

Permit Boilerplate Procedures For MANUFACTURING AND COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS

Purpose:

The purpose of this document is to specify requirements for permit approval for the manufacturing and coating of miscellaneous metal parts and products. The boilerplate and procedures documents do not apply to emission units subject to Prevention of Significant Deterioration (PSD) or Non-attainment permit review. The boilerplate procedures document is meant to provide a guideline for the minimum requirements of the Department of Environmental Quality. More stringent requirements may be imposed if necessary to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) or other special requirements.

As stated above, these boilerplate and procedures documents are for the manufacturing and coating of miscellaneous metal parts and products. This does not mean the parts and products from the following industrial categories: metal furniture, automobile and light duty truck, large appliances, metal coil, and beverage can (anything that already has a special standard or subpart).

These boilerplate and procedures documents do not apply to the operational maintenance and repair (OM&R) shop surface coating operations for miscellaneous metal parts. Examples include items like repainting equipment, fork trucks, and touching up various metal parts that get damaged during use at the facility.

Definitions:

The following definitions are for use in this permit boilerplate and procedure and do not necessarily have the same meaning in other portions of the regulations.

Coating Application System - Any operation or system where a surface coating of one type or function is applied, dried or cured. Such a system may include any equipment which applies, conveys, dries, or cures a surface coating, including, but not limited to spray booths, flow coaters, flashoff areas, air dryers, drying areas and ovens. It is not necessary for a coating application system to have an oven, flashoff area or drying area to be included in this definition.

Coating Applicator - An apparatus used to apply a surface coating.

Compliant Coatings - Electrodeposited waterborne coatings, waterborne coatings, high-solids coatings, or powder coatings.

Dip Coating - A process in which metal parts are immersed into a coating bath. After withdrawal, the excess coating is allowed to drain back into a tank.

Electrostatic Spray Coating - A process in which an electrical charge is applied to the atomized coating particles, either by the creation of an ionized zone within the spray cone area or by imparting a charge to the coating stream prior to its release from the spray gun. The charged, atomized coating particles are attracted to the metal part being coated by the electrostatic potential between the coating and the metal part.

Enclosure and Venting – Is defined as:

Enclosure – A full roof, at least two complete walls, and one or two complete side curtains or other barrier material so that all four sides are covered. For this boilerplate, “enclosure” can be defined as the building, i.e. not a room within the building. Some spray booths only consist of a separate building; therefore, the building would be the enclosure.

Venting - Air is drawn into the booth/building and leaves only through the filter/water control device.

Flame Coating - A unique one step powder coating operation. Oxygen/acetylene is typically used with a powder coating (could also be a metal in special cases). A powder is continuously fed into a flame. The flame is not the atomizing source. Instead, the flame is surrounded by a jet of compressed air or inert gas to propel the powder towards the substrate. The flame provides the heat to melt the powder to provide the desired even film.

Flow Coating - A process in which metal parts are conveyed through an enclosed booth under a continuous curtain of flowing coating material. Inside the flow coating system is a series of nozzles (which may be stationary or may oscillate) located at various angles to the conveyor, which discharge streams or curtains of coating that "flow" over the part. The excess coating drains back into a holding tank for reuse.

High Solids Surface Coating – A surface coating which contains 60% or more nonvolatile compounds by volume.

Manufacturing and Coating Miscellaneous Metal Parts and Products Facility - Three types: (1) Facilities that manufacture and coat metal parts and then assemble them to form a final product to be sold. (2) A job shop that manufactures and coats metal parts under contract and the metal parts are shipped to the final product manufacturer to be assembled with other parts into a final product. (3) Facilities that receive newly manufactured metal parts from another plant(s) for assembly into a final product to be sold but apply some type of coating to the final assembled product. This means the parts and products from the following industrial categories: large machinery, small farm machinery, small appliance, commercial machinery, industrial machinery, fabricated metal parts, or any other industrial category which coats metal parts under the SIC code of Major Groups 33, 34, 35, 36, 37, 38, 39, 40, and 41. This does not mean the parts and products from the following industrial categories: metal furniture, automobile and light duty truck, large appliances, metal coil, and beverage can (anything that already has a special standard or subpart).

Miscellaneous Metal Parts and Products - Include, but are not limited to, metal components of the following types of products as well as the products themselves: motor vehicle parts and accessories, bicycles and sporting goods, recreational vehicles, extruded aluminum structural components, railroad cars, heavy duty trucks, medical equipment, lawn and garden equipment, electronic equipment, magnet wire, steel drums, industrial machinery, metal pipes, and numerous other industrial, household, and consumer products. (40 CFR 63, Subpart M)

Powder Coating - A coating usually applied by a sprayer using a dry powder. After the spray powder has been applied to the metal part, the metal part is baked at a sufficiently high temperature to make the powder "flow out" or melt to form a continuous film. Some powder coatings can be applied by dipping to create a thicker film.

Spray Coating - A process in which the liquid coating is atomized into droplets by a spray gun and blown on to the metal parts. This is usually done in a booth which contains the overspray and prevents surface contamination.

