

REGULATION III – CONTROL OF AIR CONTAMINANTS

RULE 356 POLYESTER RESIN OPERATIONS

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DRAFT Rule 356: Polyester Resin Operations

Maricopa County Air Quality Department

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Contact Kathleen Sommer at (602)506-6706; email: SommerK@mail.maricopa.gov

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Adopted XX/XX/XX

**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS**

REGULATION III – CONTROL OF AIR CONTAMINANTS

**RULE 356
POLYESTER RESIN OPERATIONS**

SECTION 100 – GENERAL

- 101 PURPOSE:** To limit emissions of volatile organic compounds (VOCs) from the use of polyester resin material, including manufacturing, touch-up, repair and rework activities.
- 102 APPLICABILITY:** This rule is applicable to the manufacture of products from or the use of polyester resin materials, including touch-up, repair and rework activities. In addition to this rule, facilities may be subject to New Source Performance Standards (NSPS) in Rule 360 and/or to National Emission Standards for Hazardous Air Pollutants (NESHAP) in Rule 370 of these rules.
- 103 TOTAL EXEMPTIONS:** The owner or operator of a polyester resin operation can claim a total exemption under Sections 301.1 and 301.2 of this rule if they do not use more than 20 gallons per month of polyester resin material, however once a source exceeds the exemption limit, that facility is permanently subject to all components of this Rule 356: Polyester Resin Operations.
- 104 CATEGORICAL EXEMPTION:** This rule does not apply to the following operations:
- 104.1** Industrial adhesives or adhesive primers
(Rule 357: Miscellaneous Industrial Adhesives)
 - 104.2** Pleasure craft boat manufacturing and repair
(Rule 359: Pleasure Craft Manufacturing and Repair).
- 105 PARTIAL EXEMPTIONS:** An owner or operator using polyester resin/gel coats on the equipment, materials or processes listed shall be exempt from the following sections; however they are subject to all other applicable provisions of this rule. Once a facility exceeds the exemption limit, that facility is then permanently subject to all provisions of this rule.
- 105.1 Resin and Gel Coats – Fiberglass Boats:** Use of non-atomizing application equipment (Section 225 of this rule) exempts the following from Section 301.1(b), Table 356–1 of this rule.
 - a. Life-Saving Craft:** Application of polyester resin or gel coats on lifesaving craft.

- b. Part or Mold Repair and Touch up:** The total quantity of all materials shall not exceed 1 percent by weight used at a facility on a 12-month rolling-average basis.
- c. Skin Coats made with Pure 100-Percent Resins (blends of vinyl ester and polyester):** The total quantity of all materials shall not exceed 5 percent by weight of all resin used at a facility on a 12-month rolling average basis.

105.2 Polyester Resin Bonding Putties: An owner or operator using polyester resin bonding putties (Section 231) to assemble fiberglass parts at fiberglass boat manufacturing facilities and/or at other reinforced plastic composite manufacturing facilities are exempt from the VOC emission limits listed in section 301.1(b) Table 356–1 of this rule.

SECTION 200 – DEFINITIONS: For the purpose of this rule, the following definitions shall apply, in addition to those definitions found in Rule 100: General Provisions and Definitions of these rules. In the event of any inconsistency between any of the Maricopa County air pollution control rules, the definitions in this rule take precedence.

