

RULE 349. POLYESTER RESIN OPERATIONS. (Adopted 4/27/1993, revised [date of amended rule adoption])

A. Applicability

This rule shall apply to any person owning or operating any all-commercial and-or industrial polyester resin operations.

B. Exemptions

Except as otherwise specifically provided herein, the provisions of this rule shall not apply to the following:

1. All provisions of this rule, except Section D.1, shall not apply to the addition or use of styrene, provided the volume of styrene used is less than 50 gallons per calendar year per stationary source. Any person claiming this exemption shall maintain monthly records of the total volume of styrene used per calendar year at the stationary source consistent with Sections F.6 and make them available to the District for review upon request.

2. Any solvent cleaning performed with a solvent (including emulsions) that contains two percent by weight or less of each of the following:

a. Reactive organic compounds, and

b. Toxic air contaminants (as determined by generic solvent data, solvent manufacturer's composition data or by a gas chromatography test and a mass spectrometry test).

c. Any person claiming this exemption shall maintain the records specified in Section F.1 in a manner consistent with Section F.8 and make them available for review.

Comment [A1]: Monthly records will:
1. Substantiate the exemption during the calendar year, and,
2. Alert sources when they are encroaching on the 50 gal/year threshold.

Comment [A2]: Essentially the same as the Rule 321.B.1 exemption.

C. Definitions

See Rule 102, Definitions, for definitions not limited to this rule. For the purposes of this Rule, the following definitions shall apply:

“Associated Solvent” means any solvent used in solvent cleaning operations subject to this rule.

“Atomized Resin Application” means any resin application technology in which the resin leaves the application equipment and breaks into droplets or an aerosol as it travels from the application equipment to the surface of the part. Atomized resin application includes, but is not limited to, resin spray guns and resin chopper spray guns.

1. “Catalyst” is a means any substance added to the resin to initiate polymerization.

“Catalytic Incinerator” means any device that burns reactive organic compounds or toxic air contaminants in air using a material that increases the rate of combustion without itself undergoing a net chemical change in the process. Common catalyst materials include but are not limited to, platinum alloys, chromium, copper oxide, and cobalt.

2. “Cleaning Materials” include but are not limited to, materials used for cleaning hands, tools, molds, application equipment, and work area.

“Clear Gel Coat” means any gel coat that is clear or translucent so that underlying colors are visible. Clear gel coat is used to manufacture parts for sale. Clear gel coat do not include tooling gel coat used to build or repair molds.

Comment [A3]: Our protocol is to change the lead-in sentences in this manner.

3. ~~“Closed Mold System” is a means any~~ method of forming objects from polyester resins by placing the polyester resin material in a confining mold cavity and applying pressure and/or heat.

~~“Control” means the reduction, by destruction or removal, of the amount of affected pollutants in a gas stream prior to discharge to the atmosphere.~~

4. ~~“Control System” includes a control device and a collection system means any combination of pollutant capture system(s) and control device(s) used to reduce discharge to the atmosphere of reactive organic compound or toxic air contaminant emissions generated by a regulated operation.~~

5. ~~“Cross-Linking” is the means any~~ chemical process of chemically bonding two or more polymer chains together.

6. ~~“Cure” means to polymerize, i.e., to transform from a liquid to a solid or semi-solid state to achieve desired product physical properties, including hardness.~~

~~“Electrostatic Spray” means any method of applying a spray coating in which an electrical charge is applied to the coating and the substrate is grounded. The coating is attracted to the substrate by the electrostatic potential between them.~~

7. ~~“Fiberglass” is means a~~ fiber made from glass and similar in appearance to wool or cotton fiber.

~~“Filler” means any finely divided inert (non-ROC) material that is added to the resin to enhance its mechanical properties and extend its volume. Fillers include, but are not limited to, silica, carbon black, talc, mica and calcium carbonate.~~

~~“Fire Retardant Resin” means any polyester resin material used to make products that are resistant to flame or fire.~~

~~“Fluid Impingement Technology” means any spray gun that produces an expanding nonmisty curtain of liquid by the impingement of low-pressure uninterrupted liquid streams.~~

8. ~~“Gel Coat” is means a~~ polyester resin topcoat that provides cosmetic enhancement and improves resistance to degradation from exposure to the environment.

