Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings

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Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Sector Policies and Programs Division
Research Triangle Park, NC

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Final Control Techniques Guidelines for
Miscellaneous Metal and Plastic Parts Coatings

I. Introduction

Clean Air Act (CAA) section 172(c)(1) provides that state implementation plans (SIPs) for nonattainment areas must include "reasonably available control measures" (RACM), including "reasonably available control technology" (RACT), for sources of emissions. Section 182(b)(2)(A) provides that for certain nonattainment areas, States must revise their SIPs to include RACT for each category of volatile organic compound (VOC) sources covered by a control techniques guidelines (CTG) document issued between November 15, 1990 and the date of attainment.

The United States Environmental Protection Agency (EPA) defines RACT as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." 44 FR 53761 (September 17, 1979). In subsequent Federal Register notices, EPA has addressed how States can meet the RACT requirements of the CAA.

Clean Air Act section 183(e) directs EPA to list for regulation those categories of products that account for at least 80 percent of the VOC emissions, on a reactivity-adjusted basis, from consumer and commercial products in areas that violate the NAAQS for ozone (i.e., ozone nonattainment areas). EPA issued the list on March 23, 1995, and has revised the list periodically. See 60 FR 15264 (March 23, 1995); see also 71 FR 28320 (May 16, 2006), 70 FR 69759 (Nov. 17, 2005); 64 FR 13422 (March 18, 1999). Miscellaneous Metal Products Coatings and Plastic Parts Coatings are included on the current section 183(e) list. For purposes of this CTG, these two categories are being addressed under a single CTG for "miscellaneous metal and plastic parts coatings."

This CTG is intended to provide State and local air pollution control authorities information that should assist them in determining RACT for VOCs from miscellaneous metal product and plastic parts surface coating operations. In developing this CTG, EPA, among other things, evaluated the sources of VOC emissions from the miscellaneous metal product and plastic parts surface coating industries and the available control approaches for addressing these emissions, including the costs of such approaches. Based on available information and data, EPA provides recommendations for RACT for miscellaneous metal product and plastic parts surface coating.

States can use the recommendations in this CTG to inform their own determination as to what constitutes RACT for VOCs for miscellaneous metal product and plastic parts surface coating operations in their particular nonattainment areas. The information contained in this document is provided only as guidance. This guidance does not change, or substitute for, requirements specified in applicable sections of the CAA or EPA's regulations; nor is it a regulation itself. This document does not impose any legally binding requirements on any entity. It provides only recommendations for State and local air pollution control agencies to consider in determining RACT. State and local pollution control agencies are free to implement other technically-sound approaches that are consistent with the CAA and EPA's implementing regulations.

The recommendations contained in this CTG are based on data and information currently available to EPA. These general recommendations may not apply to a particular situation based upon the circumstances of a specific source. Regardless of whether a State chooses to implement the recommendations contained herein through State rules, or to issue State rules that adopt different approaches for RACT for VOCs from miscellaneous metal product and plastic part coatings, States must submit their RACT rules to EPA for review and approval as part of the SIP process.

EPA will evaluate the rules and determine, through notice and comment rulemaking in the SIP approval process, whether the submitted rules meet the RACT requirements of the CAA and EPA's regulations. To the extent a State adopts any of the recommendations in this guidance into its State RACT rules, interested parties can raise questions and objections about the substance of this guidance and the appropriateness of the application of this guidance to a particular situation during the development of the State rules and EPA's SIP approval process.

Clean Air Act section 182(b)(2) requires that a CTG issued between November 15, 1990, and the date of attainment include the date by which States subject to section 182(b) must submit SIP revisions in response to the CTG. Accordingly, EPA is providing in this CTG a one-year period for the required submittal. Pursuant to section 182(b)(2), States required to submit rules consistent with section 182(b) must submit their SIP revisions within one year of the date of issuance of the final CTG for miscellaneous metal product and plastic part coatings.

II. Background and Overview

There have been five Federal actions that affect miscellaneous metal product and plastic parts surface coating operations. In June 1978, EPA issued a CTG document (1978 CTG) for controlling VOC emissions from surface coating of Miscellaneous Metal Parts and Products.[a] In January 1988, EPA promulgated the new source performance standards (1988 NSPS) for Surface Coating of Plastic Parts for Business Machines.[b] In February 1994, EPA issued an Alternative Control Techniques (ACT) document (1994 ACT) for controlling VOC emissions from surface coating of automotive/transportation and business machine plastic parts.[c] (The 1978 CTG and the 1994 ACT can be downloaded from EPA's website at: http://www.epa.gov/ttn/naaqs/ozone/ctg_act.) The cover pages from the CTG and ACT have been included as Appendices A and B to this CTG for reference.

In January 2004, EPA promulgated the National Emission Standards for Hazardous Air Pollutants for Miscellaneous Metal Parts and Products Surface Coating (40 CFR 63, subpart MMMM). In April 2004, EPA promulgated the National Emission Standards for Hazardous Air Pollutants for Plastic Parts and Products Surface Coating (40 CFR 63, subpart PPPP).

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[a] Guideline Series. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume VI: Surface Coating of Miscellaneous Metal Parts and Products. Publication No. EPA-450/2-78-015. U.S. Environmental Protection Agency, Research Triangle Park, NC. June 1978.

[b] 40 CFR 60 Subpart TTT – Standards of Performance for Industrial Surface Coating: Surface Coating of Plastic Parts for Business Machines. Applicable to affected facilities for which construction, modification, or reconstruction begins after January 8, 1986.

[c] Alternative Control Techniques Document: Surface Coating of Automotive/Transportation and Business Machine Plastic Parts. Publication No. EPA-453/R-94-017. U.S. Environmental Protection Agency, Research Triangle Park, NC. February 1994.

The 1978 CTG, the 1988 NSPS, the 1994 ACT, and the background information for subparts MMMM and PPPP provide a thorough discussion of the miscellaneous metal product and plastic parts surface coating industries, the nature of VOC and volatile organic HAP emissions from these industries, available control technologies for addressing such emissions, the costs of available control options, and other items. The 1978 CTG, 1988 NSPS, and 1994 ACT address VOC emissions based on VOC content of low-VOC coatings, whereas subparts MMMM and PPPP establish volatile organic HAP emissions limits based on HAP content of low HAP coating materials.

At least 37 States and several local jurisdictions have specific regulations that control VOC emissions from miscellaneous metal product and plastic parts surface coating. A discussion of the applicability and control options found in the Federal actions and State and local rules is presented in Section V of this document.

EPA developed the recommended approaches contained in this document after reviewing the 1978 CTG, the 1988 NSPS, the 1994 ACT, subparts MMMM and PPPP, and existing State and local VOC emission reduction approaches.

The remainder of this document is divided into six sections. Section III describes the scope of sources to which the control recommendations in this CTG could apply. Section IV describes the miscellaneous metal product and plastic parts surface coating industries, including the types of metal and plastic parts and products, the coating materials and the coating processes, and identifies the sources of VOC emissions from those processes. Section V describes the available control approaches for addressing VOC emissions from these product categories and summarizes Federal, State and local approaches for addressing such emissions. Section VI provides our recommendations for RACT for miscellaneous metal product and plastic part coating. Section VII discusses the cost-effectiveness of the recommended control approaches. Section VIII contains a list of references.

III. Applicability

This CTG provides control recommendations for reducing VOC emissions from the use of coatings in miscellaneous metal products and miscellaneous plastic parts surface coating operations. Please see section IV of this CTG for a description of the miscellaneous metal products coatings category and the miscellaneous plastic parts coatings category under section 183(e) of the CAA In terms of applicability, we recommend that the control approaches discussed in section VI of this CTG apply to each miscellaneous metal product and plastic parts surface coating unit[d] at a facility where the total actual VOC emissions from all miscellaneous metal product and plastic parts surface coating operations, including related cleaning activities, at that facility are equal to or exceed 6.8 kg/day (15 lb/day), or an equivalent level of 2.7 tons per 12-month rolling period, before consideration of controls. We do not recommend these control approaches for facilities that emit below this level because of the very small VOC emission reductions that can be achieved.

[d] A coating unit consists of a series of one or more coating applicators and any associated drying area and/or oven wherein a coating is applied, dried, and/or cured. A coating unit ends at the point where the coating is dried or cured, or prior to any subsequent application of a different coating. It is not necessary for a coating unit to have an oven or flash-off area.

The recommended threshold level is equivalent to the evaporation of approximately two gallons of solvent per day. Such a level is considered to be an incidental level of solvent usage that could be expected even in facilities that use very low-solvent coatings, such as powder or UV cure coatings (these coatings will be discussed in more detail in section IV.B.1 of this document). Furthermore, based on the 2002 NEI data and the 2004 ozone nonattainment designations, facilities emitting below the recommended threshold level collectively emit less than 4 percent of the total reported VOC emissions from miscellaneous metal product and plastic parts surface coating facilities in ozone nonattainment areas. For these reasons, we did not extend our recommendations in this CTG to these low-emitting facilities. For purposes of determining whether a facility meets our recommended applicability threshold, aggregate emissions, before consideration of control, from all miscellaneous metal product and plastic part coating operations (including related cleaning activities) at a given facility are included.

In developing their RACT rules, State and local agencies should consider carefully the facts and circumstances of the affected sources in their States. As noted above, States can adopt the above recommended 6.8 kg/day (15 lb/day) actual VOC emissions or an equivalent applicability threshold, or they can develop other applicability criteria that they determine are appropriate considering the facts and circumstances of the sources in their particular nonattainment areas. EPA will review the State RACT rules in the context of the SIP revision process.

In addition, we recommend that states consider structuring their RACT rules to provide facilities that coat bodies and/or body parts for new heavier vehicles[e] with the option of meeting either the state RACT requirements for the automobile and light-duty truck coating category or the state RACT requirements for the miscellaneous metal products or plastic parts coatings categories. Heavier vehicle coatings are included in the Miscellaneous Metal Products and Plastic Parts Coatings categories under section 183(e) and are therefore covered in the CTG for Miscellaneous Metal and Plastic Parts Coatings. We note, however, that some automobile and light-duty truck assembly coating facilities also coat new heavier vehicle bodies or body parts for new heavier vehicles. The new heavier vehicle bodies or body parts for new heavier vehicles may be coated using the same equipment and materials that are used to coat new automobile and light-duty truck bodies or body parts for new automobiles and light-duty trucks. The permit requirements for the heavier vehicle portion of these combined use paint shops are often structured in the same way as permit requirements for automobile and light-duty truck paint shops. Also, some facilities that coat only new heavier vehicle bodies or body parts for new heavier vehicles have paint shops that are designed and operated in the same manner as paint shops that are used to coat new automobile and light-duty truck bodies and body parts for new automobiles and light-duty trucks. The permit requirements for these heavier vehicle paint shops are often structured in the same way as permit requirements for automobile and light-duty truck paint shops.

In light of the above, providing facilities that coat bodies and/or body parts for new heavier vehicles with the option of meeting the state RACT requirements for the automobile and light-duty truck coating category in lieu of the requirements for Miscellaneous Metal Products or Plastic Parts categories will provide for the most consistency with existing permit requirements and simplify compliance demonstration requirements for these facilities. Furthermore, in light of

[e] Heavier vehicles includes all vehicles that meet the definition of the term "other motor vehicles", as defined at 40 CFR § 63.3176 (the NESHAP for Surface Coating of Automobiles and Light-Duty Trucks).

the stringency of our recommended control measures in the automobile and light-duty truck assembly coatings CTG, we believe that facilities that choose this alternative will achieve at least equivalent, if not greater, control of VOC emissions. For the reasons stated above, we recommend that state RACT rules provide facilities that coat bodies and/or body parts for new heavier vehicles the option of meeting either the state RACT requirements for miscellaneous metals and plastic parts coatings or the state RACT requirements for auto and light-duty truck coatings.

The 2002 National Emission Inventory (NEI) was used as the source of emissions data for the miscellaneous metal product and plastic part surface coating facilities as a whole.

In developing this CTG, the 2002 NEI database was queried for facilities likely performing miscellaneous metal product and plastic parts surface coating based on Standard Industrial Classification (SIC) code and Source Classification Code (SCC). The resulting list of facilities was further reviewed to remove all SIC codes or SCC covered by other CTG finalized or in development. This activity resulted in 3,925 miscellaneous metal product and plastic part surface coating facilities in the 2002 NEI, and VOC emissions totaled an estimated 32,700 Mg/yr (36,000 tpy) from surface coating operations. Of the 3,925 facilities identified in the 2002 NEI, 2,539 facilities were located in ozone nonattainment areas and 1,296 of the facilities located in ozone nonattainment areas emit more than the 6.8 kg/day (15 lb/day) VOC applicability threshold described above. These 1,296 facilities emitted an estimated 20,098 Mg (22,108 tons) of VOC in 2002.

IV. Process Description and Sources of VOC Emissions

The miscellaneous metal product and plastic parts surface coatings categories under section 183(e) of the CAA includes the coatings that are applied to the surfaces of a varied range of metal and plastic parts and products. Such parts or products are constructed either entirely or partially from metal or plastic. These miscellaneous metal products and plastic parts include, but are not limited to, metal and plastic components of the following types of products as well as the products themselves: fabricated metal products, molded plastic parts, small and large farm machinery, commercial and industrial machinery and equipment, automotive or transportation equipment, interior or exterior automotive parts, construction equipment, motor vehicle accessories, bicycles and sporting goods, toys, recreational vehicles, pleasure craft (recreational boats), extruded aluminum structural components, railroad cars, heavier vehicles,[f] lawn and garden equipment, business machines, laboratory and medical equipment, electronic equipment, steel drums, metal pipes, and numerous other industrial and household products (hereinafter collectively referred to as "miscellaneous metal and plastic parts"). The CTG applies to manufacturers of miscellaneous metal and plastic parts that surface-coat the parts they produce. The final CTG also applies to facilities that perform surface coating of miscellaneous metal and plastic parts on a contract basis. However, coatings that are applied to test panels and coupons as part of research and development, quality control, or performance testing activities at paint research or manufacturing facilities are not included in the miscellaneous metal products and plastic parts coatings categories under section 183(e) and are therefore not addressed in this CTG.

[f] Heavier vehicles includes all vehicles that meet the definition of the term "other motor vehicles", as defined in the National Emission Standards for Surface Coating of Automobile and Light-Duty Trucks at 40 CFR 63.3176.

Miscellaneous metal products and plastic parts coatings do not include coatings that are a part of other product categories listed under Section 183(e) of the Act for which CTGs have been published and/or addressed by other CTGs. These other categories that are not part of the miscellaneous metal product and plastic parts coatings categories include shipbuilding and repair coatings; aerospace coatings; wood furniture coatings; metal furniture coatings; large appliance coatings; automobile and light-duty truck assembly coatings; flatwood paneling coatings; miscellaneous industrial adhesives; fiberglass boat manufacturing materials; and paper, film, and foil coatings. Can coatings, coil coatings, and magnet wire coatings were not listed under Section 183(e) of the Act, but were addressed by earlier CTGs, and are also not included in the miscellaneous metal product and plastic parts coatings categories addressed by this CTG.

Three Section 183(e) categories (aerosol coatings, architectural coatings, and automobile refinish coatings) are regulated by national VOC rules. Aerosol coatings are not included in the miscellaneous metal parts or plastic parts coating categories. Architectural coatings and automobile refinish coatings are not included in the miscellaneous metal parts or plastic parts coating categories to the extent they are used for architectural coating or automobile refinish coating purposes as defined in their respective national VOC rules. A coating recommended by its manufacturer or importer for field application to stationary structures (e.g., steel bridge) and their appurtenances, to portable buildings, to pavements, or to curbs would be regulated as an architectural coating under the national VOC rule for architectural coatings. Such a coating, when used for architectural coating as defined in the national rule, would not be included in the miscellaneous metal products coatings category under section 183(e). If, however, such coating were applied to structural steel in a shop setting, the coating would be included in the miscellaneous metal products coatings category and covered by the CTG for that category, as well as being subject to the national VOC rule for architectural coatings. Similarly, a coating recommended for automobile refinishing by its manufacturer or importer for automobile refinishing would be regulated as an automobile refinish coating under the national VOC rule for automobile refinish coatings. Such a coating, when used for automobile refinishing as defined in the national rule, would not be included in the miscellaneous metal products coatings category. If, however, such coating were applied to a metal box or plastic box, the coating would be included in the miscellaneous metal products coatings category and covered by the CTG for that category, as well as being subject to the national VOC rule for automobile refinish coatings.

As mentioned above, the miscellaneous metal products and plastic parts coatings categories, as listed under section 183(e), do not include products that are a part of other section 183(e) categories for which CTGs have been published, such as the fiberglass boat manufacturing materials category or the miscellaneous industrial adhesives category. Specifically, the miscellaneous metal products and plastic parts categories do not include gel coats applied to fiber-reinforced plastic (fiberglass composite) products removed from the mold or used as in-mold coatings in the production of fiberglass parts. The miscellaneous metal products and plastic parts coatings categories also do not include body fillers and putties used to repair surface defects in fiberglass composite parts, or putties used to bond fiberglass composite parts together. These putties are part of the composite structure and are not coatings.

Motor vehicle cavity wax, sealers, deadeners, gasket/gasket sealing material, underbody coatings, trunk interior coating, bedliner and lubricating wax/compound used at a facility that is not an automobile or light-duty truck assembly coating facility, are included in the miscellaneous metal and plastic parts coatings categories and addressed in this final CTG for miscellaneous metal products and plastic parts coatings. However, similar materials used at automobiles and

light duty trucks assembly coating facilities are included in the automobile and light-duty truck assembly coatings category and addressed in the CTG for that category.

Except as provided above, miscellaneous metal product and plastic parts coatings include paints, sealants, caulks, inks, and maskants.[g] The paints include several categories of primers, topcoats, and specialty coatings, typically defined by the coating's function. The types of coating technologies used by miscellaneous metal product and plastic part surface coating facilities include higher solids, waterborne, and powder coatings, as well as conventional solventborne coatings.

A. Process Description

Miscellaneous metal product and plastic parts surface coatings serve decorative, protective, and functional purposes. Coatings protect metal parts from corrosion by providing resistance to moisture, heat, and sometimes the outdoor elements. Plastic parts may be coated to provide color, texture, or protection, thus improving appearance and durability, and can also function to attenuate electromagnetic interference/radio frequency interference (EMI/RFI) signals, and to conceal mold lines and flaws in the substrate surface.

The coating selections and requirements for such a miscellaneous sector depend on the end use specifications, but appearance and protection will most likely be important considerations. Coatings for each type of metal or plastic part can have special requirements and contain unique properties because each type is used to serve a particular coating performance. Metal and plastic surface coatings must also be durable and have excellent adhesion properties to avoid peeling or chipping. Finally, the coatings for many products provide decorative appeal. Applying a color coat is probably the most common way of decorating metal or plastic parts for several aesthetic, commercial, and functional reasons (e.g., reflective properties). Often a primer is applied prior to a color coat.

Such coating and painting of parts in the miscellaneous metal product and plastic parts surface coating industries are often "secondary operations". These secondary operations are carried out not only by fabricators of metal and plastic parts, but also in product assembly facilities and painting job shops.

The miscellaneous metal product and plastic parts surface coating process may be divided into three main unit operations: (1) surface preparation, (2) coating application operations, and (3) cleaning activities. These three types of activities utilize VOC-containing compounds (i.e., coatings, thinners, and/or cleaning materials) and are further described below.

[g] Decorative, protective, or functional materials that consist only of protective oils for metal, acids, bases, or any combination of these substances are not considered miscellaneous metal or plastic part coatings.

1. Surface Preparation

Surface preparation is performed for two main reasons: (1) to correct any flaws in the part prior to coating and (2) to prepare the part to receive the coating. The amount of surface preparation a part requires or the types of surface preparation processes employed can greatly vary between metal and plastic part substrates.

Before a metal product can be coated, its surface must be thoroughly cleaned. The cleaning operation consists of the following basic processing steps: (1) alkaline or acid cleaning, (2) water rinse, (3) phosphate treatment (typically iron phosphate), (4) water rinse, and (5) pretreatment and/or water rinse. The last step can involve drying the parts in an oven. In general, the cleaning chemicals used in this cleaning operation contain little VOC and therefore generate negligible emissions.

In the alkaline or acid cleaning step, metal parts or products are sprayed with, or immersed in, a cleaning solution to dissolve and remove oil, grease, and dirt. This solution, which can be alkaline or acidic, typically includes one or more other ingredients, such as surfactants or corrosion inhibitors. Generally, acid-based solutions are preferred for removing corrosion and scale from metal pieces. However, because alkaline formulations are generally somewhat milder, they are recommended for certain metal substrates when the corrosiveness of acid solutions is a concern.

The cleaning step can be followed by a phosphate treatment for metal parts. The purpose of this treatment is to provide corrosion resistance to the surface of the metal part. The final pretreatment step, if utilized, may be a rust inhibitor or adhesion promoter. Following each treatment step, the metal part or product is typically sent through several rinse stages in series.

An alternate cleaning method prior to coating is an enclosed shot-blasting operation. The operation uses steel shot (fine particles) to abrasively remove dirt and grease, as well as to smooth rough edges and welds. The operation can also be used to remove cured coatings when parts require rework. This cleaning operation does not involve any liquid chemicals, and no wastewater discharge is produced.

Surface preparation for plastic parts or products can vary greatly from the surface preparation steps described above for metal products. For plastic parts or products, some sanding may be done to remove burrs or other inconsistencies. Puttying may be necessary to fill in any gaps or small cracks in the plastic part. For pre-primed plastic parts, spot-primer may be applied to any areas missing primer or with an inconsistent primer application. Following this type of pretreatment, any remaining surface residue must be removed, typically by wiping off the dust with water or alcohol soaked rags. Acetone or a hot water and grit material solution can also be used to remove any tape adhesive, dirt, or dust.

Varying degrees of cleaning are possible, including multiple stages of washing cycles with proprietary soaps or solvents, or de-ionized water. Also, depending on the types of coating to be applied, surface preparation can include treatment of the part so that it can receive the coating. For example, a conductive coating of some sort is necessary for the plastic part to be coated by some electrostatic coating application techniques.

2. Coating Application

Surface coating is accomplished by applying a coating to the metal or plastic part, followed by curing or drying the coating. The coating itself may be in the form of a liquid or powder.

Several different types of application technology are used to apply liquid coatings, and the selection of the application technology can have a significant effect on the amount of coating used and the resulting VOC emissions from the operation. The most common types of liquid coating applicators include: air atomized spray coating, electrostatic spray coating, high volume/low pressure (HVLP) spray coating, dip coating, flow coating, roll coating, electrocoating, and autophoretic coating. Powder coatings can be applied through electrostatic spraying or dipping,

Conventional air spray application uses compressed air at high pressure (e.g., 30 to 90 pounds per square inch, psi) to pull the coating from a reservoir and atomize the coating as it is expelled from the spray gun tip. The mixture of air and atomized coating then deposits the coating on the surface being coated. Because of the high pressure of air used, most of the coating does not land on the part being coated and is carried away from the part as overspray and is wasted. The fraction of coating solids that reaches the part is termed transfer efficiency, and conventional air spray has a relatively low transfer efficiency compared to other application methods. Therefore, many coating operations have adopted other types of spray application to use coatings more efficiently.

Airless Spray. With airless spray, a pump forces the coating through an atomizing nozzle at high pressure (1,000 to 6,000 psi). Airless spray is ideal for rapid coverage of large areas and when a heavy film build is required. The size of airless spray paint droplets is larger, the spray cloud is less turbulent, and the transfer efficiency is typically superior to conventional air spray. However, airless spray leaves a rougher, more textured surface; therefore, it is generally used on surfaces where appearance is not critical

Air-Assisted Airless Spray. An air-assisted airless system combines the benefits of conventional air spray and airless spray. The system consists of an airless spray gun with a compressed air jet at the gun tip to atomize the coating. It uses lower fluid pressures than airless spray and lower air pressures than conventional air spray (e.g., 5 to 20 psi versus 30 to 90 psi). This fluid/air pressure combination delivers a less turbulent spray than conventional air systems and applies a more uniform finish than airless systems. However, the amount of time needed to apply coatings is greater because of the lower fluid and air pressure.

Electrostatic Spray. In electrostatic spray application, the coating and part are oppositely charged. The part or product is grounded and attracts the negatively charged coating particles. Electrostatic spray systems are reported to have the highest transfer efficiency of any of the spray application techniques because of minimal overspray, which also results in lower paint loss and lower VOC emissions. Electrostatic systems can be used to spray apply either liquid or powder coatings. Powder coatings are applied almost exclusively by means of electrostatic spray in surface coating operations. If a powder recovery system is used, the oversprayed powder is recovered and recycled.

HVLP systems use lower air pressures (generally not more than 10 psi at the spray cap) and greater volumes than conventional air atomized spray systems. Specialized nozzles provide

better air and fluid flow at the lower air pressure, and shape the air/spray pattern and guide the atomized coating particles to the part or product being coated. The lower air pressures result in greater transfer efficiency compared to conventional air atomized spray systems.

Dip coating is another available method for applying liquid coating. It is typically used on parts that do not require a high-quality appearance, and is often used for large complicated parts such building joists, that would be difficult to paint using other methods. The metal or plastic parts to be coated are manually or automatically dipped into a tank containing the coating. The parts are then withdrawn from the tank and any excess coating is allowed to drain, thus achieving very high coating transfer efficiencies. Typical systems have some means of recirculation of the tank contents, filters to remove paint sediment and solid contaminants, and means for controlling the viscosity of the fluid. Because the tank opening exposes a large surface area of liquid coating, solvent losses occur from the tank. To maintain the desired coating viscosity in the tank, these losses are compensated for by adding thinner (water or solvent, depending on the coating used).

Powder coatings may also be applied using a dip application operation. The part to be coated is first heated to a temperature above the powder's melting point. The hot part is then immersed in a fluidized bed of the powder, melting the powder in contact with it and forming a continuous coating on the part.

Flow coating is similar to dip coating and involves conveying the metal or plastic part or product over an enclosed sink, where the coating is applied at low pressure as the item passes under a series of nozzles. Excess coating drains back into the sink, is filtered, and pumped back into a coating holding tank. A typical flow coater tank is enclosed and is smaller than the equivalent dip coating tank. As a result, less coating is used and less solvent is evaporated than in dip tank operations. This application method results in an increase in production rate.

Roll coating application is used for high viscosity coatings, particularly adhesives, and for small surface areas.

Electrocoating (electrodeposition) is a specialized form of dip coating where opposite electric charges are applied to the waterborne coating and the part. The coating is deposited on the part by means of electrical attraction, which produces a more uniform coating on the part than traditional dip application.

Autophoretic coating consists of a series of dip tanks in which the parts to be coated are immersed and cleaned. After cleaning, the coating solids are deposited on the surface of the parts via chemical reaction. The coating solids are then heat cured.

Zinc-Arc Spray. Metallic zinc may be applied to metal or plastic parts. When applied to plastic, it is usually done to provide a conductive surface or shielding. When applied to metal parts, it is usually to provide a corrosion resistant surface. This two-step process first roughens a metal or plastic surface by grit-blasting or sanding, and then spray-coats with molten zinc, either manually or with robotics. The zinc-arc spray gun operates by mechanically feeding two zinc wires into the tip of the spray gun where they are melted by an electric arc. A high-pressure air nozzle blows the molten zinc particles onto the surface of the metal or plastic part.

As described above, there are various spray application technologies that can be used to apply coatings to miscellaneous metal and plastic parts. Spray coating operations are typically

performed in a spray booth by manual or automated (e.g., robotic) means to capture paint overspray, remove solvent vapors from the workplace during liquid coating spray operations, and to keep the coating operation from being contaminated by dirt from other operations. In some instances, productivity is maximized by using automated application followed by manual touchup. Typically, overspray is collected within the booth on either dry filter media or a waterwash booth. Air flow in a booth equipped with dry filter media generally passes from the spray applicator, over the metal or plastic part or product, and through a dry filter bank. Waterwash booths are less commonly used than dry filter booths in the miscellaneous metal product and plastic parts surface coating industries. In a waterwash booth, air is drawn through a continuous curtain of moving water and overspray is removed by contact with the water. In booths equipped with dry filters and in waterwash booths, the overspray can be collected on a series of baffles in front of the dry filters or waterwash, and, in some cases, the collected overspray can be reused. This recycling method substantially reduces both air emissions and waste (including spent dry filters) generated by the coating application operation.

After each of the liquid and powder coating applications described above, the applied coating is heat dried or cured or air dried or cured after application. For liquid spray and dip coating operations, the coated parts are typically first slowly moved through a flash-off area after the coating application operation to allow solvents in the coating to evaporate slowly and thus avoid bubbling of the coating while it is curing in the oven. After application of powder coatings, the coated metal or plastic parts are conveyed directly to an oven (there is no flash-off area for powder coatings) and heated to cure the powder. This curing process melts the powder, forming a continuous coating. Following the curing step, the final unit is assembled (if necessary) and packaged for shipment.

3. Cleaning activities

Cleaning activities other than surface preparation also occur at miscellaneous metal product and plastic parts surface coating facilities. Cleaning materials are used during these activities to remove coating residue or other unwanted materials from equipment related to coating operations, as well as the cleaning of spray guns, transfer lines (e.g., tubing or piping), tanks, and the interior of spray booths. These cleaning materials are typically mixtures of VOC-containing solvents.

B. Sources of VOC Emissions

The VOC emissions from miscellaneous metal product and plastic part surface coating processes result from the evaporation of the volatile components of the coatings and cleaning materials used in these operations.[h] In most cases, VOC emissions from surface preparation, storage, handling, and waste/wastewater operations are relatively small. The following discussion describes these primary emission sources (coatings and cleaning materials).

[h] In a Federal Register notice, EPA stated that the cleaning operations associated with certain specified section 183(e) consumer and commercial product categories, including the miscellaneous metal product coating category and the plastic part coating category, would not be covered by EPA's 2006 CTG for industrial cleaning solvents (71 FR 44522 and 44540, August 4, 2006). In the notice, EPA expressed its intention to address cleaning operations associated with these categories in the CTGs for these specified categories if the Agency determines that a CTG is appropriate for the respective categories. Accordingly, this CTG addresses VOC emissions from cleaning operations associated the miscellaneous metal product coating category and the plastic part coating category.

1. Coatings

The majority of VOC emissions from miscellaneous metal product and plastic part surface coatings occur from evaporation of solvents in the coatings during coating application/flash-off and drying/curing of the coatings. In spray coating operations, the majority of VOC emissions occur in the spray booth during coating application. For liquid spray applications, it is estimated that 65 to 80 percent of the volatiles from spray coating are emitted during the application and flash-off operations, and that 20 to 35 percent are emitted from the drying/curing operation.

The remaining emissions are primarily from mixing and/or thinning. The VOC emissions from mixing and thinning of coatings occur from displacement of VOC-laden air in containers used to mix coatings containing solvents (thinners) prior to coating application. The displacement of VOC-laden air can also occur during filling of containers and can be caused by changes in temperature, changes in barometric pressure, or agitation during mixing.

The VOC emissions from coating application occur when solvent evaporates from the coating as it is being applied to the part or product. The transfer efficiency (the percent of coating solids deposited on the metal and plastic parts) of a coating application method affects the amount of VOC emitted during coating application. The more efficient a coating application method is in transferring coatings to the metal or plastic parts, the lower the volume of coatings (and therefore solvents) needed per given amount of production; thus resulting in lower VOC emissions.

Conventional air atomized spray equipment utilizes high atomizing air pressure with typical transfer efficiencies of 25 to 40 percent. The transfer efficiency of a dip coater is very high (approximately 90 percent); however, some VOC is emitted from the liquid coating bath due to its large exposed surface area. For liquid coatings, electrostatic spray coating is more efficient than conventional air atomized spray, with transfer efficiency typically ranging from 60 to 90 percent. Electrostatic spray coating is also an efficient method for applying powder coating.

After being coated by any of the typical coating methods (e.g., spray coating or dip coating), the metal or plastic parts are dried/cured. Prior to entering the ovens, solvents in the coatings evaporate slowly in the flash-off area to prevent bubble formation during curing. The amount of VOC emissions from the flash-off area depends on the type of coating used, how quickly the component or product moves through the flash-off area, and the distance between the application area and the bake oven.

For powder coatings, the curing/drying step melts the powder and forms a continuous coating on metal products. For liquid coatings, this step removes any remaining volatiles from the coating. The cured coatings provide the desired decorative and/or protective characteristics. The VOC emissions during the curing/drying process result from the evaporation of the remaining solvents in the dryer.

Until the 1970's, conventional solvent-based coatings, with high VOC content, were the majority of coatings used in the miscellaneous metal product and plastic parts surface coating industries. Due to increased regulation at the State and Federal level, these industries have steadily moved to lower VOC content coatings. These alternative coatings include powder

coatings, waterborne coatings, higher solids coatings, and ultraviolet coatings. The following discussion summarizes each of these alternative coating formulations.

