



Department of Environmental Quality  
Air Quality Program

**GENERAL  
AIR CONTAMINANT DISCHARGE PERMIT  
ASSESSMENT REPORT  
DECORATIVE CHROMIUM ELECTROPLATING**

SOURCE DESCRIPTION AND QUALIFICATION

1. This General Permit is designed to regulate air contaminant emissions from decorative chromium electroplating tanks.
2. The facilities assigned to this General Permit may not emit any other air pollution that requires regulation beyond that specified in this permit, except for other pollution emissions that also qualify for assignment, and are assigned, to other General Permits and categorically insignificant activities defined by OAR Chapter 340 Division 200. A facility that has experienced reoccurring or serious compliance problems is not eligible for assignment to this permit.
3. If this General Permit does not cover all requirements applicable to the facility, the other applicable requirements must be covered by assignment to one or more General Permit Attachments in accordance with OAR 340-216-0062, otherwise the facility must obtain a Simple or Standard Permit. A facility requesting to be assigned to a General Permit Attachment, in accordance with OAR 340-216-0062, for a source category in a higher annual fee class, must be reassigned to the General Permit for the source category in the higher annual fee class.

ASSESSMENT OF EMISSIONS

4. Facilities assigned to this General Permit are sources of hexavalent chromium emissions.
5. DEQ has assessed the level of emissions from these facilities and determined that facilities complying with the operational limits and monitoring requirements of this permit will remain area sources and compliant with applicable emissions limits. However, facilities assigned to this permit will be required to track and report various data elements to demonstrate compliance. If DEQ determines that facilities assigned to this permit emit above permitted emissions limits, the permittee will be required to obtain a different permit.

SPECIFIC AIR PROGRAM APPLICABILITY

6. This permit incorporates the National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations in 40 CFR Part 63, Subpart N (Hard and Decorative Chromium Electroplating and Chromium Anodizing) for decorative chromium electroplating. EPA promulgated the NESHAP on January 25, 1995, and several amendments and/or

corrections since initial promulgation. EPA finalized a residual risk and technology review on September 19, 2012. That review resulted in revisions to the emission limits for total chromium, addition of housekeeping requirements to minimize fugitive emissions, and a requirement to phase-out the use of Perfluorooctane sulfonic acid-based fume suppressants. The NESHAP, including amendments and corrections through July 1, 2020, are adopted as a state rule in OAR 340-244-0220.

#### NESHAP APPLICABILITY

7. The NESHAP applies to each chromium electroplating or chromium anodizing tank at facilities performing hard chromium electroplating, decorative chromium electroplating, or chromium anodizing.
8. Process tanks associated with a chromium electroplating or chromium anodizing process, but in which neither chromium electroplating nor chromium anodizing is taking place, are not subject to the provisions of the NESHAP. Examples of such tanks include, but are not limited to, rinse tanks, etching tanks, and cleaning tanks. Likewise, tanks that contain a chromium solution, but in which no electrolytic process occurs, are not subject to this NESHAP. An example of such a tank is a chrome conversion coating tank where no electrical current is applied.
9. This General permit is being reissued for approximately a one-year period. Upon the next expiration date, a General ACDP for facilities subject to 40 C.F.R. part 63 subpart N will not be reissued or otherwise available. Facilities that conduct these activities will be required to apply for, and obtain, a source specific ACDP.

#### NESHAP MACHINE DEFINITIONS AND CLASSIFICATION:

10. The NESHAP splits chromium electroplating into two categories:
  - a. Decorative chromium electroplating: 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. Decorative chromium electroplating can be performed using either a chromic acid (or hexavalent chromium) bath or a trivalent chromium bath.
  - b. Hard chromium electroplating: 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  $A/m^2$  for total plating times ranging from 20 minutes to 36 hours depending upon the desired plate thickness.

