

YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT

RULE 2.33 - ADHESIVE OPERATIONS

(Adopted September 14, 1994; Revised August 13, 1997; Revised March 12, 2003)

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100 GENERAL

- 101 **PURPOSE:** To limit the emissions of volatile organic compounds (VOC) from the use of adhesives, sealants, adhesive primers, sealant primers, and from the related use of solvents in the application of adhesives.
- 102 **APPLICABILITY:** Except as provided in Sections 110, 111, 112, 113, or 114 the provisions of this rule shall apply to any person who manufactures, applies, solicits the application of, supplies, sells, or offers for sale any adhesive, sealant, adhesive primer, or sealant primer in the Yolo-Solano Air Quality Management District (District), and to any person who uses a solvent for surface preparation, cleaning or stripping in the application of adhesives.
- 110 **EXEMPTIONS - GENERAL:** The provisions of this rule shall not apply to the following:
- 110.1 Any stationary source where the total VOC emissions from all materials listed in TABLES 1 and/or 2 are less than 200 pounds per calendar year. Any person claiming this exemption shall maintain monthly usage records that can substantiate this claim. Such records shall be maintained on site for a period of at least 5 years from the date of entry and made available to District personnel upon request.
- 110.2 Any material listed in TABLES 1, 2, or 3 that contains less than 20 grams of VOC per liter, as applied.
- 110.3 Any material listed in TABLES 1 or 2 that is being tested or evaluated in any research and development, quality assurance, or analytical laboratory. A person seeking to claim this exemption shall notify the APCO in writing of his or her intention to make use of the exemption. Any person claiming this exemption shall maintain monthly usage records. Such records shall be maintained on site for a period of at least 5 years from the date of entry and made available to District personnel upon request.
- 110.4 Adhesives used in tire repair operations,

- provided that the manufacturer's label contains the statement "For Tire Repair Only."
- 110.5 Any material listed in TABLES 1 or 2, except ABS welding adhesives, CPVC welding adhesives, PVC welding adhesives, other plastic cement welding adhesives, or plastic cement welding adhesive primers, that is sold or supplied by the manufacturer or supplier in containers having a capacity of 8 fluid ounces or less.
- 110.6 Adhesives and sealants subject to the California Air Resources Board consumer products regulation found in Title 17 of the California Code of Regulations, beginning at Section 94507.
- 110.7 Adhesives or sealants used in graphic arts operations subject to the requirements of District Rule 2.29, Graphic Arts Printing Operations.
- 110.8 Solvent welding operations used in the manufacturing of medical devices, such as, but not limited to, catheters, heart valves, blood cardioplegia machines, tracheotomy tubes, blood oxygenators, and cardiatory reservoirs.
- 110.9 Cyanoacrylate adhesives.
- 111 **EXEMPTION - ADHESIVE SUBSTRATE LIMITED USE:** The VOC content limits specified in TABLE 2 shall not apply to any stationary source that applies less than 55 gallons per calendar year, only if a complying material is not available. Any person seeking to claim this exemption shall notify the APCO in writing prior to the use of the material and shall maintain monthly usage records that can substantiate this claim. Such records shall be maintained on site for a period of at least 5 years from the date of entry and made available to District personnel upon request.
- 112 **EXEMPTION - CONTACT BOND ADHESIVES:** The provisions of Section 301 shall not apply to contact bond adhesives that are subject to the Consumer Product Safety Commission regulation in 16 CFR Part 1302, that have a

flash point greater than 20 degrees Fahrenheit as determined pursuant to those regulations, that are sold in packages that contain 3.79 liters (1 gallon) or less, and that are used at a home, a construction site, or at any location other than a stationary source.

113 **EXEMPTION - PROHIBITION OF SALE:** The provisions of Section 306 shall not apply to any manufacturer that meets all of the following:

113.1 The VOC content is displayed on the container or container label as determined in accordance with the procedures described in Section 403, as applicable.

113.2 The category information (as listed in TABLES 1 and 2) for such material is displayed on the container or container label.

113.3 The material is not sold directly to a user or a sales outlet located in the District, or the material was sold to an independent distributor located in the District that is not a subsidiary of, or under the direct control of the manufacturer.

114 **EXEMPTION - PROHIBITION OF SUPPLY OR SALE:** The provisions of Section 306 shall not apply to any person who distributes, supplies, sells, or offers for sale any material to a stationary source that operates a collection and control system in accordance with Section 305.