Powder Coatings. The use of powder coating systems in the metal products and plastic part manufacturing industries has increased. Many miscellaneous metal products surface coating facilities have replaced existing liquid coating operations with powder coating operations. Compared to conventional liquid coating systems, powder coating produces minimal amounts of VOC emissions because powder coatings are applied as dried particles, no VOC are released during the application operation, and volatile emissions from the curing operation, if any, are generally much less than the volatile emissions from liquid coating systems. Powder coating is applied via powder delivery systems, which in most cases is an electrostatic spray. Particulate emissions resulting from the application of powder coatings can be minimized through the implementation of a recovery and recycling process (reuse of overspray). Depending on the powder formulation, some volatile emissions may occur when the powder is heated during the curing step. Powder coating applications are best suited for long production runs of consistently sized parts without color changes.

Waterborne Coatings. Waterborne coatings produce minimal VOC emissions primarily because a large portion of the solvent carrier is replaced with water. The water component can constitute as much as 80 percent of the coating, with the remaining 20 percent being the coating solids. Waterborne coatings are used widely, most often when there is a primer applied to the substrate prior to the waterborne coating.

Higher Solids Coatings. These coatings contain at least 60 percent by volume of coating solids. VOC emissions are reduced through the use of these coatings because they contain less solvent per unit volume of solids than conventional solvent-based coatings. Thus, a lesser amount of VOC emissions are released during coating preparation, application, and curing to deliver a given amount of coating solids.

Ultraviolet Curable Coatings. Ultraviolet (UV) curable liquid and UV curable powder coatings are used for heat sensitive substrates as they allow for low curing temperatures. UV liquid coatings have been used for several decades on parts made of plastic and metal. Because the entire coating must be exposed to the UV light source to achieve complete curing of the UV coating, UV curable coating applications may not be feasible for some miscellaneous metal and plastic parts. Pigmentation used in the majority of metal and plastic part coatings would block the UV light. The shape of the metal or plastic part may also present curing problems. Metal and plastic parts with complex shapes or enclosed spaces would have areas that could be shaded from the UV light source.

2. Cleaning Materials

Cleaning materials are another source of VOC emitted by miscellaneous metal product and plastic parts surface coating operations. The VOC are emitted when solvents evaporate from the cleaning materials during use.

Cleaning materials with low-VOC composite vapor pressure and/or low-VOC content generate less VOC emissions than materials with higher VOC vapor pressure and/or content. The VOC composite vapor pressure of a cleaning material is a weighted average of the vapor pressures of the VOC components of that cleaning material. The vapor pressure of each VOC

component is weighted by the mole fraction of that VOC component in the whole cleaning material, including non-VOC components such as water or exempt compounds.[i]

Water and exempt compounds thereby reduce the VOC composite vapor pressure of cleaning materials in which they are present. Although use of lower vapor pressure cleaning materials may reduce VOC emissions, these materials may not be feasible with the broad range of coatings used in the miscellaneous metal product and plastic parts surface coating facilities. Similarly, cleaning materials with low VOC content would generate less VOC emissions than materials with high VOC content, but may not be feasible with the broad range of coatings used in the miscellaneous metal product and plastic parts surface coating facilities.

V. Available Controls and Regulatory Approaches

As previously mentioned, there are two main sources of VOC emissions from miscellaneous metal product and plastic parts surface coating operations: (1) evaporation of VOC from the coatings; and (2) evaporation of VOC from the cleaning materials. This section summarizes the available control options for reducing these VOC emissions and existing federal, State, and local VOC recommendations or requirements that address these emissions.

A. Available Controls for VOC Emissions from Coatings

There are two general emission control techniques for reducing VOC emissions from miscellaneous metal product and plastic parts coatings: pollution prevention measures, and emission capture and add-on control systems. Pollution prevention is the most prevalent control technique being used by the miscellaneous metal product and plastic parts surface coating facilities. Add-on control systems are available to these facilities, but few facilities utilize this control technique. Provided below is a summary of these control techniques.

1. Pollution Prevention Measures

Pollution prevention measures applicable to the miscellaneous metal product and plastic parts surface coating operations, including product substitution/reformulation, work practice procedures, and equipment substitution, may be used to decrease VOC emissions from coating application operations. Lower VOC content coatings, such as powder coatings, higher solids coatings and waterborne coatings, may be used to reduce VOC emissions by reducing or eliminating the organic solvent present in the coating. Work practice procedures may also result in VOC emission reductions during the coating process by reducing coating waste. The use of efficient coating application equipment can reduce VOC emission by increasing the coating transfer efficiency (i.e., the percentage of coating solids used that is deposited onto the substrate) and reducing the amount of coating used and wasted as overspray.

Product substitution/Reformulation

One pollution prevention measure is to substitute higher-solvent coatings with coatings containing little or no solvents. As previously discussed, these coatings include powder coatings, waterborne coatings, higher solids coatings, UV coatings, electrocoatings, and autophoretic coatings. The use of higher solids, powder and waterborne coatings has increased since 1978.

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[i] Exempt compounds are those classified by EPA as having negligible photochemical reactivity as listed in 40 CFR 51.100(s). Exempt compounds are not considered to be VOC.

Manufacturers have developed and are continuing to develop waterborne and powder coating formulations that replace conventional organic solvent-borne coatings. These coatings are generally available. Conversion to powder coatings (for example) can lower VOC emissions greatly, and many miscellaneous metal product and plastic parts coating operations are capable of converting to these coatings. However, the currently available low-VOC coatings or coatings with no solvents do not meet the performance requirements of some metal or plastic coating applications and therefore are not viable options for these operations.

Work Practices

Work practice procedures are physical actions intended to affect emission reductions. Because work practice procedures are specifically tailored to an industry, they may vary from a few manual operations to a complex program.

Coating waste is generated during coating material preparation, coating application, and equipment cleaning. If coating waste is reduced, overall VOC emissions from coating operations will be reduced because less VOC coating material will be needed for production. Coating waste may be reduced by effectively controlling material preparation and using proper equipment maintenance procedures. Other work practices include storing VOC-containing coatings, thinners, and coating-related waste materials in closed containers; ensuring that mixing and storage containers used for VOC-containing materials are kept closed as much as possible; minimizing spills of VOC-containing materials; and conveying VOC-containing materials in closed containers or pipes.

Equipment Substitution

The use of the more effective application equipment also reduces VOC emissions. Conventional air atomized spray application systems utilize high atomizing air pressure with typical transfer efficiencies of 25 to 40 percent.

More modern technologies, such electrostatic and HVLP spray equipment, can achieve much higher transfer efficiencies. The increase in transfer efficiency translates to a decrease in usage of materials containing VOC.

In electrostatic spraying, the coating is charged and the part is grounded, thereby attracting the atomized coating to the part. Transfer efficiencies of up to 90 percent may be achieved depending on the product shape, size, and substrate.

HVLP systems use reduced air pressure to atomize coatings and the reduced air reduces turbulence at the part surface and increases transfer efficiency. HVLP spray systems can achieve transfer efficiencies of up to 65 percent under optimal conditions of part size and shape, and with good operator technique.

2. Emission Capture and Add-on Control Systems

In addition to pollution prevention measures, VOC emissions from miscellaneous metal product and plastic parts surface coating operations can be reduced by the use of capture systems, in conjunction with add-on control systems that either destroy or recover the VOC in the exhaust streams. As stated previously, although capture systems and add-on control devices are available to the miscellaneous metal product and plastic parts surface coating facilities, they are generally not used. That is the case when low VOC coatings and alternative application

methods can be used to reduce VOC emissions. The majority of VOC emissions from miscellaneous metal product and plastic parts coating operations occur in the spray booth. Spray booths typically exhaust a high volume of air to dilute the concentration of VOC for safety reasons to reduce potential worker exposure to solvent vapors and to reduce the flammability of the air-vapor mixture. Although VOC emissions in spray booth exhaust can be controlled with add-on controls, it is generally not cost effective to do so because of the large volume of air that must be treated and the low concentration of VOC.

Capture Systems

Capture systems, such as hoods and enclosures, collect solvent-laden air from process vents (e.g., spray booth or bake oven vents) and/or fugitive emissions (e.g., flash-off area) and direct the captured air to a control device. The majority of VOC emissions from miscellaneous metal product and plastic parts surface coating occur in the spray booth. These emissions can be ducted from the spray booth directly to the control device. Similarly, bake oven exhaust can be ducted directly to the control device. Spray booths and bake ovens are the principal elements of the capture system. In addition, hoods, floor air sweeps or enclosures can be used to collect fugitive emissions from solvents that evaporate in flash-off areas and route them to a control device.

The design of the capture system can greatly contribute to the overall VOC control efficiency. An efficient capture system maximizes the capture of emissions and minimizes the capture of dilution air. Spray booth and bake oven design and air management can reduce the volume of exhaust air and maximize the VOC concentration of the exhaust air which can reduce the cost of control. Facilities may combine several captured VOC-laden streams and duct them to a single control device.

Add-on Control Systems

Add-on controls reduce the amount of VOC emissions by either destruction or recovery with or without recycling of VOC emission in the exhaust streams. Two categories of add-on control devices can be used by the miscellaneous metal product and plastic parts and products surface coating facilities: combustion (thermal or catalytic oxidation) and recovery (adsorption and absorption). While many control devices can be used to reduce VOC emissions, the following summary covers those control devices known to be used with surface coating operations: oxidation, adsorption, and absorption. In addition, there are other control measures known to reduce VOC emissions, but are not currently being widely used in the miscellaneous metal product and plastic parts surface coating facilities. These alternative control technologies are also discussed below.

Oxidation destroys VOC emissions in an exhaust stream by exposing the stream to an oxidizing atmosphere at high temperatures. Oxidizers may be of thermal or catalytic design and combust VOC-containing exhaust streams. Catalytic oxidizers are similar to thermal oxidizers but employ a catalyst to aid in the oxidation reaction. As a result, catalytic oxidizers operate at lower combustion temperatures relative to that required in thermal oxidizers. Both types of oxidizers generally utilize either regenerative or recuperative techniques to preheat inlet gas in order to decrease energy costs associated with high oxidation temperatures. They may also use primary or secondary heat recovery to reduce energy consumption. In general, oxidizers may

achieve destruction efficiencies of greater than 95 percent as applied to coating application operations with high and constant concentrations of VOC.

Adsorption occurs when the unbalanced molecular forces on the surface of solids (the adsorbant) attract and retain gases and particulate matter that come in contact with the solid. Several materials are widely used as the adsorbent, such as activated carbon, organic resin polymer, and inorganic materials. Each has substantial surface area per unit volume. Carbon adsorbers are most commonly used in the miscellaneous metal product and plastic parts surface coating facilities.

In a carbon adsorber, activated carbon is used as the adsorbent in a regenerable fixed bed. In a typical carbon adsorber, VOC-laden air is passed through a fixed bed of granular activated carbon. Adsorber beds are typically operated in parallel to avoid interruption of VOC control. In this arrangement, when the adsorption capacity of one bed is exhausted, it can be removed from service and a second adsorber bed can be put into service, ensuring that a control device is operating at all times. The spent carbon bed in the first adsorber bed is then regenerated and can be put into service again.

Carbon adsorption systems can achieve control device efficiencies greater than 95 percent. In contrast to combustion, carbon adsorption does not destroy the VOC it removes from the air stream. Carbon adsorbers used in miscellaneous metal and plastic parts surface coating are thermally regenerated, usually by passing steam through the carbon beds. The VOC are removed from the carbon (desorbed) and transferred to the steam. The VOC-containing steam is then condensed, and the VOC solvent is separated from the water. The recovered solvent can then be decanted for sale or reuse. Regeneration can also be achieved with hot air. Hot-air regeneration can be quite attractive when dealing with water soluble solvents. Carbon adsorption is most amenable to coatings that use a single solvent; if solvent mixtures are collected by adsorbers, they usually are distilled for reuse.

There are two options for disposing of recovered solvents which cannot be reused. The first is to sell the material back to the solvent supplier or an independent firm that specializes in reclaiming contaminated solvents. The other option is to use the recovered solvent as a fuel in coating ovens or in boilers. However, many coating ovens and boilers are gas-fired and would require burner modifications to burn solvent. Carbon adsorption is generally economically attractive only if the recovered solvent can be reused directly.

Carbon adsorbers are most suitable for solvents that are immiscible with water, such as toluene and xylene, but are not recommended for water-soluble VOC, such as methyl ethyl ketone and methyl isobutyl ketone. In the case where a water-soluble VOC is present, the water vapor will be adsorbed and desorbed along with the VOC vapor, and the VOC may require subsequent purification if it is to be reused.

The presence of solid particles or polymerizable substances in the inlet air stream to a carbon adsorber may require pretreatment of the inlet air. In addition, adsorption is usually used for coating application exhaust streams at ambient temperature up to approximately 38°C (100°F). Therefore, cooling and dehumidification may also be required as pretreatment in some cases. Adding equipment, such as a dehumidification system, increases the costs associated with the use of a carbon adsorption system.

Absorption is the process by which a gas stream is contacted with a liquid so that one or more of the components of the gas stream will dissolve in the liquid. Water is the most common absorbent, but organic solvents may also be used. Removal efficiency can be enhanced by the addition of reactive chemical additives to the absorbent to increase solubility of the absorbed pollutant or change the equilibrium.

Alternative control technologies, such as condensation, biodegradation, and UV oxidation are applicable for control of VOC emissions from coatings. However, EPA is not aware of any miscellaneous metal product and plastic parts surface coating facilities currently using these types of control technologies.

B. Available Controls for VOC Emissions from Cleaning Materials

Pollution prevention is the most common emission control technique for reducing VOC emissions from cleaning materials. The pollution prevention measures applicable to the miscellaneous metal product and plastic parts surface coating operations include product substitution or reformulation, and work practice procedures. Cleaning materials with low or no VOC content or low-VOC composite vapor pressure may be used to reduce or eliminate VOC emissions from using these materials. Work practice procedures may also reduce VOC emission during cleaning operations by reducing the amount of VOC that can evaporate due to exposure to air.

No add-on control technologies are being used specifically for reducing VOC emissions from cleaning operations associated with miscellaneous metal and plastic parts surface coating. However, if cleaning operations are performed within a capture system that is ducted to an add-on control system, such as a hood routed to a thermal oxidizer, the VOC emissions from the cleaning operations would be reduced by destruction in the thermal oxidizer.

1. Product Substitution/Reformulation

Reducing the composite VOC vapor pressure or VOC content of the cleaning material used, either by substitution or reformulation, is one pollution prevention measure that is used to reduce VOC emissions from cleaning operations. However, little information is available regarding the types of low-VOC or VOC-free cleaning materials that could be used in the miscellaneous metal product and plastic parts surface coating operations and whether they are feasible for the broad types of coatings used.

2. Work Practice Procedures

Work practice procedures are commonly used at the miscellaneous metal product and plastic parts surface coating facilities to reduce VOC emissions from cleaning operations. Such work practices include the following:

- Cover mixing and storage vessels for VOC-containing cleaning materials, and cleaning waste materials except when adding, removing, or mixing contents;
- Use closed containers or pipes to store and convey VOC-containing cleaning and cleaning waste materials;
- Minimize spills of VOC-containing cleaning and cleaning waste materials; and

- Minimize VOC emissions during cleaning operations.

C. Existing Federal, State, and Local Recommendations or Regulations

The following discussion is a summary of five EPA actions, as well as State and local regulations that address VOC emissions from miscellaneous metal product and plastic parts coating processes. In addition, Appendices C through F summarize the State and local provisions for surface coating VOC content limits for metal parts and plastic parts, application equipment requirements, and cleaning operations.

1. The 1978 CTG for Surface Coating of Miscellaneous Metal Parts and Products

The 1978 CTG recommended limiting VOC emissions for each of the major types of coatings used by the numerous and varying types of sources performing miscellaneous metal parts and products surface coating. It was found in developing the CTG that hundreds of small industrial categories perform surface coating of miscellaneous metal parts and that writing individual guidelines for each would be unreasonable. Therefore, the CTG attempted to address the different types of surface coating products that are used at miscellaneous metal part and products surface coating facilities.

For each major type of coating, the 1978 CTG recommended a daily volume-weighted average VOC content limit, excluding water and exempt compounds, as applied. The CTG recommended emission limits, in terms of mass of VOC per volume of coating less water, for the following coating operation types:

1. Air-dried or forced air-dried coated items: 0.42 kg/l (3.5 lbs/gal), based on the use of a 52 percent solids organic solvent-borne coating;

2. Clear coatings: 0.52 kg/l (4.3 lbs/gal), based on the use of a 41 percent solids organic solvent-borne coating;

3. Parts or products coating involving frequent color changes or large numbers of colors applied, or the first coat applied to an untreated non-ferrous substrate: 0.36 kg/l (3.0 lbs/gal), based on the use of a 59 percent solids organic solvent-borne coating or an equivalent water-borne coating, or electrodeposited water-borne coating;

4. Outdoor, harsh environment, or extreme performance coatings: 0.42 kg/l (3.5 lbs/gal), based on the use of a 52 percent solids organic solvent-borne coating;

5. Powder coatings: 0.05 kg/l (0.4 lbs/gal) based on a coating thickness of 2 mils; and

6. All other coatings not falling under one of the preceding categories: 0.36 kg/l (3.0 lbs/gal), based on the use of a 59 percent solids organic solvent-borne coating or an equivalent water-borne coating, or powder or electrodeposited water-borne coating.

The 1978 CTG assumed that sources could meet the emission limits with the addition of add-on controls or through the use of coatings that are low in organic solvents. The CTG assumed either of these approaches to meeting the emission limits would be RACT. The CTG also recognized that current technology did not provide coatings low in organic solvent as reasonable replacements for all sources and that some situations existed in which low-polluting

coatings or add-on controls may never be technologically or economically feasible. The 1978 CTG did not address VOC emissions from cleaning materials.

2. The 1988 NSPS for Surface Coating of Plastic Parts for Business Machines (40 CFR 60 subpart TTT)

The NSPS limits the amount of VOC in coatings that are applied to office equipment, laboratory machines, and computers. The NSPS applies to coating booths that began construction, reconstruction, or modification after January 8, 1986. The standard defines the business machine sector as typewriters (SIC Code 3572), electronic computing devices (SIC Code 3573), calculating and accounting machines (SIC Code 3574), telephone and telegraph equipment (SIC Code 3661), office machines (SIC Code 3579), and photocopy machines (SIC Code 3861).

The NSPS sets VOC content limits for prime coats (1.5 kg/liter coating solids applied), color coats (1.5 kg/liter coating solids applied), texture coats (2.3 kg/liter coating solids applied), and touch-up coats (2.3 kg/liter coating solids applied) in any facility in which plastic parts are coated for use in the manufacturing of business machines. While the standard defines the affected facility as spray booths, all resulting VOC emissions from the applied coatings (i.e., including emissions during flash off and curing) must also be included in calculating a facility's compliance status.

The standards also take into account the transfer efficiency of the equipment used to apply the coatings, since they are in units of mass of VOC per volume of coating solids applied to the actual part.

Add-on control devices can be used as an alternative means of compliance, as determined on a case-by-case basis by the Administrator. If add-on controls are used, the owner or operator must demonstrate that volume-weighted average mass of VOC emitted per unit volume of coating solids applied is within the applicable limit. The NSPS did not address cleaning operations or materials.

3. The 1994 ACT for Surface Coating of Automotive/Transportation and Business Machine Plastic Parts

The 1994 ACT provided alternative control technologies available for VOC emissions from the surface coating of plastic parts in the automotive and other transportation equipment and business machine industries. The ACT only presented options of alternative control and did not establish a RACT recommendation.

The ACT stated that the use of lower VOC content coatings (such as waterborne or high-solids coatings), the use of non-VOC coatings (such as zinc-arc, UV, powder, or vapor cure coatings), process modifications (such as improvements of spray equipment), or add-on controls (such as adsorption or incineration) are all available alternative control options. The 1994 ACT did not address VOC emissions from cleaning materials.

Three control levels were stated in the ACT, two of which (Level 1 and Level 2) were based on coating reformulation to a lower VOC coating. The third control level (Level 3) was based on thermal incineration. A fourth control level (Level 4) was identified for red and black

colors of certain automotive coatings because of the need for higher VOC contents to effectively disperse the pigments in these colors.[j]

These technologies were identified in detail in the ACT because of wide availability and feasibility for the range of coating applications covered by the ACT. Table 1 summarizes control levels 1 and 2 for coating reformulation. The ACT states that these control levels would achieve significant VOC emission reductions.

Because the 1988 NSPS limits are expressed in terms of coating solids deposited and the 1994 ACT recommended limits are expressed in terms of VOC per gallon of coating, less water and exempt solvents, these limits cannot be compared directly for surface coating of business machine plastic parts without making an assumption for the transfer efficiency of the application equipment. If we assume a transfer efficiency of 40 percent, then the 1988 NSPS limits for business machine coating are less stringent than the most stringent control level in the 1994 ACT for comparable categories of coatings.

Table 1. Reformulation Control Levels for Lower VOC Coatings from 1994 ACT. (All units are expressed in lb of VOC per gallon of coating, less water and exempt solvents.)

Category	Control Level 1	Control Level 2
Auto Interiors		
High-bake Color Coat	4.3	4.1
High-bake Primer	4.3	3.8
Low-bake Color Coat	5.0	3.2
Low-bake Primer	3.5	3.5
Auto Exteriors		
Flexible		
High-bake Color Coat	4.3	4.1
High-bake Clear Coat	3.8	3.5
High-bake Primer	5.0	4.5
Low-bake Color Coat	5.4	5.1
Low-bake Clear Coat	4.0	3.7
Low-bake Primer	5.5	5.5
Nonflexible		
High-bake Color Coat	4.3	4.1
High-bake Clear Coat	3.8	3.5
High-bake Primer	4.0	3.0
Low-bake Color Coat	5.4	5.1
Low-bake Clear Coat	4.0	3.7
Low-bake Primer	5.5	5.5
Automotive/Transportation Specialty Coatings (Control Levels are equal to Baseline VOC)		
Group A Coatings (Black and reflective argent coatings, Air bag cover coatings, Soft coatings, Vacuum metalizing basecoats, Texture basecoats)	5.5	5.5
Group B Coatings (Gloss reducers, Vacuum metalizing topcoats, Texture topcoats)	6.4	6.4

[j] See Section 6.0 of the 1994 ACT.

Table 1. Reformulation Control Levels for Lower VOC Coatings from 1994 ACT. (All units are expressed in lb of VOC per gallon of coating, less water and exempt solvents.)

Category	Control Level 1	Control Level 2
Group C Coatings (Stencil, Adhesion primers, Ink pad, Electrostatic prep, Resist)	6.8	6.8
Headlamp Lens Coatings	7.4	7.4
Business Machines		
Color Coat	3.5	2.3
Color Coat/Texture Coat	3.5	2.3
Primer	2.9	1.2
EMI/RFI Shielding	4.0	4.0
Business Machine Specialty Coatings (Control Levels are equal to Baseline VOC)		
Soft Coatings	4.3	4.3
Plating Resist	5.9	5.9
Plating Sensitizers	7.1	7.1

4. The 2004 NESHAP for Miscellaneous Metal Parts and Products

The National Emission Standards for Hazardous Air Pollutants for Miscellaneous Metal Parts and Products (Surface Coating), 40 CFR Part 63, subpart MMMM was promulgated January 2, 2004. The NESHAP applies to "major" sources of HAP emissions, which are stationary sources that emit or have the potential to emit 10 tons per year or more of any single HAP, or 25 tons per year or more of any combination of HAP.

The NESHAP applies to sources performing miscellaneous metal parts coating except those covered by other major source surface coating NESHAP (e.g., metal parts of wood furniture, large appliances, metal furniture, metal parts of wood building products, aerospace vehicles and components, web coating, coil coating, ships and boats, auto and light duty truck plants). The NESHAP regulates coating application, surface and equipment cleaning, and depainting at affected sources, but does not apply to individual coatings used in quantity of less than 50 gallons (189 liters) per year as long as the total quantity of exempt coatings does not exceed 250 gallons (946 liters) per year.

The emission limits established by the NESHAP are expressed in terms of kilograms of HAP per liter coating solids (kg/l) and include the following:

- General use coatings: 0.23 kg/l (1.9 lb/gal) (new sources) and 0.31kg/l (2.3 lb/gal) (existing sources);
- High-performance coatings: 3.3 kg/l (27.5 lb/gal) (for both new and existing sources);
- Magnet wire coatings: 0.05 kg/l (0.44 lb/gal) (new sources) and 0.12 kg/l (1.0 lb/gal) (existing sources);
- Rubber-to-metal bonding of 0.81kg/l (6.8 lb/gal) (new sources) and 4.5 kg/l (37.7 lb/gal) (existing sources); and

- Extreme performance fluoropolymer coatings: 1.5 kg/l (12.4 lb/gal) (for both new and existing sources).

In this NESHAP, coatings that do not meet one of the specialty category definitions are subject to the general use emission limitations.

Compliance with the 2003 NESHAP can be demonstrated by any of three methods: (1) a compliant coatings option, where all coatings used have organic HAP contents that individually meet the organic HAP emission limit, and all thinners and cleaning materials contain no organic HAP; (2) an emission rate without add-on controls option, where the monthly average organic HAP emission rate is equal to or less than the organic HAP emission limit; or (3) emission rate with add-on controls option, where the monthly emission rate, taking into account the emission reduction achieved through the use of one or more control devices, is equal to or less than the organic HAP emission limit.

Since this NESHAP is based on coating reformulation to lower the HAP content, it is not known how compliance has affected VOC emissions, if at all, since HAP could be replaced with non-HAP VOC in many coatings.

5. The 2004 NESHAP for Plastic Parts and Products

The National Emission Standards for Hazardous Air Pollutants for Plastic Parts and Products (Surface Coating), 40 CFR Part 63, subpart PPP was promulgated April 19, 2004. The NESHAP also applies to "major" sources of HAP emissions.

The NESHAP applies to sources performing plastic part and product surface coating, except those covered by other major source surface coating NESHAP (e.g., plastic parts of wood furniture, large appliances, plastic parts of metal furniture, plastic parts of wood building products, aerospace vehicles and components, web coating, coil coating, ships and boats, auto and light duty truck plants). The NESHAP regulates coating, cleaning, and depainting at affected sources, but does not apply to sources that use less than 100 gallons (378 liters) per year of HAP-containing coatings.

The emission limits established by the NESHAP are in terms of kilograms of HAP per kg coating solids (kg/kg) and include the following:

- General use coatings: 0.16 kg/kg (0.16 lb/lb) (new sources and existing sources);
- Automotive lamp coatings: 0.26 kg/kg (0.26 lb/lb) (new sources) and 0.45 kg/kg (0.45 lb/lb) (existing sources);
- Thermoplastic olefin coatings: 0.22 kg/kg (0.22 lb/lb) (new sources) and 0.26kg/kg (0.26 lb/lb) (existing sources); and
- Assembled on-road vehicle coatings: 1.34 kg/kg (1.34 lb/lb) (for both new and existing sources).

In this NESHAP, coatings that do not meet one of the specialty category definitions are subject to the general use emission limitations.

Compliance with the 2004 plastic Parts NESHAP can be demonstrated by any of same three methods as with the 2004 Metal Parts NESHAP: (1) compliant coatings option; (2) emission rate without add-on controls option; or (3) emission rate with add-on controls option. Since this NESHAP is based on coating reformulation to lower the HAP content, it is not known how compliance has affected VOC emissions, if at all, since HAP could be replaced with non-HAP VOC in many coatings.

6. Existing State and Local VOC Requirements

In addition to the EPA actions described above, the EPA has identified many State and local regulations that control VOC emissions from miscellaneous metal product and plastic part surface coating operations.

At least 37 States and local jurisdictions have regulations that control VOC emissions from miscellaneous metal parts surface coating. The vast majority of these States (except California) have incorporated the categories and corresponding VOC emission limits recommended by the 1978 CTG for metal parts surface coating. However, 19 States have included additional categories and limits, usually to specifically address high performance architectural coatings, steel pail and drum coatings, or heavy duty truck coating. Several States (at least 11) incorporated an emission limit for the coating of steel pail or drum interiors. Two States incorporate an emission limit for high performance architectural aluminum coatings, while two other states incorporate provisions for minimum transfer efficiency of spray applied coatings. Appendix C summarizes the applicable State and local metal parts surface coating rules.

To aid regional air districts in developing emission limits to meet or maintain ambient air quality standards, the California Air Resources Board (ARB) developed its own recommendation of RACT in 1992. Compared to the 1978 CTG, which recommended separate limits for five categories, the 1992 ARB guidance has specific limits for more categories of specialty coatings that cannot meet the more stringent "general use" category limits. However, overall, the recommended VOC content limits in the 1992 ARB guidance are more stringent than the recommended limits in the 1978 CTG.

These RACT recommendations were the basis for emission limits established by individual California Air Quality Management Districts. A total of 15 air pollution control Districts in California have established rules for metal part surface coating operations, but they do not all include the same categories and limits as the ARB RACT guidance.

Among these Districts, the South Coast Air Quality Management District (SCAQMD) has adopted the most stringent VOC content limits for 21 categories of metal parts coatings in SCAQMD Rule 1107 (South Coast Rule 1107). All of these limits, except the limits for four categories of air dried coatings (general use one component coatings, extreme high gloss, and one and two component high performance architectural component coatings), have been in place since the rule's 1996 amendment or earlier. Since the 1996 amendment, SCAQMD has further tightened the limits for these four categories of air dried coatings through subsequent amendments to Rule 1107.

In addition to setting VOC content limits, South Coast Rule 1107 requires that, if add-on controls are used, the control system must capture at least 90 percent of the VOC emissions. Rule 1107 further requires that the captured VOC emissions be reduced by at least 95 percent or

the VOC concentration at the outlet of the air pollution control device be no more than 5 parts per million (ppm) VOC by volume calculated as carbon with no dilution, and that the control system achieves at least 90 percent capture. The add-on control requirements described above have been in place since the rule's 1996 amendment or earlier.

In addition to South Coast Rule 1107, SCAQMD has also issued Rule 1125 to regulate VOC emissions from steel pail and drum coating operations, whose coatings are included in the miscellaneous metal products coatings category listed under 183(e). Rule 1125 establishes limits for interior and exterior coatings used on new and reconditioned drums and pails. At least four other Districts have specific limits for these surface coating operations in either their metal part surface coating rules or rules for metal container coating operations.

At least 13 States have emission limits for coating lines that are specifically for plastic parts and products. Seven of the State rules (Delaware, Illinois, Massachusetts, Michigan, New Hampshire, Tennessee, and Wisconsin) and the one proposed rule (Ohio) are specifically for automotive and business machine plastic parts and follow the categories and control levels included in the 1994 ACT for these categories. The other six states (Arizona, California, Indiana, Maryland, Missouri, and New York) have not adopted the control levels provided in the 1994 ACT. Instead, they have adopted limits for only one or two categories of plastic parts coatings. In some cases, these limits apply to all plastic parts coatings and are not limited to only automotive or business machine plastic parts. These limits are generally not as stringent as the most stringent control level in the 1994 ACT for comparable coating categories.

Three California Air Quality Management Districts, including the South Coast AQMD, have rules containing emission limits for coating plastic parts. Appendix D summarizes the applicable State and local plastic part surface coating rules, both for general plastic parts coating and for automotive/transportation and business machine plastic parts.

South Coast Rule 1145 (Plastic, Rubber, Leather, And Glass Coatings) has VOC content limits for 11 categories of coatings that can be applied to plastics. All of these limits, except the limits for four categories (general use one and two component coatings, electrical dissipating and shock free coatings, and optical coatings), have been in place since the rule's 1997 amendment or earlier. Since the 1997 amendment, SCAQMD has further tightened the limits for the four categories identified above through subsequent amendments to Rule 1145.

In addition to setting VOC content limits, South Coast Rule 1145 requires that, if add-on controls are used the control system must capture at least 90 percent of the VOC emissions. Rule 1145 further requires that the captured VOC emissions be reduced by at least 95 percent or the VOC concentration at the outlet of the air pollution control device be no more than 5 parts per million (ppm) VOC by volume calculated as carbon with no dilution, and that the control system achieves at least 90 percent capture. The add-on control requirements described above have been in place since 1997 or earlier.

As mentioned above in section IV, miscellaneous metal products and plastic parts coatings include coatings that are applied to the metal and plastic components of a wide range of products, including pleasure craft (recreational boats). Pleasure craft are often made of plastic (e.g., fiberglass) or metal, usually aluminum. Pleasure craft surface coating is performed either as part of the manufacturing process or during maintenance and repair. California is the only State in which specific VOC limits address pleasure craft surface coating. Six California Air

Pollution Control Districts have surface coating rules that address pleasure craft surface coating. Three of these Districts (Bay Area, Mojave Desert, and San Diego) have rules for marine surface coating, which includes pleasure craft surface coating. The Bay Area rule applies to surface coating of all vessels, but only to coatings sold in containers greater than one gallon, and does not include specific limits for coatings applied to pleasure craft. The other two Districts (Mojave Desert and San Diego) have rules with specific limits for coatings applied to pleasure craft.

