

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES**

AIR POLLUTION CONTROL REGULATION NO. 44

**CONTROL OF VOLATILE ORGANIC COMPOUNDS FROM ADHESIVES
AND SEALANTS**



Effective 4 June 2009

AUTHORITY: These regulations are authorized pursuant to R.I. Gen. Laws § 42-17.1-2(s) and 23-23, as amended, and have been promulgated pursuant to the procedures set forth in the R.I. Administrative Procedures Act, R.I. Gen. Laws Chapter 42-35.

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44. Control of Volatile Organic Compounds Adhesives and Sealants

44.1. Definitions

Unless otherwise expressly defined in this section, the terms used in this regulation shall be defined by reference to the Air Pollution Control General Definitions Regulation. As used in these regulations, the following terms shall, where the context permits, be construed as follows:

- 44.1.1 “**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.
- 44.1.2 “**Adhesive**” means any chemical substance that is applied for the purpose of bonding two surfaces together other than by mechanical means.
- 44.1.3 “**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.
- 44.1.4 “**Aerosol adhesive**” means an adhesive packaged as an aerosol product in which the spray mechanism is permanently housed in a non-refillable can designed for handheld application without the need for ancillary hoses or spray equipment
- 44.1.5 “**Aerospace component**” means the fabricated part, assembly of parts or completed unit of any aircraft, helicopter, missile, or space vehicle, including passenger safety equipment.
- 44.1.6 “**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.
- 44.1.7 “**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.
- 44.1.8 “**CARB**” means the California Air Resources Board.
- 44.1.9 “**Ceramic tile installation adhesive**” means any adhesive intended by the manufacturer for use in the installation of ceramic tiles.

- 44.1.10 **“Chlorinated polyvinyl chloride welding adhesive” or “CPVC welding adhesive”** means an adhesive labeled for welding of chlorinated polyvinyl chloride plastic.
- 44.1.11 **“Cleanup solvent”** means a VOC-containing solvent used to remove a loosely held uncured adhesive or sealant from a substrate or to clean equipment used in applying an adhesive, a sealant or a primer.
- 44.1.12 **“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.
- 44.1.13 **“Contact bond adhesive”** means an adhesive that: (i) is designed for application to both surfaces to be bonded together, and (ii) is allowed to dry before the two surfaces are placed in contact with each other, and (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 Adhesive” does not include rubber cements that are primarily intended for use on paper substrates. “Contact Adhesive” also does not include vulcanizing fluids that are designed and labeled for tire repair only.
- 44.1.14 **“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.
- 44.1.15 **“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.
- 44.1.16 **“Cyanoacrylate adhesive”** means any single-component reactive diluent adhesive that contains at least 85% by weight methyl, ethyl, methoxymethyl or other functional groupings of cyanoacrylate.
- 44.1.17 **“Exempt compound”** means any carbon-containing compound listed as an exemption to the definition of volatile organic compound (VOC) in the Rhode Island Air Pollution Control General Definitions Regulation.
- 44.1.18 **“Flexible vinyl”** means non-rigid polyvinyl chloride plastic with at five percent by weight plasticizer content.
- 44.1.19 **“Fiberglass”** means a material consisting of extremely fine glass fibers.
- 44.1.20 **“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 non-porous substrate, such as flexible vinyl, are excluded from this category.

- 44.1.21 **“Laminate”** means a product made by bonding two or more sheets or layers.
- 44.1.22 **“Low-solids adhesive, sealant or primer”** means any product that contains 120 grams or less of solids per liter of material.
- 44.1.23 **“Marine deck sealant” or “marine deck sealant primer”** means any sealant or sealant primer labeled for application to wooden marine decks.
- 44.1.24 **“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.
- 44.1.25 **“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.
- 44.1.26 **“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.
- 44.1.27 **“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.
- 44.1.28 **“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.
- 44.1.29 **“Panel installation”** means the installation of plywood, pre-decorated hardboard (or tileboard), fiberglass reinforced plastic, and similar pre-decorated or non-decorated panels to studs or solid surfaces using an adhesive formulated for that purpose.
- 44.1.30 **“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.
- 44.1.31 **“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.

