

# HEXAVALENT CHROMIUM AIRBORNE TOXIC CONTROL MEASURE FOR CHROME PLATING AND CHROMIC ACID ANODIZING OPERATIONS

## PROPOSED REGULATION ORDER (1/98 version)

The Air Resources Board staff is proposing to amend Section 93102, Subchapter 7.5, Chapter 1, Part 111, Titles 17, California Administrative Code. The amendments are significantly different from the originally adopted regulation. As a result, the ARB staff is proposing to delete all of the existing language as shown in ~~strikeout~~ below and add new text. The changes to section 93102 are necessitated by the United States Environmental Protection Agency's promulgation of the National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks (Chrome Plating NESHAP).

~~93102. Hexavalent Chromium Airborne Toxic Control Measure--Decorative and Hard Chrome Plating and Chromic Acid Anodizing Facilities.~~

~~(a) Definitions. For the purposes of this section, the following definitions shall apply:~~

~~(1) "Ampere-hours" means the integral of electrical current applied to a plating tank (amperes) over a period of time (hours).~~

~~(2) "Anti-mist additive" means a chemical which reduces the emission rate from the tank when added to and maintained in the plating tank.~~

~~(3) "Chrome" means metallic chrome.~~

~~(4) "Chrome plating" means either hard or decorative chrome plating.~~

~~(5) "Chromic acid" means an aqueous solution of chromium trioxide ( $\text{CrO}_3$ ), or a commercial solution containing chromic acid, dichromic acid ( $\text{H}_2\text{CrO}_7$ ), or trichromic acid ( $\text{H}_2\text{Cr}_3\text{O}_{10}$ ).~~

~~(6) "Chromic acid anodizing" means the electrolytic process by which a metal surface is converted to an oxide surface coating in a solution containing chromic acid.~~

~~(7) "Chromium" means hexavalent chromium.~~

~~(8) "Control equipment" means any device which reduces emissions from the emissions collection system.~~

~~(9) "Decorative chrome plating" means the process by which chromium is electrodeposited from a solution containing compounds of chromium onto an object resulting in a chrome layer 1 micron (0.04 mil.) thick or less.~~

- (10) ~~"Emission factor" means the mass of chromium emitted during a test conducted in the emissions collection system in accordance with ARB Test Method 425, divided by the ampere-hours consumed by the tanks in the tested emissions collection system, expressed as the mass of chromium emitted per ampere-hour of electrical current consumed.~~
- (11) ~~"Emissions collection system" means a device or apparatus used to gather chromium emissions from the surface of a chrome plating or chromic acid anodizing tank or tanks.~~
- (12) ~~"Facility" means a business or businesses engaged in chrome plating or chromic acid anodizing which are owned or operated by the same person or persons and are located on the same parcel or on contiguous parcels.~~
- (13) ~~"Facilitywide emissions from hard chrome plating or chromic acid anodizing" means the total emissions from all hard chrome plating or chromic acid anodizing at the facility over a calendar year. Emissions shall be calculated as the sum of emissions from the emissions collection systems at the facility. The emissions from an emissions collection system shall be calculated by multiplying the emission factor for that emissions collection system by the sum of ampere-hours consumed during that year for all of the tanks served by the emissions collection system.~~
- (14) ~~"Hard chrome plating" means the process by which chromium is electrodeposited from a solution containing compounds of chromium onto an object resulting in a chrome layer thicker than 1 micron (0.04 mil).~~
- (15) ~~"Plating Tank" means any container used to hold a chromium or chromic acid solution for the purposes of chrome plating or chromic acid anodizing.~~
- (16) ~~"Uncontrolled chromium emissions from the hard chrome plating or chromic acid anodizing facility" means the chromium emissions from the emissions collection systems at the facility calculated as if no control equipment is in use. For the purpose of determining compliance with this rule, the uncontrolled chromium emissions shall be calculated using an emission factor based on tests conducted in accordance with ARB Test Method 425 or 14 mg/ampere-hour, whichever is less.~~

~~(b) Requirements for Decorative Chrome Plating Facilities~~

- ~~(1) No person shall operate a decorative chrome plating tank unless an anti-mist additive is continuously maintained in the plating tank, or control equipment is installed and used, in a manner which has been demonstrated to and approved by the district air pollution control officer as reducing chromium emissions by 95 percent or more relative to chromium emissions when an anti-mist additive is not maintained, or control equipment is not installed and used.~~

~~(c) Requirements for Hard Chrome Plating and Chromic Acid Anodizing Facilities~~

- ~~(1) The owners or operators of all hard chrome plating and chromic acid anodizing facilities shall maintain a continuous record of current integrated over time (ampere-hours) for all plating tanks for each collection system used in the hard chrome plating or chromic acid anodizing operations and shall, within six months after district adoption of regulations enacting this control measure, and upon request thereafter, submit the information to the district air pollution control officer.~~
- ~~(2) No person shall operate a plating tank for hard chrome plating or chromic acid anodizing unless the tank has an emissions collection system.~~
- ~~(3) No person shall operate a hard chrome plating or chromic acid anodizing tank unless:
  - ~~(A) the chromium emissions from the emissions collection system serving the plating tank have been reduced by 95 percent or more of the uncontrolled chromium emissions or~~
  - ~~(B) the chromium emissions from the emissions collection system serving the plating tank have been reduced to less than 0.15 milligrams (mg) of chromium per ampere-hour of electrical charge applied to the plating tank.~~~~
- ~~(4) No person shall operate a hard chrome plating tank or chromic acid anodizing tank at a facility if facilitywide chromium emissions from hard chrome plating or chromic acid anodizing are greater than 2 pounds per year, but less than 10 pounds per year, unless:
  - ~~(A) the chromium emissions from the emissions collection systems serving the plating tanks have been reduced by at least 99 percent of the uncontrolled chromium emissions from the hard chrome plating or chromic acid anodizing facility or~~
  - ~~(B) the chromium emissions from the emissions collection systems are reduced to less than 0.03 mg of chromium per ampere-hour of electrical charge applied to the tanks.~~~~
- ~~(5) No person shall operate a hard chrome plating or chromic acid anodizing tank at a facility if facilitywide chromium emissions from hard chrome plating or chromic acid anodizing are 10 pounds per year or greater, unless:
  - ~~(A) the chromium emissions from the emissions collection systems serving the plating tanks have been reduced by a least 99.8 percent of the uncontrolled chromium emissions from the hard chrome plating or chromic acid anodizing facility or~~
  - ~~(B) the chromium emissions from the emissions collection systems are reduced to less~~~~

than 0.006 mg of chromium per ampere-hour electrical charge applied to the tanks.

