

RULE 4602 MOTOR VEHICLE ASSEMBLY COATINGS (Adopted April 11, 1991; Amended September 19, 1991; Amended December 17, 1992; Amended December 15, 1994; Amended June 15, 1995; Amended September 17, 1997; Amended December 20, 2001; Amended September 21, 2006; Amended September 17, 2009)

1.0 Purpose

Limit the emissions of volatile organic compounds (VOCs) from motor vehicle assembly coating operations.

2.0 Applicability

This rule is applicable to any person who applies VOC-containing coatings to new automobiles, light-duty trucks, heavier vehicles, and other parts coated along with these bodies or body parts during the assembly process, and associated solvent cleaning activities.

3.0 Definitions

- 3.1 Adhesion Promoter: a coating applied over both an existing non-sanded topcoat, and the coated area immediately adjacent to the non-sanded topcoat, to promote the adhesion of a subsequent topcoat. No topcoat, primer, primer sealer, or primer surfacer shall be classified as an adhesion promoter.
- 3.2 Adhesive: any chemical substance, including glass bonding adhesive, used at a motor vehicle coating facility, that is applied for the purpose of bonding two surfaces together without regard to the substrates involved.
- 3.3 Air-Dried Coatings: a coating that is cured at a temperature below 90°C (194°F).
- 3.4 Air Pollution Control Officer (APCO): as defined in Rule 1020 (Definitions).
- 3.5 Anti-glare/safety Coatings: a coating which minimizes light reflection for safety purposes.
- 3.6 Application Equipment: a device, including, but not limited to, a spray gun, brush, and roller, used to apply adhesives, coatings, or inks.
- 3.7 Application Line: that portion of a motor vehicle assembly production line which applies surface and other coatings to motor vehicle bodies, hoods, fenders, cargo boxes, doors, and grill opening panels.
- 3.8 ARB: California Air Resources Board.

- 3.9 Assembly Line: an arrangement of industrial equipment and workers in which the product passes from one specialized operation to another until complete, by either automatic or manual means.
- 3.10 Automobile: a motor vehicle designed to carry up to eight passengers, excluding vans, sport utility vehicles, and motor vehicles designed primarily to transport light loads of property.
- 3.11 Basecoat: a pigmented topcoat which is the first topcoat applied as part of a multi-stage topcoat system.
- 3.12 Bedliner: a multi-component coating, used at an automobile or light-duty truck assembly coating facility, applied to a cargo bed after the application of topcoat and outside of the topcoat operation to provide additional durability and chip resistance.
- 3.13 Bright Metal Trim Repair Coating: a coating applied directly to chrome-plated metal surfaces for the purpose of appearance.
- 3.14 Brush Coating: the manual application of coatings using brushes or rollers.
- 3.15 Capture Efficiency: the percentage of VOC used, emitted, evolved, or generated by the operation, that are collected and directed to an air pollution control device.
- 3.16 Catalyst: a substance whose presence enhances the reaction between chemical compounds.
- 3.17 Cavity Bedliner: a multi-component coating, used at a motor vehicle assembly coating facility, applied to a cargo bed after the application of a topcoat and outside of the topcoat operation to provide additional durability and chip resistance.
- 3.18 Cavity Wax: a coating, used at a motor vehicle assembly coating facility, applied into the cavities of the vehicle primarily of the purpose of enhancing corrosion protection.
- 3.19 Clearcoat: a topcoat which contains no pigments or only transparent pigments, and which is the final topcoat applied as a part of a multi-stage topcoat system.
- 3.20 Clear Coating: a colorless coating which contains binders, but no pigment, and is formulated to form a transparent film.
- 3.21 Coating: a material applied onto or impregnated into a substrate for protective, decorative, or functional purposes.