- 44.1.32 **“Plastic cement welding adhesive primer”** means any primer intended by the manufacturer for use to prepare plastic substrates prior to bonding or welding.
- 44.1.33 **“Plasticizer”** means a material, such as a high boiling point organic solvent, that is added to a hard plastic to increase its flexibility or pliability.
- 44.1.34 **“Polyvinyl chloride welding adhesive” or “PVC welding adhesive”** means any adhesive intended by the manufacturer for use in the welding of PVC plastic pipe.
- 44.1.35 **“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.
- 44.1.36 **“Propellant”** means a fluid under pressure that expels the contents of a container when a valve is opened.
- 44.1.37 **“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, twenty (20) percent or more of the reactive organic compound becomes an integral part of a finished material.
- 44.1.38 **“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.
- 44.1.39 **“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.
- 44.1.40 **“SCAQMD”** means the South Coast Air Quality Management District, a part of the California Air Resources Board.
- 44.1.41 **“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.
- 44.1.42 **“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. Sealers and other materials that are applied to a single substrate to protect or decorate are not “sealants.”
- 44.1.43 **“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.
- 44.1.44 **“Single-ply roof membrane”** means a prefabricated single sheet of compounded synthetic material, such as ethylene-propylenediene monomer, polyvinyl chloride, thermal polyolefin or ketone ethylene ester, that is applied in a single layer to a building roof.

- 44.1.45 **“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.
- 44.1.46 **“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.
- 44.1.47 **“Single-ply roof membrane sealant”** means any sealant labeled for application to single-ply roof membrane.
- 44.1.48 **“Solicit”** means to require for use or to specify, by written or oral contract.
- 44.1.49 **“Solvent”** means organic compounds that are used as diluents, thinners, dissolvers, viscosity reducers, cleaning agents or other related uses.
- 44.1.50 **“Structural glazing adhesive”** means any adhesive intended by the manufacturer to apply glass, ceramic, metal, stone or composite panels to exterior building frames.
- 44.1.51 **“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.
- 44.1.52 **“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.
- 44.1.53 **“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(s) is less than 0.25 mils.
- 44.1.54 **“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.
- 44.1.55 **“Tire retread 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.
- 44.1.56 **“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.

- 44.1.57 **“Traffic marking tape adhesive primer”** means any primer intended by the manufacturer for application to surfaces prior to installation of traffic marking tape.
- 44.1.58 **“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.
- 44.1.59 **“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.

44.2. Applicability and Exemptions

- 44.2.1 Except as provided in subsection 44.2.2 - 44.2.4, the provisions of this regulation apply to any person who, on or after July 1, 2009, sells, offers for sale, supplies or manufactures any adhesive, sealant, adhesive primer or sealant primer for use within the State of Rhode Island, as well as any person who uses or solicits the use of any adhesive, sealant, adhesive primer or sealant primer within the State of Rhode Island.
- 44.2.2 The emissions limitations in section 44.3 shall be applicable to single-ply roof membrane installation and repair adhesives, single-ply roof membrane sealants and single-ply roof membrane adhesive primers according to the following schedule:
- (a) For the year 2009, from July 1 through August 31;
 - (b) For the years 2010 and 2011, from May 1 through September 30: and
 - (c) On and after January 1, 2012.
- 44.2.3 The provisions of this regulation do not apply to the following
- (a) Adhesives, sealants, adhesive primers and sealant primers manufactured prior to July 1, 2009
 - (b) Testing or evaluation of adhesives, sealants, adhesive primers or sealant primers in a research and development, quality assurance or analytical laboratory, provided that records are maintained as specified in subsection 44.5.3 of this rule;
 - (c) Adhesives, sealants, adhesive primers and sealant primers that are subject to Rhode Island Air Pollution Control Regulation No. 31, “Control of Volatile Organic Compounds from Consumer Products,” or Rhode Island Air Pollution Control Regulation No. 33, “Control of Volatile Organic Compounds from Architectural Coatings and Industrial Maintenance Coatings;”
 - (d) Adhesives and sealants that contain less than 20 grams of VOC per liter of product, less water, as applied;