Spray Equipment Types – Air-assisted airless (AAL), high volume low pressure (HVLP), high volume stepped down low pressure (HVSDLP), low pressure low volume (LPLV), thin film atomization (TFA), and rotary atomizers.

Total Enclosure - A permanent structure that is constructed around a gaseous emission source so that all gaseous pollutants emitted from the source are collected and ducted through a control device, such that 100% capture efficiency is achieved.

Uncontrolled Emissions – (used for Article 6 permit applicability) These calculations are based on the spray gun capacity at 8760 hrs/yr (without controls) at the worst case coating proposed (no cleaning solvents at 100% VOC). Coating transfer efficiency can be taken into consideration in this calculation, but no other operational constraints should be considered.

****Note:** If a facility already has a permitted throughput on the spray booth and they want to increase that throughput, the permitted throughput is their “uncontrolled emission rate”. To see if the permit action would be a modification and if BACT would apply, the permit writer would compare calculations based on the permitted throughput (CUE) to the calculations based on the spray gun capacity at 8760 hrs/yr (see Example VOC Calculation #2 in the *Emission Limits/Calculations* section).

VOC Control Areas – Areas of Virginia designated as such in 9 VAC 5-20-206.

Waterborne Coatings – Coatings whose volatile portion consists of 91% or more by volume of water and 9% or less by volume of volatile organic compounds.

Applicability:

This boilerplate applies to the manufacturing and coating of miscellaneous metal parts and products for construction or any project (which includes any addition or replacement of an emissions unit, any modification to an emissions unit or any combination of these changes) for Article 6 applicable sources.

Existing Source Rule 4-34, Emission Standards For Miscellaneous Metal Parts and Products Coating Application Systems – This existing source rule applies to each miscellaneous metal parts and products coating application system that is in a VOC emissions control area. The limits on the miscellaneous metal parts and products coating application system cannot be less stringent than Rule 4-34. Exempted from the provisions of this article are coating application systems whose emissions of VOC are not more than 2.7 tons/yr, 15 lbs/day, and 3 lbs/hr, based on the actual emission rate. All VOC emissions from purging or washing solvents are considered in applying these exemption levels.

State Toxics – If the miscellaneous metal parts and products coating operation is subject to any NESHAP subparts (whether at an area source or major source, delegated or not delegated), then an evaluation of state toxics is not a requirement. If no NESHAP subparts apply to the miscellaneous metal parts and products coating application system, then an evaluation of state toxics is required.

****Note:** OAPP is in the process of developing a policy to address the “source category exemption from state toxics”. When the policy is finalized, it will be incorporated into this boilerplate. Until that time, please contact OAPP with any questions.

NSPS – There are currently no NSPS standards applicable for miscellaneous metal parts and products coating operations.

Part 63 NESHAP, Subpart M - National Emission Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products – The facility is subject to this subpart if they (1) own or operate a new, reconstructed, or existing affected source that uses 946 liters (250 gallons (gal)) per year, or more, of coatings that contain hazardous air pollutants (HAP) in the surface coating of miscellaneous metal parts and products and (2) that is a major source, is located at a major source, or is part of a major source of emissions of HAP. There are 17 exemptions from this Subpart and different scenarios the facility may have. Reviewers should consider the entire Subpart and its applicable requirements when evaluating affected facilities.

Part 63 NESHAP, Subpart HHHHHH— National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources –

For the purposes of this boilerplate and procedure documents, the facility is subject to this subpart if they (1) spray application of coatings containing compounds of chromium (Cr), lead (Pb), manganese (Mn), nickel (Ni), or cadmium (Cd), collectively referred to as the target HAP to any part or product made of metal or plastic, or combinations of metal and plastic that are not motor vehicles or mobile equipment, **and** (2) is an area source. An area source of HAP is a source of HAP that is not a major source of HAP, is not located at a major source, and is not part of a major source of HAP emissions.

****Note:** Currently, Virginia does not have delegation of Part 63 NESHAP, Subpart HHHHHH. Therefore, the permit writer should follow guidance document APG-569: Guidance to Implement and Enforce Non-delegated Federal Regulations.

Part 63 NESHAP, Subpart XXXXXX— National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories – The facility is subject to this subpart if they own or operate an area source that is primarily engaged in the operations stated below:

EPA Source Category		NAICS Codes
1	Electrical and Electronic Equipment Finishing Operations	335312 335999
2	Fabricated Metal Products	332117 332999
3	Fabricated Plate Work (Boiler Shops)	332313 332410 332420
4	Fabricated Structural Metal Manufacturing	332312
5	Heating Equipment, except Electric	333414
6	Industrial Machinery and Equipment Finishing Operations	333120 333132 333911
7	Iron and Steel Forging	332111
8	Primary Metal Products Manufacturing	332618
9	Valves and Pipe Fittings	332919

The provisions of this subpart apply to each new and existing affected source listed below if the facility uses materials that contain or have the potential to emit metal fabrication or finishing metal HAP (MFHAP), defined to be the compounds of cadmium, chromium, lead, manganese, and nickel, or any of these metals in the elemental form with the exception of lead. Materials that contain MFHAP are defined to be materials that contain greater than 0.1 percent for carcinogens and greater than 1.0 percent for noncarcinogens. For the MFHAP, this corresponds to materials that contain cadmium, chromium, lead, or nickel in amounts greater than or equal to 0.1 percent by weight (of the metal), and materials that contain manganese in amounts greater than or equal to 1.0 percent by weight (of the metal), as shown in formulation data provided by the manufacturer or supplier, such as the Material Safety Data Sheet for the material.

