RULE 2.30
POLYESTER RESIN OPERATIONS

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INDEX

100 GENERAL

101 **PURPOSE:** The purpose of this Rule is to control Volatile Organic Compound (VOC) emissions from polyester resin operations.

102 **APPLICABILITY:** The provisions of this Rule are applicable to any owner or operator of a facility performing polyester resin operations or any person who sells or distributes any gel coat or polyester resin material subject to the provisions of this rule.

110 **EXEMPTION, TOUCH-UP AND REPAIR:** The provisions of Sections 301, 302 and 303 shall not apply to touch-up and repair.

200 DEFINITIONS

201 **AIRLESS SPRAY:** A coating spray application system using high fluid pressure to atomize the coating without compressed air.

202 **AIR-ASSISTED AIRLESS SPRAY:** A coating spray application using fluid pressure to atomize the coating and lower pressure air to adjust the shape of the spray pattern.

203 **CATALYST:** A substance added to the resin to initiate polymerization.

204 **CLEANING MATERIALS:** Materials used for cleaning, including but not limited to: hands, tools, molds, application equipment, and work areas.

205 **CLOSED MOLD SYSTEM:** A method of forming an object from polyester resins by placing the material in a confining mold cavity and applying pressure and/or heat.

206 **CONTROL DEVICE:** Equipment such as an incinerator or adsorber used to prevent air pollutants from reaching the ambient air.

207 **CORROSION-RESISTANT MATERIALS:** Materials that are halogenated, furan, bisphenol A, vinyl ester, or isophthalic resins that are used to make products for corrosive or fire retardant applications.

208 **CROSS-LINKING:** The chemical process of chemically bonding two or more polymer chains together.

209 **CURE:** To polymerize, e.g., to transform from a liquid to a solid or semi-solid state to achieve desired product

physical properties, including hardness.

210 **ELECTROSTATIC SPRAY:** The spray application of coatings whereby an electrostatic potential is created between the part to be coated and the coating particles.

211 **EMISSION CONTROL SYSTEM:** A control device and its associated collection system.

212 **EXEMPT COMPOUNDS:** As defined in District Rule 1.1, General Provisions and Definitions.

213 **FIBERGLASS:** A fiber similar in appearance to wool or cotton fiber but made from glass.

214 **GEL COAT:** A polyester resin topcoat that provides a cosmetic enhancement and improves resistance to degradation from exposure to the environment.

215 **HIGH-VOLUME, LOW-PRESSURE (HVLP) SPRAY EQUIPMENT:** Spray equipment permanently labeled as such and which is designed and operated between 0.1 and 10 pounds per square inch (psig) air atomizing pressure measured dynamically at the center of the air cap and at the air horns.

216 **INHIBITOR:** A substance used to slow down or prevent a chemical reaction.

217 **LOW-VOC EMISSIONS RESIN SYSTEMS:** Polyester resin materials which contain vapor suppressants to reduce monomer evaporation loss.

218 **MONOMER:** A relatively low-molecular-weight organic compound that combines with itself, or other similar compounds to become a cured thermosetting resin.

219 **POLYESTER:** A complex polymeric ester containing difunctional acids and alcohols dissolved in a monomer.

220 **POLYESTER RESIN MATERIALS:** Materials including, but 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 VOC-containing materials used in polyester resin operations.

221 **POLYESTER RESIN OPERATIONS:** 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.

222 **POLYMER:** A chemical compound comprised of a large number of chemical units and which is formed by the chemical linking of monomers.

223 **REPAIR:** The part of the fabrication process that requires the addition of polyester resin material to portions of a previously fabricated product in order to mend structural damage.

224 **RESIN:** 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.

225 **SPECIALTY RESIN:** 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 or acidic agents, or flame.

226 **SURFACE PREPARATION AND CLEANUP:** The removal of contaminants such as dust, soil, oil, grease, etc., prior to any step in a manufacturing process from parts, products, tools, machinery, equipment, and general work areas.

227 **TOUCH-UP:** The portion of the fabrication process that is necessary to cover minor imperfections.

228 **VOLATILE ORGANIC COMPOUND (VOC):** As defined in Rule 1.1, General Provisions and Definitions.

229 **VAPOR SUPPRESSANT:** A substance added to a resin to minimize the outward diffusion of monomer vapor into the atmosphere.

230 **WASTE MATERIALS:** Those materials that include, but are not limited to: scraps resulting from cutting and grinding operations, any paper or cloth used for cleaning operations, waste resins, and any spent cleaning materials.

300 STANDARDS

301 **GENERAL REQUIREMENTS:** Any person operating a polyester resin operation shall comply with one or more of the following, as applicable:

301.1 The use of low VOC polyester resins with the following monomer contents as applied and as determined by the manufacturer's specification:

a. Low VOC resins contain no more than 35% monomer by weight;
b. Low VOC pigmented gel coats contain no more than 45% monomer by weight;
c. Low VOC specialty resins and clear gel coats contain no more than 50% by weight.

301.2 The use of a resin containing a vapor suppressant, such that weight loss from VOC emissions does not exceed 60 grams per square meter of exposed surface area during resin polymerization; as determined by Section 602; or

301.3 The use of a closed-mold system;

302 **APPLICATION REQUIREMENTS:** Only airless, air-assisted airless, HVLP, or electrostatic spray equipment shall be used for the application of polyester resin materials in spraying operations.

