Project No. 1394

Emission Test Program

Shieldalloy Metallurgical Corporation
Log No. 90-1307

Prepared for:

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May 1991

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1.0 Introduction

AirNova, Inc. will conducted emission compliance test program at the Shieldalloy Metallurgical Corporation facility located in Newfield, New Jersey. The purpose of this test program was to demonstrate compliance with New Jersey Department of Environmental Protection (NJDEP) regulations governing emissions resulting from a modification to the Department 115 Baghouse in operation at this site. Sampling was conducted in determination of particulate, hydrogen fluoride and boron trifluoride emissions.

A description of the sampling location as well as the test methods utilized in the completion of this program are provided herein. This report contains the complete results of the program.

2.0 Source Description

The test program was conducted in demonstration of outlet emissions of the Department 115 Baghouse. Sampling was performed at the typical maximum operating rate for all equipment serviced by the baghouse. In addition to controlling emissions from furnaces within Bldg 115, the baghouse also services the salt room. The salt room contains bins, shakers and mixers which are utilized to blend potassium bifluoride (KBF_4) and potassium titanium fluoride (K_2TiF_6) for use in the production of ferroalloys and aluminum alloys at this facility. Bagged quantities of each salt are transferred to storage bins equipped with feeding mechanisms. These materials are subsequently measured and mixed in metal hoppers identified as the Potassium Bifluoride Shaker and the Potassium Titanium Fluoride Shaker.

Any airborne particulate resulting from transfer and mixing operations within the salt room is controlled by a single 14-inch diameter exhaust duct connecting to the Building 115 baghouse. Sampling was conducted at the baghouse outlet while the salt room and other emission sources controlled by the baghouse were in operation.

A schematic diagram of the process system is presented in Figure 2-1. Emission sampling was conducted in a vertical section of 35-inch I.D. exhaust duct located 6.9 stack diameters downstream 1.4 stack diameters upstream from the nearest flow disturbance. A total of 12 sample points were utilized for all emission determinations.

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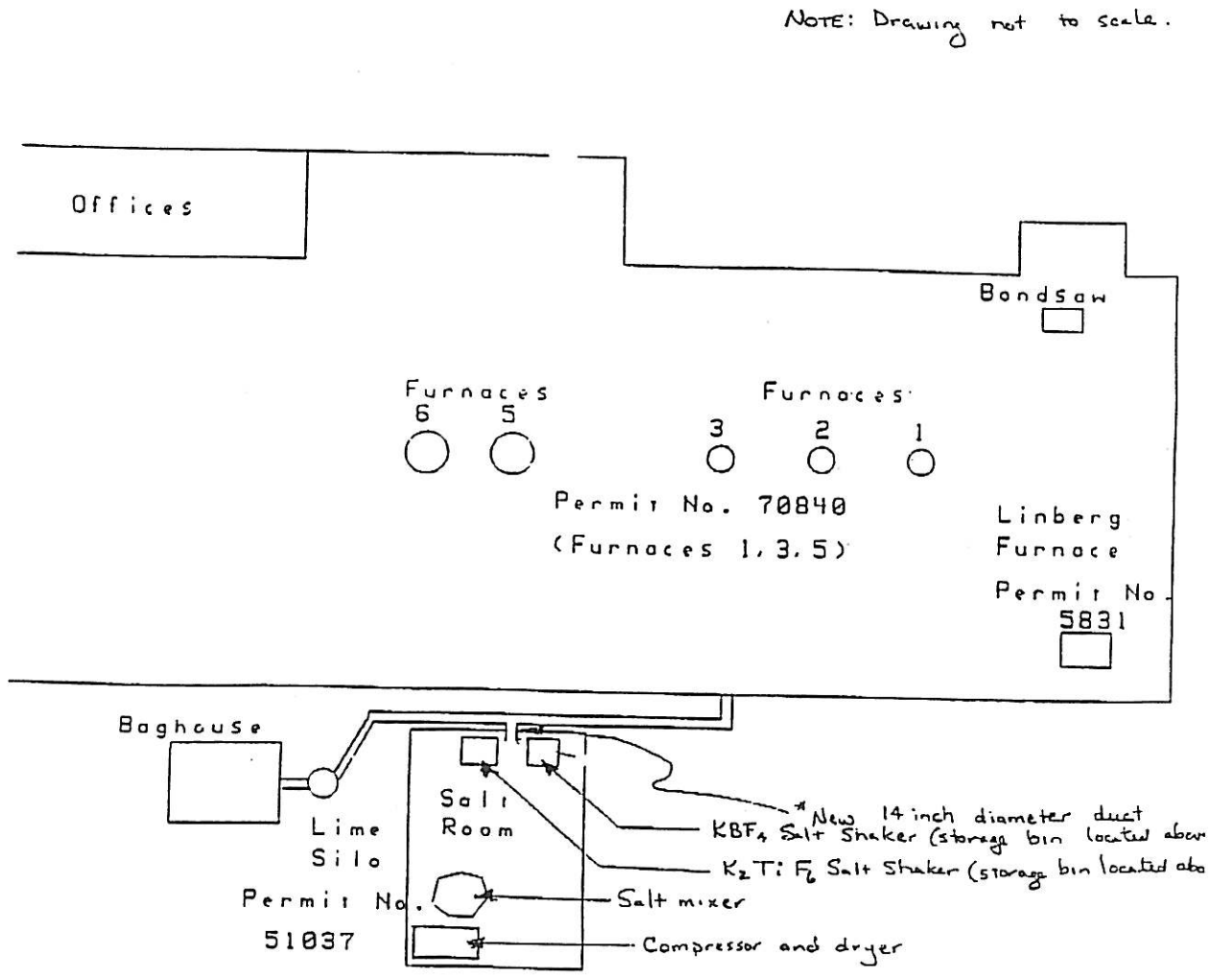

