Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

Background Report Reference

AP-42 Section Number: 12.20

Background Chapter: 4

Reference Number: 74

Title: Summary of Source Test Results, Scrubber Inlet from S-2 and S-3

Francis Plating of Oakland

February 1989

DISTRIBUTION:

Firm
Permit Services
Enforcement
Technical Services
Source Inventory
Planning
Requester
OAPCO

BAY AREA
AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street
San Francisco, California 94109
(415) 771-6000

SUMMARY OF SOURCE TEST RESULTS

AP-42 Section Reference 12.20
Report Sect. Reference 4 74

Report No. 90

Test Date: 12/

Test Times:

Run A: 1133-1223

Run B: 1237-1327

Run C: 1350-1440

SOURCE INFORMATION

Firm Name and Address
FRANCIS PLATING OF OAKLAND
785 7th Street
Oakland, CA 94607

Firm Representative and Title
Randall Lewis,
General Manager
Phone No. (415)444-5535

Source:
Scrubber Inlet
From S-2, S-3
Plant No. 2324
Operates 8 hr/day & 260 days/yr

Permit Conditions
None

BAAQMD REPRESENTATIVES

Source Test Engineers
C.McClure/G.Cowell/H. Doi

Permit Services Division / Enforcement Division
N. Lew

Test Requested by:
D.Hall

Operating Parameters:
Both chrome plating tanks operated continually during testing.

Applicable Regulations: None - Scrubber Inlet

VN Recommended: N/A

Source Test Results and Comments:

METHOD:	TEST	RUN A	RUN B	RUN C	AVERAGE
ST-17	Volume Flowrate,SDCFM				12600
	Stack Temperature, °F				60
*	Water Content, Volume %				1
ST-35	Total DC Amps				2980
	Hexavalent Chromium, mg/amp-hr	1.6	1.3	1.3	1.4
	Hexavalent Chromium, g/hr	4.8	4.0	4.0	4.3
	Hexavalent Chromium, mg/m3	.22	.18	.19	.20
	Isokinetic Ratio, act/theo	1.00	.99	.99	
ARB 425	Hexavalent Chromium, mg/amp-hr	1.14	1.14	1.14	1.14
	Isokinetic Ratio, act/theo	.99	.98	1.01	

* Determined psychrometrically

NO COMMERCIAL USE OF THESE RESULTS IS AUTHORIZED

Source Test Team Leader	Date	Senior Source Test Engineer	Date	Approved by Source Test Manager	Date
C. McClure	2/7/90	K. Kunaniec	2/7/90	G. Karels	2/15/89

Form: Summary of Source Test Results

FSSTS: e|: 15 July 88

AP-42 Section Reference 12.20
Report Sect. Reference 4 74

DISTRIBUTION:

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DAPCO

BAY AREA
AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street
San Francisco, California 94109
(415) 771-6000

SUMMARY OF SOURCE TEST RESULTS

Report No. 90
Test Date: 12/
Test Times:
Run A: 1133-1223
Run B: 1237-1327
Run C: 1350-1440

SOURCE INFORMATION

Firm Name and Address
FRANCIS PLATING OF OAKLAND
785 7th Street
Oakland, CA 94607

Firm Representative and Title
Randall Lewis,
General Manager
Phone No. (415)444-5535

Source:
Scrubber Inlet
From S-2, S-3
Plant No. 2324
Operates 8 hr/day & 260 days/yr

Permit Conditions
None

BAAQMD REPRESENTATIVES

Source Test Engineers
C.McClure/G.Cowell/H. Doi

Permit Services Division / Enforcement Division
N. Lew

Test Requested by:
D.Hall

Operating Parameters:
Both chrome plating tanks operated continually during testing.

Applicable Regulations: None - Scrubber Inlet

VN Recommended: N/A

Source Test Results and Comments:

METHOD:	TEST	RUN A	RUN B	RUN C	AVERAGE
ST-17	Volume Flowrate,SDCFM				12600
	Stack Temperature, °F				60
*	Water Content, Volume %				1
ST-35	Total DC Amps				2980
	Hexavalent Chromium, mg/amp-hr	1.6	1.3	1.3	1.4
	Hexavalent Chromium, g/hr	4.8	4.0	4.0	4.3
	Hexavalent Chromium, mg/m3	.22	.18	.19	.20
	Isokinetic Ratio, act/theo	1.00	.99	.99	
ARB 425	Hexavalent Chromium, mg/amp-hr	1.14	1.14	1.14	1.14
	Isokinetic Ratio, act/theo	.99	.98	1.01	

* Determined psychrometrically

NO COMMERCIAL USE OF THESE RESULTS IS AUTHORIZED

Source Test Team Leader	Date	Senior Source Test Engineer	Date	Approved by Source Test Manager	Date
C. McClure	2/7/90	K. Kunaniec	2/7/90	G. Karels	2/15/89

Form: Summary of Source Test Results

FSSTS: ej: 15 July 88

C90118

DISTRIBUTION:

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Enforcement
Technical Services
Source Inventory
Planning
Requester
DAPCO

BAY AREA
AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street
San Francisco, California 94109
(415) 771-6000

SUMMARY OF SOURCE TEST RESULTS

Report No. _____

Test Date: 12/27/89

Test Times:

Run A: 1133-1223

Run B: 1237-1327

Run C: 1350-1440

SOURCE INFORMATION

Firm Name and Address
FRANCIS PLATING OF OAKLAND
785-7TH ST.
OAKLAND CA 94607

Firm Representative and Title
RANDALL LEWIS
GENERAL MANAGER
Phone No. 415 444-5535

Source: SCRUBBER INLET FROM S-2, S-3

Plant No. 2324

Operates 8 hr/day & 260 days/yr

Permit Conditions
NONE

BAAQMD REPRESENTATIVES

Source Test Engineers
C. McCLURE
G. COLWELL
H. DOI

Permit Services Division / Enforcement Division
N. LEW

Test Requested by:
D. HALL / ~~R. FRAZIER~~

Operating Parameters: BOTH CHROME PLATING TANKS OPERATED CONTINUALLY DURING TESTING.