- 3.22 Composite Vapor Pressure: the sum of the partial pressure of each pure volatile organic compound in a blended solvent. VOC composite partial pressure is calculated as follows:

$$PP_c = \frac{\sum_{i=1}^n (W_i)(VP_i) / MW_i}{\frac{W_w}{MW_w} + \sum_{e=1}^n \frac{W_e}{MW_e} + \sum_{i=1}^n \frac{W_i}{MW_i}}$$

Where:

W_i	=	Weight of the “i”th VOC compound, in grams
W_w	=	Weight of water, in grams
W_e	=	Weight of the “e”th exempt compound, in grams
MW_e	=	Molecular weight of the “e”th exempt VOC compound, in grams per gram-mole
MW_i	=	Molecular weight of the “i”th VOC compound, in grams per gram-mole
MW_w	=	Molecular weight of water, in grams per gram-mole
Pp_c	=	VOC composite vapor pressure at 20°C, in mm Hg
VP_i	=	Vapor pressure of the “i”th VOC compound at 20°C, in mm Hg

- 3.23 Continuous Coating: an enclosed coating system where spray nozzles coat parts and products as they are conveyed through the enclosure. Water wash zones control the inlet and outlet of the enclosure. Excess coating drains into a recirculation system.
- 3.24 Deadener: a coating, used at a motor vehicle assembly coating facility, applied to selected vehicle surfaces primarily for the purpose of reducing the sound of road noise in the passenger compartment.
- 3.25 Dip Coating: the process in which a substrate is immersed in a solution (or dispersion) containing the coating material, and then withdrawn.
- 3.26 Elastomeric Materials: a coating which is specifically formulated for adhesion to a flexible substrate, and applied over coated or uncoated flexible plastic substrates.
- 3.27 Electrodeposition: a dip coating application method where the coating solids are given an electrical charge which is then attracted to a substrate.

- 3.28 Electrodeposition Primer: a process of applying a protective, corrosion-resistant waterborne primer on exterior and interior surfaces that provides thorough coverage of recessed areas. It is a dip coating method that uses an electrical field to apply or deposit the conductive coating onto the part. The object being painted acts as an electrode that is oppositely charged from the particles of paint in the dip tank.
- 3.29 Electrostatic Application: a method of spray application of coatings where an electrostatic potential is created between the part to be coated and the paint particles.
- 3.30 EPA: United States Environmental Protection Agency.
- 3.31 Exempt Compound: an organic compound not classified as a volatile organic compound (VOC), as listed in the definition of volatile organic compound in Rule 1020 (Definitions).
- 3.32 Final Repair: the operations performed and coating(s) applied to completely-assembled motor vehicles or to parts that are not yet on a completely assembled vehicle to correct damage or imperfections in the coating. The curing of the coatings applied in these operations is accomplished at a lower temperature than that used for curing primer-surfacer and topcoat. This lower temperature cure avoids the need to send parts that are not yet on a completely assembled vehicle through the same type of curing process used for primer-surfacer and topcoat and is necessary to protect heat sensitive components on completely assembled vehicles.
- 3.33 Flow Coating: a coating application system, with no air supplied to the nozzle, where coatings flow over the part and the excess coating drains back into the collection system.
- 3.34 Gasket/Gasket Sealing Material: a fluid, used at an automobile or light-duty truck assembly coating facility, applied to coat a gasket or replace and perform the same function as a gasket. Gasket/gasket sealing material includes room temperature vulcanization (RTV) seal material.
- 3.35 Glass Bonding Primer: a primer, used at a motor vehicle assembly coating facility, applied to windshield or other glass, or to body openings, to prepare the glass or body opening for the application of glass bonding adhesives or the installation of adhesive bonded glass. Motor vehicle glass bonding primer includes glass bonding/cleaning primers that perform both functions (cleaning and priming of the windshield or other glass, or body openings) prior to the application of adhesive or the installation of adhesive bonded glass.

- 3.36 Grams of VOC per Liter of Coating Excluding Water and Exempt Compounds: the weight of VOC per combined volume of VOC and coating solids and can be calculated by the following equation:

$$\begin{array}{l} \text{Grams of VOC per Liter of Coating} \\ \text{Excluding Water and Exempt Compounds} \end{array} = \frac{W_s - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

Where:

W_s	=	weight of volatile compounds, in grams
W_w	=	weight of water, in grams
W_{ec}	=	weight of exempt compounds, in grams
V_m	=	volume of material, in liters
V_w	=	volume of water, in liters
V_{ec}	=	volume of exempt compounds, in liters

- 3.37 Grams of VOC per liter of Material: the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{W_s - W_w - W_{ec}}{V_m}$$

Where:

W_s	=	weight of volatile compounds, in grams
W_w	=	weight of water, in grams
W_{ec}	=	weight of exempt compounds, in grams
V_m	=	volume of material, in liters

- 3.38 Heat Resistant Coating: coatings which, during normal use, must withstand temperatures of at least 400F.
- 3.39 Heavier Vehicles: a self-propelled vehicle designed for transporting persons or property on a street or highway that has a gross vehicle weight rating over 8,500 pounds.
- 3.40 High-Volume, Low-Pressure (HVL) Spray Equipment: 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.
- 3.41 Impact Resistant Coating: any coating which is applied to a rocker panel for the purpose of chip resistance to road debris.