- 201 AEROSOL COATING PRODUCT** – A pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable can for hand-held application, or for use in specialized equipment for ground traffic/marketing applications.
- 202 AIRLESS SPRAY** – A system that atomizes principally by hydraulic pressure, including “airless” and “air assisted airless”.
- 203 CLEANUP** – The removal of uncured coating from any surface.
- 204 COATING** – A material that is applied to a surface and forms a film in order to beautify and/or protect such surface.
- 205 CORROSION-RESISTANT RESIN** – Polyester resin material used to make products for corrosion resistant applications such as, but not limited to, tooling, fuel or chemical tanks, boat hulls, pools and outdoor spas.
- 206 CLOSED MOLDING OPERATIONS** – Any molding process in which pressure is used to distribute the resin through the reinforcing fabric placed between two mold surfaces to either saturate the fabric or fill the mold cavity. The pressure may be clamping pressure, fluid pressure, atmospheric pressure, or vacuum pressure used either alone or in combination. The mold surfaces may be rigid or flexible. Closed molding includes, but is not limited to, compression molding with sheet molding compound, infusion molding, resin injection molding (RIM), vacuum-assisted resin transfer molding (VARTM), resin transfer molding (RTM), and vacuum assisted compression molding. In closed molding operations, nearly all of the monomers are bound in the cross-link reactions and emissions are very low. (Closed molding is generally applicable to making a large

number of small parts, such as hatches and locker doors, or small numbers of high performance boat hulls.)

- 207 DIP COAT (INCLUDING ELECTRO-DEPOSITION)** – A coating application method accomplished by dipping an object into coating.
- 208 ELECTRIC-INSULATING COATINGS** – The charging of atomized coating droplets for deposition to a grounded substrate by electrostatic attraction.
- 209 ELECTROSTATIC SPRAY** – A coating application method accomplished by charging atomized paint particle for deposition by electrostatic attraction on a metal part or product.
- 210 FIBERGLASS BOAT MOLDS** – Fiberglass boat manufacturing facilities construct the molds or “tools” that are used to build the separate parts of the fiberglass boat. The production of molds is done using specialized resins and gel coats referred to as tooling resin and gel coat. These differ from production resin and gel coat in that they are harder, more heat resistant, and more dimensionally stable than production materials.
- 211 FIBERGLASS** – A process where the liquid resin is mixed with a catalyst before it is applied to the glass, which causes a cross-linking reaction between the resin molecules. The catalyzed resin hardens to form a rigid shape consisting of the plastic resin reinforced with glass fibers. fiberglass (also known as fiber reinforced plastic or FRP, aluminum, rotationally molded (rotomolded) polyethylene (PLASTIC)
- 212 FILAMENT APPLICATION** – A method of applying resin to an open mold that involves feeding reinforcement fibers through a resin bath and winding the resin-impregnated fibers on a rotating mandrel.
- 213 FILLER** – A finely divided inert (non-VOC) material, which may be added to the resin to enhance its mechanical properties and extend its volume. Resin fillers include, but are not limited to, silica, carbon black, talc, mica and calcium carbonate.
- 214 FILLED POLYESTER RESIN MATERIAL** – Material formulated by adding compatible filler(s) to polyester resin material(s).
- 215 FIRE RETARDANT RESIN** – Polyester resin material used to make products that are resistant to flame or are a low flame spread/low smoke product, as defined in 40 CFR 63.5935.
- 216 FLOW COATING – (Flow Coaters)** – A coating application system, with no air supplied to the nozzle, where paint flows over the part and the excess coating drains back into the collection system.
- 217 FLUID IMPINGEMENT TECHNOLOGY** – A spray gun that produces an expanding non-misting curtain of liquid by the impingement of low-pressure uninterrupted liquid stream.

