
Office of Air Quality Planning & Standards (MD-10)



New Regulation Controlling Air Emissions from Chromium Electroplating and Anodizing Tanks



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EPA'S NEW REGULATION CONTROLLING AIR EMISSIONS FROM CHROMIUM ELECTROPLATING AND ANODIZING TANKS

In November 1994, the U. S. Environmental Protection Agency (EPA) issued national regulations to control air emissions of chromium from chromium electroplating and anodizing tanks. The regulation appeared in the January 25, 1995 edition of the Federal Register [volume 60, beginning on page 4948]. The regulation affects all facilities performing hard and decorative chromium electroplating and chromium anodizing, regardless of size. Over 5,000 facilities are affected nationwide.

Why is EPA regulating electroplating and anodizing tanks?

The Clean Air Act (CAA), as amended in 1990, directs EPA to regulate emissions of 189 toxic chemicals, including chromium compounds, from a wide range of industrial sources. EPA is regulating emissions of chromium from electroplating and anodizing tanks to meet the requirements of the CAA. The **hexavalent** form of **chromium is highly toxic and strongly suspected of causing lung cancer**. Less is known about the cancer risk of the **trivalent** form of chromium, but it can accumulate in the lungs and may decrease lung function after continuous exposure.

Hard chromium electroplating operations deposit a thick layer of chromium directly on a base metal to provide wear and corrosion resistance, low friction, and hardness (for hydraulic cylinders, industrial rolls, etc.). Decorative chromium electroplating operations deposit a thin layer of chromium on a base metal, plastic, or undercoating to provide a bright finish and wear and tarnish resistance (for bicycles, auto trim, tools, etc.). Chromium anodizing operations form a chromium oxide layer on aluminum to provide corrosion and wear resistance (for aircraft parts, architectural structures, etc.). Except for the trichrome decorative process, which uses the trivalent form of chromium, all other electroplating processes use the hexavalent form of chromium.

Chromium electroplating and anodizing tanks are one of the largest sources of chromium emissions. Over 5,000 facilities with chromium electroplating and/or anodizing tanks exist in the United States; many are located in small shops (using one plating tank) that are within close proximity to residential areas. EPA estimates that full compliance with its new regulation will result in a **reduction of about 173 tons of chromium emitted into the air annually, or about a 99 percent reduction from today's levels.**

How does the new EPA regulation affect you?

The regulation affects **all facilities** that use chromium electroplating or anodizing tanks, **regardless of size**. How you are affected depends on the size and type of shop (hard, decorative, or anodizing) you have and the technique that you use to reduce emissions. Decorative chromium electroplating operations must be in compliance with the regulation by **January 25, 1996**. Hard chromium electroplating and chromium anodizing operations must comply by **January 25, 1997**. In general, the regulation requires:

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|---------------------------|----------------------|
| a Emission limits | a Ongoing monitoring |
| a Work practice standards | a Recordkeeping |
| a Initial testing | a Reporting |

These requirements are summarized below. Also, EPA has published a guidebook entitled "A Guidebook on How to Comply with the Chromium Electroplating and Anodizing National Emission Standards for Hazardous Air Pollutants" (EPA-453/B-95-001) that provides a more detailed explanation of the regulation. (See the back of this pamphlet for information on how to obtain a copy.)

Emission Limits

The regulation specifies emission limits (expressed as concentration of chromium in milligrams per dry standard cubic meter [mg/dscm] of exhaust air) that can typically be achieved by the use of a certain technique to reduce emissions (such as a control device or fume suppressant). The emission reduction technique that corresponds to the emission limit is shown in the following table. However, you may use another technique, as long as the level of emission reduction is the same or better.

Work Practice Standards

The regulation specifies work practice standards, which include:

- a Preparation of an operation and maintenance plan.
- a Quarterly inspections of control devices, ductwork, and monitoring equipment.
- a Periodic washdown of composite mesh-pad systems.
- a Fresh water additions to the top of packed-bed scrubbers.

