CHROMIUM EMISSIONS
TEST REPORT

PERFORMED FOR

CENTURY PLATING
CHICAGO, ILLINOIS

PERFORMED BY

RMC ENVIRONMENTAL, INC
Project Number: 2004-12593

Prepared for:

CENTURY PLATING
CHICAGO, ILLINOIS

Submitted By:

RMC Environmental, Inc.
9226 North 2nd Street
Machesney Park, Illinois

RMCEI Reference Number: 2004-12593

NOVEMBER 2004

CHROMIUM EMISSIONS TEST REPORT For CENTURY PLATING Chicago, Illinois

Table of Contents

1.0 PROJECT SUMMARY 1-1

1.1 Source Information..... 1-1
1.2 Testing Firm Information..... 1-1
1.3 Test Information..... 1-1

2.0 SUMMARY OF RESULTS 2-1

3.0 TEST PROCEDURES AND EMISSIONS DETERMINATION..... 3-1

3.1 Test Procedures..... 3-1
3.2 Emissions Determinations..... 3-1

Appendix A - Reference Measurement Data With Emission Rate Calculations

Appendix B - Field Data Sheets For Total Chromium

Appendix C - Analytical Data For Total Chromium Analysis

Appendix D - Reference Measurement Performance Checks and Calibration, Chain Of Custody and QA/QC Documentation

1.0 PROJECT SUMMARY

1.1 Source Information

Plant Name and Address:	Century Plating 2939 North Oakley Avenue Chicago, Illinois 60618
Units Tested:	Decorative chrome tank scrubber – CMP Scrubber 2

1.2 Testing Firm Information

Firm Name and Address:	RMC Environmental, Inc. 9226 North 2nd Street Machesney Park, Illinois 61115
Firm Contact:	Gregory Chleborowicz - Project Manager
Telephone Number:	800-532-3391 Voice 815-226-9542 Fax

1.3 Test Information

Test Requested By:	Century Plating
Firm Contact:	Mr. Vic LaPorta
Telephone Number:	773-477-1792 Phone
Test Objective:	Conduct chrome, moisture and flow rate testing on new scrubber for plating tanks in accordance with the MACT regulations and EPA Methods 1 – 4 & 306 (40 CFR 63, Appendix A).
Test Methods:	EPA Methods 1, 2, 3, 4 and 306
Test Date:	November 16, 2004
Test Coordinators:	Mr. Vic LaPorta
Test Personnel:	Gregory Chleborowicz - Project Manager Shawn Holbach – Environmental Technician Nathan Markus – Environmental Technician
Agency Personnel:	

2.0 SUMMARY OF RESULTS

The results of the emissions retesting performed on the decorative chrome tank stacks are presented in **Table 2-1.** Detailed results of all of the testing completed on this location are located in **Appendix A.** The field data and the analytical results are presented in **Appendix B** and **C**, respectively. Calibration sheets and equipment performance checks are presented in **Appendix D**, along with the chain of custody.

As indicated by the average of the three test runs, the scrubber met the MACT regulation standards of 0.030 mg/DSCM for composite mesh pad scrubber systems on decorative chrome plating tanks.

TABLE 2-1
SUMMARY OF CHROMIUM RESULTS
Century Plating
November 16, 2004

Location	Test Parameter	Result	Specification
Scrubber Unit #2	mg/DSCM Flow rate DSCFM	0.003 7,583	≤ 0.030 mg/DSCM for decorative chrome plating sources

3.0 TEST PROCEDURES AND EMISSIONS DETERMINATIONS

The sampling and analytical requirements for this program include the determination of chrome, O_2/CO_2, moisture and volumetric flow rates from the stack effluent. The plating processes were operated at "Normal Maximum" capacity. The specific equipment and procedures that were used are detailed below.

3.1 Test Procedures

Total chrome compliance testing was completed on the exhaust stacks from the chrome plating tanks. The compliance testing consisted of three two-hour test runs utilizing EPA Methods 1, 2, 3B (40 CFR 60, Appendix A) and 306 (40 CFR 63, Appendix A).

The number and location of the sampling points were determined according to the procedures outlined in EPA Method 1. The exhaust stack cross section was into the number of points on each of the two axes as indicated by the EPA Method 1 specifications. A cyclonic flow check was performed at the sampling location to determine the flow angles at each point. An S-type pitot, oil manometer, and an angle finder were used for these determinations. At each point, the Pitot was positioned at a right angle to the flow; the pitot was then rotated until a null reading was obtained. The angles of rotation were then noted.