- (e) Cyanoacrylate adhesives;
- (f) Aerosol adhesives;
- (g) Adhesives, sealants, adhesive primers or sealant primers, except plastic cement welding adhesives and contact bond 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 1 pound or less;
- (h) Contact bond adhesives that are sold or supplied by the manufacturer or supplier in containers with a net volume of 1 gallon or less.
- (i) The use of adhesives, sealants, adhesive primers, sealant primers, surface preparation and cleanup solvents in the following operations:
 - (1) Tire repair, provided that the product label states "**For tire repair only**;"
 - (2) Assembly, repair and manufacture of aerospace or undersea-based weapon systems;
 - (3) Manufacture of medical equipment; and
 - (4) Metal cleaning operations regulated by and performed in accordance with Rhode Island Air Pollution Control Regulation No. 36, "Control of Emissions from Organic Solvent Cleaning;"
- (j) The use of adhesives, sealants, adhesive primers and sealant primers at a facility, if the total VOC emissions from all adhesives, sealants, adhesive primers and sealant primers used at the facility are less than 200 pounds in any consecutive twelve month period. Any person claiming an exemption pursuant to this paragraph shall record and maintain monthly operational records sufficient to document rolling twelve month VOC emissions in accordance with the specifications in section 44.5 of this regulation
- (k) Adhesives, sealants, adhesive primers and sealant primers that are sold, offered for sale or manufactured in Rhode Island for shipment and use outside of Rhode Island
- (l) The use of any adhesive, sealant, adhesive primer, sealant primer, cleanup solvent or surface preparation solvent at a private residence for non-commercial purposes.
- (m) The use of adhesives, cleanup solvents and surface preparation solvents in the repair and manufacture of submarines, when the use of noncomplying material is necessary to meet military performance specifications, provided that records of the use of such noncompliant materials are maintained in accordance with the specifications in section 44.5 of this regulation.

44.2.4 The VOC content limits in Tables 44-1 and 44-2 of this regulation shall not apply if the total volume of adhesives, sealants, primers, cleanup and surface preparation solvents which have VOC contents in excess of those specified in Table 44-1 and 44-2 applied at a facility does not exceed 55 gallons in any consecutive twelve month period. Any person claiming exemption pursuant to this subsection shall record and maintain monthly operational records sufficient to demonstrate compliance with this exemption in accordance with the specifications in section 44.5 of this rule.

44.3. Emissions Limitations

44.3.1 Except as provided in subsections 44.2.3, 44.2.4 and 44.3.5. of this regulation, no person shall manufacture, use, solicit the use of, sell, supply or offer for sale in Rhode Island any adhesive, sealant, adhesive primer or sealant primer that has a VOC content in excess of the applicable limit specified in Table 44-1 and 44-2.

44.3.2 For adhesives, the VOC content limits in Table 44-1 and Table 44-22 shall apply as follows:

- (a) For adhesives listed in Table 44-1, the VOC content limits in Table 44-1, not the limits in Table 44-2, shall apply.
- (b) For adhesives not listed in Table 44-1, the applicable VOC content limit in Table 44-2, which are based on substrate category, shall apply. If an adhesive is used to bond two different substrates, the applicable substrate category in Table 44-2 with the higher VOC content shall apply.

44.3.3 For surface preparation solvents:

- (a) Except as provided in paragraph (b) of this subsection, the VOC content of surface preparation solvents shall be less than 70 grams per liter;
- (b) If a surface preparation solvent is used in applying single-ply roofing, the composite vapor pressure, excluding water and exempt compounds, of the surface preparation solvent shall not exceed 45 mm Hg at 20° Celsius;

44.3.4 For cleanup solvents:

- (a) Except as provided in paragraph (b) of this subsection, the composite vapor pressure, excluding water, of a cleanup solvent shall not exceed 45 mm Hg at 20° Celsius;
- (b) Removal of an adhesive, sealant, adhesive primer or sealant primer from the parts of spray application equipment shall be performed:
 - (1) In an enclosed cleaning system or equivalent cleaning system, as determined by the test method identified in subsection 44.6.8 of this regulation, or

- (2) Using a solvent with a VOC content less than or equal to 70 grams of VOC per liter of material. Parts containing dried adhesive may be soaked in a solvent if the composite vapor pressure of the solvent, excluding water and exempt compounds, is less than or equal to 9.5 mm Hg at 20° Celsius and the parts and solvent are in a closed container that remains closed except when adding parts to or removing parts from the container.