9. ~~“Grams of ROC Reactive Organic Compounds (ROC) per Liter of Material” is means the~~ weight of ROC reactive organic compound per volume of material and can be calculated by the following equation:

~~$$\text{Grams of ROC per liter of material} = \frac{(W_s - W_w - W_{es})}{V_m}$$~~

~~Where:~~

~~W_s = weight of volatile compounds in grams~~

~~W_w = weight of water in grams~~

~~W_{es} = weight of exempt compounds in grams~~

~~V_m = volume of material in liters~~

~~$$\text{Grams of ROC per liter of material} = \frac{W_s - W_w - W_e}{V_m}$$~~

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.

“High-Strength Resin” means any polyester resin material with a casting tensile strength of 10,000 pounds per square inch or more, used to manufacture high performance products.

Comment [A4]: Same as the formula found in Rule 353. Solvent ROC limits are expressed in grams of reactive organic compound per liter of material units.

10. **“High Volume-Low Pressure Spray Equipment”** means any spray equipment that is used to apply coatings by means of a high volume of air delivered at pressures between 0.1 and spray gun that operates at 10 psi pounds per square inch gauge of atomizing air pressure or less at the air cap.

11. **“Inhibitor”** is a means any substance used to slow down or prevent a chemical reaction.

“Lamination Resins” means any orthophthalate, isophthalate and dicyclopentadiene resins used in composite system consisting of layers of reinforcement fibers and resins.

“Liquid Leak” means any solvent or polyester resin material leak at a rate of more than three drops per minute or any visible liquid mist.

Comment [A5]: Similar to the Rule 321 definition.

12. **Low ROC Emissions Resin Systems** are polyester resin materials which contain vapor suppressants to reduce monomer evaporation loss.

“Maintenance Cleaning” means a solvent cleaning operation or activity carried out to keep clean general work areas where manufacturing or repair activity is performed, to clean tools, machinery, molds, forms, jigs, and equipment. This definition does not include the cleaning of adhesive, coating, or ink application equipment.

“Marble Resins” means any orthophthalate and modified acrylic isophthalate resins used for the fabrication of cast products.

“Mold” means any cavity or surface into or on which gel coat, resin, and fibers are placed and from which finished fiberglass parts take their form.

13. **“Monomer”** is a means any organic compound that combines with itself, or other similar compounds to become a cured thermosetting resin (e.g., styrene).

Comment [A6]: Added for ease of understanding that styrene is a monomer.

“Natural Draft Opening” means any opening in a room, building, or total enclosure that remains open during operation of the facility and that is not connected to a duct in which a fan is installed. The rate and direction of the natural draft through such an opening is a consequence of the difference in pressures on either side of the wall containing the opening.

“Non-Atomized Resin Application” means any application technology in which the resin is not broken into droplets or an aerosol as it travels from the application equipment to the surface of the part. Non-atomized resin application technology includes, but are not limited to, non-atomizing spray guns, flowcoaters, chopper flowcoaters, pressure fed resin rollers, resin impregnators, or fluid impingement technology.

“Open Molding Resin and Gel Coat Process” means any process in which the reinforcing fibers and resin are placed in the mold and are open to the surrounding air while the reinforcing fibers are saturated with resin. For the purpose of this rule, open molding includes operations in which a vacuum bag or similar cover is used to compress the uncured laminate to remove bubbles or excess resin, or to achieve a bond between core material and a laminate.

“Operating Parameter Value” means any minimum or maximum value established for a control equipment or process parameter which, if achieved by itself or in combination with one or more other operating parameter values, determines that an owner or operator has continued to comply with an applicable emission limitation.

“Pigmented Gel Coat” means any opaque gel coat used to manufacture parts for sale. Pigmented gel coat does not include tooling gel coat used to build or repair molds.

14. ~~“Polyester”~~ is a complex polymeric ester containing difunctional acids and alcohols dissolved in a monomer.

15. ~~“Polyester Resin Materials”~~ include, but are not limited to, unsaturated polyester resins such as isophthalic, orthophthalic, halogenated, bisphenol-A, vinyl-ester, or furan resins; cross-linking agents; catalysts, gel coats, inhibitors, accelerators, promoters, and any other ROC-reactive organic compound containing materials in polyester resin operations.

16. ~~“Polyester Resin Operations”~~ are means those methods used for the production or rework of products by mixing, pouring, hand lay-up, impregnating, injecting, forming, winding, spraying, and/or curing unsaturated polyester resin materials with fiberglass, fillers, or any other reinforcement materials and associated cleanup solvent cleaning.

17. ~~“Polymer”~~ is a means any chemical compound comprised of a large number of chemical units and which is formed by the chemical linking of monomers.

“Primer Gel Coat”: A gel coat used to coat the surface of composite parts prior to top-coat painting in the automotive, aerospace, marine and home building industries.