1. A dry abrasive blasting affected source is the collection of all equipment and activities necessary to perform dry abrasive blasting operations which use materials that contain MFHAP or that have the potential to emit MFHAP.
2. A machining affected source is the collection of all equipment and activities necessary to perform machining operations which use materials that contain MFHAP or that have the potential to emit MFHAP.

3. A dry grinding and dry polishing with machines affected source is the collection of all equipment and activities necessary to perform dry grinding and dry polishing with machines operations which use materials that contain MFHAP or have the potential to emit MFHAP.
4. A spray painting affected source is the collection of all equipment and activities necessary to perform spray-applied painting operations using paints which contain MFHAP. A spray painting affected source includes all equipment used to apply cleaning materials to a substrate to prepare it for paint application (surface preparation) or to remove dried paint; to apply a paint to a substrate (paint application) and to dry or cure the paint after application; or to clean paint operation equipment (equipment cleaning). **Affected source(s) subject to the requirements of this paragraph are not subject to the miscellaneous surface coating provisions of Part 63 NESHAP, Subpart HHHHHH.**
5. A welding affected source is the collection of all equipment and activities necessary to perform welding operations which use materials that contain MFHAP or have the potential to emit MFHAP.

****Note:** Currently, Virginia does not have delegation of Part 63 NESHAP, Subpart XXXXXX. Therefore, the permit writer should follow guidance document APG-569: Guidance to Implement and Enforce Non-delegated Federal Regulations.

Emission Controls and BACT under Article 6:

Listed below are the conditions/emission limits that are considered BACT for a miscellaneous metal parts and products coating operation (listed in items a through d).

- a. Particulate emissions from the spray booth (or other): Controlled by enclosure and venting and fiberglass filters or fabric filter or water curtain or other.
- b. VOC emissions from the spray booth (or other): The facility has 3 options to choose from as stated below (from Rule 4-34):
 1. Compliant coatings: Controlled by use of electrodeposited waterborne coatings or use of waterborne coatings or use of high-solids coatings or use of powder coatings or other.
 2. Add-on Controls: Controlled by total enclosure and carbon adsorption or incineration or other. The control device shall maintain a control efficiency for VOC of no less than 97 percent {or the manufacturer's recommendation if higher}, to be demonstrated by stack test. If an incineration control device is used, the minimum combustion chamber temperature shall be maintained at 1500 °F {or the manufacturer's recommendation if lower/higher} when the incineration unit is in operation. The exhaust gas shall have a minimum 0.5 second {or the manufacturer's recommendation if higher} retention time in the combustion chamber.

****Note:** If the unit is designed with a shorter retention time and is able to meet the standard, the manufacturer must submit that data to support this.
 3. Increased Transfer Efficiency: Controlled by increased transfer efficiency, provided baseline transfer efficiency and actual transfer efficiency are determined by methods that have been approved by DEQ. Transfer efficiency is defined as the ratio of the gallons of solids deposited on the product to the gallons of solids in the coating as applied.
- c. VOC emissions from cleaning or purging operations: Minimized by use of detergents or use of high pressure water or use of non-volatile compounds or reduced use of volatile organic compounds or adjustment of production schedules to minimize coating changes or other (from Rule 4-34).

d. VOC Content of the coating(s) delivered to the spray booth (or other): With the 3 options above to control VOC emissions, there are 3 sets of VOC content limits stated below. If multiple coatings are used on a single spray booth (or other) and the coatings are the same type or perform the same function, then the permittee may take a volume weighted average to show compliance with the limitation above. Such averaging shall not exceed 24 operating hours (the limits are from AQP-2 via Rule 4-34, which references AQP-2 through 9 VAC 5-20-121).

1. Compliant coatings:

- If apply clear coatings: 4.3 lbs VOC/gal coating, excluding water
- If apply extreme performance coatings: 3.5 lbs VOC/gal coating, excluding water
- If coating application system utilizes air or forced air driers: 3.5 lbs VOC/gal coating, excluding water
- For all other coatings and coating application systems: 3.0 lbs VOC/gal coating, excluding water

2. Add-on Controls:

- If apply clear coatings: 10.3 lbs VOC/gal coating solids
- If apply extreme performance coatings: 6.7 lbs VOC/gal coating solids
- If coating application system utilizes air or forced air driers: 6.7 lbs VOC/gal coating solids
- For all other coatings and coating application systems: 5.1 lbs VOC/gal coating solids