303 **EMISSION CONTROL SYSTEM:** In lieu of complying with the applicable provisions of Section 300, an operator may use a VOC emission control system that controls emissions from the source operation provided the following conditions are met:

303.1 The VOC emission control system shall be approved in writing by the APCO,

303.2 The VOC emission control system shall be operated with an overall capture and control efficiency of at least 85 percent by weight during periods of emission producing activity.

304 **STORAGE AND DISPOSAL - GENERAL:** All VOC-containing materials, whether in its form for intended use or as a waste or used product, including items such as cloth or paper laden with VOC containing materials, shall be stored in non-absorbent, non-leaking containers which shall be kept closed at all times, except when filling or emptying, and disposed of in a manner to prevent evaporation of VOCs into the atmosphere at the facility.

305 **REQUIREMENTS FOR SURFACE PREPARATION AND CLEANUP MATERIALS:** Any solvent cleaning of application equipment, parts, products, tools, machinery, equipment, general

work areas, and the storage and disposal of VOC-containing materials used in surface preparation and cleanup operations shall be carried out pursuant to Rule 2.31, Surface Preparation and Cleanup.

400 ADMINISTRATIVE REQUIREMENTS

401 **PROHIBITION OF SPECIFICATION:** A person shall not specify the use of any gel coat or polyester resin material subject to the provisions of this rule that does not meet the limits and requirements of this rule where such applications result in a violation of this Rule. The requirements of this Section shall apply to all written or oral contracts.

402 **PROHIBITION OF SALE:** A person shall not sell or offer for sale any gel coat or polyester resin material subject to the provisions of this rule that does not meet the limits and requirements of this rule where such applications result in a violation of this Rule.

403 **OPERATION AND MAINTENANCE PLAN (O&M Plan):** Any person using an emission control device pursuant to Section 303 of this Rule, as a means of complying with this rule, must submit with the application for Authority to Construct, pursuant to Rule 3.1, GENERAL PERMIT REQUIREMENTS, an O&M Plan for the emission control device to the APCO for approval. The O&M Plan shall specify operation and maintenance procedures which will demonstrate continuous operation of the control device during periods of emission producing operations. The O&M Plan shall also specify which records must be kept to document these operation and maintenance procedures. These records shall comply with the requirements of Sections 501.1 and 501.2 of this Rule. Any person using an emission control device must fully comply with all O&M Plans submitted for approval, even if such O&M Plans have not yet been approved, unless notified in writing by the APCO.

500 MONITORING AND RECORDS

501 **RECORD KEEPING - GENERAL:** Any person subject to this Rule shall comply with the following requirements:

501.1 A person shall maintain, or have available, a current list of polyester resins in use which provides all of the data necessary to evaluate compliance, including the following information:

a. Polyester resin, catalyst, and cleaning

materials used;

b. The weight percent of VOC in each of the polyester resin 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. The amount of each of the polyester resin materials used during each day of operations;

e. The volume of polyester resin materials used for touch-up and repair during each day of operation; and

502 **RECORD KEEPING - EMISSION CONTROL SYSTEMS:** If compliance with this rule is achieved through the use of a emission control system, in addition to the provisions of Section 501, the owner or operator shall maintain:

502.1 Daily usage records of coatings, strippers and solvents.

502.2 Daily records of key operating parameters such as temperatures, pressures, flowrates, and hours of operation of the control device to verify compliance of the capture and control device.

502.3 Maintenance work which interferes with the operation of the control device.

503 **REPORTING:** All records required by this Rule shall be maintained on site for a period of five years and made available to the APCO upon request.

600 TEST METHODS AND CALCULATIONS

601 **GENERAL:** For the purposes of this Rule, the following test methods or calculation methods shall be used. Other test methods determined to be equivalent and approved in writing by the District and the EPA may also be used. VOC emissions or other parameters determined to exceed any limits established by this Rule through the use of any of the following test methods or calculations shall constitute a violation of this Rule.

602 **EMISSION RATE:** The emission rate per square meter of exposed surface during polymerization of Polyester Resins is to be determined using South Coast Air Quality Management District Method 309-91, "Static Method for

Determination of Volatile Emissions from Polyester and Vinyl Resins Operations."

603 **CAPTURE EFFICIENCY:** The capture efficiency of a VOC emission control system's collection device shall be determined according to EPA's "Guidelines for Determining Capture Efficiency," January 9, 1995 and 40 CFR 51, Appendix M, Methods 204-204F, as applicable.

604 **CONTROL EFFICIENCY:** The control efficiency of a VOC emission control system's collection device shall be determined by using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Method 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or CARB Method 422 shall be used to determine the emissions of exempt compounds.

605 **OVERALL CAPTURE AND CONTROL EFFICIENCY**: For VOC emission control systems that consist of a single VOC emission control device, the overall capture and control efficiency shall be calculated by using the following equation:

CEoverall = [CEcapture x CEcontrol] / 100%

Where: CEoverall = Overall Capture and Control Efficiency
CEcapture = Capture Efficiency of the collection device*
CEcontrol = Control Efficiency of the collection device**

*As determined in Section 603
**As determined in Section 604

606 **MONOMER CONTENT:** The monomer content of uncatalyzed resin materials is to be determined using South Coast Air Quality Management District Method 312, Determination of Percent Monomer in Polyester Resins, or ASTM D2369-87.