- 3.42 In-line Repair: the operation performed and coating(s) applied to correct damage or imperfections in the topcoat on parts that are not yet on a completely assembled vehicle. The curing of the coatings applied in these operations is accomplished at essentially the same temperature as that used for curing the previously applied topcoat. Also referred to as high bake repair or high bake reprocess. In-line repair is considered a part of the topcoat operation.
- 3.43 Light-Duty Truck: vans, sport utility vehicles, and motor vehicles designed primarily to transport light loads of property with gross vehicle weight rating of 8,500 pounds or less.
- 3.44 Lubricating Wax/Compound: a protective lubricating material, used at a motor vehicle assembly coating facility, applied to vehicle hubs and hinges.
- 3.45 Motor Vehicle: automobiles, light-duty trucks, and heavier vehicles as defined in Section 3.0.
- 3.46 Motor Vehicle Assembly Coating Operation: any person who applies coatings to new automobiles, light-duty trucks, heavier vehicles, or body parts for new automobiles, light-duty trucks, or heavier vehicles, and other parts coated along with these bodies or body parts during the assembly process, and associated solvent cleaning activities.
- 3.47 Multi-Stage Topcoat System: any basecoat/clearcoat topcoat system or any three-stage topcoat system, manufactured as a system, and used as specified by the manufacturer.
- 3.48 Organic Solvent Cleaning: as defined in Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal).
- 3.49 Primary Coatings: coatings that include electrodeposition primer, primer-surfacer, topcoat, and final repair.
- 3.50 Primer: any coating applied prior to the application of a topcoat for the purpose of corrosion resistance and adhesion of the topcoat.
- 3.51 Primer Sealer: any coating applied for the purpose of sealing the underlying metal or coating system prior to the application of a topcoat for corrosion resistance, adhesion of the topcoat, color uniformity, and to promote the ability of an undercoat to resist penetration by the topcoat.

- 3.52 Primer-Surfacer: an intermediate protective coating applied over the electrodeposition primer and under the topcoat. Primer-surfacer provides adhesion, protection, and appearance properties to the total finish. Primer-surfacer may also be called guide coat or surfacer. Primer-surfacer operations may include other coating(s) (e.g., anti-chip, lower-body anti-chip, chip-resistant edge primer, spot primer, blackout, deadener, interior color, basecoat replacement coating, etc.) that is (are) applied in the same spray booth(s).
- 3.53 Propellant: any gas, including air, in a pressure container for expelling the contents when the pressure is released.
- 3.54 Reducer/Thinner: the solvent used to thin a coating.
- 3.55 Roll Coating: the application of coatings from a paint trough to a flat surface by a mechanical series of rollers.
- 3.56 Sealer: a high viscosity material, used at a motor vehicle assembly coating facility, generally, but not always, applied in the paint shop after the body has received an electrodeposition primer coating and before the application of subsequent coatings (e.g., primer-surfacer). The primary purpose of motor vehicle sealer is to fill body joints completely so that there is no intrusion of water, gases or corrosive materials into the passenger area of the body compartment. Such materials are also referred to as sealant, sealant primer, or caulk.
- 3.57 Solids Turnover Ratio (R_T): the ratio of total volume of coating solids that is added to the electrodeposition primer (EDP) system in a calendar month divided by the total volume design capacity of the EDP system.
- 3.58 Solvent: as defined in Rule 4663 (Organic Solvent Cleaning, Storage, and Disposal).
- 3.59 Solvent Flushing: the use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of equipment by flushing solvent, by a non-atomized solvent flow, through the equipment.
- 3.60 Specialty Coatings: unique coatings and compliant coatings with additives which are necessary due to unusual job performance requirements. Said coatings include, but are not limited to, adhesion promoters, uniform finish blenders, elastomeric materials, gloss flatteners, bright metal trim repair, heat resistant, water hold-out, weld-thru, impact resistant, rubberized asphaltic underbody, anti-glare/safety, and multi-color coatings.