Figure 2-1 Process System Scematic Diagram

3.0 Test Results

The results of the emission test program are presented on the following page in Table 3-1. Particulate emission from the baghouse exhaust averaged 0.10 lb/hr. Hydrogen Fluoride emissions averaged 0.27 lb/hr while boron trifluoride emission fell below the analytical detection limit.

Table 3-1

Test Data Summary
Shieldalloy Metallurgical Corporation

Run No.	1	2	3
Date	03/26/91	03/26/91	03/26/91
Test Period	1330-1435	1500-1607	1700-1805
Velocity (FPM)	2,596	2,621	2,608
Temperature (°F)	95	85	84
Moisture Content (%)	0.6	0.6	0.6
Molecular Wt. (lb/mole)	28.90	28.87	28.85
Flow Rate (DSCFM)	16,629	17,101	17,056
Isokinetic Variation (%)	95.1	93.8	96.0
Particulate			
Concentration (gr/DSCF)	0.001	0.001	0.0004
Emission Rate (lb/hr)	0.11	0.15	0.05
Hydrogen Fluoride			
Concentration (mg/DSCF)	0.14	0.10	0.12
Emission Rate (lb/hr)	0.30	0.23	0.27
Boron Trifluoride			
Concentration (mg/DSCF)	<0.32	<0.32	<0.31
Emission Rate (lb/hr)	0.71	0.72	0.71

Standard Condition: 70°F, 29.92 in Hg.

4.0 Sampling and Analytical Methodologies

The emission test program was conducted utilizing the methodologies specified below:

EPA Method 1 - Sample and Velocity Traverse for Stationary Sources

EPA Method 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate

EPA Method 3 - Gas Analysis for Carbon Dioxide, Oxygen, Excess Air and Dry Molecular Weight

EPA Method 4 - Determination of Moisture Content in Stack Gases

NJ Air Test Method 1 - Sampling and Analytical Procedures for Determining Emissions of Particulate from Manufacturing Processes and from Combustion of Fuels

EPA Method 13B - Determination of Total Fluoride Emission From Stationary Sources-Specific Ion Electrode Method

Triplicate test runs were conducted for all parameters with each being a minimum of 1 hour in duration. EPA Methods 1, 2, 3 and 4 were conducted concurrent with all particulate sampling for the purpose of determining the stack gas velocity, volumetric flow rate, temperature and moisture content.

A complete description of the test methodologies is presented below.

4.1 Velocity and Volumetric Flow Rate

The velocity profile at the test location was determined in accordance with procedures outlined in EPA Method 2 - "Determination of Stack Gas Velocity and Volumetric Flow Rate". The gas velocity and volumetric flow rate were determined from velocity pressure and gas temperature data. An "S" type pitot tube and thermocouple were employed. The pitot tube was connected to an inclined manometer and the thermocouple to a pyrometer (Figure 4-1). The

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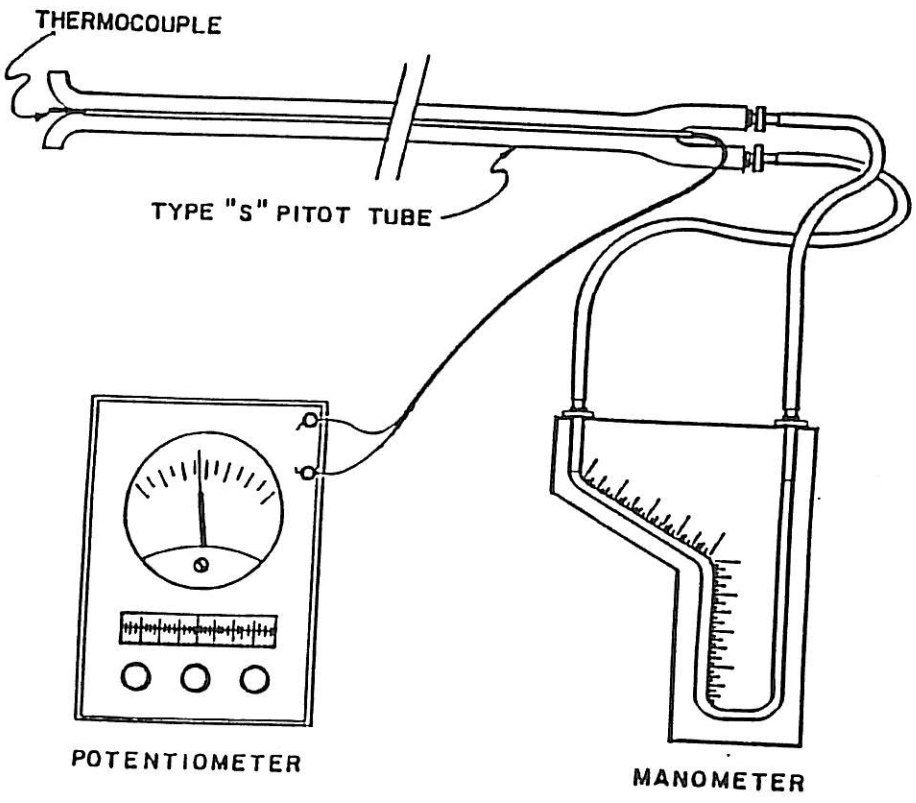