~~(d) — Compliance Schedule - Decorative Chrome Plating Facilities~~

~~(1) — No later than six months after district adoption of regulations enacting this control measure, the owners or operators of decorative chrome plating tanks must comply with the provisions of (b)(1).~~

~~(e) — Compliance Schedule - Hard Chrome Plating and Chromic Acid Anodizing Facilities~~

~~(1) — No later than twelve months after district adoption of regulations enacting this control measure, the owner or operator of a hard chrome plating or chromic acid anodizing facility subject to sections (c)(3) or (c)(5) shall submit to the district air pollution control officer an application for an Authority to Construct the equipment necessary to meet the requirements of (c)(2) and (c)(3) and no later than eighteen months after district adoption of regulations enacting this control measure, the facility shall be in compliance with the requirements of (c)(2) and (c)(3).~~

~~(2) — No later than eighteen months after district adoption of regulations enacting this control measure, the owner or operator of a hard chrome plating or chromic acid anodizing facility subject to (c)(4) shall submit to the district air pollution control officer an application for an Authority to Construct the equipment necessary to meet the requirements of (c)(2) and (c)(4) and no later than twenty four months after district adoption of regulations enacting this control measure the facility shall be in compliance with the requirements of (c)(2) and (c)(4).~~

~~(3) — No later than thirty months after district adoption of regulations enacting this control measure, the owner or operator of a hard chrome plating or chromic acid anodizing facility subject to (c)(5) shall submit to the district air pollution control officer an application for an Authority to Construct the equipment necessary to meet the requirements of (c)(5) and no later than forty eight months after district adoption of regulations enacting this control measure the facility shall be in compliance with the requirements of (c)(5).~~

~~NOTE: Authority cited: Sections 39600, 39601, 39650 and 39666, Health and Safety Code.  
Reference: Sections 39650, 39666, Health and Safety Code.~~

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## **HEXAVALENT CHROMIUM AIRBORNE TOXIC CONTROL MEASURE FOR CHROME PLATING AND CHROMIC ACID ANODIZING OPERATIONS**

17 CCR, Section 93102. Hexavalent Chromium Airborne Toxic Control Measure for Chrome Plating and Chromic Acid Anodizing Operations.

**(a) Applicability.**

(1) Each chromium electroplating or chromic acid anodizing tank at facilities performing hard chromium electroplating, decorative chromium electroplating, or chromic acid anodizing.

(2) Process tanks associated with a chromium electroplating or chromic acid anodizing process, but in which neither chromium electroplating nor chromic acid anodizing is taking place, are not subject to the provisions of this section. 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 which no electrolytic process occurs, are not subject to this section. An example of such a tank is a chrome conversion coating tank where no electrical current is applied.

(3) The requirements of sections (d), (e), (f) do not apply to decorative chrome electroplating tanks using a trivalent chromium bath with a wetting agent.

(4) The requirements of sections (b) and (f) do not apply during periods of breakdown, provided the provision of the permitting agency's breakdown rule [insert reference to district's breakdown rule] are met.

(5) The owner or operator of a major source subject to the requirements of this section is required to obtain a title V permit from the permitting authority in which the major source is located.

**(b) Standards.**

**(1) Hard Chrome Electroplating Facilities**

During tank operation, each owner or operator of an existing, modified, or new source shall control hexavalent chromium emissions discharged to the atmosphere from that source by reducing the hexavalent chromium emissions from the add-on air pollution control device(s) serving the electroplating tank as identified below.

Facility size	Requirement
Large (controlled emission $\geq$ 10 lbs/yr, or rectifier capacity $\geq$ 60 million amp-hr/yr)	$\leq$ 0.006 milligrams of hexavalent chromium per ampere-hour of electrical charge (mg/amp-hr)
Medium (controlled emission $<$ 10 lbs/yr but $>$ 2 lbs/yr, and rectifier capacity $<$ 60 million amp-hr/yr)	$\leq$ 0.03 mg/amp-hr
Small (new/modified constructed or modified after 12/16/93) (controlled emission $\leq$ 2 lbs/yr, and rectifier capacity $<$ 60 million amp-hr/yr)	$\leq$ 0.03 mg/amp-hr
Small (existing) (controlled emission $\leq$ 2 lbs/yr, and rectifier capacity $<$ 60 million amp-hr/yr)	$\leq$ 0.15 mg/amp-hr

**[Note: On January 16, 1998, U.S. EPA issued a letter concerning limiting surface tension at certain existing small hard chrome platers as a method for achieving compliance with the NESHAP. In the letter, U.S. EPA indicated that Regional offices may approve, on a case-by-case basis, alternative standards for existing hard chrome platers constructed prior to 1993 that have a rectifier capacity of 500,000 amp-hours or less. The alternative standard would be a 45 dyne/cm<sup>2</sup> surface tension requirement. We are currently evaluating whether such a provision should be added to this rule and request your comments on this issue.]**

**(b) Standards. (con't)**

**(2) Decorative Chrome Electroplating and Chromic Acid Anodizing Facilities**

During tank operation, each owner or operator of an existing, modified, or new source shall control hexavalent chromium emissions discharged to the atmosphere by meeting either or both of the requirements identified below.