Affected tanks	Emission limit	Emission reduction technique
Hard Chromium Plating Tanks		
Small, existing tanks ^a	0.03 mg/dscm	Packed-bed scrubber (PBS)
All other tanks ^b	0.015 mg/dscm	Composite mesh-pad (CMP) system
Decorative Chromium Plating Tanks Using a Chromic Acid Bath		
All tanks ^b	0.01 mg/dscm or 45 dynes/cm	Fume suppressant (FS) FS that contains a wetting agent
Decorative Chromium Plating Tanks Using a Trivalent Chromium Bath		
All tanks ^b	Only subject to recordkeeping and reporting	
Chromium Anodizing Tanks		
All tanks ^b	0.01 mg/dscm or 45 dynes/cm	FS FS that contains a wetting agent

^aSmall mean tanks having a maximum potential rectifier capacity of less than 60 million ampere-hours per year.

^bExisting means installed before 12/16/93.

^bIncludes new tanks.

Initial Testing

A one-time test is required by **July 23, 1996 for decorative chromium platers** and by **July 24, 1997 for hard chromium platers and chromium anodizers** to demonstrate that you are meeting the emission limit for your type of operation. During testing, you are required to establish operating parameters (e.g., pressure drop or foam thickness) that correspond to compliance with the emission limit. Sources that meet the following criteria do not have to perform initial testing: (1) decorative chromium plating tanks or chromium anodizing tanks that use a wetting agent and limit the surface tension of the bath to 45 dynes per centimeter (dynes/cm), or (2) decorative chromium plating tanks that use a trivalent chromium bath. The regulation contains test methods for measuring the chromium concentration discharged to the atmosphere (EPA Reference Methods 306 and 306A) and for measuring the surface tension of the bath (EPA Reference Method 306B).

EPA has produced a videotape on stack sampling and monitoring entitled "Construction and Operation of the EPA Method 306A Sampling Train and Practical Suggestions for Monitoring of Electroplating and Anodizing Facilities" that is available to you for a nominal fee by calling North Carolina State University at (919) 515-4659.

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.

Emission reduction technique	What to monitor	How often
CMP	Pressure drop across unit	Once per day
PBS	Inlet velocity pressure & 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 & across upstream unit	Once per day
Wetting agent	Surface tension of bath	Once every 4 hours ^{a,b}
Foam blanket	Foam thickness	Once per hour ^a

^aThe time between monitoring may be increased gradually if the emission limit is not exceeded.

^bDoes not apply to trivalent chromium baths with wetting agents.

Sample monitoring checklists are included in the EPA guidebook on how to comply with this regulation.

Recordkeeping

The regulation requires that sources keep records to document compliance with the regulation. Records include inspection records, equipment maintenance records, records of malfunctions and exceedances, performance test results, and monitoring data. All records must be **kept for 5 years**. If you operate a decorative chromium plating tank that uses a trivalent chromium bath, you only need to keep records of bath component purchases.

Sample recordkeeping forms are included in the EPA guidebook on how to comply with this regulation.

Reporting

The extent and frequency of reporting depends on the type and size of your source.

Requirement	Date
<i>All Tanks</i>	
Initial notification	7/24/95
<i>Decorative Chromium Plating Tanks Using a Chromic Acid Bath</i>	
Compliance deadline	1/25/96
Testing deadline	7/23/96
Notification of performance test	≥ 60 days before test
Notification of compliance status	≤ 90 days after test or 2/24/96 if no test is required
Notification of test results	≤ 90 days after test
<i>Decorative Chromium Plating Tanks Using a Trivalent Chromium Bath</i>	
Notification of compliance status	2/24/96
Notification of process change	≤ 30 days after change
<i>Hard Chromium Plating and Chromium Anodizing Tanks</i>	
Compliance deadline	1/25/97
Testing deadline	7/24/97
Notification of performance test	≥ 60 days before test
Notification of compliance status	≤ 90 days after test or 2/24/97 if no test is required
Notification of test results	≤ 90 days after test

Note: ≥ means “at least”; ≤ means “no more than.”

