

Chromium Electroplating NESHAP RTR: EPA Emission Estimates are Significantly Overstated

- Chromium NESHAP RTR is an Area Source rule for small U.S. manufacturing sector
- Major supply chains – automotive, aerospace/defense, energy, electronics, appliances, others



- EPA facility estimates for chromium are overestimated by at least one order of magnitude
- Analysis of EPA "high risk" and other facilities – compares OAR default / modeled values and NEI data with actual emissions data collected from same companies
- Essentially linear relationship between emissions, risk and population exposure
- Conclusion: Significant corrections necessary to yield realistic emission estimates



Chromium NESHAP: Overview of Emission Reductions

Pre-Chromium MACT
HAP Emissions (1995)

173
Tons/Yr

2010 EPA Projected
HAP Emissions

~ 5
Tons/Yr

2010 "Reasonable Case"
HAP Emissions

Below 0.5
Tons/Yr



Chromium Electroplating MACT Technology Review and Residual Risk

August 2010

Summary of EPA's Risk Modeling of Chromium Emissions

- Data summary of "highest risk" facilities
 - 0 of 1634 facilities with MIR > 70
 - 3 of 1634 facilities with MIR > 50 (0.2%)
 - 11 of 1634 facilities with MIR \geq 30 (0.7%)
 - 54 of 1634 facilities with MIR \geq 20 (3.3%)
- EPA's Sources of data included National Emissions Inventory (NEI), estimated emissions, and model plants (9.26 lbs for hard chrome, 2.65 lbs for decorative chrome and 0.41 lbs for chromic anodizing)
- Estimates of annual chromium emissions appear to be approximately 5 tons
- High percentage of chromium plating facilities in urban areas, i.e., 14 million individuals subject to 1 in a million risk – 90% of these are subject to less than 10 in a million risk

EPA Over-Estimated Risk from Chromium Emissions

Data Review

- All 3 facilities based on NEI data are errors and appear to be chromium emissions data from before implementation of original Chrome MACT (pre-1995)
- Information from 6 of 7 facilities report annual chromium emissions significantly lower than EPA estimates (1 of the 6 facilities has closed)
- Information from 6 of the model plants (1 of the facilities has closed and 5 facilities report emissions significantly lower than model emissions)
- EPA used worst case emissions assumptions for facilities with no information, thus more facilities identified as hard chrome with 9.26 lbs of emissions (e.g., artificially inflated universe of 1,200 hard chrome facilities in database rather than 800)
- Companies are now using additional in-process controls to meet federal OSHA Chromium PEL (2004 final rule), which provides additional emissions reductions
- Approximately 20-30 % of metal finishing facilities have closed in the last five years due to economic downturn

Risk Analysis Based on Corrected Data

- Chromium emissions at least one order of magnitude (possibly as much as two or three orders of magnitude, based on preliminary analysis) lower than EPA estimates
- If chromium emissions from the 54 highest risk facilities are actually lower than EPA estimates, then associated risk would be substantially lower and fewer individuals subject to risk – EPA model suggests linear relationship between variables
- Based on available data, 0.5 lbs of chromium emissions would be a conservative estimate of average annual facility emissions
- 1634 facilities in EPA database with an average of 0.5 lbs of chromium emissions equals a national total of 817 pounds (0.409 tons)
- Based on the corrected emissions data, very few facilities would be expected to have an MIR above 1 in a million – approximately 1.5 million individuals or fewer subject to 1 in a million risk

EPA Residual Risk Standard

HON Residual Risk Rule

- Court upheld standard based on no individual subject to risk greater than 100 in a million
- Other considerations to impose more stringent risk, such as new control technologies or large potentially exposed population

Technology Review for Chrome MACT

- No new control technology developed since promulgation of Chrome MACT
- Additional controls (e.g., HEPA filters) not cost effective
- Facilities subject to Chrome MACT are almost all area sources
- Bath surface tension/fume suppressants (in-process) effective and economical controls
- Industry-supported PFOS fume suppressant phase out part of revised Chrome MACT will reduce risks to potentially exposed populations

