

FOR OHIO EPA USE FACILITY ID: _____ EU ID: _____ PERMIT#: _____
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EMISSIONS ACTIVITY CATEGORY FORM CHROMIUM ELECTROPLATING AND ANODIZING

This form is to be completed for each chromium electroplating/anodizing tank. State/Federal regulations which may apply to the chromium electroplating/anodizing tank are listed in the instructions. Note that there may be other regulations which apply to this emissions unit which are not included in this list.

1. Reason this form is being submitted (Check one)
 New Permit Renewal or Modification of Air Permit Number(s) (e.g. P001) _____

2. Maximum Operating Schedule: _____ hours per day; _____ days per year
 If the schedule is less than 24 hours/day or 365 days/year, what limits the schedule to less than maximum? See instructions for examples. _____

3. Identify the type of chromium tank:
- Open surface hard chromium electroplating tank
 - Enclosed hard chromium electroplating tank
 - Decorative chromium electroplating tank using a chromic acid bath
 - Decorative chromium electroplating tank using a trivalent chromium bath
 - Chromium anodizing tank

4. Hourly production rate (indicate appropriate units). Please see the instructions for clarification of "Maximum" and "Average" for new versus existing operations:

Hourly	Rate	Units (e.g. pounds)
Average production		
Maximum production		

5. Annual production rates (indicate appropriate units). Please see the instructions for clarification of "Maximum" and "Average" for new versus existing operations:

Annual	Rate	Units (e.g. pounds)
Average production		
Maximum production		

6. Maximum rectifier capacity (in amperes)

This Tank: _____

Entire Facility: _____

Does the tank have a nonresettable ampere-hour meter? Yes No

No rectifier associated with this tank.

7. Tank Dimensions

Length (feet): _____

Width (feet): _____

8. Type of air pollution control equipment to which this tank is vented (Check all that apply):

- Composite mesh-pad (CMP) system
- Packed-bed scrubber (PBS)
- PBS/CMP system
- Fiber-bed mist eliminator
- Other _____
- This tank is not vented to air pollution control equipment

Operating pressure drop range (inches of water): Minimum: _____ Maximum: _____

9. Type of internal tank control methods (Check all that apply):

Foam blanket

Minimum foam blanket thickness _____ inches

Chemical fume suppressant containing a wetting agent

Specific chemical name: _____

Maximum surface tension of the bath _____ dynes/cm²

How is the surface tension measured? Stalagmometer Tensiometer

Trivalent chromium bath that incorporates a wetting agent as a bath ingredient

Specific chemical name: _____

Other _____

None

INSTRUCTIONS FOR COMPLETION OF THE EMISSIONS ACTIVITY CATEGORY FORM FOR CHROMIUM ELECTROPLATING AND ANODIZING

GENERAL INSTRUCTIONS:

Provide complete responses to all applicable questions. If an item does not apply to the emissions unit, write in "Not Applicable" or "NA". If the answer is not known, write in "Not Known" or "NK". If you need assistance in understanding a question after reading the instructions below, contact your Ohio EPA District Office or Local Air Agency for assistance. Submittal of an incomplete application will delay application review and processing. In addition, the application may be returned as incomplete if all applicable questions are not answered appropriately.

APPLICABLE REGULATIONS:

The following State and Federal Regulations may be applicable to chromium electroplating and anodizing. Note that there may be other regulations which apply to this emissions unit which are not included in this list.

Federal: 40 CFR Part 63, (MACT) Subpart A (General Provisions),
40 CFR Part 63, (MACT) Subpart N (National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks)

State: 3745-31-02 (Permit to Install or Permit to Install and Operate)
3745-17-07 (Control of Visible Particulate Emissions from Stationary Sources)
3745-17-11 (Restrictions on Particulate Emissions from Industrial Processes)

If you would like a copy of these regulations, contact your Ohio EPA District Office or Local Air Agency. State regulations may also be viewed and downloaded from the Ohio EPA website at <http://www.epa.state.oh.us/Default.aspx?tabid=2906>. Federal regulations may be viewed and downloaded at http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=084ac55877a7478650e7a886163d820b&c=ecfr&tpl=/ecfrbrowse/Title40/40tab_02.tpl.

CALCULATING EMISSIONS:

U.S. EPA has developed emission factors for many types of emissions units and published them in a document titled "Compilation of Air Pollutant Emission Factors, AP-42", available from the following website: <http://www.epa.gov/ttn/chief/ap42/index.html>. See Chapter 12.20 (Electroplating).

In addition, manufacturers of some types of emissions units and most types of control equipment develop emissions estimates or have stack test data which you can request. Stack testing of the emissions may be done. Emissions unit sampling test data may be either for this emissions unit or a similar one located at the facility or elsewhere. You may develop your own emission factors by mass balance or other knowledge of your process, if you can quantify inputs and outputs accurately. You may be able to do this on a small scale or over a short period of time, if it is not practical during regular production. If you have control equipment, you may be able to quantify the amount of pollutants collected over a known time period or production amount. Any emission factor calculation should include a reference to the origin of the emission factor or control efficiency.

SPECIFIC INSTRUCTIONS:

1. Indicate whether this is an application for a new permit or an application for permit renewal. If applying for a permit renewal, provide the 4-character OEPA emissions unit identification number.
2. Provide the maximum number of hours per day and days per year the chromium electroplating or anodizing process is expected to operate. The following are examples of why the maximum number of hours per day may be less than 24 or the maximum number of days per year may be less than 365 (this list is not all-inclusive):
 - The facility can only operate during daylight hours.
 - The process can only operate within a certain range of ambient temperatures.
 - The process is limited by another operation (i.e., a bottleneck).
3. Identify the type of chromium tank by placing a check mark in the appropriate box.