3. Increased Transfer Efficiency: The VOC content limit used for this control strategy needs to be (1) in the units of lbs VOC/gal coating solids applied and (2) calculated by the permit writer using the formula in AQP-2 (and stated below).

$$S_{sa} = \frac{S_{cs}}{TE_b}$$

Where: S_{sa} = Standard in lbs VOC/gal coating solids applied (lbs VOC/GSA)
 S_{cs} = Standard in lbs VOC/gal coating solids (lbs VOC/GCS)
 TE_b = Baseline transfer efficiency in gallons solid applied per gallon coating solids (GSA/GCS)

From AQP-2, it states that “the baseline transfer efficiency shall be determined from common industry practices using compliant coatings in a manner that has been approved by the Department.” For the purposes of this boilerplate and procedures documents, this baseline transfer efficiency is 50% (**Note: Some application methods such as air atomized spray and airless spray may be 25%, i.e. below 50%). An example of how to calculate the increased transfer efficiency standard is below:

Example: If apply extreme performance coatings:

S_{sa} = Standard in lbs VOC/gal coating solids applied (what is being calculated)

S_{cs} = 6.7 lbs VOC/gal coating solids (taken from AQP-2)

TE_b = 50%

$$S_{sa} = \frac{S_{cs}}{TE_b} = \frac{6.7}{0.5} = 13.4 \frac{lbsVOC}{GCS}$$

****Note:** If the permit writer needs to check out a coating to see if it meets any of these limits, the explanations and conversion formulas are stated in AQP-2.

There are two scenarios that the facility may face as stated in the bullets below.

- If the facility is located in a VOC control area (and/or is subject to Rule 4-34): Even if BACT is not triggered for VOC (i.e. permit applicability is only because of PM), the requirements are the same; they are either required for BACT or to ensure that the unit meets the requirements of Rule 4-34. The citation included in the specific condition of the permit should either be BACT (9 VAC 5-50-260) or the generic citation for Article 6 (9 VAC 5-80-1180), depending on applicability.
- If the facility is not located in a VOC control area (and is therefore not subject to Rule 4-34): **The conditions above should be the minimum standards unless requested otherwise by the source and determined justified by the region in the engineering analysis.** Examples of justified requests include (1) the need for extreme performance coatings (chemical resistant coating for military goods) and (2) job shops where the restriction would prevent them bidding on work with specific finish specified by the customer (bridge steel required to use coating specified by VDOT).

Emission Limits/Calculations:

- a. Particulate emissions: Particulate emissions from a spray booth (or other) can typically be calculated using information found on the coating Material Safety Data Sheet (MSDS). Parameters such as specific gravity and weight percent solids are normally provided. If the MSDS is not specific enough, then the manufacturer must supply additional information. Along with the MSDS parameters, the particulate emissions calculations may also include transfer efficiency and particulate controls. If the facility blends coatings, calculations can be estimated on an "as applied" basis.
 1. Transfer Efficiency: Particulate transfer efficiencies vary according to the size and shape of the item being coated, as well as the type of coating applicator used. For most miscellaneous metal parts and products coating operations, when the source cannot provide an estimate and when relatively broad, flat surfaces are covered, a 50% particulate transfer efficiency is considered average for non-electrostatic spray operations. Of course, if the coated item is narrow or has many edges, the transfer efficiency can drop dramatically. Each operator as well as type of spray equipment, mode of operation, coating type, or spray booth ventilation can cause transfer efficiency to vary with values from 40% to 90%. Flow, dip or roller coating, or electrostatic spray coating can yield very high transfer efficiencies of 70% to 90% or more. **All transfer efficiencies should be documented by the source and/or the permit writer.**
 2. Particulate Controls: Particulate controls for a spray booth (or other) consist of (1) fiberglass filters, fabric filters, a water curtain, or another comparable control device and (2) enclosure and venting to ensure that all particulate is vented through the

filter/water control device. A 90% – 95% control efficiency should be the minimum control efficiency for particulate controls.

Example Particulate Calculation (new spray booth):

Gun Capacity = 10.0 gals coating/hr
 Coating Density = 7.0 lbs coating/gal coating
 Solids Content = 75%
 Fiberglass Filter Control = 95%
 Transfer Efficiency = 60%

Permit Applicability: (Uncontrolled emissions: transfer efficiency can be used, controls cannot)

$$\text{Hourly Emissions} = \left(\frac{10.0 \text{ gals}}{\text{hr}} \right) * \left(\frac{7.0 \text{ lbs}}{\text{gal}} \right) * (75\%) * (1 - 0.6) = 21.0 \frac{\text{lbsPM}}{\text{hr}}$$

$$\text{Annual Emissions} = \left(\frac{21.0 \text{ lbsPM}}{\text{hr}} \right) * \left(\frac{8760 \text{ hrs}}{\text{yr}} \right) * \left(\frac{\text{tonPM}}{2000 \text{ lbsPM}} \right) = 92.0 \frac{\text{tonsPM}}{\text{yr}}$$