EMISSIONS

## 11. PM:

## a. Emission factors from AP42:

Process	Total PM (lb/A-hr)	EF Rating
Decorative Chromium Electroplating	9.848E-6	E
-- With fume suppressant	3.568E-8	E

## b. Annual PTE in lbs/yr for PM is calculated as follows:

$$E_{PM} = \sum_{i=1}^n (EF_i \times RC_i \times 8760 \text{hrs/yr})$$

Where:

- $E_{PM}$  = PM emissions, in lbs/yr  
 $EF_i$  = Emission factor for electroplating tank i, from table above or from a performance test on electroplating tank i, in lbs/Amperes-hr  
 $RC_i$  = Rectifier capacity for electroplating tank i, in Amperes

## c. Actual PM emissions in lbs/yr is calculated as follows:

$$E_{PM} = \sum_{i=1}^n (EF_i \times RU_i)$$

Where:

- $E_{PM}$  = PM emissions, in lbs/yr  
 $EF_i$  = Emission factor for electroplating tank i, from table above or from a performance test on electroplating tank i, in lbs/Amperes-hr  
 $RU_i$  = Actual rectifier usage for electroplating tank i over a 12-month period, in Amperes-hr

## 12. Hazardous Air Pollutants (HAPs):

## a. Emission factors from AP42:

Process	Chromium Compounds (lb/A-hr)	EF Rating
Decorative Chromium Electroplating	4.710E-6	D
-- With fume suppressant	1.713E-8	D

## b. Annual PTE in lbs/yr for chromium compounds is calculated as follows:

$$E_{cr} = \sum_{i=1}^n (EF_i \times RC_i \times 8760 \text{hrs/yr})$$

Where:

- $E_{cr}$  = Chromium emissions, in lbs/yr

- $E_{fi}$  = Emission factor for electroplating tank i, from table above or from a performance test on electroplating tank i, in lbs/Amperes-hr
- $RC_i$  = Rectifier capacity for electroplating tank i, in Amperes

c. Actual PM emissions in lbs/yr is calculated as follows:

$$E_{cr} = \sum_{i=1}^n (EF_i \times RU_i)$$

Where:

- $E_{cr}$  = Chromium emissions, in lbs/yr
- $EF_i$  = Emission factor for electroplating tank i, from table above or from a performance test on electroplating tank i, in lbs/Amperes-hr
- $RU_i$  = Actual rectifier usage for electroplating tank i over a 12-month period, in Amperes-hr

**NESHAP EMISSION STANDARDS:**

13. The NESHAP contains three compliance approaches for decorative electroplating tanks:
- a. Add-on controls: The following is required for this compliance option.
    - i. Limit the concentration of total chromium, emitted to the atmosphere, to 0.007 mg/dscm for all existing decorative chromium electroplating tanks using chromic acid; or
    - ii. Not allowing the concentration of total chromium in the exhaust gas stream discharged to the atmosphere to exceed 0.006 mg/dscm for all new or reconstructed decorative chromium electroplating tanks using chromic acid.
    - iii. Follow specific work and housekeeping practices to ensure that control system and monitoring equipment are maintained and operated properly.
    - iv. Follow additional work practices and housekeeping standards that include quarterly inspections of control devices, ductwork, and monitoring equipment.
    - v. Develop an operation and maintenance (O&M) plan.
  - b. Use of wetting agents: The following is required for this compliance option.
    - i. Limit the surface tension of the electroplating bath to 40 dynes per centimeter using wetting agents.
    - ii. After September 21, 2015, the permittee must not add PFOS-based fume suppressants to any affected open surface decorative chromium electroplating tank.
    - iii. Follow specific work practices and housekeeping standards to ensure that monitoring equipment are maintained and operated properly.
    - iv. Develop an operation and maintenance (O&M) plan.

- c. Use trivalent chromium bath containing a wetting agent as a bath component:
  - i. Maintain records of batch component purchases.