- 3.61 Surface Preparation: The removal of contaminants from a surface prior to the application of coatings, inks, or adhesives or before proceeding to the next step of a manufacturing process.
- 3.62 Thinner: a solvent that is added to an adhesive, coating, or ink to make it more fluid.
- 3.63 Three-Stage Topcoat System: a topcoat system composed of a basecoat portion, a midcoat portion, and a transparent clearcoat portion.
- 3.64 Topcoat: the final coating system applied to provide the final color and/or a protective finish. The topcoat may be a monocoat color or basecoat/clearcoat system. In-line repair and two-tone are part of topcoat. Topcoat operations may include other coating(s) (e.g., blackout, interior color, etc.) that is (are) applied in the same spray booth(s).
- 3.65 Transfer Efficiency: a ratio of the amount of coating solids adhering to the object being coated to the total amount of coating solids used in the application process, expressed as a percentage.
- 3.66 Trunk Interior Coating: a coating, used at a motor vehicle assembly coating facility outside of the primer-surfacer and topcoat operations, applied to the trunk interior to provide chip protection.
- 3.67 Underbody Coating: a coating, used at a motor vehicle assembly coating facility, applied to the undercarriage or firewall to prevent corrosion and/or provide chip protection.
- 3.68 Uniform Finish Blenders: a coating which is applied in spot repairs for the purpose of blending a paint overspray area of a repaired topcoat to match the appearance of an adjacent existing topcoat.
- 3.69 Volatile Organic Compound (VOC): as defined in Rule 1020 (Definitions).
- 3.70 Waste Solvent Material: any solvent which may contain dirt, oil, metal particles, sludge, and/or waste products, or wiping material containing VOCs including, but not limited to, paper, cloth, sponge, rag, or cotton swab used in organic solvent cleaning.
- 3.71 Weatherstrip Adhesive: an adhesive used at a motor vehicle assembly coating facility, applied to weather-stripping materials for the purpose of bonding the weatherstrip material to the surface of the vehicle.

3.72 Wipe Cleaning: a solvent cleaning activity performed by hand rubbing an absorbent material such as a rag, paper, sponge, brush, or cotton swab containing solvent.

4.0 Exemptions

4.1 The provisions of this rule shall not apply to materials supplied in containers with a net volume of 16 fluid ounces or less, or a net weight of one pound or less.

4.2 Except record keeping requirements in Section 6.1, the provisions of this rule shall not apply to an operation where the total actual VOC emissions from all motor vehicle assembly coating operations, including related cleaning activities, at that facility are less than 6.5 kg/day (15 lb/day) before consideration of controls.

5.0 Requirements

5.1 An operator of a motor vehicle assembly operation shall use coatings with a VOC content that does not exceed the limits in Table 1 and Table 2.

Table 1 VOC Emission Limits for Motor Vehicle Assembly Coatings

Assembly Coating Process	VOC Emission Limit		
	When solids turnover ratio (R_T) > 0.16:	When $0.040 < R_T < 0.160$:	When $R_T < .040$:
Electrodeposition primer operations (including application area, spray/rinse stations, and curing oven)	0.084 kg VOC /liter (0.7 lb/gal) coating solids applied	$0.084 \times 350^{0.160 - R_T}$ kg VOC/liter (0.084x350 ^{0.160-R_T} x 8.34 lb/gal) coating solids applied	No VOC emission limit
	1.44 kg of VOC/liter of deposited solids (12.0 lb VOC/gal deposited solids) on a daily weighted average basis as determined by following the procedures in the revised Automobile Topcoat Protocol.		
Primer-surfacer operations (including application area, flash off area, and oven)	1.44 kg of VOC/liter of deposited solids (12.0 lb VOC/gal deposited solids) on a daily weighted average basis as determined by following the procedures in the revised Automobile Topcoat Protocol.		
Topcoat operations (including application area, flash-off area, and oven)	1.44 kg of VOC/liter of deposited solids (12.0 lb VOC/gal deposited solids) on a daily weighted average basis as determined by following the procedures in the revised Automobile Topcoat Protocol.		
Final repair operations	0.58 kg VOC/liter (4.8 lb VOC/gallon of coating) less water and less exempt solvents on a daily weighted average basis or as an occurrence weighted average.		
Combined primer-surfacer and topcoat operations	1.44 kg of VOC/liter of deposited solids (12.0 lb VOC/gal deposited solids) on a daily weighted average basis as determined by following the procedures in the revised Automobile Topcoat Protocol.		

