EPA's New Chromium Emissions Regulations

A brief overview of a new law that affects more than 5,000 facilities in the United States . . .

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In November 1994, the U.S. Environmental Protection Agency (EPA) issued final national regulations to control chromium air emissions from chromium electroplating and anodizing tanks (see Pollution Control Clinic, April 1995 PF). The regulation appeared in the January 25, 1995, edition of the Federal Register (volume 60, beginning on page 4,948). The regulation affects all facilities performing hard and decorative chromium electroplating and chromic acid anodizing, regardless of size. More than 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 chromium emissions 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 trivalent chromium, but it can accumulate in the lungs and may decrease lung function after continuous exposure.

Chromium electroplating and anodizing tanks are some of the largest sources of chromium emissions. Many chromium electroplating and/or anodizing tanks in the United States are 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 reduce chromium emissions by 173 tons annually, or about a 99 pct reduction from today's levels.

How does the new EPA regulation affect you? The regulation affects all facilities that use chromium

TABLE I—Emission Limits

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 suppressants (FS) FS that contains 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 wetting agent

[a] Small means tanks having a maximum potential rectifier capacity of less than 60 million ampere-hours per year. Existing means installed before 12/16/93.

[b] Includes new tanks.

electroplating or anodizing tanks, regardless of size. How you are affected depends on the size and type of shop (hard, decorative, or anodizing) and the technique used to reduce emissions. Decorative chromium electroplating operations must be in compliance by January 25, 1996. Hard chromium electroplating and chromic acid anodizing operations must comply by January 25, 1997. The regulation requires: Emission limits; Work practice standards; Initial testing; Ongoing monitoring; Recordkeeping; and Reporting.

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.

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 using certain techniques to reduce emissions. The emission reduction technique that corresponds to the emission limit is shown in Table I. 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 that include: Preparation of an operation and maintenance plan;

TABLE II—Ongoing Monitoring

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 4 hours[a,b]
Foam blanket	Foam thickness	Once per hour[a]

[a] The time between monitoring may be increased gradually if the emission limit is not exceeded.

[b] Does not apply to trivalent chromium baths with wetting agents.

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

Quarterly inspections of control devices, ductwork, and monitoring equipment; Periodic wash down of composite mesh-pad systems; and Fresh water additions to the top of packed-bed scrubbers.

Initial Testing. A one-time testing 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 operation. During testing, you are required to establish operating parameters (that is, 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 chromic acid anodizing tanks that use a wetting agent and limit the surface tension of the bath to 45 dynes per centimeter; 2) Decorative chromium plating tanks that use a trivalent chromium bath. The regulation contains test methods (EPA Reference Methods 306 and 306A) for measuring the chromium concentration that is discharged to the atmosphere, and EPA Reference Method 306B to measure the surface tension of the plating bath.

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.

TABLE III—Reporting

Requirement	Date
All tanks	
Initial notification	7/24/95
Decorative Chromium Plating Tanks Using a Chromic Acid Bath	
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
Decorative Chromium Plating Tanks Using a Trivalent Chromium Bath	
Notification of compliance status	2/24/96
Notification of process change	≤ 30 days after change
Hard Chromium Plating and Chromium Anodizing Tanks	
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

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 (Table II).

Recordkeeping. The regulation requires that sources keep records to document compliance. Records include inspection records, equipment maintenance records, records of malfunctions and emissions, performance test results and monitoring data. All records must be kept for five 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.

Reporting. The extent and frequency of reporting depend on the type and size of your source. 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 semi-annual reports that contain information on the compliance status of the source. Check with the EPA Regional Office for your state 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 on site (Table III).

What pollution prevention op-

TABLE IV—EPA Geographic Regions

Region	States	Telephone No.
1	CT, ME, MA, NH, RI, and VT	617-565-2734
2	NJ, NY, Puerto Rico, and Virgin Islands	212-264-6676
3	DE, MD, PA, VA, WV, and District of Columbia	215-597-3237
4	AL, FL, GA, KY, MS, NC, SC, and TN	404-347-2864
5	IL, IN, MI, WI, MN, and OH	312-886-6793
6	AR, LA, NM, OK, and TX	214-665-7225
7	IA, KS, MO, and NE	913-551-7097
8	CO, MT, ND, SD, UT, and WY	303-293-1886
9	AZ, CA, HI, NV, American Samoa, and Guam	415-744-1143
10	AK, ID, WA, and OR	206-553-1949

tions exist? There are several pollution prevention options. Source reduction techniques include: 1) Fume suppressants to inhibit chromium emissions at the source; and 2) Using trivalent chromium instead of hexavalent. Trivalent chromium lowers total chromium emissions and the chromium concentration in process wastewaters, so less sludge is 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 reductions in the total wastewater treatment burden of a facility.

How does the federal regulation relate to state or local requirements? State or local requirements that may have affected you prior to the new 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 sources affected by this regulation must apply for an operating permit under Title V of the CAA. A sample General Permit is included in EPA's guidebook on how to comply with this rule. 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 $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 in-house 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. You will also be charged a permit fee by your state or local agency.

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 (Table IV); 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. Or you can 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 on this and other regulations. **PF**