- 218 GEL COAT-** Thermosetting polyester resin surface coating, either pigmented or clear, that provides a cosmetic enhancement and improves resistance to degradation from exposure to the elements. The gel coat will become the outer surface of the finished part. Gel coat is applied to a thickness of about 18 mils (0.018 inches).
- 219 HAND APPLICATION METHODS** – Application of coatings by non-mechanical, hand-held equipment including but not limited to paint brushes, hand rollers, caulking guns, trowels, spatulas, syringe daubers, rags, and sponges.
- 220 HIGH GLOSS COATING** – Any coating which achieves at least 85 percent reflectance on a 60o meter when tested by ASTM D 523-89.
- 221 HIGH STRENGTH RESIN** – Polyester resin material with a casting tensile strength of 10,000 psi or more, used to manufacture high performance products.
- 222 HIGH VOLUME-LOW PRESSURE (HVLP) SPRAY** – Spray equipment used to apply materials by means of a spray gun which is designed and intended to be operated, and which is operated, between 0.1 and 10.0 psig of air atomizing pressure, measured dynamically at the center of the air cap and the air horns.
- 223 LIFE-SAVING CRAFT** – Military vessels, U.S. Coast Guard lifeboats, rescue boats, and other life-saving appliances approved under 46 CFR subchapter Q, or the construction of small passenger vessels regulated by 46 CFR subchapter T.
- 224 MARBLE OR CULTURED RESINS** – Orthophthalate and modified acrylic isophthalate resins used for the fabrication of cast products.
- 225 MONOMER** – A volatile organic compound that partially combines with itself, or other similar compounds, by a cross-linking reaction to become a part of the cured resin or gel coat. A fraction of each monomer compound evaporates during resin and gel coat application and curing. Styrene and methacrylate (MMA) are the primary monomer VOC we have identified in the resins and gel coats used in fiberglass boat manufacturing. The resins contain styrene and the gel coats contain both compounds. In the remainder of this rule the monomers in resins and gel coats are referred to as monomer VOC.
- 226 MONOMER PERCENT BY WEIGHT OF A RESIN** – the weight of the monomer, divided by the weight of the polymer.
- 227 NON-ATOMIZING SPRAY APPLICATION EQUIPMENT** – Any application technique in which resin flows from the applicator, in a steady and observable coherent flow, without droplets, for a minimum distance of three (3) inches from the applicator orifices. Non-Atomized mechanical application means the use of application tools other than buckets and brushes to apply resin and gel coat. Examples of non-atomized application include flow coaters, pressure-fed rollers, and fluid impingement spry guns.

- 228 OPEN MOLDING** – Boats made from fiberglass are typically manufactured in a process known as open molding. Separate molds are typically used for the boat hull, deck, and miscellaneous small fiberglass parts (also known as fiber reinforced plastic or FRP). Examples of FRP parts are fuel tanks, seats, storage lockers, and hatches.
- 229 PIGMENTED GEL COATS** – Used when a solid color surface is desired. Most gel coats are pigmented. Clear gel coats do not have any pigments and usually have a higher VOC content than pigmented gel coats.
- 230 POLYESTER** – A polymer of ester molecules, which are formulated by the reaction of an acid and an alcohol and linked together by the ester linkages, which is dissolved in a monomer
- 231 POLYESTER RESIN MATERIALS** – 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 material containing VOC used in polyester resin operations.
- 232 POLYESTER RESIN PUTTIES** – Fiberglass or fiber reinforced plastic (FRP) parts of the boat assembly are small pieces of woven glass or glass mat and resin, putties, or mechanical fasteners which are used assemble fiberglass parts and to fill gaps between parts. These polyester resins are mixed with fillers to create putty. The putty becomes part of the composite structure. The putties may be applied by hand, or by using mechanically powered equipment similar to a large caulking gun. These polyester resin putties used to assemble fiberglass parts are not considered adhesives and are addressed in this CTG.
- 233 POWDER COATING** – Any material applied as a dry (without carrier) finely divided solid which, when melted and fused, adheres to the substrate as a paint film.
- 234 PRIMER** – A coating labeled as such, which is designed to be applied to a surface to provide a bond between that surface and subsequent coats.
- 235 PULTRUSION** – A process where continuous roving strands are moved through a strand-tensioning device into a resin bath for impregnation and then passed through a heated die for curing.
- 236 REPAIR** – Addition of polyester resin to portions of a previously fabricated product in order to mend mechanical damage which occurs after the normal fabrication process.
- 237 RESIN** – Any thermosetting polyester resin, which is used to encapsulate and bind together reinforcement fibers and/or fillers in the formulation of composite materials. A resin includes any class of organic polymers of natural or synthetic origin used in these reinforced products and is solid or semi-solid in the cured state.