In addition, major sources (emitting 10 tons per year or more of chromium or 25 tons per year or more of a combination of hazardous air pollutants) must submit semiannual reports that contain information on the compliance status of the source. Check with the EPA Regional Office for your State or territory to see if reports should be sent to the Regional Office or to the delegated State authority. All other sources must complete a compliance status report annually and keep the report onsite.

Sample reporting forms are included in the EPA guidebook on how to comply with this regulation.

What pollution prevention options exist?

There are several pollution prevention options in this regulation. Source reduction techniques include: (1) the use of fume suppressants to inhibit chromium emissions at the source (i.e. the bath) and (2) the use of a trivalent chromium bath instead of a hexavalent chromium (chromic acid) bath to lower total chromium emissions and lower chromium concentrations in process wastewaters (thus, less sludge generated). 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.

How does the new EPA regulation relate to State or local requirements?

State or local requirements that may have affected you prior to the new Federal EPA regulation continue to apply. The new EPA regulation is the minimum emission reduction that is required nationally. Some State and local agencies do require stricter limits. In addition, the format of some State requirements may differ from EPA's regulation. Testing will always give you the chromium concentration in mg/dscm; other formats, such as percent control or mg/ampere-hour, may be derived from mg/dscm.

All major sources are required to obtain a Title V operating permit. A sample model permit is included in EPA's guidebook on how to comply with this regulation. The EPA is considering amending the regulation to allow States to defer all nonmajor sources from Title V permitting requirements for five years (up to November 1999). Contact your State or local air pollution control agency or your State Small Business Assistance Program for more information on permitting.

How much will it cost?

The cost of compliance will vary considerably from facility to facility. The average price to purchase a packed-bed scrubber (PBS) or a composite mesh-pad (CMP) system ranges from \$27,000 to \$186,000 depending on the size of your operation. Ongoing annual costs related to upkeep of these emission reduction devices range from \$10,000 to \$45,000 for a PBS and from \$14,000 to \$84,000 for a CMP system. Ongoing annual fume suppressant costs range from \$1,000 to \$17,000. The initial compliance test will cost about \$1,150 per stack if you perform the test inhouse or \$4,500 per stack if you use a contractor. The ongoing annual costs for monitoring, recordkeeping, and reporting are \$2,300 per facility on average.

Whom can you contact for additional information?

For more information on this regulation, EPA's testing videotape, or EPA's guidebook on how to comply with this rule, please call your State or local air pollution control agency. You can also call your local, regional, or national metal finishers trade association; your State Small Business Assistance Program; or your State Small Business Ombudsman. Contact EPA's Control Technology Center (CTC) Hotline at (919) 541-0800 to get information on your State small business program contacts. A copy of the regulation can be obtained from the Federal Register (January 25, 1995) or the EPA's Technology Transfer Network (TTN). The TTN can be accessed via modem by dialing (919) 541-5742. Call (919) 541-5384 for TTN assistance.

The EPA is divided into 10 geographic regions. You may also call the Regional Office where your State or territory resides for more information.

Region	States	Telephone No.
1	CT, ME, MA, NH, RI, & VT	(617) 565-3728
2	NJ, NY, Puerto Rico, & Virgin Islands	(212) 264-6676
3	DE, MD, PA, VA, WV, & District of Columbia	(215) 597-3237
4	AL, FL, GA, KY, MS, NC, SC, & TN	(404) 347-2864
5	IL, IN, MI, WI, MN, & OH	(312) 886-6793
6	AR, LA, NM, OK, & TX	(214) 665-7225
7	IA, KS, MO, & NE	(913) 551-7097
8	CO, MT, ND, SD, UT, & WY	(303) 293-1886
9	AZ, CA, HI, NV, American Samoa, & Guam	(415) 744-1143
10	AK, ID, WA, & OR	(206) 553-1949

The information in this pamphlet is intended for general reference only; it is not a full and complete statement of the technical or legal requirements associated with the regulation.

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