The flue gas velocity and volumetric flow rates were determined according to EPA Method 2. Velocity head measurements (delta P) were made using an S-type Pitot tube conforming to the geometric specifications indicated in Method 2 and each Pitot has been assigned a coefficient of 0.84. The differential pressures were measured using an oil manometer of the appropriate range. Flue gas temperatures were obtained with chromel-alumel thermocouples equipped with a digital readout.

The composition of the flue gas was determined utilizing the procedures outlined in Method 3. The percent moisture content of the flue gas was obtained from the amount of moisture collected in the Method 306 sampling train. Analysis for carbon dioxide and oxygen were was performed using a Fyrite analyzer and the analytical results were used in the calculation of flue gas composition and molecular weight.

3.2 Emissions Determinations

The chrome samples were drawn isokinetically from the source using an EPA method 306 sampling train. The sampling train consisted of a glass nozzle and probe liner, an attached Type S Pitot tube, four-glass impinger chilled and a metering console. No filter is used for this method.

The first impinger is left empty, the second and third impingers contain 100 ml of 0.1 N sodium hydroxide (NaOH) in place of water, and the fourth impinger contains 200g of preweighed silica gel for moisture removal. Each of the twenty-four points was sampled for 5 minutes resulting in a net run time of 120 minutes.

After sampling, the reagents were returned to their original container, weighed, the weights recorded on the label and the liquid level marked. The silica gel was returned to the original container, weighed and the weight recorded on the label. The volume of water vapor condensed in the impingers and the volume of water collected in the silica gel were

summed and entered into the moisture content calculations. All sampling components exposed to the effluent were rinsed three times with NaOH and the rinses were added to the reagent containers.

The combined samples and rinses were analyzed for chrome using ICP.

Appendix A - Reference Measurement Data With Emission Rate Calculations

RMC Environmental, Inc.
Emissions Testing & Consulting

Plant:	Century Plating	Date:	12/10/04
Project #:	2004-12593		
Location:	Chrome Tank 2 - Complaince Test		

Sample Identification			2-M306-1	2-M306-2	2-M306-3	
Test Date			11/16/04	11/16/04	11/16/04	
Start			825	1045	1255	
Finish			1035	1250	1501	
Total			120	120	120	
Cp	Pitot Coefficient	(CF)	0.84	0.84	0.84	
A	Area of stack	sq. inches	490.9	490.9	490.9	
Pbar	Barometric Pressure	(in HG)	30.37	30.37	30.37	
Wm	Volume of Condensate	(mg)	19.6	28.3	32.1	
Ts	Temperature of Effluent	(F)	81	84	84.2	
Pavg	Average Delta P		0.466	0.466	0.463	
Pg	Static Pressure	(in H2O)	0.35	0.35	0.35	
DH	Delta H, Orifice pressure diff	(in H2O)	1.65	1.66	1.65	
Tm	Meterbox Temperature	(F)	58.9	66.1	69.2	
Vm	Volume of sample metered	(CF)	82.466	83.207	83.430	
Y	Meter correction factor		0.995	0.995	0.995	
Dn	Nozzle Diameter	(in)	0.242	0.242	0.242	
CO2	Percent Carbon Dioxide	(%)	6.00	6.00	6.00	
O2	Percent Oxygen	(%)	18.50	18.50	18.50	
CO	Percent Carbon Monoxide	(%)	0	0	0	
N2	Percent Nitrogen	(%)	75.50	75.50	75.50	
Ms	Molecular Weight (wet)	(lb/lb-m)	29.57	29.52	29.49	
Laboratory Results						
	Total Chrome	(mg)	1.06E-02	1.05E-02	2.66E-03	
Ps	Absolute pressure of Flue G	(in HG)	30.40	30.40	30.40	**AVERAGES**
Vwstd	Volume of Water Vapor	(SCF)	0.92	1.33	1.51	
Vmstd	Volume of Metered Gas	(DSCF)	85.052	84.645	84.373	
M	Moisture	(%)	1.07	1.55	1.76	
Vs	Velocity	(FPS)	38.04	38.15	38.09	
Qaw	Volumetirc Flow	(ACFM)	7,781	7,804	7,790	7,792
Qsd	Volumetric Flow	(DSCF)	7,632	7,575	7,543	7,583
	Chromium Concentration	(mg/DSCM)	0.0044	0.0044	0.0011	0.0033
	Chromium Concentration	(lb/Hr)	0.00013	0.00012	0.00003	0.00009
I	Isokenetic	(%)	99.11	99.37	99.48	

Appendix B - Field Data Sheets For Total Chrome

Sampling and Velocity Traverse Point Determination
EPA Method 1

CLIENT _____
PLANT NAME Century Plating
CITY, STATE Chicago, IL
SAMPLING LOCATION Outlet

NO. OF PORTS AVAILABLE 2
NO. OF PORTS USED 2
PORT INSIDE DIAMETER 3"