- 238 RESIN IMPREGNATOR** – A mechanical non-atomizing composite materials application technique in which fiber reinforcement is saturated with resins in a controlled ratio for each specific composite product.
- 239 ROLL COAT (Resin Rollers)** – A coating application method accomplished by rolling a coating only a flat surface using a roll applicator.
- 240 SOLVENT CLEANING** – Removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants which include, but are not limited to, dirt, soil, and grease from parts, products, tools, machinery, equipment, and general work areas. Each distinct method of cleaning in a cleaning process, which consists of a series of cleaning methods, shall constitute a separate solvent cleaning operation.
- 241 SPECIALTY GEL COATS** – Gel coats which are used in conjunction with fire retardant, corrosion resistant or high-strength materials.
- 242 TOOLING RESIN-** A resin that is used to produce molds. Tooling resins generally more heat resistant (have higher heat distortion temperatures), low shrinkage, higher hardness, and higher dimensional stability than the production materials or outer surface coatings.
- 243 TOPCOAT** – Any final coating applied to the interior or exterior of a pleasure craft.
- 244 TOUCH-UP OPERATION** – Portion of the coating operation which is incidental to the main coating process but necessary to cover minor imperfections or minor mechanical damage incurred prior to intended use, or to achieve coverage as required.
- 245 TUB/SHOWER RESINS** – Dicyclopentadiene (DCPD) resins, along with orthophthalate and isophthalate resins, are used to fabricate bathware products.
- 246 VACUUM BAGGING** – A partially closed molding technology using techniques similar to open molding but with a modification in the resin curing stage. After resin decks, but it is not feasible to replace open molding with closed molding at all types of boat manufacturing facilities.
- 247 VAPOR PRESSURE** – Pressure exerted at a uniform temperature by the gas of a substance when the gas is in equilibrium with the liquid (or solid) phase of that substance.
- 248 VOC VAPOR PRESSURE (VOC COMPOSITE PARTIAL PRESSURE)** – Sum of the partial pressures of the compounds defined as VOCs, calculated according to the formula in Section 502.2(e) of this rule.
- 249 VOC-CONTAINING MATERIALS** – Any chemical or item that contains an organic compound that participates in atmospheric photochemical reactions, except the non-precursor organic compounds. “VOC-containing materials” includes but is not limited to rags, waste coatings, waste brushes, waste rollers, waste applicators, waste solvents, and

their residues which are used in the surface preparation, cleanup, or surface coatings associated with polyester resin operations.

- 250 VAPOR SUPPRESSANT** – A wax substance added to resin for the purpose of forming a layer on the surface of the resin while it is curing and minimize the outward diffusion of monomer vapor into the atmosphere.
- 251 VAPOR-SUPPRESSED RESIN (VSR)** – Polyester resin material which contains additives to reduce VOC evaporation loss to less than fifty (50) grams per square meter of surface area as determined and certified by resin manufacturers.

SECTION 300 – STANDARDS

301 POLYESTER RESIN OPERATIONS:

301.1 Material Requirements:

- a. Closed Molding Process:** An owner or operator, who uses a closed molding process, as defined in Section 206 of this rule, shall comply with at least one of the requirements listed in Section 301.2, as well as the requirements in Section 301.3, Section 301.4 if applicable and Section 500 of this rule.
- b. Open Molding Process:** An owner or operator using an open molding system, as defined in Section 228 of this rule, shall limit all formulations of the monomer content of materials used to the percentages specified in Table 356–1 below, by weight, as applied and non-monomer VOC content shall be limited to 5 percent by weight of the total VOC in all resin and gel coats.

