

Rule 228 **Surface Coating of Metal Parts and Products**

Part 1.0 **General**

1.1 Applicability

Provisions of this Rule shall apply to surface coating of metal parts and products in portions of the Northern Sierra Air Quality Management District that are designated as Non-attainment for any federal ambient air quality standard for ozone (per 40 CFR 81.305).

1.2 Exemptions

1.2.1 Requirements of this Rule, except for Subsection 4.2 (Record Keeping), shall not apply to coating operations at facilities where total uncontrolled facility VOC emissions (excluding exempt compounds) from use of all coatings does not exceed 2.7 tons per rolling 12-month period (average of 15 pounds per day).

1.2.2 Requirements of Subsection 3.3 (Application Equipment Requirements) of this Rule shall not apply to touch-up, repair, textured finishing or stenciling of identification numbers and letters, although VOC limits and work practices specified herein shall apply to such coatings.

1.2.3 Requirements of this Rule shall not apply to coating of automobiles, light duty trucks, mobile equipment, aircraft, aerospace vehicles, marine vessels, cans, coils, magnetic wire, or magnetic data storage disks, or to coating with polyester resins, aerosol coatings or powder coatings.

1.2.4 VOC limits and application methods specified herein shall not apply to graphic arts printing and coatings, stencil coatings, safety-indicated coatings, solid-film lubricant coatings, electric-insulating and thermal-conducting coatings, or plastic extruded onto metal parts to form a coating, although work practices specified herein shall apply to such coatings.

1.2.5 Up to 55 gallons of coatings exceeding the VOC content limits specified in section 3.1 and 3.2.1 may be used by a facility (including all units at that facility) per rolling twelve-month period.

1.2.6 The provisions of this rule shall not apply to stripping of cured coatings, cured adhesives, and cured inks, except the stripping of such materials from spray application equipment.

1.3 Effective Date

This regulation shall become effective July 1, 2011. Until the effective date, the previously adopted version of Rule 228 shall remain effective.

Part 2.0 **Definitions**

Air Dried Coating: A coating that is cured at a temperature below 194 degrees F (90 degrees C).

APCO: Air Pollution Control Officer or Executive Director of the Northern Sierra Air Quality Management District, or an authorized representative thereof.

ARB: California Air Resources Board.

Baked Coating: A coating that is cured at a temperature at or above 194 degrees F (90 degrees C).

Camouflage Coating: A coating used to conceal items or equipment from visual detection.

Clear Coating: A coating that either lacks color and opacity, or is transparent, and uses the surface to which it is applied as a reflective base or undertone color.

Control Device: Equipment such as an incinerator or absorber used to prevent air pollutants from reaching the ambient air.

Dip Coat: A coating method which is applied by dipping an object into a vat of coating material and allowing any excess coating material to drain off.

Drum Coating: A coating used on a metal drums having a capacity ranging from 12 to 110 gallons.

Electrostatic Application: The electrical charging of atomized coating droplets for deposition by electrostatic attraction.

Emission Control System: A control device and its associated collection system.

Electric-Insulating Varnish: 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.

EPA: United States Environmental Protection Agency.

Etching Filler: 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.

Exempt Compounds: Any compound specifically excluded from the definition of Volatile Organic Compound (VOC) in the Federal Register, codified at 40 CFR Part 51.100(s), as having negligible atmospheric photochemical reactivity.

Extreme High-Gloss Coating: A coating which, when tested by the American Society for Testing Material (ASTM) Test Method D523 (Standard Test Method for Specular Gloss, 1980), shows a reflectance of 75 or more on a 60° meter.

Extreme-Performance Coating: A coating that is used on a metal surface where the coated surface, in it's intended use, is acutely or chronically exposed to salt water, corrosives, caustics, acids, oxidizing agents, wind or ocean driven debris, electromagnetic pulse or temperatures exceeding 250°F.

Flow Coat: 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.

Heat-Resistant Coating: A coating that must withstand a temperature of at least 400°F during normal use.

High-Performance Architectural Coating: A coating used to protect architectural subsections and which meets the requirements of the Architectural Aluminum Manufacturer Association's publication number AAMA 2604-05 (Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels) or 2605-05 (Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels).

High Temperature Coating: A coating that is certified to withstand a temperature of 1000 degrees F (538 degrees C) for 24 hours.

High-Volume, Low-Pressure Application (HVLV): Spray equipment which is designed to operate and is operated using a high volume of air delivered at atomized air pressures between 0.1 to 10.0 psig measured dynamically at the center of the air cap and at the air horns and which operates at a maximum fluid delivery pressure not exceeding the manufacturer's recommended inlet air pressure.