DISTANCE FROM FAR WALL TO OUTSIDE OF PORT 25"
NIPPLE LENGTH AND/OR WALL THICKNESS 0
DEPTH OF STACK OR DUCT 25"
STACK OR DUCT WIDTH (IF RECTANGULAR) _____

EQUIVALENT DIAMETER:

$$D_E = \frac{2 \times \text{DEPTH} \times \text{WIDTH}}{\text{DEPTH} + \text{WIDTH}} = \frac{2(\quad)(\quad)}{(\quad + \quad)} = 25$$

DISTANCE FROM PORTS TO FLOW DISTURBANCES	UPSTREAM	DOWNSTREAM
	70"	15"
DIAMETERS	2.8	.6

STACK/DUCT AREA = _____ = _____ IN^2

LOCATION OF POINTS IN CIRCULAR STACKS OR DUCTS

	4	6	8	10	12	14	16	18	20	22	24
1	6.7	4.4	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.1	1.1
2	25.0	14.6	10.5	8.2	6.7	5.7	4.9	4.4	3.9	3.5	3.2
3	75.0	29.6	19.4	14.6	11.8	9.9	8.5	7.5	6.7	6.0	5.5
4	93.3	70.4	32.3	22.6	17.7	14.6	12.5	10.9	9.7	8.7	7.9
5		85.4	67.7	34.2	25.0	20.1	16.9	14.6	12.9	11.6	10.5
6		95.6	80.6	65.8	35.6	26.9	22.0	18.8	16.5	14.6	13.2
7			89.5	77.4	64.4	36.6	28.3	23.6	20.4	18.0	16.1
8			96.8	85.4	75.0	63.4	37.5	29.6	25.0	21.8	19.4
9				91.8	82.3	73.1	62.5	36.2	30.6	26.2	23.0
10				97.4	88.2	79.9	71.7	61.8	36.8	31.5	27.2
11					93.3	85.4	78.0	70.4	61.2	39.3	32.3
12					97.9	90.1	83.1	76.4	69.4	60.7	39.8
13						94.3	87.5	81.2	75.0	68.5	60.2
14						98.2	91.5	85.4	79.6	73.8	67.7
15							95.1	89.1	83.5	78.2	72.8
16							98.4	92.5	87.1	82.0	77.0
17								95.6	90.3	85.4	80.6
18								98.6	93.3	88.4	83.9
19									96.1	91.3	86.8
20									98.7	94.0	89.5
21										96.5	92.1
22										98.9	94.5
23											96.8
24											98.9

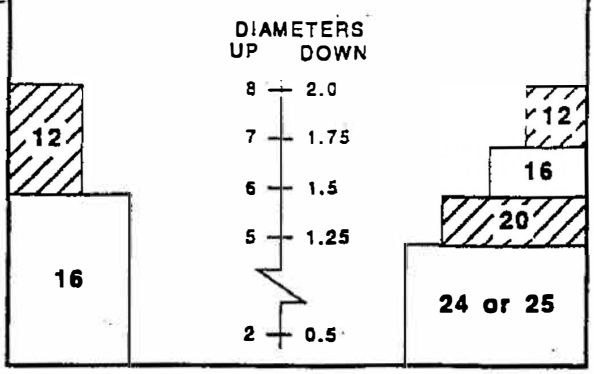
LOCATION OF POINTS IN RECTANGULAR STACKS OR DUCTS

	2	3	4	5	6	7	8	9	10	11	12
1	25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2	75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3		83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4			87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5				90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6					91.7	78.6	68.8	61.1	55.0	50.0	45.8
7						92.9	81.3	72.2	65.0	59.1	54.2
8							93.8	83.3	75.0	68.2	62.5
9								94.4	85.0	77.3	70.8
10									95.0	86.4	79.2
11										95.5	87.5
12											95.8

F-0016 rev. 8-93

DRAW HORIZONTAL LINE THROUGH DIAMETERS

If more than 8 and 2 diameters and if duct dia. is less than 24", use 8 or 9 points.