“Reactive Organic Compound” as defined in Rule 102, Definitions.

18. ~~“Repair”~~ is that part of the fabrication process that requires the addition of polyester resin material to portions of a previously fabricated product in order to mend minor structural damage means the process of returning a damaged object or an object not operating properly to good condition.

19. ~~“Resin”~~ is means any of a class of organic polymers of natural or synthetic origin used in reinforced products to surround and hold fibers, and is solid or semi-solid in the cured state.

“Solid Surface Resins” means any resin used without gel coats to fabricate homogenous solid surface products.

“Solvent” means any liquid containing any reactive organic compound or any toxic air contaminant, which is used as a diluent, thinner, dissolver, viscosity reducer, cleaning agent, drying agent, preservative, or other similar uses.

“Solvent Cleaning” means any activity, operation, or process (including, but not limited to, surface preparation, cleanup, or wipe cleaning) performed outside of a solvent cleaning machine, that uses solvent to remove uncured adhesives, uncured coatings, uncured inks, uncured polyester resin material, uncured sealant, or other contaminants, including, but not limited to, dirt, soil, oil, lubricants, coolants, moisture, fingerprints, and grease, from parts, products, tools, machinery, application equipment, and general work areas. Cleaning spray equipment used for the application of coating, adhesive, ink, polyester resin material, or sealant is also considered to be solvent cleaning irrespective of the spray material being cured.

Comment [A7]: Solvent and solvent cleaning are the same definitions found in Rule 321. Solvent includes any liquid containing any toxic air contaminant.

“Specialty Gel Coat” means any gel coat which is used in conjunction with fire retardant, corrosion resistant or high-strength materials.

20. ~~“Specialty Resin”~~ is means any halogenated, furan, bisphenol A, vinyl ester, or isophthalic resin used to make products for exposure to one or more of the following extreme environmental conditions: acute or chronic exposure to corrosive, caustic, acidic, agents, or flame.

“Stationary Source” as defined in Rule 102, Definitions.

“Thermal Incinerator” means any device that burns reactive organic compounds or toxic air contaminants in air by direct application of heat. Thermal incinerators are usually equipped with burners, refractory lined chambers, heat recovery equipment, and process controllers.

“Tooling Resin” means any resins used to build or repair molds (also known as tools) or prototypes (also known as plugs) from which the molds will be made.

“Tooling Gel Coat” means any gel coat used to build or repair molds (also known as tools) or prototypes (also known as plugs) from which the molds will be made.

21. **Touch-Up** is that portion of the fabrication process that is necessary to cover minor imperfections.

“Tub/Shower Resin” means any dicyclopentadiene resin, along with orthophthalate and isophthalate resins, used to fabricate bathware products.

22. **“Vapor Suppressant”** is a means any substance added to resin to minimize the outward diffusion of monomer vapor into the atmosphere.

23. **“Waste Materials”** include, but are not limited to any paper or cloth used for cleaning operations, waste resins, and any spent cleaning materials.

“Waste Solvent Residue” means sludge that may contain dirt, oil, metal particles, and/or other undesirable waste products concentrated after heat distillation of solvent either in a solvent cleaning machine itself or after distillation in a separate still.

D. Requirements

1. Process and Control

Any ~~No~~ person ~~shall operating/operate~~ a polyester resin operation ~~unless the operation shall comply/complies~~ with one or more of the following, as applicable.

- a. ~~Before [24 months after the date of amended rule adoption], Use-use~~ polyester resin material with monomer content of no more than 35 percent by weight as applied and as determined by the manufacturer's specification. This requirement shall not apply to gel coats, provided the monomer content does not exceed 45 percent by weight for pigmented gel coats and does not exceed 50 percent by weight for clear gel coats. ~~On and after [24 months after the date of amended rule adoption], use materials that comply with the limits in Table 349-1;~~ or,
- b. ~~Before [24 months after the date of amended rule adoption], Use-use~~ specialty resin with a monomer content of no more than 50 percent by weight as applied and as determined by the manufacturer's specification. ~~On and after [24 months after the date of amended rule adoption], use materials that comply with the limits in Table 349-1;~~ or,
- c. ~~On and after [24 months after the date of amended rule adoption], use polyester resin material that comply with the limits shown in Table 349-1 below when using the open molding resin and gel coat process; or~~

Comment [A8]: The Air Resources Board suggested we lower the monomer content limits and emission limit for vapor suppressed resins. They also suggested we increase the add-on control equipment efficiency to 90%. The District is proposing a 24-month phase-in period for these new requirements.