Table 2 VOC Content Limits for Miscellaneous Materials Used at Motor Vehicle Assembly Coating Operations (grams of VOC per liter of coating excluding water and exempt compounds, as applied)

Material	VOC Emission Limit (g VOC/liter)
Glass bonding primer	900
Adhesive	250
Cavity wax	650
Sealer	650
Deadener	650
Gasket/gasket sealing material	200
Underbody coating	650
Trunk interior coating	650
Bedliner	200
Weatherstrip adhesive	750
Lubricating wax/compound	700

5.2 VOC Emission Control System Requirements

In lieu of complying with the requirements in Sections 5.1, 5.3, or 5.4 an operator may use a VOC emission control system that meets all of the requirements of Section 5.2.1 through 5.2.3.

- 5.2.1 The VOC emission control system shall be approved, in writing by the APCO.
- 5.2.2 The VOC emission control system shall achieve an overall capture and control efficiency of at least 90 percent by weight as calculated according to Section 5.2.3.
- 5.2.3 Use of a VOC emission control system shall result in VOC emissions equal to or less than VOC emissions which would result from compliance with the applicable requirements of Section 5.1, 5.3, or 5.4.

5.2.4 The minimum required control efficiency of an emission control system at which an equivalent or greater level of VOC reduction will be achieved shall be calculated by the following equation:

$$CE = \left[1 - \left(\frac{VOC_{LWc}}{VOC_{LWn,Max}} \times \frac{1 - (VOC_{LWn,Max} / D_{n,Max})}{1 - (VOC_{LWc} / D_c)} \right) \right] \times 100$$

Where:

CE	=	Control Efficiency, percent
VOC _{LWc}	=	VOC Limit less water and less exempt compounds
VOC _{LWn,Max}	=	Maximum VOC content of noncompliant coating used in conjunction with a control device, less water and less exempt compounds
D _{n,Max}	=	Density of solvent, reducer, or thinner contained in the noncompliant coating, containing the maximum VOC content of the multi-component coating
D _c	=	Density of corresponding solvent, reducer, or thinner used in the compliant coating system.

5.3 Coating Application Methods

The operator shall apply coatings using one of the following methods:

5.3.1 Brush, dip, or roll coating; or

5.3.2 Electrostatic application; or

5.3.3 Electrodeposition; or

5.3.4 Flow coating; or

5.3.5 Continuous Coating; or

5.3.6 High-Volume, Low-Pressure (HVLP) spray equipment operated in accordance with the manufacturer's recommendations.

5.3.6.1 For HVLP spray guns manufactured prior to January 1, 1996, the end user shall demonstrate that the gun meets HVLP spray equipment standards. Satisfactory proof will be either in the form of manufacturer's published technical material or by a demonstration using a certified air pressure tip gauge measuring the air atomizing pressure dynamically at the center of the air cap and at the air horns.

5.3.6.2 A person shall not sell or offer for sale for use within the District any HVLP spray gun without a permanent marking denoting the maximum inlet air pressure in psig at which the gun will operate within the parameters specified in Section 3.0.

5.3.7 Any other coating application method which is demonstrated to the APCO to be capable of achieving at least 65 percent transfer efficiency. The transfer efficiency shall be determined in accordance with the SCAQMD method "Spray Equipment Transfer Efficiency Test Procedure for Equipment User," May 24, 1989, as contained in Section 6.5. Prior written approval from the APCO shall be obtained for each coating application method to be used pursuant to Section 5.3.7.

5.3.8 In lieu of compliance with Sections 5.3.1 through 5.3.7 an operator may control emissions from application equipment with a VOC emission control system that meets the requirements of Section 5.2.

5.4 Organic Solvent Cleaning

5.4.1 For solvent cleaning operations other than for bug and tar removal the operator shall use solvents that have VOC content equal to or less than 25 grams VOC per liter of cleaning material, as calculated using the equation listed in Section 3.0.

5.4.2 For bug and tar removal, a person shall not use any material other than bug and tar remover regulated under the Consumer Products Regulation (California Code of Regulations Section 94507 et seq.).