Applicable Regulations: NONE-SCRUBBER INLET

VN Recommended: N/A

Source Test Results and Comments:

METHOD	TEST	RUN A	RUN B	RUN C	AVERAGE
ST-17	Volume Flowrate, SDCFM				12600
	Stack Temperature, °F				60
*	Water Content, volume %				1
ST-35	Total DC Amps				2980
	Hexavalent Chromium, mg/amp-hr	1.6	1.3	1.3	1.4
	Hexavalent Chromium, g/hr	4.8	4.0	4.0	4.3
	Hexavalent Chromium, mg/m3	.22	.18	.19	.20
	Isokinetic Ratio, act/theo	1.00	.99	.99	
A.R.B. 425	Hexavalent Chromium, mg/amp-hr	1.14	1.14	1.14	1.14
	ISOKINETIC RATIO, ACT/THEO	.99	.98	1.01	

* DETERMINED PSYCHROMETRICALLY

NO COMMERCIAL USE OF THESE RESULTS IS AUTHORIZED

Source Test Team Leader	Date	Senior Source Test Engineer	Date	Approved by Source Test Manager	Date
C. McClure	1/19/90			G. Karels	

Form: Summary of Source Test Results

PSSTS: ej: 15 July 88

THE FRANCIS PLATING CO.

12/21/89 & 12/27/89

PLEASE NOTE: THIS SERIES OF TESTS WERE PERFORMED SIDE BY SIDE ST-35 // ARB-425 WITH A SPECIAL DUAL PROBE AND MATCHING 6.9mm GLASS NOZZLES.

C. McCLURE
S-507

DISTRIBUTION:
Firm
Permit Services
Enforcement
Technical Services
Source Inventory
Planning
Requester
DAPCO

BAY AREA
AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street
San Francisco, California 94109
(415) 771-6000

SUMMARY OF SOURCE TEST RESULTS

Report No. _____
Test Date: 12/27/89
Test Times:
Run A: _____
Run B: _____
Run C: _____

SOURCE INFORMATION		BAAQMD REPRESENTATIVES
Firm Name and Address: FRANCIS PLATING CO.	Firm Representative and Title: RANDY Phone No. ( )	Source Test Engineers
	Source:	Permit Services Division / Enforcement Division
Permit Conditions	Plant No. Operates hr/day & days/yr	Test Requested by:

Operating Parameters: ST-35 (INLET.)

Applicable Regulations:

VN Recommended: NO*

Source Test Results and Comments:

METHOD:	TEST	RUN A	RUN B	RUN C	AVERAGE	
ST-17	Volume Flowrate, SDCFM				12600	
	Stack Temperature, °F				60	
~~ST-23~~ DETERMINED PSYCHROMETRICLY	Water Content, volume %				1	
ST-35	Total DC Amps				2980	
	Hexavalent Chromium, mg/amp-hr	1.6	1.3	1.3	1.4	.15
	Hexavalent Chromium, g/hr	4.8	4.0	4.0	4.3	
	Hexavalent Chromium, mg/m3	.22	.18	.19	.20	
	Isokinetic Ratio, act/theo	1.00	.99	.99		

FIGURE IV-97

NO COMMERCIAL USE OF THESE RESULTS IS AUTHORIZED

Source Test Team Leader	Date	Senior Source Test Engineer	Date	Approved by Source Test Manager	Date
				G. Karels	

Form: Summary of Source Test Results

FSSTS: ok 15 Jun 88

FRANCIS PATTING.
12/27/89
ST-35
(INLET)

DISTRIBUTION OF PROBE & NOZZLE WASH

BY SAMPLE VOLUMES

$V_{OA} = 23.45$

$V_{OB} = 23.38$

$V_{OC} = 23.70$

$V_{O_{TOTAL}} = 70.53$

RUN A) $\frac{23.45}{70.53} = 0.33$

RUN B) $\frac{23.38}{70.53} = 0.33$

RUN C) $\frac{23.70}{70.53} = 0.34$

TOTAL HEX CHROME IN ST-35 WASH = 370.8 µg

RUN A = 370.8 X 0.33 = 122.36 µg

RUN B = 370.8 X 0.33 = 122.36 µg

RUN C = 370.8 X 0.34 = 126.07 µg

TOTAL 370.79 µg ⇒ 6000

HEX CHROME CONCENTRATION

FRANCIS PLATING CO.
12/27/89
ST-35
(INLET)

$C = mg/m^3$

$$C = \frac{35.31(W)}{1000 \cdot V_o}$$

W = WEIGHT OF HEX CHROME IN µg

$$V_o = \frac{530 \cdot V_m \cdot P_b}{29.92 \cdot T_m}$$

V_m = FT³, P_b = "Hg, T_m = °R

RUN A) $W_p = W_{FILTER} + W_{WASH} + W_{IMPINGER}$

$W_p = 26.0\,\mu g + 122.36\,\mu g + (LOD)$

$\boxed{W_{p_A} = 148.36\,\mu g}$

$$V_{o_A} = \frac{(530)(22.93)(30.17)}{29.92 \cdot (522.5)}$$

$\boxed{V_{o_A} = 23.45\ SDCF}$

$$C_A = \frac{35.31(148.36\,\mu g)}{1000 \cdot 23.45\ SDCF}$$

$\boxed{C_A = 0.223\ mg/m^3}$

$$V_{o_B} = \frac{(530)(22.885)(30.17)}{29.92\ (523)}$$

$\boxed{V_{o_B} = 23.38\ SDCF}$

$$V_{o_C} = \frac{(530)(23.24)(30.17)}{29.92\ (524)}$$

$\boxed{V_{o_C} = 23.70\ SDCF}$

RUN B) $W_{p_B} = W_{FILT} + W_{WASH} + W_{IMP.}$

$W_{p_B} = LOD + 122.36\,\mu g + LOD$

$W_{p_B} = 122.36\,\mu g$

$$C_B = \frac{(35.31)(122.36\,\mu g)}{1000 \cdot 23.38}$$

$\boxed{C_B = 0.185\ mg/m^3}$

RUN C) $W_p = W_{FLT} + W_{WASH} + W_{IMP}$

$W_p = LOD + 126.07\,\mu g + LOD$ $\quad W_{p_C} = 126.07\,\mu g$

$$C = \frac{(35.31)(126.07\,\mu g)}{1000 \cdot 23.70}$$

$\boxed{C = 0.189\ mg/m^3}$

HEX CHROME EMISSION RATE

FRANCIS PLATING CO.
12/27/89
ST-35
(INLET)

$$M_{g/HR} = \frac{(60)(1\times10^{-6})(W)(Q_{STACK})}{V_D}$$

W = WEIGHT HEX CR, µg

RUN A)

$$M_A = \frac{(60)(1\times10^{-6})(148.36\,\mu g)(12600)}{23.45\ SDCF}$$

$$\boxed{M_A = 4.78\ g/HR}$$

RUN B)

$$M_B = \frac{(60)(1\times10^{-6})(122.36)(12600)}{23.38\ SDCF}$$

$$\boxed{M_B = 3.96\ g/HR}$$

RUN C)

$$M_C = \frac{(60)(1\times10^{-6})(126.07)(12600)}{23.70\ SDCF}$$

$$\boxed{M_C = 4.02\ g/HR}$$

HEX CHROME PLATING EMISSION

FACTOR = m_A

$$m_A \; {}^{mg}/_{A\text{-}HR} = \frac{1000 \cdot m_{g/HR}}{I_{AMPS}}$$

FRANCIS PLATING CO
12/27/89
ST-35
(INLET)

