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RULE 1107. COATING OF METAL PARTS AND PRODUCTS

(a) Purpose and Applicability

The purpose of Rule 1107 is to reduce volatile organic compound (VOC) emissions from the coating of metal parts and products. This rule applies to all metal coatings operations except those performed on aerospace assembly, magnet wire, marine craft, motor vehicle, metal container, and coil coating operations. This rule does not apply to the coating of architectural components coated at the structure site or at a temporary unimproved location designated exclusively for the coating of structural components.

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

- (1) AEROSOL COATING PRODUCT is 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.
- (2) AIR-DRIED COATING is a coating that is cured at a temperature below 90°C (194°F).
- (3) ALTERNATIVE EMISSION CONTROL PLAN is a plan that allows a source to demonstrate an alternative method of rule compliance, pursuant to Rule 108 – Alternative Emission Control Plans.
- (4) BAKED COATING is a coating that is cured at a temperature at or above 90°C (194°F).
- (5) CAMOUFLAGE COATING is a coating used, principally by the military, to conceal equipment from detection.
- (6) CAPTURE EFFICIENCY is the percentage of VOCs used, emitted, evolved, or generated by the operation, that are collected and directed to an air pollution control device.
- (7) CATALYST is a substance that alters the rate of a chemical reaction without participating in that reaction or changing during the course of that reaction.

- (b) (8) COATING is a material which is applied to a surface and which forms a continuous film in order to beautify and/or protect such surface.
- (9) CONTRACT PAINTER is a non-manufacturer of metal parts and products who applies coatings to such products at his facility exclusively under contract with one or more parties that operate under separate ownership and control.
- (10) DIP COATING is a method of applying coatings to a substrate by submersion into and removal from a coating bath.
- (11) ELECTRIC-INSULATING VARNISH is a non-convertible-type coating applied to electric motors, components of electric motors, or power transformers, to provide electrical, mechanical, and environmental protection or resistance.
- (12) ELECTRIC-INSULATING AND THERMAL-CONDUCTING COATING is a coating that displays an electrical insulation of at least 1000 volts DC per mil on a flat test plate and an average thermal conductivity of at least 0.27 BTU per hour-foot-degree-Fahrenheit.
- (13) ELECTROCOATING is a process that uses coating concentrates or pastes added to a water bath. The coating is applied by using an electrical current in either an anodic or cathodic process.
- (14) ELECTROSTATIC APPLICATION is a method of applying coating particles or coating droplets to a grounded substrate by electrically charging them.
- (15) ENERGY CURABLE COATINGS are single-component reactive products that cure upon exposure to visible-light, ultra-violet light, or an electron beam. The VOC content of thin film energy curable coatings may be measured by manufacturers using ASTM D7767-11 (2018) – Standard Test Method to Measure Volatiles from Radiation Curable Acrylate Monomers, Oligomers, and Blends and Thin Coatings Made from Them.
- (16) ESSENTIAL PUBLIC SERVICE COATING is a protective (functional) coating applied to components of power, water, and natural gas production, transmission, or distribution systems during repair and maintenance procedures.
- (17) ETCHING FILLER is a coating that contains less than 23 percent solids by weight and at least 1/2-percent acid by weight, and is used instead of applying a pretreatment coating followed by a primer.
- (18) EXEMPT COMPOUNDS (see Rule 102 – Definition of Terms).
- (19) EXTREME HIGH-GLOSS COATING is a coating which, when tested by ASTM D523-14 (2018) – Standard Test Method for Specular Gloss, shows a reflectance of 75 or more on a 60° meter.