Table 349-1: Monomer Content Limits for Polyester Resin Materials

<u>Polyester Resin Material</u>	<u>As-Applied Monomer Content Limits (Percentage, by Weight)</u>
<u>Clear Gel Coat</u>	
<u>For Marble Resins</u>	<u>40%</u>
<u>All Other Resins</u>	<u>44%</u>

<u>Polyester Resin Material</u>	<u>As-Applied Monomer Content Limits (Percentage, by Weight)</u>
<u>Pigmented Gel Coat</u>	
<u>White and Off White</u>	<u>30%</u>
<u>Non-White</u>	<u>37%</u>
<u>Primer</u>	<u>28%</u>
<u>Specialty Gel Coat</u>	<u>28%</u>
<u>Tooling Gel Coat</u>	<u>40%</u>
<u>General Purpose Resin</u>	
<u>Lamination Resins</u>	<u>31% or 35%, as supplied, with no fillers</u>
<u>Marble or Cultured Resins</u>	<u>10% or 32%, as supplied, with no fillers</u>
<u>Solid Surface Resins</u>	<u>17%</u>
<u>Tub/Shower Resins</u>	<u>24% or 35%, as supplied, with no fillers</u>
<u>Specialty Resin</u>	
<u>Corrosion Resistant Resin</u>	<u>48%</u>
<u>Fire Retardant Resin</u>	<u>38%</u>
<u>High Strength Resin</u>	<u>40%</u>
<u>Tooling Resin</u>	
<u>Atomized (spray)</u>	<u>30%</u>
<u>Non-atomized</u>	<u>39%</u>
<u>All Other Resin</u>	<u>35%</u>

- d. Before [24 months after the date of amended rule adoption], Use a resin containing a vapor suppressant, such that weight loss from ~~ROC~~ reactive organic compound emissions does not exceed 60 grams per square meter of exposed surface area during resin polymerization. On and after [24 months after the date of amended rule adoption], the vapor suppressed resin limit shall be 50 grams per square meter of exposed surface area during resin polymerization. The "grams per square meter of exposed surface area during resin polymerization" shall be as determined by the test method specified in Section E.42;
or,
- de. Use a closed mold system; or,
- ef. Install and operate an add-on emission control system, which is designed and operated in a manner that reduce uncontrolled emissions by at least 85 percent, provided all of the applicable requirements below are met. Any person installing such control system shall obtain an Authority to Construct from the District prior to installation.
- i. Before [24 months after the date of amended rule adoption], the overall efficiency (the capture efficiency multiplied by the control device efficiency) of the total system shall be at least 85 percent by weight. On and after [24 months after the date of amended rule adoption] the overall efficiency shall be at least 90 percent by weight.
- ii. Combustion temperature shall be continuously monitored when operating a thermal incinerator.
- iii. Inlet and exhaust gas temperatures shall be continuously monitored when operating a catalytic incinerator.

- iv. Control device efficiency shall be continuously monitored when operating a control device other than a thermal or catalytic incinerator, and
- v. Compliance through the use of an emission control system shall not result in affected pollutant emissions in excess of the affected pollutant emissions that would result from compliance with Sections D.1.a - D.1.d or H.

Comment [A9]: Subsections i - iv mirror Rule 353.I provisions.

Comment [A10]: Similar to Rule 321.N.6. (Reactive organic compound changed to affected pollutant to include TACs.)

2. Spray Application Methods

Any No person operating shall apply a polyester resin operation shall, when applying polyester resin materials by in a spraying operation, unless the application is performed with equipment operating according to the manufacturers operating guidelines. use only In addition, the application method employed shall be one of the following:

- 1. Airless, or
- 2. Air-assisted airless, or
- 3. High volume, low pressure spraying equipment, or
- 4. Electrostatic spray equipment, or
- 5. Any other spray application method as approved by the Control Officer, the Air Resources Board, and the Environmental Protection Agency, and operated in accordance with the manufacturer's recommendations.