TABLE 356-1. (Title)

Material	Maximum Monomer Percentage by Weight as Applied
Clear Gel Coats:	
–Marble Resin Gel Coats	42
–Boat Manufacturing Gel Coats (Clear)	48
–Other Tooling Gel Coats	40
–All Other Clear Gel Coats	44
Pigmented Gel Coats:	
–White and Off-White Gel Coats	30
–Non-White Boat Manufacturing Gel coats	33
–Other Non-White Gel Coats	37
–Primer Gel Coats	28
Specialty Gel Coats	48
Resins:	
Marble Resins	10% with fillers or 32% without fillers*
Solid Surface Resins	17
Tub/Shower Resins	24% with fillers or 35% without fillers
Boat Manufacturing (atomized)	30
Boat Manufacturing (non-atomized)	39
Lamination Resins	31% with fillers or 35% without fillers
Fire Retardant Resins	38
Corrosion Resistant, High Strength and Tooling Resins	
Non-atomizing Mechanical Application	46 **
Filament Application	42 **
Manual Application	40 **
Other Resins	35

Monomer percent by weight includes the addition of any VOC-containing materials.

* An owner or operator of a polyester resin operation may meet the monomer content limits by adding filler to a resin to reduce the monomer content to the applicable limit or by using resin with a monomer content that complies with the applicable limit without the addition of fillers.

** If the owner or operator manufactures a composite product by using more than one technology to apply corrosion-resistant, high strength or tooling resins, the highest permissible resin monomer content is the applicable limit.

301.2 Process or Control Requirements: An owner or operator shall comply with any one of the following process or control requirements.

a. Emission Control System (ECS): The limits of Section 301.1(b) Table 356–1 do not apply when emissions of VOC from coating operations are controlled by an ECS that meets the following requirements:

- (1) The control device shall reduce VOC emissions from an emission collection system by at least 95 percent by weight or VOC emissions shall be no more than 5 parts per million (ppm) VOC by volume calculated as carbon with no dilution; and
- (2) The emission collection system achieves an overall emission capture and control efficiency of at least 90 percent by weight of the VOC emissions generated by the sources; and
- (3) Any owner or operator electing to use an emissions control system as a means of complying with this rule shall comply with Section 303 of this rule; and
- (4) All resin and gel coats used shall meet non-monomer VOC content limits of 5 percent.

b. Application Techniques:

- (1) **Resin Material Application Excluding Gel Coats:** An owner or operator shall not apply any resin materials to an open mold surface unless one of the following non-atomizing application techniques (defined in Section 227 of this rule) are used and operated according to the operating procedure specified by the equipment manufacturer:
 - (i) Pressure-fed resin rollers (Section 239); or
 - (ii) Resin Impregnators (Section 238); or
 - (iii) Flow Coaters (Section 216); or
 - (iv) Fluid impingement technology (Section 217); or
 - (iv) Hand Lay-up applications (Section 219); or
 - (v) Other non-atomizing application techniques which are approved in writing by the Control Officer and U.S. EPA, as having similar emission reduction efficiencies.
- (2) **Gel Coat Material Application:** An owner or operator shall not apply gel coat materials to an open molding surface unless one of the following application techniques are used and operated according to the operating procedure specified by the equipment manufacturer:

- (i) Non-atomizing Spray Application Techniques (defined in Section 227 of this rule); or
- (ii) Air-Assisted Airless Spray (defined in section 202 of this rule); or
- (iii) Electrostatic Attraction (defined in section 209 of this rule); or
- (iv) High-Volume; Low-Pressure (HVLP) defined in Section 222 of this rule.

c. Tub/Shower Polyester Resin Materials: An owner or operator shall not apply to an open molding system any tub/shower polyester resin material unless all the applied resin material is vapor-suppressed.

301.3 Pultrusion Operations: An owner or operator shall not perform pultrusion operations, unless wet-out tubs baths are covered except for 18 inches from the exit of the bath to the die. The weight loss of polyester resin materials during polymerization shall be less than three (3) percent in a pultrusion operation.

301.4 Alternative Compliance Option: An owner or operator may use alternative application processes and materials to those listed in Section 303 of this rule provided they result in equivalent VOC emissions and are approved in writing by the Control Officer and U.S. EPA.

