Minnesota Pollution Control Agency

AQ Doc. # 5.07 May 2000

Facts about Final NESHAP for Chromium Emissions

On January 25, 1995, the U.S. Environmental Agency (EPA) finalized regulations known as the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks. The EPA estimates that these regulations will reduce chromium emissions from electroplaters and anodizers by about 99 percent.

Regulating Chromium Emissions

The chromium emissions of concern are hexavalent chromium and trivalent chromium. There is strong evidence suggesting that hexavalent chromium causes lung cancer. Though less toxic, trivalent chromium can accumulate in the lungs, which could result in decreased lung function after extended exposure.

The final regulation was published in the Federal Register on January 25, 1995. Copies will be provided upon request. Please keep in mind that these standards are different from Hazardous Waste and Occupational Safety and Health Administration (OSHA) regulations.

Permits

Major Sources should already have submitted Part 70 air emissions permit applications.

Area Sources are currently deferred from Part 70 air emissions permit requirements.

Pollution Prevention Can Pay

The simplest way to lessen the impact of this regulation on your business is to reduce chromium emissions. And, if you use trivalent chromium instead of hexavalent chromium, you will reduce both the toxicity of your emissions and the complexity of the regulatory burden. Although still regulated, trivalent chromium is not as toxic nor as stringently regulated as hexavalent chromium.

Reducing chromium emissions can be accomplished in several ways. The regulation outlines acceptable control technologies and a chemical method.

Reducing your use of hazardous substances can cut costs and liability for your manufacturing process while protecting the health of your employees and the environment.

Information on alternative manufacturing and chemical processes can be found through trade associations, trade journals, vendors, and the Minnesota Technical Assistance Program (MnTAP), a state-sponsored program at the University of Minnesota. MnTAP staff can evaluate a facility's operations and suggest pollution prevention techniques including process safety and maintenance practices. For more information about assistance available from MnTAP, call (612) 624-1300.

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(651) 296-6300, toll-free 800-657-3864, TDD/TTY (651) 282-5332
Upon request, this material can be made available in alternative formats.

Permanent exemptions from Part 70 permits are granted for Area Sources with:

- decorative chrome electroplating and chrome anodizing tanks that use fume suppressants
- decorative chrome electroplating tanks that use a trivalent chromium bath with a wetting agent incorporated into the bath

See the glossary at the end of this fact sheet for definitions of major and area sources.

Compliance Dates

Existing Sources: Compliance dates have passed.

New Sources: If you are planning to install a chromium electroplating or anodizing tank, you will need to comply with this NESHAP upon startup.

Reducing Emissions

Most emissions from chromium electroplating and anodizing baths are found in the fine mists formed by the processes. So, reducing mist reduces emissions, and this can be achieved through chemical or mechanical means.

To comply with the NESHAP, you may choose from the following control methods:

- Composite mesh-pad (CMP) system
- Packed-bed scrubber
- Fiber-bed mist eliminator
- Wetting agent-type fume suppressant
- Foam blanket – type fume suppressant

Even though these control methods form the basis for the standards, you can use any method as long as you are able to demonstrate that it meets the emission limit that applies to your tank.

Testing and Monitoring

If you use an air pollution control device such as a CMP system to comply with this NESHAP you will need to conduct an initial performance test. If you are required to test, report your results within 180 days of your compliance date. If you chose to use foam blanket-type fume suppressants to comply with the NESHAP you will need to conduct an initial performance test.

In general, a performance test is a way for you to determine how you will monitor your compliance with this standard. The NESHAP describes the procedures you must follow if you need to conduct a performance test.

If you operate a decorative chromium electroplating or anodizing tank, you can avoid conducting a performance test if you purchase a plating bath that uses a wetting agent and monitor to ensure that the surface tension of the bath never exceeds 45 dynes/ centimeter. If this bath is a trivalent chromium bath and the wetting agent is an ingredient in the bath components when it is purchased from vendors, you do not have to conduct a performance test and you do not have to monitor the surface tension of the bath.

