

Proposed Amendments to the Airborne Toxic Control Measure (ATCM) for Chromium Plating and Chromic Acid Anodizing Facilities

Public Workshops

Diamond Bar, California: June 27th, 2006

Sacramento, California: June 30th, 2006



California Environmental Protection Agency
Air Resources Board

Topics

- Overview
- Comments received on concepts
- Draft proposed regulatory language
 - Alternative control strategies
 - Phasing out hexavalent chromium for decorative chromium plating applications
 - Phasing in Best Available Control Technology (BACT) for all facilities
 - Proposed changes based on May comments
- Estimated costs of proposal
- Estimated cancer risk before and after ATCM implemented
- Schedule

Hexavalent Chromium

- Hexavalent chromium is a known human carcinogen
- Identified as a toxic air contaminant in 1986
- Excess cancer risk from exposure to 1 $\mu\text{g}/\text{M}^3$ is 146,000 chances per one million people
 - As comparison, the potential cancer risk from exposure to 1 $\mu\text{g}/\text{M}^3$ of perchloroethylene is 6 chances per one million people
- Airborne Toxic Control Measure for Chromium Plating and Chromic Acid Anodizing adopted in 1988 and amended in 1998

3

Current ATCM Requirements

- Requirements based on type of operation
 - Hard: emission limits based on size (0.15 to 0.006 mg/amp-hr)
 - Must be met with add-on control
 - Decorative/Anodizing: meet surface tension limit with fume suppressant only or meet an emission limit with add-on controls
 - Receptors not taken into account
- Emissions reduced by over 90%

4

Why are Further Controls Necessary?

- Despite stringent regulation, chrome plating and chromic acid anodizing facilities continue to be a source of adverse exposures, especially to near-by people
- About 30% of facilities have estimated cancer risk > 10 per million people
 - Percentage reflects implementation of Rule 1469 in the SCAQMD

5

Comments Received on Concepts

- Underlying risk level for the proposal
- Provide risk off-ramp
- Use OSHA's PEL ($5\mu\text{g}/\text{M}^3$) as control level
- Require HEPAs for all facilities
- Implement Rule 1469 statewide
- Requirements for existing facilities should be based on the same distance as for new facilities (150 meters vs. 100 meters)
- Cost impacts of the proposal

6

Comments Received on Concepts--Continued

- Fume suppressants can't be used in all applications
- Freeboard height requirement is not feasible
- Spray-down of parts not always feasible
- Address multiple facility impacts
- Provide alternative emission limit rather than just requiring HEPAs
- Address situations that may occur if people move in after adoption of the ATCM

7

Draft Proposed Regulatory Language

**Title 17, California Code of
Regulations, section 93102**

Subsection (a): Applicability

- Proposed changes
 - Applies to 'Facility' rather than 'Tank'
 - Explanation on organization of the regulation
 - Clarifies the exemptions

9

Subsection (b): Definitions

Proposed new definitions

- | | |
|--|----------------------|
| ■ Air Sparging | ■ Fugitive dust |
| ■ Annual permitted ampere-hour usage | ■ Initial start-up |
| ■ Dragout | ■ Modified Facility |
| ■ Enclosed hexavalent chromium electroplating tank | ■ New Facility |
| ■ Enclosed storage area | ■ Owner or operator |
| ■ Existing Facility | ■ Permitting agency |
| | ■ Person |
| | ■ Sensitive Receptor |
| | ■ Tank |

10

Proposed Definition for Sensitive Receptor

-means any residence including private homes, condominiums, apartments, and living quarters; education resources such as preschools and kindergarten through grade twelve (k-12) schools; daycare centers; and health care facilities such as hospitals or retirement and nursing homes. A sensitive receptor includes individuals housed in long term care hospitals, prisons, and dormitories or similar live-in housing.