Metal Parts and Products: Any metal parts or products except for those subject to coating requirements of other source-specific rules.

Metallic Coating: A coating which contains more than 5 grams of metal particles per liter of coating as applied. "Metal particles" are pieces of a pure elemental metal or a combination of elemental metals.

Military Specification Coating: A coating which has a formulation approved by a United States Military Agency for use on military equipment.

Mold-Seal Coating: The initial coating applied to a new mold or repaired mold and associated tooling to provide a smooth surface which, when coated with a mold release coating, prevents products from sticking to the mold or to the tooling.

Multi-Component Coating: 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.

One-Component Coating: 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.

Pan Backing Coating: A coating applied to the surface of pots, pans, or other cooking implements that are exposed directly to a flame or other heating elements.

Powder Coating: Any coating applied as a dry (without solvent or other carrier) finely divided solid, which when melted and fused, adheres to the substrate as a paint film.

Prefabricated Architectural Component Coating: Any coating applied to metal parts and products which are intended for use as components of architectural structures.

Pretreatment Coatings: Any coating, including wash primer, which contains no more than 12 percent solids by weight, and at least ½-percent acid, by weight, is used to provide surface etching, and is applied directly to metal surfaces to provide corrosion resistance, adhesion, and/or ease of stripping.

Repair Coating: Recoating portions of previously coated product due to mechanical damage to the coating following normal painting operations.

Roll Coater: A series of one or more mechanical rollers operating via the formation of a thin coating film on the surface of the roller(s), which is applied to a substrate by moving the substrate underneath the roller(s).

Silicone-Release Coating: Any coating which contains silicone resin and is intended to prevent food from sticking to surfaces such as baking pans.

Solar-Absorbent Coating: A coating which has as its prime purpose the absorption of solar radiation.

Stripping: The use of solvent to remove material such as cured adhesives, cured inks, cured or dried paint, cured or dried paint residue or temporary protective coating.

Touch-Up Coating: Any coating used to cover minor coating imperfections appearing after the main coating operation.

Transfer Efficiency: The ratio of the weight of coating solids which adhere to the object being coated to the weight of coating solids used in the application process, expressed as a percentage.

Vacuum-Metalizing Coating: The undercoat applied to the substrate on which the metal is deposited or the overcoat applied directly to the metal film.

Volatile Organic Compound (VOC): As defined in the Federal Register and codified at 40 CFR Part 51.100(s).

Zinc Filled Primer: Any coating which has an elemental zinc content of not less than 240 grams/liter (2.0 pounds/gallon) of coating as applied.

Part 3.0 Requirements

3.1. VOC Content Limits

Except as provided in Subsection 3.2, no person shall apply to any metal part or product any coating with a VOC content in excess of the following limits as applied:

**VOC Content Limits (Weight of VOC per Volume of Coating,
Less Water and Exempt Compounds)**

<u>Coating Category</u>	<u>Air Dried</u> <u>kg VOC/lb</u>	<u>Air Dried</u> <u>VOC/gal</u>	<u>Baked</u> <u>kg VOC/lb</u>	<u>Baked</u> <u>VOC/gal</u>
General Use, One-Component	0.34	2.8	0.28	2.3
General Use, Multi-Component	0.34	2.8	0.28	2.3
Camouflage	0.42	3.5	0.42	3.5
Electric-Insulating Varnish	0.34	2.8	0.28	2.3
Etching Filler	0.42	3.5	0.42	3.5
Extreme High-Gloss	0.42	3.5	0.36	3.0
Extreme Performance	0.42	3.5	0.36	3.0
Heat-Resistant	0.42	3.5	0.36	3.0
High Performance Architectural	0.42	3.5	0.42	3.5
High Temperature	0.42	3.5	0.42	3.5
Metallic	0.42	3.5	0.42	3.5
Military Specification	0.34	2.8	0.28	2.3
Mold-Seal	0.42	3.5	0.42	3.5
Pan Backing	0.42	3.5	0.42	3.5
Prefab Architectural Multi-Component	0.42	3.5	0.28	2.3
Prefab Architectural One-Component	0.42	3.5	0.28	2.3
Pretreatment Coatings	0.42	3.5	0.42	3.5
Repair and Touch-up	0.42	3.5	0.36	3.0
Silicone Release	0.42	3.5	0.42	3.5
Solar-Absorbent	0.42	3.5	0.36	3.0
Vacuum-Metalizing	0.42	3.5	0.42	3.5
Drum Coating, New, Exterior	0.34	2.8	0.34	2.8
Drum Coating, New, Interior	0.42	3.5	0.42	3.5
Drum Coating, Reconditioned, Exterior	0.42	3.5	0.42	3.5
Drum Coating, Reconditioned, Interior	0.50	4.2	0.50	4.2

3.2 Alternate Emissions Control

3.2.1 Emission Rate Limitation: In lieu of complying with VOC content limits specified in Subsection 3.1, the following after-control weight-per-volume emission rates constitute compliance with this rule.