Method of compliance	Requirement
add-on air pollution control equipment, chemical fume suppressants forming a foam blanket, mechanical fume suppressants (i.e. polyballs)	$\leq 0.01$ milligrams per dry standard cubic meter of air (mg/dscm) ( $4.4 \times 10^{-6}$ gr/dscf)
chemical fume suppressants containing a wetting agent	$\leq 45$ dynes per centimeter (dynes/cm) ( $3.1 \times 10^{-3}$ pound-force per foot [lbF/ft])

**(3) Decorative Chromium Electroplating Tanks Using a Trivalent Chromium Bath**

During tank operation, each owner or operator of an existing, modified, or new source shall control chromium emissions discharged to the atmosphere by meeting either or both of the requirements identified below.

Method of compliance	Requirement
add-on air pollution control equipment, chemical fume suppressants forming a foam blanket, mechanical fume suppressants (i.e. polyballs)	$\leq 0.01$ mg/dscm ( $4.4 \times 10^{-6}$ gr/dscf)
chemical fume suppressants containing a wetting agent	use wetting agent as bath ingredient and comply with recordkeeping and reporting provisions §(g)(11) and §(h)(5).



**(c) Performance Test Requirements and Test Methods.**

**(1) Performance test requirement.** Any source subject to the emission standards in section (b)(1), or any source electing to comply with the mg/dscm emission standard in sections (b)(2) or (b)(3) shall conduct a performance test to demonstrate compliance with the applicable emission standards as follows:

- (A) On or before 180 days after [effective date of regulation] for all existing sources; or
- (B) Within 180 days after initial startup for a new or modified source that has an initial startup after the effective date of this regulation.

**(2) Use of existing performance test.** A performance test conducted prior to [effective date of this regulation] may be used to demonstrate compliance provided it is approved by the permitting agency and the U.S. EPA.

**(3) Approved test methods.**

(A) Emissions testing shall be conducted in accordance with either of the following test methods:

1. CARB Test Method 425, or
2. U.S. EPA Method 306, with a minimum of three test runs; or
3. SCAQMD Method 205.1, for results reported as total chromium.
4. Smoke Test to Verify the Seal Integrity of Covers Designed to Reduce Chromium Emissions from Electroplating and Anodizing Tanks (See Appendix 6.)

(B) Surface tension shall be measured in accordance with U.S. EPA Method 306B.

**(4) Pre-Test protocol.** Sources subject to the provisions of §(c)(1) above, must submit a pre-test protocol at least 60 days prior to conducting a performance test. The pre-test protocol should include the test performance criteria of the end user and all assumptions, required data, and calculated targets for testing the source target chromium concentration, the preliminary chromium analytical data, and the planned sampling parameters. In addition, the pre-test protocol should include information on equipment, logistics, personnel, and other resources necessary for an efficient and coordinated test.

**(5) Test all emission points.** Each emission point must be tested unless a waiver is granted by U.S. EPA and approved by the permitting agency.

**(d) Parameter Monitoring.**

**(1) Ampere-hours.** Each tank of group of tanks shall have installed a continuous recording, non resettable, ampere-hour meter that operates on the electrical power lines connected to the tank or group of tanks. A separate meter shall be installed for each emissions collection system.

**(2) Pressure drop.** The owner or operator shall continuously monitor the pressure drop across an add-on control device such as a composite mesh-pad (CMP), packed-bed scrubber (PBS), a CMP/PBS, fiber-bed mist eliminator, and a HEPA filter with a mechanical gauge. The gauge shall be located so that it can be easily visible and in clear sight of the operation or maintenance personnel. The pressure drop shall be maintained within  $\pm 1$  inch of water of the value established during the performance test to demonstrate compliance with the emission limitation.

**(3) Inlet velocity pressure.** The owner or operator shall continuously monitor the inlet velocity pressure of a packed-bed scrubber with a mechanical gauge. The gauge shall be located so that it can be easily visible and in clear sight of the operation or maintenance personnel. The inlet velocity pressure shall be maintained within  $\pm 10$  percent of the value established during the performance test to demonstrate compliance with the emission limitation.

**(4) Surface tension.** The owner or operator shall monitor the surface tension of the chrome plating or chromic acid anodizing tank that contains a wetting agent with either a stalagmometer or tensiometer using U.S. EPA method 306B. The surface tension shall be maintained at or below the value required by § (b)(2). Surface tension shall be measured daily for 20 days, and weekly thereafter as long as there are no violations of the surface tension requirement.

**(5) Foam blanket thickness.** The owner or operator shall monitor the foam blanket thickness across the surface of the chrome plating or chromic acid anodizing tank. The foam blanket thickness shall be maintained consistent with the requirements established during the performance test to demonstrate compliance with the emission limitation. Foam thickness shall be measured hourly for 15 days, and daily thereafter as long as there are no violations of the foam thickness requirement.

**(6) Polyballs or similar mechanical fume suppressants.** The owner or operator shall visually inspect the chrome plating or chromic acid anodizing tank for coverage comparable to the coverage during the performance test daily.