302 WORK PRACTICES – STORAGE, HANDLING, CLEANING AND DISPOSAL OF VOC-CONTAINING MATERIAL: An owner or operator shall control emissions from VOC-containing materials used during storage, handling, cleaning, and disposal as well as for surface preparation before coating with the following practices:

302.1 For the purposes of this rule, the following definitions apply:

- a. “In use” is the active application of contents to a substrate by pouring, siphoning, brushing, rolling, padding, wiping or other methods; and
- b. “Containers” include but are not limited to drums, buckets, cans, pails, and trays.

302.2 Storage, Mixing, and Use of VOC Containing Materials: An owner or operator shall store all VOC-containing material and VOC-containing cleaning materials in closed or covered leak-free containers. The containers shall be closed at all times except when the material is being handled such as when mixing, depositing, removing or transferring material into or out of the container.

302.3 Waste Materials: An owner or operator shall store all VOC-containing coatings, thinners, and coating-related waste materials intended for disposal in closed or

covered, leak-free containers which are legibly labeled with their contents and which remain covered at all times when not in use.

- 302.4 Spills:** An owner or operator shall implement procedures to minimize spills of any VOC-containing material immediately during handling and transfer to and from containers, enclosed systems, waste receptacles and other equipment including small containers.
- 302.5 Conveyance of VOC-Containing Materials and VOC-Containing Cleaning Materials:** An owner or operator shall ensure that all VOC-containing materials and VOC-containing cleaning materials shall be conveyed from one location to another in labeled and closed containers and pipes.
- 302.6 Labeling:** All containers that are 1 gallon or larger used for collection of VOC-containing material shall be clearly identified with their contents.
- 302.7 Solvent Cleaning:** An owner or operator shall ensure any solvent used to clean polyester resin application equipment, parts, products, tools, machinery, equipment, and general working areas shall contain no more than 5 percent VOC, by weight, or have a composite vapor pressure of no more than 0.50 mm Hg at 68 °F.
- 302.8 Fiberglass Resin, Gel Coat and Putty Mixing Operations:** Mixing containers with a capacity equal to or greater than 55 gallons (208 liters), including those used for on-site mixing of putties and poly-putties, shall have a cover with no visible gaps in place at all times. This shall not apply when the material is being manually added to or removed from a container, or when mixing or pumping equipment is being placed in or removed from a container.

303 OPERATION AND MAINTENANCE (O&M) PLAN REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT AND APPROVED EMISSION CONTROL SYSTEMS (ECS):

An owner, operator, or person subject to this rule must provide, properly install and maintain in calibration, in good working order, and in operation air pollution control equipment required by this rule.

- 303.1** An owner, operator, or person subject to this rule must provide and maintain readily available on-site at all times (an) O&M Plan(s) for any ECS and any ECS monitoring devices that are used under this rule or an air pollution control permit.
- 303.2** An owner, operator, or person subject to this rule must submit to the Control Officer for review within 45 days every O&M Plan(s) for any ECS including any ECS monitoring device that is used under this rule or required under an air pollution control permit.
- 303.3** An owner, operator, or person subject to this rule operating an ECS must install, maintain, and accurately calibrate monitoring devices described in the O&M

Plan(s) including, but not limited to, monitoring devices that measure pressure differentials and other operating conditions necessary to determine if control devices are functioning properly.

303.4 An owner, operator, or person who is required to have an O&M Plan for any ECS including any ECS monitoring devices must fully comply with all elements of an O&M Plan(s) including, but not limited to every action, schedule, and condition identified in each O&M Plan.

303.5 An O&M Plan for any ECS including any ECS monitoring devices must include all of the following information:

- a. ECS equipment manufacturer,
- b. ECS equipment model,
- c. ECS equipment identification number or identifier that owner, operator, or person subject to this rule assigns to such ECS equipment when manufacturer's equipment identification number is unknown, and
- d. Information required by Section 501.3 of this rule.