Three California Districts (Antelope Valley, Ventura County, and South Coast) have rules that specifically address pleasure craft surface coating as a separate category from miscellaneous metal parts coating, plastic parts coating, and marine coating. These three rules have separate definitions and VOC limits for eight categories of pleasure craft coatings used on either metal or plastic substrates. The three District rules have nearly the same categories and VOC limits, but the South Coast limits are the most stringent among the three where there are differences in VOC limits. Appendix E summarizes the California Air District rules for pleasure craft surface coating and marine coatings.

Several States (Arizona, California, Massachusetts, and New Hampshire) have requirements to use specific types of high-efficiency coating application methods to further reduce VOC emissions. In California, ten of the Air Quality Management Districts require the use of high efficiency application methods as part of either metal part or plastic part surface coating rules. These high efficiency methods include the following types of application equipment: electrostatic application; flow coating; dip coating; roll coating; hand application; high-volume, low-pressure (HVLP) spray; or an alternative method that is demonstrated to be capable of achieving a transfer efficiency equal to or better than HVLP spray. Three other states (Arizona, Massachusetts, and New Hampshire) have similar requirements for either metal or plastic part surface coating operations. Appendix F summarizes the State and local requirements that specify high-efficiency application methods.

California and at least 11 other States have requirements to reduce VOC emissions from cleaning materials used in metal and plastic part surface coating operations for either surface preparation or spray gun cleaning. At least 12 Districts in California regulate the VOC content of cleaning materials used in metal or plastic part surface coating operations. These regulations are aimed at reducing VOC emissions from cleaning materials by combining work practice and equipment standards with limits on the VOC content, boiling point, or composite vapor pressure of the solvent being used.

Some District rules allow the use of add-on controls as an alternative to the VOC content/boiling point/vapor pressure limits for cleaning materials. As mentioned above, several Districts have also established work practice and equipment standards to minimize VOC solvent emissions. These standards include, for example, using closed containers for storing solvent and solvent containing wipes and rags, using enclosed and automated spray gun washing equipment, and prohibiting atomized spraying of solvent during spray gun cleaning. However, the cleaning material VOC content/boiling point/vapor pressure limits, overall control efficiency requirements, and work practices vary by District.

At least 12 States have cleaning material work practice requirements that apply to miscellaneous metal or plastic part surface coating operations for either surface preparation or spray gun cleaning. Of these, only one (Massachusetts) limits the VOC content of solvents used for surface preparation, and no State limits the VOC content or vapor pressure of solvents used

specifically for spray gun cleaning. Instead, the States have established equipment standards and work practices, such as the use of enclosed spray gun washers and requirements to store solvents and solvent containing rags and wipes in closed containers. However, for metal part surface coating operations, seven States require that VOC from equipment cleaning must be considered in determining compliance with the emission limits, unless the solvent is directed into containers that prevent evaporation into the atmosphere. Appendix G summarizes the State and local requirements for cleaning solvents used for surface preparation and spray gun cleaning.

VI. Recommended Control Options

Based on a review of the previous Federal actions and the current State and local requirements discussed above, we are recommending three options for controlling the VOC emissions from the coatings used by miscellaneous metal product and plastic part surface coating facilities. We are also recommending work practices to further reduce VOC emissions from coatings as well as to minimize emissions from cleaning materials used in miscellaneous metal product and plastic part surface coating processes.

To control VOC emissions from miscellaneous metal and plastic part surface coatings, we are recommending the following three options: (1) VOC content limits for each coating category based on the use of low-VOC content coatings and specified application methods to achieve good transfer efficiency; (2) equivalent VOC emission rate limits based on the use of a combination of low-VOC coatings, specified application methods, and add-on controls; or (3) an overall VOC control efficiency of 90 percent for facilities that choose to use add-on controls instead of low-VOC content coatings and specified application methods.

We are recommending that states provide all three options described above in their RACT rules for miscellaneous metal products and plastic parts coatings. That is, we are recommending that States not include just one option and exclude the other two. All three options are recommended to be included, together, so as to provide flexibility to facilities as they reduce their VOC emissions in response to State RACT determinations.

The low-VOC coatings recommendation (Option 1) consists of VOC content limits in terms of mass of VOC per volume of coating, as applied, excluding water and exempt compounds, and the use of specified application methods.

The equivalent emission rate limit recommendation (Option 2) consists of emission rate limits in terms of mass of VOC emitted per volume of coating solids, as applied, and the use of specific application methods. This option is intended only for facilities using a combination of low-VOC coatings, specific application methods, and add-on control equipment on a coating unit to meet the recommended limits for mass of VOC emitted per volume of coating solids.

The VOC emission rate limits in Option 2 (VOC per volume solids) were converted from the VOC content limits in Option 1 using an assumed VOC density of 7.36 lb/gallon (883 g/liter). The units of VOC per volume solids are used in Option 2 instead of VOC per volume coating, less water and exempt compounds (as in Option 1), because the former units are more compatible with the use of an add-on control, which is among the control measures contemplated under Option 2. As the efficiency of the control device increases, the emission rate, expressed as VOC per volume solids, decreases in a measurable and predictable manner. The same is not true for VOC per volume coating, less water and exempt compounds, because these units cannot be

directly related to VOC emissions unless the volume of water and exempt compounds is known and accounted for in each coating.

In addition, we are recommending the specified use of one or more of the following coating application methods in conjunction with the use of low-VOC content coatings in options 1 and 2: electrostatic application, HVLP spray, flow coat, roller coat, dip coat (including electrodeposition), airless spray, air-assisted airless spray, or other coating application methods capable of achieving a transfer efficiency equivalent to or better than that achieved by HVLP spraying.

Under option 3, a facility would use an emission capture system and add-on control device to achieve an overall emission capture and control efficiency of at least 90 percent. The facility would not have to limit the VOC content of the coating materials, and would not need to use any particular coating application method.

The first two options are expected to achieve equivalent VOC emission reductions. The third option provides facilities the flexibility to use a high efficiency add-on control in lieu of low VOC coatings and specified application methods, especially when the use of high VOC coatings is necessary or desirable. The third option is expected to achieve an emission reduction at least as great as the first two options.

We are recommending that all VOC-containing materials (i.e., coatings, thinners, and any other additives) used by each miscellaneous metal and plastic part surface coating unit should be included when determining the coating unit's emission rate.

For Option 1, we are recommending the VOC content limits and application method, as well as the exemptions, in the following State regulations:

- South Coast AQMD's Rule 1106.1 (as amended February 12, 1999) for Pleasure Craft Coating Operations.
- South Coast AQMD's Rule 1107 (March 6, 1996) for Coating of Metal Parts and Products.
- South Coast AQMD's Rule 1125 (as amended January 13, 1995) for Metal Container, Closure, And Coil Coating.
- South Coast AQMD's Rule 1145 (February 14, 1997) for Plastic, Rubber, Leather, And Glass Coatings.
- Michigan Rule 336.1632 (as amended April 28, 1993) for Emission of Volatile Organic Compounds From Existing Automobile, Truck, And Business Machine Plastic Part Coating Lines.

The limits in SCAQMD Rule 1125 and Michigan Rule 336.1632 have been in place since the amendments noted above for these rules. As mentioned above, SCAQMD has changed the limits for several categories in SCAQMD Rules 1107 and 1145 in subsequent amendments to these two rules. These new limits, however, have not been in place very long. We do not have information regarding the cost of implementing these new limits. We could not conclude that these limits are technologically and economically feasible and, therefore, reflect RACT for all affected facilities in ozone nonattainment areas nationwide. We are, therefore, not

recommending the limits in SCAQMD Rules 1107 and 1145 promulgated subsequent to the amendments to these rules noted above.

The recommended limits in the SCAQMD rules described above are more stringent than the limits provided in other existing Federal, State, and local actions limiting VOC emissions from these coating categories. Because of the large size of the SCAQMD and the number of regulated sources, the facilities subject to these four SCAQMD rules are considered to be representative of the type of sources located in other parts of the country. The recommended limits from Rules 1107, 1125, and 1145 have been or were in effect a long time (i.e., since 1997 or earlier). The limits in Rule 1106.1, except for non-aluminum antifoulant coatings, have been in effect since 1994, and the limit for non-aluminum antifoulant coatings has been in effect since 2001. Therefore, we believe that these limits are technically and economically feasible for sources in other parts of the country and, therefore, have included them as our recommendations in the final CTG.

The Michigan rule is based on the control levels provided in the 1994 ACT, which is more stringent than the 1988 NSPS for comparable coating categories for business machines. Michigan has a substantial number of sources subject to Rule 336.1632, and these sources' compliance with Michigan Rule 336.1632 shows that the VOC content limits in Michigan Rule 336.1632 are technically and economically feasible. The limits in the Michigan rule have been in effect since 1993. Therefore, we recommend in the final CTG the VOC content limits contained in Michigan Rule 336.1632.

Specifically, for metal parts surface coatings except high performance architectural coatings, our recommended Option 1 includes the VOC content limits in South Coast Rule 1107 (Coating of Metal Parts and Products) (March 6, 1996). As in that rule, we recommend separate limits for baked coatings and air-dried coatings for 21 categories of coatings used on metal parts. Option 1 also includes the four limits for drum, pail and lid coating in South Coast Rule 1125, (Metal Container, Closure, and Coil Coating Operations). With respect to high performance architectural coatings, we are recommending a VOC limit of 0.74 kg VOC/l (6.2 lb/gal) coating, less water and exempt compounds. Liquid high performance architectural coatings currently available and in use today contain significantly more than the 3.5 lb VOC/gallon limit we recommended in the draft CTG. The cost of converting to powder coatings or installing and operating add-on controls to meet a limit of 3.5 lb VOC/gallon generally would be unreasonable compared to the emission reduction that would be achieved. The 6.2 lb VOC/gallon limit recommended in this final CTG can be achieved by the liquid high performance architectural coatings currently available and in use today. Further reformulation to reduce VOC below the recommended 6.2 lb VOC/gallon limit may not be technically feasible. In light of all of the above, we believe that the 6.2 lb VOC/gallon limit represents RACT for high performance architectural coatings.

For surface coating of plastic parts that are not part of automotive/transportation equipment or business machines, Option 1 includes the VOC content limits in South Coast Rule 1145 (Plastic, Rubber, Leather, and Glass coatings) for 11 categories of plastic parts coatings (February 14, 1997). These limits became effective January 1, 1998. As mentioned above, all but four of these limits are still in place.

For surface coatings for automotive plastic parts and business machine plastic parts, Option 1 includes the VOC content limits in Michigan Rule 336.1632 (Emission of Volatile

Organic Compounds from Existing Automobile, Truck, and Business Machine Plastic Part Coating Lines). We also recommend applying these limits to surface coating of plastic parts on fully assembled motor vehicles, as well as separate parts. These include, for example, the surface coating of fiberglass bodies on assembled recreational vehicles (RVs).

For surface coating of pleasure craft (recreational boats), Option 1 includes the VOC content limits in South Coast Rule 1106.1 (Pleasure Craft Surface Coating) for the eight categories of coatings that could be used on metal or plastic substrates.[k] These separate categories and limits are being included in our recommendations to recognize the unique performance requirements of pleasure craft coatings, such as their suitability for use in marine environments, durability, and high gloss.

We are also recommending under Option 1 specific VOC content limits for certain motor vehicle materials used at facilities that are not automobile or light-duty truck assembly coating facilities. Since these motor vehicle materials typically are low use materials and are often used in areas of these facilities that would expensive to control with add-on controls (e.g., used in open assembly areas), we are only recommending VOC content limits for these materials (Option 1), and are not recommending VOC emission rate limits (Option 2) or an overall 90 percent control efficiency (Option 3).

We recommend that EPA Method 24 in Appendix A-7 of 40 CFR part 60, be used to determine the VOC content of coating materials used at miscellaneous metal and plastic part coating facilities. In addition, we recommend that manufacturer's formulation data be accepted as an alternative to EPA Method 24. If there is a disagreement between manufacturer's formulation data and the results of a subsequent test, we recommend that States use the test method results unless the facility can make a demonstration to the States' satisfaction that the manufacturer's formulation data are correct.

Consistent with the State rules which are the basis for the recommended VOC limits, we are recommending that the recommended VOC limits and application methods not apply to certain types of coatings and coating operations. For all coating operations, we are recommending that the recommended VOC limits and application methods not apply to aerosol coating products or powder coatings. Aerosol coatings are a separate category under Section 183(e), and powder coatings are an inherently low-VOC alternative to many liquid coatings.

For metal parts coatings, we are recommending that only the recommended work practices, but not the recommended VOC limits and application methods, apply to the following types of coatings and coating operations:

- Stencil coatings;
- Safety-indicating coatings;
- Solid-film lubricants;
- Electric-insulating and thermal-conducting coatings;

[k] VOC limits for wood coatings (teak primers and clear wood finishes) that are included in South Coast Rule 1106.1 are not included in these recommendations because wood surface coating is not part of this source category under Section 183(e).

- Magnetic data storage disk coatings; and
- Plastic extruded onto metal parts to form a coating.

For metal parts coatings, we also recommend that the recommended application methods not apply to touch-up coatings, repair coatings, and textured finishes, but we recommend that the recommended VOC limits and work practices apply to these coatings and coating operations.

For plastic parts coatings, we are recommending that the recommended application methods and work practices, but not the recommended VOC limits, apply to the following types of coatings and coating operations:

- Touch-up and repair coatings;
- Stencil coatings applied on clear or transparent substrates;
- Clear or translucent coatings;
- Coatings applied at a paint manufacturing facility while conducting performance tests on the coatings;
- Any individual coating category used in volumes less than 50 gallons in any one year, if substitute compliant coatings are not available, provided that the total usage of all such coatings does not exceed 200 gallons per year, per facility;
- Reflective coating applied to highway cones;
- Mask coatings that are less than 0.5 millimeter thick (dried) and the area coated is less than 25 square inches;
- EMI/RFI shielding coatings; and
- Heparin-benzalkonium chloride (HBAC)-containing coatings applied to medical devices, provided that the total usage of all such coatings does not exceed 100 gallons per year, per facility.

For plastic parts coatings, we also recommend that the recommended application methods not apply to airbrush operations using 5 gallons or less per year of coating, but we recommend that the VOC limits and work practices apply to these operations.

For automotive/transportation and business machine plastic part coating, we are recommending that the recommended application methods and work practices , but not the recommended VOC limits, apply to the following types of coatings and operations:

- Texture Coatings;
- Vacuum Metalizing Coatings;
- Gloss Reducers;
- Texture Topcoats;

- Adhesion Primers;
- Electrostatic preparation coatings;
- Resist coatings; and
- Stencil Coatings.

For pleasure craft surface coating operations, we recommend that the recommended application methods not apply to extreme high gloss coatings, but we recommend that the VOC limits and work practices do apply to these coatings.

The VOC content limits can be met by averaging the VOC content of materials used on a single surface coating unit each day (i.e., daily within-coating unit averaging). We do not recommend the use of cross-coating unit averaging (i.e., averaging across multiple coating units) to meet the VOC content limits. However, we have previously provided guidance on cross-line averaging.[1] The guidance is directed to State and local agencies that elect to adopt a discretionary economic incentive program (EIP) and includes guidance on the use of cross-line averaging.

For cleaning materials, we are recommending work practices for use with all three of the control options to reduce VOC emissions. We are not recommending the application of add-on controls in conjunction with these work practices. The use of add-on controls to reduce emissions from cleaning operations at miscellaneous metal product and plastic part surface coating facilities would be a costly option because the area to be controlled is quite large and a large volume of air would be captured and directed to a control device. We are also not recommending the use of a VOC content or VOC composite vapor pressure limit for cleaning materials. We do not have information available regarding current VOC content or VOC composite vapor pressure usage to determine a RACT limit(s) for cleaning materials used in these numerous and various miscellaneous metal product and plastic part surface coating operations.

We estimate that our recommendations for coatings and cleaning materials will reduce VOC emissions from miscellaneous metal and plastic part coatings by about 35 percent (a reduction of 7,034 Mg/yr (7,738 tpy) of VOC) from the nonattainment area facilities above the recommended 6.8 kg/day (15 lb/day) threshold. In our analysis of the impacts of the recommended level of control, we have assumed that all facilities will choose to utilize the low-VOC coating materials option. We made this assumption for two reasons. First, we believe that low-VOC coating materials are already widely available at a cost that is not significantly greater than the cost of coating materials with higher VOC contents. Secondly, the use of add-on controls to reduce emissions from typical spray coating operations would be a more costly option.

The following discussion summarizes our specific recommendations for coating operations and cleaning materials used in miscellaneous metal product and plastic part surface coating operations.

[1] Improving Air Quality with Economic Incentive Programs. U.S. Environmental Protection Agency. Research Triangle Park, NC. EPA-452/R-01-001. January 2001.

A. Recommended Option 1 for Reducing Coating Emissions: VOC Content Limits Based on Low-VOC Coatings

We are recommending separate sets of emission limits for metal parts coatings, plastic parts coatings, automotive/transportation and business machine plastic parts, and pleasure craft coatings. For the metal parts coatings, we are recommending separate emission limits for baked and air-dried coatings. Provided in the following five tables are the recommended emission limits expressed in terms of mass of VOC per volume of coating (excluding water and exempt compounds, as applied).

Table 2. Metal Parts and Products VOC Content Limits

Coating Category	Air Dried		Baked	
	kg VOC/l coating	lb VOC/gal coating	kg VOC/l coating	lb VOC/gal coating
General One Component	0.34	2.8	0.28	2.3
General Multi Component	0.34	2.8	0.28	2.3
Camouflage	0.42	3.5	0.42	3.5
Electric-Insulating Varnish	0.42	3.5	0.42	3.5
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	0.74	6.2	0.74	6.2
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
Prefabricated Architectural Multi-Component	0.42	3.5	0.28	2.3
Prefabricated 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

Table 3. Plastic Parts And Products VOC Content Limits

Coating Category	kg VOC/liter coating	lbs VOC/gal coating
General One Component	0.28	2.3
General Multi Component	0.42	3.5
Electric Dissipating Coatings and Shock-Free Coatings	0.80	6.7
Extreme Performance	0.42 (2-pack coatings)	3.5 (2-pack coatings)
Metallic	0.42	3.5
Military Specification	0.34 (1 pack) 0.42 (2 pack)	2.8 (1 pack) 3.5 (2 pack)
Mold-Seal	0.76	6.3
Multi-colored Coatings	0.68	5.7
Optical Coatings	0.80	6.7
Vacuum-Metalizing	0.80	6.7

Table 4. Automotive/Transportation and Business Machine Plastic Parts VOC Content Limits

Coating Category	kg VOC/liter coating	lbs VOC/gal coating
Automotive/Transportation Coatings[1]		
I. High Bake Coatings – Interior and Exterior Parts		
Flexible Primer	0.54	4.5
Non-flexible Primer	0.42	3.5
Base Coats	0.52	4.3
Clear Coat	0.48	4.0
Non-basecoat/clear coat	0.52	4.3
II. Low Bake/Air Dried Coatings – Exterior Parts		
Primers	0.58	4.8
Basecoat	0.60	5.0
Clearcoats:	0.54	4.5
Non-basecoat/clearcoat	0.60	5.0
III. Low Bake/Air Dried Coatings – Interior Parts	0.60	5.0
IV. Touchup and Repair Coatings	0.62	5.2
Business Machine Coatings		
I. Primers	0.35	2.9
II. Topcoat	0.35	2.9
III. Texture Coat	0.35	2.9
IV. Fog Coat	0.26	2.2
V. Touchup and repair	0.35	2.9

[1] For red, yellow, and black automotive coatings, except touch up and repair coatings, the recommended limit is determined by multiplying the appropriate limit in this table by 1.15.

Table 5. Pleasure Craft Surface Coating VOC Content Limits

Coating Category	kg VOC/liter coating	lbs VOC/gal coating
Extreme High Gloss Topcoat	0.49	4.1
High Gloss Topcoat	0.42	3.5
Pretreatment Wash Primers	0.78	6.5
Finish Primer/Surfacer	0.42	3.5
High Build Primer Surfacer	0.34	2.8
Aluminum Substrate Antifoulant Coating	0.56	4.7
Other Substrate Antifoulant Coating	0.33	2.8
All other pleasure craft surface coatings for metal or plastic	0.42	3.5

Table 6. Motor Vehicle Materials VOC Content Limits

Coating Category	kg VOC/liter coating	lbs VOC/gal coating
Motor vehicle cavity wax	0.65	5.4
Motor vehicle sealer	0.65	5.4
Motor vehicle deadener	0.65	5.4
Motor vehicle gasket/gasket sealing material	0.20	1.7
Motor vehicle underbody coating	0.65	5.4
Motor vehicle trunk interior coating	0.65	5.4
Motor vehicle bedliner	0.20	1.7
Motor vehicle lubricating wax/compound	0.70	5.8

B. Recommended Option 2 for Reducing Coating VOC Emissions: Emission Rate Limits Based on Low-VOC Coatings and Add-on Controls - VOC per Volume Solids

The recommended emission limits can also be expressed in terms of mass of VOC per volume of coating solids, as applied. This recommendation is intended for facilities that use a combination of low-VOC coatings and add-on control equipment on a coating unit. Using an assumed VOC density of 7.36 pounds per gallon, the equivalent limits in terms of mass of VOC per volume of solids, as applied, are provided in the following three tables. As noted earlier, for the motor vehicle materials listed in Table 6 under Option 1, above, we are not recommending alternative emission rate limits (VOC per volume solids).

Table 7. Metal Parts and Products VOC Emission Rate Limits (VOC per Volume Solids)

Coating Category	Air Dried		Baked	
	kg VOC/l solids	lb VOC/gal solids	Kg VOC/l solids	lb VOC/gal solids
General One Component	0.54	4.52	0.40	3.35
General Multi Component	0.54	4.52	0.40	3.35
Camouflage	0.80	6.67	0.80	6.67
Electric-Insulating Varnish	0.80	6.67	0.80	6.67
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	4.56	38.0	4.56	38.0
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
Prefabricated Architectural Multi-Component	0.80	6.67	0.40	3.35
Prefabricated 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

Table 8. Plastic Parts And Products VOC Emission Rate Limits (VOC per Volume Solids)

Coating Category	kg VOC/liter solids	lbs VOC/gal solids
General One Component	0.40	3.35
General Multi Component	0.80	6.67
Electric Dissipating Coatings and Shock-Free Coatings	8.96	74.7
Extreme Performance	0.80 (2-pack coatings)	6.67 (2-pack coatings)
Metallic	0.80	6.67
Military Specification	0.54 (1 pack) 0.80 (2 pack)	4.52 (1 pack) 6.67 (2 pack)
Mold-Seal	5.24	43.7
Multi-colored Coatings	3.04	25.3
Optical Coatings	8.96	74.7
Vacuum-Metalizing	8.96	74.7

Table 9. Automotive/Transportation and Business Machine Plastic Parts VOC Emission Rate Limits (VOC per Volume Solids)

Coating Category	kg VOC/liter solids	lbs VOC/gal solids
Automotive/Transportation Coatings[1]		
I. High Bake Coatings – Interior and Exterior Parts		
Flexible Primer	1.39	11.58
Non-flexible Primer	0.80	6.67
Base Coats	1.24	10.34
Clear Coat	1.05	8.76
Non-basecoat/clear coat	1.24	10.34
II. Low Bake/Air Dried Coatings – Exterior Parts		
Primers	1.66	13.80
Basecoat	1.87	15.59
Clearcoats:	1.39	11.58
Non-basecoat/clearcoat	1.87	15.59
III. Low Bake/Air Dried Coatings – Interior Parts	1.87	15.59
IV. Touchup and Repair Coatings	2.13	17.72
Business Machine Coatings		
I. Primers	0.57	4.80
II. Topcoat	0.57	4.80
III. Texture Coat	0.57	4.80
IV. Fog Coat	0.38	3.14
V. Touchup and repair	0.57	4.80

[1] For red, yellow, and black automotive coatings, except touch up and repair coatings, the recommended limit is determined by multiplying the appropriate limit in this table by 1.15.

Table 10. Pleasure Craft Surface Coating VOC Emission Rate Limits (VOC per Volume Solids)

Coating Category	kg VOC/liter solids	lbs VOC/gal solids
Extreme High Gloss Topcoat	1.10	9.2
High Gloss Topcoat	0.80	6.7
Pretreatment Wash Primers	6.67	55.6
Finish Primer/Surfacer	0.80	6.7
High Build Primer Surfacer	0.55	4.6
Aluminum Substrate Antifoulant Coating	1.53	12.8
Other Substrate Antifoulant Coating	0.53	4.4
All other pleasure craft surface coatings for metal or plastic	0.80	6.7

C. Recommended Option 3 for Reducing Coating VOC Emissions: Add-on Controls In Lieu of Low-VOC Coatings and Specified Application Methods

Should product performance requirements or other needs dictate the use of higher-VOC materials than those that would meet the recommended emission limits, a facility could choose to use add-on control equipment with an overall control efficiency of 90 percent in lieu of using low-VOC coatings and specified application methods. This control option, like the two options described above, applies to all coatings and thinners applied to miscellaneous metal and plastic part components or products, except as described above for motor vehicle materials.

For both recommended options 2 and 3, available add-on devices include, for example, oxidizers, adsorbers, absorbers, and concentrators. Add-on devices coupled with capture systems to collect the VOC being released at the affected facilities can achieve an overall control efficiency of 90 percent.

D. Work Practices for Coating-Related Activities

In addition to the control options above, this CTG recommends work practices to further reduce VOC emissions from miscellaneous metal and plastic part surface coating-related activities. Although VOC reductions achieved by implementing the recommended work practices may not be quantifiable, they are beneficial to the overall goal of reducing VOC emissions. We recommend work practices for storage, mixing operations, and handling operations for coatings, thinners, and coating-related waste materials. We recommend these practices for use with all three of the control options described above.

Specifically, we recommend the following work practices: (1) store all VOC-containing coatings, thinners, and coating-related waste materials in closed containers; (2) ensure that mixing and storage containers used for VOC-containing coatings, thinners, and coating-related waste materials are kept closed at all times except when depositing or removing these materials; (3) minimize spills of VOC-containing coatings, thinners, and coating-related waste materials; and (4) convey VOC-containing coatings, thinners, and coating-related waste materials from one location to another in closed containers or pipes.

E. Work Practices for Cleaning Materials

This CTG recommends work practices to reduce VOC emissions from cleaning materials used in miscellaneous metal product and plastic part surface coating operations. These cleaning materials include both materials used to clean surfaces before coating (surface preparation) and to clean application equipment between coating jobs. Although VOC reductions achieved by implementing the recommended work practices may not be quantifiable, they are beneficial to the overall goal of reducing VOC emissions. We recommend work practices for storage, mixing, and handling operations for cleaning materials. We recommend these practices for use with all three of the control options described above

Specifically, we recommend that, at a minimum, the work practices include the following: (1) store all VOC-containing cleaning materials and used shop towels in closed containers; (2) ensure that storage containers used for VOC-containing cleaning materials are kept closed at all times except when depositing or removing these materials; (3) minimize spills of VOC-containing cleaning materials; (4) convey VOC-containing cleaning materials from one location to another in closed containers or pipes; and (5) minimize VOC emission from cleaning of application, storage, mixing, and conveying equipment by ensuring that equipment cleaning is performed without atomizing the cleaning solvent and all spent solvent is captured in closed containers.

VII. Cost Effectiveness of Recommended Control Options

We used the 2002 National Emissions Inventory (NEI) database to estimate the number of miscellaneous metal product and plastic part manufacturing facilities. Based on the 2002 NEI, we estimated that there are a total of 3,925 miscellaneous metal product and plastic part facilities in the U.S. Using the 2004 ozone nonattainment designations, we estimated that a total of 2,539 of these facilities are in ozone nonattainment areas. Based on the NEI VOC emissions data, 1,269 of the 2,539 facilities in ozone nonattainment areas emitted at or above the 6.8 kg/day (15 lb/day) recommended VOC emissions applicability threshold. These 1,269 facilities emitted a total of about 20,098 Mg/yr of VOC (22,108 tpy), or an average of about 15.5 Mg/yr (17.0 tpy) of VOC per facility.

As previously mentioned, the recommendations in this CTG are similar to the South Coast regulations governing miscellaneous metal product and plastic part surface coating operations, and Michigan Rule 336.1632. It is not known if the cost effectiveness related to the implementation of these regulations was estimated during their development, and no cost estimates could be found. Although the 2004 NESHAP regulate organic HAP, the 2004 NESHAP cost estimates are relevant to this CTG's recommended levels of control because they are based on the use of similar control measures (i.e., product substitution/reformulation and work practices) for miscellaneous metal product and plastic part coatings and cleaning materials. Therefore, cost-effectiveness estimates for the recommended control levels were determined using the approach used during development of the two 2004 NESHAP.

In our analysis of the impacts of implementing the recommended levels of control in this CTG, we have assumed that all miscellaneous metal product and plastic part surface coating facilities will choose to utilize the low-VOC coating materials option. We made this assumption for two reasons. First, since facilities are meeting equivalent State limits, we believe that low-VOC coating materials that can meet the recommended control levels in this CTG are already

available at a cost that is not significantly greater than the cost of coating materials with higher VOC contents. Secondly, the use of add-on controls to reduce emissions from typical spray coating operations is a more costly option.

According to studies performed for the development of the two 2004 NESHAP for miscellaneous metal parts and plastic parts surface coating operations, the cost averaged across all sizes of facilities was estimated to be $10,500 per facility. We believe that this estimate also represents the cost of implementing this CTG's recommended VOC limits because the NESHAP were based on similar control measures. That is, the NESHAP were based on reformulating coatings to lower the HAP content and this CTG is based on reformulating coatings to lower the VOC content. We assumed that the costs for reformulation under the NESHAP (e.g., costs for research and development, raw materials, production, and marketing the reformulated products) would be representative of the costs for reformulation to lower VOC content under the recommended control options. Therefore, for the 1,296 facilities we identified as emitting more than 6.8 kg/day (15 lb/day) in ozone nonattainment areas, we estimate the total annual cost to be $13.6 million, based on the use of low-VOC content coatings. We estimate that the recommendations in this CTG will reduce VOC emissions from miscellaneous metal and plastic part coating by about 35 percent of 20,056 Mg/yr (22,108 tpy). This is a reduction of 7,034 Mg/yr (7,738 tpy of VOC) from the 1,296 facilities. Therefore, we estimate the cost effectiveness to be $1,933 per Mg ($1,758 per ton) of VOC emission reduction.

We believe that the work practice recommendations in this CTG will result in a net cost savings. Implementing work practices reduces the amount of cleaning materials used by reducing the amount that evaporates and is wasted. Similarly, we also believe that the recommendation to use the specified coating application methods will also result in net cost savings. Increasing the transfer efficiency of coating application to reduce VOC emissions will also reduce coating consumption and costs. However, these cost savings cannot be accurately estimated.

VIII. References

Guideline Series. Control of Volatile Organic Emissions from Existing Stationary Sources - Volume VI: Surface Coating of Miscellaneous Metal Parts and Products. Publication No. EPA-450/2-78-015. U.S. Environmental Protection Agency, Research Triangle Park, NC. June 1978.

40 CFR 60 Subpart TTT – Standards of Performance for Industrial Surface Coating: Surface Coating of Plastic Parts for Business Machines. Applicable to affected facilities for which construction, modification, or reconstruction begins after January 8, 1986.

Alternative Control Techniques Document: Surface Coating of Automotive/Transportation and Business Machine Plastic Parts. Publication No. EPA-453/R-94-017. U.S. Environmental Protection Agency, Research Triangle Park, NC. February 1994.

National Emission Standards for Hazardous Air Pollutants for Miscellaneous Metal Parts and Products Surface Coating (40 CFR 63, subpart MMMM).

National Emission Standards for Hazardous Air Pollutants for Plastic Parts and Products Surface Coating (40 CFR 63, subpart PPPP).

State of California Air Resources Board. Determination of Reasonably Available Control Technology for Metal Parts and Products Coating Operations. ARB Publication No. ARB/SSD-93-003. December 10, 1992.

South Coast (California) AQMD Rule 1106.1, Pleasure Craft Coating Operations. Amended February 12, 1999).

South Coast (California) AQMD Rule 1107, Coating of Metal Parts and Products. As amended March 6, 1996.

South Coast (California) AQMD Rule 1125, Metal Container, Closure, and Coil Coating. As amended January 13, 1995.

South Coast (California) AQMD Rule 1145, Plastic, Rubber, Leather, And Glass Coatings. As amended February 14, 1997.

Michigan Rule 336.1632 (rule 632) for Emission of Volatile Organic Compounds From Existing Automobile, Truck, And Business Machine Plastic Part Coating Lines. Amended April 28, 1993.