**(e) Inspection and Maintenance Requirements.**

**(1) Hard and decorative chrome electroplating, and chromic acid anodizing operations using add-on air pollution control equipment shall comply with the applicable inspection and maintenance requirements listed in Table (e)(1).**

Table (e)(1) -- Summary of Inspection and Maintenance Requirements for Sources Using Add-on Air Pollution Control Devices

<b>Control Technique/Equipment</b>	<b>Inspection and Maintenance Requirements</b>	<b>Frequency</b>
Composite mesh-pad (CMP) system.	<ol style="list-style-type: none"> <li>1. Visually inspect device to ensure that there is proper drainage, no unusual chromic acid buildup on the pads, and no evidence of chemical attack that affects the structural integrity of the device.</li> <li>2. Visually inspect back portion of the mesh pad closest to the fan to ensure there is no breakthrough of chromic acid mist.</li> <li>3. Visually inspect ductwork from tank to the control device to ensure there are no leaks.</li> <li>4. Perform washdown of the composite mesh-pads in accordance with manufacturer's recommendations.</li> </ol>	<ol style="list-style-type: none"> <li>1. 1/quarter.</li> <li>2. 1/quarter.</li> <li>3. 1/quarter.</li> <li>4. Per manufacturer.</li> </ol>
Packed-bed scrubber (PBS) <sup>A</sup>	<ol style="list-style-type: none"> <li>1. Visually inspect device to ensure there is proper drainage, no unusual chromic acid buildup on the packed-beds, and no evidence of chemical attack that affects the structural integrity of the device.</li> <li>2. Visually inspect back portion of the chevron blade mist eliminator to ensure that it is dry and there is no breakthrough of chromic acid mist.</li> <li>3. Same as number 3 above.</li> </ol>	<ol style="list-style-type: none"> <li>1. 1/quarter.</li> <li>2. 1/quarter.</li> <li>3. 1/quarter.</li> </ol>

Table (e)(1) -- Summary of Inspection and Maintenance Requirements for Sources Using Add-on Air Pollution Control Devices (con't.)

Control Technique/Equipment	Inspection and Maintenance Requirements	Frequency
PBS/CMP system	<ol style="list-style-type: none"> <li>4. Add fresh makeup water to the packed-bed</li> <li>1. Same as for CMP system</li> <li>2. Same as for CMP system</li> <li>3. Same as for CMP system</li> <li>4. Same as for CMP system</li> </ol>	<ol style="list-style-type: none"> <li>4. Whenever makeup is added.</li> <li>1. 1/quarter.</li> <li>2. 1/quarter.</li> <li>3. 1/quarter.</li> <li>4. Per manufacturer.</li> </ol>
Fiber-bed mist eliminator <sup>B</sup>	<ol style="list-style-type: none"> <li>1. Visually inspect fiber-bed unit and prefiltering device to ensure there is proper drainage, no unusual chromic acid buildup in the units, and no evidence of chemical attack that affects the structural integrity of the devices.</li> <li>2. Visually inspect ductwork from tank or tanks to the control device to ensure there are no leaks.</li> <li>3. Perform washdown of fiber elements in accordance with manufacturer's recommendations.</li> </ol>	<ol style="list-style-type: none"> <li>1. 1/quarter.</li> <li>2. 1/quarter.</li> <li>3. Per manufacturer.</li> </ol>
HEPA filter	<ol style="list-style-type: none"> <li>1. Visually inspect for leaks.</li> <li>2. Replace HEPA filter.</li> </ol>	<ol style="list-style-type: none"> <li>1. 1/quarter.</li> <li>2. Per manufacturer specifications or permitting agency's requirement.</li> </ol>

Table (e)(1) -- Summary of Inspection and Maintenance Requirements for Sources Using Add-on Air Pollution Control Devices (con't.)

<b>Control Technique/Equipment</b>	<b>Inspection and Maintenance Requirements</b>	<b>Frequency</b>
Merlin Hood	<ol style="list-style-type: none"> <li>1. Drain the air-inlet (purge air) valves at the end of each day that the tank is in operation.</li> <li>2. Visually inspect access door seals and membranes for integrity.</li> <li>3. Drain the evacuation unit directly into the plating tank or into the rinse tanks (for recycle into the plating tank).</li> <li>4. Visually inspect membranes for perforations using a light source that adequately illuminates the membrane (e.g., Grainger model No. 6X971 Fluorescent Hand Lamp).</li> <li>5. Visually inspect all clamps for proper operation; replace as needed.</li> <li>6. Clean or replace filters on evacuation unit.</li> <li>7. Visually inspect piping to, piping from, and body of evacuation unit to ensure there are no leaks and no evidence of chemical attack.</li> <li>8. Replace access door seals, membrane evacuation unit filter, and purge air inlet check valves in accordance with the manufacturer's recommendations.</li> </ol>	<ol style="list-style-type: none"> <li>1. 1/day.</li> <li>2. 1/week.</li> <li>3. 1/week.</li> <li>4. 1/month.</li> <li>5. 1/month.</li> <li>6. 1/month.</li> <li>7. 1/quarter.</li> <li>8. Per manufacturer.</li> </ol>

Table (e)(1) -- Summary of Inspection and Maintenance Requirements for Sources Using Add-on Air Pollution Control Devices (con't.)

Control Technique/Equipment	Inspection and Maintenance Requirements	Frequency
Pitot tube	Backflush with water, or remove from the duct and rinse with fresh water. Replace in the duct and rotate 180 degrees to ensure that the same zero reading is obtained. Check pitot tube ends for damage. Replace pitot tube if cracked or fatigued.	1/quarter.
Ampere-hour meter	Install, calibrate, and maintain per manufacturer's specifications	Per manufacturer.

<sup>A</sup> Horizontal packed-bed scrubbers without continuous recirculation must add make-up water to the top of the packed-bed.

<sup>B</sup> Inspection and maintenance requirements for the control device installed upstream of the fiber-bed mist eliminator to prevent plugging do not apply as long as the inspection and maintenance requirements for the fiber-bed unit are followed.

**(2) Hard and decorative chrome electroplating, and chromic acid anodizing operations using chemical fume suppressants (i.e. wetting agent, foam) or mechanical fume suppressants (i.e. polyballs) shall comply with the applicable inspection and maintenance requirements in Table (e)(2).**

Table (e)(2) -- Summary of Inspection and Maintenance Requirements for Sources Using Chemical or Mechanical Fume Suppressants

Equipment	Inspection and Maintenance Requirement for Monitoring Equipment	Frequency
Ampere-hour meter	Install, calibrate, and maintain per manufacturer's specifications	Per manufacturer.
Stalagmometer/ Tensiometer	Calibrate and maintain per manufacturer's specifications	Per manufacturer.