VOC Emission Rate Limits (VOC Weight Per Volume Of Solids)

<u>Coating Category</u>	<u>Air Dried</u>	<u>Air Dried</u>	<u>Baked</u>	<u>Baked</u>
	<u>kg VOC/lb</u>	<u>VOC/gal.</u>	<u>kg VOC/lb</u>	<u>VOC/gal.</u>
General Use, One-Component	0.54	4.52	0.40	3.35
General Use, Multi-Component	0.54	4.52	0.40	3.35
Camouflage	0.80	6.67	0.80	6.67
Electric-Insulating Varnish	0.54	4.52	0.40	3.35
Etching Filler	0.80	6.67	0.80	6.67
Extreme High-Gloss	0.80	6.67	0.61	5.06
Extreme Performance	0.80	6.67	0.61	5.06
Heat-Resistant	0.80	6.67	0.61	5.06
High Performance Architectural	0.80	6.67	0.80	6.67
High Temperature	0.80	6.67	0.80	6.67
Metallic	0.80	6.67	0.80	6.67
Military Specification	0.54	4.52	0.40	3.35
Mold-Seal	0.80	6.67	0.80	6.67
Pan Backing	0.80	6.67	0.80	6.67
Prefab Architectural Multi-Component	0.80	6.67	0.40	3.35
Prefab Architectural One-Component	0.80	6.67	0.40	3.35
Pretreatment Coatings	0.80	6.67	0.80	6.67
Silicone Release	0.80	6.67	0.80	6.67
Solar-Absorbent	0.80	6.67	0.61	5.06
Vacuum-Metalizing	0.80	6.67	0.80	6.67
Drum Coating, New, Exterior	0.54	4.52	0.54	4.52
Drum Coating, New, Interior	0.80	6.67	0.80	6.67
Drum Coating, Reconditioned, Exterior	0.80	6.67	0.80	6.67
Drum Coating, Reconditioned, Interior	1.17	9.78	1.17	9.78

3.2.2 In lieu of complying with VOC content limits specified in Subsection 3.1 or the emission rate limitation in 3.2.1, air pollution control equipment with a VOC capture and control efficiency of at least 90% may be used in accordance with the manufacturer's recommendations at all times while applying non-exempt coatings and thinners, and while using solvents for cleaning, provided that the facility holds a valid Authority to Construct or Permit to Operate issued by the APCO.

3.3 Application Methods

No person shall coat any metal part or product subject to provisions of Subsection 3.1 or 3.2.1 (but not 3.2.2) unless one or more of the following methods is used in accordance with equipment manufacturer's recommendations: electrostatic application, High Volume Low Pressure (HVLV) spray, flow coat, roll coater, dip coat (including electrodeposition), a system that atomizes principally by hydraulic pressure such as airless spray or air-assisted airless spray, or another application technology achieving a greater transfer efficiency than HVLV.

3.4 Work Practices for Solvent Cleaning

The following VOC limits and work practices shall apply to cleaning of spray guns, lines, tanks, floors and spray booths, as well as to cleaning and surface preparation of manufactured parts and products and other cleaning related to activities that are subject to the provisions of this Rule. This subsection does not apply to cleaning of solar cells, laser equipment, electrical and electronic components, scientific instruments, precision optics or application equipment for resins, inks or adhesives; or to small-scale (as determined by the APCO) activities undertaken exclusively for research, product development, performance testing or quality assurance testing; or to the use of pretreatment coatings; or where the capture and control efficiency option in 3.2.2 is employed.

3.4.1 Surface Cleaning and Cleaning of Coatings Application Equipment: Solvents used for surface cleaning of parts and coatings application equipment shall comply with at least one of the following limits:

- a. Solvent shall have a VOC content of 25 grams or less per liter (0.21 lb/gal) of material; or
- b. Solvent shall have a VOC composite partial pressure of 8 mm Hg or less at 20°C (68°F).