“Hard chromium electroplating” means a process by which a thick layer of chromium (typically 1.3 to 760 microns) is electrodeposited on a base material to provide a surface with functional properties such as wear resistance, a low coefficient of friction, hardness, and corrosion resistance. In this process, the part serves as the cathode in the electrolytic cell and the solution serves as the electrolyte. Hard chromium electroplating process is performed at current densities typically ranging from 1,600 to 6,500 Amperes per square meter (A/m^2) for total plating times ranging from 20 minutes to 36 hours depending upon the desired plate thickness.

“Open surface hard chromium electroplating tank” means a chromium electroplating tank that is ventilated at a rate consistent with good ventilation practices for open tanks.

“Enclosed hard chromium electroplating tank” means a chromium electroplating tank that is equipped with an enclosing hood and ventilated at half the rate or less of an open surface tank of the same surface area.

“Decorative chromium electroplating” means the process by which a thin layer of chromium (typically 0.003 to 2.5 microns) is electrodeposited on a base metal, plastic, or undercoating to provide a bright surface with wear and tarnish resistance. In this process, the part(s) serves as the cathode in the electrolytic cell and the solution serves as the electrolyte. Typical current density applied during this process ranges from 540 to 2,400 Amperes per square meter (A/m^2) for total plating times ranging between 0.5 to 5 minutes.

“Chromium anodizing” means the electrolytic process by which an oxide layer is produced on the surface of a base metal for functional purposes (e.g., corrosion resistance or electrical insulation) using a chromic acid solution. In chromium anodizing, the part to be anodized acts as the anode in the electrical circuit, and the chromic acid solution, with a concentration typically ranging from 50 to 100 grams per liter (g/L), serves as the electrolyte.

4. State the average and maximum hourly production rates (indicate units) of the process operation. The average hourly production rate is the actual (for existing) annual production for the last full

calendar year or projected actual annual production (for new operations) divided by the total hours of operation for that process during the same calendar year or projected hours of production (for new operations).

Formula for average hourly production rate: actual or projected actual annual rate divided by the actual or projected actual annual hours of operation.

“Maximum” is defined as the operation’s highest attainable production rate. This often is identified by the manufacturer as the “maximum design capacity” for equipment.

5. State the projected annual production and indicate the appropriate units (e. g., 10,000 tons of steel, 150,000 barrels of benzene, etc.). “Maximum” is defined as the operations highest attainable production rate. This often is identified by the manufacturer as the “maximum design capacity” for equipment.
6. Enter the maximum rectifier capacity for the individual tank covered by the permit and for the entire facility in amperes. Indicate whether or not the tank has a nonresettable ampere-hour meter. If there is no rectifier associated with the tank, mark the appropriate box.
7. Enter the length (longer horizontal measurement) and the width (shorter horizontal measurement, in feet, of the working portion (i.e., liquid surface area) of the chromium electroplating or anodizing tank.
8. Identify the control equipment that is used to control the emissions by placing a check mark in the appropriate box.

“Composite mesh-pad system” means an add-on air pollution control device typically consisting of several mesh-pad stages. The purpose of the first stage is to remove large particles. Smaller particles are removed in the second stage, which consists of the composite mesh pad. A final stage may remove any reentrained particles not collected by the composite mesh pad.

“Packed-bed scrubber” means an add-on air pollution control device consisting of a single or double packed bed that contains packing media on which the chromic acid droplets impinge. The packed-bed section of the scrubber is followed by a mist eliminator to remove any water entrained from the packed-bed section.

“Fiber-bed mist eliminator” means an add-on air pollution control device that removes contaminants from a gas stream through the mechanisms of inertial impaction and Brownian diffusion. These devices are typically installed downstream of another control device, which serves to prevent plugging, and consist of one or more fiber beds. Each bed consists of a hollow cylinder formed from two concentric screens; the fiber between the screens may be fabricated from glass, ceramic plastic, or metal.

Identify the operating pressure drop range in inches of water as determined from the most recent stack test that demonstrated that the emissions unit was in compliance.

9. Indicate the internal tank control method employed by placing a check mark in the appropriate box.

“Foam blanket” means the type of chemical fume suppressant that generates a layer of foam across the surface of a solution when current is applied to that solution.

“Chemical fume suppressant” means any chemical agent that reduces or suppresses fumes or mists at the surface of an electroplating or anodizing bath. Another term for fume suppressant is mist suppressant.

“Wetting agent” means the type of chemical fume suppressant that reduces the surface tension of the liquid.

If a foam blanket is used, indicate the minimum foam blanket thickness as established during the stack test or use the default value of 1 inch.

If a chemical fume suppressant containing a wetting agent is used, indicate the specific chemical name of the fume suppressant, the maximum surface tension of the bath as established during the stack testing or use the default value of 45 dynes/cm as measure by a stalagmometer or 35 dynes/cm as measured by a tensiometer, and how the surface tension is measured.

“Stalagmometer” means an instrument used to measure the surface tension of a solution by determining the mass of a drop of liquid by weighing a known number of drops or by counting the number of drops obtained from a given volume of liquid.

“Tensiometer” means an instrument used to measure the surface tension of a solution by determining the amount of force needed to pull a ring from the liquid surface. The amount of force is proportional to the surface tension.

If a trivalent chromium bath incorporates a wetting agent as a bath ingredient, indicate the specific chemical name.