Appendix A

Cover Page of 1978 CTG for Surface Coating of Miscellaneous Metal Parts and Products

Appendix B

Cover Page of 1994 ACT for Surface Coating of Automotive/Transportation and Business Machine Plastic Parts

Appendix C
Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
AL	Etowah, Mobile, and Russell Counties	All VOC sources with a potential VOC emission rate of greater than or equal to 100 tons/year This rule does not apply to the surface coating of the following metal parts and products: automobiles and light-duty trucks; metal cans; flat metal sheets and strips in the form of rolls or coils; magnet wire for use in electrical machinery; metal furniture; large appliances; exterior of airplanes; automobile refinishing; customized coating of automobiles and trucks, if production is less than 35 vehicles per day; and exterior of marine vessels.	1. 0.52 kg/L (4.3 lb/gal) of coating delivered to a coating applicator that applies clear coatings; 2. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 90° C (194° F); 3. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator that applies extreme performance coatings; and, 4. 0.36 kg/L (3.0 lb/gal) of coating delivered to a coating applicator for all other coatings and coating application systems.	
AL	Jefferson County	All VOC sources with a potential VOC emission rate of greater than or equal to 100 tons/year This rule shall not apply to the surface coating of the following metal parts and products: automobiles and light-duty trucks; metal cans; flat metal sheets and strips in the form of rolls or coils; magnet wire for use in electrical machinery; metal furniture; large appliances; exterior of airplanes; automobile refinishing; customized coating of automobiles and trucks, if production is less than 35 vehicles per day and if the VOC emission rate from the customized coating operation does not exceed 60 tons per year based on an annual rolling average calculated at the end of each calendar month; exterior of marine vessels; and fabricated metal parts and products under the major Standard Industrial Classification Code of Group No. 34 if the VOC emissions rate is less than a potential ten tons per calendar year (10 TPY) before an add-on VOC control device.	1. 0.52 kg/L (4.3 lb/gal) of coating delivered to a coating applicator that applies clear coatings; 2. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 90° C (194° F); 3. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator that applies extreme performance coatings; 4. 0.36 kg/L (3.0 lb/gal) of coating delivered to a coating applicator for all other coatings and coating application systems, excluding powder coating systems; and 5. 0.05 kg/L (0.4 lb/gal) of coating delivered to a coating applicator for all powder coating systems.	
AZ		Facilities engaged in the surface coating of miscellaneous metal parts and products	1. 4.3 lb/gal (0.5 kg/L) of coating delivered to a coating applicator that applies clear coatings. 2. 3.5 lb/gal (0.42 kg/L) of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			temperatures up to 194°F (90°C). 3. 3.5 lb/gal (0.42 kg/L) of coating delivered to a coating applicator that applies extreme performance coatings. 4. 3.0 lb/gal (0.36 kg/L) of coating delivered to a coating applicator for all other coatings and application systems.	
AZ	Maricopa County	Other metal parts and products This rule is not applicable to coatings having a VOC content, minus exempt compounds, of less than 0.15 lb VOC/gal (18g/L) nor to solvents having a VOC content of material less than 0.15 lb VOC/gal. This rule does not apply to the following operations: Aerospace coating operations; Architectural coating, including buildings and erected structures; Cleaning: VOC loss from cleaning or stripping a surface for coating or other purpose is regulated elsewhere; Marine vessel exterior refinishing; Polyester coatings applied to polyester composites; Printing and graphic arts coating; Semiconductor manufacturing; Coating a highway vehicle or mobile equipment; Wood: Coating Wood Furniture or Coating Wood Millwork. Extreme performance coatings are exempt from the VOC limits when used under certain conditions: (1) Used on internal combustion engine components that are normally above 250°F (121°C) during use; or (2) Used at temperatures above 250°F (121°C) on items that are both included under SIC (Standard Industrial Classification, 1987) codes 3661, 3663, 3669, 3677, 3678, 3679, or 3769 and are electronic products in space vehicles and/or are communications equipment. The following are exempt from the limits of this rule:	Air-Dried Coating 3.5 lb/gal Baked Coating [above 200°F (93°C)] 3.0 lb/gal Silicone Release Coating: Baked or Air-Dried 3.5 lb/gal	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		Coating with an aerosol can; Touch up or repair-coating operations; Low usage coatings which in aggregate of all formulations do not exceed 55 gallons (208 liters) per year facility-wide if the operator updates usage records of these coatings on each day of their use; A small surface-coating source (SSCS) as defined in the rule; A Quality Class Q protective coating that is used on equipment, structures, and/or components within a containment facility of a nuclear power plant; A tactical military-equipment coating that is approved in an MCESD Air Pollution Permit subsequent to a sufficient demonstration by the user that no compliant substitute exists.		
AR	Pulaski County		1. 0.52 kg/l (4.3 lb/gal) of coating delivered to a coating applicator that applies clear coatings; 2. 0.42 kg/l (3.5 lb/gal) of coating delivered to a coating applicator in a coating application system that utilizes air or forced air dryers; 3. 0.42 kg/l (3.5 lb/gal) of coating delivered to a coating applicator that applies extreme performance coatings; and 4. 0.36 kg/l (3.0 lb/gal) of coating delivered to a coating applicator for all other coatings and coating application systems. 5. The above emission limitations shall include all VOC emissions from both coating and solvent washing unless the solvent is directed into containers that prevent evaporation.	The emission limits shall be achieved by: 1. The application of low solvent coating technology; 2. An incineration system which oxidizes at least 90.0 percent of the nonmethane volatile organic compounds (VOC) measured as total combustible carbon to carbon dioxide and water; or 3. An equivalent means of VOC removal. The equivalent means must be certified by the owner or operator and approved by the Director.

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
CA	Antelope Valley AQMD	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. The limits of this rule, shall not apply to: Stencil coatings; A facility which uses a total of less than one gallon of coating, including any VOC-containing materials added to the original coating as supplied by the manufacturer, subject to this rule, in any one day; Total noncompliant coating use per facility that does not exceed 55 gallons per rolling 12-month period; Safety-indicating coatings; Magnetic data storage disk coatings; Solid-film lubricants; the application of coatings and use of cleaning solvents while conducting performance tests on the coatings at paint manufacturing facilities; high performance architectural, vacuum metalizing, and/or pretreatment coatings used at a facility which has the potential to emit a total of 10 tons or less per year of VOCs, before application of add-on controls; aerosol coating products	Coating - Air Dried General 2.8 lb/gal Military Specification 2.8 lb/gal Etching Filler 3.5 lb/gal Solar-Absorbent 3.5 lb/gal Heat-Resistant 3.5 lb/gal Extreme High-Gloss 3.5 lb/gal Metallic 3.5 lb/gal Extreme Performance 3.5 lb/gal Prefabricated Architectural Component 3.5 lb/gal Touch Up 3.5 lb/gal Repair 3.5 lb/gal Silicone Release 3.5 lb/gal High Performance Architectural 3.5 lb/gal Camouflage 3.5 lb/gal Vacuum-Metalizing 3.5 lb/gal Mold-Seal 3.5 lb/gal High-Temperature 3.5 lb/gal Electric-Insulating Varnish 3.5 lb/gal Pan Backing 3.5 lb/gal Pretreatment Coatings 3.5 lb/gal Coating - Baked General 2.3 lb/gal Military Specification 2.3 lb/gal Etching Filler 3.5 lb/gal Solar-Absorbent 3.0 lb/gal Heat-Resistant 3.0 lb/gal Extreme High-Gloss 3.0 lb/gal Metallic 3.5 lb/gal Extreme Performance 3.0 lb/gal	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			Prefabricated Architectural Component 2.3 lb/gal Touch Up 3.0 lb/gal Repair 3.0 lb/gal Silicone Release 3.5 lb/gal High Performance Architectural 3.5 lb/gal Camouflage 3.5 lb/gal Vacuum-Metalizing 3.5 lb/gal Mold-Seal 3.5 lb/gal High-Temperature 3.5 lb/gal Electric-Insulating Varnish 3.5 lb/gal Pan Backing 3.5 lb/gal Pretreatment Coatings 3.5 lb/gal	
CA	Bay Area AQMD	The limits shall not apply to the use of any coating used in volumes less than 75.7 liters (20 gal) in any one calendar year; the application of adhesives; touch-up operations; Light-duty.and medium-duty motor vehicles; Metal containers and closures (cans, drums, lids, etc.) and metal coil; Magnet wire for use in electrical machinery; Metal furniture or large appliances; Aircraft or aerospace vehicles; Motor vehicle and mobile equipment coating operations; Marine vessels and component parts; Stationary structures and their appurtenances which require architectural coatings, except where baked coatings are applied; Magnetic data storage disks; Test panels for evaluation of coating performance; coating operations employing hand-held aerosol cans; coatings that are applied by template in order to add designs, letters and/or numbers to the products; the use of any powder coating provided the emission of VOC to the atmosphere does not exceed that which is equivalent to the use of coatings which comply with those limits; any solid film lubricant; any electrical cathode coating; any chemical milling maskant coating. The requirements shall not apply to the following specialty coatings, provided that the VOC of those coatings does not	Coating - Air Dried General Coatings - 2.8 lb/gal Camouflage - 3.5 lb/gal High Gloss - 3.5 lb/gal Heat Resistant - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal Metallic Topcoat - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3.5 lb/gal Extreme Performance - 3.5 lb/gal High Temperature - 3.5 lb/gal Coating - Baked General Coatings - 2.3 lb/gal Camouflage - 3 lb/gal High Gloss - 3 lb/gal Heat Resistant - 3 lb/gal High Performance Architectural - 3.5 lb/gal	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		exceed the following VOC limits in grams per liter (lb/gal) and provided that the requirements of the limited exemption petition are met. High Performance Architectural 750 (6.2); Pretreatment Wash Primer 780 (6.5); Silicone Release 700 (5.8); Extreme Performance 750 (6.2); High Temperature 550 (4.6).	Metallic Topcoat - 3 lb/gal High Performance Architectural - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3 lb/gal Extreme Performance - 3.5 lb/gal High Temperature - 3.5 lb/gal	
CA	Butte County AQMD	Each stationary source may use a total volume of less than 55 gallons per calendar year of any coating materials exceeding the VOC content limits provided the recordkeeping & reporting requirements are met. Each stationary source may use a volume of less than 200 gallons per calendar year of any aluminum coating for window frames and door frames and/or pretreatment wash primer exceeding the VOC content limits provided the recordkeeping & reporting requirements are met. The requirements of this Rule shall not apply to: Coating of prefabricated architectural components or structures not coated in a shop environment; Motor vehicles including automotive, truck or heavy equipment finishing or refinishing, excluding radiators, drive trains, differentials, and engine components; Adhesives and other materials; Magnetic data storage discs; Safety-indicating coatings; Stencil coatings; Conformal coatings; and Hand lettering. The provisions of this Rule shall not apply to coatings and coating removers (strippers) sold in non-refillable aerosol containers having a capacity of one liter (1.1 quarts) or less.	Coating - Air Dried General Coatings - 2.8 lb/gal Camouflage - 3.5 lb/gal Etching Filler - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Heat Resistant - 3.5 lb/gal High Gloss - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal Metallic - 3.5 lb/gal Mold Seal - 3.5 lb/gal Pan Backing - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3.5 lb/gal Vaccuum-Metalizing - 3.5 lb/gal Coating - Baked General Coatings - 2.3 lb/gal Camouflage - 3 lb/gal Etching Filler - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Heat Resistant - 3 lb/gal High Gloss - 3 lb/gal High Performance Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			Metallic - 3 lb/gal Mold Seal - 3.5 lb/gal Pan Backing - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3 lb/gal Vaccuum-Metalizing - 3.5 lb/gal	
CA	Kern County AQMD	Requirements of this Rule shall not apply to any combination of coatings, provided total allowed facility VOC emissions from use of all coatings does not exceed 15 pounds in any one day. Requirements of this Rule shall not apply to application of coatings to automobiles, light duty trucks, aircraft, aerospace vehicles, marine vessels, cans, coils, or magnetic wire or to powder coatings Requirements of this Rule shall not apply to an operation subject to requirements of Rule 410.4A (Motor Vehicle and Mobile Equipment Refinishing Operations).	Coatings – Air Dried All other coatings - 2.8 lb/gal Camouflage - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Heat Resistant - 3.5 lb/gal High Gloss - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal Metallic Topcoat - 3.5 lb/gal Pretreatment Wash Primer - 2.8 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3.5 lb/gal Coatings - Baked All other coatings - 2.3 lb/gal Camouflage - 3 lb/gal Extreme Performance - 3 lb/gal Heat Resistant - 3 lb/gal High Gloss - 3 lb/gal High Performance Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal Metallic Topcoat - 3.5 lb/gal Pretreatment Wash Primer - 2.3 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3 lb/gal	In lieu of complying with VOC content limits specified, air pollution control equipment with a capture efficiency of at least 85% and a control device efficiency of at least 90% may be used.

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
CA	Mojave Desert AQMD	The limits shall not apply to any facility that does not exceed 10 tons per year of Theoretical Potential Emissions of VOC. This Rule shall apply to all metal coating operations, except those performed on Aircraft or Aerospace Vehicles; Magnet Wire; Metal Containers, Closures and Coils; marine vessel exteriors; Motor Vehicles; Motor Vehicle Assembly Lines; Mobile Equipment; or those operations subject to the coating provisions of any other source-specific rule of the District. The provisions of this Rule shall not apply to aerosol coating products; The provisions of this Rule shall not apply to: Any facility which has a daily usage of less than one gallon of coating, including any VOC-containing materials added to the original coating as supplied by the manufacturer, subject to this Rule; Total noncompliant coating use per facility that does not exceed 55 gallons per year; Stencil Coatings; Safety-indicating Coatings; Magnetic Data Storage Disk Coatings; Solid-film Lubricants; Adhesives; the coating of Motor Vehicle bodies at Motor Vehicle Rework facilities. The provisions of this Rule shall not apply to the application of coatings and use of cleaning solvents while conducting Performance Tests on the coatings at paint manufacturing facilities.	Coating - Air Dried General - 3.5 lb/gal Military Specification - 3.5 lb/gal Etching Filler - 3.5 lb/gal Solar-Absorbant - 3.5 lb/gal Heat-Resistant - 3.5 lb/gal High-Gloss - 3.5 lb/gal Extreme High Gloss - 3.5 lb/gal Metallic - 3.5 lb/gal Extreme-Performance - 3.5 lb/gal Prefabricated Architectural Component - 3.5 lb/gal Touch-Up - 3.5 lb/gal Repair - 3.5 lb/gal Silicone-Release - 3.5 lb/gal High-Performance - 3.5 lb/gal Architectural - 3.5 lb/gal Camouflage - 3.5 lb/gal Vacuum-Metalizing - 3.5 lb/gal Mold-Seal - 3.5 lb/gal High-Temperature - 3.5 lb/gal Electric-Insulating Varnish - 3.5 lb/gal Pan-Backing - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Clear Coating - 4.3 lb/gal Coating – Baked General - 3 lb/gal Military Specification - 3 lb/gal Etching Filler - 3.5 lb/gal Solar-Absorbant - 3 lb/gal Heat-Resistant - 3 lb/gal	In lieu of complying with the VOC content limitations, air pollution control equipment with a capture and control system Combined Efficiency of at least 85%, may be used.

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			High-Gloss - 3 lb/gal Extreme High Gloss - 3 lb/gal Metallic - 3.5 lb/gal Extreme-Performance - 3 lb/gal Prefabricated Architectural Component - 2.3 lb/gal Touch-Up - 3 lb/gal Repair - 3 lb/gal Silicone-Release - 3.5 lb/gal High-Performance - 3.5 lb/gal Architectural - 3.5 lb/gal Camouflage - 3.5 lb/gal Vacuum-Metalizing - 3.5 lb/gal Mold-Seal - 3.5 lb/gal High-Temperature - 3.5 lb/gal Electric-Insulating Varnish - 3.5 lb/gal Pan-Backing - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Clear Coating - 4.3 lb/gal	
CA	Monterrey Bay Unified AQMD	The provisions of this Rule shall not apply to aircraft or aerospace vehicle coatings, marine vessel exteriors, plastic coatings, magnetic wire coatings, motor vehicle coatings and mobile equipment coatings. The provisions of this Rule shall not apply to stencil coatings, safety temperature- indicating coatings, powder coatings, and adhesives. The provisions of this Rule shall not apply to any combination of coatings used for coating metal parts and products in a total volume less than 55 gallons/year (208 liters/year) per facility .	Coating - Air Dried General - 3.5 lb/gal Camouflage - 3.5 lb/gal Etching Filler - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Heat-Resistant - 3.5 lb/gal High Gloss - 3.5 lb/gal High Performance-Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal Metallic - 3.5 lb/gal Mold-Seal - 3.5 lb/gal Pan Backing - 3.5 lb/gal Pretreatment Wash Primer - 6.5 lb/gal	Add-on controls may be used provided that the combined efficiency of capture and control of the system is not less than 90 percent by weight in reducing volatile organic compounds;

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		The provisions of this Rule shall not apply to coatings sold in non-refillable aerosol containers.	Silicone Release - 3.5 lb/gal Solar-Absorbent - 3.5 lb/gal Vacuum-Metalizing - 3.5 lb/gal Coating – Baked General - 3 lb/gal Camouflage - 3 lb/gal Etching Filler - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Heat-Resistant - 3.5 lb/gal High Gloss - 3 lb/gal High Performance-Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal Metallic - 3 lb/gal Mold-Seal - 3.5 lb/gal Pan Backing - 3.5 lb/gal Pretreatment Wash Primer - 6.5 lb/gal Silicone Release - 3.5 lb/gal Solar-Absorbent - 3 lb/gal Vacuum-Metalizing - 3.5 lb/gal	
CA	Northern Sierra AQMD	Provisions of this Rule shall apply to surface coating of metal parts or 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. Requirements of this Rule shall not apply to any combination of coatings, provided total uncontrolled facility VOC emissions from use of all coatings does not exceed 15 pounds in any one day. Requirements of this Rule shall not apply to application of coatings to automobiles, light duty trucks, aircraft, aerospace vehicles, marine vessels, cans, coils, or magnetic wire or to	Coating - Air Dried All Other Coatings 3.5 lb/gal Camouflage 3.5 lb/gal Clear Coating 3.5 lb/gal Extreme-Performance 3.5 lb/gal High Performance Architectural 3.5 lb/gal High Temperature 3.5 lb/gal Metallic Topcoat 3.5 lb/gal Pretreatment Wash Primer 3.5 lb/gal Silicone Release 3.5 lb/gal Coating - Baked	In lieu of complying with VOC content limits air pollution control equipment with a VOC capture efficiency of at least 85% and a control device efficiency of at least 90% may be used.

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		powder coatings, except the rule does apply to the customized top coating of automobiles and trucks with production of 35 or more vehicles per day.	All Other Coatings 3.0 lb/gal Camouflage 3.5 lb/gal Clear Coating 4.3 lb/gal Extreme-Performance 3.5 lb/gal High Performance Architectural 3.5 lb/gal High Temperature 3.5 lb/gal Metallic Topcoat 3.5 lb/gal Pretreatment Wash Primer 3.5 lb/gal Silicone Release 3.5 lb/gal	
CA	Sacramento Metro AQMD	The limits shall not apply to the use of materials exceeding the VOC content limits in a total volume less than 55 gallons per calendar year, per stationary Source provided the recordkeeping & reporting requirements are met. The limits shall not apply to the use of any aluminum coating for window frames and door frames exceeding the VOC content limit in a volume less than 200 gallons per calendar year, per stationary source provided the recordkeeping & reporting requirements are met. The limits shall not apply to the use of any pretreatment wash primer that exceeds the VOC content limits in a volume of less than 200 gallons per calendar year, per stationary source provided the recordkeeping & reporting requirements are met. The requirements of this rule shall not apply to: Coating of prefabricated architectural components or structures not coated in a shop environment which are regulated by Rule 442 - Architectural Coatings; Motor vehicles including automotive, truck or heavy equipment finishing or refinishing, excluding radiators, drive trains, differentials, and engine components which are regulated by Rule 459 - Automotive, Truck and Heavy Equipment Refinishing Operations; Aircraft or aerospace vehicles, components and tooling which are	Coating - Air Dried Aluminum Coating for Window & Door Frames - 3.5 lb/gal Camouflage - 3.5 lb/gal Electrical Insulating - 2.8 lb/gal Extreme High Gloss - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Heat Resistant - 3.5 lb/gal Metallic/Iridescent - 3.5 lb/gal Non-skid - 3.5 lb/gal Prefabricated Architectural Component - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3.5 lb/gal All Other coatings - 2.8 lb/gal Coating - Baked Aluminum Coating for Window & Door Frames - 3.5 lb/gal Camouflage - 3 lb/gal Electrical Insulating - 2.3 lb/gal Extreme High Gloss - 3 lb/gal	

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		regulated by Rule 456 - Aerospace Assembly and Component Coating Operations; Cans, coils, or magnetic wire which are regulated by Rule 452 - Can Coating; Adhesives and other materials which are regulated by Rule 460 - Adhesives and Sealants; Magnetic data storage discs; Safety-indicating coatings; Stencil coatings; Conformal Coatings; and Hand Lettering. The provisions of this rule shall not apply to coatings and coating removers (strippers) sold in non-refillable aerosol containers having a capacity of one liter (1.1 quarts) or less.	Extreme Performance - 3.5 lb/gal Heat Resistant - 3 lb/gal Metallic/Iridescent - 3.5 lb/gal Non-skid - 3 lb/gal Prefabricated Architectural Component - 2.3 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3 lb/gal All Other coatings - 2.3 lb/gal	
CA	San Diego AQMD	The provisions of this rule shall not apply to the following: (i) Any coating operation where 20 gallons or less of coatings are applied per consecutive 12-month period. (ii) Any powder coating operation which uses less than 0.5 gallons per day of any surface preparation or cleaning material containing volatile organic compounds. (iii) Coatings applied to motor vehicles, excluding the application of coatings to component parts or accessories during original manufacture. (iv) Coatings applied using non-refillable handheld aerosol spray containers. (v) Coatings applied to metal surfaces for the specific purpose of protecting the metal substrate from corrosive attack by storage battery electrolytes. (vi) The application of the following coatings: Cathode coatings; Chemical milling maskants; Magnetic tape storage disks coatings; Safety indicating coatings; Solid film lubricants; Stencil coatings; and Wet fastener installation coatings. The limits shall not apply to the following: (i) Pretreatment wash primers with a VOC content, as applied, of less than 780 grams of VOC per liter of coating, less water	Coating – Air Dried All Other coatings - 2.8 lb/gal Chemical Agent Resistant - 3.5 lb/gal Heat Resistant - 3.5 lb/gal High Gloss - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal Metallic Topcoat - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Solar Absorbent - 3.5 lb/gal Coating – Baked All Other coatings - 2.3 lb/gal Chemical Agent Resistant - 3.5 lb/gal Heat Resistant - 3 lb/gal High Gloss - 3 lb/gal High Performance Architectural - 3.5 lb/gal Metallic Topcoat - 3 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Solar Absorbent - 3 lb/gal	In lieu of complying with VOC content limits air pollution control equipment that has a combined emissions capture and control device efficiency of at least 85 percent by weight may be used.

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		and exempt compounds, provided that not more than 500 gallons of all pretreatment wash primers are used at a stationary source in each consecutive 12-month period. (ii) High performance architectural coatings with a VOC content, as applied, of less than 750 grams of VOC per liter of coating, less water and exempt compounds, used at a stationary source which has continuously maintained a District Permit to Operate for each high performance architectural coating operation since November 1, 1993.		
CA	San Joaquin Valley AQMD	An operator at a given facility may use up to a total of 55 gallons of non-compliant coatings per rolling, consecutive 365-day period. The requirements of this rule shall not apply to touch-up and repair. The requirements of this rule shall not apply to the application of coatings to aircraft, aerospace vehicles, marine vessels, can, coils, and magnetic wire. Through December 31, 2008, the provisions of this rule shall not apply to an operation subject to the requirements of Rule 4602 (Motor Vehicle and Mobile Equipment Coating Operations). On and after January 1, 2009, the provisions of this rule shall not apply to an operation subject to the requirements of Rule 4612 (Motor Vehicle and Mobile Equipment Operations Phase II). The provisions of this rule shall not apply to polyester resin operations and the application of polyester resin materials to metal parts and products. 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.	Coating - Air Dried Camouflage - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Heat Resistant - 3.5 lb/gal High Gloss - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal Metallic Topcoat - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3.5 lb/gal Solid Film Lubricant - 7.3 lb/gal General - 2.8 lb/gal Dip coating of steel joists (SIC 3441) -2.8 lb/gal for coatings with a viscosity, as applied, of more than 45.6 centistokes at 78°F or an average dry-film thickness of greater than 2.0 mils; -3.32 lb/gal for coatings with a viscosity, as applied, of less than or equal to 45.6 centistokes at 78°F and an average dry-film thickness of less than or equal to 2.0 mils. Coating - Baked Camouflage - 3 lb/gal	In lieu of complying with the applicable VOC content limits, an operator may control emissions from coating operations with an APCO-approved VOC emission control system

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			Extreme Performance - 3.5 lb/gal Heat Resistant - 3 lb/gal High Gloss - 3 lb/gal High Performance Architectural - 3.5 lb/gal High Temperature - 3.5 lb/gal Metallic Topcoat - 3 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Silicone Release - 3.5 lb/gal Solar Absorbent - 3.5 lb/gal Solid Film Lubricant - 7.3 lb/gal General - 2.3 lb/gal	
CA	San Luis Obispo	The provisions of this Rule shall not apply to: Aircraft or aerospace vehicle coating operations; Marine vessel exteriors (below water-line); Automobile refinishing; or Architectural surface coating, The provisions of this Rule shall not apply to: Any coating used in volumes of less than 20 gallons in any calendar year, provided that the source demonstrates that no complying coatings are available; and Stationary sources using not more than four (4) gallons of paint, varnish, lacquer, thinner, and other solvent containing materials in any one day based on a monthly operating day average, provided the recordkeeping requirements are satisfied.	Coating - Air Dried General - 2.8 lb/gal Military Specification - 2.8 lb/gal Metallic - 3.5 lb/gal Zinc Filled Primers - 3.5 lb/gal Etching filler - 6 lb/gal Solar Abosrbent - 3.5 lb/gal Heat-Resistant - 3.5 lb/gal Extreme-High Gloss - 3.5 lb/gal Extreme-Performance - 3.5 lb/gal Prefabricated Architectural Component - 3.5 lb/gal Touch-up - 3.5 lb/gal Repair - 3.5 lb/gal Silicone Release - 3.5 lb/gal High-performance Architectural - 6.3 lb/gal Camouflage - 3.5 lb/gal Vacuum-metalizing - 6.7 lb/gal Mold Seal - 6.3 lb/gal High-temperature - 6 lb/gal Electric-Insulating Varnish - 5.2 lb/gal	

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			Pretreatment Wash Primer - 6.5 lb/gal Coating – Baked General - 2.3 lb/gal Military Specification - 2.3 lb/gal Metallic - 3 lb/gal Zinc Filled Primers - 3.5 lb/gal Etching filler - 6 lb/gal Solar Abosrbent - 3 lb/gal Heat-Resistant - 3 lb/gal Extreme-High Gloss - 3 lb/gal Extreme-Performance - 3 lb/gal Prefabricated Architectural Component - 2.3 lb/gal Touch-up - 3 lb/gal Repair - 3 lb/gal Silicone Release - 3.5 lb/gal High-performance Architectural - 6 lb/gal Camouflage - 3 lb/gal Vacuum-metalizing - 6.7 lb/gal Mold Seal - 6.3 lb/gal High-temperature - 6 lb/gal Electric-Insulating Varnish - 5.2 lb/gal Pretreatment Wash Primer - 6.5 lb/gal	
CA	South Coast AQMD	The limits of this rule shall not apply to:Stencil coatings; Safety-indicating coatings; Magnetic data storage disk coatings; Solid-film lubricants; or Electric-insulating and thermal-conducting coatings. The limits 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.	Coating - Air Dried General 1-component – 2.3 lb/gal General multi-component – 2.8 lb/gal Military Specification – 2.8 lb/gal Etching Filler – 3.5 lb/gal Solar Absorbent – 3.5 lb/gal Heat Resistant – 3.5 lb/gal Extreme High Gloss – 2.8 lb/gal	

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		The limits of this rule shall not apply to high performance architectural, vacuum-metalizing, and/or pretreatment coatings used at a facility which has the potential to emit a total of 10 tons or less per year of VOCs, before application of add-on controls. The limits of this rule shall not apply to aerosol coating products. The limits 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. The limits 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. The limits shall not apply to electrocoatings, provided the VOC content of coating concentrates do not exceed 450 grams per liter, less water and less exempt compounds, and the usage of coating concentrates is less than 66 gallons per calendar month, per facility, including any VOC-containing materials added to the concentrate, as supplied by the manufacturer, and any VOC-containing materials added to the bath as make-up solvents. The limits 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.	Metallic – 3.5 lb/gal Extreme Performance – 3.5 lb/gal Prefabricated Architectural 1-Component – 2.3 lb/gal Prefabricated Architectural Multi-Component – 2.8 lb/gal Touch up – 3.5 lb/gal Repair – 3.5 lb/gal Silicone Release – 3.5 lb/gal High Performance Architectural – 3.5 lb/gal Camouflage – 3.5 lb/gal Vaccuum-Metalizing – 3.5 lb/gal Mold Seal – 3.5 lb/gal High Temperature – 3.5 lb/gal Electric Insulating Varnish – 3.5 lb/gal Pan Backing – 3.5 lb/gal Pretreatment Coatings – 3.5 lb/gal Coating - Baked General 1-component – 2.3 lb/gal General multi-component – 2.3 lb/gal Military Specification – 2.3 lb/gal Etching Filler – 3.5 lb/gal Solar Absorbent – 3.0 lb/gal Heat Resistant – 3.0 lb/gal Extreme High Gloss – 3.0 lb/gal Metallic – 3.5 lb/gal Extreme Performance – 3.0 lb/gal Prefabricated Architectural 1-Component – 2.3 lb/gal Prefabricated Architectural Multi-Component – 2.3 lb/gal Touch up – 3.0 lb/gal	

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			Repair – 3.0 lb/gal Silicone Release – 3.5 lb/gal High Performance Architectural – 3.5 lb/gal Camouflage – 3.5 lb/gal Vaccuum-Metalizing – 3.5 lb/gal Mold Seal – 3.5 lb/gal High Temperature – 3.5 lb/gal Electric Insulating Varnish – 3.5 lb/gal Pan Backing – 3.5 lb/gal Pretreatment Coatings – 3.5 lb/gal	
CA	Ventura County AQMD	The limits of this rule do not apply to any one coating provided that no complying coatings are available, and total usage of all noncomplying coatings has not exceeded 55 gallons in any calendar year. This rule does not apply to: Aircraft or aerospace vehicle coating operations; Marine vessel exteriors; Motor vehicle and mobile equipment coating; or Aerosol coating products. This rule shall not apply to any stationary source that emits less than 200 pounds of ROC in every rolling period of 12 consecutive calendar months from metal parts and products coating operations.	Coating – Air Dried All other coatings 2.8 lb/gal Camouflage 3.5 lb/gal Extreme Performance 3.5 lb/gal Etching Filler 3.5 lb/gal Heat Resistant 3.5 lb/gal High Gloss 3.5 lb/gal High Performance Architectural 3.5 lb/gal High Temperature 3.5 lb/gal Laboratory Furniture 2.8 lb/gal Metallic 3.5 lb/gal Mold Seal 3.5 lb/gal Pan Backing 3.5 lb/gal Pretreatment Wash Primer 2.8 lb/gal Silicone Release 3.5 lb/gal Solar Absorbent 3.5 lb/gal Vacuum Metalizing 3.5 lb/gal Coating - Baked All other coatings 2.3 lb/gal Camouflage 3.0 lb/gal	In lieu of complying with VOC content limits air pollution control equipment may be used, under certain conditions.

