

Requirements for Chrome Plating

There is an Environmental Protection Agency (USEPA) rule entitled the National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks. This rule is found in 40 CFR Part 63, Subpart N¹. It is commonly referred to as Rule N or the Chrome Plating MACT² or the Chrome Plating NESHAP³. This rule contains requirements for hard chromium electroplating tanks, decorative chromium electroplating tanks, and chromium anodizing tanks. This rule contains requirements for both existing and new facilities of all capacities. The rule was issued on January 25, 1995. An amendment to the rule was issued on September 15, 2012.

Note: There is another USEPA rule that regulates metal plating some polishing. It contains requirements for chrome polishing operations that are located at area sources⁴ of hazardous air pollutants (HAPs). That rule is found in 40 CFR Part 63, subpart W and is referred to as Rule 6W. This document does not address Rule 6W.

Emission Limits

Table 1 contains emission limits that apply to plating, as well as related requirements for testing, monitoring, recordkeeping, and reporting. **HOWEVER**, if your facility uses a chemical fume suppressant containing a wetting agent, the Table 1 emission limits and related requirements do not apply to you. Instead, there are limits on the surface tension of electroplating or anodizing baths, with their own monitoring, recordkeeping and reporting requirements. Below are the requirements if your facility uses a chemical fume suppressant to comply with Rule N:

- For hard chromium electroplating tanks: You shall not exceed 40 dynes per centimeter (dynes/cm) (2.8×10^{-3} pound-force per foot (lbf/ft)), as measured by a stalagmometer, or 33 dynes/cm (2.3×10^{-3} lbf/ft), as measured by a tensiometer.
- For decorative chromium electroplating tanks using a chromic acid bath and for chromium anodizing tanks: You shall not exceed 40 dynes/cm (2.8×10^{-3} lbf/ft), as measured by a stalagmometer or 33 dynes/cm (2.3×10^{-3} lbf/ft), as measured by a tensiometer.
- Instead of being subject to one of the above surface tension limits, a facility is allowed to determine their site-specific surface tension limit. To do so, you would need to carry out a test to determine chrome emissions, while measuring surface tension (per Method 306B found in appendix A of Part 63). The maximum allowed surface tension will be that which corresponds to compliance with the applicable emission limitation.
- It is prohibited to use perfluorooctane sulfonic acid (PFOS)-based fume suppressants in a chromium electroplating tank or a chromium anodizing tank.
- Note: If your decorative chromium electroplating tank has been using a trivalent chromium bath with a wetting agent and then stops using this type of bath, you must submit a report to EPD within 30 days of the change. This report must address the requirements in §63.347(i)(3). Also, if this changed the applicable emission limitation, you must demonstrate compliance with that limit within 1 year of stopping use of this type of bath.

¹ The full text of the current rule, as well as additional EPA information about this rule, is available at the following link: www.epa.gov/ttn/atw/chrome/chromepeg.html.

² MACT is the abbreviation for Maximum Achievable Control Technology. Rules such as the Chrome Plating MACT contain emission limits based on use of MACT. MACT is determined through a defined process of evaluation of test results and other data.

³ NESHAP is the abbreviation for National Emission Standards for Hazardous Air Pollutants.

⁴ An "area source" is defined by USEPA as a facility that emits less than 10 tons annually of a single HAP and less than 25 tons annually of a combination of HAPs.

Table 1: Emission Limits

Type of Tank	Emission Limitations ^a	
	Small ^b	Large ^c
Hard Chromium Plating Tanks		
All existing open surface and enclosed tanks	0.015 mg/dscm (6.6 x 10 ⁻⁶ gr/dscf)	0.011 mg/dscm (4.8 x 10 ⁻⁶ gr/dscf)
All new open surface and enclosed tanks	0.006 mg/dscm (2.6 x 10 ⁻⁶ gr/dscf)	0.006 mg/dscm (2.6 x 10 ⁻⁶ gr/dscf)
Alternative Compliance Option: Mass Emission Rate Standard		
All existing enclosed tanks	The mass rate of total chromium in the exhaust gas stream must be less the maximum allowable mass emission rate as determined by using calculation procedure in §63.344(f)(1)(i) or §63.344(f)(1)(ii), as applicable	
All new enclosed tanks	The mass rate of total chromium in the exhaust gas stream must be less the maximum allowable mass emission rate as determined by using calculation procedure in 40 CFR 63.344(f)(1)(iii)	
Decorative Chromium Plating Tanks Using a Chromium Acid Bath^d		
All existing decorative chromium electroplating tanks using chromic acid bath.	0.007 mg/dscm (3.1 x 10 ⁻⁶ gr/dscf)	
All new or reconstructed decorative chromium electroplating tanks using a chromic acid bath.	0.006 mg/dscm (2.6 x 10 ⁻⁶ gr/dscf)	
Decorative Chromium Plating Tanks Using a Trivalent Chromium Bath with a Wetting Agent^e		
All existing, new or reconstructed tanks	Only subject to recordkeeping and reporting requirements	
Decorative Chromium Anodizing Tanks		
All existing tanks	0.007 mg/dscm (3.1 x 10 ⁻⁶ gr/dscf)	
All new or reconstructed tanks	0.006 mg/dscm (2.6 x 10 ⁻⁶ gr/dscf)	
^a mg/dscm = milligrams per dry standard cubic meter of exhaust air gr/dscf = grains per dry standard cubic feet of exhaust air		
^b Small, hard chromium electroplating facility means a facility that has a maximum cumulative potential rectifier capacity of less than 60 million ampere-hours per year.		
^c Large, hard chromium electroplating facility means a facility that has a maximum cumulative potential rectifier capacity greater or equal to 60 million ampere-hours per year.		
^e If you have a chromic acid bath, you are not allowed to comply just by using a reducing agent to change the form of chromium from hexavalent to trivalent.		
^d If a trivalent chromium bath is using a wetting agent as the control method, the wetting agent must be an ingredient in the components purchased as a package.		