- (b) (20) EXTREME-PERFORMANCE COATING is a coating used on a metal surface where the coated surface is, in its intended use, subject to the following:
- (A) Chronic exposure to corrosive, caustic or acidic agents, chemicals, chemical fumes, chemical mixtures, or solution;
 - (B) Repeated exposure to temperatures in excess of 250°F; or
 - (C) Repeated heavy abrasion, including mechanical wear and repeated scrubbing with industrial grade solvents, cleansers, or scouring agents.
- (21) FLOW COAT is a non-atomized technique of applying coatings to a substrate with a fluid nozzle in a fan pattern with no air supplied to the nozzle.
- (22) GRAMS OF VOC PER LITER OF COATING LESS WATER AND LESS EXEMPT COMPOUNDS is the weight of VOC per combined volume of VOC and coating solids and can be calculated by the following equation:

Grams of VOC per Liter of Coating Less Water and Less Exempt Compounds

$$= \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

- 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
 - V_w = volume of water in liters
 - V_{es} = volume of exempt compounds in liters

- (23) GRAMS OF VOC PER LITER OF MATERIAL is the weight of VOC per volume of material and can be calculated by the following equation:

Grams of VOC 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

- (24) HAND APPLICATION METHODS is the application of coatings by manually held non-mechanically operated equipment. Such equipment includes paintbrushes, hand rollers, caulking guns, trowels, spatulas, syringe daubers, rags, and sponges.

- (b) (25) **HARDENER** is a substance or mixture of substances that controls the viscosity of the reactants and products of a chemical reaction; while participating in chemical reaction and becoming part of the product or products of chemical reaction.
- (26) **HEAT-RESISTANT COATING** is a coating that must withstand a temperature of at least 400°F during normal use.
- (27) **HIGH-PERFORMANCE ARCHITECTURAL COATING** is a coating used to protect architectural subsections and which meets the requirements of the Architectural Aluminum Manufacturer Association's publication numbers AAMA 2604-05 – Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels or AAMA 2605-05 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- (28) **HIGH-TEMPERATURE COATING** is a coating that is certified to withstand a temperature of 1000°F for 24 hours.
- (29) **HIGH-VOLUME, LOW-PRESSURE (HVLP) SPRAY** is a coating application system which is designed to be operated and which is operated between 0.1 and 10 pounds per square inch gauge (psig) air pressure, measured dynamically at the center of the air cap and the air horns.
- (30) **INK** is a fluid that contains dyes and/or colorants and is used to make markings but not to protect surfaces.
- (31) **MAGNETIC DATA STORAGE DISK COATING** is a coating used on a metal disk which stores data magnetically.
- (32) **METAL PARTICLES** are pieces of an elemental pure metal or a combination of elemental metals.
- (33) **METAL PARTS AND PRODUCTS** are any components or complete units fabricated from metal, except those subject to the coating provisions of other source specific rules of Regulation XI – Source Specific Standards.
- (34) **METALLIC COATING** is a coating which contains more than 5 grams of metal particles per liter of coating, as applied.
- (35) **MIL** is 0.001 inch.
- (36) **MILITARY SPECIFICATION COATING** is a coating applied to metal parts and products and which has a paint formulation approved by a United States Military Agency for use on military equipment.

