

Chrome platers apply new MACT standards

**Jean Waters, Air Toxins Engineer
Pollution Prevention Institute**

William A. Spratlin
Director of Air, RCRA and Toxics
US EPA, Region 7
726 Minnesota Ave.
Kansas City, KS 66101

In the initial notification you must include:

On January 25, 1995, the United States Environmental Protection Agency (EPA) published the final Maximum Achievable Control Technology (MACT) standard for chromium electroplaters and anodizers as required by the Clean Air Act Amendments (CAAA) of 1990.

- Your basic responsibilities under this new law will be to:
- Notify EPA that your operation will be regulated by the law
 - Meet new chromium emission limits
 - Keep required records
 - Establish operation and maintenance plans.

This rule applies to all facilities performing hard chromium electroplating, decorative chromium electroplating, and chromium anodizing. It applies to tanks where an electrolytic process occurs. The rule does not apply to rinse, etching or cleaning tanks; or to chrome conversion tanks using no electric current. Your chromium emissions are limited. Specific pollution control technologies are not required but some effective ones are included.

Initial notification and compliance dates

Owners and operators of affected sources (each chromium electroplating or chromium anodizing tank) must notify the EPA in writing that they are subject to the new standard. Send notification by July 25, 1995 to:

- Name, title and address of the owner or operator.
- Address (i.e., physical location) of each affected source.
- A statement that, "40 CFR part 63, subpart N" is the basis for this notification. 40 CFR part 63, subpart N is the chromium electroplaters MACT standard.
- Identification of the applicable emission limitation (see compliance limits) and compliance date for each affected source.
- A brief description of each affected source, including type of process operation performed.
- For sources performing hard chromium electroplating:
 - Give the maximum cumulative potential rectifier capacity (MCPRC - see Terms) of each tank.
 - Tell whether the tank(s) is located at a small or large, hard chromium electroplating facility (see compliance limits). Also state whether you'll measure actual or maximum cumulative potential rectifier capacity.
 - Tell them if you plan to limit the MCPRC so that the source is considered small.
 - State whether the affected source is at a major or area source as defined by part 63.2 (see Terms).

You must also get a Title V permit from the Kansas Department of Health and Environment (KDHE). They will send you more information on this at the appropriate time.

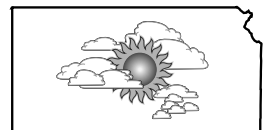
The EPA has set deadlines or compliance dates by which you must meet the emission limits, have your record keeping system in place and use your operation and maintenance plans. However, you have until July 24, 1997 to get all the paperwork in to EPA. Within 90 days of the initial performance test, you must notify EPA that you're in compliance. If no performance test is required for your source (decorative plater or anodizer), you must notify the EPA that you're in compliance within 30 days of the compliance date.

Source categories and their emission limits

The MACT standard effectively treats all operations as area sources and subdivides existing hard chromium electroplating into large and small affected sources. Affected sources are

Table 1 — Compliance dates by category

Decorative chromium electroplaters	January 25, 1996
Hard chromium electroplaters	January 25, 1997
Chromium anodizers	January 25, 1997
New or reconstructed source (initial start up between Dec. 16, 1993, and Jan. 25, 1995)	January 25, 1997
New source (start up after January 25, 1995)	compliance upon start up



MACT standards – chromium

each individual hard chromium electroplating, decorative chromium electroplating and chromium anodizing tank. A single facility can contain multiple large and small affected sources. The chart below describes the emission limits for various sizes and types of electroplating.

Record keeping requirements

You must keep records at least five years. In addition to the records outlined below, you must meet all record keeping requirements of subpart A of the General Provisions to 40 CFR part 63, unless the MACT rule specifically states otherwise.

Initial Performance Test:

Decorative chromium electroplaters or chromium anodizers using a wetting agent type fume suppressant do not need an initial performance test if you use the standard value for surface tension, 45 dynes/cm. You are only required to submit initial notification, an update on compliance status within 30 days of one year after initial notification, and purchasing records of bath solutions clearly listing the wetting agent.

All other owners or operators of affected sources must conduct an initial performance test to establish values of param-

Table 2 — Compliance limits

Type of tank	Small source emission limit (MCPRC ≤ 60 million amp hr/yr)*	Large source emission limit (MCPRC > 60 million amp hr/yr)
New, hard chromium electroplating (hexavalent)	0.015 mg/dscm (based on use of composite mesh pads)	
Existing, hard chromium electroplating (hexavalent)	0.03 mg/dscm (based on packed bed scrubber)	0.015 mg/dscm (based on composite mesh pad)
New & existing decorative chromium electroplaters (hexavalent--chromic acid bath)	0.01 mg/dscm or surface tension ≤ 45 dynes/cm or as established in initial performance test	
New & existing decorative chromium electroplaters (trivalent chromium bath)	Notify EPA that a trivalent chromium process incorporating a wetting agent in the bath components (as supplied from the vendor) is being used, and provide bath components. Notify EPA if a change in the bath is made which puts it in a different compliance status.	
New & existing chromium anodizing	0.01 mg/dscm or surface tension ≤ 45 dynes/cm or as established in initial performance test	
Research & laboratories	exempt	