Permit Limits: (Transfer efficiency and controls can be used)

$$\text{Hourly Emissions} = \left(\frac{10.0 \text{ gals}}{\text{hr}} \right) * \left(\frac{7.0 \text{ lbs}}{\text{gal}} \right) * (75\%) * (1 - 0.6) * (1 - 0.95) = 1.05 \frac{\text{lbsPM}}{\text{hr}}$$

$$\text{Annual Emissions} = \left(\frac{1.05 \text{ lbsPM}}{\text{hr}} \right) * \left(\frac{8760 \text{ hrs}}{\text{yr}} \right) * \left(\frac{\text{tonPM}}{2000 \text{ lbsPM}} \right) = 4.6 \frac{\text{tonsPM}}{\text{yr}}$$

b. VOC emissions: Like particulate emissions, VOC emissions from a spray booth (or other) can typically be calculated using information found on the coating MSDS. Parameters such as specific gravity and VOC content (either as a weight percent or in lbs VOC/gal) are normally provided. If the MSDS is not specific enough, then the manufacturer must supply additional information. If the facility blends coatings, calculations can be estimated on an "as applied" basis.

1. VOC Add-on Controls: VOC add-on controls for a spray booth (**or** other) consist of (1) total enclosure and (2) an add-on control device such as carbon adsorption **or** incineration **or** other. A 97% control destruction efficiency should be the minimum expected from any add-on control device.
2. Additional VOC emission sources: In addition to VOC emissions calculations for the spray booth (**or** other), VOC emissions from cure volatiles, various solvents used as coating thinners, cleaning and purging operations, and metal cleaning in preparation of the coating operation should also be calculated for the facility total emissions. Besides cure volatiles, additional VOC emissions do not need to be calculated from ovens if the permit writer assumes 100% of the VOC emissions from the coating comes off prior to the oven.

Cure Volatiles: Cure volatiles are only for units that have a cure oven and that use compliant coatings for VOC controls. Cure volatiles are VOCs that are secondary and

are formed in cure ovens from reactions or oxidation arising from processing the otherwise non-volatile components in the applied coating. For compliance determination, both cure volatiles and non cure volatiles shall be counted towards the VOC content limit (lbs VOC/gal coating, excluding water). The amount of cure volatiles should come from the facility or MSDS manufacturer and it should state that EPA Reference Method 24 was used to determine the amount, i.e. check with the vendor for the VOC content as measured per EPA Method 24. "Method 24 accounts for cure volatiles since it determines VOC by weight loss. The method does not look at what the individual compounds are." (per EPA). It is hard to say if cure volatiles will be a significant amount or not since it will depend on the coating. Most probably give off little to no cure volatiles while other coatings will be primarily cure volatiles. Therefore, cure volatiles should be evaluated on a case-by-case basis.

****Note:** Per EPA Method 24, the test is conducted at 230°F. Therefore, if the facility's cure oven is not above this temperature, then it is very unlikely that there will be any cure volatiles.

Example VOC Calculation #1 (New spray booth):

Gun Capacity = 15.0 gals coating/hr
 VOC Content = 3.0 lbs VOC/gal coating
 RTO Control = 97%
 Proposed Throughput = 15,000 gals coating/yr

Permit Applicability: (Uncontrolled emissions: Controls and proposed throughput cannot be used)

$$\text{Hourly Emissions} = \left(\frac{15.0 \text{ gals}}{\text{hr}} \right) * \left(\frac{3.0 \text{ lbs VOC}}{\text{gal}} \right) = 45.0 \frac{\text{lbs VOC}}{\text{hr}}$$

$$\text{Annual Emissions} = \left(\frac{45.0 \text{ lbs VOC}}{\text{hr}} \right) * \left(\frac{8760 \text{ hrs}}{\text{yr}} \right) * \left(\frac{\text{ton VOC}}{2000 \text{ lbs VOC}} \right) = 197.1 \frac{\text{tons VOC}}{\text{yr}}$$

Permit Limits: (Controls and throughput can be used)

$$\text{Hourly Emissions} = \left(\frac{15.0 \text{ gals}}{\text{hr}} \right) * \left(\frac{3.0 \text{ lbs VOC}}{\text{gal}} \right) * (1 - 0.97) = 1.4 \frac{\text{lbs VOC}}{\text{hr}}$$

$$\text{Annual Emissions} = \left(\frac{15,000 \text{ gal}}{\text{yr}} \right) * \left(\frac{3.0 \text{ lbs VOC}}{\text{gal}} \right) * \left(\frac{\text{ton VOC}}{2000 \text{ lbs VOC}} \right) * (1 - 0.97) = 0.7 \frac{\text{tons VOC}}{\text{yr}}$$

Example VOC Calculation #2 (Modified spray booth):

Gun Capacity = 15.0 gals coating/hr
 VOC Content = 3.0 lbs VOC/gal coating
 RTO Control = 97%
 Current Throughput = 15,000 gals coating/yr
 Proposed Throughput = 30,000 gal coating/yr

Permit Applicability: (Uncontrolled emissions: Controls and proposed throughput cannot be used)