303.6 The owner, operator, or person subject to this rule, who receives a written notice from the Control Officer that the O&M Plan is deficient or inadequate, must make written revisions to the O&M Plan for any ECS including any ECS monitoring devices and must submit such revised O&M Plan to the Control Officer within five working days of receipt of the Control Officer's written notice, unless such time period is extended by the Control Officer, upon written request, for good cause. During the time that such owner, operator, or person subject to this rule is preparing revisions to the O&M Plan, such owner, operator, or person must still comply with all requirements of this rule.

SECTION 400 – ADMINISTRATIVE REQUIREMENTS- COMPLIANCE SCHEDULE:

An owner or operator who chooses to, or is required to comply with the new emission limits by installing or increasing the efficiency of an ECS under Section 303 of this rule shall meet the following milestones:

401 SUBMIT PLAN: Submit a compliance plan, by (3 months after DATE OF RULE ADOPTION) or within three (3) months of becoming subject to the rule, to the Control Officer for approval which describes the method(s) used to achieve full compliance with the rule. The compliance plan shall specify dates for completing increments of progress, such as the contractual arrival date of new control equipment. The Control Officer may require an owner or operator submitting the compliance plan to also submit subsequent reports on progress in achieving compliance; and

402 COMPLIANCE DATE: Attain full compliance with all of the standards in this rule by (12 months after DATE OF RULE ADOPTION) or within twelve (12) months of becoming subject to the rule.

SECTION 500 – MONITORING AND RECORDS:

501 RECORDKEEPING AND REPORTING: An owner, operator or person subject to this rule shall comply with the recordkeeping and reporting requirements of this section. Records can consist of but are not limited to purchase orders, invoices, receipts, usage records, MSDS, and hazardous wastes manifests. Any records required by this rule shall be retained for five (5) years and be made available to the Control Officer upon request. Records may be kept in either electronic or paper format.

501.1 General Data: Daily records shall be kept for all days that a facility is actively operating. Records shall include all of the following:

a. Hours of operation; and

b. Type of operations including;

(1) **Applications:** The type of non-atomizing application, or other in the case of gel coat, application techniques(s) used, manufacturer's names, and the records of the fluid tip, pressure calibration as specified by the manufacturer; and

(2) **Materials and VOC Content:** The manufacturer's name, the type and amount of each of the polyester resin basic raw materials used, delivered and the weight (in percent) of monomer for all polyester resin materials and filler(s). If VOC-containing materials are added to the polyester resin, the amount of VOC-containing materials, in grams, and the VOC content in grams per liter, of VOC-containing materials; and

(3) **Tub/Shower Resins:** Certification of analysis from the resin manufacture(s) to verify that all the applied tub/shower resin materials are vapor-suppressed; and

(4) **Pultrusion systems:** For pultrusion systems, the weight loss (in percent) of polyester resins materials for each application; and

501.2 VOC Vapor Pressure: An owner or operator of a polyester resin operation shall keep a hardcopy of the VOC vapor pressure (VP) at 20°C (68°F) of solvent(s) for coating and of solvents used for cleaning spray guns, hoses, reservoirs, and any other coating application equipment. Any one of the following ways of providing the VP data is sufficient:

a. A current manufacturer's technical data sheet; or

- b. A current manufacturer's safety data sheet (MSDS); or
- c. Actual test results; or
- d. A letter signed by an official or lab manager of the supplying facility.

501.3 ECS Recordkeeping Requirements: The owner or operator of the facility shall document the installation, maintenance, and calibration of ECS monitoring devices described in an O&M Plan in the following manner:

- a. **Initial Installation:** Make a permanent record of the date of installation of the ECS.
- b. **Daily:** Make a permanent record of the operating parameters of the key systems as required by the O&M Plan. If the ECS was not operational due to equipment malfunction or not being used at any time during the day, record this fact in the permanent record; and
- c. Within 24 hours of a completed scheduled routine maintenance, make a permanent record of the maintenance actions taken for each day or period in which the O&M Plan requires that maintenance be done; or
- d. Enter an explanation for scheduled maintenance that is not performed during the period designated for it in the O&M Plan.

