Division of Environmental and Financial Assistance
March 2023

Controlling Air Emissions from Chromium Electroplating and Anodizing Tanks

Background

In November 1994, the U.S. Environmental Protection Agency (U.S. EPA) finalized regulations known as the National Emission Standards for Hazardous Air Pollutants (NESHAP) to control air emissions of chromium electroplating and chromium anodizing tanks. ***NESHAP, Subpart N*** affects all facilities performing hard or decorative chromium electroplating and chromium anodizing, regardless of size. At that time, U.S. EPA estimated these regulations would reduce chromium emissions by electroplaters and anodizers by about 99 percent.

As a result of reviews required and other corrections and clarifications needed pursuant to the Clean Air Act, U.S. EPA promulgated amendments to this subpart. Revisions include reductions in emission limits for total chromium, additional housekeeping requirements and a requirement to phase out the use of sulfonic acid (PFOS)-based fume suppressants. The new requirements took effect Sept. 19, 2012.

Why is U.S. EPA regulating electroplating and anodizing tanks?

The hexavalent form of chromium is highly toxic and strongly suspected of causing lung cancer. Less is known about the trivalent form of chromium, but it can accumulate in the lungs and may decrease lung function after continuous exposure.

U.S. EPA believes that the high toxicity of chromium compounds and the close proximity of many small shops to residential areas warrant regulation of all sources, even small businesses.

How does the U.S. EPA regulation affect you?

How you are affected depends on the type and size shop you have and the technique used to reduce emissions. The source categories being regulated are:

Hard Chromium Electroplating

- one-step process depositing a thick layer of chromium
- functional characteristics: corrosion and wear resistant
- examples: hydraulic cylinders, industrial rolls

Decorative Chromium Electroplating

- one in a series of plating steps each depositing a thin layer of chromium
- decorative characteristics: bright, reflective finish, tarnish and wear resistant
- examples: auto bumpers, bathroom fixtures, tools

Chromium Anodizing

- process by which an oxide film is formed on the surface of aluminum electrolytically
- characteristics: aluminum part is strong, lightweight and highly corrosion resistant
- examples: aircraft parts, electronic parts, bicycle parts

In accordance with the federal rule, **decorative chromium electroplating** operations were supposed to be in compliance with the regulation by Jan. 25, 1996. **Hard chromium electroplating** and **chromium anodizing** operations were supposed to be in compliance by Jan. 25, 1997. In general, the regulation requires:

- emission limits
- work practice standards
- initial testing
- ongoing monitoring
- housekeeping
- record keeping
- reporting

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Emission Limits

Most emissions from chromium electroplating and chromium anodizing baths are found in the fine mists formed by the process. Therefore, reducing mist reduces emissions. 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

Emission Limits and Control Methods		
Affected Tanks	**Emission Limits**	**Demonstrate Compliance By**
Hard Chromium Plating Tanks		
small, existing tanks*	0.015 mg/dscm or 40 dynes/cm**	Sept. 19, 2014
all other existing tanks	0.011 mg/dscm or 40 dynes/cm**	Sept. 19, 2014
all new enclosed tanks	0.006 mg/dscm	Immediately upon start-up
Decorative Chromium Plating Tanks Using a Chromic Acid Bath and Chromium Anodizing Tanks		
existing tanks	0.007 mg/dscm or 40 dynes/cm	Sept. 19, 2014
new tanks	0.006 mg/dscm or 40 dynes/cm	Immediately upon start-up
Decorative Chromium Plating Tanks Using a Trivalent Chromium Bath		
all tanks	Only subject to recording keeping and reporting	
All Tanks		
	No longer add PFOS-based fume suppressants	After Sept. 21, 2015
* Small tanks have a maximum potential rectifier capacity of less than 60 million ampere-hours per year. Existing tanks were installed prior to Dec. 16, 1993. ** Limits when measuring with a stalagmometer; 33 dynes/cm when measuring with a tensiometer		

Monitoring Requirements		
Emission Reduction Technique	**What to Monitor**	**How Often**
CMP	Pressure drop across unit	Once per day
PBS	Inlet velocity pressure and pressure drop across unit	Once per day
CMP/PBS	Pressure drop across unit	Once per day
Fiber-bed Mist Eliminator (FBME)	Pressure drop across FBME and across upstream unit	Once per day
Wetting Agent	Surface tension of bath	Once every four hours
Foam Blanket	Foam thickness	Once per hour

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Work Practice Standards

The regulation specifies work practice standards, which include:

- preparation of an operational and maintenance plan
- quarterly inspections of control devices, ductwork and monitoring equipment
- periodic wash down of composite mesh-pad systems
- fresh water additions to the top of packed-bed scrubbers

Housekeeping

Housekeeping requirements are required for the following activities:

- handling, use of, cleaning, storage and transporting of any substance used in the tanks that contains hexavalent chromium
- minimization of bath solution spills that result from dragout
- spraying operations for removing excess chromic acid
- buffing, grinding or polishing operations located in the same room as chromium electroplating or chromium anodizing tank
- storage, disposal, recovery and recycling of chromium or chromium containing wastes generated from housekeeping activities

Housekeeping requirements must be implemented by March 19, 2013.

Initial Testing

At the initial finalization of the subpart, a one-time test was required by July 23, 1996, for decorative chromium platers and by July 24, 1997, for hard chromium electroplaters and chromium anodizers to demonstrate that you are meeting the emission limit for your type of operation. During testing, you were required to establish operating parameters (e.g., pressure drop or foam thickness) that correspond to compliance with the emission limit.