200 DEFINITIONS

201 **ABS WELDING ADHESIVE:** An adhesive that is used to weld acrylonitrile-butadiene-styrene (ABS) pipe. ABS pipe is made by reacting monomers of acrylonitrile, butadiene, and styrene and is normally identified with an ABS marking.

202 **ADHESIVE:** Any material that is used to bond one surface to another surface by attachment.

203 **ADHESIVE PRIMER:** Any material that is applied to a substrate, prior to the application of an adhesive, to provide a bonding surface.

- 204 **AIR POLLUTION CONTROL OFFICER (APCO):** The Air Pollution Control Officer of the Yolo-Solano Air Quality Management District.
- 205 **ARCHITECTURAL SEALANT & SEALANT PRIMER:** Any sealant or sealant primer intended by the manufacturer to be applied to a stationary structure, including mobile homes, and their appurtenances. For the purpose of this rule, appurtenances include but are not limited to, hand railings, bathroom and kitchen fixtures, fences, rain gutters and downspouts, and windows.
- 206 **AUTOMOTIVE GLASS ADHESIVE PRIMER:** An adhesive primer that is applied to automotive glass prior to installation with an adhesive/sealant. This primer improves adhesion to the pinch weld and blocks ultraviolet light.
- 207 **CERAMIC TILE INSTALLATION ADHESIVE:** An adhesive that is used for the installation of ceramic tiles.
- 208 **CLEANUP:** To remove uncured adhesives, sealants, or primers from surfaces or to clean equipment used in applying a material.
- 209 **COMPUTER DISKETTE JACKET MANUFACTURING ADHESIVE:** An adhesive that is used to glue the fold-over flaps to the body of a vinyl computer diskette jacket.
- 210 **CONTACT BOND ADHESIVE:** An adhesive that forms an instantaneous bond that cannot be repositioned when substrates, on which the adhesive is applied and allowed to dry, are brought together using momentary pressure.
- 211 **CONTACT BOND ADHESIVE-SPECIAL SUBSTRATES:** An adhesive that is used for any of the following:
- 211.1 The bonding of two nonporous substrates.
 - 211.2 The bonding of decorative laminate in postforming application.
 - 211.3 The bonding of decorative laminate to metal, melamine-covered board, or cured surfaces.
 - 211.4 The bonding of any substrate to metal, rubber, rigid plastic, or wood veneer not

exceeding 1/16 inch in thickness.

- 212 **COVE BASE INSTALLATION ADHESIVE:** An adhesive used for the installation of cove (or wall base), which is generally made of vinyl or rubber, on a wall or vertical surface at floor level.
- 213 **CPVC WELDING ADHESIVE:** An adhesive used for the welding of CPVC plastic pipe. Chlorinated polyvinyl chloride (CPVC) plastic is a polymer of the chlorinated polyvinyl monomer that contains 67 percent chlorine and is normally identified with a CPVC marking.
- 214 **CURED:** Dry to the touch.
- 215 **CYANOACRYLATE ADHESIVE:** An adhesive with a cyanoacrylate content of at least 90 percent by weight.
- 216 **DRYWALL INSTALLATION:** The installation of gypsum dry wall to studs or solid surfaces.
- 217 **ENCLOSED GUN WASHER:** A device used to clean spray guns, pots, cups, or hoses, that has a closed solvent container that is not open to the ambient air when in use. The solvent may be flushed through the spray equipment by air, hydraulic pressure, or by pumping.
- 218 **EXEMPT COMPOUNDS:** For the purposes of this rule, "exempt compounds" has the same meaning as in the Definitions of District Rule 1.1, General Provisions and Definitions.
- 219 **FIBERGLASS:** A fiber made of fine filaments of glass.
- 220 **FLEXIBLE VINYL:** A nonrigid polyvinyl chloride (PVC) plastic with at least five (5) percent of plasticizer content by weight.
- 221 **HAND APPLICATION:** The application of a material by manual equipment. Manual equipment includes paint brushes, hand rollers, trowels, spatulas, daubers, rags, sponges, as well as mechanically or pneumatically driven syringes that do not atomize the applied materials.
- 222 **HIGH PRESSURE LAMINATE:** Sheets of materials, consisting of paper, fabric, or other core material, that have been laminated at temperatures exceeding 265 degrees

Fahrenheit, and at pressures between 1000 and 1400 pounds per square inch.