**(f) Operation and Maintenance Plan Requirements.**

**(1) Prepare the O&M plan.** The owner or operator subject to the inspection and maintenance requirements of paragraph (e)(1) shall prepare an operation and maintenance plan. For major sources, the plan shall be incorporated by reference into the source's title V permit. The plan shall incorporate the inspection and maintenance requirements for that device or monitoring equipment, as identified in Table (e)(1) of this section and include the following elements:

- (A) A standardized checklist to document the operation and maintenance of the source, the add-on air pollution control device, and the process and control system monitoring equipment; and
- (B) Procedures to be followed to ensure that equipment is properly maintained.

[To satisfy the inspection and maintenances of this subsection, the owner or operator may use applicable standard operating procedure (SOP) manuals, Occupational Safety and Health Administration (OSHA) plans, or other existing plans, provided the alternative plans meet the requirements of this subsection.]

**(2) Retain the O&M plan.** The owner or operator shall keep the written operation and maintenance plan on record after it is developed to be made available for inspection, upon request.

**(3) Changes to the O&M plan.** Any changes made by the owner or operator should be documented in an addendum to the plan. In addition, the owner or operator shall keep previous (i.e., superseded) versions of the operation and maintenance plan on record to be made available for inspection, upon request, for a period of 5 years after each revision to the plan.

**(4) Revisions to the O&M plan to address breakdowns.** The operation and maintenance plan shall be revised as necessary to minimize breakdowns.

**(g) Recordkeeping.**

**(1) Inspection records for sources using add-on control air pollution control devices.** The owner or operator shall maintain inspection records to document that the inspection and maintenance requirements of § (e) and Table (e)(1), and that the provisions of the operation and maintenance plan required by § (f) have been met. The record can take the form of a checklist and should identify:

- (A) the device inspected,
- (B) the date and time of inspection,
- (C) a brief description of the working condition of the device during the inspection,
- (D) maintenance activities performed on the components of the air pollution control system (i.e. duct work replacement, filter pad replacement, fan replacement, etc), and
- (E) any actions taken to correct deficiencies found during the inspection.

**(2) Inspection records for sources using chemical fume suppressants (i.e. wetting agent, foam) or mechanical fume suppressants (i.e. polyballs).** The owner or operator shall maintain inspection records to document that the inspection and maintenance requirement of § (e)(2) and Table (e)(2) have been met. The record can take the form of a checklist.

**(3) Performance test records.** The owner or operator shall maintain test reports documenting the conditions and results of all performance tests.

**(4) Monitoring data records.** The owner or operator shall maintain records of monitoring data required by § (d) that are used to demonstrate compliance with the standard including the date and time the data are collected.

- (A) Cumulative rectifier capacity records. Record the actual cumulative rectifier capacity of each hard chromium electroplating tank expended during each month of the reporting period, and the total capacity expended to date.
- (B) Pressure drop. The owner or operator shall record the pressure drop once a week.
- (C) Inlet Velocity Pressure. The owner or operator shall record the inlet velocity pressure weekly.
- (D) Surface tension. The owner or operator shall record the surface tension daily for 20 days, and weekly thereafter as long as there are no violations of the surface tension requirement.
- (E) Foam thickness. The owner or operator shall record the foam thickness hourly for 15 days, and daily thereafter as long as there are no violations of the foam thickness requirement.

**(5) Breakdown records.** The owner or operator shall maintain records of the occurrence, duration, and cause (if known) and action taken on each breakdown.



**(g) Recordkeeping.** (con't.)

**(6) Records of excesses.** The owner or operator shall maintain records of any emissions exceeding the emission limitation in § (b), and/or monitoring parameter values established under § (b), or any site-specific operating parameters established for alternative equipment. The records shall include the date of the occurrence, the duration, cause (if known), and, where possible, the magnitude of any excess emissions.

**(7) Records demonstrating facility size.** An owner or operator may demonstrate the size of a hard chromium electroplating facility through the definitions in Appendix 1. Alternatively, an owner or operator of a facility with a maximum cumulative potential rectifier capacity of 60 million amp-hr/yr or more may be considered small or medium if the actual cumulative rectifier capacity is less than 60 million amp-hr/yr as demonstrated using the following procedures:

- (A) Annual actual cumulative rectifier capacity. Show by records that the facility's previous annual actual cumulative rectifier capacity was less than 60 million amp-hr/yr, by using nonresettable ampere-hr meters and keeping monthly records of actual ampere-hour usage for each 12-month rolling period following the compliance date. The actual cumulative rectifier capacity for the previous 12-month rolling period shall be tabulated monthly by adding the capacity for the current month to the capacities for the previous 11 months; or
- (B) Maximum potential cumulative potential rectifier capacity limit. By accepting a limit on the maximum potential cumulative potential rectifier capacity of a hard chromium electroplating facility through a title V permit or a permitting agency operating permit and by maintaining monthly records in accordance with § (g)(4)(A) to demonstrate that the limit has not been exceeded.

**(8) Records of fume suppressant additions.** For sources using fume suppressants to comply with the standards, the owner or operator shall maintain records of the date, time, approximate volume, and product identification of the fume suppressants that are added to the electroplating or anodizing bath.

**(9) Records of trivalent bath components.** For sources complying with § (b)(3) using trivalent chrome baths, the owner or operator shall maintain records of the bath components purchased, with the wetting agent clearly identified as a bath constituent contained in one of the components.

**(10) New/modified source review information.** The owner or operator shall maintain records supporting the notifications and reports required by the permitting agency's new source review provisions and/or § (i).

**(11) Records retention.** All records shall be maintained for five years, two years on site.

**(h) Reporting.**

**(1) Performance test documentation.**

(A) Notification of performance test.

1. The owner or operator of a source shall notify the permitting agency of his or her intention to conduct a performance test at least 60 calendar days before the performance test is scheduled.
2. The provisions in § (h)(1)(A)1., above, do not apply if the performance test was conducted prior to the effective date of the standard and was approved by the permitting agency and the U.S. EPA.