PITOT USED (✓) TYPE "S" ____ STANDARD ____

POINT	% OF DUCT DEPTH	DISTANCE FROM INSIDE WALL	DISTANCE FROM OUTSIDE OF PORT
1	0.021	.525	.525
2	.067	1.675	1.675
3	.118	2.95	2.95
4	.177	4.425	4.425
5	.250	6.25	6.25
6	.356	8.9	8.9
7	.644	16.1	16.1
8	.75	18.75	18.75
9	.823	20.575	20.575
10	.882	22.05	22.05
11	.933	23.325	23.325
12	.979	24.475	24.475
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			

Sampling Data-Method(s) _____

RUN NUMBER

Client		**Equipment ID Numbers**		**Fyrites %**	**Equipment Checks**
Plant Name	Century	Meter Box	#1	O_2 20.1%	Pitot, Pre/Post ✓/✓
City, State	Chicago ILL	Y Value	.995	CO_2 1.3%	Thermocouple
Sample Location	Outlet	Pitot Coefficient	.84		Orsat System
Job Number		Nozzle Diameter	.242		Nozzle Pre/Post ✓/✓
Run Number	01	**Nomograph Data**			**Leak Checks**
Date	11-16-04	Delta-H@	1.851		B B
Start Time	8:25am	Meter Temp	55		
End Time	10:35am	Est. H20	2%		E E
Test Personnel	SH/NM	Stack Temp	74		
		"C" Factor	1.005		B B
		Ref Delta P	.518		
		"K" Factor	3.555		E E
Barometric Pressure, In. Hg	30.37	Leak Check Vacuum, In. Hg	10	10	
Static Pressure, In. H20	.35	Leak Rate, CFM	0.001	0.001	

Sample Point Number	Clock Time, Minutes	DGM Meter Reading Cubic Feet	Pitot Reading IN. H20	Gas Meter Temp Degrees Fahrenheit IN	OUT	Stack Temp Deg F	Orifice Setting (Delta-H) IN. H20 Actual	Ideal	Gauge Vacuum IN. Hg	Gas Temperatures Degrees Fahrenheit Probe	Filter	Imp. Exit
A-1	0	218.934	.43	51	53	77	1.5	1.54	4			39
2	5	221.35	.42	52	52	79	1.5	1.47	4			40
3	10	224.351	.43	53	52	79	1.5	1.5	4			40
4	15	227.183	.45	54	52	79	1.6	1.57	4			41
5	20	230.9[illegible]	.46	58	52	80	1.6	1.61	4			40
6	25	234.5[illegible]	.47	59	55	80	1.7	1.65	5			42
7	30	237.80	.49	59	56	81	1.7	1.72	5			43
8	35	241.31	.48	61	57	80	1.7	1.69	5			44
9	40	244.82	.50	62	57	80	1.8	1.77	5			44
10	45	248.40	.49	62	57	79	1.7	1.73	5			45
11	50	251.931	.47	62	58	80	1.7	1.66	5			44
12	55	255.387	.46	62	59	82	1.6	1.62	5			46
B-1	60	258.78	.47	62	58	82	1.6	1.66	4			46
2	65	262.24	.45	63	61	82	1.6	1.59	4			46
3	70	265.60	.44	63	60	82	1.6	1.55	4			47
4	75	268.951	.42	64	60	82	1.5	1.49	4			46
5	80	272.21	.46	64	60	83	1.6	1.67	4			47
6	85	275.65	.46	63	60	82	1.6	1.62	4			47
7	90	279.051	.48	63	61	82	1.7	1.70	5			47
8	95	282.55	.47	64	60	82	1.7	1.66	5			46
9	100	286.005	.49	64	59	83	1.7	1.73	5			47
10	105	289.539	.49	64	60	82	1.7	1.73	5			48
11	110	293.11	.51	64	60	82	1.8	1.80	5			48
12	115	296.70	.50	63	60	82	1.8	1.77	5			48
END	120	300.31										

Minutes	Vm	Delta P	Tm	Ts	Delta H
120	82.466	.4663	58.9	81	1.6458

Yqa 1.000

< +/- 5% of cal'd Y? (Y) / (N)

COMMENTS:

Sampling Data-Method(s)_____

RUN NUMBER

Client		**Equipment ID Numbers**		**Fyrites %**	**Equipment Checks**
		Meter Box	#1	O_2 20.6%	Pitot, Pre/Post ✓/✓
Plant Name	Century Plating	Y Value	.993	CO_2 1.4%	Thermocouple
City, State	Chicago IL	Pitot Coefficient	.84		Orsat System
Sample Location	Outlet	Nozzle Diameter	.242		Nozzle Pre/Post ✓/✓
Job Number		**Nomograph Data**			**Leak Checks**
		Delta-H@	1.851		B B
Run Number	02	Meter Temp	55		
Date	11-16-04	Est. H20	2%		E E
Start Time	10:45am	Stack Temp	74		
End Time	12:50pm	"C" Factor	1.005		B B
Test Personnel	SH/WM	Ref Delta P	.518		
		"K" Factor	3.555		E E
Barometric Pressure, In. Hg	30.37	Leak Check Vacuum, In. Hg	10	10	
Static Pressure, In. H20	.35	Leak Rate, CFM	0.001	0.001	