3.4.2 Work Practices for Cleaning -- Devices and Methods: No person shall perform solvent cleaning operations unless the solvent is not atomized during the process and all spent solvent is captured and kept in closed containers. The following cleaning devices or methods may be used:

- a. Wipe Cleaning.
- b. Spray bottles or containers with a maximum capacity of 16 fluid ounces from which solvents are applied without a propellant induced force or atomization of the contents.
- c. Cleaning equipment having a closed solvent container during cleaning operations, except when depositing and removing objects to be cleaned, and closed during non-operation except during maintenance and repair of the cleaning equipment itself.
- d. System totally enclosing guns, cups, nozzles, bowls, and other parts during washing, rinsing, and draining procedures.
- e. Non-atomized solvent flow method collecting cleaning solvent in a container or a collection system closed except for solvent

collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container.

f. Solvent flushing method discharging solvent into a closed container, except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container. Discharged solvent from such equipment shall be collected in containers without atomizing into open air. Solvent may be flushed through the system by air or hydraulic pressure, or by pumping.

3.5 Work Practices for Transfer, Storage and Disposal

Regardless of VOC content, all VOC-containing coatings, thinners, solvents, waste materials and used clean-up media (such as rags and other absorbent materials) shall be stored, transferred and transported in non-absorbent, non-leaking containers which shall be kept closed at all times except when filling, using, emptying, mixing, pumping or otherwise actively working with the VOC-containing substances. These materials shall not be disposed of through heating, emptying into a non-airtight container such as a trash can or dumpster, or otherwise allowed to evaporate. General work practices intended to prevent spillage (such as avoiding practices that allow materials to run down the outside of a drum or can and keeping containers where they are not likely to be knocked over) shall be employed.

3.6 Prohibition of Specification

No person shall solicit or require for use or specify application of a coating on metal parts and products if such use or application results in a violation of provisions of this Rule. This prohibition shall apply to all written or oral contracts under terms of which any coating subject to provisions of this Rule is to be applied to any metal part or product.

Part 4.0 Administrative Requirements

4.1 Labeling Requirements

4.1.1 VOC Content: Each container (or accompanying data sheet) of any coating subject to this Rule shall display maximum VOC content of the coating as applied, including coating components, and after any thinning as recommended by the manufacturer. VOC content shall be displayed as grams of VOC per liter less water and exempt compounds. VOC content displayed shall be determined using Subsection 5.1. test methods or calculated using product formulation data.

4.1.2 Thinning Recommendations: Each container (or accompanying data sheet) of any coating subject to this Rule shall display a statement of manufacturer's recommendation regarding thinning of the coating. This requirement shall not apply to thinning of coatings with water.

4.2 Record Keeping Requirements

Any person subject to Section 3 or exempt by Subsection 1.2.1 shall maintain and have available for inspection:

A current list of VOC containing products in use containing all data necessary to evaluate compliance, including the following information, as applicable:

- 4.2.1 Product name, type and manufacturer.
- 4.2.2 Application method.
- 4.2.3 Usage instructions.
- 4.2.4 Mixing instructions.
- 4.2.5 Maximum VOC content of coating as applied, including thinning solvents, hardeners and other additives, and excluding water and exempt compounds.
- 4.2.6 Coating composition and density.

Monthly coating and solvent use records, including the following information for each:

- 4.2.7 Volume and mix ratio of each component used.
- 4.2.8 VOC content in grams/liter (or pounds/gallon) as applied/used.
- 4.2.9 Volume applied/used in liters (or gallons).

Capture and control equipment records, if applicable, including:

- 4.2.10 Make, model and description of capture and control equipment, along with manufacturer's instructions and operation recommendations.
- 4.2.11 System operating parameters, including times of operation, adequate to demonstrate compliance with this Rule.
- 4.2.12 Records of all control system maintenance (such as repairs and filter changes), including device, date performed, and description.

All records shall be retained and made available for inspection by the APCO, ARB and EPA for at least three years.

Part 5.0 Test Methods

The following test methods shall be used to determine compliance with the provisions of this rule if testing is required by the APCO, ARB or EPA. Alternate test methods may be used provided they are approved by the APCO, ARB and EPA. A violation determined by any applicable test method below shall constitute a violation of this Rule.

5.1 Analysis of Samples

VOC content of coating materials covered by this Rule shall be determined by U.S. EPA Method 24 (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings, 40 CFR 60, Appendix A) or by manufacturer's formulation data (MSDS sheet). In case of a discrepancy between these approaches, U.S. EPA Method 24 shall take precedence unless it is demonstrated that manufacturer's data are correct.

Analysis of halogenated exempt compounds in coatings shall be performed using ARB Method 432 (Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings).