3. ~~Storage and Disposal~~ General Operating

A person operating a polyester resin operation shall use closed containers to store all polyester resin materials, cleaning materials, and any unused ROC containing materials except when accessed for use. Any person who owns or operates any polyester resin equipment or uses any associated solvent shall meet the following requirements:

- a. All polyester resin materials and cleaning materials, used or unused, shall be stored and disposed of in nonabsorbent and nonleaking containers equipped with tight-fitting covers. All covers shall be in place unless adding material to or removing material from the containers, the containers are empty, or doing maintenance/inspection of the containers. After distillation recovery of solvent, waste solvent residues shall not contain more than 20 percent of reactive organic compound by weight as determined by the test method specified in Section E.8.
- b. All application equipment, ventilation system, and emission control equipment shall be installed, operated, and maintained consistent with the manufacturer's specifications.
- c. All containers holding polyester resin materials and cleaning materials shall be free of liquid leaks. All application equipment, solvent distillation units, and gun washers shall not have any liquid leaks, visible tears, holes, or cracks. Any such liquid leak, visible tear, hole, or crack is a violation of this rule.

Any liquid leak, visible tear, hole, or crack that is detected shall be repaired within one day from discovery, or the equipment shall be drained of all polyester resin materials or cleaning materials, consistent with Section D.3.a provisions, and shut down until replaced or repaired. Application equipment, solvent distillation units, and gun washers shall not be operated when leaking.

- d. All covers, valves, drain plugs, and other closure devices designed to reduce polyester resin material and cleaning material evaporation shall not be removed or opened except to process work or to perform monitoring, inspections, maintenance, or repairs that require the removal of the covers or other closure devices.
- e. Any spills of polyester resin materials or cleaning materials shall be wiped up immediately and the used absorbent material (e.g., cloth, paper, sand, sawdust, etc.) shall be stored in closed containers that are handled in accordance with Section D.3.a.
- f. The handling and transfer of coatings and cleaning solvents to or from enclosed systems, vats, waste containers, and other cleaning operation equipment that hold or store fresh or spent coatings and cleaning solvents shall be conducted in such a manner to minimize spills.

Comment [A11]: The housekeeping provisions are similar to requirements found in Rule 321.F

E. Compliance Provisions and Test Methods

1. Compliance with Section D.1.a or D.1.b Polyester resin material monomer contents shall be determined-measured using ASTM method-D2369-8495, "Standard Test Method for Volatile Content of Coatings," ASTM International. Material tested shall be non-catalyzed.
2. Compliance with Section D.1.e-The weight loss from reactive organic compound emissions shall be determined-measured by laboratory static tests, "Static Method for Determination of Volatile Emissions from Polyester and Vinyl Ester Resins," as described in Attachment A.
3. Capture efficiency determinations-The capture efficiency for reactive organic compound emissions required in Section D.1.d shall be based on criteria set forth by EPA in 40 CFR 52.741 determined by verifying the use of a Permanent Total Enclosure and 100 percent capture efficiency as defined by Environmental Protection Agency Method 204, "Criteria for and Verification of a Permanent or Temporary Total Enclosure." Alternatively, if an Environmental Protection Agency Method 204 defined Permanent Total Enclosure is not employed, capture efficiency shall be determined using a minimum of three sampling runs subject to data quality criteria presented in the Environmental Protection Agency technical guidance document "Guidelines for Determining Capture Efficiency, January 9, 1995." Individual capture efficiency test runs subject to the Environmental Protection Agency technical guidelines shall be determined by:
 - a. The Temporary Total Enclosure approach of Environmental Protection Agency Methods 204 through 204F; or
 - b. The South Coast Air Quality Management District "Protocol for Determination of Volatile Organic Compounds (VOC) Capture Efficiency," May 1995.]
4. Control efficiency determinations-The control device efficiency for reactive organic compound emissions required in Section D.1.d shall be made using EPA Method 25 or 25A. Gas flow rate measurements in pipes or small ducts shall be made using EPA Method 2A; determined by Environmental Protection Agency Methods 25, 25A, the South Coast Air Quality Management District Method 25.1, "Determination of Total Gaseous Non-Methane Organic Emissions as Carbon," February 1991, or the South Coast Air Quality Management District Method 25.3, "Determination of Low Concentration Non-Methane Non-Ethane Organic Compound Emissions from Clean Fueled Combustion Sources," March 2000, as applicable. Environmental Protection Agency Test Method 18 or Air Resources Board Method 422, "Exempt Halogenated VOCs in Gases," September 1990, shall be used to determine emissions of exempt compounds.]
5. Solvent reactive organic compound content shall be measured by the Environmental Protection Agency Reference Method 24, its constituent methods, or an equivalent method approved by the Environmental Protection Agency, the Air Resources Board, and the Control Officer. The determination of exempt compounds shall be performed in accordance with ASTM D 4457-1991,

Comment [A12]: EPA recommended that the District model the provisions on SC Rule 1122(h)(7)(A) text.

Comment [A13]: EPA suggested that this provision mirror the SC Rule 1122(h)(7)(B) text.