Sample Point Number	Clock Time, Minutes	DGM Meter Reading Cubic Feet	Pitot Reading IN. H20	Gas Meter Temp Degrees Fahrenheit IN	OUT	Stack Temp Deg F	Orifice Setting (Delta-H) IN. H2O Actual	Ideal	Gauge Vacuum IN. Hg	Gas Temperatures Degrees Fahrenheit Probe	Filter	Imp. Exit
A-1	0	300.693	.45	64	63	84	1.6	1.55	4			40
2	5	304.110	.43	64	63	83	1.5	1.52	4			41
3	10	307.451	.44	65	63	83	1.6	1.56	4			40
4	15	310.873	.45	64	63	84	1.6	1.55	4			42
5	20	314.20[illegible]	.47	65	63	83	1.7	1.66	5			42
6	25	317.65[illegible]	.46	66	62	82	1.6	1.63	4			43
7	30	321.091	.47	66	62	83	1.7	1.67	5			43
8	35	324.61	.49	65	63	84	1.7	1.73	5			43
9	40	328.15	.50	66	64	84	1.8	1.77	5			44
10	45	331.71	.48	67	63	83	1.7	1.70	5			43
11	50	335.07	.47	62	64	83	1.7	1.67	5			42
12	55	338.74	.48	66	65	84	1.7	1.70	5			44
B-1	60	342.21	.43	68	64	85	1.5	1.52	4			45
2	65	345.531	.45	68	65	85	1.6	1.60	4			45
3	70	348.95	.44	68	66	84	1.6	1.57	4			46
4	75	352.31	.46	68	66	84	1.6	1.64	4			47
5	80	355.754	.45	69	65	85	1.6	1.60	4			46
6	85	359.23	.47	69	65	84	1.7	1.68	5			46
7	90	362.75	.45	69	65	85	1.6	1.60	4			47
8	95	366.15	.48	70	65	85	1.7	1.71	5			47
9	100	369.653	.50	69	66	85	1.8	1.78	5			48
10	105	373.25	.49	69	66	85	1.8	1.75	5			49
11	110	376.83	.50	70	66	85	1.8	1.78	5			50
12	115	380.41	.47	69	66	85	1.7	1.67	5			50
END	120	383.91										

Minutes	Vm	Delta P	Tm	Ts	Delta H
120	83.207	.4656	66.1	84.0	1.6625

Yqa 1.003

< +/- 5% of cal'd Y? (Y) (N)

COMMENTS:

Sampling Data-Method(s)

RUN NUMBER

Client		**Equipment ID Numbers**		**Fyrites %**	**Equipment Checks**
		Meter Box	#1	O_2 20.9 %	Pitot, Pre/Post ✓/✓
Plant Name	Century Plating	Y Value	.553	CO_2 1 %	Thermocouple
City, State	Chicago, IL	Pitot Coefficient	.84		Orsat System
Sample Location	Outlet	Nozzle Diameter	.242		Nozzle Pre/Post ✓/✓
Job Number		**Nomograph Data**			**Leak Checks**
Run Number	03	Delta-H@	1.851		B B
Date	11-16-04	Meter Temp	55		
Start Time	12:55pm	Est. H20	2%		E E
End Time	3:01pm	Stack Temp	74		
Test Personnel	SH/NM	"C" Factor	1.005		B B
		Ref Delta P	.518		
		"K" Factor	3.555		E E
Barometric Pressure, In. Hg	30.77	Leak Check Vacuum, In. Hg	10	10	
Static Pressure, In. H20	.35	Leak Rate, CFM	0.001	0.001	

Sample Point Number	Clock Time, Minutes	DGM Meter Reading Cubic Feet	Pitot Reading IN. H20	Gas Meter Temp Degrees Fahrenheit IN	OUT	Stack Temp Deg F	Orifice Setting (Delta-H) IN. H2O Actual	Ideal	Gauge Vacuum IN. Hg	Gas Temperatures Degrees Fahrenheit Probe	Filter	Imp. Exit
A-1	0	384.22	.43	67	66	83	1.5	1.54	4			41
2	5	387.61	.44	67	67	84	1.6	1.57	4			42
3	10	391.01	.45	67	67	83	1.6	1.60	4			41
4	15	394.40	.43	68	67	84	1.5	1.59	4			40
5	20	[illegible]	.46	68	67	85	1.6	1.64	4			42
6	25	401.21	.45	69	67	84	1.6	1.60	4			43
7	30	404.65	.46	69	67	84	1.6	1.64	4			43
8	35	408.12	.48	69	67	84	1.7	1.71	5			44
9	40	411.65	.50	65	68	84	1.8	1.79	5			43
10	45	415.25	.51	70	67	84	1.8	1.82	5			44
11	50	418.92	.48	70	68	84	1.7	1.71	5			44
12	55	422.45	.49	70	69	85	1.8	1.75	5			45
B-1	60	426.01	.42	70	69	85	1.5	1.5	4			46
2	65	429.30	.44	71	68	84	1.6	1.58	4			46
3	70	432.76	.45	71	68	84	1.6	1.61	4			47
4	75	436.11	.43	71	69	85	1.5	1.54	4			47
5	80	439.461	.46	71	69	84	1.7	1.65	4			45
6	85	442.93	.45	72	68	84	1.6	1.61	4			46
7	90	446.30	.45	71	69	85	1.6	1.61	4			47
8	95	449.74	.48	71	70	85	1.7	1.72	5			49
9	100	453.30	.47	71	70	85	1.7	1.68	5			50
10	105	456.80	.49	71	69	84	1.8	1.75	5			50
11	110	460.38	.51	72	69	85	1.8	1.82	5			51
12	115	464.08	.50	72	69	85	1.8	1.79	5			51
END	120	467.65										