Basis for Rulemaking Decisions

- Data suggest that existing Chrome MACT has successfully reduced chromium emissions
- Residual chromium emissions at least one order of magnitude (possibly two or three orders of magnitude) lower than EPA estimates
- EPA Model: Linear relationship among emissions, risk and population at risk
- Lower Emissions = Reduced Risk = Fewer Individuals Subject to Risk
- Any additional controls to address residual risk would trigger RFA for small business impacts on facilities subject to Chrome MACT

Chromium Electroplating: Summary of Risk Modeling -- All Facilities with MIR = 20 or Greater

Fac ID	Facility Name	Address	City	State	Process	Emissions, lbs/yr	MIR	Basis (a)
	Chrome Craft	1819 23rd Street	Sacramento	CA	Decorative Cr electroplating	11.8	70	NEI
322	Empire Hard Chrome	1615 S Kostner Ave	Chicago	IL	Hard Cr electroplating	31.2	70	EE
3687	Bayamon Bumpers	Carr.#2 Km.16.8	Bayamon	PR	Hard Cr electroplating	9.26	55	MP
3690	Lawson-Mardon-Wheaton of PR Inc.	Pr #1 Km.156.4 Bo.Monte Llano	Cayey	PR	Hard Cr electroplating	9.26	49	MP
321	Empire Hard Chrome Inc	1537 S Wood St	Chicago	IL	Hard Cr electroplating	18.0	40	EE
3693	Velazquez Hydraulic Services	C/Brisas Final Lt.7, Sab.Llana	Rio Piedras	PR	Hard Cr electroplating	9.26	38	MP
442	Industrial Chrome Plate	2805 S. Flores St.	San Antonio	TX	Hard Cr electroplating	9.26	33	MP
3991	AAA Industrial Chrome Co.	2409 Whitmore	Fort Worth	TX	Hard Cr electroplating	9.26	33	MP
3999	Alcatel Network Systems	790 Glendale Drive	Dallas	TX	Hard Cr electroplating	9.26	33	MP
253	Denver Metal Finishing	3100 E 43rd Ave	Denver	CO	Hard Cr electroplating	0.71	30	EE
3596	Industrial Hard Chromium Co.	7 Rome St	Newark	NJ	Hard Cr electroplating	11.9	30	NEI
4098	Tenneco Packaging	9200 Old McGregor Rd.	Waco	TX	Hard Cr electroplating	9.26	29	MP
5023	M & R Plating Corp.	10939 Magnolia Blvd.	North Hollywood	CA	Hard Cr electroplating	9.26	28	MP
4107	Turbine Chrome Services	7419 Avenue O	Houston	TX	Hard Cr electroplating	9.26	27	MP
4931	HCC Hermetic Seal Corporation	4232 Temple City Blvd	Rosemead	CA	Hard Cr electroplating	9.26	27	MP
210	Coastal Multichrome, Inc.	1160 Mercantile St	Oxnard	CA	Hard Cr electroplating	9.26	26	MP
4645	Aero Dynamic Plating Co., Inc.	13620 S. St. Andrews Place	Gardena	CA	Hard Cr electroplating	9.26	25	MP
846	Superior Metal Finishing	1733 W. 134th	Gardena	CA	Hard Cr electroplating	9.26	25	MP
602	Moog Aircraft Group - Torrance Operations	20263 Western Avenue	Torrance	CA	Hard Cr electroplating	9.26	24	MP
5059	Monitor Polishing & Plating	390 South Pasadena Avenue	Pasadena	CA	Hard Cr electroplating	9.26	23	MP
4866	Esposito Plating & Polishing Company	2904 Chapman Street	Oakland	CA	Hard Cr electroplating	9.26	23	MP
4066	Lockheed Martin Kelly Aviation Center	661 Duncan Dr., Bldg. 360	San Antonio	TX	Hard Cr electroplating	9.26	23	MP
818	Southwest United Industries - Tulsa	422 S. St. Louis St.	Tulsa	OK	Hard Cr electroplating	9.26	23	MP
4904	General Plating Company	951 W. Vernon Avenue	Los Angeles	CA	Hard Cr electroplating	9.26	23	MP