11

Subsection (b): Definitions

Proposed Modified Definitions

- Base metal
- Chromic acid anodizing
- Chromium electroplating or chromic acid anodizing tank
- Composite mesh-pad system
- Decorative chromium electroplating
- Emission limitation
- Facility
- Fiber-bed mist eliminator
- Foam blanket
- Hard chromium electroplating or industrial chromium electroplating
- High Efficiency Particulate Air (HEPA) Filter
- Mechanical fume suppressant
- Packed-bed scrubber
- Stalagmometer
- Tensiometer

12

Subsection (c): Requirements

- Limits for existing facilities, (c)(1)(A) and (B)
 - Current limits to remain in effect until new requirements become effective
- Proposed new requirements in (c)(1)(C)
 - Harmonize requirements for all types of operations

13

Subsection (c) Changes from May Comments

- Modeled all facilities similarly (9 hours)
 - Increases ampere-hour thresholds
- Alternative emission rate proposed as alternative to HEPA installation
 - 0.0015 mg/amp-hr
- Different method of measuring to nearest sensitive receptor
 - Edge of building nearest sensitive receptor

14

Emission Limit Proposal: Facility ≤ 100 M from Sensitive Receptor

Subsections (c)(1)(C) 2. & 3.

Chemical Fume Suppressant Emission Rate 0.01 mg/amp-hr

Annual Permitted Amp-hours	Control Method
≤ 95,000	Use fume suppressant to reduce surface tension
> 95,000	Install HEPA or equivalent add-on control + fume suppressant*

* When emissions exceed 0.007 lb/yr, site specific analysis must be conducted using OEHHA guidelines. Facility must comply with air district's "Hot Spots" requirements.

15

Emission Limit Proposal: Facility > 100 M from Sensitive Receptor

Subsections (c)(1)(C) 4. & 5.

Chemical Fume Suppressant Emission Rate 0.01 mg/amp-hr

Annual Permitted Amp-hours	Control Method
≤ 330,000	Use fume suppressant to reduce surface tension
> 330,000	Install HEPA or equivalent add-on control + fume suppressant*

* When emissions exceed 0.009 lb/yr, site specific analysis must be conducted using OEHHA guidelines. Facility must comply with air district's "Hot Spots" requirements.

16

Proposed Subsection (c)(2): Modified Facilities

- Modified chromium plating or anodizing facility must meet following criteria:
 - Use add-on controls (HEPA or equivalent control) and chemical fume suppressant
 - Conduct performance test to determine emission rate
 - If emissions > 0.007 lbs/yr using actual annual amp-hrs:
 - Conduct site specific analysis using OEHHA guidelines. Facility must comply with air district's "Hot Spots" requirements.

17

Proposed Subsection (c)(3): New Facilities

- No person shall operate a new chromium plating or anodizing facility unless all the following criteria are met:
 - Facility may not be located in an area zoned residential or mixed use, or within 500 feet of an area so zoned
 - Use add-on controls (HEPA or equivalent) and a chemical fume suppressant
 - Conduct site specific analysis using OEHHA guidelines
 - Facility must comply with air district's "New Source Review" rule and "Hot Spots" program

18

Alternative Control Strategies

Alternative 1: Use of Trivalent Chromium

- Phase out hexavalent chromium for decorative chromium plating applications, and require use of the trivalent chromium process
 - Evaluating feasibility
 - Timing
- Not a carcinogen
 - Still has toxic effects
 - Adverse effects on lung, kidney, reproductive systems at high doses
- Requirements for hard chromium plating and chromic acid anodizing would be consistent with proposal in draft regulation

20

Alternative 1: Use of Trivalent Chromium

- Is the trivalent chromium process suitable for all decorative chromium plating applications in the near-term?
 - Color of deposit
 - Thickness of deposit
 - Durability
 - Quantifying fume suppressant controlled emissions
 - Bath maintenance
 - Cost
- Future effective date to allow for continued research and development?

21

Alternative 2: BACT Phase-in

- Phase-in BACT over time for all facilities
- BACT for chromium plating and chromic acid anodizing facilities is installation of HEPA filter(s)
- Example:
 - Establish phase-in schedule based on estimated cancer risk of 10/million people
 - Estimated cancer risk of 10/million is reached at production of 200,000 amp-hrs for a chemical fume suppressant controlled source (assume emission rate of 0.01 mg/amp-hr)

22

Alternative 2: BACT Phase-in

- Hexavalent chromium electroplating or chromic acid anodizing facilities with permitted annual ampere-hours > 200,000:
 - Two years after effective date:
 - Install a HEPA add-on air pollution control device; or
 - Meet an emission rate of 0.0015 mg/amp-hr after add-on air pollution control device(s); and
 - Use specified chemical fume suppressant [6 months after effective date]
 - Conduct site specific analysis when annual emissions exceed 0.01 pounds per year