Minutes	Vm	Delta P	Tm	Ts	Delta H
120	83.43	.4634	69.2	84.2	1.6542

Yqa 1.001

< +/- 5% of cal'd Y? (Y) (N)

COMMENTS:

MOISTURE ANALYTICAL RESULTS

Client: Century Plating (Vic La Porte)

Plant Name: " " Job No.:

City/State: Chicago IL Sampling Loc.: Outlet

Run Number	01	02	03
Sampling Date	11-16-04	11-16-04	11-16-04
Analysis Date			
Analyst			
Reagent 1 (NaOH)			
Final Weight, g	108 mL	115 mL	118
Tared Weight, g	100 mL	100 mL	100 mL
Water Catch, g	8 mL	15 mL	18
Reagent 2 (NaOH)			
Final Weight, g	100	100	102
Tared Weight, g	100 mL	100 mL	100 mL
Water Catch, g	0 mL	0	2
Reagent 3 (NaOH)			
~~Final Weight~~, g (Rinse)	145 mL	160 mL	160 mL
Tared Weight, g	—	—	—
~~Water Catch~~, g (Jar weight)	—	—	—
~~CONDENSED WATER~~, g (Jar weight)	353 mL	375 mL	380 mL
Silica Gel			
Final Weight, g	161.6	163.3	162.1
Tared Weight, g	150 g	150	150 g
ADSORBED WATER, g	11.6	13.3	12.1
TOTAL WATER COLLECTED, g	19.6	28.3	32.1

Balance No. _____ Type (✓) Triple Beam ___ Electronic ___ Reagent Box No. _____

Balance located in stable, draft-free area (✓)? Yes ___ No ___ (If "No", explain below.)

Comments _____

L-0036 rev. 5-93

CYCLONIC FLOW DETERMINATIONS

Plant Name: Century Plating Job No. ____
City/State: Chicago IL Date: 11-16-04
Test Loc.: Outlet Personnel: SH/WM
Barometric Pres. (Pbar) 30.37 In. Hg Static Pres. (Pg) ____ In. H_2O
Pitot/Orifice ID ____ Pitot Coef. (Cp) ____ Pres. Gauge Set ID ____
Thermocouple ID ____ Duct Length/Diameter ____ Width ____
---Specify inches (") or feet (')---
Horizontal Duct Flyash/Dust Buildup > 1" Depth (√)? Yes ____ No ____ (If Yes, see Page 2 for Instructions.)

PRELIMINARY TRAVERSES
Start - Finish Times: ____ - ____

Test Pt.	Yaw Ang.°	ΔP "H_2O	Temp. °F
A1	1°	.40	71
2	0	.45	72
3	0	.43	73
4	2°	.42	74
5	0	.41	75
6	0	.42	76
7	0	.46	77
8	0	.48	78
9	0	.47	79
10	0	.49	79
11	0	.48	79
12	1°	.50	79
B1	0	.42	72
2	0	.44	73
3	0	.44	74
4	0	.43	75
5	0	.44	76
6	0	.42	77
7	0	.46	78
8	0	.51	79
9	0	.50	79
10	0	.50	79
11	0	.47	80
12	0	.48	80
Avg.			

ALIGNMENT APPROACH DATA
(OMIT IF AVERGE OF YAW ANGLES ≤ 20°)

Run No.* Base Time	Min./Point**	Run No.* Base Time	Min./Point**	Run No.* Base Time	Min./Point**
Avg. ΔP_v***		Avg. ΔP_v***		Avg. ΔP_v***	

Note: Yaw angle average is sum of the absolute values divided by number of measurements, and must be ≤ 20°.
ΔP average is square of average square root.
* From isokinetic sampling field data sheet.
** Minutes/Point = cos φ (Base Time).
*** Average $\Delta P_v = ((\Sigma \cos \phi \sqrt{\Delta p}) / n)^2$

F-1107 rev. 12-91

See page 2 for cyclonic flow check criteria.