- 223 **HVLP APPLICATION EQUIPMENT:** High volume low pressure (HVLP) spray equipment used to apply coatings by means of a spray gun which operates using air pressure between 0.1 and 10 pounds per square inch.
- 224 **INDOOR FLOOR COVERING INSTALLATION ADHESIVE:** An adhesive that is used for the installation in an enclosed area (not exposed to ambient weather conditions during normal use), wood flooring, carpet, carpet pads, rubber flooring, resilient tile, vinyl tile, vinyl backed carpet, resilient sheet and roll, or artificial grass. Indoor floor covering installation does not include ceramic tile installation, the installation of perimeter bonded sheet flooring with vinyl backing onto a non-porous substrate, such as flexible vinyl, or subfloor installation.
- 225 **LAMINATE:** A product made by bonding together two or more layers of material.
- 226 **LOW-SOLIDS MATERIAL:** Any material listed in TABLES 1, 2, or 3 that contains 120 grams or less of solids per liter of material.
- 227 **MARINE DECK SEALANT & SEALANT PRIMER:** Any sealant or sealant primer intended by the manufacturer to be applied to the wooden deck of marine vessels.
- 228 **METAL TO URETHANE/RUBBER MOLDING OR CASTING ADHESIVE:** Any adhesive intended by the manufacturer to bond metal to high density or elastomeric urethane or molded rubber materials, in heated molding or casting processes, to fabricate products such as rollers for computer printers or other paper handling equipment.
- 229 **MULTIPURPOSE CONSTRUCTION ADHESIVE:** Any adhesive intended by the manufacturer for 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.
- 230 **NONMEMBRANE ROOF INSTALLATION OR REPAIR ADHESIVE & SEALANT:** Any adhesive or sealant intended by the manufacturer for the installation or repair of

nonmembrane roofs and is not intended for the installation of prefabricated single-ply flexible roofing membrane. This category includes plastic or asphalt roof_cement, asphalt roof coatings, and cold application cement.

- 231 **OUTDOOR FLOOR COVERING INSTALLATION ADHESIVE:** Any adhesive intended by the manufacturer for the installation of floor covering that is not in an enclosure and exposed to ambient weather conditions during normal use.
- 232 **PANEL INSTALLATION:** 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.
- 233 **PERIMETER BONDED SHEET VINYL FLOORING INSTALLATION:** 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 floor.
- 234 **PLASTIC:** Various synthetic materials chemically formed by the polymerization of organic (carbon-based) substances.
- 235 **PLASTIC CEMENT WELDING ADHESIVE PRIMER:** Any primer intended by the manufacturer to prepare plastic substrates prior to bonding or welding.
- 236 **PLASTIC FOAM:** A foam constructed of plastic material.
- 237 **PLASTICIZER:** A material, such as a high boiling point organic solvent, that is incorporated into an adhesive to increase its flexibility, workability, or distensibility.
- 238 **POROUS MATERIAL:** A material whose surface is permeable to liquids. Such materials include but are not limited to wood, paper, foam plastics, and cardboard.
- 239 **PVC WELDING ADHESIVE:** Any adhesive intended by the manufacturer for the welding of polyvinyl chloride (PVC) plastic pipe. PVC plastic is a polymer of the chlorinated polyvinyl monomer that contains 57 percent chlorine and is normally identified with a PVC marking.