(B) Reports of performance test results. The owner or operator should report performance test results to the permitting agency. Reports of performance test results shall be submitted no later than 90 days following the completion of the required performance test, and shall be submitted as part of the notification of compliance status required by paragraph (2) of this subsection.

(C) The content of performance test reports is identified in Appendix 2.

**(2) Initial compliance status report.** An initial compliance status report is required each time that a source becomes subject to the requirements of this section. The owner or operator shall submit to the permitting agency an initial compliance status report, signed by the responsible official who shall certify its accuracy, attesting to whether the source has complied with this rule.

(A) Initial compliance status report due date.

1. For sources required to conduct a performance test, the initial compliance status report shall be submitted to the permitting agency no later than 90 calendar days following completion of the compliance demonstration.
2. For sources that are not required to complete a performance test, the initial compliance status report shall be submitted to the permitting agency no later than 30 days after the effective date of this rule for existing sources, or at start-up for new sources.

(B) The content of the initial compliance status report is identified in Appendix 3.

**(h) Reporting.** (con't.)

**(3) Ongoing compliance status reports.** The owner or operator shall submit a summary report to the permitting agency to document the ongoing compliance status.

(A) Frequency of ongoing compliance status reports.

1. The report shall be submitted annually for major sources.
2. The report shall be prepared annually and made available to the permitting agency upon request for area sources.

(B) The content of ongoing compliance status reports is identified in Appendix 4.

**(4) Reports of breakdowns.** The owner or operator shall report breakdowns as required by the permitting agency's breakdown rule.

**(5) Reports associated with trivalent chromium baths using a wetting agent.**

Owners or operators with trivalent chromium baths using a wetting agent are not subject to paragraphs (1) through (3) of this subsection, but must instead submit the following reports:

(A) Sources currently using trivalent chrome. No later than 30 days after the effective date of this rule, the owner or operator shall submit a notification of compliance status that contains:

1. The name and address of each source subject to this paragraph;
2. A statement that a trivalent chromium process that incorporates a wetting agent will be used to comply; and
3. The list of bath components that comprise the trivalent chromium bath, with the wetting agent clearly identified.

(B) Sources changing to trivalent chrome. Within 30 days of a change to the trivalent chromium electroplating process, a report that includes:

1. A description of the manner in which the process has been changed and the emission limitation, if any, now applicable to the source; and
2. The notification and reporting requirements of paragraphs (1), (2), and (3) of this subsection, if the source complies with the emission limitation option, or paragraph (5) of this subsection, if the source uses a wetting agent to comply. The report shall be submitted in accordance with the schedules identified in those paragraphs.

**(6) Adjustments to the timeline for submittal and format of reports.** A permitting agency

**(h) Reporting.** (con't.)

may adjust the timeline for submittal of periodic reports, allow consolidation of multiple reports into a single report, establish a common schedule for submittal or reports, or accept reports prepared to comply with other State or local requirements. Prior to allowing an adjustment, the permitting agency must find that the adjustment will provide the same information and will not alter the overall frequency of reporting.

**(i) New and Modified Sources.**

(1) Notification of Construction. After the effective date of this rule no person may construct or modify a source, such that it becomes a source subject to this section, without submitting a notification of construction or modification to the permitting agency and receiving approval in advance to construct or modify the source.

(2) The contents of the Notification of Construction is contained in Appendix 5.

(3) In lieu of complying with requirements in paragraph (i)(2) of this subsection, a facility can fulfill these requirements by complying with the permitting agency's new source review rule or policy, provided similar information is obtained.

**(j) Procedures for establishing alternative requirements.**

**[ARB is still developing language for this section. We will present our ideas for this section at the workshop.]**

**Definitions.** (con't.)

**Appendix 1 - Definitions.**

For the purposes of this regulation, the following definitions shall apply:

- (1) **Add-on air pollution control device** means equipment installed in the ventilation system of chromium electroplating and anodizing tanks for the purposes of collecting and containing chromium emissions from the tank(s).
- (2) **Air pollution control technique** means any method, such as an add-on air pollution control device or a chemical fume suppressant, that is used to reduce chromium emissions from chromium electroplating and chromic acid anodizing tanks.
- (3) **Ampere-hours** means the integral of electrical current applied to a plating tank (amperes) over a period of time (hours).
- (4) **Area source** means any stationary source of hazardous air pollutants that is not a major source as defined in this part.
- (5) **Base metal** means the metal or metal alloy that comprises the workpiece.
- (6) **Bath component** means the trade or brand name of each component(s) in trivalent chromium plating baths. For trivalent chromium baths, the bath composition is proprietary in most cases. Therefore, the trade or brand name for each component(s) can be used; however, the chemical name of the wetting agent contained in that component must be identified.
- (7) **Breakdown** means an unforeseeable impairment of an air pollution control equipment or related operating equipment which causes a violation of any emission limitation or restriction prescribed by a permitting agency's rule or by State law and which: is not the result of neglect or disregard of any air pollution control law, rule, or regulation; is not intentional or the result of negligence, or improper maintenance; is not a recurrent breakdown of the same equipment; and, does not constitute a nuisance as defined in the State of California Health and Safety Code, Section 41700, with the burden of proving the criteria of this section placed upon the person seeking to come under the provisions of this law.
- (8) **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.
- (9) **Chromic acid** means the common name for chromium anhydride (CrO<sub>3</sub>).
- (10) **Chromic acid 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 chromic acid anodizing, the part to be

**Definitions.** (con't.)

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.

(11) **Chromium electroplating or chromic acid anodizing tank** means the receptacle or container in which hard or decorative chromium electroplating or chromic acid anodizing occurs.

(12) **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.

(13) **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<sup>2</sup>) for total plating times ranging between 0.5 to 5 minutes.