Terms you need to know:

≤: less than or equal to
 mg/dscm: milligrams (of total chromium) per dry standard cubic meter (of ventilation air)

Decorative chromium plating: Process in which a thin (typically 0.003 to 2.5 microns) layer of chromium is electrodeposited on a base material. Current densities are typically 540 to 2400 A/m² and plating times are 0.5 to 5 minutes.

Hard chromium plating: Process in which a thick (typically 1.3 to 760 microns) layer of chromium is electrodeposited on a base material. Current densities are typically 1,600 to 6,500 A/m² and plating times are 20 minutes to 36 hours.

Hexavalent chromium: The form of chromium in a valence state of +6 (e.g., CrO₃—chromic acid)

Major or area source as defined in part 63.2: The CAAA definition of *major source* is any stationary source or group of stationary sources within a contiguous area and under common control that emits or has the potential to emit 10 tons/yr or more of any single hazardous air pollutant (HAP) or 25 tons/yr or more of any combination of HAPs. An *area source* is any source that is not a major source.

MCPRC: Maximum cumulative potential rectifier capacity. MCPRC = Σ RC ↔ 8400 hrs/yr ↔ 0.7, where Σ RC = the sum of the rectifier capacity ratings of individual tanks.

The MCPRC can be limited by:

- Installing a nonresettable amp/hr meter on the chromium electroplating tank—using actual cumulative rectifier capacity (ACRC) and demonstrating compliance by keeping records and reporting the ACRC monthly.
- Establishing limits on rectifier capacity via your air permit. This makes the limits federally enforceable and might include limited operation hours or material procurement.
- Including only rectifiers associated with hard chromium electroplating.
 - * If 60 million amp-hrs/yr is exceeded in any 12-month period (or less), you must consider the affected source large and meet all requirements of a large source, even if subsequent usage is less. You must achieve compliance within one year after the monthly report (see *additional records* under **Record keeping requirements**) shows an excess of the 60 million amp-hr/yr limit.

Trivalent: The form of chromium in a valence state of +3 (e.g. Cr₂O₃)

MACT standards — chromium

ters monitored daily for compliance. You must establish the following parameters in the initial performance test and subsequently monitor them for compliance. Use approved test methods and procedures (per the MACT) and test under representative operating conditions.

Monitoring Reports:

You must daily monitor parameters established in the initial performance test (IPT), except for foam blanket thickness and surface tension. Include date and time of monitoring, a description of the device being monitored, and data collected.

For foam blanket thickness, initially measure at least once per hour of tank operation. After 40 hours without a measurement that exceeds the value set in the IPT, you can decrease monitoring frequency to once every 4 hours of tank operation. Once no measurement exceeds the IPT value during another 40 hours of tank operation, you can decrease monitoring frequency to once every 8 hours of tank operation.

For chemical fume suppressants, initially measure surface tension once every 4 hours. After 40 hours without a value in excess of that established in the IPT, you can decrease monitoring frequency to once every 8 hours of tank operation. Once no measurement exceeds the IPT value during 40 hours of tank operation, you can decrease monitoring frequency to once every 40 hours of tank operation.

Inspection Reports (for add-on control devices, e.g., CMP or PBS, and monitoring equipment):

Include date of inspection, identification of device, description of device's working condition and any corrective action taken.

Additional records that must be kept include (but are not limited to):

- All maintenance on the source, add-on control device and monitoring equipment.
- All malfunctions of process, add-on control and monitoring equipment. Records must include occurrence, duration and cause (if known).
- Actions taken during malfunction, if they deviate from the operation and maintenance plan (see Operation and maintenance plans).
- Other records (e.g., checklists) showing consistency with the operation and maintenance plan (see Operation and maintenance plans).
- Documentation of all performance tests and conditions of performance tests.
- Specific identification of periods of excess emissions.
- Total process operating time of the affected source during the reporting period.
- If using actual cumulative rectifier capacity to determine facility size, you must record this monthly with the total capacity expended to date recorded for each reporting period.