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			Extreme Performance 3.0 lb/gal Etching Filler 4 3.5 lb/gal Heat Resistant 3.0 lb/gal High Gloss 3.0 lb/gal High Performance Architectural 3.5 lb/gal High Temperature 3.5 lb/gal Laboratory Furniture 2.8 lb/gal Metallic 3.0 lb/gal Mold Seal 3.5 lb/gal Pan Backing 3.5 lb/gal Pretreatment Wash Primer 2.3 lb/gal Silicone Release 3.5 lb/gal Solar Absorbent 3.0 lb/gal Vacuum Metalizing 3.5 lb/gal	

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CA	Yolo Solano AQMD	The limits shall not apply to coatings used in volumes of less than 50 gallons per year. The provisions of Section 300 shall not apply to the following: Stencil coatings; Safety-temperature indicating coatings; Powder coatings; and Adhesive coatings upon the effective compliance dates of Rule 2.31, Adhesives. The limits shall not apply to the application of coatings while conducting performance tests on the coatings at paint manufacturing facilities. The provisions of this rule shall not apply to coating operations subject to the provisions of Rule 2.26, Motor Vehicle and Mobile Equipment Coating Operations.	Coating – Air Dried General Coatings - 2.8 lb/gal Etching Filler - 3.5 lb/gal Solar-Absorbent - 3.5 lb/gal Heat-Resistant - 3.5 lb/gal High Gloss - 3.5 lb/gal Metallic - 3.5 lb/gal Extreme Performance - 3.5 lb/gal Silicone Release - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal Camouflage - 3.5 lb/gal Vacuum-Metalizing - 3.5 lb/gal Mold-Seal - 3.5 lb/gal High Temperature - 3.5 lb/gal Pan Backing - 3.5 lb/gal Pretreatment Wash Primer - 3.5 lb/gal Coating – Baked General Coatings - 2.3 lb/gal Etching Filler - 3.5 lb/gal Solar-Absorbent - 3.0 lb/gal Heat-Resistant - 3.0 lb/gal High Gloss - 3.0 lb/gal Metallic - 3.0 lb/gal Extreme Performance - 3.5 lb/gal Silicone Release - 3.5 lb/gal High Performance Architectural - 3.5 lb/gal Camouflage - 3.0 lb/gal Vacuum-Metalizing - 3.5 lb/gal Mold-Seal - 3.5 lb/gal High Temperature - 3.5 lb/gal Pan Backing - 3.5 lb/gal	Alternatively, a person may comply with the provisions by using air pollution control equipment, provided that the overall efficiency (capture efficiency multiplied by destruction efficiency) of the system shall not be less than 85 percent by weight in reducing volatile organic compounds.

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			Pretreatment Wash Primer - 3.5 lb/gal	
CO	All provisions of this regulation apply to the Denver 1-hour ozone attainment/maintenance area, and to any non-attainment area for the 1-hour ozone standard.	Limits are not applicable to sources whose actual emissions, including fugitive emissions, before add-on controls, are less than 6.8 kilograms (15 lbs.) per day and less than 1.4 kilograms (3 lbs.) per hour. Emissions from all sources within the same control technique guidance group shall be totaled to determine actual emissions. This subsection is not applicable to the surface coating of the following metal parts and products: Automobiles and light-duty trucks; Metal cans; Flat metal sheets and strips in the form of rolls or coils; Large appliances; Magnet wire for use in electrical machinery; and Metal furniture. This subsection is not applicable to the following special purpose coatings: Division-approved exemptions for high performance coatings on a case-by-case basis; and Full exterior repainting of automobiles and light-duty trucks if fewer than 18 vehicles are painted per day	1. Clear coatings: 0.52 kg/L(4.3 lb/gal) 2. Extreme Performance Coatings: 0.42 kg/L (3.5 lb/gal) 3. Air-Dried Coatings: 0.42 kg/L (3.5 lb/gal) 4. Other coatings and systems: 0.36 kg/L (3.0 lb/gal) delivered to a coating applicator for all other coatings and coating application systems.	the emission limits designated for that process shall be achieved by: 1. use of coatings with proportions of VOC less than or equal to the maximums specified by the applicable subsection of this regulation; or 2. use of the specified equipment and procedures prescribed by the applicable subsection of this regulation; or 3. use of an alternative means of control which satisfies the requirements of 5.e and f below and section II.D; or 4. use of crossline averaging.
CT		Applies to any premises which have actual VOC emissions of 15 lb/day or more (with some exceptions). The following categories are excluded: automobile and light-duty trucks; metal cans; flat metal sheets and strips in the form of rolls or coils; plastic and glass objects; magnet wire for use in electrical machinery; metal furniture; the exterior surface of assembled aircraft; automobile refinishing; customized top coating of automobiles and trucks, if production is less than	A) 0.52 kg/L of coating delivered to a coating applicator that applies clear coat; B) 0.42 kg/L of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 90 degrees C C) 0.42 kg/L of coating delivered to a coating applicator that applies extreme performance coatings	

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		five vehicles per day; and the exterior surface of assembled marine vessels. An owner or operator may use, in aggregate, up to 55 gallons of coatings than exceed the emission limitations of this rule at such premise for any twelve consecutive months.	D) 0.36 kg/L of coating delivered to a coating applicator for all other coatings, adhesives, fillers or sealants and coating applications systems E) 0.75 kg/L of coating delivered to a coating applicator which applies high performance architectural aluminum coatings, provided that 1) such applicator is located at the premises which emits 3,333 lb VOC per month or less from such applicator, 2) such applicator was an existing source in CT on or before Nov 1, 1994	
DE		The emission limits in this Section do not apply to any coating unit within a facility whose actual emissions without control devices from all miscellaneous metal part and products coating units within the facility are less than 6.8 kg (15 lb) of VOC per day. This Section does not apply to the coating of the following metal parts and products that are covered by other Sections of this regulation: Automobiles and light-duty trucks; Metal cans; Flat metal sheets and strips in the form of rolls or coils; Magnet wire for use in electrical machinery; Metal furniture; Large appliances; and Heavy-duty trucks that use electrodeposition (EDP) to apply prime coat. This Section does not apply to: Exterior of completely assembled aircraft; Exterior of major aircraft subassemblies, if approved by the Department as part of a State Implementation Plan (SIP) revision; Automobile, light-duty truck, and heavy-duty truck refinishing; Customized top coating of automobiles and trucks, if production is less than 35 vehicles per day; Exterior of completely assembled marine vessels; Exterior of major marine vessel subassemblies if approved by the Department as part of a SIP revision.	1. Clear coating (0.52 kg/L, 4.3 lb/gal) 2. Steel pail and drum interior coating (0.52 kg/L, 4.3 lb/gal) 3. Air-dried coating (0.42 kg/L, 3.5 lb/gal) 4. Extreme performance coating (0.42 kg/L, 3.5 lb/gal) 5. All other coatings (0.36 kg/L, 3.0 lb/gal)	An owner or operator of a miscellaneous metal parts and products coating unit subject to this Section may comply with this Section by: 1. Installing and operating a capture system on that unit. 2. Installing and operating a control device on that unit. 3. Determining for each day the overall emission reduction efficiency needed to demonstrate compliance. iv. Demonstrating each day that the overall emission reduction efficiency achieved for that day, is greater than or equal

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				to the overall emission reduction efficiency required for that day.
FL	Limits apply to existing VOC-emitting facilities in all designated ozone nonattainment and air quality maintenance areas... and apply to new and modified VOC-emitting facilities in all designated ozone nonattainment and air quality maintenance areas [with some exemptions].	Emissions units which in combination with all other emissions units at the facility that emit VOC at rates of not more than 15 pounds (6.8 kilograms) in any one day and not more than 3 pounds (1.4 kilograms) in any one hour are exempt. The provisions shall not apply to the surface coating of the following metal parts and products: Automobiles and light-duty trucks; Metal cans; Flat metal sheets and strips in the form of rolls or coils; Magnet wire for use in electrical machinery; Metal furniture; Large appliances; Exterior of airplanes; Automobile refinishing; Customized top coating of automobiles and trucks if production is less than 35 vehicles per day; and Exterior of marine vessels.	1. 4.3 lb/gal of coating (0.52 kg/L) delivered to a coating applicator that applies clear coatings; 2. 3.5 lb/gal of coating (0.42 kg/L) delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 194 degrees F (90 degrees C); 3. 3.5 lb/gal of coating (0.42 kg/L) delivered to a coating applicator that applies extreme performance coatings; or, 4. 3.0 lb/gal of coating (0.36 kg/L) elivered to a coating applicator for all other coatings and coating application systems.	The emission limits shall be achieved by: 1. The application of low solvent coating technology; or, 2. Incineration, provided that 90 percent of the volatile organic compounds (VOC measured as total combustible carbon) which enter the incinerator are oxidized to carbon dioxide and water.
GA	Sources located outside Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale counties whose potential emissions of VOC are not more than 100 tons per year are not subject; Sources located within Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, or Rockdale	The requirements of this subsection shall not apply to facilities at which the potential to emit volatile organic compounds, from all surface coating of miscellaneous metal parts and products, is less than 10 tons per year. Coatings, inks and other VOC-containing materials in use at sources of VOC emissions shall not be subject to any requirements of such subsections, provided the source's total aggregate use of such materials is not in excess of 55 gallons per year and such exemption is approved in writing by the Division. "Miscellaneous metal parts and products" shall not mean the following: automobiles and light-duty trucks; metal cans; flat metal sheets and strips in the form of rolls or coils; magnet wire for use in electrical machinery; metal furniture; large appliances;	(i) 4.3 lb/gal of coating delivered to a coating applicator that applies clear coatings. If any coating delivered to the coating applicator contains more than 4.3 lb/gal, the solids equivalent limit shall be 10.3 lb/gal of coating solids delivered to the coating applicator. (ii) 3.5 lb/gal of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 194°F. If any coating delivered to the coating applicator contains more than 3.5 lb/gal, the solids equivalent limit shall be 6.67 lb/gal of coating solids delivered to the coating applicator. (iii) 3.5 lb/gal of coating delivered to a coating applicator that applies extreme performance coatings. If any coating delivered to the coating applicator contains more than 3.5	The emission limits in this subsection shall be achieved by: 1. the application of low solvent coating technology where each and every coating meets the limit expressed in pounds VOC per gallon of coating, excluding water, or 2. the application of low solvent coating technology where the 24-hour weighted average of all coatings on a single coating line or operation meets the

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
	counties whose actual emissions of VOC are less than 15 pounds per day shall not be subject	aerospace manufacturing and rework operations; automobile refinishing; customized top coating of automobiles and trucks, if production is less than 35 vehicles per day; and exterior of marine vessels.	lb/gal, the solids equivalent limit shall be 6.67 lb/gal of coating solids delivered to the coating applicator. (iv) 6.2 lb/gal of coating delivered to a coating applicator in a high performance architectural coating operation; and (v) 3.0 lb/gal of coating, delivered to a coating applicator for all other coatings and coating application systems. If any coating delivered to the coating applicator contains more than 3.0 lb/gal, the solids equivalent limit shall be 5.06 lb/gal of coating solids delivered to the coating applicator.	solids equivalent limit expressed in pounds VOC per gallon of coating solids; averaging across lines is not allowed; or 3. control equipment, including but not limited to incineration, carbon adsorption and condensation, with a capture system approved by the Director, provided that 90 percent of the nonmethane volatile organic compounds which enter the control equipment are recovered or destroyed, and that overall VOC emissions do not exceed the solids equivalent limit, expressed in pounds VOC per gallon of coating solids
IL	State-wide, excluding Chicago and Metro East areas	The limitations of this Subpart shall not apply to: 1) Coating plants in which emissions of volatile organic material as limited by the operating permit will not exceed 22.7 Mg/year (25 T/year), in the absence of air pollution control equipment; or 2) Coating plants in which the total coating usage does not exceed 9,463 l/yr (2,500 gal/yr); 3) Sources used exclusively for chemical or physical analysis or determination of product quality and commercial acceptance	1) Clear coating 0.52 kg/L (4.3 lb/gal) 2) Air dried coating 0.42 kg/L (3.5 lb/gal) 3) Extreme performance coating 0.42 kg/L (3.5 lb/gal) 4) Power driven fastener coating A) Nail Coating Refer to limits in (j) (1),(2), (3),and (5) B) Staple, brad and finish nail unit fabrication bonding coating 0.64 kg/L (5.3 lb/gal)	Alternative compliance options to the content limits include the application of an afterburner system or aggregation of emission units

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		provided that: A) The operation of the source is not an integral part of the production process; B) The emissions from the source do not exceed 363 kg (800lbs) in any calendar month; and C) The exemption is approved in writing by the Agency. The limitations of this Subpart shall not apply to touch-up and repair coatings, provided that the source-wide volume of such coatings does not exceed 0.95 l (1 quart) per eight-hour period or exceed 209 l/yr (55 gal/yr) for any rolling twelve-month period.	C) Staple, brad and finish nail incremental fabrication lubricity coating 0.64 kg/L (5.3 lb/gal) D) Staple, brad and finish nail incremental fabrication withdrawal resistance coating 0.60 kg/L (5.0 lb/gal) E) Staple, brad and finish nail unit fabrication coating 0.64 kg/L (5.3 lb/gal)	
IL	Metro East area counties of Madison, Monroe, and St. Clair	Does not apply to coating lines with a combined actual emission of VOM from all lines at the source that never exceed 6.8 kg/day (15 lbs/day) before the application of capture systems and control devices. The limitations shall not apply to touch-up and repair coatings, provided that the source-wide volume of such coatings used does not exceed 0.95 l (1 quart) per eight- hour period or exceed 209 l/yr (55 gal/yr) for any rolling twelve month period.	1) Clear coating 0.52 kg/L (4.3 lb/gal) 2) Extreme performance coating A) Air dried 0.42 kg/L (3.5 lb/gal) B) Baked 0.40 kg/L (3.3 lb/gal) 3) Steel pail and drum interior Coating 0.52 kg/L (4.3 lb/gal) 4) All other coatings A) Air Dried 0.40 kg/L (3.3 lb/gal) B) Baked 0.34 kg/L (2.8 lb/gal) 5) Metallic Coating A) Air Dried 0.42 kg/L (3.5 lb/gal) B) Baked 0.36 kg/L (3.0 lb/gal)	Alternative compliance options to the content limits include daily-weighted average limitation or the application of capture and control system.
IL	Chicago area counties of Cook, DuPage, Kane, Lake, McHenry, and Will, the Townships of Aux Sable and Goose Lake in Grundy County, and the Township of Oswego in Kendall County	Does not apply to coating lines with actual emissions of VOM from all lines at the source subject that never exceed 6.8 kg/day [15 lbs/day] before the application of capture systems and control devices. The limitations shall not apply to touch-up and repair coatings, provided that the source-wide volume of such coatings used does not exceed 0.95 l (1 quart) per eight-hour period or exceed 209 l/yr [55 gal/yr] for any rolling twelve month period.	1) Clear coating 0.52 kg/L (4.3 lb/gal) 2) Extreme performance coating A) Air dried 0.42 kg/L (3.5 lb/gal) B) Baked 0.40 kg/L (3.3 lb/gal) 3) Steel pail and drum interior Coating 0.52 kg/L (4.3 lb/gal) 4) All other coatings A) Air Dried 0.40 kg/L (3.3 lb/gal) B) Baked 0.34 kg/L (2.8 lb/gal)	Alternative compliance options to the content limits include daily-weighted average limitation or the application of capture and control system.

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			5) Marine engine coating A) Air Dried 0.42 kg/L (3.5 lb/gal) B) Baked i) Primer/Topcoat 0.42 kg/L (3.5 lb/gal) ii) Corrosion resistant basecoat 0.28 kg/L (2.3 lb/gal) C) Clear Coating 0.52 kg/L (4.3 lb/gal) 6) Metallic Coating A) Air Dried 0.42 kg/L (3.5 lb/gal) B) Baked 0.36 kg/L (3.0 lb/gal)	
IN		Facilities existing as of November 1, 1980 located in Clark, Elkhart, Floyd, Lake, Marion, Porter, and St. Joseph Counties and which are located at sources which have potential emissions of ninety and seven-tenths (90.7) megagrams (one hundred (100) tons) or greater per year of VOC. Facilities, construction of which commences after November 1, 1980 in any county and which have potential emissions of twenty-two and seven-tenths (22.7) megagrams (twenty-five (25) tons) or greater per year of VOC. Facilities existing as of July 1, 1990 located in Clark, Elkhart, Floyd, Lake, Marion, Porter, and St. Joseph Counties and which have actual emissions of greater than fifteen (15) pounds of VOC per day before add-on controls. Facilities, construction of which commences after July 1, 1990 located in any county and which have actual emissions of greater than fifteen (15) pounds of VOC per day before add-on controls. This section is not applicable to the surface coating of the following metal parts and products or to the following types of coating: Any metal parts or products limited by other sections	1) 0.52 kg/L (4.3 lb/gal) of coating, delivered to a coating applicator that applies clear coatings. 2) 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 90 degrees C (194 degrees F). 3) 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator that applies extreme performance coatings. 4) 0.36 kg/L (3 lb/gal) of coating, delivered to a coating applicator for all other coatings and coating application systems.	

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		of this rule; Exterior of airplanes; Automobile refinishing; Customized top coating of automobiles and trucks, if production is less than thirty-five (35) vehicles per day; Exterior of marine vessels; Maintenance coatings of production equipment; The application of adhesives or preparation of adhesives; Lubricants used to prevent sticking of internally moving parts; Chromium plated plastics; and The application of coatings to burial caskets if the source is not located in or adjacent to a county designated as nonattainment for ozone or if the source is not located in or adjacent to Clark or Floyd County.		
KS	The provisions of this regulation shall be applicable only to affected facilities located in areas which have been identified as not meeting the national primary ambient air quality standard for ozone…	The provisions of this regulation shall be applicable to each miscellaneous metal parts and products and metal furniture coating application system at those facilities which have a VOC potential contaminant emission rate equal to or greater than three tons per year on a facility-wide basis. This regulation shall not be applicable to the following manufacturing categories which have miscellaneous metal parts and products coating operations: automobiles and light duty trucks; metal cans; customized top coating of automobiles and trucks, if less than 35 vehicles per day are processed; and automobile refinishing.	1. 4.3 lb/gal of coating delivered to a coating application system that applies clear coatings; 2. 3.5 lb/gal of coating delivered to a coating application system that is air-dried or forced warm air-dried at temperatures up to 194° F; 3. 3.5 lb/gal of coating delivered to a coating application system that applies extreme performance coatings except that coatings applied to the interior of metal pails and metal drums may contain 4.3 lb/gal of coating. 4. 0.4 lb/gal of coating delivered to a coating application system that applies powder coatings; 5. 3.0 lb/gal of coating delivered to a coating application system for any other coating	The emission limits which will result from the use of coatings shall be achieved by: 1. application of coatings which meet or exceed the requirements per coating application system on a daily weighted average basis; or 2. application of coatings with improved transfer efficiency demonstrated, through testing, by methods approved by the department, to achieve equivalent emissions based on the weight of VOC emitted per gallon of solids applied as would be emitted with

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				the coatings specified in subsection (c) per coating application system on a daily weighted average basis; or 3. application for the capture and reduction of VOC emissions through either destruction or collection, of a VOC vapor processing system demonstrated through testing as capable of maintaining an overall VOC emission reduction of at least 90 percent. Use of a VOC vapor processing system shall require that continuous monitors be installed, calibrated, operated, and maintained. 4. any combination of methods approved by the department which results in emissions, when calculated as pounds of VOC per gallon of solids applied per coating operation, that are no greater on a daily weighted average

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				basis than those achieved with the appropriate coatings specified in the limits.
KY		Existing sources which are located in a county or portion of a county which is designated ozone nonattainment, for any nonattainment classification except marginal. This administrative regulation shall not apply to affected facilities which are subject to local air pollution control district regulations which have been approved by the cabinet and the U.S. EPA. An affected facility shall be exempt from this administrative regulation if the total VOC emissions from all affected facilities subject to this administrative regulation are less than or equal to thirty (30) tons per year. The surface coating of the following metal parts and products are exempt from this rule: The exterior of airplanes and marine vessels, but not parts for the exterior of airplanes and marine vessels that are coated as a separate manufacturing or coating operation; Automobile refinishing; and Customized top coating of automobiles and trucks, if production is less than thirty-five (35) vehicles per day. Low-use coatings shall be exempt if the plantwide consumption of these coatings in the aggregate is less than or equal to fifty-five (55) gallons during the previous twelve (12) months. Glass adhesive primer with VOC content equal to or less than five and one-tenth (5.1) lb/gal of glass adhesive primer excluding water or exempt solvent or both, shall be exempt from this administrative regulation.	No person shall cause, allow, or permit an affected facility to discharge into the atmosphere more than 15 percent by weight of the VOCs net input into the affected facility. Exemptions. (1) An affected facility shall be exempt from above if the VOC content of the coating is: (a) Less than 0.52 kg/l of coating (4.3 lb/gal) delivered to applicators associated with clear coat; (b) Less than 0.42 kg/l of coating (3.5 lb/gal) delivered to applicators associated with air or forced air-dried items or items subject to outdoor or harsh exposure or extreme environmental conditions; (c) Less than 0.36 kg/l of coating (3.0 lb/gal) delivered to applicators associated with color coat or first coat on untreated ferrous substrate; or (d) Less than 0.05 kg/l of powder coating (0.4 lb/gal) delivered to applicators associated with no or infrequent color change, or a small number of colors applied.	
KY		New Sources Each affected facility commenced on or after February 4, 1981 and located in a county or portion of a county designated as nonattainment for ozone for any classification	No person shall cause, allow, or permit an affected facility to discharge into the atmosphere more than 15 percent by weight of	

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		except marginal; and (b) Each affected facility commenced on or after June 24, 1992 which is part of a major source located in a county or portion of a county designated attainment or marginal nonattainment for ozone (2) Each affected facility commenced on or after February 4, 1981 but prior to June 24, 1992 which is part of a major source located in a county or portion of a county designated attainment or marginally nonattainment for ozone shall be exempt from this administrative regulation except that control devices and procedures required at the time it commenced shall continue to be operated and maintained. The provisions of this administrative regulation shall not apply to affected facilities which are subject to local air pollution control district regulations which have been approved by the cabinet and the U.S. EPA. The surface coating of the following metal parts and products are exempt from this rule: The exterior of airplanes and marine vessels, but not parts for the exterior of airplanes and marine vessels that are coated as a separate manufacturing or coating operation; Automobile refinishing; and Customized top coating of automobiles and trucks, if production is less than thirty-five (35) vehicles per day. An affected facility shall be exempt from this administrative regulation if the total VOC emissions from all affected facilities subject to this administrative regulation are less than or equal to twenty (20) tons per year. Low-use coatings shall be exempt if the plantwide consumption of these coatings in the aggregate is less than or equal to fifty-five (55) gallons during the previous twelve (12) months. Glass adhesive primer with VOC content equal to or less than five and one-tenth (5.1) lb/gal of glass adhesive primer,	the VOCs net input into the affected facility. 1) An affected facility shall be exempt from the provisions of Section 3 of this administrative regulation if the VOC content of coating is: (a) Less than 0.52 kg/l of coating (4.3 lb/gal) delivered to applicators associated with clear coat; (b) Less than 0.42 kg/l of coating (3.5 lb/gal) delivered to applicators associated with air or forced air-dried items or items subject to outdoor or harsh exposure or extreme environmental conditions; (c) Less than 0.36 kg/l of coating (3.0 lb/gal) delivered to applicators associated with color coat or first coat on untreated ferrous substrate; or (d) Less than 0.05 kg/l of powder coating (0.4 lb/gal) delivered to applicators associated with no or infrequent color change, or a small number of colors applied.	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		excluding water or exempt solvent or both, shall be exempt from this administrative regulation.		
KY	Louisville, KY APCD	(Existing) This regulation applies to each affected facility commenced before May 20, 1981. Any affected facility that is ever subject to this regulation will always be subject to it unless the affected facility changes its process to one not covered by this regulation. Any affected facility shall be exempt if the total VOC emissions from all affected facilities subject to this regulation are less than or equal to five tons per year (potential emissions prior to any add-on controls). The surface coating of the following metal parts and products, or operations, are exempt from this regulation: The exterior of airplanes and marine vessels, but not parts for the exterior of airplanes and marine vessels that are coated as a separate manufacturing or coating operation; Automobile refinishing; Customized top coating of automobiles and trucks if production is less than 35 vehicles per day; Metallic surfaces that are subject to other regulations; and Parts consisting of both metallic and nonmetallic components, if a demonstration is made that the limits of this rule cannot be met due to the presence of the nonmetallic component.	A person shall not cause or allow the emission of VOC from any affected facility resulting from the coating of metallic surfaces in excess of the applicable emission rate as follows: 1. 0.52 kg of VOC/l (4.3 lb of VOC/gal) of coating as applied for clear coatings, 2. 0.42 kg of VOC/l (3.5 lb of VOC/gal) of coating as applied for air-dried coatings, 3. 0.42 kg of VOC/l (3.5 lb of VOC/gal) of coating as applied for extreme performance coatings, or 4. 0.36 kg of VOC/l (3.0 lb of VOC/gal) of coating as applied for all other coatings.	
KY	Louisville, KY APCD	(New) This regulation applies to each affected facility commenced on or after May 20, 1981. Any affected facility that is ever subject to this regulation will always be subject to it unless the affected facility changes its process to one not covered by this regulation. Any affected facility shall be exempt from Section 3 if the total VOC emissions from all affected facilities subject to this regulation are less than or equal to five tons per year (potential emissions prior to any add-on controls).	A person shall not cause or allow the emission of VOC from any affected facility resulting from the coating of metallic surfaces in excess of the applicable emission rate as follows: 1. 0.52 kg of VOC/l (4.3 lb of VOC/gal) of coating as applied for clear coatings, 2. 0.42 kg of VOC/l (3.5 lb of VOC/gal) of coating as applied for air-dried coatings, 3. 0.42 kg of VOC/l (3.5 lb of VOC/gal) of coating as applied for extreme performance	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		The surface coating of the following metal parts and products, or operations, are exempt from this regulation: The exterior of airplanes and marine vessels, but not parts for the exterior of airplanes and marine vessels that are coated as a separate manufacturing or coating operation; Automobile refinishing; Customized top coating of automobiles and trucks if production is less than 35 vehicles per day; Metallic surfaces that are subject to other regulations; and Parts consisting of both metallic and nonmetallic components, if a demonstration is made that the limits of this rule cannot be met due to the presence of the nonmetallic component.	coatings, or 4. 0.36 kg of VOC/l (3.0 lb of VOC/gal) of coating as applied for all other coatings	
LA		Any emission source using organic solvents having an emission of organic solvents of more than 3 lb (1.3kg) per hour or 15 lb (6.8 kg) per day. Surface coating facilities on any property in Ascension, East Baton Rouge, Iberville, Livingston, Pointe Coupee, and West Baton Rouge parishes which when controlled have a potential to emit at maximum production a combined weight (total from the property) of VOC less than 10 tons in any consecutive 12 calendar months are exempt Surface coating facilities on any property in parishes other than Ascension, East Baton Rouge, Iberville, Livingston, Pointe Coupee, and West Baton Rouge which when uncontrolled have a potential to emit a combined weight of VOC less than 100 lb (45 kg) in any consecutive 24-hour period are exempt.	Clear coat – 4.3/0.52 (lb/gal, kg/L); Air or force air dried items (not oven dried) – 3.5/0.42 (lb/gal, kg/L); Frequent color change and/or large numbers of colors applied, or first coat on untreated ferrous substrate – 3.0/0.36 (lb/gal, kg/L); Outdoor or harsh exposure or extreme performance characteristics – 3.5/0.42 (lb/gal, kg/L); No or infrequent color change, or small number of colors applied: a. Powder Coating 0.4/0.05 (lb/gal, kg/L) b. Other 3.0/0.36 (lb/gal, kg/L)	Except for the emission limits provided, any emission source using organic solvents having an emission of organic solvents of more than three pounds (1.3 kilograms) per hour or 15 pounds (6.8 kilograms) per day shall reduce the emission, where feasible, by incorporating one or more of the following control methods: 1. incineration, provided 90 percent of the carbon in the organic compounds being incinerated is oxidized to carbon dioxide 2. carbon adsorption of the organic compounds;

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				3. any other equivalent means as may be approved by the administrative authority.
ME		Any surface coating unit, line or operation whose total actual emissions of VOC from all coating units, lines or operations at the surface coating facility are 15 lb VOC per day or greater, shall comply with the applicable emission limitations unless: (1)The maximum theoretical emissions from all surface coating operations are limited by permit or order of the Department to 1,666 lb or less in any calendar month; (2)The owner or operator of the surface coating facility subject to this Chapter is and has at all times been in compliance with the maximum theoretical emission limitation since the issuance of the permit or order of the Department; and (3) The total actual emissions from the surface coating facility have not exceeded 1,666 lb in any calendar month since January 1990. The following surface coating operations shall be exempt: 1. Coating units, lines or operations whose total actual coatings usage from all coating units, lines or operations at the surface coating facility under the same surface coating category is less than 50 gallons per year of coatings; 2. Facilities exclusively utilizing powder coatings or other non-VOC methods of coating; and Surface coating of the following: exterior of completely assembled aircraft; exterior of major aircraft subassemblies; automobile, light-duty truck, and heavy duty truck refinishing; exterior of completely assembled marine vessels; and exterior of major marine vessel subassemblies.	The owner or operator of a miscellaneous metal parts and products coating unit shall not cause or allow the release of VOC that exceeds the following emission limitations: 1. Clear coating 0.52 kg/L 2. Steel pail & drum interior 0.52 kg/L 3. Air-dried coating 0.42 kg/L 4. Extreme performance coating 0.42 kg/L All other coatings 0.36 kg/L	The owner or operator of a surface coating unit, line or operation subject to this Chapter shall choose one or more of the three compliance methods below in order to comply with the applicable emission limitations contained in this Chapter. A.Low solvent content coating technology. B.Daily-weighted average limitation. C. Add-on air pollution control devices.

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		An owner or operator may use in the aggregate, up to 50 gallons of coatings that exceed the emissions limitations of this Chapter, for any twelve (12) consecutive months.		
MD		The provisions of this regulation apply to any metal surface coating operation at a premises where the total VOC emissions from all metal surface coating operations exceed 20 pounds (9.1 kilograms) per day. The provisions of this regulation do not apply to: (a) Refinishing motor vehicles; (b) Customizing less than 20 motor vehicles per day; (c) Marine vessel coating operations subject to Regulation .27 of this chapter; (d) Aerospace coating operations subject to Regulation .13-1 of this chapter; (e) Brake shoe coating operations subject to Regulation .13-2 of this chapter; and (f) Structural steel coating operations subject to Regulation .13-3 of this chapter.	High performance – 3.5 lb/gal Clear coating – 4.3 lb/gal Standard – 3.0 lb/gal A person may not use any coating to line the interior of a metal drum or pail unless the VOC content of the coating is 4.3 pounds per gallon (0.51 kilogram per liter) of coating minus water, or less.	
MA		A person who owns, leases, operates, or controls a miscellaneous metal parts and products coating lines, which has the potential to emit equal to or greater than ten tons per year of VOC. Emissions of volatile organic compounds from coatings used in small amounts are exempt from the emissions limitations. The sum of all coatings exempted from the emission limitations shall not exceed 55 gallons per year at any facility. Any facility which has not, since January 1, 1991 emitted, before the application of any air pollution control equipment, one ton or more of volatile organic compounds in any one calendar month, or ten or more tons of volatile organic compounds in any consecutive 12 month time period is exempt from the emissions limitations.	Clear Coatings - 10.3 lb VOC/gal Coating line that is air-dried or forced warm-air dried at temperatures up to 90°C - 6.7 lb VOC/gal Extreme Performance Coating - 6.7 lb VOC/gal All other coatings and coating lines - 5.1 lb VOC/gal Units are lb VOC/gallon solids applied	
MI		This rule does not apply to a metallic surface coating line that complies with both of the following provisions:	(a) 4.3 lb of VOC emitted per gallon of coating as applied for clear coatings.	