5.4.3 Cleaning activities that use solvents shall be performed by one or more of the following methods:

5.4.3.1 Wipe cleaning; or

5.4.3.2 Application of solvent from hand-held spray bottles from which solvents are dispensed without a propellant-induced force: or

5.4.3.3 Non-atomized solvent flow method in which the cleaning solvent is collected in a container or a collection system which is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container; or

5.4.3.4 Solvent flushing method in which the cleaning solvent is discharged into a container that is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure build-up inside the container. The discharged solvent from the equipment must be collected into containers without atomizing into the open air. The solvent may be flushed through the system by air or hydraulic pressure, or by pumping.

5.4.4 Solvent shall not be atomized into the open air unless it is vented to an APCO-approved VOC emission control system that complies with Section 5.2. This provision shall not apply to the cleaning of nozzle tips of automated spray equipment systems, except for robotic systems, and cleaning with spray bottles or containers described in Section 5.4.3.2.

5.4.5 An operator shall not use VOC-containing materials to clean spray equipment used for the application of coatings, adhesives, or ink, unless an enclosed system or equipment that is proven to be equally effective at controlling emissions is used for cleaning. If an enclosed system is used, it must totally enclose spray guns, cups, nozzles, bowls, and other parts during washing, rinsing and draining procedures, and it must be used according to the manufacturer's recommendations and must be closed when not in use.

5.4.6 In lieu of complying with Sections 5.4.1, or 5.4.3 through 5.4.5 an operator may control VOC emissions from solvent cleaning with an APCO-approved VOC emission control system for the solvent cleaning operation that meets the requirements of Section 5.2.

5.5 Organic Solvent Disposal and Storage

The operator shall store or dispose of fresh or spent solvents, waste solvent cleaning materials such as cloth, paper, etc., coatings, adhesives, catalysts, and thinners in closed, non-absorbent and non-leaking containers. The containers shall remain closed at all times except when depositing or removing the contents of the containers or when the container is empty.

6.0 Administrative Requirements

The records kept in compliance with Sections 6.1, 6.2, 6.3, and 6.4 shall be retained on site for a minimum of five (5) years and made available to the APCO, ARB, or EPA upon request.

6.1 Recordkeeping for Coatings

The operator shall maintain records on a daily basis, and have available at all times, a current list of coatings in use which provides all of the coating data necessary to evaluate compliance.

6.1.1 Maintain a current list of coatings and solvents in use which contains all of the coating data necessary to evaluate compliance, including the following information, as applicable:

6.1.1.1 mix ratio of components used,

6.1.1.2 VOC content and specific chemical constituents of coatings as applied, and

6.1.1.3 VOC content and specific chemical constituents of solvents used for surface preparation and cleanup.

6.1.2 Maintain daily records which include the following information:

6.1.2.1 volume coating/solvent mix ratio,

6.1.2.2 VOC content (lb/gal or grams/liter) and, for dip coating operations, viscosity (cSt) of coating,

6.1.2.3 volume of each coating used (gallons), and

6.1.2.4 quantity of cleanup solvent used (gallons).

6.2 Recordkeeping for VOC Emission Control Systems

An operator using a VOC emission control system as a means of complying with the provisions in Section 5.2 shall maintain daily records of key system operating parameters which will demonstrate continuous operation and compliance of the emission control system during periods of emission producing activities. Key system operating parameters are those necessary to ensure compliance with VOC limits. The parameters include, but are not limited to, temperatures, pressures, and flowrates.

6.3 Work Practice Plan

The operator shall develop and implement a work practice plan to minimize VOC emissions from cleaning and from purging of equipment associated with new motor vehicle assembly coating operations for which emission limits are required by this rule. The plan specify practices and procedures to ensure VOC emissions from the operations pursuant to Section 6.3.1 through 6.3.6.

6.3.1 Vehicle Body wiping;

6.3.2 Coating line purging;

6.3.3 Flushing of coating systems;

6.3.4 Cleaning of spray booth grates, walls, and equipment;

6.3.5 Cleaning external spray booth areas; and

6.3.6 Other housekeeping measures.

6.3.7 If an operator has a 2004 National Emission Standard for Hazardous Pollutants (NESHAP) (40 CFR, part 63, subpart III) work practice plan in place, instead of creating another work practice plan to address VOC emissions, the operator shall add to its NESHAP work practice plan procedures for minimizing non-hazardous air pollutants (HAP) VOC emissions.