23

Alternative 2: BACT Phase-in

- Hexavalent chromium electroplating or chromic acid anodizing facilities with permitted annual ampere-hours < 200,000:
 - 5 years after effective date:
 - Install a HEPA add-on air pollution control device; or
 - Meet an emission rate of 0.0015 mg/amp-hr after add-on air pollution control devices; and
 - Use specified chemical fume suppressant [6 months after effective date]

24

Alternative 2: BACT Phase-in

- Hexavalent chromium electroplating or chromic acid anodizing facilities with permitted annual ampere-hours < 20,000:
 - 10 years after effective date:
 - Install a HEPA add-on air pollution control device; or
 - Meet an emission rate of 0.0015 mg/amp-hr after add-on air pollution control devices; and
 - Use specified chemical fume suppressant [6 months after effective date]

25

Draft Proposed Regulatory Language, Continued

**Title 17, California Code of
Regulations, section 93102**

Proposed Subsection (d) Changes from May Comments

- Use of chemical fume suppressants can be waived for demonstrated good cause
- Housekeeping
 - Freeboard height deleted
 - Flexibility on how to minimize dragout of chromic acid from plating baths for manual lines

27

Proposed Subsection (d): Other Requirements

- Use of chemical fume suppressants
 - Requirement may be waived
 - Must have HEPA or meet 0.0015 mg/amp-hr
- Removing existing controls prohibited
- Prohibit air sparging
- Compliance training
- Housekeeping
 - Proposing weekly cleaning of surfaces

28

Proposed Implementation Schedule for Requirements

- At the effective date:
 - Requirements for new and modified facilities
 - Prohibition on removal of existing controls
 - Prohibition on air sparging
- Within 6 months of the effective date:
 - Use of specified chemical fume suppressants
 - Implement housekeeping
- Within 2 years of the effective date:
 - Installation of HEPA add-on air pollution control devices, if required
 - Source testing and site specific analyses, if required

29

Proposed Subsection (e)

- Requirements for facilities using the trivalent chromium process (subpart 1)
 - Essentially unchanged
 - New facility provision
 - Requirements that don't apply
- Requirements for enclosed tanks (subpart 2)
 - NESHAP changes
 - Emission limit options
 - New facility provision

30

Proposed Amendments to Subsection (f)

- Performance Test Requirements and Test Methods
 - Explicitly define facilities that must conduct a source test
 - Source test for existing facilities to be conducted within 2 years using an approved test method
 - Existing test can be used if conducted after January 1, 2000

31

Proposed Subsection (g): Chemical Fume Suppressants

Chemical Fume Suppressants to be used for Compliance

Chemical Fume Suppressant & Manufacturer	Stalagmometer Surface Tension (dynes/cm)	Tensiometer Surface Tension (dynes/cm)
Benchbrite CR 1800® Benchmark Products	< 40	< 35
Clepo Chrome® MacDermid	< 40	< 35
Fumetrol 140® Atotech U.S.A.	< 40	< 35

32

Proposed Subsection (g): Chemical Fume Suppressants

- Alternative chemical fume suppressants can be used if approved by the Executive Officer
 - Must demonstrate emissions of hexavalent chromium are no more than 0.01 mg/amp-hr
- Delisting of approved chemical fume suppressants if found to no longer achieve an emission rate of 0.01 mg/amp-hr

33

Proposed Amendments to Subsections (h) and (i)

- Parameter Monitoring Requirements, subsection (h)
 - Surface tension to be measured using the procedure in Appendix 8
- Inspection and Maintenance (I & M) Requirements, subsection (i)
 - Consolidation of I & M requirements that are similar
 - Provision for custom-designed systems

34

Proposed Amendments to Subsections (j), (k), (l) & (m)

- Operation and Maintenance Plan Requirements, subsection (j)
- Recordkeeping Requirements, subsection (k)
 - Ampere-hour usage
 - Housekeeping records
- Reporting Requirements, subsection (l)
 - Clarification of report contents and due dates
- Procedure for Establishing Alternative Requirements, subsection (m)

