, offer for sale, or manufacture for sale of single-ply roof membrane installation and repair adhesive, single-ply roof membrane sealant, and single-ply roof membrane adhesive primer prior to January 1, 2012.

9VAC5-45-660. Control technology guidelines.

Any owner or other person using an adhesive, sealant, adhesive primer or sealant primer subject to this article may comply with the provisions of 9VAC5-45-650 B and D using add-on air pollution control equipment if such equipment meets the following requirements:

1. The VOC emissions from the use of all adhesives, sealants, adhesive primers, or sealant primers subject to this article are reduced by an overall capture and control efficiency of at least 85% by weight;

2. The combustion temperature is monitored continuously if a thermal incinerator is operated;

3. Inlet and exhaust gas temperatures are monitored continuously if a

catalytic incinerator is operated;

4. Control device efficiency is monitored continuously if a carbon absorber or control device other than a thermal or catalytic incinerator is operated; and

5. Operation records sufficient to demonstrate compliance with the requirements of this section are maintained as required in 9VAC5-45-730 of this article.

9VAC5-45-670. Standard for visible emissions.

The provisions of Article 1 (9VAC5-40-60 et seq.) of 9VAC5-40 (Emission Standards for Visible Emissions and Fugitive Dust/Emissions, Rule 4-1) apply.

9VAC5-45-680. Administrative requirements.

Each manufacturer of an adhesive, sealant, adhesive primer, or sealant primer subject to the provisions of this article shall display the following information on the product container or label:

1. A statement of the manufacturer's recommendation regarding thinning, reducing, or mixing of the product, except that:

a. This requirement does not apply to the thinning of a product with water; and

b. If thinning of the product prior to use is not necessary, the recommendation must specify that the product is to be applied without thinning.

2. The maximum or the actual VOC content of the product as supplied, determined in accordance with 9VAC5-45-710, displayed in grams of VOC per liter of product.

3. The maximum or the actual VOC content of the product as applied (which includes the manufacturer's maximum recommendation for thinning), determined in accordance with 9VAC5-45-710, displayed in grams of VOC per liter of product.

9VAC5-45-690. Compliance.

The provisions of 9VAC5-45-20 (Compliance) apply.

9VAC5-45-700. Compliance schedules.

Affected owners or other persons shall comply with the provisions of this article as expeditiously as possible but in no case later than:

1. August 1, 2010, in the Northern Virginia and Fredericksburg VOC

Emissions Control Areas; or

2. March 1, 2014, in the Richmond VOC Emissions Control Area.

9VAC5-45-710. Test methods and procedures.

A. The provisions of 9VAC5-45-30 (Emission testing) apply.

B. Except as provided in subsections D, E and F of this section, the VOC and solids content of all nonaerosol adhesives, adhesive primers and cleanup solvents shall be determined using either Reference Method 24 or SCAQMD "Determination of Volatile Organic Compounds (VOC) In Various Materials" (see 9VAC5-20-21).

C. The organic content of exempt organic compounds shall be determined using ASTM "Standard Test Method for Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings by Direct Injection into a Gas Chromatograph" (see 9VAC5-20-21), as applicable.

D. The VOC content of any plastic welding cement adhesive or primer shall be determined using SCAQMD "Determination of Volatile Organic Compounds (VOC) in Materials Used for Pipes and Fittings" (see 9VAC5-20-21).

E. To determine if a diluent is a reactive diluent, the percentage of the reactive organic compound that becomes an integral part of the finished materials shall be determined using SCAQMD "Determination of Volatile Organic Compounds (VOC) in Materials Used for Pipes and Fittings" (see 9VAC5-20-21).

F. 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).

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

$Mw_w$  = Molecular weight of water, 18 grams per g-mole.

$Mw_e$  = Molecular weight of the "i"th exempt compound, in grams per g-mole, as given in chemical reference literature.

$Vp_i$  = Vapor pressure of the "i"th VOC compound at 20°C, in mm Hg, as determined by subsection G of this section.

G. 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.

H. If air pollution control equipment is used to meet the requirements of 9VAC5-45-650, the owner or operator shall make the following determinations:

1. The measurement of capture efficiency shall be conducted and reported in accordance with the EPA Technical Document "Guidelines for Determining Capture Efficiency" (see 9VAC5-20-21).

2. The control efficiency shall be determined in accordance with Reference Methods 25, 25A, 25B or CARB Method 100 (see 9VAC5-20-21), as appropriate.

I. The active and passive solvent losses from spray gun cleaning systems shall be determined using SCAQMD's "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems" (see 9VAC5-20-21). The test solvent for this determination shall be any lacquer thinner with a minimum vapor pressure of 105 mm of Hg at 20°C, and the minimum test temperature shall be 15°C.

J. For adhesives that do not contain reactive diluents, the VOC content of adhesive in grams per liter, less water and exempt compounds, shall be calculated according to the following equation:



$$VOC = \frac{W_s - W_w - W_e}{V_m - V_w - V_e}$$

where:

VOC = VOC content of adhesive, in grams per liter.

W<sub>s</sub> = weight of volatile compounds, in grams.

W<sub>w</sub> = weight of water, in grams.

W<sub>e</sub> = weight of exempt compounds, in grams.