RUN A)

$$m_{A\,mg/A\text{-}HR} = \frac{1000 \cdot 4.78 g/HR}{2980 A}$$

$$I_{(INLET)} = \begin{array}{r} 980A \\ +2000A \\ \hline 2980 AMPS \end{array}$$

ACROSS 2 BATHS.

$$\boxed{m_{A_A} = 1.6 \; mg/A\text{-}HR.}$$

RUN B)

$$m_{A_B} = \frac{1000 \cdot 3.96 g/HR}{2980 A}$$

$$\boxed{m_{A_B} = 1.33 \; mg/A\text{-}HR}$$

RUN C)

$$m_{A_C} = \frac{1000 \cdot 4.02 g/HR}{2980 A}$$

$$\boxed{m_{A_C} = 1.35 \; mg/A\text{-}HR}$$

STACK I.D. = 45"

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 • 771-6000

Source Test Data Sheet

Source Operation: FRANKLIS PLATING-OFCAL
Plant: CHROME-HARD
Sample Type: CR-ST-35
Process Cycle: INLET-SCRUBBER
Duct Size: 45" NO NIPPLE
Duct Pressure: -5.5"
ASSUMED H_2O: 3%

Source Test No.:
Run No.: RUN A
Date: 12/27/89

$S_1 \rightarrow S_6$ – ARB-425 IMPINGERS
$T_1 \rightarrow T_6$ – ST-35 IMPINGERS

WB = 50°F / DB = 56°F
at 1016 AM
1% H_2O

6.9 Nozzle Diameter
0.85 Pitot Tube
AMBIENT Gas Collector No.
30.17 Barometric Pressure
0.0016 at 20 Leak Rate @ 15" Hg
50 TIME EACH POINT
1 # OF POINTS
50 TIME EACH RUN

Sampling Train: (IMPINGERS T_1, T_2)

ST-35

Traverse Point	Dist. From inches	INITIAL TRAVERSE Duct Temp °F	H H_2O	$\sqrt{h}$	Traverse Point	h H_2O	V_s FPS	Time 1133	METER Rate CFM	METER Temp °F	METER Volume Ft³ 380.105	Vac "Hg	Sat'd Gas Temp °F	T_s Duct Temp °F 520	REMARKS ROTO CFM	
P_1	1.5"	.09	.25		P_5	.12	19.5	5 MIN	.4562	62	82.39 382.395	8	36	60	27.3	2.29
P_2	1.5+6		.10		P_5	.12	19.5	5	.4562	62	84.68 384.682	8	36	60		2.287
P_3	1.5+12		.10					5	.4562	62	86.96 386.968	8	36	60		2.286
P_4	1.5+18		.12					5	.4562	62	89.25 389.26	8	36	60		2.292
P_5	1.5+24		.12					5	.4562	62	91.54 391.59	8	36	60		2.33
P_6	1.5+30		.11					5	.4562	62	93.87 393.883	8	36	60		2.293
P_7	1.5+36		.11					5	.4562	63	96.16 396.166	8	37	60		2.283
P_8	1.5+42		.09					5	.4562	63	98.45 398.453	8	37	60		2.287
								5	.4562	63	400.73 400.732	8	37	60		2.279
								5 TRIP 3	.4562	63	403.01 403.015	8	37	60		2.303
											22.93					22.93

SAM ΔP AVG = .11
T_s = 516°F

$$D_n = 13.7 \left[\frac{T_s + 460}{V_s (100 - \%H_2O)} \right]^{1/2} = 7.33\,mm$$

Condensate 2.281 gm.

V_o
$\%H_2O$
$\%CO_2$
$\%CO$
$\%O_2$

$$Q_m = \left[(2.638 \times 10^{-3}) \quad (100 - \%H_2O) D_{nun}^2 \right] \frac{V_s}{T_s}$$

$V_s = 2.9 (K_p) \sqrt{T_s \cdot h_{H_2O}}$

NOZZLE NIPPLE

0 1.5 7.5 13.5 19.5 25.5 31.5 37.5 43.5 46

P_1 P_2 P_3 P_4 P_5 P_6 P_7 P_8

FIG SEE V-59 TRANSPOSE FRANKLIS

Source Test Team
CHUCK McCLURE
Source Test Engineer I
GLENN COLWELL
HIROSHI NOJI

IN SHOP PRIOR TO ABATEMENT

LOT ALLEY

FLOW

45" ROUND → TO ABATEMENT

SAFETY NOTES
DUCTS 10-12' ABOVE DECK IN DIFFICULT LOCATION – ONE ACCESS WILL BE USED – RESPIRATORS USED BY TEAM'S – LADDERS TIED – LIGHTING OK!
UNIFORM FLOWS ACROSS DUCT.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 • 771-6000

Source Test Data Sheet

Source Operation: CHROME PLATING
Plant: FRANCIS PLATING OF OAKLAND
Sample Type: Cr6
Process Cycle: SCRUBBER-INLET.
Duct Size: 45" ROUND
Duct Pressure: -5.5"
ASSUMED H_2O: 3%

Source Test No.:
Run No.: RUN B
Date: 12/27/89

6.9mm Nozzle Diameter
0.85 Pitot Tube
AMBIENT Gas Collector No.
30.17 Barometric Pressu
0.001 at 20 Leak Rate @ 15"Hg
50 TIME EACH POINT
1 # OF POINTS
50 TIME EACH RUN

Sampling Train: IMPINGERS ⇒ T_3, T_4

(ST-35)