35

Proposed Amendments to Appendices

- Appendix 2, Initial Compliance Status Reports
 - Modifications to reflect new requirements
- Appendix 3, Ongoing Compliance Status Reports
 - Modifications to reflect new requirements
- Appendix 7, Calculating Emissions from Enclosed Tanks
- Appendix 8, Surface Tension Procedure for a Stalagmometer

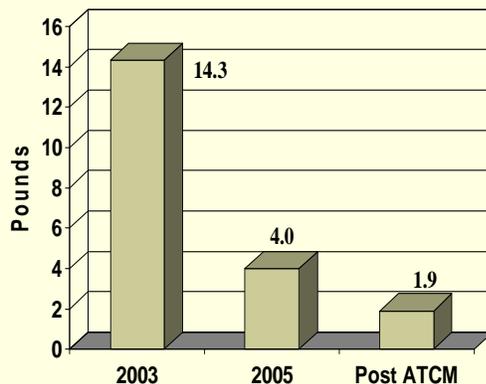
36

Estimated Costs of Proposal

- Total cost of \$9.1 million, which includes:
 - Capital costs of \$6.0 million
 - 31 new HEPA systems
 - 14 possible upgrades to HEPA systems
 - Annual recurring costs of \$1.9 million
 - Operating and maintaining systems
 - Other costs of \$1.2 million
 - Initial compliance status reports, permits, source testing, site specific analyses, and housekeeping

37

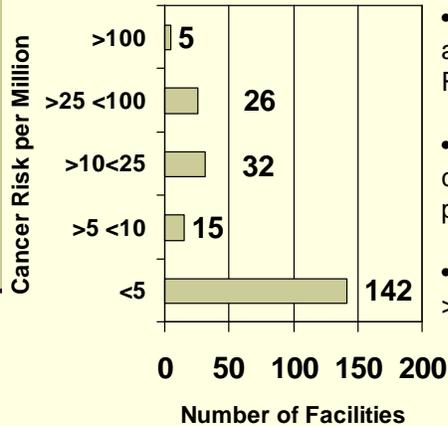
Total Pounds of Hexavalent Chromium Emissions



- Annual baseline pounds (from survey) were 14.3 pounds
- Annual pounds after SCAQMD's Rule 1469 are 4.0 pounds (72% reduction).
- Annual pounds if proposal were adopted would be 1.9 pounds (53% reduction).

38

Estimated Cancer Risk for all Facilities in 2005



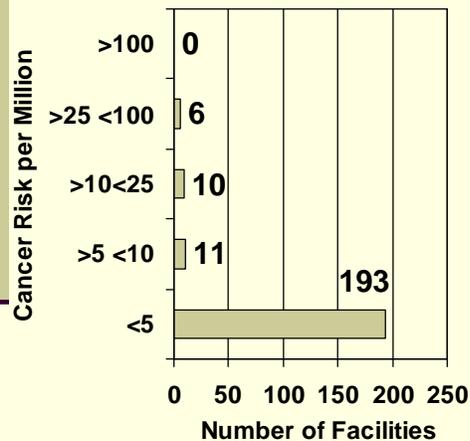
- Reflects estimated cancer risk after implementation of Rule 1469 in SCAQMD.

- 65% of facilities have estimated cancer risk of < 5 per million people.

- 29% of facilities have cancer risk > 10 per million people.

39

Estimated Cancer Risk for all Facilities after ATCM Implementation



- 93% of facilities have estimated cancer risk of < 10 per million people.

- 88% of facilities have estimated cancer risk of < 5 per million people.

- 7% of facilities have estimated cancer risk of > 10 per million people.

- When estimated cancer risk > 5 per million, need for further risk reduction must be evaluated by conducting site specific analysis.

40

Schedule

- Public workshops:
 - July 2006
 - August and September 2006, if needed
- Release of Staff Report:
 - August 11th, 2006
- Board hearing in Sacramento:
 - September 28th or 29th, 2006

41

Contacts

- Carla Takemoto, 916-324-8028, or ctakemot@arb.ca.gov
- Shobna Sahni, 626-575-7039, or spandhoh@arb.ca.gov
- Robert Barrera, 916-324-9549, or rbarrera@arb.ca.gov
- Website:
 - <http://www.arb.ca.gov/toxics/chrome/chrome.htm>
- Listserv:
 - <http://www.arb.ca.gov/listserv/chrome.htm>

42