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		(a) The coating line has an actual emission rate of VOC equal to or less than 2,000 lb/ month and 10.0 tpy as of the effective date of this amendatory rule. If the actual rate of emissions from an exempted metallic surface coating line exceeds 2,000 lb/month for a subsequent month or 10.0 tpy for a subsequent year, then the provisions of this rule shall thereafter permanently apply to the metallic surface coating line. (b) VOC emissions from the coating line, when combined with the total emissions of VOC from all other metallic surface coating lines at the stationary source that are exempted by this subrule, do not exceed 30.0 tpy. This rule does not apply to any of the following: (a) Automobile refinishing. (b) Customized topcoating of less than 35 automobiles or trucks, or both, per day. (c) Coating of the exterior of airplanes when the part to be coated has already been assembled on the airplane. (d) Coating of the exterior of marine vessels when the part to be coated has already been assembled on the marine vessel. (e) Coating of a part consisting of both metallic and nonmetallic components if a demonstration is made, to the satisfaction of the department, that the limits of this rule cannot be met due to the presence of the nonmetallic component. A person may exclude low-use coatings that total 55 gallons or less per rolling 12-month period at a stationary source from the provisions of this rule	(b) 3.5 lb of VOC emitted per gallon of coating, as applied for air-dried coatings. (c) 3.5 lb of VOC emitted per gallon of coating as applied for extreme performance coatings. (d) 4.8 lb of VOC emitted per gallon of coating as applied for truck final repair coatings. (e) 4.9 lb of VOC emitted per gallon of coating as applied for glass adhesion body primer. (f) 4.3 lb of VOC emitted per gallon of coating as applied for steel pail and drum interior coatings. (g) 3.0 lb of VOC emitted per gallon of coating, as applied for all other coatings.	
MO	Clay, Jackson and Platte Counties	This regulation shall apply to any installation with an uncontrolled potential to emit greater than 6.8 kg/day or 2.7 tpy of VOC from industrial surface coating operations covered under this rule. This includes any installation which does not have an allowable VOC emission limit established under 10 CSR 10-6.060 or legally enforceable state implementation plan revision and has uncontrolled potential emissions greater than	Clear Coat - 4.3 VOC/gal Extreme Performance Coat and Air-Dried Coating - 3.5 VOC/gal Other Coatings - 3.0 VOC/gal	

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		or equal to 6.8 kg/day or 2.7 tpy. This regulation is not applicable to the surface coating of the following metal parts and products: 1. Exterior refinishing of airplanes; 2. Automobile refinishing; 3. Customizing top coating of automobiles and trucks, if production is less than thirty-five (35) vehicles per day; and 4. Exterior of marine vessels.	Railroad Cars, Farm Implements, Machinery and Heavy Duty Trucks - 3.5 VOC/gal	
MO	Throughout St. Louis City and Jefferson, St. Charles, Franklin and St. Louis Counties.	This rule shall apply to any installation with actual emissions of greater than 2 1/2 tons in any calendar year after December 1, 1989, of VOC from surface coating operations covered under this rule. This includes any installation which does not have an allowable VOC emission limit established under 10 CSR 10-6.060 or legally enforceable state implementation plan revision, which has actual VOC emissions of greater than 2 1/2 tons in any calendar year after December 1, 1989. Once a source is determined to exceed the applicability level of this rule, it shall remain subject to this rule even if its actual emissions drop below the applicability level. This rule is not applicable to the surface coating of the following metal parts and products: 1. Automobile refinishing; 2. Customizing top coating of automobiles and trucks, if production is less than thirty-five (35) vehicles per day; and 3. Exterior of marine vessels.	Clear Coat - 4.3 lb VOC/gal Extreme Performance and Air Dried Coatings - 3.5 lb VOC/gal All Other Coatings - 3.0 lb VOC/gal Railroad Cars, Farm Implements, Machinery and Heavy Duty Trucks - 3.5 VOC/gal	
NC	Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Union, Iredell, and Mecklenburg Counties.	Facilities with the potential to emit 100 tons or more volatile organic compounds per year in the following areas: 1. Cabarrus County 2. Gaston County 3. Lincoln County 4. Mecklenburg County 5. Rowan County 6. Union County	Emissions of volatile organic compounds from any coating line shall not exceed: 1. 10.3 pounds of volatile organic compounds per gallon of solids delivered to a coating applicator that applies clear coatings; 2. 6.7 pounds of volatile organic compounds per gallon of solids delivered to a coating applicator in a coating application system that	

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		7. Davidson Township and Coddle Creek Township in Iredell County 8. And all sources located in Mecklenburg County that were required to comply before July 5, 1995.	utilized air or forced air driers; 3. 6.7 pounds of volatile organic compounds per gallon of solids delivered to a coating applicator that applies extreme performance coatings; 4. 5.1 pounds of volatile organic compounds per gallon of solids delivered to a coating applicator that applies coatings of five or more color changes or of five or more colors or applies the coating that is the first coat on untreated ferrous substrate; or 5. where there are less than five color changes and less than five colors are applied: • 0.4 pounds of volatile organic compounds per gallon of solids delivered to a coating applicator that applies powder coatings; or • 5.1 pounds of volatile organic compounds per gallon of solids delivered to a coating applicator for any other type of coating. Any source which has chosen to control emissions of volatile organic compounds and which has installed air pollution control equipment may comply with the limits below: 1. 4.3 pounds of volatile organic compounds per gallon of coating, excluding water and exempt compounds, delivered to a coating applicator that applies clear coatings; 2. 3.5 pounds of volatile organic compounds per gallon of coating, excluding water and exempt compounds, delivered to a coating applicator in a coating application system that utilized air or forced air driers; 3. 3.5 pounds of volatile organic compounds per gallon of coating, excluding water and	

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			exempt compounds, delivered to a coating applicator that applies extreme performance coatings; 4. 3.0 pounds of volatile organic compounds per gallon of coating, excluding water and exempt compounds, delivered to a coating applicator that applies coatings of five or more color changes or of five or more colors or applies the coating that is the first coat on untreated ferrous substrate; or 5. where there are less than five color changes and less than five colors are applied: • 0.4 pounds of volatile organic compounds per gallon of coating, excluding water and exempt compounds, delivered to a coating applicator that applies powder coatings; or • 3.0 pounds of volatile organic compounds per gallon, excluding water and exempt solvents, delivered to a coating applicator for any other type of coating.	
NH		Any miscellaneous metal coating operations have combined potential VOC emissions during any consecutive 12-month period which are equal or exceed 10 tons of VOCs.	(1) For a coating that is a clear or transparent top coat, 0.52 kg VOC/l (4.3 lb VOC/gallon) of coating, as applied, excluding water and exempt compounds; (2) For a coating that is air dried, 0.42 kg VOC/l (3.5 lb VOC/gallon) of coating, as applied, excluding water and exempt compounds; (3) For a coating that is used in extreme environmental conditions, 0.42 kg VOC/l (3.5 lb VOC/gallon) of coating, as applied, excluding water and exempt compounds; and (4) For all other coatings, 0.36 kg VOC/l (3.0 lb VOC/gallon) of coating, as applied, excluding water and exempt compounds.	1. Applying coatings that meet the established emission limits. 2. Implementing add-on control techniques or a bubble and complying with the solids-based emission rate limits calculated using the procedures of Env-A 1204.04(d); or 3. Meeting either a coatings-based or

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Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
				solids-based modified emission rate limit as approved by the director and EPA in accordance with the RACT order provisions of Env-A 1204.05 and Env-A 1204.06 in the event that the source owner or operator demonstrates that the specified emission rate limits cannot be met because of technological or economic reasons.
NJ		Any operation in which the total surface coating formulations containing VOC are applied in excess of one half gallon per hour and two and one half gallons per day.	Maximum allowable VOC content per volume of coating minus water for Miscellaneous Metal Parts and Products Clear Coating – 4.3 lbs/gal Air Dried Coating – 3.5 lbs/gal Extreme Performance Coating– 3.5 lbs/gal All Other Coatings – 3.0 lbs/gal New Jersey also has an "Alternative Maximum Allowable VOC Limit" for sources that meet minimum transfer efficiency. Those alternatives are listed below. 3.0 lbs/gal – 34 percent TE 3.2 lbs/gal – 37 percent TE 3.4 lbs/gal – 42 percent TE 3.6 lbs/gal – 47 percent TE 3.8 lbs/gal – 52 percent TE	1. Coating formulation 2.VOC emissions control apparatus

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			4.0 lbs/gal – 58 percent TE 4.2 lbs/gal – 65 percent TE	
NY	Statewide, New York City Metro Area, and Orange County Metro Area	1. Located in the New York City metropolitan area. 2. Located in the Lower Orange County metropolitan area, for which the annual potential to emit volatile organic compounds (VOCs) from all sources at the facility, regardless of process type but excluding combustion installations, equal or exceeds 10 tons. 3. Located outside the New York City metropolitan area and the Lower Orange County metropolitan area, for which the annual potential to emit VOCs from all sources at the facility, regardless of process type but excluding combustion installations, equals or exceeds 10 tons.	1. Clear Coatings - 4.3 lb/gal; 2. Force Air Dried or Air Dried at 90˚C - 3.5 lb/gal; 3. Extreme Performance Coatings - 3.5 lb/gal; 4. Other miscellaneous meta coatings - 3.0 lb/gal;	1. Point of sale restriction 2. Control devices 3. Process specific RACT variance is granted by regulating authority.
OH	Statewide, and Clark, Greene, Miami, and Montgomery counties specifically.	Any miscellaneous metal parts or products coating line which uses more than: 1. For Clark, Greene, Miami, and Montgomery counties, eight gallons of coating per day; and 2. For all other counties, ten gallons per day.	1. 4.3 pounds of VOC per gallon of coating, excluding water and exempt solvents, or, if a control system is employed, 10.3 pounds of VOC per gallon of solids for a clear coating; 2. 4.0 pounds of VOC per gallon of coating, excluding water and exempt solvents, or, if a control system is employed, 8.8 pounds of VOC per gallon of solids for a zinc rich primer coating; 3. 3.5 pounds of VOC per gallon of coating, excluding water and exempt solvents, or, if a control system is employed, 6.7 pounds of VOC per gallon of solids for an extreme performance coating; 4. 3.5 pounds of VOC per gallon of coating, excluding water and exempt solvents, or, if a control system is employed, 6.7 pounds of	Compliant coatings or control systems.

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Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			VOC per gallon of solids for any coating that is dried at temperatures not exceeding two hundred degrees Fahrenheit; 5. 4.3 pounds of VOC per gallon of coating, excluding water and exempt solvents, or, if a control system is employed, 10.3 pounds of VOC per gallon of solids for the interior coating of a steel pail or drum; 6. 3.5 pounds of VOC per gallon of coating, excluding water and exempt solvents, or, if a control system is employed, 6.7 pounds of VOC per gallon of solids for the exterior coating of a steel pail or drum; 7. 4.9 pounds of VOC per gallon of coating, excluding water and exempt solvents, for a glass adhesion body primer coating used for the installation of any glass windows during the assembly of automobiles and trucks; 8. 3.0 pounds of VOC per gallon of coating, excluding water and exempt solvents, or, if a control system is employed, 5.1 pounds of VOC per gallon of solids for any coating that is not listed above.	
OK		All new installations of any equipment or processes after the effective date of December 28, 1974, and all existing installations of any equipment or processes in use that are located in Tulsa County or Oklahoma County after the effective date of June 9, 1981.	No coating operation with VOC emissions shall use coatings that, as applied, contain VOCs in excess of the amounts listed below. Limits are expressed in pounds of VOC per gallon of coating, excluding the volume of any water and exempt organic compounds. 1. Alkyd primer - 4.8 2. Vinyls - 6.0 3. NC lacquers - 6.4	1. Low VOC coatings. 2. Developing a plant-wide emission plan instead of having each coating line comply with the VOC content limitations that sufficient reductions in emissions of VOCs

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Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			4. Acrylics - 6.0 5. Epoxies - 4.8 6. Maintenance finishes - 4.8 7. Custom products finish - 6.5	may be obtained by controlling other sources within the plant to the extent necessary to compensate for all excess emissions that result from one or more coating lines not achieving the limitation.
OR	Portland, Medford, and Salem Metro Areas	Sources, new or existing, whose potential to emit volatile organic compounds of more than 10 tons per year (or 3 lb. VOC/hr or 15 lb. VOC/day actual) and are located in the in the Portland and Medford AQMA's and in the Salem SATS.	1. Clear Coatings 4.3 lb/gal; 2. Force Air Dried or Air Dried 3.5 lb/gal; 3. Extreme Performance Coatings 3.5 lb/gal; 4. Other Coatings (i.e., Powder, oven dried) 3.0 lb/gal; 5. High Performance Architectural Coatings 3.5 lb/gal.	1. The application of low solvent content coating technology; 2. An incineration system which oxidizes at least 90.0 percent of the nonmethane volatile organic compounds entering the incinerator (VOC measured as total combustible carbon) to carbon dioxide and water; or 3. An equivalent means of VOC removal. The equivalent means must be approved by the Department and will be incorporated in the source's Air Contaminant Discharge Permit or Title V Permit, and shall not become effective until

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Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
				approved by EPA as a source-specific SIP revision. Other alternative emission controls approved by the Department and allowed by EPA may be used to provide an equivalent means of VOC removal.
PA		Applies to a surface coating process category, regardless of the size of the facility, which emits or has emitted VOCs into the outdoor atmosphere in quantities greater than 3 pounds (1.4 kilograms) per hour, 15 pounds (7 kilograms) per day or 2.7 tons (2,455 kilograms) per year during any calendar year	Maximum VOC emissions in pounds VOC per gallon coating solids: Clear Coating - 10.34 Air Dried Coating - 6.67 Extreme Performance Coating - 6.67 All Other Coatings - 5.06 These limits are equivalent to state limits in lbs/gal coating 1. Clear Coating – 4.3 lbs/gal 2. Air Dried Coating – 3.5 lbs/gal 3. Extreme Performance Coating– 3.5 lbs/gal 4. All Other Coatings – 3.0 lbs/gal	Compliance by the use of a low VOC coating, a control technology with demonstration of capture efficiency, or an alternative method of compliance as approved by the regulating authority.
RI		Applies to all surface coating facilities for which actual uncontrolled emissions that have been greater than 15 pounds of volatile organic compounds in any one day after December 31, 1989.	Surface coating lines must meet the emission limitations given below in either pounds of VOC per gallon of coating (minus water) or in pounds of VOC per gallon of solids, depending on the method of compliance: 1. Clear Coating – 4.3 lbs/gal 2. Steel pail and drum interiors – 4.3 lbs/gal	1. Installation of an approved control system such that the total emission reduction from the controlled coating line is 95 percent or greater over uncontrolled volatile organic compound

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			3. Air Dried Coating – 3.5 lbs/gal 4. Extreme Performance Coating– 3.5 lbs/gal 5. All Other Coatings – 3.0 lbs/gal If more than one emission limitation applies to a specific coating, then the least stringent emission limitation shall be applied.	emissions, or 2. Coating reformulation such that the emission limitation of Subsection 19.3.1 is met for all coatings on any coating lines using this method of compliance, or 3. Installation of control equipment to reduce emissions to the equivalent of the emission limitations of Subsection 19.3.1 as calculated on a solids applied basis, or 4. Use of daily-weighted averaging, as determined by the procedures in Appendix A of this regulation, to achieve the emissions limitations in Subsection 19.3.1 for all surface coating operations except the coating of flat wood paneling; 4. An alternative equivalent method of control as approved by the regulating authority.
SC	Statewide except in the following six counties: Anderson, Bamberg, Barnwell, Chesterfield,	Affected sources include those which utilize coating application systems for miscellaneous metal parts and products in the following industries: (i) Large Farm Machinery;	1. Clear Coating – 4.3 lbs/gal 2. Air Dried Coating – 3.5 lbs/gal 3. Extreme Performance Coating– 3.5 lbs/gal	1. The application of low solvent content coating technology; or, 2. Incineration,

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
	Darlington and Hampton.	(ii) Small Farm Machinery; (iii) Small Appliances; (iv) Commercial Machinery; (v) Industrial Machinery; (vi) Fabricated Metal Products; (vii) Any other industrial category which coats metal parts or products under the Standard Industrial Classification Code 33 (primary metal industries), 34 (fabricated metal products), 35 (non-electric machinery), 36 (electric machinery), 37 (transportation equipment), 38 (miscellaneous instruments), and 39 (miscellaneous manufacturing industries).	4. All Other Coatings – 3.0 lbs/gal	provided that 90 percent of the nonmethane volatile organic compounds (VOC measured as total combustible carbon) which enter the incinerator are oxidized to carbon dioxide and water; or, 3. Carbon bed solvent recovery system; or, 4. Alternative controls as allowed under Section I, Part C; 5. A capture system must be used in conjunction with emission control equipment systems.
TN	Rule applies Statewide. Sources in Davidson, Knox, Rutherford, Shelby, Sumner, Williamson, or Wilson Counties may have additional reporting requirements. .	1. In Davidson, Rutherford, Sumner, Williamson, or Wilson County whose actual emissions without control devices from all miscellaneous metal parts and products coating lines within the facility are less than 6.8 kilograms (kg) (15 pounds [lb]) of volatile organic compounds (VOC's) per day or whose maximum theoretical emissions from all miscellaneous metal parts and products coating lines within the facility are less than 10 tons of VOC per year; 2. In Hamilton or Shelby County whose potential VOC emissions from all miscellaneous metal parts and products coating lines within the facility are more than 25 tons of VOC per year; or 3. In any other county whose potential VOC emissions from all miscellaneous metal parts and products coating lines within the facility are more than 100 tons of VOC per year.	1. High performance architectural coating - 6.2 lb/gal 2. Heavy-duty truck touch-up - 4.8 lb/gal 3. Clear coating - 4.3 lb/gal 4. Steel pail and drum interior - 4.3 lb/gal 5. Air-dried coating - 3.5 lb/gal 6. Extreme performance coating - 3.5 lb/gal 7. All other coatings - 3.0 lb/gal	As an alternative to the emission limits, coating operations can meet the following: 1.) No owner or operator of a miscellaneous metal parts and products coating line that applies multiple coatings during the same day shall apply coatings on that line during any day whose weighted

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Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
				average VOC content exceeds the weighted average VOC content limit calculated using VOC content factors contained in the rule. 2.) An owner or operator of a miscellaneous metal parts and products coating line subject to this rule may comply with this rule by: i. Installing and operating a capture system and a control device on that line; ii. Determining for each day the overall emission reduction efficiency needed to demonstrate compliance. The overall emission reduction needed is the lesser of the value calculated according to the procedure in this chapter or 95 percent; and iii. Demonstrating each day that the overall emission reduction efficiency achieved is greater than or equal to

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
				the overall emission reduction efficiency required. (c) An owner or operator of a miscellaneous metal parts and products coating line subject to this rule shall ensure that: i. A capture system and control device are operated at all times that the line is in operation, and the owner or operator demonstrates compliance with this rule through the applicable coating analysis and capture system and control device efficiency test methods specified in this chapter, and; ii. The control device is equipped with the applicable monitoring equipment specified in this chapter, and the monitoring equipment is installed, calibrated, operated, and maintained according to the vendor's

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
				specifications at all times the control device is in use.
TX	Brazoria, Chambers, Collin, Dallas, Denton, El Paso, Ellis, Fort Bend, Galveston, Gregg, Hardin, Harris, Jefferson, Johnson, Kaufman, Liberty, Montgomery, Nueces, Orange, Parker, Rockwall,Tarrant, Victoria, and Waller Counties. Beaumont/Port Arthur, Dallas/Fort Worth, El Paso, and Houston/Galveston metro areas may have more detailed compliance demonstration and reporting requirements	Surface coating operations on a property which, when uncontrolled, would emit a combined weight of VOC of more than 3 pounds per hour and 15 pounds in any consecutive 24-hour period	1. 4.3 pounds per gallon (0.52 kg/liter) of coating (minus water and exempt solvent) delivered to the application system as a clear coat; or as an interior protective coating for pails and drums; 2. 3.5 pounds per gallon (0.42 kg/liter) of coating (minus water and exempt solvent) delivered to the application system as a low-bake coating; or that utilizes air or forced air driers; 3. 3.5 pounds per gallon (0.42 kg/liter) of coating (minus water and exempt solvent) delivered to the application system as an extreme performance coating, including chemical milling maskants; and 4. 3.0 pounds per gallon (0.36 kg/liter) of coating (minus water and exempt solvent) delivered to the application system for all other coating applications, including high-bake coatings that pertain to MMPP.	1. Low VOC compliant coatings 2. Emissions control system or capture and abatement system 3. Alternative compliance options, such as improved transfer efficiency, with approval of regulating authority.
UT		The surface coating of miscellaneous metal parts and products if the potential uncontrolled emissions of VOC is greater than 10 tons per year. Applicable industries include: (a) Large farm machinery (b) Small farm machinery (c) Small appliance (d) Commercial machinery (e) Industrial machinery (f) Fabricated metal products (g) Any other industrial category which coats metal parts or products under the standard Industrial Classification Code of	1. 0.52 kg/L (4.3 lb/gal) of coating delivered to a coating applicator that applies clear coatings; 2. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 90° C (194° F); 3. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator that applies extreme performance coatings; 4. 0.36 kg/L (3.0 lb/gal) of coating delivered to a coating applicator for all other coatings and coating application systems, excluding powder	The emission limits shall be achieved by: (a) The application of low solvent technology; or (b) An incineration system which oxidizes a minimum of 90 percent of the non-methane volatile organic compounds (VOC measures as total

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		major group 33 (primary metal industries), major group 34 (fabricated metal products), major group 35 (nonelectric machinery), major group 36 (electrical machinery), major group 37 (transportation equipment) major group 38 (miscellaneous instruments), and major group 39 (miscellaneous manufacturing industries).	coating systems;	combustible carbon) to carbon dioxide and water.
VT		1. This subsection applies to any miscellaneous metal parts and products coating unit, except automobile, light-duty and heavy-duty truck refinishing. 2. The emission limits in this subsection do not apply to any coating unit within a source whose actual emissions without control devices from all miscellaneous metal part and product coating units within the source are less than 5 tons of VOCs per year. 3. Any source that becomes or is currently subject to this subsection shall remain so even if emissions from the source later fall below the applicability threshold.	1. Clear coating - 4.3 lb/gal 2. Steel pail and drum interior coating - 4.3 lb/gal 3. Air-dried coating - 3.5 lb/gal 4. Extreme performance coating - 3.5 lb/gal 5. All other coatings - 3.0 lb/gal	Low VOC coatings or installing and operating a control device and demonstrating its efficiency.
VA	Areas located within designated Emissions Control Areas of (counties unless other wise listed as City): Arlington, Fairfax, Loudoun, Prince William, Stafford, Alexandria City, Fairfax City, Falls Church City, Manassas City, Manassas Park City, Spotsylvania, Fredericksburg City, Charles City, Chesterfield , Hanover Henrico, Prince George,	Applies to sources of volatile organic compounds in volatile organic compound emissions control areas that emit more than 2.7 tons per year, 15 pounds per day and three pounds per hour, based on the actual emission rate. All volatile organic compound emissions from purging or washing solvents shall be considered in applying the exemption levels specified in this subsection. The provisions of this article do not apply to the following: 1. Coating application systems used exclusively for determination of product quality and commercial acceptance provided: a. The operation is not an integral part of the production process; b. The emissions from all product quality coating application systems do not exceed 400 pounds in any 30 day period; and	1. 4.3 pounds per gallon of coating, excluding water, delivered to the coating applicator that applies clear coatings; 2. 3.5 pounds per gallon of coating, excluding water, delivered to a coating applicator in a coating application system that utilizes air or forced air driers; 3. 3.5 pounds per gallon of coating, excluding water, delivered to a coating applicator that applies extreme performance coatings, or 4. 3.0 pounds per gallon of coating, excluding water, delivered to a coating applicator for all other coatings and coating application systems.	The control technology should consist of one of the following: 1. Use of electrodeposited waterborne coatings; 2. Use of waterborne coatings; 3. Use of high-solids coatings; 4. Use of powder coatings; 5. Carbon adsorption; 6. Incineration; or 7. Any technology of equal or greater control

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
	Colonial Heights City, Hopewell City, Petersburg City, Richmond City, Gloucester, Isle of Wight, James City, York, Chesapeake City, Hampton City, Newport News City, Norfolk City, Poquoson City, Portsmouth City, Suffolk City, Virginia Beach City, Williamsburg City, Botetourt, Frederick, Roanoke, Roanoke City, Salem City, Winchester City	c. The exemption is approved by the board. 2. Vehicle refinishing operations. 3. Vehicle customized coating operations, if production is less than 20 vehicles per day. 4. Fully assembled aircraft and marine vessel exterior coating operations.	No owner or other person shall use any coating application system or equipment unless reasonable precautions are taken to minimize the discharge or emissions from cleaning or purging operations. Reasonable precautions may include the following: 1. The use of capture or control devices or both; 2. The use of detergents, high pressure water, or other non-volatile cleaning methods; 3. The minimization of the quantity of volatile organic compounds used to clean lines of equipment; and 4. The adjustment of production schedules to minimize coating changes thereby reducing the need for frequent cleaning or purging of a system.	efficiency when compared to the use of a coating complying with 9VAC5-40-4780 A, provided such technology is approved by the Air Quality Board.
WA		Applies to specified emission sources of VOCs located in or operating within designated ozone non-attainment areas of the state of Washington that exceed 300 kg (660 lbs) per month of VOC emissions.	1. 0.52 kg/L (4.3 lb/gal) of coating delivered to a coating applicator that applies clear coatings; 2. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 90° C (194° F); 3. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator that applies extreme performance coatings; 4. 0.36 kg/L (3.0 lb/gal) of coating delivered to a coating applicator for all other coatings and coating application systems, excluding powder coating systems; and 5. 0.05 kg/L (0.4 lb/gal) of coating delivered to a coating applicator for all powder coating systems.	The emission limits shall be achieved by: 1. The application of low solvent coating technology; or 2. An incineration system that oxidizes at least ninety percent of the VOCs (VOC measured as total combustible carbon) to carbon dioxide and water; or 3. An equivalent means of VOC reduction

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Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
				certified by the owner(s) or operator(s) and approved by regulating authority.
WV	Putnam County, Kanawha County, Cabell County, Wayne County, and Wood Counties.	Any new or existing source that employs surface coating operations and that the total actual VOC emissions from all such equipment at the facility exceed 450 pounds in any calendar month. It does not apply to: 1. Exterior of completely assembled aircraft; 2. Exterior of major aircraft subassemblies, if approved by the Director and the U.S. EPA; 3. Automobile and truck refinishing; 4. Customized top coating of automobiles and trucks, if production is less than 35 vehicles per day; 5. Exterior of completely assembled marine vessels; or 6. Exterior of major marine vessel subassemblies	1. 0.52 kg/L (4.3 lb/gal) of coating delivered to a coating applicator that applies clear coatings; 2. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator in a coating application system that is air dried or forced warm air dried at temperatures up to 90° C (194° F); 3. 0.42 kg/L (3.5 lb/gal) of coating delivered to a coating applicator that applies extreme performance coatings; 4. 0.36 kg/L (3.0 lb/gal) of coating delivered to a coating applicator for all other coatings and coating application systems.	1. Installing and operating a capture system on that line; 2. Installing and operating a control device on that line; 3. Determining for each day the overall emission reduction efficiency needed to demonstrate compliance. The overall emission reduction needed for a day is the lesser of the value calculated according to the procedure in section 43.2. for that day or 95 percent; and d. Demonstrating each day that the overall emission reduction efficiency achieved for that day, as determined in section 44.3., is greater than or equal to the overall emission reduction efficiency required for that day.
WI	Door, Kenosha,	Surface Coating facilities with greater than 6.8 kilograms (15	1. 0.52 kilograms per liter (4.3 pounds per	1. The application of

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
	Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha Counties.	pounds) in any one day with all emission control equipment inoperative.	gallon) of coating, excluding water, delivered to a coating applicator that applies clear coatings. 2. 0.42 kilograms per liter (3.5 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies extreme performance coatings. 3. 0.36 kilograms per liter (3.0 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings. 4. 0.52 kilograms per liter (4.3 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies clear coatings. 5. 0.42 kilograms per liter (3.5 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings.	low solvent content coating or ink technology. 2. A vapor recovery system which recovers the solvent for reuse. 3. Incineration or catalytic oxidation, provided that 90% of the nonmethane VOCs (VOC measured as total combustible carbon) which enter the incinerator or oxidation unit are oxidized to non−organic compounds. 4. An equivalent system or approach demonstrated to reliably control emissions to a level at or below the applicable emission limit and approved by the department.
WI	Statewide	1. Surface Coating facilities with greater than 6.8 kilograms (15 pounds) in any one day with all emission control equipment inoperative. 2. Surface coating facilities located in the county of Brown, Calumet, Dane, Dodge, Fond du Lac, Jefferson, Outagamie, Rock or Winnebago and which have actual emissions of VOCs from all surface coating process within the facility of more than 10 tons per year with all emission control equipment inoperative.	No owner or operator of a miscellaneous metal parts or products coating line may cause, allow or permit the emission of any VOCs in excess of 0.78 kilograms per liter (6.50 pounds per gallon).	1. The application of low solvent content coating or ink technology. 2. A vapor recovery system which recovers the solvent for reuse. 3. Incineration or catalytic oxidation, provided that 90% of

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Summary of State and Local Rules for VOC Emissions from Metal Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		3. Surface coating facilities located outside the counties of Brown, Calumet, Dane, Dodge, Door, Fond du Lac, Jefferson, Kenosha, Kewaunee, Manitowoc, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, Walworth, Washington, Waukesha and Winnebago and which have total emissions of VOCs from the facility, with all emission control equipment inoperative, of more than 100 tons per year.		the nonmethane VOCs (VOC measured as total combustible carbon) which enter the incinerator or oxidation unit are oxidized to non−organic compounds. 4. An equivalent system or approach demonstrated to reliably control emissions to a level at or below the applicable emission limit and approved by the department.

Appendix D
Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
AZ	Maricopa County	Plastic parts and products	Not Defined as Flexible 3.5 lb/gal Flexible: Primer 4.1 lb/gal Color Topcoat 3.8 lb/gal Basecoat/Clear Coat (Combined System) for either coat 4.5 lb/gal	
CA	Antelope Valley AQMD	Plastics, glass and rubber coatings	Emissions limits stated in coating lb per gal General Coatings: One-component - 2.3 Two-component - 3.5 Military Spec. Coating: One-component - 2.8 Two-component - 3.5 Multi-Colored Coatings -5.7 Mold Seal Coatings - 6.3 Vacuum Metalizing Coatings - 6.7 Mirror Backing: Curtain Coated - 4.2 Roll Coated - 3.6 Optical Coatings - 6.7 Electric Dissipating Coatings and Shock-Free Coatings - 3.0 Metallic Coatings - 3.5	A person may comply with by using air pollution control equipment, provided that the VOC emissions from such operations or materials are reduced in accordance with the provisions below: (A) The control device shall reduce VOC emissions from an emission collection system by at least 95 percent, by weight, or the concentration of VOC in the output of the air pollution control device shall be less than 50 PPM calculated as carbon with no dilution. (B) The owner/operator demonstrates that the system collects at least 90 percent, by weight, of the VOC emissions generated by the sources of emissions.
CA	Bay Area AQMD	Plastic Parts and Products	A person shall not apply to any plastic part or product any coating with a VOC content in excess of 340 grams of VOC per liter of coating applied (2.8 lb/gal), excluding water. A person shall not apply to any flexible part or product any coating which has a VOC content in excess of the following	Emissions to the atmosphere are to be controlled to an equivalent level by use of an air pollution abatement device with an abatement device efficiency of at least 85%.

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			limits expressed as grams of VOC per liter (lb VOC per gal) of coating applied. Flexible primer 490 grams/liter (4.1 lb/gal) Color topcoat 450 grams/liter (3.8 lb/gal) Base coat/clear coat (combined system) 540 grams/liter (4.5 lb/gal) A person shall not apply to any plastic part or product any specialty coating with VOC content in excess of the following limits, expressed as grams of VOC per liter (lb VOC per gal) of coating applied. Camouflage 420 grams/liter (3.5 lb/gal) Conductive 325 grams/liter (2.7 lb/gal) Metallic Topcoat 420 grams/liter (3.5 lb/gal) Extreme Performance 750 grams/liter (6.2 lb/gal) High Gloss 420 grams/liter (3.5 lb/gal) Optical 800 grams/liter (6.7 lb/gal) Any person using the above coatings shall also comply with the following provisions: a. Usage is limited to 3785 liters (1000 gal) in any calendar year. b. Requirements of Section 8-31-401 must be satisfied.	
CA	South Coast AQMD		Coating lb per gal Electrical dissipating and shock free coatings-3.0 Extreme performance 2-component coatings-3.5 General 1-component coating-1.0 General 2-component coating-2.5 (after 1-1-‘06); 1.0 (after 1-1-‘08) Metallic coatings-3.5 Military spec 1-component coatings-2.8	A person may comply with by using air pollution control equipment, provided that the VOC emissions from such operations or materials are reduced in accordance with the provisions below: (A) The control device shall reduce VOC emissions from an emission collection system by at least 95

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			Military spec 2-component coatings-3.5 Mold seal coatings-6.3 Multi-colored coatings-5.7 Optical coatings-0.4 Vacuum metalizing-6.7	percent, by weight, or the concentration of VOC in the output of the air pollution control device shall be less than 50 PPM calculated as carbon with no dilution. (B) The owner/operator demonstrates that the system collects at least 90 percent, by weight, of the VOC emissions generated by the sources of emissions.
DE		Limits do not apply to plastic parts coating facilities whose plant-wide actual emissions, without control devices, from all plastic parts coating operations, are less than 6.8 kg (15 lb) of VOCs per day.	Automotive/Transportation Coating Category I. Auto Interiors 1) High-Bake Colorcoats - 4.1 lb VOC/gal (0.49 kg VOC/L) 2) High-Bake Primers - 3.8 lb VOC/gal (0.46 kg VOC/L) 3) Low-Bake Colorcoats - 3.2 lb VOC/gal (0.38 kg VOC/L) 4) Low-Bake Primers - 3.5 lb VOC/gal (0.42 kg VOC/L) II. Auto Exteriors (Flexible and Non-Flexible) 1) High-Bake Coatings a) Colorcoats - 4.6 lb VOC/gal (0.55 kg VOC/L) b) Clearcoats - 4.3 lb VOC/gal (0.52 kg VOC/L) c) Primers - 5 lb VOC/gal (0.6 kg VOC/L) d) Primers-Non-Flexible - 4.5 lb VOC/gal (0.54 kg VOC/L) 2) Low-Bake Coatings a) Primers - 5.5 lb VOC/gal (0.66 kg VOC/L) b) Red and Black Colorcoats - 5.6 lb VOC/gal (0.67 kg VOC/L) c) Colorcoats - All Other Colors - 5.1 lb VOC/gal (0.61 kg VOC/L) d) Clearcoats - 4.5 lb VOC/gal (0.54 kg VOC/L) III. Auto Specialty 1) Vacuum Metalizing Basecoats and Texture Coatings - 5.5 lb VOC/gal (0.66 kg VOC/L)	As an alternative to compliance with the emission limits of this Section, an owner or operator may meet the requirements of a daily-weighted average limitation or installing control devices

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			2) Black and Reflective Argent Coatings, Soft Specialty Coatings, and Air Bag Cover Coatings - 5.9 lb VOC/gal (0.71 kg VOC/L) 3) Gloss Flatteners, Vacuum Metalizing Topcoats, and Texture Topcoat. - 6.4 lb VOC/gal (0.77 kg VOC/L) 4) Stencil Coatings, Adhesion Primers, Ink Pad Printing Coatings, Electrostatic Prep Coats, and Resist Coatings - 6.8 lb VOC/gal (0.81 kg VOC/L) 5) Headlamp Lens Coatings - 7.4 lb VOC/gal (0.89 kg VOC/L) Business Machine Coating Category I. Primers - 1.2 lb VOC/gal (0.14 kg VOC/L) II. Clearcoats 2.3 lb VOC/gal (0.28 kg VOC/L) III. Colorcoats/ Texture coats 2.3 lb VOC/gal (0.28 kg VOC/L) IV. EMI/RFI Coatings 4.0 lb VOC/gal (0.48 kg VOC/L) V. Specialty Coatings 1) Soft Coatings - 4.3 lb VOC/gal (0.52 kg VOC/L) 2) Plating Resist Coatings - 5.9 lb VOC/gal (0.71 kg VOC/L) 3) Plating Sensitizer Coatings - 7.1 lb VOC/gal (0.85 kg VOC/L)	
IL	Chicago, IL area counties of Cook, DuPage, Kane, Lake, McHenry, and Will, the Townships of Aux Sable and Goose Lake in Grundy County, and the Township of Oswego in Kendall County	Does not apply to coating lines with actual emissions of VOM from all lines at the source subject that never exceed 6.8 kg/day [15 lbs/day] before the application of capture systems and control devices	Automotive/Transportation kg/l (lb/gal) 1) Interiors A) Baked i) Color coat 0.49 (4.1) ii) Primer 0.46 (3.8) B) Air Dried i) Color coat 0.38 (3.2) ii) Primer 0.42 (3.5) 2) Exteriors (flexible and nonflexible) A) Baked i) Primer 0.60 (5.0) ii) Primer non-flexible 0.54 (4.5)	Alternative compliance options to the content limits include daily-weighted average limitations or the application of capture and control system.