- (b) (37) MOLD-SEAL COATING is the initial coating applied to a new mold or repaired mold to provide a smooth surface which, when coated with a mold release coating, prevents products from sticking to the mold.
- (38) MOTOR VEHICLE is a passenger car, light-duty truck, medium-duty vehicle, or heavy-duty vehicle as defined in Title 13, California Administrative Code, Section 1902.
- (39) MULTI-COMPONENT COATING is a coating requiring the addition of a separate reactive resin, commonly known as a catalyst or hardener, before application to form an acceptable dry film.
- (40) ONE-COMPONENT COATING is a coating that is ready for application as it comes out of its container to form an acceptable dry film. A thinner, necessary to reduce the viscosity, is not considered a component.
- (41) OPTICAL ANTI-REFLECTION COATING is a coating with a low reflectance in the infrared and visible wavelength range and is used for anti-reflection on or near optical and laser hardware.
- (42) PAN-BACKING COATING is a coating applied to the surface of pots, pans, or other cooking implements that are exposed directly to a flame or other heating elements.
- (43) PHOTORESIST COATING is a coating applied directly to a metal substrate to protect surface areas when chemical milling, etching, or other chemical surface operations are performed on the substrate.
- (44) PHOTORESIST OPERATION is a process for the application and development of photoresist coating on a metal substrate, including preparation (except primary cleaning), soft bake, development, hard bake, and stripping, and can be generally subdivided as follows:
 - (A) NEGATIVE PHOTORESIST OPERATION is a process where the photoresist hardens when exposed to light and the unhardened photoresist is stripped, exposing the metal surface for etching.
 - (B) POSITIVE PHOTORESIST OPERATION is a process where the photoresist softens when exposed to light and the softened photoresist is stripped, exposing the metal surface for etching.
- (45) PREFABRICATED ARCHITECTURAL COMPONENT COATINGS are coatings applied to metal parts and products which are to be used as an architectural structure.
- (46) PRETREATMENT COATING is a coating which contains no more than 12 percent solids by weight, and at least 1/2-percent acid by weight, is used to provide surface

etching, and is applied directly to metal surfaces to provide corrosion resistance, adhesion, and ease of stripping.

- (b) (47) **REACTIVE DILUENT** is a liquid which is a VOC during application and one in which, through chemical reaction such as polymerization, 20 percent or more of the VOC becomes an integral part of a finished coating.
- (48) **REPAIR COATING** is a coating used to recoat portions of a product which has sustained mechanical damage to the coating following normal painting operations.
- (49) **ROLL COAT** is a coating method using a machine that applies coating to a substrate by continuously transferring coating through a pair or set of oppositely rotating rollers.
- (50) **SAFETY-INDICATING COATING** is a coating which changes physical characteristics, such as color, to indicate unsafe conditions.
- (51) **SILICONE-RELEASE COATING** is any coating which contains silicone resin and is intended to prevent food from sticking to metal surfaces such as baking pans.
- (52) **SOLAR-ABSORBENT COATING** is a coating which has as its prime purpose the absorption of solar radiation.
- (53) **SOLID-FILM LUBRICANT** is a very thin coating consisting of a binder system containing as its chief pigment material one or more of molybdenum disulfide, graphite, polytetrafluoroethylene (PTFE), or other solids that act as a dry lubricant between faying surfaces.
- (54) **STENCIL COATING** is an ink or a coating which is rolled or brushed onto a template or stamp in order to add identifying letters and/or numbers to metal parts and products.
- (55) **TEXTURED FINISH** is a rough surface produced by spraying and splattering large drops of coating onto a previously applied coating. The coatings used to form the appearance of the textured finish are referred to as textured coatings.
- (56) **TOUCH-UP COATING** is a coating used to cover minor coating imperfections appearing after the main coating operation.
- (57) **TRANSFER EFFICIENCY** is the ratio of the weight or volume of coating solids adhering to an object to the total weight or volume, respectively, of coating solids used in the application process, expressed as a percentage.
- (58) **VACUUM-METALIZING COATING** is the undercoat applied to the substrate on which the metal is deposited or the overcoat applied directly to the metal film.
- (59) **VOLATILE ORGANIC COMPOUND (VOC)** (see Rule 102 – Definition of Terms).

(c) Requirements

(1) Operating Equipment

A person shall not apply VOC-containing coatings to metal parts and products subject to the provisions of this rule unless the coating is applied with equipment operated according to the equipment manufacturer specifications, and by the use of one of the following methods:

- (A) Electrostatic application;
- (B) Flow coat;
- (C) Dip coat;
- (D) Roll coat;
- (E) High-Volume, Low-Pressure (HVLP) Spray;
- (F) Hand Application Methods; or
- (G) Such other coating application methods as are demonstrated to the Executive Officer to be capable of achieving a transfer efficiency equivalent or better to the method listed in subparagraph (c)(1)(E) and for which written approval of the Executive Officer has been obtained.