“Standard Test Method for Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings by Direct Injection into a Gas Chromatograph,” ASTM International. The reactive organic compound content of materials containing 50 grams per liter of reactive organic compound or less shall be determined by the South Coast Air Quality Management District Method 313-91, “Determination of Volatile Organic Compounds by Gas Chromatography-Mass Spectrometry,” June 1993, or any other test methods approved by the Environmental Protection Agency, the Air Resources Board, and the Control Officer.

Comment [A14]: EPA recommended referring to SC Method 313 for determining ROC content of materials containing < 50 g/l.

6. The capture efficiency for toxic air contaminant emissions that are not reactive organic compounds shall be determined by using the methods described in Section E.3 modified in a manner approved by the Control Officer to quantify the mass of liquid or gaseous reactive organic compounds and/or toxic air contaminants.

Comment [A15]: Similar to the Rule 321.P.3 requirements.

7. The control device efficiency for toxic air contaminant emissions that are not reactive organic compounds shall be determined using:

- a. an Environmental Protection Agency approved test method or methods, or
- b. in the case where there is no Environmental Protection Agency approved test method, a Control Officer approved detection method applicable for each target toxics specie.
- c. the Control Officer may require more than one test method on any emission control device where necessary to demonstrate that the overall efficiency is at least 85 percent by weight in reducing emissions of reactive organic compounds and/or toxic air contaminants. Any technique to convert “parts per million by volume” test method results to either 1) “parts per million by weight,” or 2) “mass emission rates” (e.g., pounds per hour) shall first be approved by the Control Officer and, if such approval is not provided, then the technique shall not be used to show compliance with this rule.

Comment [A16]: Essentially the same as Rule 321.P.4 provisions.

8. Solvent waste residue reactive organic compound content shall be determined by using Environmental Protection Agency Test Method 25D or an equivalent method approved by the Environmental Protection Agency, the Air Resources Board, and the Control Officer.

9. When more than one test method or set of test methods are specified for any testing, a test result showing an exceedance of any limit of this rule shall constitute a rule violation.

Comment [A17]: Added per the EPA recommendation in the Technical Support Document for SJV Rule 4605 (June 2009).

10. Pursuant to Section F.I.d and e, when a solvent is used that is a mixture of different materials blended by the operator, the volumes of each component for each batch shall be recorded. The reactive organic compound content of the batch shall be calculated and recorded in order to demonstrate compliance with the specified “as applied” limits.

Comment [A18]: This provision stems from Rule 321.R.1.b.5.

11. The Environmental Protection Agency test methods in effect on [date of amended rule adoption] shall be the test methods used to meet the requirements of this rule.

F. Recordkeeping

Any person subject to this rule shall comply with the following requirements:

1. A person shall maintain a current list file of resins and cleaning all reactive organic compound-containing materials in use at the stationary source subject to this rule. The file shall provide all of the data necessary to evaluate compliance and shall include, including the following information, as applicable:

Comment [A19]: Our protocol is to specify requirements are on a stationary source basis.

Comment [A20]: Essentially the same text found in Rule 353.O.1.

- a. the type of resin, catalyst, and cleaning materials used (e.g., brand name, stock identification number);

[Annotated draft of July 7, 2011]

- b. the weight percent of ~~ROC~~reactive organic compound in each of the polyester resin materials, and the grams of ~~ROC~~reactive organic compound per liter of material for the cleaning materials;
 - c. for approved vapor suppressed resins, the weight loss (grams per square meter) during resin polymerization, the monomer percentage, and the gel time for each resin;
 - d. specific solvent mixing volumes of each component for each batch;
 - e. the actual as applied reactive organic compound content of the solvent used and, when not using the closed mold system, the corresponding monomer content limits from Sections D.1.a, b, or c, and the actual as applied monomer contents; or if complying using a vapor suppressant, the actual as applied polyester resin weight loss rate of the materials used; and
 - f. current polyester resin material and solvent manufacturer specification sheets, Material Safety Data Sheets, or air quality data sheets, which list the reactive organic compound content of each material in use at the stationary source subject to this rule.
2. Maintain records for each reactive organic compound-containing material purchased for use at the stationary source. The records shall include, but not be limited to, the following:
- a. material name and manufacturer identification (e.g., brand name, stock identification number);
 - b. material type (e.g., air dried or baked enamel, powder coating, extreme performance coating, cleanup solvent, etc.);
 - c. volume of material purchased;
 - d. date of purchase; and
 - e. receipts of each purchase.
3. Maintain records of the method of disposal each time waste solvent or waste solvent residue is removed from the stationary source for disposal.
4. For each material listed in response to Section F.1, maintain on a monthly basis a record of the following:
- a. volume used (gallons);
 - b. polyester resin material as-applied weight percent of monomer or the cleaning material reactive organic compound content (grams per liter or pounds per gallon); and
 - c. resulting reactive organic compound emissions (pounds).
- For permitted facilities, all records required by this Subsection and Subsection F.1 shall be summarized for each calendar year and submitted to the District by March 1 of the following year. The annual report shall include the name and address of the Permittee, and the Permit to Operate number that the polyester resin operations are subject to (if permitted), and/or a statement that the annual report includes non-compliant polyester resin material usage information.
25. Any person using add-on For any stationary source that uses emission control equipment to meet the requirements of this rule ~~shall maintain daily~~ records of key operating parameters, values and maintenance procedures that ~~verify~~ demonstrate that the control equipment was operating properly