Operation and Maintenance Plan

- **All facilities subject to Rule N must have an Operations and Maintenance Plan.**
- Your plan must specify the operation and maintenance criteria for the tank, any required add-on control equipment as well as the process and control system monitoring equipment. You will need to have and use a checklist to document the operation and maintenance of this equipment.
- If you must use an add-on control device or monitoring equipment to comply with this rule, your plan must include the operation and maintenance practices for that device or monitoring equipment, as identified in Table 2 below if the specific equipment used is identified in Table 2 below which appears as Table 1 in Rule N.
- If a piece of your equipment is not identified in Table 2 below, you must include proposed operation and maintenance practices for that equipment. These proposed operation and maintenance practices must be submitted for approval as part of the submittal required under §63.343(d).
- Your plan must specify the procedures you will follow to ensure that equipment or process malfunctions due to poor maintenance or other preventable conditions do not occur.
- Your plan must include a systematic procedure for identifying malfunctions of process equipment, add-on air pollution control devices, and process and control system monitoring equipment and for implementing corrective actions to address such malfunctions.
- Your plan must include housekeeping procedures, as specified in Table 3, which appears as Table 2 in Rule N.
- Your plan must incorporate the work practices for the selected monitoring equipment. Specifically, the plan must include the manufacturer's recommended operating and maintenance procedures. If you use a tensiometer, the work practices must include a Division-approved procedure that implements EPA Method 306B and ASTM Method D 1331-89 and a copy of EPA Method 306B and ASTM Method D 1331-89.
- If your **operation** and maintenance plan does not address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, you will need to revise the operation and maintenance plan within 45 days after such an event occurs. The revised plan must include procedures for operating and maintaining the process equipment or monitoring equipment during similar malfunction events, and a program for corrective action for such events.

TABLE 2: SUMMARY OF OPERATION AND MAINTENANCE PRACTICES

Control technique	Operation and maintenance practices	Frequency
Composite mesh-pad (CMP) system	1. Visually inspect device to ensure there is proper drainage, no chronic acid buildup on the pads, and no evidence of chemical attack on the structural integrity of the device	once/quarter
	2. Visually inspect back portion of the mesh pad closest to the fan to ensure there is no breakthrough of chromic acid mist	once/quarter
	3. Visually inspect ductwork from tank to the control device to ensure there are no leaks	once/quarter
	4. Perform washdown of the composite mesh-pads in accordance with manufacturers recommendations	once/quarter
Packed-bed scrubber (PSB)	1. Visually inspect device to ensure there is proper drainage, no chronic acid buildup on the packed beds, and no evidence of chemical attack on the structural integrity of the device	once/quarter
	2. Visually inspect back portion of the chevron blade mist eliminator to ensure that it is dry and there is no breakthrough of chromic acid mist	once/quarter
	3. Visually inspect ductwork from tank to the control device to ensure there are no leaks	once/quarter

	4. Add fresh makeup water to the top of the packed bed ^{a b}	Whenever makeup is added
PBS/CMP system	1. Same as for CMP system	once/quarter
	2. Same as for CMP system	once/quarter
	3. Same as for CMP system	once/quarter
	4. Same as for CMP system	Per manufacturer
Fiber-bed mist eliminator ^c	1. Visually inspect fiber-bed unit and prefiltering device to ensure there is proper drainage, no chromic acid buildup in the units, and no evidence of chemical attack on the structural integrity of the devices	once/quarter
	2. Visually inspect ductwork from tank or tanks to the control device to ensure there are no leaks	once/quarter
	3. Perform washdown of fiber elements in accordance with manufacturers recommendations	Per manufacturer
Air pollution control device (APCD) not listed in rule	To be proposed by the source for approval by the Administrator	To be proposed by the source for approval by the Administrator
Monitoring Equipment		
Pitot tube	Backflush with water, or remove from the duct and rinse with fresh water. Replace in the duct and rotate 180 degrees to ensure that the same zero reading is obtained. Check pitot tube ends for damage. Replace pitot tube if cracked or fatigued	once/quarter
Stalagmometer	Follow manufacturers 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, the top is defined as the area downstream of the packing material such that the makeup water would flow countercurrent 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 the work practice standards for the fiber-bed unit are followed.		