Traverse Point	Dist. From inches	INITIAL TRAVERSE Duct Temp°F	H H_2O	Th	Traverse Point	h H_2O	V_s FPS	Time 1237	METER Rate CFM	METER Temp °F	METER Volume Ft³ 403.035	Vac "Hg	Sat'd Gas Temp°F	T_s Duct Temp°F	ROTO CFH	REMARKS
					P_5	0.12	19.5	5	.4562	63	05.31 405.312	10.0	37	60 520	27.3	2.277
						0.12	19.5	5	.4562	63	07.59 407.59	10.0	37	60 520		2.278
					*	0.12	19.5	5	.4562	63	09.87 409.914	10	37	60		2.324
						0.12	19.5	5	.4562	63	12.195 412.192	10	37	60 520		2.278
					*	0.12	19.5	5	.4562	63	14.47 414.488	10	37	60 520		2.296
						0.12	19.5	5	.4562	63	16.77 416.771	10	37	60 520		2.283
						0.12	19.5	5	.4562	63	19.05 419.048	10	37	60		2.277
						0.12	19.5	5	.4562	63	21.33 421.338	10	37	60		2.29
						0.12	19.5	5	.4562	63	23.62 423.633	10	37	60		2.295
					P_5	0.12	19.5	1:275	.4562	63	25.914 425.92	10	37	60 520		2.287
											22.885					22.885

Δ60 63 / 52 3

$$D_n = 13.7\left[\frac{T_s + 460}{V_s(100-\%H_2O)}\right]^{1/2}$$

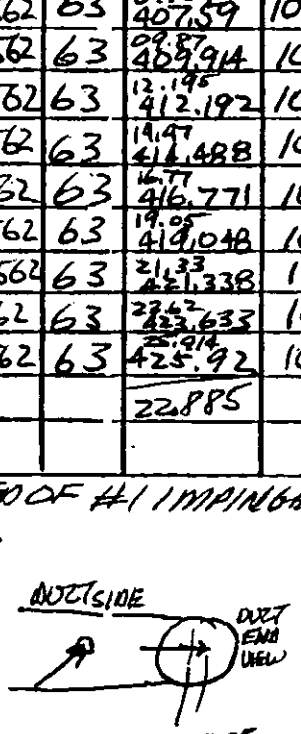
$$Q_m = \left[(2.638 \times 10^{-3})\ (100-\%H_2O)\,D_{mm}^2\right]\frac{V_s}{T_s}$$

$$V_s = 2.9(K_p)\sqrt{T_s \cdot h_{H_2O}}$$

* — SAMPLE LINE SLIPPED OF #1 IMPINGER — USED CHAMP — NOTE THIS FILTER ST-35 RUN B — BLOWN BACK OFF FRIT FILTER FAILURE DUE TO -5.5" IN DUCT

Condensate ____ gm.

V_o ____
$\%H_2O$ ____
$\%CO_2$ ____
$\%CO$ ____
$\%O_2$ ____



NOZZLES ARE PLACED 4" PAST CENTER LINE

Source Test Team
CHUCK McCLURE
Source Test Engineer I
GLENN COLWELL
HIROSHI NOJI

FILTER FRIT

FIG V-59
77a

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 • 771-6000

Source Test Data Sheet

Source Operation: CHROME PLATING
Plant: FRANCIS PLATING OF OAKLAND
Sample Type: CR6
Process Cycle: INLET SCRUBBER
Duct Size: 45" ROUND
Duct Pressure: (−5.5")
ASSUMED H_2O: 3%

Source Test No.:
Run No.: RUN C
Date: 12/27/89

6.9 mm Nozzle Diameter
0.85 Pitot Tube
AMBIENT Gas Collector No.
30.17 Barometric Pressure
0.005 cf 22 Leak Rate @ 15"Hg
50 TIME EACH POINT
1 # OF POINTS
50 TIME EACH RUN

Sampling Train: (IMPINGERS T5, T6)

Traverse Point	Dist. From inches	INITIAL TRAVERSE Duct Temp °F	H H_2O	$\sqrt{h}$	ST-35 Traverse Point	h H_2O	V_s FPS	Time 1350	METER Rate CFM	METER Temp °F	METER Volume Ft^3 425.92	Vac "Hg	Sat'd Gas Temp °F	T_s Duct Temp °F	ROTO CFH	REMARKS
					P5	.12	19.5	5	.4562	64	28.20 428.25	10	37	60 520	27.3	2.33
								5	.4562	64	30.53 430.53	10	37	60 520		2.28
								5	.4562	64	32.81 432.816	10	38	60		2.286
								5	.4562	64	35.1 435.13	10	38	60		2.314
								5	.4562	64	37.41 437.584	10	38	60		2.454
								5	.4562	64	39.86 439.785	10	36	60		2.201
								5	.4562	64	42.08 442.405	10	36	60 520		2.62
								5	.4562	64	44.69 444.697	10	36	60 520		2.292
								5	.4562	64	46.98 446.93	10	36	60 520		2.233
					P5	.12	19.5	1445	.4562	64	49.21 449.16	10	36	60 520		2.23
								1400PM			23.24					23.24

2.281

$$D_n = 13.7\left[\frac{T_s + 460}{V_s(100-\%H_2O)}\right]^{1/2}$$

$$Q_m = \left[(2.638 \times 10^{-3})\ (100-\%H_2O)\,D_{nun}^2\right]\frac{V_s}{T_s}$$

$$V_s = 2.9(K_p)\sqrt{T_s \cdot h_{H_2O}}$$

Condensate _____ gm.
V_o _____
$\%H_2O$ _____
$\%CO_2$ _____
$\%CO$ _____
$\%O_2$ _____

Source Test Team
CHUCK McCLURE
Source Test Engineer I
GLEN COLWELL
HIROSHI OOI

NOTE: FILTER WAS OFF FRIT. PORT TO 5.5" IN DUCT.