~~for each day of operation~~ continuous operation and compliance of the emission control system during periods of emission producing activities shall be maintained. These parameters shall include, but not be limited to:

- a. ~~Hours of operation;~~
- b. ~~All maintenance work that requires the emission control system to be shut down; and~~
- c. ~~All information needed to demonstrate continuous compliance with Section D.1.f, such as temperatures, pressures, and/or flow rates.~~

Comment [A21]: Subsections a - c are from Rule 321.R.1.c.

6. ~~Any person claiming an exemption under Section B.1 shall maintain monthly records of styrene volumes used to support the claim of exemption.~~

37. ~~Such records shall be retained for the previous 24 month period and be available to the District upon request. Any records required to be maintained pursuant to this rule shall be kept on site for at least 3 years. Thereafter, such records shall either be kept on site or be readily available for expeditious inspection and review for an additional 2 years.~~

Comment [A22]: Similar to the Rule 321.R.3 provision.

8. ~~If an operator or District staff discovers a liquid leak, visible tear, hole, or crack in application equipment, a solvent distillation unit, or in a gun washer, the operator shall record:~~

- a. ~~the date of discovery;~~
- b. ~~the corrective action taken; and~~
- c. ~~the date of repair or equipment replacement.~~

G. Compliance Schedule

~~A person who is subject to the requirements of this determination shall be in compliance by April 27, 1994. Except as otherwise specified, the provisions of this rule are effective on [date of amended rule adoption].~~

H. Requirements – Solvent Cleaning

Comment [A23]: Section H stems from similar solvent cleaning provisions in Rule 321.M.

~~Section H requirements apply to any person performing solvent cleaning associated with polyester resin operations, including, but not limited to, use of wipe cleaning cloths, hand-held spray bottles, squirt bottles, aerosol products, and the cleaning of application equipment. The following requirements become effective [one year from the date of amended rule adoption] and are in addition to the general operating requirements specified in Section D.3.~~

1. ~~**Solvent Requirements.** Except when using an emission control system that meets the requirements of Section D.1.e, no person shall use any solvent to perform solvent cleaning which exceeds the applicable grams of reactive organic compound per liter of material limit specified in Table 1.~~

Comment [A24]: Both ARB and EPA recommend a 25 g/l limit on the solvent's ROC content.

Table 1: Reactive Organic Compound Content Limits for Solvent Cleaning

<u>SOLVENT CLEANING ACTIVITY</u>	<u>ROC Limit, grams of ROC per liter of material (pounds of ROC per gallon)</u>
(a) <u>Produce Cleaning During Manufacturing Process or Surface Preparation for Coating Application</u>	<u>25 (0.21)</u>
(b) <u>Repair and Maintenance Cleaning</u>	<u>25 (0.21)</u>
(c) <u>Cleaning of Polyester Resin Application Equipment</u>	<u>25 (0.21)</u>

ATTACHMENT A

STATIC METHOD FOR DETERMINATION OF VOLATILE EMISSIONS FROM
POLYESTER AND VINYL ESTER RESINS

1. PURPOSE

- 1.1 This test is designed for the determination of volatile organic compound emissions of polyester and vinyl ester resins as received from the manufacturer, according to requirements of California's South Coast Air Quality Management District (~~SCAQMD~~ ~~proposed Rule 1162 amendment published July 17, 1990~~ Method 309-91, Determination of Static Volatile Emissions, revised February 1993.)
- 1.2 This test allows fabricators using polyester and vinyl ester resins to monitor volatile organic compound emissions (principally styrene monomer) from resins used in the fabrication process. The results are to be reported as volatile organic compound losses in grams per square meter (gm/m^2).