4117	U.S. Polestar Marin Engineer	215 No. Sampson Street	Houston	TX	Hard Cr electroplating	9.26	22	MP
3990	AAA Advertising	10141 Long Point Rd	Houston	TX	Hard Cr electroplating	9.26	22	MP
4804	Control Plating Co.	17014 South Gramercy Place	Gardena	CA	Hard Cr electroplating	9.26	22	MP
3821	Norfolk Shipbuilding	750 W Berkley Ave	Norfolk	VA	Hard Cr electroplating	9.26	22	MP
300	Electro-Coatings of Texas Inc.	216 Baywood St.	Houston	TX	Hard Cr electroplating	9.26	22	MP
3926	Tank Lining of Paris	Dobbins Street	Paris	TN	Hard Cr electroplating	9.26	22	MP
304	Electrolizing, Inc	1947 Hooper Avenue	Los Angeles	CA	Hard Cr electroplating	9.26	22	MP
3908	Purecoat International, LLC	3301 Electronics Way	West Palm Beach	FL	Hard Cr electroplating	9.26	22	MP
4041	Gull Industries	3302 Cochran St.	Houston	TX	Decorative Cr electroplating	2.65	21	MP
108	Babbit Bearing	1170 N. Fifth St.	San Jose	CA	Hard Cr electroplating	9.26	21	MP
939	Valley Plating Works	5900 Shelia St.	Commerce	CA	Decorative Cr electroplating	2.65	21	MP
4873	Faith Plating Company of Los Angeles	7141 Santa Monica Boulevard	Los Angeles	CA	Hard Cr electroplating	9.26	21	MP
4885	Fosters Plating & Metal	1570 34th Street	Oakland	CA	Hard Cr electroplating	9.26	21	MP
4221	Toastmaster Inc.	200 Vine	Boonville	MO	Hard Cr electroplating	9.26	21	MP
70	Anoplate Corp	459 Pulaski St	Syracuse	NY	Hard Cr electroplating	9.26	20	EE
253	Denver Metal Finishing	3100 E 43rd Ave	Denver	CO	Decorative Cr electroplating	0.40	20	EE
4832	Dover Industrial Chrome	2929 N Campbell Ave	Chicago	IL	Hard Cr electroplating	4.76	20	EE
289	Economy Plating Inc	2350 N Elston Ave	Chicago	IL	Hard Cr electroplating	4.24	20	EE
2442	Quebecor Printing	404 N Wesley Ave	Mt. Morris	IL	Hard Cr electroplating	21.5	20	NEI
3992	Action Bumper	1919 Lone Oak	Houston	TX	Decorative Cr electroplating	2.65	20	MP
3958	Delta Faucet	Hwy. 62 W	Chickasha	OK	Decorative Cr electroplating	2.65	20	MP
470	Jobsite, Inc.	545 31 Rd	Grand Junction	CO	Hard Cr electroplating	9.26	20	MP
3674	U. S. Army Watervliet Arsenal	Broadway	Watervliet	NY	Hard Cr electroplating	9.26	20	MP
4171	Vektok	1334 East 6th Ave.	Emporia	KS	Hard Cr electroplating	9.26	20	MP
4812	Crocker Plating	5908 Crocker St	Los Angeles	CA	Hard Cr electroplating	9.26	20	MP
927	US Chrome Corp. of California	1480 Canal Ave.	Long Beach	CA	Hard Cr electroplating	9.26	20	MP
4991	K & L Anodizing Corp.	1200 South Victory Boulevard	Burbank	CA	Hard Cr electroplating	9.26	20	MP
4816	Custom Chrome Plating Co.	1613 East Marshall	Tulsa	OK	Hard Cr electroplating	9.26	20	MP
5016	London Platers Inc.	1080 East 24 Street	Hialeah	FL	Hard Cr electroplating	9.26	20	MP
4925	Hard Chrome Enterprises, Inc.	220 10th Street	Lake Park	FL	Hard Cr electroplating	9.26	20	MP

(a) NEI = emissions based on NEI data; MP = emissions based on model plants; EE = emissions based on emission estimate.

EPA's "High Risk" Facilities for Chromium Emissions

Corrected Data

1) Chrome Craft, Sacramento, CA (NEI Emissions of 11.8 lbs)

Tested emissions rate of 0.00012mg/AH with 11,141,142 AH for 2009 for a total of 0.0029 lbs of chromium emissions.