44.3.5 A person using an adhesive, sealant, adhesive primer or sealant primer subject to this rule may comply with the VOC content limits in Tables 44-1 and 44-2 using air pollution control equipment, provided that such equipment meets the following requirements:

- (a) The air pollution control equipment reduces VOC emissions from all adhesives, sealants, adhesive primers or sealant primers used at the facility that are subject to this regulation by an overall capture and control efficiency of at least 85%, by weight;
- (b) For thermal incinerators, the combustion temperature shall be monitored continuously;
- (c) For catalytic incinerators, inlet and exhaust gas temperatures shall be monitored continuously;
- (d) For control devices other than thermal or catalytic incinerators, including carbon absorbers, the control device efficiency shall be monitored continuously;
- (e) Records sufficient to demonstrate compliance with the requirements of this subsection shall be maintained as specified in subsection 44.5.2 of this regulation.
- (f) A minor source permit or major source permit, issued pursuant to Air Pollution Control Regulation No. 9, has been issued for the air pollution control equipment. If the air pollution control equipment is exempt from the requirements to obtain a permit in Regulation No. 9, a registration form must be on file with the Office of Air Resources.
- (g) Facilities that intend to comply with this regulation using air pollution control equipment may apply to the Director for an extension to the compliance date specified in subsection 44.2.1. Extension requests must be received, in writing, by July 1, 2009 and must include the date by which a permit application or registration form will be submitted and the date by which the control equipment will be installed.

44.3.6 Any person using adhesives, sealants, adhesive primers, sealant primers, surface preparation or clean-up solvents subject to this regulation shall store or dispose of all absorbent materials, such as cloth or paper, which are moistened with adhesives, sealants, primers or solvents subject to this regulation in non-absorbent containers that

shall be closed except when placing materials in or removing materials from the container.

- 44.3.7 No person who applies or solicits the application of any adhesive, sealant, adhesive primer or sealant primer subject to this regulation shall add solvent to such adhesive, sealant or primer in an amount in excess of the manufacturer's recommendation for application, if such addition causes the adhesive, sealant or primer to exceed the applicable VOC content limit in Table 44-1 or 44-2.

Table 44-1 VOC Content Limits for Adhesives, Sealants, Adhesive Primers, Sealant Primers and Adhesives

Adhesive, sealant, adhesive primer or sealant primer category	VOC content limit (as applied) (grams VOC per liter*)
<i>Adhesives</i>	
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
<i>Sealants</i>	
Architectural	250
Marine deck	760
Nonmembrane roof installation/repair	300
Roadway	250
Single-ply roof membrane	450
Other	420
<i>Adhesive Primers</i>	
Automotive glass	700
Plastic cement welding	650
Single-ply roof membrane	250

Traffic marking tape	150
Other	250
<i>Sealant Primers</i>	
Non-porous architectural	250
Porous architectural	775
Marine deck	760
Other	750

Table 44-2 VOC Content Limits for Adhesives Applied to Listed Substrates

Substrate	VOC content limit (as applied) (grams VOC per liter*)
Flexible vinyl	250
Fiberglass	200
Metal	30
Porous material	120
Rubber	250

* The VOC content is determined as the weight of volatile organic compounds, less water, determined as specified in section 44.6 of this regulation..

44.4. Labeling Requirements

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

- (a) A statement of the manufacturer's recommendation regarding thinning, reducing, or mixing of the product, provided that:
 - (1.) This requirement does not apply to the thinning of a product with water; and
 - (2.) If thinning of the product prior to use is not necessary, the statement must specify that the product is to be applied without thinning;
- (b) The maximum or the actual VOC content of the product, as supplied, in grams of VOC per liter of product, calculated as specified in section 44.6 of this regulation;
- (c) The maximum VOC content of the product, as applied, in grams of VOC per liter of product, after thinning according to the manufacturer's maximum thinning recommendation.