Notify the MPCA and the EPA if you will be conducting a test and submit a test plan to the MPCA at least 60 days before the test is performed. If you are unable to conduct the test as planned, you will have to resubmit your plan and notify the MPCA and the EPA at least 75 days before the new date. Sample test plans are available from the MPCA's performance test staff. The test plan needs to outline the operating conditions and test methods you plan to follow when testing. You will also need to have a pre-test meeting with the MPCA performance test staff at least seven working days before the test.

Summary of Monitoring Requirements

Control Method	Initial Compliance Test	Parameter(s) for Compliance Monitoring	Frequency of Compliance Monitoring
Composite mesh-pad (CMP) system	Yes	Pressure drop across the CMP system	Once per day
Packed-bed scrubber (PBS)	Yes	Velocity pressure at the inlet of the PBS and pressure drop across the scrubber.	Once per day
PBS/CMP system	Yes	Pressure drop across the CMP system	Once per day
Fiber-bed mist eliminator	Yes	Pressure drop across the fiber-bed mist eliminator and the pressure drop across the upstream control used to prevent unplugging.	Once per day
Wetting agent-type fume suppressant	Yes[1]	Surface tension[4]	Once every 4 hours[3]
Foam blankets	Yes[2]	Foam thickness	Once per hour of operation[3]
Air pollution control device not listed in rule	Yes	To be proposed by the source for approval by Administrator	N/A

1 For decorative chromium electroplating and chromium anodizing, instead of conducting an initial performance test, you can choose a maximum surface tension of 45 dynes per centimeter as your monitoring parameter.

2 During your initial performance test, you can choose to use a maximum thickness of one inch as your monitoring parameter.

3 You may be able to reduce the frequency of your compliance monitoring, if you do not exceed your emission limits for a specified period of time.

4 Tanks that contain a trivalent chromium bath with a surfactant that which is incorporated into the bath, and are used for decorative plating, are not required to monitor for compliance.

Inspection, Operation and Maintenance Plans

Unless a tank is used for decorative plating and contains a trivalent chromium bath with a surfactant, you will need to develop and use inspection, operation and maintenance plans. In the NESHAP, these are referred to as "work practice standards." Here is a brief outline of how to develop these plans:

- Specify the operation and maintenance criteria for the tank, air pollution control device and monitoring equipment.
- Provide a checklist to document the inspection and the operation and maintenance of the tank, air pollution control device and monitoring equipment.
- Include a step by step procedure for identifying malfunctions and reporting them to supervisory personnel.

Specify procedures to be followed that prevent equipment or process malfunctions.

Reporting and Record Keeping

You will need to submit all reporting forms to the EPA by their due date as required. Keep all records for a minimum of five years.

Summary of Reporting Requirements

Type of Report	This Report Applies To:	Report Deadlines
Initial Notification	Existing Sources	Should already have been submitted.
Performance test notification	All sources conducting tests	At least 60 days prior to test.
Performance test results notification	All sources conducting tests	No later than 90 days after the test.
Notification of initial compliance status	All sources conducting performance tests Sources not required to test	No later than 90 days after performance test. No later than 30 days after compliance date.
Ongoing compliance status report	Major Sources Area Sources	Two times a year, or four times a year if standards are exceeded or if requested by the EPA. Complete once a year, or two times a year if exceedences occur, or if requested by the EPA.
Notification of construction or reconstruction	All sources	As soon as practical before construction or reconstruction is planned to begin.
Notification of when construction or reconstruction is commenced	All sources	Within 30 days of commencement of construction for sources built after January 25, 1995.
Notification of actual startup	All sources	Within 30 days of startup
Notification of process change	All sources	No later than 30 days after the process change.