Appendix C - Analytical Data for Total Chromium

con-test
ANALYTICAL LABORATORY
39 Spruce Street * 2nd Floor * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

REPORT DATE 12/8/2004

RMC ENVIRONMENTAL, INC.
9226 NORTH 2ND STREET
MACHESNEY PARK, IL 61115
ATTN: RACHEL C

CONTRACT NUMBER:
PURCHASE ORDER NUMBER:

PROJECT NUMBER:

ANALYTICAL SUMMARY

LIMS BAT #: LIMS-84294
JOB NUMBER: -

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: CENTURY PLATING

FIELD SAMPLE #	LAB ID	MATRIX	SAMPLE DESCRIPTION	TEST
BLANK	04B41031	WATER OTHE	NOT SPECIFIED	cr (mg/l) icp
RUN 1	04B41028	WATER OTHE	NOT SPECIFIED	cr (mg/l) icp
RUN 2	04B41029	WATER OTHE	NOT SPECIFIED	cr (mg/l) icp
RUN 3	04B41030	WATER OTHE	NOT SPECIFIED	cr (mg/l) icp

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations :

AIHA 100033	AIHA ELLAP (LEAD) 100033	
MASSACHUSETTS MA0100	NEW HAMPSHIRE NELAP 2516	NEW JERSEY NELAP NJ MA007 (AIR)
CONNECTICUT PH-0567	VERMONT DOH (LEAD) No. LL015036	ARIZONA AZ0648
NEW YORK ELAP/NELAP 10899	RHODE ISLAND (LIC. No. 112)	ARIZONA AZ0654 (AIR)

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Edward Denison 12/9/04

SIGNATURE DATE

Tod Kopyscinski
Director of Operations

Sondra S. Kocot
Quality Control Coordinator

Edward Denison
Technical Director

con-test
ANALYTICAL LABORATORY

39 Spruce Street * 2nd Floor * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL 413/525-2332

RACHEL C
RMC ENVIRONMENTAL, INC.
9226 NORTH 2ND STREET
MACHESNEY PARK, IL 61115

12/8/2004
Page 1 of 1

Project Location CENTURY PLATING
Date Received 11/22/2004

LIMS-BAT # LIMS-84294
Job Number -
Sample Matrix WATER OTHER

Chromium

Units mg/l

Description	Sample Id #	Lab #	Date Sampled	Date Analyzed	Analyst	Result	RL	P/F
NOT SPECIFIED	RUN 1	04B41028	11/16/04	12/06/04	PM	0.030	0.004	
NOT SPECIFIED	RUN 2	04B41029	11/16/04	12/06/04	PM	0.028	0.004	
NOT SPECIFIED	RUN 3	04B41030	11/16/04	12/06/04	PM	0.007	0.004	
NOT SPECIFIED	BLANK	04B41031	11/16/04	12/06/04	PM	ND	0.004	

Analysis:

EPA 200.7/SW846 6010

SAMPLES ARE ANALYZED BY INDUCTIVELY COUPLED PLASMA EMISSION SPECTROMETRY (ICP).

RL = Reporting Limit

ND = Not Detected

NM = Not Measured

* = See end of report for comments and notes applying to this sample

SPEC LIMIT = a client specified recommended or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.

Appendix D - Reference Measurement Calibration, Chain of Custody and QA/QC Documentation

ENVIRONMENTAL MONITORING AND TECHNOLOGIES, INC.

Chain of Custody Record

8100 North Austin Avenue
Morton Grove, Illinois 60053-3203
847-967-6866
FAX: 847-967-6735
www.emt.com

TURNARAOUND TIME:
☐ RUSH
____ day turnaround
☒ ROUTINE

Due Date: ___-___-___ COC #: 1914537

Company: RMC Environmental Inc.
Address: 9226 N. 25th
Machesney Park IL 61115
Phone #: (815) 226-9542 Fax #: (815) 425-1102
P.O. #: Proj. #:
Client Contact: Rahul Chlebowski
Project ID / Location: Century Plating

Sample Type:
1. Waste Water 4. Sludge 7. Groundwater (Filtered)
2. Drinking Water 5. Oil 8. Other
3. Soil 6. Groundwater Ave

Container Type:
P - Plastic V - VOC Vial O - Other
G - Glass B - Tedlar Bag

Preservative:
1. None 4. NaOH 7. Zn Ace
2. H_2SO_4 5. HCl 8. Other
3. HNO_3 6. MeOH