(2) VOC Content of Coatings

A person shall not apply to metal parts and products subject to the provisions of this rule any coatings, including any VOC-containing materials added to the original coating supplied by the manufacturer, which contain VOCs in excess of the limits specified below:

VOC LIMITS				
Less Water and Less Exempt Compounds				
Coating	Air-Dried		Baked	
	g/L	lb/gal	g/L	lb/gal
General One-Component	275	2.3	275	2.3
General Multi-Component	340	2.8	275	2.3
Military Specification	340	2.8	275	2.3
Etching Filler	420	3.5	420	3.5
Solar-Absorbent	420	3.5	360	3.0
Heat-Resistant	420	3.5	360	3.0
Extreme High-Gloss	340	2.8	360	3.0
Metallic	420	3.5	360	3.0
Extreme Performance	420	3.5	360	3.0
Prefabricated Architectural One-Component	275	2.3	275	2.3
Prefabricated Architectural Multi-Component	340	2.8	275	2.3
Touch Up	420	3.5	360	3.0
Repair	420	3.5	360	3.0
Silicone Release	420	3.5	420	3.5
High-Performance Architectural	420	3.5	420	3.5
Camouflage	420	3.5	360	3.0
Vacuum-Metalizing	420	3.5	420	3.5
Mold-Seal	420	3.5	420	3.5
High-Temperature	420	3.5	420	3.5
Electric-Insulating Varnish	420	3.5	420	3.5
Pan Backing	420	3.5	420	3.5
Pretreatment Coatings	420	3.5	420	3.5

- (c) (3) A person shall not use VOC-containing materials which have a VOC content of more than 200 grams per liter of material for stripping any coating governed by this rule.
- (4) A person shall store and dispose of the following in closed containers, except when depositing or removing material from the container:
- (A) VOC-containing coatings, thinners, and coating-related waste materials applied to any metal parts and products subject to the provisions of this rule;
 - (B) Cloth or paper used in stripping cured coating; and
 - (C) VOC-laden application tools, such as a brush, pad, rag, cloth, or paper, used in the application of coatings applied to any metal parts and products subject to the provisions of this rule.

- (c) (5) Solvent cleaning of application equipment, parts, products, tools, machinery, equipment, general work areas, and the storage and disposal of VOC-containing materials used in cleaning operations shall be carried out pursuant to Rule 1171 – Solvent Cleaning Operations.
- (6) For coatings that contain reactive diluents, the Grams of VOC per Liter of Coating Less Water and Less Exempt Compounds shall be calculated by the following equation:

Grams of VOC per Liter of Coating Less Water and Less Exempt Compounds

$$= \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

- Where: W_s = weight of volatile compounds not consumed during curing, in grams
 W_w = weight of water not consumed during curing, in grams
 W_{es} = weight of exempt compounds not consumed during curing, in grams
 V_m = volume of the material prior to reaction, in liters
 V_w = volume of water not consumed during curing, in liters
 V_{es} = volume of exempt compounds not consumed during curing, in liters

- (7) Owners or operators of control equipment may comply with provisions of paragraph (c)(1) and/or (c)(2) by using approved air pollution control equipment provided:
- (A) The control device reduces VOC emissions from an emission collection system by at least 95 percent by weight or the output of the air pollution control device is no more than 5 parts per million (ppm) VOC by volume calculated as carbon with no dilution; and
- (B) The owner or operator demonstrates that the emission collection system collects at least 90 percent by weight of the VOC emissions generated by the sources of VOC emissions.
- (d) Prohibition of Specifications
 A person shall not specify the use in the South Coast AQMD of any coating to be applied to any metal parts and products subject to the provisions of this rule that does not meet the

limits and requirements of this rule. The requirements of this paragraph shall apply to all written and oral contracts.