- 240 **ROADWAY SEALANT:** Any sealant intended by the manufacturer to be applied to public streets, highways, and other surfaces, including but not limited to curbs, berms, driveways, and parking lots.
- 241 **SEALANT:** Any material with adhesive properties that is formulated primarily to fill, seal, waterproof, or weatherproof gaps or joints between two surfaces.
- 242 **SEALANT PRIMER:** Any primer intended by the manufacturer to be applied to a substrate, prior to the application of a sealant, to enhance the bonding surface.
- 243 **SINGLE-PLY ROOF MEMBRANE ADHESIVE PRIMER:** Any primer intended by the manufacturer to clean and promote adhesion of the single-ply roof membrane seams or splices prior to bonding.
- 244 **SINGLE-PLY ROOF MEMBRANE INSTALLATION & REPAIR ADHESIVE:** An adhesive intended by the manufacturer to be used for the installation or repair of a prefabricated single-ply flexible roofing membrane. Single-ply roofing membranes are field-applied using just one layer of membrane material. Installation includes, as a minimum, attaching the edge of the membrane to the edge of the roof and applying flashing to the vents, pipes and ducts that protrude through the membrane. Repair includes gluing the edges of tears together, attaching a patch over a hole and reapplying flashings to vents, pipes or ducts installed through the membrane.
- 245 **SINGLE-PLY ROOFING MEMBRANE SEALANT:** A sealant intended by the manufacturer to be used for the installation or repair of a prefabricated single-ply flexible roofing membrane.
- 246 **SOLVENT:** A VOC-containing material which is used as a cleaning agent, stripper, diluent, thinner, dissolver, viscosity reducer, or for similar uses.
- 247 **SOLVENT WELDING:** The softening of the surfaces of two substrates by wetting them with solvents and/or adhesives, and joining them together with a chemical and/or physical reaction(s) to form a fused union.
- 248 **STATIONARY SOURCE:** For the purposes of this rule, "stationary source" has the same meaning as in the

Definitions of District Rule 3.4, New Source Review.

- 249 **STRIPPER:** A VOC-containing material used to remove cured_adhesives or cured sealants.
- 250 **STRUCTURAL GLAZING ADHESIVE:** Any adhesive intended by the manufacturer to be used to adhere glass, ceramic, metal, stone, or composite panels to the exterior of a building.
- 251 **SURFACE PREPARATION:** The removal of dust, dirt, soil, oil, grease, etc. from a substrate prior to the application of an adhesive, sealant, adhesive primer, or sealant primer.
- 252 **THIN METAL LAMINATING ADHESIVE:** Any adhesive intended by the manufacturer to bond 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 millimeters.
- 253 **TIRE REPAIR:** The repair of a hole, tear, fissure, or blemish in a tire casing by grinding or gouging, applying adhesive or sealant product and filling the hole or crevice with rubber.
- 254 **TIRE RETREAD:** The process of tire retreading where adhesives are applied to the back of precured tread rubber and to the casing and cushion rubber. It may also be used to seal buffed tire casings to prevent oxidation while the tire is being prepared for a new tread
- 255 **TOP & TRIM INSTALLATION:** The installation of automotive, marine, or aeronautical trim, including, but not limited to, headliners, vinyl tops, vinyl trim, dash covering, door covering, floor covering, panel covering, and upholstery.
- 256 **TRAFFIC MARKING TAPE:** Any preformed reflective film intended by the manufacturer to be applied to public streets, highways, and other surfaces, including but not limited to curbs, berms, driveways and parking lots.
- 257 **TRAFFIC MARKING TAPE ADHESIVE PRIMER:** Any primer intended by the manufacturer to be applied to surfaces

prior to installation of traffic marking tape.

- 258 **UNDERSEA-BASED WEAPON SYSTEMS:** The fabricated part, assembly of parts or completed units of any portion of the missile launching system used on undersea ships.
- 259 **VOLATILE ORGANIC COMPOUNDS (VOC):** For purposes of this rule, has the same meaning as in Rule 1.1, General Provisions and Definitions.
- 260 **WATERPROOF RESORCINOL ADHESIVE:** 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.

300 STANDARDS

- 301 **MATERIAL VOC CONTENT:** No person shall apply any material in excess of the corresponding VOC content limits listed in TABLES 1 or 2 after the specified effective dates, as determined in accordance with the procedures described in Section 403, as applicable.

TABLE 1. MATERIAL VOC CONTENT LIMITS¹

Category:	VOC Limit g/l (lb/gal)	
	Effective ² 1/1/97	Effective 1/1/04
Adhesives:		
ABS Welding		400 (3.3)
Ceramic Tile Installation	130 (1.1)	
Computer Diskette Jacket Manufacturing		850 (7.1)
Contact Bond		250 (2.1)
Contact Bond-Specialty Substrates		250 (2.1)
Cove Base Installation		150 (1.3)
CPVC Welding		490 (4.1)
Indoor Floor Covering Installation	150 (1.3)	
Metal to Urethane/Rubber Molding or Casting		250 (2.1)
Multipurpose Construction	200 (1.7)	
Nonmembrane Roof Installation or Repair		300 (2.5)
Other Plastic Cement Welding	450 (3.8)	
Outdoor Floor Covering Installation		250 (2.1)
Perimeter Bonded Sheet Vinyl Flooring Install.		660 (5.5)
PVC Welding		510 (4.3)
Single-ply Roof Membrane Installation & Repair	250 (2.1)	
Structural Glazing	100 (0.8)	
Thin Metal Laminating		780 (6.5)