New Uncontrolled Emissions (NUE) =

$$\left(\frac{15.0\text{gals}}{\text{hr}}\right) * \left(\frac{3.0\text{lbsVOC}}{\text{gal}}\right) * \left(\frac{8760\text{hrs}}{\text{yr}}\right) * \left(\frac{\text{tonVOC}}{2000\text{lbsVOC}}\right) = 197.1 \frac{\text{tonsVOC}}{\text{yr}}$$

Current Uncontrolled Emissions (CUE) =

$$\left(\frac{15,000\text{gal}}{\text{yr}}\right) * \left(\frac{3.0\text{lbsVOC}}{\text{gal}}\right) * \left(\frac{\text{tonVOC}}{2000\text{lbsVOC}}\right) = 22.5 \frac{\text{tonsVOC}}{\text{yr}}$$

Permit Applicability = NUE – CUE

$$197.1 \text{ tons/yr} - 22.5 \text{ tons/yr} = \mathbf{174.6 \text{ tons VOC/yr} > 10 \text{ tons VOC/yr}}$$

Therefore, this will be a modification subject to permitting and BACT.

Permit Limits: (Controls and proposed throughput can be used)

$$\text{Hourly Emissions} = \left(\frac{15.0\text{gals}}{\text{hr}}\right) * \left(\frac{3.0\text{lbsVOC}}{\text{gal}}\right) * (1 - 0.97) = 1.4 \frac{\text{lbsVOC}}{\text{hr}}$$

Annual Emissions =

$$\left(\frac{30,000\text{gal}}{\text{yr}}\right) * \left(\frac{3.0\text{lbsVOC}}{\text{gal}}\right) * \left(\frac{\text{tonVOC}}{2000\text{lbsVOC}}\right) * (1 - 0.97) = 1.4 \frac{\text{tonsVOC}}{\text{yr}}$$

- c. **Toxic Pollutant emissions:** The number and type of toxic emission can vary widely depending upon the coating being used. Toxic pollutants can be VOCs or particulates. Like particulate and VOC emissions, toxic emissions from a spray booth (or other) can typically be calculated using information found on the coating MSDS. Parameters such as specific gravity and individual toxic content (either as a weight percent or in lbs toxic pollutant/gal) are normally provided. If the MSDS is not specific enough, then the manufacturer must supply additional information. If the facility blends coatings, calculations can be estimated on an “as applied” basis.

Particulate toxic pollutant emissions should be calculated like particulate emissions as stated above. Instead of using a solids content percentage, a toxic pollutant content percentage should be used. Transfer efficiency and particulate controls should be used for these particulate toxic pollutants as well. Volatile toxic pollutants should be calculated like VOC emissions as stated above (just substitute the VOC content for the individual toxic pollutant content).

1. **Toxic Metal Compounds:** When evaluating toxic metal compounds for state toxics applicability, only the weight percent of metal of the compound should be quantified and evaluated, not the entire compound. However, for federal program applicability (Title V or Part 63 NESHAP), the entire compound should be quantified and counted toward the major source threshold levels.

Example - How to separate the metal toxics out of the compound:

From MSDS:

Cobalt compound = Cobalt 2-ethylhexanoate = $2(C_8H_{15}O_2)Co$
Cobalt 2-ethylhexanoate weight percent in coating = 0.2%

Calculate weight fraction of cobalt (Co) in cobalt 2-ethylhexanoate:

Molar weight of cobalt (Co) = 58.93 lbs Co/mol
Molar weight of $2(C_8H_{15}O_2)Co$ = 345.34 lbs $2(C_8H_{15}O_2)Co/mol$

Weight fraction of cobalt (Co) in cobalt 2-ethylhexanoate:

$$\left(\frac{58.93 \text{ lbs Co}}{\text{mol}} \right) * \left(\frac{\text{mol}}{345.34 \text{ lbs } 2(C_8H_{15}O_2)Co} \right) = 0.17 \frac{\text{lbs Co}}{\text{lbs } 2(C_8H_{15}O_2)Co}$$

Maximum percent by weight of cobalt (Co):

$$\left(\frac{0.002 \text{ lbs } 2(C_8H_{15}O_2)Co}{\text{coating}} \right) * \left(\frac{0.17 \text{ lbs Co}}{\text{lbs } 2(C_8H_{15}O_2)Co} \right) = 0.00034 \frac{\text{lbs Co}}{\text{coating}} = 0.034\%$$

2. HDI and MDI Extra Information: A folder has been placed on DEQNet (Program - Air Permitting - Air Toxics/MACT Info - MDI and HDI Documents) that contains Hexamethylene diisocyanate (HDI) and 4,4'-methylene diphenyl diisocyanate (MDI) documents for permit writers to read and use for informational purposes.

Requirements by Reference:

This condition should be placed in the permit only if the source will be a Title V source. Even though Virginia does not have delegation of the majority of the Part 63 NESHAP Subparts that apply to this boilerplate, conditions of the Part 63 NESHAP Subparts are still placed in the Title V permit (i.e. the state then takes delegation of that facility).

Visible Emissions:

Visible emissions from the spray booth (or other) exhaust[s] shall not exceed 5 percent opacity as determined by EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during startup, shutdown and malfunction.