Analyses

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	pH	Temp.	Preservation Field	Preservation Lab	Total Chrome	EMT USE ONLY	EMT WORKORDER
Run 1 41028	8	1L	G	1	SH	11/16						✓		
Run 2 41029	8	1L	G	1	SH	↓						✓		
Run 3 41030	8	1L	G	1	SH	↓						✓		
BLANK 41031	8	1L	G	1	SH	↓						✓		

Relinquished By:	Date: 11-19-04 Time: 11:30	Received By:	Date: 11-22-4 Time: 14 00	EMT USE ONLY	☐ SAMPLE RECEIVED ON ICE
Relinquished By:	Date: - - Time: :	Received By:	Date: - - Time: :	Client Code: EMT Project ID:	☐ TEMPERATURE (Must be recorded if sampling was greater than 6 hrs. prior to sample receipt)
Relinquished By:	Date: - - Time: :	Received For Lab By:	Date: - - Time: :	Jar Lot No.	EMT SAMPLE RETURN POLICY ON BACK

SPECIAL INSTRUCTIONS: Please provide QA/QC info.

NOTIFICATION OF PERFORMANCE TEST
(This notification is not required if you do not have to conduct a performance test under the regulation)

Applicable Rule: 40 CFR Part 63, Subpart N - National Emissions Standards for Chromium Emissions from Hard and Decorative Chrome Electroplating and Chromium Anodizing Tanks.

1. Print or type the following for each plant in which chromium electroplating and/or chromium anodizing operations are performed:

Owner/Operator/Title: Century Plating Company, Inc.

Street Address: 2939 North Oakley Avenue

City : Chicago State: IL Zip Code: 60618

Plant Name: Century Plating Company, Inc.

Plant Phone Number: 773-477-1792

Plant Contact/Title: Mr. Vic La Porta

Plant Address (if different than owner/operator's):

Street Address: SAME AS ABOVE

City : _____ State: _____ Zip Code: _____

2. Complete the following table. If additional lines are needed, make copies of this page.

EPA Method 306 will be utilized for this testing.

Type of Control technique	Control System ID Number	ID # of tank ducted to Control system	Type of tank	Date of Performance test
Composite Mesh Pad Scrubber	Scrubber # 2	Tanks	~~Hard Chrome~~ Tanks DECORATIVE CR.	November 15, 2004

RMC Environmental, Inc.
EPA Method 5
Meter Box Calibration
Critical Orifice Method
English Meter Box Units, English K' Factor

Revised: 12/7/01 Version: 1.1

Meterbox Number: RMC 001
Calibrated by: emq

Date: 01/22/04
Barometric Pressure: 30.1 (in. Hg)
Theoretical Critical Vacuum: 14.20 (in. Hg)

IMPORTANT: For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT: The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

DRY GAS METER READINGS									CRITICAL ORIFICE READINGS					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	-- Ambient Temperature --		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.320	10.00	964.600	967.771	3.171	58.0	55.0	58.0	56.0	40	0.2390	24.5	58.0	58.0	82.0
0.670	10.00	967.771	972.375	4.604	58.0	56.0	58.0	57.0	48	0.3460	23.0	57.0	57.0	82.5
1.300	10.00	972.375	978.506	6.131	58.0	57.0	58.0	59.0	55	0.4610	20.5	58.0	58.0	83.0
2.100	10.00	978.506	986.398	7.892	58.0	59.0	59.0	61.0	63	0.5950	19.0	58.0	58.0	83.0
4.100	10.00	986.398	997.256	10.858	59.0	61.0	65.0	62.0	73	0.8200	16.5	58.0	59.0	83.0

RESULTS

DRY GAS METER		ORIFICE			DRY GAS METER		ORIFICE		
VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL	CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@		
Vm(std) (cu ft)	Vm(std) (liters)	Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)	Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)
3.100	87.8	3.090	87.5	3.154	0.997	0.002	1.847	46.93	-0.088
4.497	127.4	4.471	126.6	4.569	0.994	0.000	1.846	46.88	-0.089
5.992	169.7	5.955	168.6	6.090	0.994	-0.001	2.017	51.24	0.082
7.725	218.8	7.686	217.7	7.860	0.995	0.000	1.956	49.69	0.021
10.665	302.0	10.592	300.0	10.832	0.993	-0.001	2.009	51.03	0.074
					0.995		1.935	49.15	
					Maximum Variation =	0.002	Maximum Variation =		0.089

For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02. **PASS** **Average Y =** **0.995**

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2. **PASS** **Average dh@ =** **1.935** (in H2O)

SIGNED:_____ Date:_____