Top & Trim Installation		540 (4.5)
Tire Retread		100 (0.8)
Waterproof Resorcinol		170 (1.4)
Sealants:		
Architectural		250 (2.1)
Marine Deck		760 (6.3)
Nonmembrane Roof Installation or Repair		300 (2.5)
Roadway		250 (2.1)
Single-ply Roof Membrane		450 (3.8)
Other Sealants Not Listed		420 (3.5)
Adhesive Primers:		
Automotive Glass		700 (5.8)
Plastic Cement Welding	450 (3.8)	
Single-ply Roof Membrane		250 (2.1)
Traffic Marking Tape		150 (1.3)
Other Adhesive Primers Not Listed	250 (2.1)	
Sealant Primers:		
Nonporous Architectural		250 (2.1)
Porous Architectural		775 (6.5)
Marine Deck		760 (6.3)
Other Sealant Primers Not Listed		750 (6.3)

1. Units in grams of VOC per liter of material (pounds per gallon).

2. The limits remain in effect unless revised limits are listed in subsequent columns.

TABLE 2. ADHESIVE SUBSTRATE VOC CONTENT LIMITS¹

Adhesive Application Onto Substrate Type ³ :	VOC Limit g/l (lb/gal)	
	Effective ² 1/1/97	Effective 1/1/04
Flexible Vinyl		250 (2.1)
Fiberglass		200 (1.7)
Metal to Metal	30 (0.3)	
Porous Material	150 (1.3)	120 (1.0)
Other Substrates Not Listed	250 (2.1)	

1. Units in grams of VOC per liter of material (pounds per gallon).

2. The limits remain in effect unless revised limits are listed in subsequent columns.

3. If an adhesive is used to bond dissimilar substrates together, the adhesive with the highest VOC content limit shall be allowed.

Conversion factor: 1 pound VOC per gallon = 119.95 grams VOC per liter.

302 **SOLVENT USE:** No person shall use a solvent for surface preparation, cleanup, or stripping that exceeds the VOC content limits and/or the composite vapor pressure limits listed in TABLE 3 after the specified effective date, as determined in accordance with the procedures described in Sections 403 or 404, as applicable.

TABLE 3. SOLVENT USE LIMITS¹

Application Use	Effective 1/1/2004		
	VOC Limit g/l (lb/gal)		Vapor Pressure ²
Surface Preparation:			
Electronic Components	900 (7.5)	And	33
Medical Devices	900 (7.5)	And	33
Single-ply Roof Membrane Installation & Repair	No Limit		45
Other Substrates Not Listed	70 (0.6)		No limit
Cleanup:			
Spray Application Equipment Using Enclosed Gun Washer	No Limit		45
Soaking Spray Application Equipment Using Closed Container	No Limit		9.5
Spray Application Equipment Not Using Closed Container or Enclosed Gun Washer	70 (0.6)		No Limit
Other Than Spray Application Equipment	No Limit		45
Stripping:			
Adhesive or Sealant Material on Wood	350 (2.9)	And	2.0
Adhesive or Sealant Material on All Other	No limit		9.5

1. Units in grams of VOC per liter of material (pounds per gallon).

2. Units in millimeters of mercury at 20 degrees Celsius.

Conversion factor: 1 pound VOC/gallon (U.S.) = 119.95 grams VOC/liter.

303 **STORAGE AND DISPOSAL:** Closed non-absorbent, nonleaking containers shall be used to store any VOC-containing

material subject to this rule except when accessed for use. Self-closing, non-absorbent, and nonleaking containers shall be used for the disposal of all VOC-laden paper or cloth or similar material that is used for surface preparation, cleanup, or stripping operations.

304 **APPLICATION METHODS:** No person shall apply any material listed in TABLES 1 or 2 except in the following manner:

304.1 Hand application.

304.2 Dip coat.

304.3 Flow coat.

304.4 Brush or roll coat.

304.5 Electrodeposition equipment operated in accordance with the manufacturer's specifications.

304.6 Electrostatic spray equipment operated in accordance with the manufacturer's specifications.

304.7 High-volume low-pressure (HVLP) application equipment operated in accordance with the manufacturer's specifications.