FIG V-59

DISTRIBUTION:

Firm
Permit Services
Enforcement
Technical Services
Source Inventory
Planning
Requester
DAPCO

BAY AREA
AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street
San Francisco, California 94109
(415) 771-6000

SUMMARY OF SOURCE TEST RESULTS

Report No. _____
Test Date: 12/27/89
Test Times:
Run A: B
Run B: _____
Run C: _____

SOURCE INFORMATION		BAAQMD REPRESENTATIVES
Firm Name and Address: FRANCIS PLATING CO.	Firm Representative and Title: RANDY Phone No. ( )	Source Test Engineers
	Source:	Permit Services Division / Enforcement Division
Permit Conditions	Plant No. Operates hr/day & days/yr	Test Requested by:

Operating Parameters: ARB 425 (INLET)

Applicable Regulations:

VN Recommended:

Source Test Results and Comments:

METHOD:	TEST	RUN A	RUN B	RUN C	AVERAGE
ST-17	Volume Flowrate, SDCFM				12600
	Stack Temperature, °F				60
~~ST-23~~ DETERMINED PSYCHROMETRICALLY	Water Content, volume %				1
ST-35	Total DC Amps				2980
	Hexavalent Chromium, mg/amp-hr	1.14	1.14	1.14	1.14
	Hexavalent Chromium, g/hr	3.4	3.4	3.4	3.4
	Hexavalent Chromium, mg/m3	.16	.16	.16	.16
	Isokinetic Ratio, act/theo	.99	.98	1.01	

FIGURE IV-97

NO COMMERCIAL USE OF THESE RESULTS IS AUTHORIZED

Source Test Team Leader / Date	Senior Source Test Engineer / Date	Approved by Source Test Manager / Date
		G. Karels

Form: Summary of Source Test Results

FSSTS: 01 29 Jun

DISTRIBUTION OF PROBE & NOZZLE WASH.

FRANCIS PLATING CO.
12/27/89
~~ST~~ ARB 425
(INLET)

SAMPLE VOLUMES:

$$V_{O_A} = \frac{(530)(V_m)\cdot P_b}{29.92\ T_m}$$

$$V_{O_A} = \frac{(530)(22.904)(30.17)}{29.92 \cdot 522.5}$$

$$\boxed{V_{O_A} = 23.43\ SDCF}$$

460
62.5
522.5

$$V_{O_B} = \frac{(530)(22.625)(30.17)}{29.92\ \ 523}$$

$$\boxed{V_{O_B} = 23.12\ SDCF}$$

$$V_{O_C} = \frac{(530)(22.842)(30.17)}{29.92 \cdot 524}$$

$$\boxed{V_{O_C} = 23.30\ SDCF}$$

$$\begin{aligned} V_{O_A} &= 23.43\ SDCF \\ V_{O_B} &= 23.12\ SDCF \\ + \ V_{O_C} &= 23.30\ SDCF \\ \hline V_{TOTAL} &= 69.85\ SDCF \end{aligned}$$

DISTRIBUTION:

TOTAL HEX CR PROBE & NOZZLE = 316.2 µg

$$\frac{V_{O_A}}{V_{TOTAL}} = \frac{23.43}{69.85} = 0.335 \times 316.2\ \mu g = 105.927 = 105.9\ \mu g$$

RUN A →

$$\frac{V_{O_B}}{V_T} = \frac{23.12}{69.85} = 0.331 \times 316.2\ \mu g = 104.6622 = 104.7\ \mu g$$

RUN B →

$$\frac{V_{O_C}}{V_T} = \frac{23.30}{69.85} = \frac{0.334}{1.000} \times 316.2\ \mu g = 105.6708 = 105.6\ \mu g$$

RUN C →

TOTAL 316.2 µg ⇒ OK

HEX CHROME CONCENTRATIONS

FRANCIS PLATING CO.
12/27/89
ARB-425
(INLET)

$$C_{mg/m^3} = \frac{35.31 \cdot (W) \rightarrow \mu g \text{ HEX CHROME TOTAL}}{1000 \cdot V_0}$$

RUN A)

$$W_P = \overset{LOD}{W_{FILT}} + \overset{105.9}{W_{PROBE}} + \overset{LOD}{W_{IMP}}$$

$$C_A = \frac{35.31(105.9\mu g)}{1000 \cdot 23.43 SDCF}$$

$$\boxed{C_A = 0.16\ mg/m^3}$$

RUN B)

$$C_B = \frac{(35.31)(104.7)^{\mu g}}{1000 \cdot 23.12 SDCF}$$

$$\boxed{C_B = 0.16\ mg/m^3}$$

RUN C)

$$C_C = \frac{(35.31)(105.6)}{1000 \cdot (23.30)}$$

$$\boxed{C_C = 0.16\ mg/m^3}$$

HEX CHROME EMISSION RATE

FRANCIS PLATING CO.
12/27/89
ARB-425
(INLET)

$$m = \frac{(60)(1\times10^{-6})(W_{\mu g})(Q_{STACK})}{V_D} \text{ g/HR}$$

RUN A)

$$m_A = \frac{(60)(1\times10^{-6})(105.9\mu g)(12600 SDCF)}{23.43}$$

$$\boxed{m_A = 3.4 \text{ g/HR}}$$

RUN B)

$$m_B = \frac{(60)(1\times10^{-6})(104.7)(12600)}{23.12 \text{ SDCF}}$$

$$\boxed{m_B = 3.4 \text{ g/HR}}$$

RUN C)

$$m_C = \frac{(60)(1\times10^{-6})(105.6)(12600)}{23.30}$$

$$\boxed{m_C = 3.4 \text{ g/HR}}$$

HEX CHROME PLATING EMISSION FACTOR - FRANCIS PLATING CO.
12/27/89
ARB-425
(INLET)

$$M_a = \frac{1000 \cdot m}{I}$$

RUN A)

$$M_a = \frac{1000 \, mg/A \; 3.4 \, g/HR}{2980}$$

$$\boxed{M_{a_A} = 1.14 \, mg/A\text{-}HR.}$$

RUN B)

$$M_A = \frac{1000 \cdot 3.4}{2980}$$

$$\boxed{M_{A_B} = 1.14 \, mg/A\text{-}HR}$$

RUN C)

$$M_{A_C} = \frac{1000 \cdot 3.4}{2980}$$

$$\boxed{M_{A_C} = 1.14 \, mg/A\text{-}HR.}$$

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 - 771-6000

Source Test Data Sheet

Source Operation: CHROME-HARD
Plant: FRANCIS PLATING OF OAKLAND
Sample Type: CR6
Process Cycle: INLET-SCRUBBER
Duct Size: 45"
Duct Pressure: (-5.5")
ASSUMED H_2O: 3%

Source Test No.:
Run No.: RUN A
Date: 12/27/89

$W_B = 50$ °F / $D_B = 55$ °F

6.9 Nozzle Diameter
0.85 Pitot Tube
AMBIENT Gas Collector No.
30.17 Barometric Pressu
0.00742 Leak Rate @ 15"Hg
50 TIME EACH POINT
1 # OF POINTS
50 TIME EACH RUN