501.4 Facilities Claiming an Exemption: The owner or operator claiming an exemption under Section 103 of this rule shall document the quantity of VOC materials used and keep sufficient records of the basis of such calculations to justify the exemption status.

502 COMPLIANCE DETERMINATION – TEST METHODS: An exceedance of the limits established in this rule determined by any of the applicable test methods constitutes a violation of this rule. The EPA and the American Society for Testing and Materials (ASTM) test methods and other documents as they exist in the Code of Federal Regulations (CFR) as listed below, are adopted and incorporated by reference in Appendix G of the Maricopa County Air Pollution Control Regulations. These documents are available Maricopa County Air Quality Department, 1001 N. Central Ave., Phoenix, AZ 85004; or by calling (602) 506-0169 for information. ASTM methods are also available from the American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, or from its website at www.astm.org.

502.1 VOC Content of Materials:

- a. The VOC content of polyester resin operations regulated by Section 301 of this rule shall be determined using one of the following:

(1) EPA Reference Method 24 – Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings, 40 CFR 60, Appendix A; or

(2) A material safety data sheet (MSDS) or product data sheet showing the material name and VOC content as applied.

(3) Exempt solvent content shall be determined by: South Coast Air Quality Management District's (SCAQMD) "Laboratory Method of Analysis for Enforcement Samples" manual;

(i) Method 302; or

(ii) Methods 303.

a. Weight Loss of Polyester Resin Materials shall be determined and reported in accordance with SCAQMD Method 309-91 for determination of static volatile emissions.

b. Monomer content of polyester resin materials shall be determined by SCAQMD Method 312-91.

c. Volatile Organic Compounds shall be determined SCAQMD Method 313- 91 (February 1997) “ Determination of Volatile Organic Compounds (VOC) by Gas Chromatography/ Mass Spectrometry (GC/MS):”

502.2 Vapor Pressure: The total composite partial vapor pressure of all VOCs in a solution shall be determined by one of the following methods:

a. U.S. EPA Reference Method 24 (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings), 40 CFR, Part 60, Appendix A-7; or

b. ASTM D2879-97(2007) Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope; or

c. Calculations using certified data from a laboratory or manufacturer revealing the exact formulation; or

d. A Material Safety Data Sheet (MSDS) or product data sheet showing the material name and VOC vapor pressure; or

e. Calculating VOC composite partial vapor pressure as follows:

$$PP_c = \frac{\sum_{i=1}^n \frac{(W_i)(VP_i) / MW_i}{MW_w + \sum_{i=1}^n \frac{W_c}{MW_c} + \sum_{i=1}^n \frac{W_i}{MW_i}}}{\text{---}}$$

where:

W_i = Weight of the “*i*”th VOC compound, in grams

W_w = Weight of water, in grams

W_c = Weight of exempt compound, in grams

MW_i = Molecular weight of the “*i*”th VOC compound, in g/g-mol

MW_w = Molecular weight of water, in g/g-mol

MW_c = Molecular weight of exempt compound, in g/g-mol

PP_c = VOC composite partial vapor pressure at 20 °C (68°F), in mm Hg

VP_i = Vapor pressure of the “*i*”th VOC compound at 20 °C (68°F), in mm

Hg

502.3 Emission Testing: Capture and control efficiency of an emissions control device shall be determined according to:

- a. “Guidelines for Determining Capture Efficiency”, January 9, 1995, Candace Sorrell, Source Characterization Group A, Office of Air Quality Planning and Standards, US EPA; or
- b. EPA Reference Method 204 – Criteria for and Verification of a Permanent or Temporary Total Enclosure, 40 CFR 51, Appendix M; or applicable Subparts 204A, 204B, 204C or 204D; or
- c. EPA Reference Method 18 – Measurement of Gaseous Organic Compound Emissions by Gas Chromatography, 40 CFR 60, Appendix A; or
- d. EPA Reference Method 25 – Determination of Total Gaseous Nonmethane Organic Emissions as Carbon, 40 CFR 60, Appendix A; or applicable Subparts 25A or 25B.