304.8 Low-volume low-pressure (LVLP) application equipment operated in accordance with the manufacturer's specifications.

304.9 Aerosol cans.

304.10 For contact adhesives only: airless sprayer equipment, air-assisted airless sprayer equipment, or air-atomized sprayer equipment operated in accordance with the manufacturer's specifications.

304.11 Any other equivalent application method approved in writing by the APCO and the U.S. Environmental Protection Agency.

305 **VOC COLLECTION AND CONTROL SYSTEM:** In lieu of complying with the provisions of Sections 301 and/or 302, VOC

emissions may be controlled by a collection and control system that reduces VOC emissions to the atmosphere by at least 85 percent, by weight, as determined in accordance with the procedures described in Sections 405 and 406.

306 **PROHIBITION OF SUPPLY OR SALE:** No person shall distribute, supply, sell, or offer for sale, to any person within the District for use within the District, any material that exceeds the VOC content limits specified in TABLES 1 or 2, after the specified effective dates.

307 **PROHIBITION OF SPECIFICATION:** No person shall solicit, require the use of, or specify the application of, any material for use in the District that exceeds the VOC content limits specified in TABLES 1 or 2 after the specified effective dates. This prohibition shall apply to any written or oral contracts.

400 ADMINISTRATIVE REQUIREMENTS

401 **COMPLIANCE DATE:** Any person subject to the provisions of this rule shall be in compliance by March 12, 2003.

402 **CONTAINER LABELING:** No later than January 1, 2004, each manufacturer of any material listed in TABLES 1 or 2 shall include a designation on the container or the container label which reports the VOC content as supplied, expressed in grams per liter or pounds per gallon, as determined in accordance with the procedures described in Section 403, as applicable. This designation shall include recommendations regarding thinning, reducing, or mixing with any other VOC-containing materials and shall include the maximum VOC content on an as-applied basis when used in accordance with the manufacturer's recommendations.

403 **CALCULATION OF VOC CONTENT AS APPLIED:** For the purpose of determining compliance with the corresponding VOC content limits specified in TABLES 1, 2, or 3, the VOC content of a material as applied shall be determined according to the following:

403.1 Except for low-solids materials and solvents,

Yolo-Solano AQMD
Adopted September 14, 1994
Revised August 13, 1997
Revised March 12, 2003

determine the VOC content as applied, excluding the volume of water and exempt compounds using the following equation:

$$\underline{VOC\ Content} = \frac{W_v - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

where:

VOC content = Grams of VOC per liter of material.

W_v = Weight of volatiles, in grams.

W_w = Weight of water, in grams.

W_{ec} = Weight of exempt compounds, in grams.

V_m = Volume of material, in liters.

V_w = Volume of water, in liters.

V_{ec} = Volume of exempt compounds, in liters.

- 403.2 For low-solids materials and solvents, determine the VOC content, including the volume of water and exempt compounds using the following equation:

$$\underline{VOC\ Content}_{ls} = \frac{W_v - W_w - W_{ec}}{V_m}$$

where:

VOC Content_{ls} = VOC content of a low-solids material in grams of VOC per liter of coating.

W_v = Weight of volatiles, in grams.

W_w = Weight of water, in grams.

W_{ec} = Weight of exempt compounds, in grams.

V_m = Volume of material, in liters.

- 403.3 If the VOC content of a material sample is measured directly, written notification shall be given to the APCO at least 30 days prior to conducting the compliance test, to afford the APCO the opportunity to have an observer present. Such notification shall include a test protocol that is approved in writing by

Yolo-Solano AQMD

Adopted September 14, 1994

Revised August 13, 1997

Revised March 12, 2003

the APCO prior to performing such compliance test.