Sampling Train: (IMPINGERS S_1-S_2)

ARB-425

Traverse Point	Dist. From inches	INITIAL TRAVERSE Duct Temp °F	h H_2O	$\sqrt{h}$	Traverse Point	h H_2O	V_s FPS	Time	METER Rate CFM	METER Temp °F	METER Volume Ft^3	Vac "Hg	Sat'd Gas Temp °F	T_s Duct Temp °F	ROTO CFM	REMARKS
								1133			224.374					
						0.12	19.5	1138	.4562	62°	26.65 227.70	6.0	36°	60 ~~[illegible]~~°	27.3	3.326
								1143	.4562	62°	29.98 229.03	5.5	36°	60°	27.3	1.33
								1148	.4562	62°	31.31 231.41	6.0	36°	60	27.3	2.38
								1153	.4562	62°	33.69 233.71	5.8	36°	60	27.3	2.3
								1158	.4562	62°	35.99 236.01	5.7	36°	60	27.3	2.3
								1203	.4562	63°	38.24 238.26	5.7	37°	60	27.3	2.25
								1208	.4562	63	40.49 240.49	5.6	37°	60	27.3	2.23
								1213	.4562	63	42.73 242.73	5.6	37°	60	27.3	2.24
								1218	.4562	63	45.01 244.97	5.8	37.°	60	27.3	2.24
								1223	.4562	63	247.[illegible]	5.7	37.°	60	27.3	2.308
								1228	.4562		22.904			60	27.3	22.904
								1233						60	27.3	

$$D_n = 13.7\left[\frac{T_s + 460}{V_s(100-\%H_2O)}\right]^{1/2}$$

$$Q_m = \left[(2.638 \times 10^{-3})\ (100-\%H_2O)\,D_{nm}^2\right]\frac{V_s}{T_s}$$

$$V_s = 2.9(K_p)\sqrt{T_s \cdot h_{H_2O}}$$

Condensate _____ gm.
V_o _____
$\%H_2O$ _____
$\%CO_2$ _____
$\%CO$ _____
$\%O_2$ _____

THERMO LABEL
OPERATING
9.6VAC
980A
TANK

160V-3 Φ 60Hz 24A / 12 kW
0-10-12VDC OUTPUT
1000A

Source Test Team
CHUCK McCLURE
Source Test Engineer I
GLEN COLWELL
HIROSHI OOI

TANKS STARTED OPERATION
11:10AM

FIG V-59 TANK 2000A at 5VDC

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 - 771-6000

Source Test Data Sheet

Source Operation: CHROME PLATING
Plant: FRANCIS PLATING OF OAKLAND
Sample Type: C26
Process Cycle: INLET-SCRUBBER
Duct Size: 45" ROUND
Duct Pressure: (-5.5")
ASSUMED H_2O: 3%

Source Test No.:
Run No.: RUN B
Date: 12/27/89

6.9mm Nozzle Diameter
0.85 Pitot Tube
AMBIENT Gas Collector No.
30.17 Barometric Pressu
0.00 Leak Rate @ 15"Hg
50 TIME EACH POINT
1 # OF POINTS
50 TIME EACH RUN

Sampling Train: IMPINGERS S-3, S-4

ARB-425

Traverse Point	Dist. From inches	Initial Traverse: Duct Temp °F	Initial Traverse: h H_2O	Initial Traverse: $\sqrt{h}$	Sampling: Traverse Point	h H_2O	V_s FPS	Time 1237	Meter: Rate CFM	Meter: Temp °F	Meter: Volume Ft^3 247.279	Vac "Hg	Sat'd Gas Temp °F	T_s Duct Temp °F	Roto CFH	Remarks
					P5	0.12	19.5	1242	.4562	63	49.56 / 249.51	6	37	60 $520	27.3	2.231
								1247	.4562	63	51.79 / 251.75	6	37	60	27.3	2.24
								1252	.4562	63	54.03 / 253.99	6	37	60	27.3	2.23
								1257	.4562	63	56.27 / 256.15	6	36	60	27.3	2.17
								1302	.4562	63	58.43 / 258.50	7	36	60	27.3	2.35
								1307	.4562	63	60.78 / 260.68	6	36	60	27.3	2.18
								1312	.4562	63	62.96 / 263.01	6.5	36	60	27.3	2.33
								1317	.4562	63	65.29 / 265.25	6.5	36	60	27.3	2.24
								1322	.4562	63	67.53 / 267.575	6.5	36	60	27.3	2.325
								1327	.4562	63	69.86 / 269.904	6.2	37	60	27.3	2.329
											22.625					22.625

$$Q_n = 13.7\left[\frac{T_s + 460}{V_s(100-\%H_2O)}\right]^{1/2}$$

$$Q_m = \left[(2.638 \times 10^{-3})\ (100-\%H_2O)\,Q_{nm}^2\right]\frac{V_s}{T_s}$$

$$V_s = 2.9(K_p)\sqrt{T_s \cdot h_{H_2O}}$$

Condensate _____ gm.
V_o _____
$\%H_2O$ _____
$\%CO_2$ _____
$\%CO$ _____
$\%O_2$ _____

Source Test Team
CHUCK McCLURE
Source Test Engineer I
COLEEN COLWELL
MROSHE DOI

FIG V-59

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street, San Francisco, Calif. 94109 • 771-6000

Source Test Data Sheet

Source Operation: CHROME PLATING
Plant: FRANCIS PLATING CO
Sample Type: CR 6
Process Cycle: INLET SCRUBBER
Duct Size: 45" ROUND
Duct Pressure: (-6.5")
ASSUMED H_2O: 3%

Source Test No.:
Run No.: RUN C
Date: 12/27/89

6.9mm Nozzle Diameter
0.85 Pitot Tube
AMBIENT Gas Collector No.
30.17 Barometric Pressu
0.001at17 Leak Rate @ 15"Hg
5 MIN. TIME EACH POINT
10 # OF POINTS
50 MIN TIME EACH RUN

Sampling Train: (IMPINGERS S5-S6)