6.4 Compliance Statement Requirement

6.4.1 The manufacturer of coatings subject to this rule shall include a designation of VOC as supplied, including coating components, expressed in grams per liter or pounds per gallon, excluding water and exempt compounds, on material safety data sheets or product data sheets.

6.4.2 Manufacturers of solvents subject to this rule shall indicate on the solvent container, or on a separate product data sheet or material safety data sheet, the name of the solvent, manufacturer's name, the VOC content, density, and VOC composite partial vapor pressure, as defined in the rule, of the solvent, as supplied. The VOC content and VOC composite vapor pressure shall be expressed in units of gm/liter or lb/gallon and mm Hg at 20°C (68°F), respectively.

6.5 Test Methods

The following test methods are incorporated by reference herein, and shall be used to determine compliance with the provisions of this rule. Alternate test methods may be used provided they are approved by APCO, ARB, and EPA.

- 6.5.1 VOC content of coatings, other than reactive adhesives, used at motor vehicle assembly coatings facilities shall be determined using EPA Method 24, and analysis of halogenated exempt compounds shall be analyzed by ARB Method 432.
- 6.5.2 The procedure for reactive adhesives in appendix A of the NESHAP for surface coating of plastic parts (40 CFR Part 63, subpart PPPP) shall be used to determine the VOC content of reactive adhesives.
- 6.5.3 The manufacturer's formulation data shall be accepted as an alternative to these methods. If there is a disagreement between manufacturer's formulation data and the results of a subsequent test, use the test method results unless the facility can make a demonstration to the APCO's satisfaction that the manufacturer's formulation data are correct.
- 6.5.4 Acid Content: Measurement of acid content shall be determined by using ASTM D1613-03 "Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates used in Paint, Varnish, Lacquer, and Related Products," October 2003.
- 6.5.5 Determination of emissions of VOC from spray gun cleaning systems shall be made using South Coast Air Quality Management District "General Test Method for Determining Solvent Losses from Spray Gun Cleaning Systems," October 3, 1989.
- 6.5.6 The transfer efficiency of alternative coating application methods shall be determined in accordance with the SCAQMD method "Spray Equipment Transfer Efficiency Test Procedure for Equipment User," May 24, 1989.
- 6.5.7 Determination of Overall Capture and Control Efficiency of VOC Emission Control Systems
 - 6.5.7.1 The capture efficiency for a VOC emission control system's collection device(s) shall be determined according to EPA's technical document, "Guidelines for Determining Capture Efficiency," January 9, 1995 and 40 CFR 51, Appendix M, Methods 204-204F, as applicable, or any other method approved by EPA, ARB, and the APCO.

6.5.7.2 The control efficiency of a VOC emission control system's control device(s) shall be determined using EPA Methods 2, 2A, or 2D for measuring flow rates and EPA Methods 25, 25A, or 25B for measuring total gaseous organic concentrations at the inlet and outlet of the control device. EPA Method 18 or ARB Method 422 shall be used to determine the emissions of exempt compounds.

6.5.8 For VOC emission control systems that consist of a single VOC emission collection device connected to a single VOC emission control device, the overall capture and control efficiency shall be calculated by using the following equation:

$$CE_{\text{CAPTURE AND CONTROL}} = [CE_{\text{CAPTURE}} \times CE_{\text{CONTROL}}] / 100$$

Where:

$CE_{\text{CAPTURE AND CONTROL}}$ = Overall Capture and Control Efficiency, in percent

CE_{CAPTURE} = Capture Efficiency of the collection device, in percent, as determined in Section 6.5.7.1

CE_{CONTROL} = Control Efficiency of the control device, in percent, as determined in Section 6.5.7.2

6.6 Multiple Test Methods

When more than one test method or set of test methods is 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 this rule.

6.7 Version of Test Methods

All ASTM test methods referenced in Section 6.0 are the most recently EPA-approved version that appears in the Code of Federal Regulations as Materials Approved for Incorporation by Reference.

7.0 Compliance Schedule

Operators of facilities subject to Rule 4602 shall be in compliance with rule requirements on and after January 1, 2011.

This page intentionally blank.