Recordkeeping:

Recordkeeping is divided into two sections: (1) If the facility is located in a VOC control area and/or is subject to Rule 4-34 and (2) If the facility is not located in a VOC control area and/or is not subject to Rule 4-34. The reason there are two sections of recordkeeping is because of AQP-4. In Rule 4-34 (9 VAC 5-40-4870), it states that "The provisions of 9 VAC 5-40-50 (Notification, Records and Reporting) apply." Within 9 VAC 5-40-50, it references 9 VAC 5-20-121, which then references AQP-4. Therefore, if the facility is subject to Rule 4-34, it must follow AQP-4.

If a new or modified facility is just located in a VOC control area and not subject to Rule 4-34, it is still subject to AQP-4. As stated in the *Applicability* section of AQP-4, "These procedures are to be used for maintaining records for existing surface coating operations and graphic arts printing processes subject to the emission standards prescribed under Rules 4-26 through 4-36 of the regulations and any new or modified source subject to any volatile organic compound emission standard for a coating operation or printing process prescribed pursuant to Part VIII (which means *Permits for Stationary Sources*) of the regulations." AQP-4 was initially part of a RACT Control Technology Guideline (CTG) and was therefore placed in the State Implementation Plan (SIP).

RACTs were written at the time for those VOC non-attainment areas in an effort to help get them out of non-attainment and into attainment status. Today, those "old VOC non-attainment areas" are now called "VOC controlled areas". Therefore, new and modified facilities located in a VOC control area are subject to AQP-4.

- If the facility is located in a VOC control area and/or is subject to Rule 4-34:

On site records should contain:

- a. The permittee shall maintain the following information at all times:
 - i. Coating application system number
 - ii. Method of application
 - iii. Number and types of coats applied to the substrate
 - iv. Drying method
 - v. Substrate type
- b. The permittee shall maintain the following information on a daily basis:
 - i. Coating application system number
 - ii. Time period of each application run
 - iii. Coating identification number
 - iv. Diluent and clean up solvent identification numbers
- c. The permittee shall maintain the following information for each coating at all times:
 - i. Supplier name, coating name, and identification number
 - ii. Coating density (lb/gal)
 - iii. Volatile content of coating as supplied (percent by weight)
 - iv. Water content of coating as supplied (percent by weight)
 - v. Exempt solvent content of coating as supplied (percent by weight)
 - vi. Solids content of coating as supplied (percent by volume)
 - vii. Name of diluent added, if any
 - viii. Identification number of diluent
 - ix. Diluent VOC density (lbs/gal)
 - x. VOC content of diluent (percent by weight)
 - xi. Exempt solvent content of diluent (percent by weight)
 - xii. Diluent/coating ratio (gal diluent/gal coating)
- d. Daily and annual hours of operation of {spray booth(s) or other}. Annual hours of operation shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

****Note:** Items a through d are all from AQP-4.
- e. **[O]** Daily and annual throughput of {(specify coating, solvent, etc.)} to the {spray booth(s) or other} (in gallons). Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- f. **[O]** Daily and annual throughput of {volatile organic compound or particulate matter or other} to the {spray booth(s) or other} (in tons). Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

****Note:** Items e and f are optional depending on what kind of throughput condition the facility wanted. "Daily" is added to these items because of AQP-4.

- g. Daily and annual throughput (in gallons) of each cleaning solution, coating, diluent, {adhesive, ink, thinner, fountain solution, other} used in the {spray booth(s) or other}. Annual throughput shall be calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

- h. Daily and annual VOC emissions from each {spray booth or other}. Annual emissions shall be calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

****Note:** For items g and h: "Daily" is added to these items because of AQP-4.

- i. Average daily and monthly VOC content {(in lbs VOC/gal coating, excluding water) or (in lbs VOC/gal coating solids) or (in lbs VOC/gal coating solids applied)} from each {spray booth or other}.

****Note:** This condition item is necessary for compliance with Conditions 10-12 if multiple coatings are used on a single {spray booth(s) or other}. As stated in those conditions, "the permittee may take a volume weighted average to show compliance with the limitation. Such averaging shall not exceed 24 operating hours."

- j. Material Safety Data Sheets (MSDS) or other vendor information showing VOC content, toxic compound content, water content, solids content, and density for each {coating, thinner, cleaning solution, other} used.

- k. **[O]** Operation and control device monitoring records for the {process or air pollution control device} as required in Condition {condition number}.