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			iii) Clear coat 0.52 (4.3) iv) Color coat 0.55 (4.6) B) Air Dried i) Primer 0.66 (5.5) ii) Clear coat 0.54 (4.5) iii) Color coat (red & black) 0.67 (5.6) iv) Color coat (others) 0.61 (5.1) 3) Specialty A) Vacuum metallizing basecoats, texture basecoats 0.66 (5.5) B) Black coatings, reflective argent coatings, air bag cover coatings, and soft coatings 0.71 (5.9) C) Gloss reducers, vacuum metallizing topcoats, and texture topcoats 0.77 (6.4) D) Stencil coatings, adhesion primers, ink pad coatings, electrostatic prep coatings, and resist coatings 0.82 (6.8) E) Head lamp lens coatings 0.89 (7.4) Business Machine kg/l (lb/gal) 1) Primer 0.14 (1.2) 2) Color coat (non-texture coat) 0.28 (2.3) 3) Color coat (texture coat) 0.28 (2.3) 4) Electromagnetic interference/radio frequency interference (EMI/RFI) shielding coatings 0.48 (4.0) 5) Specialty Coatings A) Soft coat 0.52 (4.3) B) Plating resist 0.71 (5.9) C) Plating sensitizer 0.85 (7.1)	
IL	Metro East area, counties of Madison, Monroe, and St. Clair	Does not apply to coating lines with a combined actual emissions of VOM from all lines at the source subject that never exceed 6.8 kg/day (15 lbs/day) before the application of capture systems and control	Automotive/Transportation kg/l (lb/gal) 1) Interiors A) Baked i) Color coat 0.49 (4.1) ii) Primer 0.46 (3.8) B) Air Dried	Alternative compliance options to the content limits include daily-weighted average limitations or the application of capture and control system.

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		devices.	i) Color coat 0.38 (3.2) ii) Primer 0.42 (3.5) 2) Exteriors (flexible and nonflexible) A) Baked i) Primer 0.60 (5.0) ii) Primer non-flexible 0.54 (4.5) iii) Clear coat 0.52 (4.3) iv) Color coat 0.55 (4.6) B) Air Dried i) Primer 0.66 (5.5) ii) Clear coat 0.54 (4.5) iii) Color coat (red & black) 0.67 (5.6) iv) Color coat (others) 0.61 (5.1) 3) Specialty A) Vacuum metallizing basecoats, texture basecoats 0.66 (5.5) B) Black coatings, reflective argent coatings, air bag cover coatings, and soft coatings 0.71 (5.9) C) Gloss reducers, vacuum metallizing topcoats, and texture topcoats 0.77 (6.4) D) Stencil coatings, adhesion primers, ink pad coatings, electrostatic prep coatings, and resist coatings 0.82 (6.8) E) Head lamp lens coatings 0.89 (7.4) Business Machine kg/l (lb/gal) 1) Primer 0.14 (1.2) 2) Color coat (non-texture coat) 0.28 (2.3) 3) Color coat (texture coat) 0.28 (2.3) 4) Electromagnetic interference/radio frequency interference (EMI/RFI) shielding coatings 0.48 (4.0) 5) Specialty Coatings A) Soft coat 0.52 (4.3) B) Plating resist 0.71 (5.9) C) Plating sensitizer 0.85 (7.1)	

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
IN	Lake, Porter, Clark or Floyd Counties	This rule shall apply to stationary sources located in Lake, Porter, Clark, or Floyd County that emit or have the potential to emit VOCs at levels equal to or greater than 25 tpy in Lake and Porter Counties and 100 tpy in Clark and Floyd Counties. This rule shall also apply to sources that have coating facilities which emit or have the potential to emit a total equal to or greater than ten 10 tpy of VOCs in Floyd, Clark, Lake, or Porter County.	Affected facilities must implement one (1) of the following emissions reduction measures on or before May 31, 1995: (1) Achieve an overall VOC reduction from baseline actual emissions of at least ninety-eight percent (98%) by the documented reduction in use of VOC containing materials or install an add-on control system that achieves an overall control efficiency of ninety-eight percent (98%). (2) Where it can be demonstrated by the source that control technology does not exist that is reasonably available and both technologically and economically feasible to achieve a ninety-eight percent (98%) reduction in VOC emissions, a source shall achieve an overall VOC reduction of at least eighty-one percent (81%) from baseline actual emissions with the documented reduction in use of VOC containing materials or install an add-on control system that achieves an overall control efficiency of eighty-one percent (81%). (3) Achieve an alternative overall emission reduction with the application of reasonably available control technology (RACT) that has been determined as reasonably available by the U.S. EPA and the department. A petition developed in accordance with the procedures in 326 IAC 8-1-5 shall accompany the request for an alternative overall emission reduction. The petition shall be submitted to the department on or before December 31, 1994. The department may approve an extension until February 28, 1995, for submittal of the petition provided the request is received by the department prior to December 31,1994.	
MA		Applies to any person who owns, leases, operates or controls plastic parts surface coating line(s) which in total have the potential to emit, before the application of air	Emission Limits for Surface Coating of Plastic Parts using Low/no VOC Coatings (lbs VOC/gal solids as applied) Business Machines/Miscellaneous Plastic Parts Color coating 3.4 Color/texture coating 3.4 Primer Coating 1.4	

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		pollution control equipment, equal to or greater than 50 tons per year of volatile organic compounds.	EMI/RFI 8.8 Automotive Interior Parts Coating Colorcoat 5.7 Primer 6.7 Automotive Exterior Flexible Parts Coating Colorcoat 9.3 Clearcoat 6.7 Primer 11.6 Automotive Exterior Rigid (non-flexible) Parts Coating Colorcoat 9.3 Clearcoat 6.7 Primer 6.7 Emission Source Emission Limitation w/ Add-on Controls (lbs VOC/gal solids as applied) Business Machines/Miscellaneous Plastic Parts Color coating 1.7 Color/texture coating 1.7 Primer Coating 1.4 EMI/RFI 1.9 Automotive Interior Parts Coating Colorcoat 3.6 Primer 1.4 Automotive Exterior Flexible Parts Coating Colorcoat 2.8 Clearcoat 2.4 Primer 4.8 Automotive Exterior Rigid (non-flexible) Parts Coating Colorcoat 2.8 Clearcoat 2.4 Primer 3.6	
MD		This regulation applies to a person who owns or operates	Plastic vehicle parts: 3.0 lb/gallon (0.36 kg/liter) Decorative coating of other plastic parts: 5.9 lb/gallon (0.70	

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		any coating or printing installation that is listed in and that has VOC emissions equal to or greater than 20 lb of VOC/day	kg/liter)	
MI	Kent, Livingston, Macomb, Monroe, Muskegon, Oakland, Ottawa, St. Clair, Washtenaw, and Wayne Counties	Automobile, truck, or business machine plastic part coating	Emissions limits for automotive and truck plastic parts coating in pounds of volatile organic compounds allowed to be emitted per gallon of coating (minus water) as applied: 1. High bake coating-exterior and interior parts Primer (i) Flexible coating – 4.5 (ii) Nonflexible coating – 3.5 Topcoat (i) Basecoat – 4.3 (ii) Clearcoat - 4.0 (iii) Non-basecoat/clearcoat- 4.3 2. Air-dried coating--exterior parts3 (a) Primer – 4.8 (b) Topcoat (i) Basecoat - 5.0 (ii) Clearcoat – 4.5 (iii) Non-basecoat/clearcoat - 4.5 3. Air-dried coating--interior parts - 5.2 4. Touch-up and repair - 5.0 Emission limits for business machines plastic parts coating in pounds of volatile organic compounds allowed to be emitted per gallon of coating (minus water) as applied: 1. Prime - 2.9 2. Topcoat - 2.9 3. Texture coat - 2.9 4. Fog coat - 2.2 5. Touch-up and repair - 2.9	
MO	Throughout St.	This rule shall apply to any	Plastic Parts 3.5 lb/gal	

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
	Louis City and Jefferson, St. Charles, Franklin and St. Louis Counties.	installation with actual emissions of greater than 2 1/2 tons in any calendar year after December 1, 1989, of VOC from surface coating operations covered under this rule. This includes any installation which does not have an allowable VOC emission limit established under 10 CSR 10-6.060 or legally enforceable state implementation plan revision, which has actual VOC emissions of greater than 2 1/2 tons in any calendar year after December 1, 1989. Once a source is determined to exceed the applicability level of this rule, it shall remain subject to this rule even if its actual emissions drop below the applicability level.		
NH		Any plastic parts coating operations have combined potential VOC emissions during any consecutive 12-month period after December 31, 1989 which are equal or exceed 50 tons of VOC.	Coating of Plastic parts for Automotive Interiors high bake prime coating, 3.8 lb VOC/gallon high bake color coating, 4.1 lb VOC/gallon low bake prime coating, 3.5 lb VOC/gallon low bake color coating, 3.2 lb VOC/gallon Coating of Plastic parts for Automotive Exteriors high bake flexible prime coating, 5.0 lb VOC/gallon high bake nonflexible prime coating, 4.5 lb VOC/gallon high bake color coating, 4.6 lb VOC/gallon high bake clear coating, 4.3 lb VOC/gallon low bake prime coating, 5.5 lb VOC/gallon Coating of non-Automotive plastic parts prime coating, 1.2 lb VOC/gallon	1. Applying coatings that meet the established emission limits. 2. Implementing add-on control techniques or a bubble and complying with the solids-based emission rate limits calculated using the procedures of Env-A 1204.04(d); or 3. Meeting either a coatings-based or solids-based modified emission rate limit as approved by the director and EPA in accordance with the RACT order provisions of Env-A 1204.05 and

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			nontexture color coating, 2.3 lb VOC/gallon texture color coating, 2.3 lb VOC/gallon electromagnetic interference (EMI) shielding, 4.0 lb VOC/gallon radio frequency interference (RFI) shielding, 4.0 lb VOC/gallon soft coatings, 4.3 lb VOC/gallon plating resist, 5.9 lb VOC/gallon plating sensitizer, 7.1 lb VOC/gallon	Env-A 1204.06 in the event that the source owner or operator demonstrates that the specified emission rate limits cannot be met because of technological or economic reasons.
NY	Statewide, New York City Metro Area, and Orange County Metro Area	1. All facilities performing surface coating located in the New York City metropolitan area. 2. All facilities performing surface coating located in the Lower Orange County metropolitan area, for which the annual potential to emit volatile organic compounds (VOCs) from all sources at the facility, regardless of process type but excluding combustion installations, equal or exceeds 25 tons. 3. All facilities performing surface coating located outside the New York City metropolitan area and the Lower Orange County metropolitan area, for which the annual potential to emit VOCs from all sources at the facility, regardless of process	Maximum permitted pounds of VOC per gallon of coating less water and excluded VOC for Plastic Parts Coating: 1. Color topcoat – 3.8 lb/gal; 2. Clear Coat – 4.8 lb/gal	1. Point of sale restriction 2. Control devices 3. Process specific RACT variance is granted by regulating authority.

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
		type but excluding combustion installations, equals or exceeds 50 tons.		
TN	Davidson, Rutherford, Sumner, Williamson and Wilson Counties	Any plastic parts coating line within a facility whose potential VOC emissions from all plastic parts coating lines within the facility are greater than 25 tons of volatile organic compounds (VOC's) per year and coats plastic components for automotive or other transportation equipment including interior and/or exterior parts for automobiles, trucks, tractors, lawn mowers, other mobile equipment, business machines, medical equipment housing, entertainment equipment housing, miscellaneous plastic parts, including toys, musical equipment housing, sporting goods, outdoor signs, and architectural structures such as doors, floors, and window frames.	Emission limits listed below in lbs/gal: 1. Business machines, Medical equipment housing, Entertainment equipment housing and Miscellaneous plastic parts: Primer - 1.20 Color - 2.30 Color/texture - 2.30 EMI/RFI - 2.50 2. Automotive Coating: (i)Auto Interior: High Bake Colorcoat - 4.1 High Bake Primer - 3.8 Low Bake Colorcoat - 3.2 Low Bake Primer - 3.5 (ii) Auto Exterior Flexible/Nonflexible (unless otherwise noted) High Bake Colorcoat - 4.7 High Bake Clearcoat - 4.3 High Bake Primer - 5.0 (Flexible) High Bake Primer - 4.5 (Nonflexible) Low Bake Colorcoat - 5.6 (Red & Black) Low Bake Colorcoat - 5.1 Low Bake Primer - 5.5 Low Bake Clear - 4.5	An owner or operator of a plastic coating line subject to this rule may comply with this rule by: (i) Installing and operating a capture system and a control device on that line; (ii) Determining for each day the overall emission reduction efficiency needed to demonstrate compliance. The overall emission reduction needed is the lesser of the value calculated according to the procedure in this chapter or 95 percent; (iii) Demonstrating each day that the overall emission reduction efficiency achieved is greater than or equal to the overall emission reduction efficiency required. An owner or operator of a plastic coating line subject to this rule electing to comply with an add on control shall ensure that: (i) A capture system and control device are operated at all times that the line is in operation, and the owner or operator demonstrates compliance with this rule through the applicable coating analysis and capture system and

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State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			Automotive Specialty (i) Group A-1 Coatings: - 5.5 Vacuum Metallizing, Basecoats, Texture Basecoats (ii) Group A-2 Coatings: - 5.9 Black and Reflective, Argent, Air Bag Cover Coatings, Soft Coatings (iii) Group B Coatings: - 6.4 Gloss Reducers, Vacuum Metallizing Topcoats, Texture Topcoats (iv) Group C Coatings: - 6.8 Stencil, Adhesion Primer/Promoter, Ink Pad, Electrostatic Prep, Resist (v) Headlight Lens Coating - 7.4	control device efficiency test methods described in the rule. (ii) The control device is equipped with the applicable monitoring equipment, and the monitoring equipment is installed, calibrated, operated, and maintained according to the vendor's specifications at all times the control device is in use.
WI	Kewaunee, Kenosha, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington or Waukesha counties	Applies to plastic parts coating at facilities which are located in Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha county and have maximum theoretical emissions of VOC from the facility, excluding any maximum theoretical emissions of VOC of 25 tons per year or more, and plastic parts coating at facilities that are located in Kewaunee, Manitowoc, or Sheboygan county and have maximum theoretical emissions of VOC from the facility, excluding any maximum theoretical emissions of VOC of 100 tons per year or more.	VOC content limitations for coatings used in plastic parts coating in pounds/gallons of coating, excluding water, as applied (a) Automotive/transportation 1. Interiors a. Baked Prime coats - 3.8 Other nonclear coatings - 4.1 b. Air dried Prime coats - 3.5 Other nonclear coatings - 4.9 2. Exteriors a. Baked Nonelastomeric prime coats - 4.5 Elastomeric prime coats - 5.0 Clear coats - 4.3 Other coatings - 4.6 b. Air dried	1. The application of low solvent content coating or ink technology. 2. A vapor recovery system which recovers the solvent for reuse. 3. Incineration or catalytic oxidation, provided that 90% of the nonmethane VOCs (VOC measured as total combustible carbon) which enter the incinerator or oxidation unit are oxidized to non−organic compounds. 4. An equivalent system or approach demonstrated to reliably control emissions to a level at or below the applicable emission limit and approved by the department.

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			Prime coats - 5.5 Clear coats - 4.5 Other coatings, red and black - 5.6 Other coatings - 5.1 3. Specialty a. Adhesive primers - 6.8 b. Air bag cover coatings - 5.9 c. Anti−glare safety coatings - 6.4 d. Electrostatic prep coatings - 6.8 e. Head lamp lens coatings - 7.4 f. Pad printing coatings - 6.8 g. Reflective argent coatings - 5.9 h. Resist coatings - 6.8 i. Soft coatings - 5.9 j. Stencil coatings - 6.8 k. Texture basecoats - 5.5 l. Texture topcoats - 6.4 m. Vacuum metallizing basecoats - 5.5 n. Vacuum metallizing topcoats - 6.4 (b) Business machine 1. Prime coats - 2.9 2. Other nonclear coatings - 2.9 3. Specialty a. Electromagnetic interference/radio frequency interference (EMI/RFI) shielding coatings - 4.0 b. Resist coatings - 5.9 c. Sensitizer coatings - 7.1 d. Soft coatings - 4.3 (c) Miscellaneous categories 1. Air cleaner covers - 6.0 2. Building exterior molding, trim, shutters and weather	

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Summary of State and Local Rules for VOC Emissions from Plastic Parts Coating

State	County/Area	VOC Limit Applies To	VOC Limit	Emission Limit Achieved By
			stripping - 6.2 3. Building interior molding and trim - 2.5 4. Cosmetic cases a. Opaque coatings - 4.8 b. Other coatings - 5.9 5. Personal hygiene razors a. Soft coatings - 5.5 b. Other coatings - 6.2 6. Signs a. Mask coatings - 0.8 b. Opaque coatings - 5.9 c. Other coatings - 6.5 7. Smoke detector covers - 6.2	

Appendix E

Summary of California Air District Requirements for VOC Emissions from Pleasure Craft Surface Coating

County/Area	VOC Limit Applies to	VOC Limit	Emission Limit Achieved By
Bay Area Air Quality Management District (BAAQMD) RULE 43 - SURFACE PREPARATION AND COATING OF MARINE VESSELS	Applies to coating of any marine vessel, component or structure intended for exposure to a marine environment.	VOC limits listed below in lbs/gal: Anti-Foulant - 3.3 Heat Resistant (Air Dried) - 3.5 Heat Resistant (Baked) - 3.0 High-Gloss (Air Dried) - 2.8 High-Gloss (Baked) - 2.3 High-Temperature - 4.2 Inorganic Zinc - 2.8 Navigational Aids - 4.6 Pretreatment Wash Primer - 3.5 Specialty Interior - 2.8 Sealant Coat for Wire Spray Aluminum - 5.1 Special Marking - 4.1 Tack Coat - 5.1 Repair and Maintenance Thermoplastic - 2.8 Extreme High-Gloss (Air Dried) - 4.1 Extreme High-Gloss (Baked) - 3.5 Low Activation Interior Coating - 3.5	Unless emissions to the atmosphere are controlled by an approved emission control system with an overall abatement efficiency of at least 85%, any person using solvent for surface preparation or cleanup or any person mixing, using or disposing of coatings containing organic solvent: (i) Shall use closed containers for the storage or disposal of cloth or paper used for solvent surface preparation and cleanup. (ii) Shall close containers of coating, catalyst, and fresh or spent solvent when not in use. (iii) Shall not use organic solvent for the cleanup of spray equipment, including paint lines, with a VOC content in excess of 50 g/l (0.42 lbs/gal) unless either (i) the solvent is pressurized though spray equipment with atomizing air off or dispensed from a small non-atomizing container, and collected and stored in a closed container until recycled or properly disposed of offsite, or (ii) a spray gun washer subject to and in compliance with the requirements of Regulation 8, Rule 16 is used.

Mojave Desert Air Quality Management District (MDAQMD) RULE 1106 – MARINE COATING OPERATIONS	Applies to all marine coating operations of both commercial boats and ships, pleasure craft and their appurtenances, and to the coating of buoys and oil drilling rigs, or their parts and components intended for the marine environments, which occur within the Mojave Desert Air Quality Management District.	Air-Dried VOC limits listed below in g/L, followed by baked VOC limits in g/L in parenthases where applicable. 1. Exteriors Elastomeric Adhesives with 15%, by weight, Natural or Synthetic Rubber - 730 Extreme Performance - 420 (360) Extreme High-Gloss - 490 (420) Finish Primer/Surfacer - 420 General Use - 340 (275) Heat Resistant - 420 (360) High Build Primer/Surfacer - 340 High-Gloss - 340 (275) High-Temperature - 500 Inorganic Zinc (high-build) - 340 Metallic Heat Resistant - 530 Mist - 610 Nonskid - 340 Organic Zinc - 360 Pretreatment Wash Primer - 780 (780) Repair and Maintenance of Thermoplastics - 550 (550) Sealant for Wire-Sprayed Aluminum - 610 Special Marking - 490 (490) Specialty Interior - 340 Tack Coat - 610 Teak Primer - 775 Topcoats – Extreme High Gloss - 490 Topcoats – High Gloss - 420 Weld-through Preconstruction Primer - 340 2. Antifoulant Non-Pleasure Craft - 400 Aluminum Substrate for Pleasure Craft - 560 Other Substrates for Pleasure Craft - 330 3. Miscellaneous Parts Air Flask - 340 Antenna - 530 Navigational Aids - 340	A person shall not apply any coatings to marine vessels and appurtenances subject to the provisions of this Rule, unless the coating is applied with equipment properly operated according to the manufacturer's suggested guidelines, and using one of the following application methods: (a) Electrostatic attraction; or (b) High Volume Low Pressure (HVLP) spray equipment; or (c) Dip coat; or (d) Hand application methods; or (e) Other coating application methods as are demonstrated to have a transfer efficiency at least equal to one of the above methods, and which are used in a manner that the parameters under which they were tested are permanent features of the method. Prior to their use, such coating applications shall be approved in writing by the APCO.

Ventura County Air Pollution Control District (VCAPCD) RULE 74.24.1 - PLEASURE CRAFT COATING AND COMMERCIAL BOATYARD OPERATIONS	Applies to any person who applies, specifies the use of, or supplies coatings for pleasure craft, and their parts or components. The provisions of this rule also apply to any person who applies, specifies the use of, or supplies marine coatings that are used at a commercial boatyard.	ROC limits in grams of ROC per liter of coatings less water and exempt organic compounds: 1. Exteriors Finish Primer(One-Component) - 420 Finish Primer(Two-Component) - 420 High Build Primer Surfacer - 340 Marine Deck Sealant Primer - 760 Pretreatment Wash Primer - 780 Topcoats (One-Component) - 490 Topcoats (Two-Component) - 650 Other Coatings - 420 2. Antifoulant Aluminum Substrates - 580 Other Substrates - 400	1. No person shall apply any coating to an entire vessel or their exterior parts and components unless one of the following methods is properly used: a. Hand application methods b. High-Volume, Low-Pressure (HVLP) application c. Any other coating application method which has been demonstrated to be capable of achieving a transfer efficiency of at least 65 percent. 2. No person shall use ROC-containing materials which have more than 200 grams of ROC per liter of material for surface preparation.
South Coast Air Quality Management District (SCAQMD) RULE 1106.1 -- PLEASURE CRAFT COATING OPERATIONS	Applies to all coating operations of pleasure craft, or their parts and components, for the purpose of refinishing, repairing, modification, or manufacturing such craft. Also applies to establishments engaged in activities described in the United States Office of Management and Budget's 1987 Standard Industrial Classification Manual, under Standard Industrial Classification (SIC) codes 3732 - Boat Building and Repairing and 4493 - Marinas.	VOC limits listed below in g/L: 1. Topcoats Extreme High Gloss - 490 High Gloss - 420 2. Antifoulant Aluminum Substrate - 560 Other Substrates - 330 3. Exteriors Pretreatment Wash Primers - 780 Finish Primer/Surfacer - 420 High Build Primer Surfacer - 340 Teak Primer - 775 Others - 420	1. Solvent cleaning of coating application equipment, parts, products, tools, machinery, equipment, and general work areas, and the storage and disposal of VOC-containing materials used in solvent cleaning operations, shall be carried out in accordance with Rule 1171 (Solvent Cleaning Operations). 2. A person shall not apply pleasure craft coatings subject to the requirements of this rule with a coating containing carbon tetrachloride or any of the Group II exempt compounds as defined in paragraph (b)(4) except for: methylene chloride; perchloroethylene; cyclic, branched, or linear, completely methylated siloxanes (VMS); or parachlorobenzotrifluoride (PCBTF).

San Diego County Air Pollution Control District (SDCAPCD) RULE 67.18 - MARINE COATING OPERATIONS	Applies to marine coating operations including the coating of marine and fresh water vessels, oil drilling platforms, navigational aids and component parts; and structures intended for exposure to a marine environment.	Air-Dried VOC limits listed below in g/L, followed by baked VOC limits in g/L in parenthases where applicable. Air Flask - 340 Antenna Coating - 340 Antifoulant Coating (except for pleasure craft) - 400 Antifoulant Coating (for pleasure craft) - 330 (Effective June 13, 1995) Finish Primer 600 Heat Resistant Coating - 420 (360) High Gloss Coating - 420 (360) High Solids Epoxy Coating - 280 High Temperature Coating - 500 Impregnating Sealer - 700 Inorganic Zinc Coating - 340 Low Activation Interior Coating - 420 Mist Coating - 610 Navigational Aids Speciality Coating - 550 Organic Zinc Coating - 340 Pleasure Craft Topcoat - 650 Preconstruction Zinc Primer - 650 Pretreatment Wash Primer - 420 Primer Surfacer - 340 Radar Exterior Topcoat - 340 Sealing Coat for Thermal Spray Aluminum - 610 Special Marking Coating - 420 Specialty Interior Coating - 340 Tack Coat - 610 Thermoplastic Coatings used in a Repair and Maintenance Coating Operation - 550	In lieu of complying with provisions of Subsections (d)(1), (d)(2), (d)(3), and/or (d)(4) of this rule, a person may use an air pollution control system which: (i) has been installed in accordance with an Authority to Construct; and (ii) includes an emission collection system which captures organic gaseous emissions, including emissions associated with applicable coating, equipment cleaning, and surface preparation operations, and transports the captured emissions to an air pollution control device; and (iii) has a combined emissions capture and control device efficiency of at least 85 percent by weight.

Antelope Valley Air Quality Management District (AVAQMD) RULE 1106.1 -- PLEASURE CRAFT COATING OPERATIONS	Applies to all coating operations of pleasure craft, or their parts and components, for the purpose of refinishing, repairing, modification, or manufacturing such craft. This rule shall also apply to establishments engaged in activities described in the United States Office of Management and Budget's 1987 Standard Industrial Classification Manual, under Standard Industrial Classification (SIC) codes 3732 - Boat Building and Repairing and 4493 - Marinas.	VOC limits listed below in g/L: 1. Topcoats Extreme High Gloss - 490 High Gloss - 420 2. Antifoulant Aluminum Substrate - 560 Other Substrates - 150 3. Exteriors Pretreatment Wash Primers - 780 Finish Primer/Surfacer - 420 High Build Primer Surfacer - 340 Teak Primer - 775 Others - 420	A person shall not apply coatings subject to this rule unless the coating is applied by use of one of the following methods: (i) Hand Application Methods, or (ii) High Volume, Low Pressure (HVLP) Spray, or (iii) such other alternative spray application method as is demonstrated, in accordance with the provisions of paragraph (e)(2), to be capable of achieving equivalent or better transfer efficiency than the application method listed in subparagraph (c)(2)(B), and for which written approval of the District's Executive Officer has been obtained to use this method.

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Summary of State and Local Requirements for Coating Application Equipment

State	County/Area	Requirement Applies To	Requirement
AZ	Maricopa County	Application methods for surface coatings	A person shall employ one of the following for all applications of surface coating containing more than 2 pounds of VOC per gallon (240 g/L) minus exempt compounds: 302.1 A low pressure spray gun; or 302.2 An electrostatic system; or 302.3 A system that atomizes principally by hydraulic pressure, including "airless" and "air assisted airless"; or 302.4 Non-atomizing or non-spraying application methods, such as but not limited to dipping, rolling, or brushing; or 302.5 Any method which is approved by the Administrator of the Federal EPA and the Control Officer as having a transfer efficiency of 65% or greater.
CA	Antelope Valley AQMD		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 properly operating equipment according to an operating procedure specified by the equipment manufacturer or the Executive Officer, or designee, and by the use of one of the following methods: (A) Electrostatic attraction, or (B) Flow coat, or (C) Dip coat, or (D) Roll coater, or (E) High-Volume, Low-Pressure (HVLP) Spray, or (F) Hand Application Methods, or (G) Such other coating application methods as are demonstrated to the Executive Officer, or designee, using EPA approved procedures, specified in paragraph (f)(4) of this rule, to be capable of achieving at least 65 percent transfer efficiency and for which written approval of the Executive Officer, or designee, has been obtained.
CA	Bay Area AQMD	Surface Preparation and Coating of Plastic Parts and Products, Spray Application Equipment	Any person who uses spray application equipment to apply coatings to miscellaneous metal parts or products within the District shall use one or more of the following high transfer efficiency application methods, unless emissions to the atmosphere are controlled by an approved emission control system with an overall abatement efficiency of at least 85 percent: 1. High-Volume, Low-Pressure (HVLP) Spray, operated in accordance with the manufacturer's recommendations; or 2. Electrostatic spray, operated in accordance with the manufacturer's recommendations; or 3. Detailing gun; or 4. Any other coating spray application that achieves an equivalent transfer efficiency compared to the spray application methods listed above. Prior written approval from the APCO shall be obtained for each alternative method used.
CA	Kern County AQMD	Application Equipment	No person shall coat any metal part or product subject to provisions of this Rule unless one of the following methods is used: 1. Brush, dip, or roll coating conducted in accordance with equipment manufacturer's recommendations, 2. Electrostatic or electrodeposition application conducted in accordance with manufacturer's recommendations, 3. High Volume Low Pressure (HVLP) spray equipment operated in accordance with equipment manufacturer's recommendations,

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State	County/Area	Requirement Applies To	Requirement
			4. Other application method demonstrated to achieve at least 65% transfer efficiency, for example, flow or continuous coating.
CA	Mojave Desert AQMD	Metal Parts & Products Coating Operations	A person shall not apply any coatings to Metal Parts and Products subject to the provisions of this Rule, unless the coating is applied with equipment properly operated according to manufacturer's suggested guidelines, and using one of the following application methods: (i) Electrostatic attraction; or (ii) High Volume Low Pressure (HVLP) Spray equipment; or (iii) Dip coat; or (iv) Hand Application Methods; or (v) Other coating application methods as are demonstrated to have a Transfer Efficiency at least equal to one of the above methods, and which are used in such a manner that the parameters under which they were tested are permanent features of the method. Prior to their use, such coating applications shall be approved in writing by the APCO.
CA	Sacramento Metro AQMD	Application equipment for miscellaneous metal parts or product coatings	A person shall not apply to any miscellaneous metal part or product any coating unless one of the following application methods is used: 1. Roll Coater 2. Dip Coat 3. Electrostatic Spray 4. Flow Coat 5. High-Volume Low-Pressure (HVLP) Application Equipment 6. Low-Volume Low-Pressure (LVLP) Application Equipment 7. Hand Application Equipment, such as brush or roller 9. Any other equivalent method which has been approved in writing by the Air Pollution Control Officer and the U.S. Environmental Protection Agency
CA	San Diego AQMD	Application equipment for miscellaneous metal parts or product coatings	No coatings shall be applied unless one of the following application methods is used: 1. Electrostatic spray application, or 2. Flow coat application, or 3. Dip coat application, or 4. High-volume low-pressure (HVLP) spray application, or 5. Roll coat, or 6. Hand application methods, or 7. Other coating application methods that are demonstrated to have a transfer efficiency at least equal to one of the above application methods, and which are used in such a manner that the parameters under which they were tested are permanent features of the method. Such coating application methods shall be approved in writing prior to use by the Air Pollution Control Officer.
CA	San Joaquin Valley AQMD	Application equipment for miscellaneous metal parts or product coatings	An operator shall not use or operate any coating application equipment on any metal parts and products subject to the provisions of this rule unless one of the following methods is used: 1. Electrostatic application; 2. Electrodeposition;

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State	County/Area	Requirement Applies To	Requirement
			3. High-Volume, Low-Pressure (HVLP) spray, 1. High-Volume, Low-Pressure (HVLP) spray equipment shall be operated in accordance with the manufacturer's recommendations. 2. 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. 3. 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. 4. Flow coating; 5. Roll coating; 6. Dip coating; 7. Brush coating; or 8. Continuous coating; 9. 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 6.3.8. Prior written approval from the APCO shall be obtained for each coating application method to be used pursuant to Section 5.7.9. 10. In lieu of compliance with 1 through 9, an operator may control emissions from application equipment with a VOC emission control system that meets the requirements of Section 5.4.
CA	South Coast AQMD	Application equipment for miscellaneous metal parts or product coatings	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, or (B) Flow coat, or (C) Dip coat, or (D) Roll coat, or (E) High-Volume, Low-Pressure (HVLP) Spray, or (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.
CA	South Coast AQMD	Application equipment for plastic, rubber, leather and glass coatings	A person shall not apply coatings unless the coating is applied with equipment operated according to the manufacturer's specifications, and by the use of one of the following methods: (A) Electrostatic application; or (B) Flow coater; or

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State	County/Area	Requirement Applies To	Requirement
			(C) Roll coater; or (D) Dip coater; or (E) Hand application methods; or (F) High-volume, low-pressure (HVLP) spray; or (G) Such other coating application methods as are demonstrated to the Executive Officer to be capable of achieving at least equivalent or better transfer efficiency to the method listed in subparagraph (c)(4)(F), using District approved procedures and for which written approval of the Executive Officer has been obtained.
MA	Statewide	Paint Spray Booths	Spray guns shall utilize one of the following methods of spray application and be maintained and operated in accordance with the recommendations of the manufacturer: 1. Electrostatic spray application; or 2. High Volume Low Pressure (HVLP) spray application; or 3. Any other coating application method that achieves a transfer efficiency equivalent to electrostatic or HVLP spray application and is approved by the Department in writing.
NH	Statewide	Plastic parts coating operations, except touch-up and repair activities.	One of the following control techniques shall be used: (1) High volume-low pressure (HVLP) spray; (2) Electrostatic spray; (3) Zinc-arc spray; (4) Air-assisted airless spray; (5) Airless spray; or (6) A flow coating technique.