Housekeeping Practices

The following housekeeping requirements must be used in order to minimize fugitive emissions of chromium compounds. These were added to this rule in the 2012 amendment.

Table 3 to §63.342 – Housekeeping Practices

For	You must:	Minimum Frequency
1. Any substance used in an affected chromium electroplating or chromium anodizing tank that contains hexavalent chromium	(a) Store the substance in a closed container in an enclosed storage area or building; AND	At all times, except when transferring the substance to and from the container.
	(b) Use a closed container when transporting the substance from the enclosed storage area.	Whenever transporting substance, except when transferring the substance to and from the container
2. Each affected tank, to minimize spills of bath solution that result from dragout. Note: this measure does not require the return of contaminated bath solution to the tank. This requirement applies only as the parts are removed from the tank. Once away from the tank area, any	(a) Install drip trays that collect and return to the tank any bath solution that drips or drains from parts as the parts are removed from the tank; OR	Prior to operating the tank.
	(b) Contain and return to the tank any bath solution that drains or drips from parts as the parts are removed from the tank; OR	Whenever removing parts from an affected tank.
	(c) Collect and treat in an onsite wastewater treatment plant any bath	Whenever removing parts from

spilled solution must be handled in accordance with Item 4 of these housekeeping measures.	solution that drains or drips from parts as the parts are removed from the tank.	an affected tank.
3. Each spraying operation for removing excess chromic acid from parts removed from, and occurring over, an affected tank.	Install a splash guard to minimize overspray during spraying operations and to ensure that any hexavalent chromium laden liquid captured by the splash guard is returned to the affected chromium electroplating or anodizing tank.	Prior to any such spraying operation.
4. Each operation that involves the handling or use of any substance used in an affected chromium electroplating or chromium anodizing tank that contains hexavalent chromium	Begin clean up, or otherwise contain, all spills of the substance. Note: substances that fall or flow into drip trays, pans, sumps, or other containment areas are not considered spills.	Within 1 hour of the spill.
5. Surfaces within the enclosed storage area, open floor area, walkways around affected tanks contaminated with hexavalent chromium from an affected chromium electroplating or chromium anodizing tank.	(a) Clean the surfaces using one or more of the following methods: (i) HEPA vacuuming; (ii) Hand-wiping with a damp cloth; (iii) Wet mopping; (iv) Hose down or rinse with potable water that is collected in a wastewater collection system; (v) Other cleaning method approved by the permitting authority; OR (b) Apply a non-toxic chemical dust suppressant to the surfaces.	At least once every 7 days if one or more chromium electroplating or chromium anodizing tanks were used, or at least after every 40 hours of operating time of one or more chromium electroplating or chromium anodizing tank, whichever is later
		According to manufacturer's recommendations.
6. All buffing, grinding, or polishing operations that are located in the same room as chromium electroplating or chromium anodizing operations.	Separate the operation from any affected electroplating or anodizing operation by installing a physical barrier; the barrier may take the form of plastic strip curtains.	Prior to beginning the buffing, grinding, or polishing operation.
7. All chromium or chromium-containing wastes generated from housekeeping activities.	Store, dispose, recover, or recycle the wastes using practices that do not lead to fugitive dust and in accordance with hazardous waste requirements.	At all times.

Performance Testing & Monitoring

- If your facility is subject to an emission limit in Table 1, you are required to conduct a performance test to demonstrate compliance. This rule only requires initial testing. However, your Georgia Air Quality Permit may require additional testing. Additional testing is likely to be required if you significantly change your plating process or control equipment.

Recordkeeping Requirements

- You are required to maintain records of all required maintenance that is performed on equipment that is subject to this rule, as well as any required maintenance done on add-on air pollution control device and monitoring equipment. Records need not be retained for the housekeeping requirements.
- During periods of malfunction, you are required to maintain records of what you did to minimize emissions, in accordance with the general duty clause found in 40 CFR 63.342(a)(1). This includes corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

- If you use fume suppressants to comply with this rule, you must maintain records of the date and time that fume suppressants are added to the plating bath and keep records of the fume suppressant manufacturer and product name.

Reporting Requirements

- If you are required to carry out a performance test, you must submit a copy of the report to the Air Branch, as well as an electronic copy of the test report to USEPA's WebFIRE database through an electronic emissions test report structure called the Electronic Reporting Tool (ERT). The ERT generates an electronic report which would be submitted using the Compliance and Emissions Data Reporting Interface (CEDRI). The submitted report will be transmitted through EPA's Central Data Exchange (CDX) network for storage in the WebFIRE database. The requirement to submit performance test data electronically to USEPA applies only to those performance tests conducted using test methods that are supported by the ERT. For more information go to <http://epa.gov/ttn/chief/cedri/index.html>
- The performance test results, including any associated fuel analyses required by the Chromium MACT, must be submitted within 60 days after the date of completing the performance test.

Questions?

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