Final Standards for Chromium Emissions

Facility/Process	Emission Limit [1]	Compliance Dates
Hard chrome electroplating tank		
New equipment	0.015 mg/dscm (6.6×10^{-6} gr/dscf) Limit based on use of composite mesh-pad system	Upon startup
Existing equipment at small facilities	0.03 mg/dscm (1.3×10^{-5} gr/dscf) Limit based on the use of packed bed scrubbers	Should already be in compliance
Existing equipment at large facilities	0.015 mg/dscm (6.6×10^{-6} gr/dscf) Limit based on the use of composite mesh-pad system	Should already be in compliance
Decorative Chrome Electroplating Tank		
Chromic acid process equipment	wetting agent[2], or 0.01 mg/dscm (4.4×10^{-6} gr/dscf)	New equipment - upon startup Existing equipment - should already be in compliance
New and existing trivalent chrome process equipment	Reporting and record keeping only[3]	
Chrome Anodizing Tank		
Chrome anodizing tank	wetting agent[2], or 0.01 mg/dscm (4.4×10^{-6} gr/dscf)	New equipment - upon startup Existing equipment - should already be in compliance

1 If you have add-on pollution control equipment over a group of tanks, the emission limit applies when any of the tanks are operating. Refer to the rule for further information on this requirement.

2 You must maintain a surface tension of 45 dynes per centimeter (3.1×10^{-3} lb/ft).

3 If you use a wetting agent that is part of the plating bath when purchased, you do not have to meet or monitor for an emission limit.

Legend

dynes/cm = dynes per centimeter
gr/dscf = grains per dry standard cubic foot of ventilation air
lbf/ft = pound force per foot
mg/dscm = milligrams total chromium per dry standard cubic meter of ventilation air

Glossary of commonly used technical terms

Area source means the source is not, by itself, a major source and is not located at a major source.

Chromium anodizing means the hexavalent chromium process by which an oxide layer is produced on the surface of a base metal using a chromic acid solution to provide a surface that is highly corrosion resistant. Examples of chrome anodized parts are aircraft parts, electronic parts, and bicycle rims.

Decorative chromium electroplating means one in a series of plating steps by which a thin layer of chromium is electrodeposited on a base metal or plastic to provide a reflective finish with wear and tarnish resistance. This can be a hexavalent or trivalent chromium process. Examples of decorative chrome plated parts are automotive trim, bathroom fixtures, and hand tools.

Hexavalent chromium is the form of chromium in the valence state of +6. (Chromic acid contains hexavalent chromium.)

Hard chromium electroplating means a one step, hexavalent chromium process by which a thick layer of chromium is electrodeposited on a base metal to provide a surface with wear resistance, a low coefficient of friction, hardness, and corrosion resistance. Examples of hard chrome plated parts are hydraulic cylinders and industrial rolls.

Large hard chromium electroplating facilities have a maximum cumulative potential rectifier capacity greater than or equal to 60 million ampere-hours per year (Ah/yr).

Rectifier means a device that converts alternating current into direct current by permitting a considerable flow of current in one direction.

Reconstruction means the replacement of components of an affected tank such that the fixed capital cost of the new components is more than 50 percent of the fixed capital cost required to construct a comparable new source.

Small hard chromium electroplating facilities have a maximum cumulative potential rectifier capacity less than 60 million Ah/yr.

Major Source means one that has the potential to emit at least 10 tons/year of a single hazardous air pollutant (HAP) or at least 25 tons/year of a combination of HAPs.

Maximum cumulative potential rectifier capacity means the summation of the total installed rectifier capacity at a facility, expressed in amperes, multiplied by an operating schedule of 8,400 hours per year and 0.7 which assumes that electrodes are energized 70% of the total operating time.

Trivalent chromium is the form of chromium in the valence state of +3.

Trivalent chromium process means the process used for electrodeposition of a thin layer of chromium onto a base metal using a trivalent chromium solution instead of a chromic acid solution.

Valence is a measure of an element's capacity to form chemical bonds.

For more information about regulations regarding equipment using halogenated solvents, contact the Small Business Assistance Hotline at (651) 282-6143 or (800) 657-3938.

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