44.5. Record keeping and Reporting

44.5.1. Except as provided in subsection 44.5.2, each person subject to this regulation shall maintain records sufficient to demonstrate compliance with the applicable limitations in section 44.3 of this regulation. Such records shall include, as applicable, but not be

limited to, the following information for each adhesive, sealant, adhesive primer, sealant primer, cleanup solvent and surface preparation solvent in use or in storage::

- (a) The product name, manufacturer and applicable category or substrate, as listed in Tables 44-1 and 44-2;
- (b) The VOC content of the product, as supplied, in grams of VOC per liter of product, calculated as specified in section 44.6 of this regulation;;
- (c) The name and VOC content of any catalysts, reducers, thinners or other components with which the product is mixed prior to the use and the mix ratio used:
- (d) The final VOC content of the product, as applied, after mixing, in grams of VOC per liter of product; and
- (e) The monthly volume of product used.

44.5.2. Any person who complies with section 44.3 through the use of air pollution control equipment, as specified in subsection 44.3.5, shall record the following information:

- (a) The volume used per day of each adhesive, sealant, adhesive primer, sealant primer or solvent with a VOC content that exceeds the applicable VOC content limit in Table 44-1 or 44-2;
- (b) Daily hours of operation of the control equipment;
- (c) Date and type of maintenance operations performed on the control equipment,
- (d) For thermal incinerators, the combustion temperature, recorded daily;
- (e) For catalytic incinerator; the inlet and exhaust gas temperatures, recorded daily;
- (f) For control devices other than thermal and catalytic incinerators, the VOC concentrations of the inlet and exhaust gas; and
- (g) Any other records necessary to document that the control equipment is in compliance with the control and capture efficiency requirement in paragraph 44.3.5(a).

44.5.3. For adhesives, sealants, adhesive primers and sealant primers subject to the laboratory testing exemption pursuant to paragraph 44.2.3(b) of this regulation, the person conducting the testing shall make and maintain records of all such materials used, including, but not limited to, the product name, the manufacturer and the product category of the material or type of application.

44.5.4. Information recorded pursuant to requirements of this section shall be maintained at the facility for five years and shall be made available to the Director within 90 days of request.

44.6. Compliance Provisions and Test Methods

- 44.6.1. Except as provided in subsections 44.6.2 – 44.6.5, the VOC and solids content of all non-aerosol adhesives, adhesive primers and cleanup solvents shall be determined using U.S. EPA Reference Method 24, as identified in 40 CFR 60, Appendix A, or SCAQMD Method 304.
- 44.6.2. The organic content of exempt organic compounds shall be determined using ASTM D4457-85, as applicable.
- 44.6.3. The VOC content of any plastic cement welding adhesive or primer shall be determined using SCAQMD Method 316A.
- 44.6.4. To determine if a diluent is a reactive diluent, the percent of the reactive organic compound that becomes an integral part of the finished materials shall be determined using SCAQMD Method 316A.
- 44.6.5. The composite vapor pressure of organic compounds in cleaning materials shall be determined by quantifying the amount of each compound in the blend using gas chromatographic analysis (ASTM E 260-91) for organics and ASTM D3792-79 for water content, as applicable, and the following equation:

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

Where:

Ppc = VOC composite partial pressure at 20 C, in mm Hg

Wi = Weight of the "i"th VOC compound, in grams, as determined by ASTM E 260-91

Ww = Weight of water, in grams as determined by ASTM D 3792-86

We = Weight of the "i"th exempt compound, in grams, as determined by ASTM E 260-91

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

Mww = Molecular weight of water, 18 grams per g-mole

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

Vpi = Vapor pressure of the "i"th VOC compound at 20 C, in mm Hg, as determined by subdivision (6) of this section