In addition, the address listed on the EPA report for Chrome Craft was the old address. 12-15 years ago, Chrome Craft moved to a new location and installed the requisite control equipment. Accordingly, the NEI data appears to be before the Chrome MACT was promulgated and before controls were installed. Chrome Craft provided a report that documents this information.

2) Empire Hard Chrome, Kostner Ave. (Estimated Emissions of 31.2 lbs.)

The emissions rate was calculated using AP42 emissions factors for hard chrome and a control efficiency of 99.4%

2009	263.5 million AH	27.0 lbs
2008	240.7 million AH	24.7 lbs
2007	232.3 million AH	23.8 lbs
2006	257.7 million AH	26.4 lbs
2005	270.4 million AH	27.7 lbs

The average emissions rate over the past 5 years is 25.78 lbs which is over 16 % less than the estimate, so the MIR should be lower than the figure on the EPA list of "high risk" facilities.

3) Empire Hard Chrome, Wood St. (Estimated Emissions of 18.0 lbs.)

The emissions rate was calculated using AP42 emissions factors for hard chrome and a control efficiency of 99.4%

2009	33.9 million AH	3.5 lbs
2008	76.5 million AH	7.8 lbs
2007	68.9 million AH	7.1 lbs
2006	81.9 million AH	8.4 lbs
2005	88.5 million AH	9.0 lbs

The average emissions rate over the past 5 years is 7.2 lbs which is approximately 60% less than the estimate, so the MIR should be lower than the figure on the EPA list of "high risk" facilities.

4) Industrial Hard Chromium Co., Newark, NJ (NEI Emissions of 11.9 lbs.)

I am still waiting for some additional information, but based on my conversation with the folks at Industrial Hard Chromium their emissions are very low with the existing controls. The estimate was well under a pound (approximately 0.001 lbs.). It would appear that the NEI data appears to be before the Chrome MACT was promulgated and before controls were installed. As soon as I get more details from this facility, I will send to you.

5) Denver Metal Finishing, Denver, CO -- Hard Chrome (Estimated Emissions of 0.71 lbs)

The following emissions for the facility were based on the facility's initial performance test and AH

2009	2,226.9 AH	0.180 lbs
2008	2,292.8 AH	0.187 lbs
2007	4,402.7 AH	0.359 lbs
2006	8,216.0 AH	0.670 lbs
2005	4,197.0 AH	0.342 lbs

The average over the past 5 years is 0.3476 lbs which is approximately one half of EPA's estimated emissions.

6) Denver Metal Finishing, Denver, CO -- Decorative Chrome (Estimated Emissions of 0.40 lbs)

The following emissions for the facility were based on the facility's initial performance test and AH

2009	212.6 AH	0.017 lbs
2008	297.9 AH	0.024 lbs
2007	170.3 AH	0.014 lbs
2006	207.6 AH	0.017 lbs
2005	113.9 AH	0.009 lbs

The average over the past 5 years is 0.016 lbs which is more than an order of magnitude less than EPA's estimated emissions.

7) Electro-Coating of Texas Inc., Houston, TX (Default Emissions of 9.26 lbs.)

This facility has five separate plating tanks and each is equipped with a three-stage wet mesh pad mist eliminator. The facility also uses polyethylene balls on the tanks to reduce chrome emissions even further. The annual chromium emissions for the facility are based on annual amp hours and emission factors that were based on source testing conducted in July 1995, August 1996 and May 2005. The following summarizes the facility's annual chromium emissions for the past five years.

Year	Amp Hours/Yr	Chromium Emissions/Yr
2005	47,498,753	1.412 lbs
2006	84,097,341	2.420 lbs
2007	56,509,717	1.603 lbs
2008	44,859,116	1.130 lbs
2009	38,313,669	0.952 lbs

The average annual chromium emissions for this facility based on the last five years of production is 1.503 lbs, which is more than 80% less than the default emissions of 9.26 lbs. Accordingly, The MIR should be significantly lower than the figure on the EPA list of "high risk" facilities.

8) Electrolizing, Inc., Los Angeles, CA (Default Emissions of 9.26 lbs.)