5.2 Determination of Emissions

Emissions of VOC shall be measured by EPA Method 25 (Determination of Total Gaseous Nonmethane Organic Emissions as Carbon, 40 CFR 60, Appendix A), 25A (Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, 40 CFR 60, Appendix A), or 25B (Determination of Total Gaseous Organic Concentration Using a Nondispersive Infrared Analyzer, 40 CFR 60, Appendix A), as applicable. Analysis of halogenated exempt compounds in emissions shall be performed using ARB Method 422 (Determination of Volatile Organic Compounds in Emissions from Stationary Sources).

5.3 Determination of Capture and Control 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 the following EPA Test Methods, as applicable, contained in 40 CFR 51, Appendix M: Method 204A (Volatile Organic Compounds Content in Liquid Input Stream), 204B (Volatile Organic Compounds Emissions in Captured Stream), 204C (Volatile Organic Compounds Emissions in Captured Stream ((Dilution Technique))), 204D (Volatile Organic Compounds Emissions in Uncaptured Stream from Temporary Total Enclosure), Method 204E (Volatile Organic Compounds Emissions in Uncaptured Stream from Building Enclosure), 204F (Volatile Organic Compounds Content in Liquid Input Stream ((Distillation Approach))). The control efficiency of a VOC emission control system's VOC control device shall be determined using EPA Method 2 (Determination of Stack Gas Velocity and Volumetric Flow Rate ((Type S Pitot Tube)), 40 CFR 60, Appendix A), 2A (Direct Measurement of Gas Volume Through Pipes and Small Ducts, 40 CFR 60, Appendix A), or 2D (Measurement of Gas Volume Flow Rates in Small Pipes and Ducts, 40 CFR 60, Appendix A), as applicable, for measuring flow rates and EPA Methods 25 (Determination of Total Gaseous Nonmethane Organic Emissions as Carbon, 40 CFR 60, Appendix A), 25A (Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer, 40 CFR 60, Appendix A), or 25B (Determination of Total Gaseous Organic Concentration Using a Nondispersive Infrared Analyzer, 40 CFR 60, Appendix A), as applicable, for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 (Measurement of Gaseous Organic Compound Emissions By Gas Chromatography, 40 CFR 60, Appendix A) or ARB Method 422 (Determination of Volatile Organic Compounds in Emissions from Stationary Sources) shall be used to determine the emissions of exempt compounds.

5.4 Quantification of Metal Content in Coatings

The quantification of metal content, for purposes of determining coating definitions or applicability of this Rule, shall be determined by South Coast Air Quality Management District Method 318-95 (Determination of Weight Percent Elemental Metal in Coatings by X-Ray Diffraction).

5.5 Measurement of Acid Content

Acid content of pre-treatment wash primers and etching fillers shall be conducted and reported in accordance with ASTM D1613 (Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates used in Paint, Varnish, Lacquer, and Related Products, 1996).

5.6 Demonstration of Transfer Efficiency

Transfer efficiency shall be demonstrated using South Coast Air Quality Management District Method TE (Spray Equipment Transfer Efficiency Test Procedure for Equipment User).

5.7 Determination of VOC Composite Partial Pressures

VOC composite partial pressures shall be determined using either manufacturer's information regarding formulation or using ASTM methods E168 (Standard Practices for General Techniques of Infrared Quantitative Analysis, 1992), E169 (General Techniques of Ultraviolet Quantitative Analysis, 1993) or E260 (General Gas Chromatography Procedures, 1996) for determination of mole fractions and then summing products of each VOC component's vapor pressure and its mole fraction. For materials containing no non-VOC components, VOC composite partial pressure can be measured directly by ASTM Method D2879 (Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope, 1997).

5.8 Determination of VOC Emissions From Spray Gun Cleaning Systems

VOC emissions from spray gun cleaning systems shall be quantified using South Coast Air Quality Management District Method CS (Solvent Losses from Spray Gun Cleaning Systems).

Part 6.0 Compliance Schedule

6.1 Existing Sources

Any person becoming subject to requirements of this Rule by loss of exemption shall comply with the following increments of progress:

6.1.1 Within 6 months from date exemption is lost, submit a complete Authority to Construct application for control equipment, if necessary.

6.1.2 Within 12 months from date exemption is lost, be in full compliance with all requirements of this Rule.

6.2 New Sources

Any new proposed surface coating of metal parts or products operation not exempt by Section 1.2 shall demonstrate its ability to comply with the requirements of this Rule prior to issuance of an Authority to Construct permit.