- l. **[O]** **[For Add-on Controls]** The permittee shall maintain the following information at all times:

- i. Control device identification number and model number
- ii. Manufacturer
- iii. Installation date
- iv. Coating application systems controlled
- v. Whether or not the control device is always in operation when the system it is serving is in operation
- vi. Type of control device
- vii. Destruction or removal efficiency
- viii. Date tested
- ix. Design combustion temperature (°F) for thermal incinerators
- x. Design exhaust gas temperature (°F), design temperature rise across catalyst bed (°F), and anticipated frequency of catalyst change for catalytic incinerators
- xi. Design inlet temperature of cooling medium (°F) and design exhaust gas temperature (°F) for a condenser
- xii. Design pressure drop across the adsorber at breakthrough, specific VOC species analyzed, and its concentration at breakthrough for a carbon adsorber

- xiii. Emission test results, including inlet VOC concentration (ppm), outlet VOC concentration (ppm), method of concentration determination, and date of determination
- xiv. Type and location of capture system
- xv. Capture efficiency (percent)
- xvi. Method of determining capture efficiency

****Note:** Item I is from AQP-4.

- m. **[O]** *[For Add-on Controls]* Results of all stack tests and visible emissions evaluations.
 - n. **[O]** *[For Add-on Controls Incineration]* The minimum combustion chamber temperature observations for the {incineration}.
 - o. **[O]** *[For Increased Transfer Efficiency]* Baseline transfer efficiency and actual transfer efficiency.
 - p. Scheduled and unscheduled maintenance and operator training.
 - q. **[O]** {other records as required}.
- If the facility is **not** located in a VOC control area and/or is **not** subject to Rule 4-34:

On site records should contain:

- a. **[O]** Annual hours of operation of {spray booth(s) **or** other}, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- b. **[O]** Annual throughput of {(specify coating, solvent, etc.)} to the {spray booth(s) **or** other} (in gallons), calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- c. **[O]** Annual throughput of {volatile organic compound **or** particulate matter **or** other} to the {spray booth(s) **or** other} (in tons), calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.

****Note:** Items a through c are optional depending on what kind of throughput condition the facility wanted.

- d. Annual throughput (in gallons) of each cleaning solution, {coating, adhesive, ink, thinner, fountain solution, other} used in the {spray booth(s) **or** other}, calculated monthly as the sum of each consecutive 12-month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the most recently completed calendar month to the individual monthly totals for the preceding 11 months.
- e. Annual VOC emissions from each {spray booth **or** other}. Annual emissions shall be calculated monthly as the sum of each consecutive 12 month period. Compliance for the consecutive 12-month period shall be demonstrated monthly by adding the total for the

most recently completed calendar month to the individual monthly totals for the preceding 11 months.

- f. Average daily and monthly VOC content {(in lbs VOC/gal coating, excluding water) or (in lbs VOC/gal coating solids) or (in lbs VOC/gal coating solids applied)} from each {spray booth or other}.

****Note:** This condition item is necessary for compliance with Conditions 8-10 if multiple coatings are used on a single {spray booth(s) or other}. As stated in those conditions, "the permittee may take a volume weighted average to show compliance with the limitation. Such averaging shall not exceed 24 operating hours."

- g. Material Safety Data Sheets (MSDS) or other vendor information showing VOC content, toxic compound content, water content, solids content, and density for each {coating, thinner, cleaning solution, other} used.
- h. **[O]** Operation and control device monitoring records for the {process or air pollution control device} as required in Condition {condition number}.
- i. **[O]** *[For Add-on Controls Incineration]* The minimum combustion chamber temperature observations for the {incineration}.
- j. **[O]** *[For Add-on Controls]* Results of all stack tests and visible emissions evaluations.
- k. **[O]** *[For Increased Transfer Efficiency]* Baseline transfer efficiency and actual transfer efficiency.
- l. Scheduled and unscheduled maintenance and operator training.
- m. **[O]** {other records as required}.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.

Initial Notifications:

These initial notifications shall be included in the permit:

- a. The actual date on which {construction, modification, replacement, **or** relocation} of the {spray booth(s) or other} commenced within 30 days after such date.
- b. The anticipated start-up date of the {spray booth(s) or other} postmarked not more than 60 days nor less than 30 days prior to such date.
- c. The actual start-up date of the {spray booth(s) or other} within 15 days after such date.
- d. **[O]** *[For Add-on Controls]* The anticipated date of the performance tests and visible emissions evaluation of the {control technology} postmarked at least 30 days prior to such date.

Testing Requirements:

Initial VEE: This boilerplate does not contain a requirement for an initial visible emissions evaluation, unless an add-on control is operating. An initial visible emissions evaluation shall be conducted to show that the unit is in compliance with the 5% opacity standard.

Initial Stack Testing: This boilerplate does not contain a requirement for stack testing, unless an add-on control is operating. Initial performance tests shall be conducted for VOC capture efficiency from the total enclosure (using Reference Method 204) and for VOC to determine compliance with the emission limits and control efficiency requirements listed in the permit.

For the other control scenarios, (i.e. compliance coatings and increased transfer efficiency), the source will demonstrate compliance by material balance.

****Note:** The possibility of testing for a specific criteria or toxic pollutant should not be ruled out entirely.

State Only Enforceable Requirements:

The State Only section of the boilerplate is only if the facility uses toxic pollutants. If the miscellaneous metal parts and products coating operation is not exempt from state toxics, then for each toxic pollutant over its respective state toxic exemption threshold, an emission limit must be included in the permit (whether it be lbs/hr, tons/yr, or both). Recordkeeping must then be placed in the permit so that the facility can show compliance with these emission limits.