(14) **Electroplating or anodizing bath** means the electrolytic solution used as the conducting medium in which the flow of current is accompanied by movement of metal ions for the purposes of electroplating metal out of the solution onto a workpiece or for oxidizing the base material.

(15) **Emission limitation** means, for the purposes of this section, the concentration of total chromium allowed to be emitted expressed in milligrams per dry standard cubic meter (mg/dscm), or the allowable surface tension expressed in dynes per centimeter (dynes/cm) for decorative chromium electroplating and chromic acid anodizing tanks; and the milligrams of hexavalent chromium per ampere-hour (mg/amp-hr) of electrical charge applied to the electroplating tank for hard chromium electroplating tanks.

(16) **Facility** means the major or area source at which chromium electroplating or chromic acid anodizing is performed.

(17) **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.

(18) **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.

(19) **Fresh water** means water, such as tap water, that has not been previously used in a process



**Definitions.** (con't.)

operation or, if the water has been recycled from a process operation, it has been treated and meets the effluent guidelines for chromium wastewater.

(20) **Hard chromium electroplating or industrial chromium electroplating** means a process by which a thick layer of chromium (typically greater than 1.0 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<sup>2</sup> for total plating times ranging from 20 minutes to 36 hours depending upon the desired plate thickness.

(21) **Hexavalent chromium** means the form of chromium in a valence state of +6.

(22) **Large, hard chromium electroplating facility** means a facility that performs hard chromium electroplating, emits greater than or equal to 10 pounds per year (lbs/yr), or has a maximum cumulative potential rectifier capacity greater than or equal to 60 million ampere-hours per year (amp-hr/yr).

(23) **Leak** means the release of chromium emissions from any opening in the emission collection system prior to exiting the emission control device.

(24) **Major source** means any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants.

(25) **Maximum cumulative potential rectifier capacity** means the summation of the total installed rectifier capacity associated with the hard chromium electroplating tanks at a facility, expressed in amperes, multiplied by the maximum potential operating schedule of 8,400 hours per year and 0.7, which assumes that electrodes are energized 70 percent of the total operating time. The maximum potential operating schedule is based on operating 24 hours per day, 7 days per week, 50 weeks per year.

(26) **Mechanical fume suppressant** means any device that reduces fumes or mist at the surfaces of an electroplating or anodizing bath by direct contact with the surface of the bath. Polyballs are the most commonly used mechanical fume suppressant.

(27) **Medium, hard chromium electroplating facility** means a facility that performs hard chromium electroplating and emits greater than 2 pounds per year (lbs/yr) but less than 10 pounds per year (lbs/yr) and has a maximum cumulative potential rectifier capacity less than

**Definitions.** (con't.)

60 million amp-hr/year.

(28) **Modification** means either:

(A) any physical change in, change in method of operation of, or addition to an existing permit unit that requires an application for a permit to construct and/or operate. Routine maintenance and/or repair shall not be considered a physical change. A change in the method of operation of equipment, unless previously limited by an enforceable permit condition, shall not include:

1. an increase in the production rate, unless such increases will cause the maximum design capacity of the equipment to be exceeded; or
  2. an increase in the hours of operation; or
  3. a change in ownership of a source; or
- (B) the addition of any new permit unit at an existing source; or
- (C) exact replacements that exceed 50% of the source cost.

(29) **Operating parameter value** means a minimum or maximum value established for a control device or process parameter which, if achieved by itself or in combination with one or more other operating parameter values, determines that an owner or operator is in continual compliance with the applicable emission limitation or standard.

(30) **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.

(31) **Responsible official** means one of the following:

(A) For a corporation: A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporations, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities and either:

1. The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding \$25 million (in second quarter 1980 dollars); or
2. The delegation of authority to such representative is approved in advance by the Administrator.

(B) For a partnership or sole proprietorship: a general partner or the proprietor, respectively.

**Definitions.** (con't.)

(C) For a municipality, state, Federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of the U.S. EPA).

(D) For sources (as defined in this part) applying for or subject to a title V permit: "responsible official" shall have the same meaning as defined in part 70 or federal title V regulations in this chapter (42 U.S.C. 7661), whichever is applicable.

(32) **Small, hard chromium electroplating facility** means a facility that performs hard chromium electroplating, emits less than or equal to 2 pounds per year, and has a maximum cumulative potential rectifier capacity less than 60 million amp-hr/yr.

(33) **Source** means any chromium electroplating or chromic acid anodizing operation and any equipment or materials associated with the selected associated air pollution control technique.

(34) **Stalagmometer** means a device used to measure the surface tension of a solution.

(35) **Surface tension** means the property, due to molecular forces, that exists in the surface film of all liquids and tends to prevent liquid from spreading.

(36) **Tank operation** means the time in which current and/or voltage is being applied to a chromium electroplating tank or a chromic acid anodizing tank.

(37) **Tensiometer** means a device used to measure the surface tension of a solution.

(38) **Trivalent chromium** means the form of chromium in a valence state of +3.

(39) **Trivalent chromium process** means the process used for electrodeposition of a thin layer of chromium onto a base material using a trivalent chromium solution instead of a chromic acid solution.

(40) **Weekly** means at least once every seven calendar days.

(41) **Wetting agent** means the type of chemical fume suppressant that reduces the surface tension of a liquid.

## **Appendix 2 - Content of Performance Test Reports.**

Performance test reports shall contain, at a minimum, the following information:

1. A brief process description;
2. Sampling location description(s);
3. A description of sampling and analytical procedures and any modifications to standard procedures;
4. Test results;
5. Quality assurance procedures and results;
6. Records of operating conditions during the test, preparation of standards, and calibration procedures;
7. Original data for field sampling and field and laboratory analyses;
8. Documentation of calculations; and
9. Any other information required by the test method.

Note: Test reports consistent with the provisions of ARB Method 425 will fulfill the above performance test report content requirement.