Record Keeping

The regulation requires that sources keep records to document compliance with the regulation. These include inspection records, equipment maintenance records, records of malfunctions and exceedances, performance test results and monitoring data. All records must be kept for five years.

If you operate a decorating chromium plating tank that uses a trivalent chromium bath, you only need to keep records of bath component purchases.

Reporting

The extent and frequency of reporting depends on the type and size of your source. The new limitations can require some existing sources to have to perform another initial test. For sources that have to perform another initial performance test, testing must be performed within 180 days of the compliance date.

Sources that meet the following criteria do not have to perform initial testing:

- decorative chromium plating tanks or chromium anodizing tanks that use a wetting agent and limit the surface tension of the bath to 40 dynes per centimeter (dynes/cm)
- decorative chromium plating tanks that use a trivalent chromium bath

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Reporting Requirements	
Requirement	**Date**
All Existing Sources	
Compliance Deadline	Sept. 19, 2014
Notification of Performance Test	At least 60 days before test
Notification of Compliance Status	No later than 90 days after required performance test or 30 days after compliance deadline (Oct. 18, 2014) if no performance test is required
Notification of Performance Test Results	Reports of Performance Test results submitted no later than 90 days after test – shall be submitted as part of the Notification of Compliance Status. Results of Performance Test shall be submitted within 60 days after the date of completing each performance test
Testing Deadline	Within 180 days after specified compliance date
All New Sources (commenced construction/reconstruction and operation after Feb. 8, 2012)	
Compliance Deadline for New Sources	Immediately upon start-up
Notification of Intent to Construct/Reconstruct	As soon as possible before commencement of construction/ reconstruction
Initial Notification	No later than 120 days after the source becomes subject to this subpart
Notification of Construction/ Reconstruction	No later than 30 days after the commencement of construction / reconstruction
Notification of Startup	Within 30 days of the actual startup date
Notification of Performance Test	At least 60 calendar days before the test
Notification of Compliance Status	No later than 90 days after required performance test or 30 days after compliance deadline (Oct. 18, 2014) if no performance test is required
Notification of Performance Test Results	Reports of Performance Test results submitted no later than 90 days after test – shall be submitted as part of the Notification of Compliance Status Results of Performance Test shall be submitted within 60 days after the date of completing each performance test
Testing Deadline	Within 180 days of the start-up for the source

Ongoing Monitoring

Continuous compliance with the regulation is demonstrated through ongoing monitoring of the operating parameters established during initial testing. The monitoring requirements vary depending on the type of emission reduction technique that you use.

If you operate a decorating chromium plating tank that uses a trivalent chromium bath, you only need to keep records of bath component purchases.

Pollution Prevention

The simplest way to lessen the impact of this regulation on your business is to reduce chromium emissions. 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.

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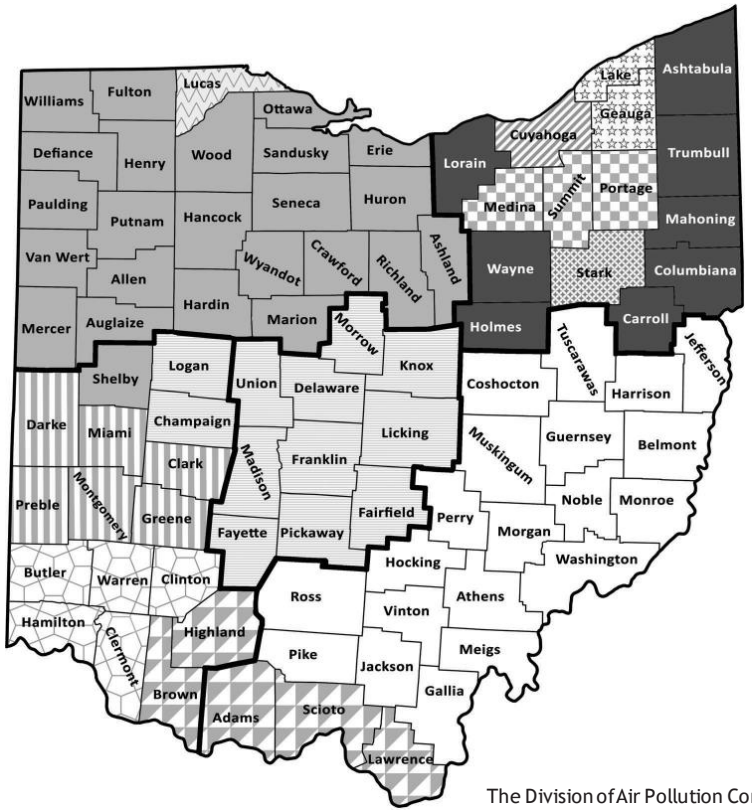
In addition, each of the add-on emission reduction techniques has a recycling element; they allow for recycling of all collected chromium and/or reducing the total wastewater treatment burden of a facility.

Where can I get more help?

Reference the map below to reach out to the your ***Division of Air Pollution Control*** local distirct office or local air agency based on your county. If you have questions or need help in understanding Ohio EPA's regulations, you can contact Ohio EPA's Office of Compliance Assistance and Pollution Prevention (OCAPP) for help. OCAPP is a non-regulatory Ohio EPA office with a goal of helping small businesses comply with environmental regulations and permitting requirements. For more information, contact OCAPP at (800) 329-7518, or ***visit OCAPP's website.***

Division of Air Pollution Control
District Office and Local Air Agency Jurisdiction



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The Division of Air Pollution Control's jurisdictional boundaries for district offices and local air agencies are not the same as Ohio EPA's standard district boundaries. Standard district boundaries, indicated by the dark lines, are for reference only.

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