404 **CALCULATION OF COMPOSITE VAPOR PRESSURE:** For the purpose of determining compliance with the corresponding vapor pressure limits specified in TABLE 3, the composite vapor pressure shall be determined according to the following equation:

$$PPC = \frac{\sum_{i=1}^n (W_i)(V_{Pi}) / MW_i}{\frac{W_w}{MW_w} + \sum_{i=1}^n \frac{W_{ec}}{MW_{ec}} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

where:

PPC = VOC composite partial pressure, in millimeters of mercury at 20 degrees Celsius.
Wi = Weight of the "i"th VOC compound, in grams as determined by ASTM Method E-260-96.
Ww = Weight of water, in grams as determined by ASTM Method D-3792-99.
Wec = Weight of "i"th exempt compounds, in grams as determined by ASTM Method E-260-96.
MWi = Molecular weight of the "i"th VOC compound, in grams per gram-mole, as given in chemical reference literature.
MWw = Molecular weight of water, 18 grams per gram-mole.
MWec = Molecular weight of the "i"th exempt compound, in grams per gram-mole, as given in chemical reference literature.
V_{Pi} = Vapor pressure of the "i"th VOC compound as determined according to Section 606, in millimeters of mercury at 20 degrees Celsius.

If the composite vapor pressure of a sample is measured directly, written notification shall be given to the APCO at least 30 days prior to conducting the compliance test, to afford the APCO the opportunity to have an observer present. Such notification shall include a test protocol that is approved in writing by

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the APCO prior to performing such compliance test.

405 **APPROVED COLLECTION AND CONTROL SYSTEM:** Any person who must install a collection and control system to meet the requirements of Section 305 shall obtain prior written approval from the APCO in the form of an Authority to Construct and Permit to Operate.

406 **CALCULATION OF COLLECTION AND CONTROL SYSTEM EFFICIENCY:** For the purpose of determining compliance with the percent VOC efficiency limit specified in Section 305, the overall VOC collection and control efficiency shall be determined at least once every 12 months using the equation:

$$\underline{CE_{\text{overall}}} = (CE_{\text{capture}} \times CE_{\text{control}}) \times 100$$

where:

CE_{overall} = Overall collection and control system efficiency, in percentage.

CE_{capture} = Capture efficiency of the collection system, as determined according to Section 603, in percentage.

CE_{control} = Control efficiency of the control system, as determined according to Section 604, in percentage.

The owner or operator of such VOC collection and control system shall provide written notification to the APCO at least 30 days prior to conducting any compliance test, to afford the APCO the opportunity to have an observer present. Such notification shall include a test protocol that is approved in writing by the APCO prior to performing such compliance test.

407 **VIOLATIONS:** Failure to comply with any provision of this rule shall constitute a violation of this rule.

500 RECORD KEEPING AND REPORTING

501 **RECORD KEEPING - GENERAL:** Any person subject to Sections 301, 302, or 305 shall maintain a current file that contains all of the data necessary to verify

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compliance and shall include the following:

- 501.1 Itemized list of each material used or stored on site that is listed in TABLES 1, 2, or 3 including diluents, catalysts, thinners, solvents, viscosity reducers or other VOC-containing materials and the mix ratio. The list shall include the category type, name of material, application method, and substrate types.
- 501.2 Such list shall include the VOC content limit and/or the composite partial pressure limit of the material specified in the rule and the actual VOC content and/or composite partial pressure of the material, as applied.
- 501.3 Monthly purchase, inventory, and usage records of each material recorded in Section 501.1, reported in pounds or gallons and the mix ratio, as applicable. A violation of any provision of Section 300 shall be presumed to be a violation for each day of the reporting period up to the day the violation is discovered. A person may rebut this presumption by presenting factual evidence that demonstrates the violation did not occur on each day of the reporting period.
- 501.4 An up-to-date copy of the material safety data sheet (MSDS) or technical data sheet of each material recorded in Section 501.1 that reports the VOC content in grams per liter or pounds per gallon and/or the composite vapor pressure in millimeters of mercury at 20 degrees Celsius, as supplied.
- 501.5 Results of performance tests using the approved test methods specified in Section 600.

- 502 **RECORD KEEPING - APPROVED COLLECTION AND CONTROL SYSTEM:** In addition to provisions of Section 501, the owner or operator of a collection and control system shall maintain:

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502.1 Daily usage records in pounds or gallons of all materials that exceed the corresponding limits specified in TABLES 1, 2, or 3.

502.2 Daily records of the key operating parameters and maintenance procedures that can demonstrate continuous operation and compliance of the collection and control system.

503 **REPORTING:** All records required by Sections 501 or 502 shall be retained on site for a period of at least 5 years from the date of entry and made available to District personnel upon request.