### **Appendix 3 - Content of Initial Compliance Status Reports.**

Initial compliance status reports shall contain, at a minimum, the following information:

1. The applicable emission limitation and the methods that were used to determine compliance with this limitation;
2. If a performance test is required, the test report documenting the results of the performance test, which contains the elements listed in Appendix 2, including measurements and calculations to support the special compliance provisions of § (c)(3)(C) if these are being followed;
3. The type and quantity of hazardous air pollutants emitted by the source reported in mg/dscm or mg/hr for decorative and anodizing operations if the source is using the special provisions of §(c)(3)(C) to comply with the standards. (If the owner or operator is subject to the construction and modification provisions of § (i) and had previously submitted emission estimates, the owner or operator shall state that this report corrects or verifies the previous estimate.) For sources not required to conduct a performance test, the surface tension measurement may fulfill this requirement;
4. For each monitored parameter for which a compliant value is to be established under § (d), the specific operating parameter value, or range of values, that corresponds to compliance with the applicable emission limit;
5. The methods that will be used to determine continuous compliance, including a description of monitoring and reporting requirements, if methods differ from those identified in this section;
6. A description of the air pollution control technique for each emission point;
7. A statement that the owner or operator has completed and has on file the operation and maintenance plan as required by § (f);
8. If the owner or operator is determining facility size based on actual cumulative rectifier capacity, records to support that the facility is small or medium. For existing sources, records from any 12-month period preceding the compliance date shall be used or a description of how operations will change to meet a small or medium designation shall be provided. For new sources, records of projected rectifier capacity for the first 12-month period of tank operation shall be used;
9. A statement by the owner or operator as to whether the source has complied with the provisions of this section.

#### **Appendix 4 - Content of Ongoing Compliance Status Reports.**

Ongoing compliance status reports shall, at a minimum, contain the following information:

1. The company name and address of the source;
2. An identification of the operating parameter that is monitored for compliance determination, as required by § (d);
3. The relevant emission limitation for the source, and the operating parameter value, or range of values, that correspond to compliance with this emission limitation as specified in the notification of compliance status required by Appendix 3;
4. The beginning and ending dates of the reporting period;
5. A description of the type of process performed in the source;
6. The actual cumulative rectifier capacity expended during the reporting period, on a month-by-month basis, if the source is a hard chromium electroplating tank;
7. A summary of any excess emissions or exceeded monitoring parameters as identified in the records required by (g)(6);
8. A certification by a responsible official that the inspection and maintenance requirements in § (e) were followed in accordance with the operation and maintenance plan for the source;
9. If the operation and maintenance plan required by § (f) was not followed, an explanation of the reasons for not following the provisions, an assessment of whether any excess emissions and/or monitoring parameter excesses are believed to have occurred, and a copy of the record(s) required by § (g)(1) documenting that the operation and maintenance plan was not followed;
10. A description of any changes in monitoring, processes, or controls since the last reporting period;
11. The name, title, and signature of the responsible official who is certifying the accuracy of the report; and
12. The date of the report.

## **Appendix 5 - Notification of Construction Reports.**

Notification of Construction reports shall contain the following information:

- (A) The owner or operator's name, title, and address;
- (B) The address (i.e., physical location) or proposed address of the source if different from the owner's or operator's;
- (C) A notification of intention to construct a new source or make any physical or operational changes to an source that may meet or has been determined to meet the criteria for a modification;
- (D) The expected commencement and completion dates of the construction or modification;
- (E) The anticipated date of (initial) startup of the source;
- (F) The type of process operation to be performed (hard or decorative chromium electroplating, or chromic acid anodizing);
- (G) A description of the air pollution control technique to be used to control emissions, such as preliminary design drawings and design capacity if an add-on air pollution control device is used; and
- (H) An estimate of emissions from the source based on engineering calculations and vendor information on control device efficiency, expressed in units consistent with the emission limits of this subpart. Calculations of emission estimates should be in sufficient detail to permit assessment of the validity of the calculations.

Note: A facility can fulfill these report content requirements by complying with the permitting agency's new source review rule or policy, provided similar information is obtained.

## **Appendix 6 - Smoke Test for Merlin Hoods.**

### **SMOKE TEST TO VERIFY THE SEAL INTEGRITY OF COVERS DESIGNED TO REDUCE CHROMIUM EMISSIONS FROM ELECTROPLATING AND ANODIZING TANKS**

#### **1. Applicability and Principle**

1.1 **Applicability.** This alternative method is applicable to all hard chromium electroplating and anodizing operations where a Cr Dome, Inc. Emission Elimination Device<sup>®</sup>(EED) is used on the tank for reducing chromium emissions.

1.2 **Principle.** During chromium electroplating or anodizing operations, bubbles of hydrogen and oxygen gas generated during the process rise to the surface of the tank liquid and burst. Upon bursting, tiny droplets of chromic acid (chromium mist) become entrained in the air above the tank. Because the EED completely encloses the air above the tank, the chromium mist either falls back into the solution because of gravity or collects on the inside walls of the EED and runs back into the solution. A semi-permeable membrane allows passage of the hydrogen and oxygen out of the EED. A lit smoke device is placed inside the EED to detect leaks at the membrane, joints, or seals.

#### **2. Apparatus**

2.1 **Smoke device.** Adequate to generate 500 to 1000 ft<sup>3</sup> of smoke/20 ft<sup>2</sup> of tank surface area (e.g., Model #1A=15 SECONDS from Superior Signal, New York).

2.2 **Small container.** To hold the smoke device.

#### **3. Procedure**

Place the small container on a stable and flat area at center of the EED (you can use a board and place it on the buss bars). Place the smoke device inside the container. After lighting the smoke device, quickly close the access door to avoid smoke from escaping. Let smoke device completely burn; entire space under the EED will now be filled with the smoke. Observe for leaks of smoke from each seal, joint, and membrane of the EED. Record these observations including the locations and a qualitative assessment of any leaks of smoke.

When all seals, joints, and membranes have been observed, turn on the evacuation unit to remove the smoke from the EED.