(e) **Methods of Analysis**

All applicable methods of analysis shall be as cited in paragraphs (e)(1) through (e)(6), or any other applicable method approved in writing by the Executive Officer, United States Environmental Protection Agency (U.S. EPA), and the California Air Resources Board (CARB).

(1) **Determination of VOC Content**

(A) The VOC content of coatings subject to the provisions of this rule shall be determined by the following methods:

- (i) U.S. EPA Reference Method 24 (Title 40, Code of Federal Regulations, Part 60, Appendix A) – Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings. The exempt solvent content shall be determined by South Coast AQMD Method 303 – Determination of Exempt Compounds contained in the South Coast AQMD "Laboratory Methods of Analysis for Enforcement Samples" manual; or
- (ii) South Coast AQMD Method 304 – Determination of Volatile Organic Compounds (VOC) in Various Materials contained in the South Coast AQMD "Laboratory Methods of Analysis for Enforcement Samples" manual.

(B) **Exempt Perfluorocarbon Compounds**

The following classes of compounds:

- cyclic, branched, or linear, completely fluorinated alkanes;
- cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
- cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
- sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine;

will be analyzed as exempt compounds for compliance with subdivision (c) only when manufacturers specify which individual compounds are used in the coating formulation. In addition, the manufacturers must identify the

U.S. EPA, CARB, and the South Coast AQMD approved test methods used to quantify the amount of each exempt compound.

- (e) (1) (C) Thin Film Energy Curable Coatings
The VOC content of thin film energy curable coatings may be measured by manufacturers using ASTM D7767-11 (2018) – Standard Test Method to Measure Volatiles from Radiation Curable Acrylate Monomers, Oligomers, and Blends and Thin Coatings Made from Them.
- (2) Determination of the Acid Content of Pretreatment Coatings and Etching Fillers
The acid content of pretreatment coatings and etching fillers shall be determined by ASTM D1613-17 – Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products.
- (3) Determination of the Metal Particle Content of Metallic Coatings
The metal particle content of metallic coatings subject to the provisions of this rule shall be determined by the following methods:
 - (A) South Coast AQMD Method 318 – Determination of Weight Percent Elemental Metal in Coatings by X-Ray Diffraction contained in the South Coast AQMD "Laboratory Methods of Analysis for Enforcement Samples" manual for coatings containing elemental aluminum metal; or
 - (B) South Coast AQMD Method 311 – Analysis of Percent Metal in Metallic Coatings by Spectrographic Method contained in the South Coast AQMD "Laboratory Methods of Analysis for Enforcement Samples" manual for all other non-aluminum particle content analyses.
- (4) Determination of Efficiency of Emission Control System
 - (A) Capture efficiency specified in paragraph (c)(7), shall be determined by verifying the use of a Permanent Total Enclosure (PTE) and 100% capture efficiency as defined by U.S. EPA Method 204 – Permanent (PTE) or Temporary Total Enclosure (TTE) for Determining Capture Efficiency. Alternatively, if a U.S. EPA Method 204 defined PTE is not employed, capture efficiency shall be determined using a minimum of three sampling runs subject to data quality criteria presented in the U.S. EPA technical guidance document, "Guidelines for Determining Capture Efficiency", January 9, 1995. Individual capture efficiency test runs subject to the U.S. EPA technical guidance document shall be determined by:
 - (i) The Temporary Total Enclosure (TTE) approach of U.S. EPA Methods 204 through 204F; or

- (e) (4) (A) (ii) The South Coast AQMD "Protocol for Determination of Volatile Organic Compounds (VOC) Capture Efficiency."

Notwithstanding the test methods specified by the technical guidance document, any other method approved in writing by the U.S. EPA, CARB, and the South Coast AQMD Executive Officer may be substituted.