503.1 All performance tests used to demonstrate compliance with any provision of this rule shall be documented in a report that includes sufficient detail to verify compliance. The report shall be submitted to the APCO within 60 calendar days after the completion of the test and include the date of test, the name, address, and telephone number of the testing company, and the names and titles of personnel performing the test.

503.2 Any stationary source subject to the provisions of this rule shall submit an annual throughput report to the APCO no later than March 31 for the previous calendar year. The report shall certify quarterly usage totals for each material recorded in Section 501.3.

600 TEST METHODS: The test methods and procedures listed below are approved for use to demonstrate rule compliance. A person may petition the APCO in writing to use an alternative test method or procedure. However, the alternative test method or procedure shall be approved in writing by the APCO and the U.S. Environmental Protection Agency (EPA) prior to its use. Test results determined to exceed any limits specified by this rule through the use of any test method or procedure listed below, or any alternate test method or procedure approved by the APCO and the US

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EPA, or any amendments and successors thereto, shall constitute a violation of this rule.

- 601 **DETERMINATION OF MATERIAL VOC CONTENT:** The VOC content of materials listed in TABLES 1, 2, or 3 shall be determined in accordance with U.S. EPA Method 24, Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings.
- 602 **DETERMINATION OF EXEMPT COMPOUNDS:** The content of exempt compounds contained in materials listed in TABLES 1, 2, or 3 shall be determined in accordance with American Society of Testing and Materials (ASTM) Method D-4457-91, Standard Test Method for Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings by Direct Injection into a Gas Chromatograph.
- 603 **DETERMINATION OF CAPTURE EFFICIENCY:** The capture efficiency of the collection system shall be determined in accordance with U.S. EPA's Guidelines for Determining Capture Efficiency issued January 9, 1995, as applicable.
- 604 **DETERMINATION OF CONTROL EFFICIENCY:** The efficiency of the control system and VOC concentration measured and calculated as carbon shall be determined in accordance with U.S. EPA Method 25, Determination of Total Gaseous Nonmethane Organic Emissions as Carbon, U.S. EPA Method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, or Air Resources Board Method 100, Procedures for Continuous Gaseous Emission Stack Sampling, as applicable. Exempt compounds contained in the exhaust gas of the control system shall be determined in accordance with U.S. EPA Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography or ARB Method 422, Exempt Halogenated VOCs in Gases, as applicable.
- 605 **DETERMINATION OF COMPOSITE VAPOR PRESSURE:** The composite vapor pressure of materials listed in TABLE 3 shall be determined by quantifying the amount of each compound in the blend in accordance with ASTM Method E-260-96, Standard Practice for Packed Column Gas

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Chromatography, for organics and ASTM Method D-3792-99, Standard Test Method for Water Content of Coatings by Direct Injection Into a Gas Chromatograph, for water content, as applicable, and the procedures specified in Sections 404 and 606, as applicable.

- 606 **DETERMINATION OF SINGLE COMPONENT COMPOUND VAPOR PRESSURE:** The vapor pressure of each single component compound shall be determined in accordance with ASTM Method D-2879-97, Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope, or the most current edition of a published source, including, but not limited to: Boublik, T., V. Freid and E. Hala, *"The Vapor Pressure of Pure Substances"*, Elsevier Scientific Publishing Co., New York, *Perry's Chemical Engineer's Handbook*, McGraw-Hill Book Company, *CRC Handbook of Chemistry and Physics*, Chemical Rubber Publishing Company, and *Lange's Handbook of Chemistry*, John A. Dean, editor, McGraw-Hill Book Company.
- 607 **DETERMINATION OF PLASTICIZER CONTENT:** The plasticizer content of flexible vinyls shall be determined in accordance with ASTM Method E-260-96.
- 608 **DETERMINATION OF THE VOC CONTENT OF PLASTIC WELDING CEMENT ADHESIVE OR PRIMER:** The VOC content of ABS, CPVC, PVC, or other plastic welding cement adhesive or primer shall be determined in accordance with South Coast Air Quality Management District's Method 316A, Determination of Volatile Organic Compounds in Materials Used for Pipes and Fittings.
- 609 **DETERMINATION OF THE VOC CONTENT OF MATERIALS CONTAINING CYANOACRYLATE:** The VOC content of cyanoacrylate shall be determined in accordance with South Coast Air Quality Management District's Method 316B, Determination of VOCs in Materials Containing Cyanoacrylates.

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Revised August 13, 1997
Revised March 12, 2003