Comment [A25]: Attachment A changes align the procedures to this text method.

2. METHOD

The weight of a one gallon can lid filled with 100 ~~gm~~ grams of resin is accurately measured over a period of time. The measurement is made on resin catalyzed with peroxide initiators to determine weight losses attributed to monomer and other volatile organic compound emissions.

3. EQUIPMENT REQUIREMENTS

- 3.1 Controlled environment at 25.0 ~~C~~ Celsius and humidity of 50% ~~R.H~~ percent relative humidity. If controlled environment is not available, report condition under which measurements are made.
- 3.2 **Balance** with an accuracy of 0.01 ~~gm~~ gram.
- 3.3 **Draft free enclosure** for balance. This can be achieved by placing the balance in a four sided enclosure that extends a minimum of eight inches above the top of the balance.
- 3.4 **Gallon can lid** with deep form sufficient to contain 100 ~~gm~~ grams of resin, having a normal diameter of 14.5 ~~cm~~ centimeter.
- 3.5 **Certified or calibrated thermometer** capable of measurements accurate to 1 degree ~~C~~ Celsius.
- 3.6 **Constant temperature** bath controlled at 25 ~~C~~ degrees Celsius to adjust resin temperature to 25 ~~C~~ degrees Celsius.
- 3.7 **Timer** - capable of recording time to 0.1 minute.
- 3.8 **Paper clip** - bent to approximately 90 ~~degrees~~ degree angle.
- 3.9 **Syringe or pipette** accurate to 0.1 ~~ml~~ milliliter for peroxide catalyst addition.

4. PROCEDURE

- 4.1 Weigh out 200 gm-grams of prepromoted resin into a suitable dry and clean container. Wax cups should not be used for this test.
- 4.2 Cover container and place in constant temperature bath and adjust resin temperature to 25°C degrees Celsius.
- 4.3 Place balance in draft free enclosure.
- 4.4 Clean gallon lid with solvent, wipe dry and air dry and measure diameter to the nearest 0.1 emcentimeter.
- 4.5 Place gallon can lid on an inverted paper or plastic cup mounted on the balance pan. Position bent paper clip in the center of the gallon can lid. Record TARE WEIGHT to 0.01-gmgram.
- 4.6 Take container with resin from water bath and add appropriate volumetric or weight measure of catalyst using syringe or pipette. Start timer. (continued)
- 4.7 Using stirring rod or thermometer, mix in catalyst for one minute.
- 4.8 Pour 100.0 +/-plus or minus 0.5 gm-gram of catalyzed resin into can lid and record weight to +/- plus or minus 0.01 gmgram. This is the INITIAL WEIGHT.
- 4.9 Using paper clip, determine when resin has hardened sufficiently to allow resin or lid to be lifted or the gel to be torn.
- 4.10 Record this as gel time.
- 4.11 Allow resin to harden in can lid and reweigh every 15 minutes until concurrent weighing agrees to within 0.05-gmgram. Record this as FINAL WEIGHT to +/-plus or minus 0.01-gmgram.
- 4.12 Procedure should be repeated until duplicate samples agree to the nearest 5 gm-per-m³grams per meter².

5. CALCULATION

- 5.1 Volatile Organic Compound Emissions per Square Meter

$$\text{Area of Gallon Can Lid in m}^2 = \frac{(d/2)^2 \times 3.14}{10,000 \text{ cm}^2 / \text{m}^2}$$

$$\text{Area of Sample in Square Meter} = (d/2)^2 * 3.14$$

Where:

- d = diameter of the gallon can lid in centimeters (cm)
- 3.14 = value of Pi
- cm² = square centimeters
- m² = square meters

Volatile Organic Compound Losses, **Grams** per Square Meter \equiv
 $\frac{\text{INITIAL WEIGHT} - \text{FINAL WEIGHT}}{\text{Area of Sample Gallon Can Lid}}$ in Square Meters

5.2 Percent Volatile Organic Compound Emission \equiv
 $\frac{\text{INITIAL WEIGHT} - \text{FINAL WEIGHT}}{\text{INITIAL WEIGHT} - \text{TARE WEIGHT}} \times 100$

6. REPORTING REQUIREMENTS

- 6.1 Ambient temperature and humidity.
- 6.2 Resin identification and batch number.
- 6.3 Initiator system and amounts used.
- 6.4 Volatile organic compound losses as grams per square meter.
- 6.5 Percent volatile organic compound emission.
- 6.6 Gel time under conditions of test.