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Summary of State and Local Requirements for VOC Emissions from Cleaning Operations

State	County/Area	Requirement Applies To	Requirement
CA	Antelope Valley AQMD	Product Cleaning During Manufacturing Process Or Surface Preparation For Coating, Adhesive, Or Ink Application; Cleaning of Coatings, or Adhesives Application Equipment	Product Cleaning During Manufacturing Process Or Surface Preparation For Coating, Adhesive, Or Ink Application: General: 70 g/l (0.58 lb/gal) Cleaning of Coatings, or Adhesives Application Equipment: 950 g/l (7.9 lb/gal), and 35 mm Hg @ 20oC (68oF) VOC Composite Partial Pressure A person may comply with by using air pollution control equipment, provided that the VOC emissions from such operations or materials are reduced in accordance with the provisions below: (A) The control device shall reduce VOC emissions from an emission collection system by at least 95 percent, by weight, or the concentration of VOC in the output of the air pollution control device shall be less than 50 PPM calculated as carbon with no dilution. (B) The owner/operator demonstrates that the system collects at least 90 percent, by weight, of the VOC emissions generated by the sources of emissions.
CA	Bay Area AQMD	Solvent Evaporative Loss Minimization	Unless emissions to the atmosphere are controlled by an approved emission control system with an overall abatement efficiency of at least 85%, any person using organic solvent for surface preparation and cleanup or any person mixing, using or disposing of coatings containing organic solvent: 1. Shall use closed containers for the storage or disposal of cloth or paper used for solvent surface preparation and cleanup. 2. Shall not use organic solvent for the cleanup of spray equipment including paint lines with a VOC content in excess of 50 g/l (0.42 lbs/gal) unless either (i) the solvent is pressurized though spray equipment with the atomizing air off or dispensed from a small non-atomizing container, and collected and stored in a closed container until recycled or properly disposed of offsite, or (ii) a spray gun washer subject to and in compliance with the requirements of Regulation 8, Rule 16 [Solvent cleaning operations] is used. 3. Shall close containers of coating, catalyst or solvent when not in use.
CA	Kern AQMD	Surface Preparation and Equipment Cleanup	No person shall conduct surface preparation or equipment cleanup for activities subject to provisions of this rule unless the following VOC limits are met and methods are used: 1. Surface Cleaning: No material shall be used containing VOC in excess of 200 grams per liter (1.7 lb/gal) of material to remove dirt, oils, or other contaminants prior to application of surface coatings or adhesives.

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State	County/Area	Requirement Applies To	Requirement
			2. Stripping: No material shall be used containing VOC in excess of 200 grams per liter (1.7 lb/gal) of material to strip any coating. 3. Cleaning of Coatings Application Equipment: Solvents used for cleaning of coatings application equipment shall comply with both limits specified below: a. Solvent shall have a VOC content of 950 grams or less per liter (7.9 lb/gal) of material; and b. Solvent shall have a VOC composite partial pressure of 35 mm Hg or less at 20°C (68°F).
CA	Mojave Desert AQMD	The requirements of this Section shall apply to any person using solvent for Surface Preparation, cleanup, and paint removal, including paint spray equipment.	A person shall not use VOC-containing materials for the cleanup of application equipment used in coating operations, unless such material is collected in a closed container when not in use; and (i) The application equipment is disassembled and cleaned in an enclosed system during the washing, rinsing and draining processes; or (ii) The application equipment or equipment parts are cleaned in a container which is open only when being accessed for adding, cleaning, or removing application equipment or when cleaning material is being added, provided the cleaned equipment or equipment parts are drained to the container until dripping ceases; or (iii) Other application equipment cleaning methods that are demonstrated to be as effective as the equipment described above in minimizing emissions of VOC to the atmosphere are used, provided that the device has been approved in writing prior to use by the APCO. (c) A person shall not use VOC-containing materials for Surface Preparation unless: (i) The material contains 200 grams or less of VOC per liter of material (1.67 pounds per gallon); or (ii) The material has an initial boiling point of 190^{o}C (374^{o}F) or greater; or (iii) The material has a total VOC vapor pressure of 20 mm Hg or less, at 20^{o}C (68^{o}F). (d) A person shall use closed, nonabsorbent containers for the storage or disposal of cloth, paper, or any other absorbent material used for solvent Surface Preparation and cleanup.
CA	Northern Sierra AQMD	Surface Preparation and Equipment Cleanup; Cleaning-Devices and	No person shall conduct surface preparation or equipment cleanup for activities unless the following VOC limits are met and methods are used: 1. Surface Cleaning: No material shall be used containing VOC in excess of 200 grams per liter (1.7 lb/gal) of material to remove dirt, oils, or other contaminants prior to application of

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State	County/Area	Requirement Applies To	Requirement
		Methods	surface coatings or adhesives. 2. Stripping: No material shall be used containing VOC in excess of 200 grams per liter (1.7 lb/gal) of material to strip any coating. 3. Cleaning of Coatings Application Equipment: Solvents used for cleaning of coatings application equipment shall comply with both limits specified below: a. Solvent shall have a VOC content of 950 grams or less per liter (7.9 lb/gal) of material; and b. Solvent shall have a VOC composite partial pressure of 35 mm Hg or less at 20°C (68°F). No person shall perform solvent cleaning operations unless one of the following cleaning devices or methods is 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. c. Cleaning equipment having a closed solvent container during cleaning operations, except when depositing and removing objects to be cleaned, and closed during nonoperation except during maintenance and repair of the cleaning equipment itself. d. Remote reservoir cold cleaner operated in conformance with Rule 410.3; e. System totally enclosing guns, cups, nozzles, bowls, and other parts during washing, rinsing, and draining procedures. f. 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. g. 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 Storage and Disposal Requirements Regardless of VOC content, all VOC-containing materials used in solvent cleaning operations, such as solvents, and cloth and paper moistened with solvents, shall be stored in non-absorbent, non-leaking containers kept closed at all times except when filling or emptying.
CA	Sacramento Metro AQMD	Surface Preparation, Cleanup, and	Any person subject to this rule shall comply with the following requirements: 1. Closed containers shall be used for the disposal of cloth,

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State	County/Area	Requirement Applies To	Requirement
		Storage	paper, or sponges used for surface preparation, cleanup, and coating removal. 2. VOC-containing materials shall be stored in containers, which are closed when not in use, and shall be disposed of in a manner that the VOC are not emitted into the atmosphere. 3. Except for electrostatic spray guns, a person shall not use VOC-containing materials for the cleanup of application equipment used in miscellaneous metal parts and products coating operations, unless the equipment is cleaned in an enclosed gun cleaner, or the VOC content of the material used does not exceed 72 grams per liter (0.6 pounds per gallon). 4. Spray gun nozzles only, may be soaked in solvent-based materials for cleaning, provided the container (not to exceed five (5) gallons in size) is kept tightly covered at all times except when accessing the container. 5. Effective October 1, 1998, a person shall not perform product cleaning or surface preparation with a material containing VOC in excess of 72 grams per liter (0.6 pounds per gallon).
CA	San Diego AQMD	Surface Preparation and Cleanup Solvents; Cleaning of Application Equipment	A person shall not use VOC-containing materials for surface preparation or cleanup unless: (i) The material contains 200 grams or less of VOC per liter of material; or (ii) The material has an initial boiling point of 190°C (374° F) or greater; or (iii) The material has a total VOC vapor pressure of 20 mm Hg or less, at 20°C (68°F). A person shall not use VOC containing materials for the cleaning of application equipment used in operations subject to this rule unless: (i) The cleaning material contains 200 grams or less of VOC per liter of material; or (ii) The cleaning material has an initial boiling point of 190°C (374°F) or greater; or (iii) The cleaning material has a total VOC vapor pressure of 20 mm Hg or less, at 20°C (68°F); or (iv) The cleaning material is flushed or rinsed through the application equipment in a contained manner that will minimize evaporation into the atmosphere; or (v) The application equipment or equipment parts are cleaned in a container which is open only when being accessed for adding, cleaning, or removing application equipment or when cleaning material is being added, provided the cleaned equipment or equipment parts are drained to the container until dripping ceases; or

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State	County/Area	Requirement Applies To	Requirement
			(vi) A system is used that totally encloses the component parts being cleaned during the washing, rinsing, and draining processes; or (vii) Other application equipment cleaning methods that are demonstrated to be as effective as any of the equipment described above in minimizing the emissions of VOC to the atmosphere, provided that the device has been tested and approved prior to use by the Air Pollution Control Officer.
CA	San Joaquin Valley AQMD		Product Cleaning During Manufacturing Process or Surface Preparation for Coating Application: 50 g/l (0.42 lb/gal) After 9/21/08: 25 g/l (0.21 lb/gal) Cleaning of Coating Application Equipment: 550 g/l (4.6 lb/gal) After 9/21/08: 25 g/l (0.21 lb/gal)
CA	San Luis Obispo AQMD	Solvent Disposal and clean-up	a. Surface Preparation, Clean-up or Coating Removal: Closed containers approved by the local fire agency shall be used for the storage or disposal of solvent-containing cloth or paper used for surface preparation, clean-up or coating removal. Containers shall be nonabsorbent. b. All VOC containing materials, including but not limited to fresh or spent solvent, coatings, and reducers, shall be kept in closed containers when not in use. c. Spray Equipment Clean-up Limitation: No person shall use materials containing VOCs for spray equipment cleanup unless: -An enclosed gun washer is properly used for cleaning, or -A gun washer, approved by the APCO, is properly used for cleaning and the composite vapor pressure of materials used is less than 45 mm Hg (0.87 psi) at a temperature of 20 degrees Celsius (68 F^o). d. Disposal and Evaporation of Solvents: No person shall dispose of a total of more than one (1) quart per day of any organic solvent by means which will permit the evaporation of such solvent into the atmosphere. The volume of organic solvent in any disposed material containing organic solvent shall be included in the above total.
CA	Santa Barbara		All reactive organic compounds-containing materials, used or unused, including but not limited to surface coatings, thinners, cleanup solvents, or surface preparation materials shall be stored in closed containers and opened only during extraction or introduction of material for mixing, use or storage.
CA	South Coast AQMD		Product Cleaning During Manufacturing Process Or Surface Preparation For Coating, Adhesive, Or Ink Application General 25 g/l (0.21 lb/gal) Cleaning of Coatings, or Adhesives Application Equipment :

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State	County/Area	Requirement Applies To	Requirement
			25 g/l (0.21 lb/gal) Cleaning Devices and Methods Requirements A person shall not perform solvent cleaning unless one of the following cleaning devices or methods is used: (A) Wipe cleaning; (B) Closed containers or hand held spray bottles from which solvents are applied without a propellant-induced force; (C) Cleaning equipment which has a solvent container that can be, and is closed during cleaning operations, except when depositing and removing objects to be cleaned, and is closed during non-operation with the exception of maintenance and repair to the cleaning equipment itself; (D) Cleaning device which is listed in the Office of Operations' manual "Alternative Devices for Rule 1171 Compliance" dated July 1, 1991. The Executive Officer shall periodically update the manual to identify any additional cleaning devices determined by the Executive Officer to result in equivalent or lower emissions; (E) Remote reservoir cleaner used pursuant to the provisions of paragraph (c)(3); (F) Non-atomized solvent flow method where 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 (G) Solvent flushing method where the cleaning solvent is discharged into a container which 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.
CA	Ventura AQMD	Surface Preparation and Clean-up	No person shall use any material which contains more than 70 grams of ROC per liter of material for substrate surface cleaning. Substrate surface cleaning performed in a vapor degreaser shall not be subject to this ROC content limit. No person shall use organic solvent for cleanup unless: -An enclosed gun washer or "low emission spray gun cleaner" that has been approved in writing by the APCO is properly used for spray equipment cleaning, and The ROC composite partial pressure of organic solvent used for cleanup, including spray equipment cleaning, is less than 45 mm Hg at 20 oC.
CO		Fugitive	1. Control techniques and work practices shall be implemented

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State	County/Area	Requirement Applies To	Requirement
		emission control	at all times to reduce VOC emissions from fugitive sources. Control techniques and work practices include, but are not limited to: a. tight-fitting covers for open tanks; b. covered containers for solvent wiping cloths; c. proper disposal of dirty cleanup solvent. 2. Emissions of organic material released during clean-up operations, disposal, and other fugitive emissions shall be included when determining total emissions, unless the source owner or operator documents that the VOCs are collected and disposed of in a manner that prevents evaporation to the atmosphere.
FL			All volatile organic compound emissions from solvent washings shall be considered in the emission limitations unless the solvent is directed into containers that prevent evaporation into the atmosphere.
GA			All VOC emissions from solvent washings shall be considered in the emission limitations unless the solvent is directed into containers that prevent evaporation into the atmosphere.
IN			Solvent sprayed from application equipment during cleanup or color changes shall be directed into containers. Such containers shall be closed as soon as such solvent spraying is complete, and the waste solvent shall be disposed of in such a manner that evaporation is minimized.
ME		Handling, Storage and Disposal of Materials Containing VOC at any subject surface coating facility	A. Vapor-tight containers shall be used for the storage of spent or fresh VOC and for the storage or disposal of cloth or paper impregnated with VOC that are used for surface preparation, clean up or coating removal. B. The use of VOC is prohibited for cleanup operations unless equipment is used to collect the cleaning compounds and to minimize their evaporation to the atmosphere. The owner or operator of a surface coating unit, line or operation subject to this Chapter shall comply with the following work practice standards: (1) Spray gun cleaning. The owner or operator of a surface coating unit, line or operation subject to this Chapter shall collect all organic solvent used to clean spray guns into a normally closed container. (2) Line cleaning. The owner or operator of a surface coating unit, line or operation subject to this Chapter shall pump or drain all organic solvent used for line cleaning into a normally closed container. (3) Spray booth cleaning. The owner or operator of a surface coating unit, line or operation subject to this Chapter shall not use compounds containing more than 8.0 percent by weight of

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Summary of State and Local Requirements for VOC Emissions from Cleaning Operations

State	County/Area	Requirement Applies To	Requirement
			VOC for cleaning spray booth components other than conveyers, continuous coaters and their enclosures, and/or metal filters, unless the spray booth is being refurbished. If the spray booth is being refurbished, that is, the spray booth coating or other material used to cover the booth is being replaced, the affected source shall use no more than 1.0 gallon of organic solvent to prepare the booth prior to applying the booth coating. (4) Washoff operations. The owner or operator of a surface coating unit, line or operation subject to this Chapter shall control emissions from washoff operations by: (a) Using normally closed tanks for washoff; and (b) Minimizing dripping by tilting or rotating the part to drain as much organic solvent as possible.
MA			For surface preparation, prior to coating, the VOC content of any surface preparation solution shall not exceed 1.67 pounds per gallon. This requirement is not applicable to cleanup solutions which are re-used as thinners/reducers for coatings. However, for surface preparation of plastic parts the VOC content of the surface preparation solution shall not exceed 6.5 pounds of VOC per gallon. Spray guns shall be cleaned in a device that: 1. minimizes solvent evaporation during the cleaning, rinsing, and draining operations; 2. recirculates solvent during the cleaning operation so that the solvent is reused; and, 3. collects spent solvent in a container with a tight-fitting cover so that it is available for proper disposal or recycling.
NH		Miscellaneous Metal Parts Surface Coating emission limits	All VOC emissions from solvent washing shall be considered in the emission limitations unless the solvent is directed into containers that prevent evaporation into the atmosphere.
NY	Statewide	Handling, storage and disposal of volatile organic compounds.	Within the work area(s) associated with a coating line, the owner or operator of a facility subject to this Part must: (a) use closed, non-leaking containers to store or dispose of cloth or other absorbent applicators impregnated with VOC solvents that are used for surface preparation, cleanup or coating removal; (b) store in closed, non-leaking containers spent or fresh VOC solvents to be used for surface preparation, cleanup or coating removal; (c) not use VOC solvents to cleanup spray equipment unless equipment is used to collect the cleaning compounds and to minimize VOC evaporation; 1. an enclosed spray gun cleaning system that is kept

Appendix G
Summary of State and Local Requirements for VOC Emissions from Cleaning Operations

State	County/Area	Requirement Applies To	Requirement
			closed when not in use; 2. non-atomized discharge of VOC solvent into a paint waste container that is kept closed when not in use; 3. disassembling and cleaning of the spray gun in a vat that is kept closed when not in use; or 4. atomized spray into a paint waste container that is fitted with a device designed to capture atomized VOC solvent emissions. (d) not use open containers to store or dispense surface coatings and/or inks unless production, sampling, maintenance or inspection procedures require operational access. This provision does not apply to the actual device or equipment designed for the purpose of applying a coating material to a substrate. These devices may include, but are not limited to: spray guns, flow coaters, dip tanks, rollers, knife coaters, and extrusion coaters; (e) not use open containers to store or dispose of spent surface coatings, or spent VOC solvents; (f) minimize spills during the handling and transfer of coatings and VOC solvents;
OK		VOC-containing materials used for clean up on miscellaneous metal parts surface coating facilities with a potential to emit more than 10 tons per year of VOC from coating operations.	VOC-containing materials used for clean up shall be considered in the VOC content limits for miscellaneous metal parts surface coating unless: 1. the VOC containing materials are maintained in a closed container when not in use; 2. closed containers are used for the disposal of cloth or paper or other materials used for surface preparation and cleanup; 3. the spray equipment is disassembled and cleaned in a VOC vat and the vat is closed when not in use; or, 4. the VOC containing materials used for the clean up of spray equipment are sprayed directly into closed containers.
TX	Brazoria, Chambers, Collin, Dallas, Denton, El Paso, Ellis, Fort Bend, Galveston, Gregg, Hardin, Harris, Jefferson,	Equipment cleaning related miscellaneous metal parts and products surface coating operations.	All VOC emissions from non-exempt solvent washings shall be included in determination of compliance with the emission limitations for miscellaneous metal parts surface coating (TAC §115.421) unless the solvent is directed into containers that prevent evaporation into the atmosphere.

Appendix G
Summary of State and Local Requirements for VOC Emissions from Cleaning Operations

State	County/Area	Requirement Applies To	Requirement
	Johnson, Kaufman, Liberty, Montgomery, Nueces, Orange, Parker, Rockwall, Tarrant, Victoria, and Waller Counties.		
WA		Equipment cleaning related miscellaneous metal parts and products surface coating operations.	All VOC emissions from solvent washings shall be considered in the emission limitations for miscellaneous metal parts surface coating (WAC 173-490-205 (2)(a) unless the solvent is directed into containers that prevent evaporation into the atmosphere. Waste solvent shall be stored in covered containers and returned to the supplier or to a firm which processes solvents for disposal.

Appendix H

Recommended Coating Category Definitions

Recommended Coating Category Definitions and Related Definitions for Metal and Plastic Part Surface Coating:
Separate definitions are recommended for automotive/transportation and business machine plastic parts coating, pleasure craft coating, and for motor vehicle materials.
If a coating does not meet a specific coating category definition, then it can be assumed to be a general use coating and the VOC limit for "general coating" or "other coating" is recommended to apply.

AIR-DRIED coating means a coating that is cured at a temperature below 90°C (194°F).

BAKED COATING means a coating that is cured at a temperature at or above 90°C (194°F).

CAMOUFLAGE COATING means a coating used, principally by the military, to conceal equipment from detection.

CLEAR COATING means a colorless coating which contains binders, but no pigment, and is formulated to form a transparent film.

DRUM means any cylindrical metal shipping container larger than 12 gallons capacity but no larger than 110 gallons capacity.

ELECTRIC DISSIPATING COATING means a coating that rapidly dissipates a high-voltage electric charge.

ELECTRIC-INSULATING VARNISH means 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.

EMI/RFI SHIELDING means a coating used on electrical or electronic equipment to provide shielding against electromagnetic interference, radio frequency interference, or static discharge.

ETCHING FILLER means 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.

EXTREME HIGH-GLOSS COATING means a coating which, when tested by the American Society for Testing Material Test Method D-523 adopted in 1980, shows a reflectance of 75 or more on a 60° meter.

EXTREME-PERFORMANCE COATING means a coating used on a metal or plastic 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 solutions; or

(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.
Extreme performance coatings include, but are not limited to, coatings applied to locomotives, railroad cars, farm machinery, and heavy duty trucks.

HEAT-RESISTANT COATING means a coating that must withstand a temperature of at least 400°F during normal use.

HIGH-PERFORMANCE ARCHITECTURAL COATING means 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 means a coating that is certified to withstand a temperature of 1000°F for 24 hours.

MASK COATING means thin film coating applied through a template to coat a small portion of a substrate.

METALLIC COATING means 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 means a coating which has a formulation approved by a United States Military Agency for use on military equipment.

MOLD SEAL COATING means the initial coating applied to a new mold or a repaired mold to provide a smooth surface which, when coated with a mold release coating, prevents products from sticking to the mold.

MULTI-COLORED COATING means a coating which exhibits more than one color when applied, and which means packaged in a single container and applied in a single coat.

MULTI-COMPONENT COATING means 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 means 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.

OPTICAL COATING means a coating applied to an optical lens.

PAN-BACKING COATING means a coating applied to the surface of pots, pans, or other cooking implements that are exposed directly to a flame or other heating elements.

PREFABRICATED ARCHITECTURAL COMPONENT COATINGS are coatings applied to metal parts and products which are to be used as an architectural structure.

PRETREATMENT COATING means 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.

REPAIR COATING means a coating used to re-coat portions of a previously coated product which has sustained mechanical damage to the coating following normal coating operations.

SHOCK-FREE COATING means a coating applied to electrical components to protect the user from electric shock. The coating has characteristics of being of low capacitance and high resistance, and having resistance to breaking down under high voltage.

SILICONE-RELEASE COATING means any coating which contains silicone resin and is intended to prevent food from sticking to metal surfaces such as baking pans.

SOLAR-ABSORBENT COATING means a coating which has as its prime purpose the absorption of solar radiation.

STENCIL COATING means an ink or a pigmented coating which is rolled or brushed onto a template or stamp in order to add identifying letters, symbols and/or numbers.

TOUCH-UP COATING means a coating used to cover minor coating imperfections appearing after the main coating operation.

TRANSLUCENT COATING means a coating which contains binders and pigment, and is formulated to form a colored, but not opaque, film.

TWO-COMPONENT COATING means a coating requiring the addition of a separate reactive resin, commonly known as a catalyst, before application to form an acceptable dry film.

VACUUM-METALIZING COATING means the undercoat applied to the substrate on which the metal is deposited or the overcoat applied directly to the metal film. Vacuum metalizing/physical vapor deposition (PVD) is the process whereby metal is vaporized and deposited on a substrate in a vacuum chamber.

Recommended Coating Category Definitions and Related Definitions For Automotive/Transportation and Business Machine Plastic Parts Surface Coating:

ADHESION PRIME means a coating that is applied to a polyolefin part to promote the adhesion of a subsequent coating. An adhesion prime is clearly identified as an adhesion prime or adhesion promoter on its accompanying material safety data sheet.

AIR-DRIED COATING means a coating that is dried by the use of air or forced warm air at temperatures up to 90 degrees Celsius (194 degrees Fahrenheit).

BLACK COATING means a coating which meets both of the following criteria:
(i) Maximum lightness: 23 units.
(ii) Saturation: less than 2.8, where saturation equals the square root of $A^2 + B^2$.
These criteria are based on Cielab color space, 0/45 geometry. For spherical geometry, specular included, maximum lightness is 33 units.

BUSINESS MACHINE means a device that uses electronic or mechanical methods to process information, perform calculations, print or copy information or convert sound into electrical impulses for transmission, including devices listed in standard industrial classification numbers 3572, 3573, 3574, 3579, and 3661 and photocopy machines, a subcategory of standard industrial classification number 3861.

CLEAR COATING means a coating which lacks color and opacity or is transparent and which uses the undercoat as a reflectant base or undertone color.

COATING OF PLASTIC PARTS OF AUTOMOBILES AND TRUCKS means the coating of any plastic part that is or shall be assembled with other parts to form an automobile or truck.

COATING OF PLASTIC PARTS OF BUSINESS MACHINES means the coating of any plastic part that is or shall be assembled with other parts to form a business machine.

ELECTROSTATIC PREP COAT means a coating that is applied to a plastic part solely to provide conductivity for the subsequent application of a prime, a topcoat, or other coating through the use of electrostatic application methods. An electrostatic prep coat is clearly identified as an electrostatic prep coat on its accompanying material safety data sheet.

FLEXIBLE COATING means any coating that is required to comply with engineering specifications for impact resistance, mandrel bend, or elongation as defined by the original equipment manufacturer.

FOG COAT means a coating that is applied to a plastic part for the purpose of color matching without masking a molded-in texture. A fog coat shall not be applied at a thickness of more than 0.5 mils of coating solids.

GLOSS REDUCER means a coating that is applied to a plastic part solely to reduce the shine of the part. A gloss reducer shall not be applied at a thickness of more than 0.5 mils of coating solids.

HIGH BAKE coating means a coating which is designed to cure only at temperatures Of more than 90 degrees Celsius (194 degrees Fahrenheit).

RED COATING means a coating which meets all of the following criteria:
(i) Yellow limit: the hue of hostaperm scarlet.
(ii) Blue limit: the hue of monastral red-violet.
(iii) Lightness limit for metallics: 35% aluminum flake.
(iv) Lightness limit for solids: 50% titanium dioxide white.
(v) Solid reds: hue angle of -11 to 38 degrees and maximum lightness of 23 to 45 units.
(vi) Metallic reds: hue angle of -16 to 35 degrees and maximum lightness of 28 to 45 units.
These criteria are based on Cielab color space, 0/45 geometry. For spherical geometry, specular included, the upper limit is 49 units. The maximum lightness varies as the hue moves from violet to orange. This is a natural consequence of the strength of the colorants, and real colors show this effect.

RESIST COAT means a coating that is applied to a plastic part before metallic plating to prevent deposits of metal on portions of the plastic part.

STENCIL COAT means a coating that is applied over a stencil to a plastic part at a thickness of 1 mil or less of coating solids. Stencil coats are most frequently letters, numbers, or decorative designs.

TEXTURE COAT means a coating that is applied to a plastic part which, in its finished form, consists of discrete raised spots of the coating.

VACUUM-METALIZING COATINGS means topcoats and basecoats that are used in the vacuum-metalizing process.

Recommended Coating Category Definitions and Related Definitions for Pleasure Craft Surface Coating:

ANTIFOULANT COATING means any coating applied to the underwater portion of a pleasure craft to prevent or reduce the attachment of biological organisms, and registered with the United States Environmental Protection Agency (EPA) as a pesticide under the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code Section 136).

CLEAR WOOD FINISHES are clear and semi-transparent topcoats applied to wood substrates to provide a transparent or translucent film.

EXTREME HIGH GLOSS COATING means any coating which achieves at least 95 percent reflectance on a 60o meter when tested by ASTM Method D 523-89.

FINISH PRIMER/SURFACER means a coating applied with a wet film thickness of less then 10 mils prior to the application of a topcoat for purposes of providing corrosion resistance, adhesion of subsequent coatings, a moisture barrier, or promotion of a uniform surface necessary for filling in surface imperfections.

HIGH BUILD PRIMER/SURFACER means a coating applied with a wet film thickness of 10 mils or more prior to the application of a topcoat for purposes of providing corrosion resistance, adhesion of subsequent coatings, or a moisture barrier, or promoting a uniform surface necessary for filling in surface imperfections.

HIGH GLOSS COATING means any coating which achieves at least 85 percent reflectance on a 60o meter when tested by ASTM D 523-89.

PLEASURE CRAFT are vessels which are manufactured or operated primarily for recreational purposes, or leased, rented, or chartered to a person or business for recreational purposes. The owner or operator of such vessels shall be responsible for certifying that the intended use is for recreational purposes.

PLEASURE CRAFT COATING means any marine coating, except unsaturated polyester resin (fiberglass) coatings, applied by brush, spray, roller, or other means to a pleasure craft.

PRETREATMENT WASH PRIMER means a coating which contains no more than 12 percent solids, by weight, and at least 1/2 percent acids, by weight; is used to provide surface etching; and is applied directly to fiberglass and metal surfaces to provide corrosion resistance and adhesion of subsequent coatings.

TOPCOAT means any final coating applied to the interior or exterior of a pleasure craft.

Recommended Coating Category Definitions and Related Definitions for Motor Materials:

MOTOR VEHICLE BEDLINER means a multi-component coating, used at a facility that is not an automobile or light-duty truck assembly coating facility, applied to a cargo bed after the application of topcoat to provide additional durability and chip resistance.

MOTOR VEHICLE CAVITY WAX means a coating, used at a facility that is not an automobile or light-duty truck assembly coating facility, applied into the cavities of the vehicle primarily for the purpose of enhancing corrosion protection.

MOTOR VEHICLE DEADENER means a coating, used at a facility that is not an automobile or light-duty truck assembly coating facility, applied to selected vehicle

surfaces primarily for the purpose of reducing the sound of road noise in the passenger compartment.

MOTOR VEHICLE GASKET/SEALING MATERIAL means a fluid, used at a facility that is not an automobile or light-duty truck assembly coating facility, applied to coat a gasket or replace and perform the same function as a gasket. Automobile and light-duty truck gasket/gasket sealing material includes room temperature vulcanization (RTV) seal material.

MOTOR VEHICLE LUBRICATING WAX/COMPOUND means a protective lubricating material, used at a facility that is not an automobile or light-duty truck assembly coating facility, applied to vehicle hubs and hinges.

MOTOR VEHICLE SEALER means a high viscosity material, used at a facility that is not an automobile or light-duty truck 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 automobile and light-duty truck 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.

MOTOR VEHICLE TRUNK INTERIOR COATING means a coating, used at a facility that is not an automobile or light-duty truck assembly coating facility, applied to the trunk interior to provide chip protection.

MOTOR VEHICLE UNDERBODY COATING means a coating, used at a facility that is not an automobile or light-duty truck assembly coating facility, applied to the undercarriage or firewall to prevent corrosion and/or provide chip protection.

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