#### NESHAP COMPLIANCE DEMONSTRATION

- 14. Add-on Controls:
  - a. Initial Compliance:
    - i. Perform an initial performance test.
    - ii. Establish operating parameters to be monitored in order to ensure continuous compliance.
  - b. Continuous Compliance:
    - i. Monitor operating parameters to demonstrate continuous compliance.
    - ii. Maintain the following records for 5 years:
      - A. Inspection records;
      - B. Equipment maintenance records;
      - C. Malfunction records;
      - D. Records to demonstrate compliance with operation and maintenance plan;
      - E. Records of fume suppressant usage, manufacturer, and product name;
      - F. Records of occurrence, duration, and cause of excess emissions;
      - G. Performance test results;
      - H. Monitoring data.
- 15. Use of wetting agents:
  - a. Initial Compliance:
    - i. Measure surface tension.
  - b. Continuous Compliance:
    - i. Measure surface tension to demonstrate continuous compliance.
    - ii. Maintain the following records for 5 years:
      - A. Equipment maintenance records;
      - B. Records of occurrence, duration, and cause of excess emissions;
      - C. Surface tension measurement data.
- 16. Use of trivalent chromium bath containing a wetting agent as a bath component:
  - a. Initial Compliance:
    - i. Maintain records of batch component purchases.
  - b. Continuous Compliance:
    - i. Maintain records of batch component purchases.

#### NESHAP REPORTING:

- 17. The NESHAP specifies the information required for each report. Report forms are also available through DEQ.

- a. Initial Notification Report: This report is used to notify EPA and DEQ that a source is subject to the NESHAP. It also provides some preliminary facility and tank information. It is due according to the following schedule:
  - i. New sources: Is due as soon as possible before construction is scheduled to commence.
- b. Notification of Compliance Status Report: This report is due shortly after the compliance date and is used to demonstrate to EPA and DEQ that the tank is in compliance with the NESHAP. It includes information on the how compliance was achieved, how it was initially demonstrated and the necessary ongoing demonstration measurements. It is due according to the following schedule:
  - i. New sources using add-on controls: Is due 270 days after startup.
  - ii. New sources using wetting agents: Is due 30 days after startup.
- c. Performance test report: This report is required within 60 days of completing a performance test. EPA requires this report to be submitted via EPA's WebFIRE database by using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through the EPA's Central Data Exchange (CDX) ([www.epa.gov/cdx](http://www.epa.gov/cdx)).
- d. Ongoing Compliance Status Report: This report is required to be prepared annually and retained onsite. This report is not required for tanks using trivalent chromium baths that contain a wetting agent as a bath component.
- e. Exceedance Report: This report should be prepared semiannually and submitted to DEQ if:
  - i. The total duration of excess emissions exceeds 1% of the total operating time for the reporting period; and
  - ii. The total duration of malfunction of the add-on air pollution control device and monitoring equipment exceeds 5% of the total operating time.

#### COMPLIANCE ASSURANCE

18. Permittees are required to maintain records of inspections, maintenance, malfunctions, an operations and maintenance plan, test reports, operating time, ampere hours, fume suppressants, and complaints, as applicable. Many of these items are reported to DEQ annually.
19. DEQ staff members review annual report submittals and perform site inspections of the permitted facilities on a routine basis; inspections may be performed more frequently if complaints are received.

#### REVOCATION OF ASSIGNMENT

20. Any facility that fails to demonstrate compliance or fails to conform to the requirements and limitations contained in the permit may have its assignment to the General Permit revoked. The facility would then be subject to more stringent level of permitting.

PUBLIC NOTICE

21. General Air Contaminant Discharge Permits are authorized by Oregon Administrative Rules and are part of the State Implementation Plan. As part of the General ACDP issuance process under OAR chapter 340 division 209, the public was provided at least 30 days to submit written comments. DEQ reviewed all comments received within the comment period and modified the permit in response to comments to correct typographical errors.

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9/23/2016; drd 6/25/21;