- (B) The efficiency of the control device of the emission control system as specified in paragraph (c)(7) and the VOC content in the control device exhaust gases, measured and calculated as carbon, shall be determined by the U.S. EPA Test Method 25 – Determination of Total Gaseous Nonmethane Organic Emissions as Carbon, U.S. EPA Test Method 25A – Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, South Coast AQMD Method 25.1 – Determination of Total Gaseous Non-Methane Organic Emissions as Carbon, or South Coast AQMD Method 25.3 – Determination of Low Concentration Non-Methane Non-Ethane Organic Compound Emissions from Clean Fueled Combustion Sources, as applicable. U.S. EPA Test Method 18 – Measurement of Gaseous Organic Compound Emissions by Gas Chromatography, or CARB Method 422 – Determination of Volatile Organic Compounds in Emissions from Stationary Sources shall be used to determine emissions of exempt compounds.

(5) Multiple Test Methods

When more than one test method or set of methods are specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of the rule.

- (6) Demonstrations of transfer efficiency shall be conducted in accordance with South Coast AQMD method "Spray Equipment Transfer Efficiency Test Procedure for Equipment User", May 24, 1989 and South Coast AQMD "Guidelines for Demonstrating Equivalency with District Approved Transfer Efficiency Spray Guns", September 26, 2002.

(f) Exemptions

- (1) The provisions of paragraphs (c)(1) and (c)(2) of this rule shall not apply to:
- (A) Stencil coatings;
 - (B) Safety-indicating coatings;
 - (C) Magnetic data storage disk coatings;
 - (D) Solid-film lubricants; and

- (f)
 - (1) (E) Electric-insulating and thermal-conducting coatings.
 - (2) The provisions of paragraph (c)(1) of this rule shall not apply to the application of touch-up coatings, repair coatings, and textured finishes.
 - (3) The provisions of paragraphs (c)(1), (c)(2), and (c)(3) of this rule do not apply to the application of coatings and use of cleaning solvents while conducting performance tests on the coatings at paint manufacturing facilities.
 - (4) The provisions of paragraph (c)(2) of this rule shall not apply to aerosol coating products.
 - (5) The provisions of paragraph (c)(2) of this rule shall not apply to the use of essential public service coatings provided such aggregate use does not exceed 55 gallons in any one calendar year per facility.
 - (6) The provisions of paragraph (c)(2) of this rule shall not apply to the use of optical anti-reflective coatings provided such aggregate use does not exceed 10 gallons in any one calendar year, per facility.
 - (7) The provisions of paragraph (c)(2) shall not apply to photoresist operations applying liquid photoresist coating used for photofabrication of metal substrates with a thickness not exceeding 0.060 inches provided the annual usage per facility is 10 gallons or less.
 - (8) The provisions of paragraph (c)(1) shall not apply to metal coatings with a viscosity of 650 centipoise or greater, as applied.
- (g) **Rule 442 Applicability**

Any coating, coating operation, or facility which is exempt from all or a portion of the VOC limits of this rule shall comply with the provisions of Rule 442 – Usage of Solvents.
- (h) **Alternative Emission Control Plan**

An owner or operator may achieve compliance with paragraph (c)(2) by means of an Alternative Emission Control Plan pursuant to Rule 108 – Alternative Emission Control Plans.
- (i) **Qualification for Classification as Extreme-Performance Coating**

A coating may be classified as an extreme-performance coating provided that the applicator requests and receives written approval of such classification from the Executive Officer, prior to application of such coating, and shows that the intended use of each coated object would require coating with an extreme-performance coating.

- (j) Recordkeeping
Records of coating and solvent usage shall be maintained pursuant to Rule 109 – Recordkeeping for Volatile Organic Compound Emissions.

- (k) Emission Reduction Credits
Facilities that use high-performance architectural, pretreatment, or vacuum-metalizing coatings shall not receive emission reduction credit(s) pursuant to Rule 1309 – Emission Reduction Credits and Short Term Credits above those emission reduction credit(s) that the facility would have received if it was operated with coatings having a VOC content of no more than 420 grams per liter, less water and less exempt compounds.