Traverse Point	Dist. From inches	INITIAL TRAVERSE Duct Temp°F	H H_2O	$\sqrt{h}$	ARB-425 Traverse Point	h H_2O	V_s FPS	Time 1350	METER Rate CFM	METER Temp °F	METER Volume Ft^3 269.904	Vac "Hg	Sat'd Gas Temp°F	T_s Duct Temp°F	ROTO CFM	REMARKS
					P5	.12	19.5	1355	.4562	64	272.18 / 272.145	7	37	60.6	27.3	2.241
								1400	.4562	64	274.43 / 274.390	7	38	60.2	27.3	2.245
								1405	.4562	64	276.67 / 276.66	7	37	60.2	27.3	2.27
								1410	.4562	64	278.94 / 278.95	7	37	60.8	27.3	2.29
								1415	.4562	64	281.23 / 281.25	7	37	60.6	27.3	2.3
								1420	.4562	64	283.53 / 283.54	7	37	60.4	27.3	2.29
								1425	.4562	64	285.82 / 285.83	7	36	60.2	27.3	2.29
								1430	.4562	64	288.11 / 288.14	7	36	60.4	27.3	2.31
								1435	.4562	64	290.42 / 290.43	7	36	60.6	27.3	2.29
					P5	.12	19.5	1440	.4562	64	292.71 / 292.746	7	36	60.8	27.3	2.316
											22.842					22.842

$$D_n = 13.7\left[\frac{T_s + 460}{V_s(100-\%H_2O)}\right]^{1/2}$$

$$Q_{sn} = \left[(2.638 \times 10^{-3})\ (100-\%H_2O)\,D_{nun}^2\right]\frac{V_s}{T_s}$$

$$V_s = 2.9(K_p)\sqrt{T_s \cdot h_{H_2O}}$$

Condensate _____ gm.
V_o _____
$\%H_2O$ _____
$\%CO_2$ _____
$\%CO$ _____
$\%O_2$ _____

Source Test Team
CHUCK McCLURE
Source Test Engineer I
GLENN COLWELL
HIROSHI DOI

FIG V-59
77a

FRANCIS PLATING CO
12/27/89

OVERALL ISOKINETIC RATIO

T_s = TEMP STACK °R

V_D = METERED VOLUME ft³ SDCF

V_s = AVERAGE STACK VELOCITY

T = TIME OF RUN

A_n = AREA NOZZLE ft²

P_s = PRESSURE IN STREAM

$H_2O\%$ = 1%

$$R = \frac{(T_s)(V_D)(29.92)(100)}{(V_s)(T_{IME})(A_n)(P_s)(530)(60)(100-\%H_2O)}$$

$$P_s = 29.92 \pm \frac{\text{STACK PRESSURE}}{13.6}$$

$$P_s = 29.92 - \frac{5.5}{13.6}$$

$$P_s = 29.92 - 0.4044$$

$$\boxed{P_s = 29.52}$$

$$V_D = \frac{(530)(V_m)(P_b)}{29.92\,(T_m\ °R)}$$

RUN A ST-35

$$R_{A_{ST}} = \frac{(520)(\cancel{22.93}\ 23.48)(29.92)(100)}{(19.5)(50)(0.0004025\,ft^2)(29.52)(530)(60)(99)}$$

$$V_{D_{A_{ST}}} = \frac{(530)(22.93)(30.17)}{29.92\,(522)}$$

$$\boxed{V_{D_{A_{ST}}} = 23.48\ SDCF}$$

$$R_{A_{ST}} = \frac{36531123}{36471126} = 1.002$$

$$\boxed{R_{A_{ST}} = 1.00}$$

$$A_n = \frac{0.15499\,\pi\,D_{cm}^2}{576}$$

D = 6.9mm
D = .69cm

$$A_n = \frac{0.15499(\pi)(.69)^2}{576}$$

$$A_n = 0.0004025\ ft^2$$

$$R_{A_{ARB}} = \frac{(520)(23.44)(29.92)(100)}{(19.5)(50)(0.0004025\,ft^2)(29.52)(530)(60)(99)}$$

$$R_{A_{ARB}} = \frac{36468890}{36471126} = 0.9999$$

$$\boxed{R_{A_{ARB}} = 0.99}$$

$$V_D = \frac{(530)(22.904)(30.17)}{(29.92)(5225)}$$

$$\boxed{V_{D_{A_{ARB}}} = 23.44\ SDCF}$$

FRANCIS PLATING CO.
12/27/89

RUN B_{ST-35}

$$R_{B_{ST}} = \frac{(520)(23.38)(29.92)(100)}{(19.5)(50)(0.0004025\,ft^2)(29.52)(530)(60)(99)}$$

$$V_D = \frac{(530)(22.885)(30.17)}{29.92(523)}$$

$$\boxed{V_{D_{B_{ST}}} = 23.38\,SDCF}$$

$$R_{B_{ST}} = \frac{36375839}{36471126}$$

$$R_{B_{ST}} = 0.997 \qquad \boxed{R_{B_{ST}} = 0.99}$$

$$RUN\,B_{ARB} = \frac{(520)(23.12)(29.92)(100)}{(19.5)(50)(0.0004025\,ft^2)(29.52)(530)(60)(99)}$$

$$V_D = \frac{(530)(22.625)(30.17)}{29.92(523)}$$

$$\boxed{V_{D_{B_{ARB}}} = 23.12\,SDCF}$$

$$RUN_{B_{ARB}} = \frac{35971021}{36471126} = .9862$$

$$\boxed{RUN_{B_{ARB}} = .98}$$

RUN C_{ST-35}

$$R_{C_{ST-35}} = \frac{(520)(23.30)(29.92)(100)}{(19.5)(50)(0.0004025)(29.52)(530)(60)(99)}$$

$$V_D = \frac{(530)(22.892)(30.17)}{(29.92)(524)}$$

$$\boxed{V_{D_{C_{ST}}} = 23.30\,SDCF}$$

$$R_{C_{ST-35}} = \frac{36251072}{36471126} = 0.994$$

$$\boxed{R_{C_{ST-35}} = 0.99}$$

$$V_D = \frac{(530)(23.24)(30.17)}{29.92(524)}$$

$$V_{D_{C_{ARB}}} = 23.70$$

$$RUN\,C_{ARB} = \frac{(520)(23.70)(29.92)(100)}{(19.5)(50)(0.0004025)(29.52)(530)(60)(99)}$$

$$RUN\,C_{ARB} = \frac{36873408}{36471126} = 1.01$$

$$\boxed{RUN\,C_{ARB} = 1.01}$$

SOURCE TEST LAB DATA SHEET

PLANT: FRANCIS PLATING OF OAKLAND
SOURCE OPERATION: CHROME SCRUBBER - INLET
SOURCE TEST NO.: ST-35
FILTER MEDIA: FILTER + FOLLOWING H_2O IMPINGERS