This facility has a Merlin hood control system that returns chromium emission back into the system rather than be emitted. The system has been in place for approximately 15 years with estimated annual chromium emissions of approximately 0.02 lbs.

9) Gull Industries (Cochran St.), Houston, TX (Default Emissions of 2.65 lbs.)

This facility has a scrubber with composite mesh pad system and uses fume suppressants for its decorative chrome plating operation. Using AP42 emissions factors with a removal efficiencies of 99.9% for the scrubber and 90% for the fume suppressant, the chrome emissions are 0.003 lbs. for 2009. This is approximately three orders of magnitude lower than EPA's default estimate for this facility.

10) Quebecor Printing (now World Color), Mt. Morris, IL (NEI Emissions of 21.5 lbs.)

This facility only has two small hard chrome plating tanks, so it is very unlikely that the NEI data is representative of this facility. As with the other two facilities with NEI data, this appears to be erroneous and may be data before any controls were installed (even that would appear to be an anomaly for this facility).

11) U.S. Army Watervliet Arsenal, Watervliet, NY (Default Emissions of 9.26 lbs.)

The following emissions were based on the facility's initial performance test and AH

2009	2.77 lbs
2008	2.28 lbs
2007	2.81 lbs
2006	2.68 lbs
2005	2.95 lbs
2004	2.30 lbs
2003	3.99 lbs

The average emissions for this facility over the past 7 years is 2.83 lbs which is more than one third less than the default emissions rate.

12) Economy Plating, Chicago, IL (Estimated emissions of 4.24 lbs.)

This facility is closed.

13) Delta Faucet, Chickasha, OK (Default Emissions of 2.65 lbs.)

This facility was closed in 2006. All of the plating equipment was sold and removed from the facility. The building is now being used as a warehouse.

14) K & L Anodizing, Burbank, CA (Default Emissions of 9.26 lbs.)

This is an anodizing facility that has never operated any hard chrome plating processes.

15) Additional Facilities

I have had contact with the following facilities and am awaiting additional data regarding historic chromium emissions:

Southwest United Industries, Tulsa, OK (Default Emissions of 9.26 lbs.)

Anoplate Corp, Syracuse, NY (Estimated Emissions of 9.26 lbs.)

Chromium Electroplating -- Estimated Cost Effectiveness for HEPA Retrofit

Electroplating Type	No. of plants nationwide	Net reductions, tons/yr	Annualized cost, \$/yr	Cost effectiveness, \$/ton	NESHAP reductions, tons/yr	NESHAP annualized cost, \$/ton	NESHAP cost effectiveness, \$/ton
Hard Chromium							
Small	553	0.24	\$17,640,000	\$73,400,000	19.8	\$4,020,000	\$210,000
Medium	158	0.48	\$12,953,000	\$27,200,000	47.6	\$3,990,000	\$90,000
Large	79	0.73	\$13,375,000	\$18,400,000	87.8	\$4,330,000	\$50,000
Total	790	1.44	\$43,968,000		155.2	\$12,340,000	
			Overall	\$30,500,000			\$80,000
Decorative Chromium (a)							
Small	592	0.020	\$2,355,000	\$117,700,000	2.53	(\$680,000)	(\$270,000)
Medium	111	0.016	\$1,467,000	\$89,000,000	1.91	(\$170,000)	(\$90,000)
Large	37	0.062	\$2,740,000	\$44,200,000	6.35	\$200,000	\$40,000
Total	740	0.098	\$6,562,000		10.8	(\$650,000)	
			Overall	\$66,600,000			(\$70,000)
Chromium Anodizing (a)							
Small	180	0.0034	\$718,000	\$213,100,000	0.80	(\$730,000)	(\$920,000)
Large	60	0.017	\$2,457,000	\$148,100,000	3.10	(\$530,000)	(\$180,000)
Total	240	0.020	\$3,175,000		3.90	(\$1,260,000)	
			Overall	\$159,100,000			(\$330,000)
Total for All Electroplating Types							
Total	1,770	1.56	\$53,705,000				
			Overall	\$34,400,000	169.9	\$10,430,000	\$70,000

(a) NESHAP cost effectiveness is negative due to assumption that the use of WAFS would decrease operating costs (net negative cost).