Operation and maintenance plans

You are required to have a written operation and maintenance plan that specifies operation and maintenance criteria. Plans must contain systematic procedures for identifying malfunctions and ensuring that malfunctions do not occur as a

Table 3 — Parameters for types of control devices

Control device	Parameters to establish and monitor
Composite mesh pad (CMP) or packed bed scrubber/ CMP system	Pressure drop across the unit
Packed bed scrubber	Pressure drop across the unit Velocity pressure at the inlet to the control device
Packed bed scrubber/ composite pad	Same as composite mesh
Fiber-bed mist eliminator	Pressure drop across eliminator and control device
Foam blanket	Blanket thickness (or use value of 2.5 cm)
Chemical fume suppressant value	Surface tension (or use of 45 dynes/cm)

result of poor maintenance or other preventable conditions. Include a standardized checklist to document inspection and maintenance of equipment. These plans must be implemented by the compliance date and are incorporated by reference into your permit.

Decorative platers using a trivalent bath have no requirement for work practice standards or continuous compliance monitoring. All other affected sources must incorporate the following work practice standards into their operation and maintenance plans.

Work practice standards to incorporate into operation and maintenance plans

A manual for chromium electroplaters is currently being written. Contact PPI for more information about the manual.

Notice of nondiscrimination

Kansas State University is committed to a policy of nondiscrimination on the basis of race, sex, national origin, disability, religion, age, sexual orientation or other nonmerit reasons in admissions, educational programs or activities and employment (including employment of disabled veterans and veterans of the Vietnam Era), all as required by applicable laws and regulations. Responsibility for coordination of compliance efforts and receipt of inquiries, including those concerning Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, has been delegated to Jane D. Rowlett, director, Unclassified Affairs and University Compliance, 111 Anderson Hall, Kansas State University, Manhattan, KS 66506-0104, 913-532-4392.

MACT standards — chromium

Table 4 — Work practice standards to incorporate into operation and maintenance plans

Control technique	Work practice standards	Frequency
Composite mesh pad (CMP) system or PBS/CMP system	<ol style="list-style-type: none"> 1. Visually inspect device to ensure proper drainage, no chromic acid buildup on pads, and no evidence of chemical attack on structural integrity of the device. 2. Visually inspect back portion of the mesh pad closest to the fan to ensure there is no breakthrough of chromic acid mist. 3. Visually inspect ductwork from tank or tanks to the control device to ensure there are no leaks. 4. Perform wash down of the composite mesh pads in accordance with manufacturer's recommendations. 	<ol style="list-style-type: none"> 1. Quarterly 2. Quarterly 3. Quarterly 4. Per manufacturer
Packed bed scrubber (PBS)	<ol style="list-style-type: none"> 1. Visually inspect device to ensure proper drainage, no chromic acid buildup on packed beds, and no evidence of chemical attack on structural integrity of the device. 2. Visually inspect back portion of chevron blade mist eliminator to ensure that it is dry with no breakthrough of chromic acid mist. 3. Same as number 3 above. 4. Add fresh makeup water to top of the packed bed.^{a,b} 	<ol style="list-style-type: none"> 1. Quarterly 2. Quarterly 3. Quarterly 4. Whenever makeup is added
Fiber bed mist eliminator ^c	<ol style="list-style-type: none"> 1. Visually inspect fiber-bed unit and prefiltering device to ensure proper drainage, no chromic acid buildup in units, and no evidence of chemical attack on structural integrity of the devices. 2. Visually inspect ductwork from tank or tanks to the control device to ensure there are no leaks. 3. Perform wash down of fiber elements in accordance with manufacturer's recommendations. 	<ol style="list-style-type: none"> 1. Quarterly 2. Quarterly 3. Per manufacturer
Air pollution control device (APCD) not listed in rule	To be proposed by the source for EPA approval.	To be proposed by the source for EPA approval
Monitoring equipment		
Pitot tube	Backflush with water, or remove from duct and rinse with fresh water. Replace in duct and rotate 180 degrees to ensure same zero reading is obtained. Check pitot tube ends for damage. Replace pitot tube if cracked or fatigued.	Quarterly
Stalagmometer	Follow manufacturer's recommendations.	

a If greater than 50 percent of the scrubber water is drained (e.g., for maintenance purposes), makeup water may be added to the scrubber basin.

b For horizontal-flow scrubbers, top is defined as the section of the unit directly above the packing

media, such that the makeup water would flow perpendicular to the air flow through the packing. For vertical-flow units, top is defined as the area downstream from the packing material, such that the makeup water would flow counter-current to the air flow through the unit.

c Work practice standards for the control device installed upstream of the fiber-bed mist eliminator to prevent plugging do not apply as long as work practice standards for the fiber-bed unit are followed.

For more information contact:

Jean S. Waters
Small Business Environmental Assistance
Program—Technical Assistance
KSU Pollution Prevention Institute
133 Ward Hall
Manhattan, KS 66506
913-532-6501
800-578-8898

Janet Neff
Small Business Environmental Assistance
Program—Public Advocate
Kansas Dept. of Health and Environment
Building 283
Topeka, KS 66620
913-296-0669
800-357-6087

Gary Schlicht
U.S. EPA, Region VII
726 Minnesota Ave.
Kansas City, KS 66101
913-551-7097