PAGE 1 OF 1
INITIAL CMMP
TEST DATE 12/27/89

Drying Procedure: 105 °C 24 hours before and after test, desiccated

FILTER DATA

RUN NO.	FILTER NO.	TARE WEIGHT (g)			FINAL WEIGHT (g)	SAMPLE WEIGHT (µg)

PROBE & NOZZLE RINSE DATA (total all runs)

RUN NO.	FILTER NO.	JAR TARE WEIGHT (g)	JAR FINAL WEIGHT (g)	SAMPLE WEIGHT (µg)

PROBE & NOZZLE RINSE DATA (each run)

RUN NO.	PROBE/NOZZLE NOS.	JAR TARE WEIGHT (g)	JAR FINAL WEIGHT (g)	SAMPLE WEIGHT (µg)

IMPINGER DATA

SOLUTION	NO.	A TARE WEIGHT	B FILLED WEIGHT	C FINAL WEIGHT	C-A SAMPLE WEIGHT	C-B CONDENSATE WEIGHT	
H_2O	T-1	492.8	592.0	594.1	101.3	2.1	→ 1.6
	T-2	486.8	587.2	586.7	99.9	-<0.5>	
	T-3	472.3	572.5	~~581.5~~ 573.9	101.6	1.4	→ 1.6
	T-4	503.1	603.2	603.4	100.3	0.2	
	T-5	495.8	595.6	597.9	102.1	2.3	→ 2.0
	T-6	503.2	603.4	603.1	99.9	-<0.3>	

Form: 'Source Test Lab Data Sheet'

FLABDATA : KJ : June 23, 1989

SOURCE TEST LAB DATA SHEET

PLANT: FRANCIS PLATING OF OAKLAND
PAGE 1 OF 1
SOURCE OPERATION: CHROME TANK SCRUBBER-INLET
INITIAL CDMP
SOURCE TEST NO.: ARB-425
TEST DATE 12/27/89
FILTER MEDIA: 0.1N NaOH + FOLLOWING FILTER
Drying Procedure: 105 °C 24 hours before and after test, desiccated

FILTER DATA

RUN NO.	FILTER NO.	TARE WEIGHT (g)			FINAL WEIGHT (g)	SAMPLE WEIGHT (µg)

PROBE & NOZZLE RINSE DATA (total all runs)

RUN NO.	FILTER NO.	JAR TARE WEIGHT (g)	JAR FINAL WEIGHT (g)	SAMPLE WEIGHT (µg)

PROBE & NOZZLE RINSE DATA (each run)

RUN NO.	PROBE/NOZZLE NOS.	JAR TARE WEIGHT (g)	JAR FINAL WEIGHT (g)	SAMPLE WEIGHT (µg)

IMPINGER DATA

SOLUTION	NO.	A TARE WEIGHT	B FILLED WEIGHT	C FINAL WEIGHT	C-A SAMPLE WEIGHT	C-B CONDENSATE WEIGHT	
0.1N NaOH	S-1	520.8	621.5	676.9	156.1	55.4	3.5
	S-2	501.8	601.6	549.7	47.9	-<51.9>	
	S-3	482.8	584.9	586.4	103.6	1.5	0.6
	S-4	479.4	580.8	579.9	100.5	-<0.9>	
	S-5	516.5	618.8	620.9	104.4	2.1	1.5
	S-6	488.9	590.9	590.3	101.4	-<0.6>	

BAY AREA
AIR QUALITY MANAGEMENT DISTRICT
939 Ellis Street
San Francisco, California 94109
(415) 771-6000

SOURCE TEST REQUEST

SOURCE TEST ACTION:
Date Rec'd: 9-8-89
Sr. Engineer Assigned: KK
Test Number:
Date Tested:
Date Completed:

SOURCE DATA

Firm Name: Francis Plating of Oakland, Inc. Telephone No.: (415) 444-5535
Address: 785 Seventh Street City: Oakland Zip: 94607
Representative to Contact: Randall E. Lewis Title: General Manager
Source Operation: Chrome Plating Permit No.: NONE Plant No.: 2324
Permit Conditions: NONE

Condition No.:

SAMPLE DATA

S-2 Chrome Plating; 3'x12' tank; abated by chemical water scrubber A-3
S-3 Chrome Plating; 6'x6' tank; abated by chemical water scrubber A-3

Points to be Tested: ~~inlet to each scrubber A-3;~~ outlet from water scrubber A-3
(List each Source No.:) S-2 and S-3 -- They have common exhaust stack and abatement device(s)
Type of Tests: Determination of Emission Factor (mg hexavalent chromium/amp-hr) as prescribed in the Manual of Procedures, Volume IV, ST-35.

Special Instructions:

REQUEST DATA

Reason for Request: Compliance with Reg. 11-8-310.1 and efficiency of abatement device. Information is necessary for permit issuance.
[X] Compliance with Regulation 11 Rule 8 Section(s) 310.1
[ ] Developmental Data [ ] Hearing Board [ ] Permit
[ ] Other

Date Results Requested by: September 1, 1989 Type of Request: [X] Announced [ ] Unannounced
Request Initiated by: Douglas W. Hall Section: Permit Services Division
Requester to be Present During Test? No Approved by: Douglas W. Hall 8/21/89 (Date)

Form: Source Test Request

FREQUEST: 6): 1 November 1988

list DETAIL for plant # >> 2324

Plant number 2324
Business name ..... Francis Plating of Oakland, Inc
Location address ..... 785 7th Street
City ..... Oakland, CA 94607
Telephone ..... (415) 444-5535
Mailing address ..... 785 7th Street
City ..... Oakland, CA 94607
Principal product ..... Metal finishing
Parent company .....
Contact ..... Randall Lewis
Title ..... General Manager
Address ..... 785 7th Street
City ..... Oakland, CA 94607
Telephone ..... (415) 444-5535
BAAQMD engineer ..... Douglas W Hall (436)
BAAQMD data engineer ...
Inspection Area # ..... 502 - Noriko W Lew (354)
Ownership type ..... Private
Number of employees 32
Property area, acres ... 1
Inside city limits ..... No
Permit month 10

list DETAIL for plant # >>

RANDY!

P.C. 9/14 1410 - RANDALL LEWIS - OK REARRANGE FOR INSPECTION, AFTER 9AM PLEASE - OK!
FRIDAY 9/15