- 44.6.6. The vapor pressure of each single component compound may be determined from ASTM D2879-86 or may be obtained from any of the following sources:
- (a) The most recent edition of *The Vapor Pressure of Pure Substances*, Boublik, Fried, and Hala; Elsevier Scientific Publishing Company, New York;
 - (b) The most recent edition of *Perry's Chemical Engineer's Handbook*, McGraw-Hill Book Company;
 - (c) The most recent edition of *CRC Handbook of Chemistry and Physics*, Chemical Rubber Publishing Company;
 - (d) The most recent edition of *Lange's Handbook of Chemistry*, John Dean, editor, McGraw-Hill Book Company; or
 - (e) Additional sources approved by the SCAQMD or other California air districts.
- 44.6.7. If air pollution control equipment is used to meet the requirements of this rule, the owner or operator shall make the following determinations:
- (a) The measurement of capture efficiency shall be conducted and reported in accordance with the EPA Technical Document "*Guidelines for Determining Capture Efficiency*," issued January 9, 1995; and
 - (b) The control efficiency shall be determined in accordance with U.S. EPA Methods 25, 25A, 25B or CARB Method 100.
- 44.6.8. 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," dated October 3, 1989. The test solvent for this determination shall be any lacquer thinner with a minimum vapor pressure of 105 mm of Hg at 20° Celsius, and the minimum test temperature shall be 15° Celsius.
- 44.6.9. For adhesives that do not contain reactive diluents, grams of VOC per liter of adhesive, less water, shall be calculated according to the following equation:

$$\text{Grams of VOC per liter of adhesive} = \frac{W_s - W_w - W_e}{V_m - V_w - V_e}$$

Where

- | | | |
|-------|---|--|
| W_s | = | weight of volatile compounds, in grams |
| W_w | = | weight of water, in grams |
| W_e | = | weight of exempt compounds, in grams |
| V_m | = | volume of material, in liters |
| V_w | = | volume of water, in liters |
| V_e | = | volume of exempt compounds, in liters |

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

$$\text{Grams of VOC per liter of adhesive} = \frac{Wrs - Wrw - Wre}{Vrm - Vrw - Vre}$$

Where

Wrs = weight of volatile compounds not consumed during curing, in grams
Wrw = weight of water not consumed during curing, in grams
Wre = weight of exempt compounds not consumed during curing, in grams
Vrm = volume of material not consumed during curing, in liters
Vrw = volume of water not consumed during curing, in liters
Vre = volume of exempt compounds not consumed during curing, in liters

44.6.11. Grams of VOC per liter of material shall be calculated according to the following equation:

$$\text{Grams of VOC per liter of materials} = \frac{Ws - Ww - We}{Vm}$$

Where

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

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

$$\% \text{ VOC by weight} = [(Wv / W)] \times 100$$

Where

Wv = weight of VOCs in grams
W = weight of material in grams

44.7. General Provisions

44.7.1. Purpose

The purpose of this regulation is to limit the emissions of volatile organic compounds from adhesives and sealants.

44.7.2. Authority

These regulations are authorized pursuant to R.I. Gen. Laws § 42-17.1-2(s) and 23-23, as amended, and have been promulgated pursuant to the procedures set forth in the R.I. Administrative Procedures Act, R.I. Gen. Laws Chapter 42-35.

44.7.3. Application

The terms and provisions of this regulation shall be liberally construed to permit the Department to effectuate the purposes of state law, goals and policies.

44.7.4. Severability

If any provision of this regulation or the application thereof to any person or circumstance, is held invalid by a court of competent jurisdiction, the validity of the remainder of the regulation shall not be affected thereby.

44.7.5. Effective Date

The foregoing regulation, "Control of Volatile Organic Compounds from Adhesives and Sealants", is hereby adopted and filed with the Secretary of State this 12th day of February, 2015 in accordance with the provisions of Chapters 23-23, 42-35, 42-17.1, 42-17.6, of the General Laws of Rhode Island of 1956, as amended.

Janet Coit, Director
Department of Environmental Management

Notice Given on: **January 20, 2009**

Public Hearing held: **February 20, 2009**

Filing Date: **May 15, 2009**

Effective Date: **June 4, 2009**