V<sub>m</sub> = volume of material, in liters.

V<sub>w</sub> = volume of water, in liters.

V<sub>e</sub> = volume of exempt compounds, in liters.

K. For adhesives that contain reactive diluents, the VOC content of the adhesive is determined after curing. The VOC content of adhesive in grams per liter, less water and exempt compounds, shall be calculated according to the following equation:

$$VOC = \frac{W_{rs} - W_{rw} - W_{re}}{V_{rm} - V_{rw} - V_{re}}$$

where:

VOC = VOC content of adhesive, in grams per liter.

W<sub>rs</sub> = weight of volatile compounds not consumed during curing, in grams.

W<sub>rw</sub> = weight of water not consumed during curing, in grams.

W<sub>re</sub> = weight of exempt compounds not consumed during curing, in grams.

V<sub>rm</sub> = volume of material not consumed during curing, in liters.

V<sub>rw</sub> = volume of water not consumed during curing, in liters.

V<sub>re</sub> = volume of exempt compounds not consumed during curing, in liters.

L. The VOC content of materials, in grams per liter, shall be calculated according

to the following equation:

$$VOC = \frac{W_s - W_w - W_e}{V_m}$$

where:

VOC = VOC content of materials, in grams per liter.

Ws = weight of volatile compounds, in grams.

Ww = weight of water, in grams.

We = weight of exempt compounds, in grams.

Vm = volume of material, in liters.

M. Percent VOC by weight shall be calculated according to the following equation:

$$\% \text{ VOC by weight} = \frac{W_v}{W} \times 100$$

where:

Wv = weight of VOC in grams.

W = weight of material in grams.

9VAC5-45-720. Monitoring.

The provisions of 9VAC5-45-40 (Monitoring) apply.

9VAC5-45-730. Notification, records and reporting.

A. The provisions of 9VAC5-45-50 (Notification, records and reporting) apply.

B. Each owner or other person subject to this article shall maintain records demonstrating compliance with this article, including, but not limited to, the following information:

1. A list of each adhesive, sealant, adhesive primer, sealant primer cleanup solvent and surface preparation solvent in use or in storage;

2. A data sheet or material list that provides the material name, manufacturer identification, and material application for each product on the list;

3. Catalysts, reducers or other components used in each product on the list and the mix ratio;

4. The VOC content of each product on the list, as supplied;

5. The final VOC content or vapor pressure of each product on the list, as applied; and

6. The monthly volume of each adhesive, sealant, adhesive primer, sealant primer, cleanup or surface preparation solvent used.

C. Any owner or other person who complies with the provisions of 9VAC5-45-650 B through the use of add-on air pollution control equipment shall record the key operating parameters for the control equipment, including, but not limited to, the following information:

1. The volume used per day of each adhesive, sealant, adhesive primer, sealant primer or solvent that is subject to a VOC content limit in Table 45-6A and that exceeds such limit;

2. On a daily basis, the combustion temperature, inlet and exhaust gas temperatures or control device efficiency, as appropriate, pursuant to 9VAC5-45-660;

3. Daily hours of operation; and

4. All maintenance performed including the date and type of maintenance.

D. For adhesives, sealants, adhesive primers and sealant primers subject to the laboratory testing exemption pursuant to 9VAC5-45-630 B 1 of this article, the person conducting the testing shall make and maintain records of all such materials used, including, but not limited to (i) the product name, (ii) the product category of the material or type of application, and (iii) the VOC content of each material.

E. Any owner or other person that is subject to the provisions of this article and who sells an adhesive, sealant, adhesive primer or sealant primer that is subject to the provisions of this article but does not comply with the VOC content limits in Table 45-6A, shall make and keep records as follows:

1. The name of, and contact information for, each owner or other person to whom such noncompliant product is sold, and

2. The amount of each such noncompliant product that is sold to that owner or other person per calendar year.

F. Any owner or other person claiming an exemption for plaque laminating

equipment pursuant to 9VAC5-45-630 C 4 shall keep records sufficient to demonstrate that the exemption applies. Such records shall include, but are not limited to, (i) the installation date of the plaque laminating equipment, (ii) monthly records of the types of laminate and substrate used and the VOC content of each adhesive used by the equipment during the month, and (iii) certification by a responsible official of the company that there is no compliant adhesive available for this purpose.

G. All records made to determine compliance with the provisions of this article shall be maintained for three years from the date such record is created and shall be made available to the board within 90 days of a request.

#### 9VAC5-45-740. Registration.

The provisions of 9VAC5-20-160 (Registration) apply, except that the following provisions also apply:

1. Any owner or other person subject to the provisions of this article who complies with the provisions of 9VAC5-45-650 B through the use of add-on air pollution control equipment shall register such operations with the board and update such registration information.

2. The information required for registration shall be determined by the board and shall be provided in the manner specified by the board. Registration information shall include, but is not limited to, (i) contact information for the owner or other person (name, mailing address and phone number) and (ii) the type of add-on control equipment used to comply with the provisions of 9VAC5-45-650 B. All registration information and updates to such registration information submitted to the board are subject to the provisions of 9VAC5-20-230 (Certification of documents).

#### 9VAC5-45-750. Facility and control equipment maintenance or malfunction.

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

#### HISTORICAL NOTES:

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