Figure 4-1 Velocity Measurement Apparatus

velocity pressure was measured on the manometer and the gas temperature on the pyrometer. These readings were taken and recorded for each traverse point.

4.2 Moisture Content

In accordance with EPA Reference Method 4, Section 2.0, the procedure described in EPA Reference Method 5, Section 2.1.7 was utilizing as an acceptable reference method for determining moisture content.

4.3 Gas Composition

The composition of the flue gas at the test location was determined in accordance with procedures outlined in EPA Method 3, "Gas Analysis for Carbon Dioxide, Excess Air and Dry Molecular Weight" . An integrated sample of stack gas was collected into an evacuated sample bag through a sample pump and flow meter. The contents of the bag were then analyzed for carbon dioxide, oxygen and carbon monoxide using an ORSAT analyzer (Figure 4-2). One sample was collected during each test run. Prior to sampling, each sample was leak checked by connecting the bag to a water manometer and pressurizing the bag to 2-4 in. H_2O for approximately 60 minutes. Any displacement in the water manometer indicated a leak.

After a positive leak check the bag was then evacuated with a leak free pump connected on the downstream side of a rotometer.

4.4 Particulate

Following those procedures outlined in NJ Air Test Method 1, gas samples were isokinetically extracted from the exhaust stack and passed through a glass lined probe and teflon filter, both maintained at 225°F. This gas

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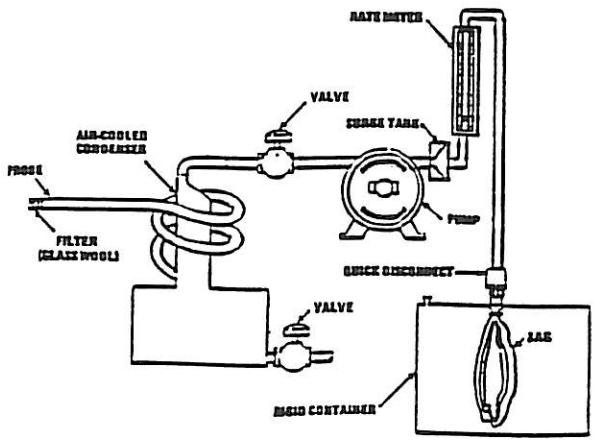

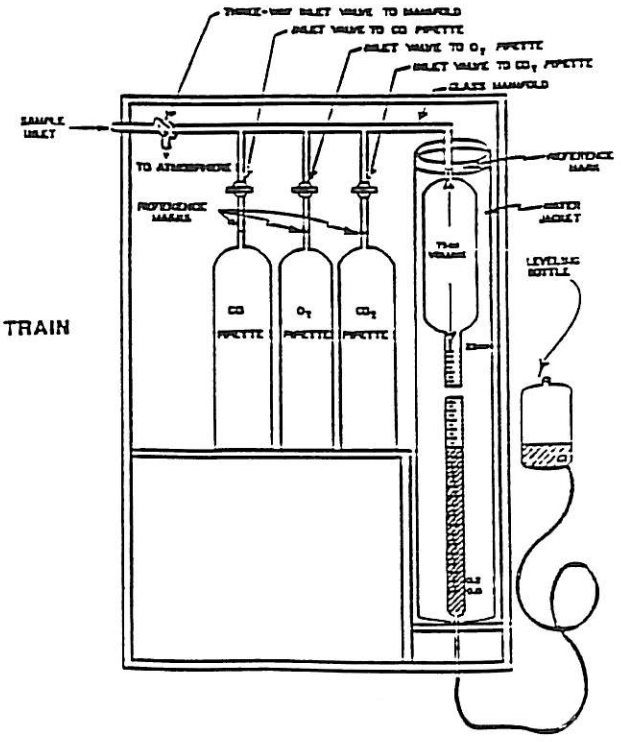

INTEGRATED GAS SAMPLING TRAIN
and
ORSAT ANALYZER

Figure 4-2 ORSAT Sampling Train and Analyzer

sample the passed through an impinger train consisting of four glass impingers immersed in an ice bath. The first two contained 100 ml of distilled water. A third impinger was initially dry. A fourth impinger contained silica gel for final dying of the gas sample. The sample volume was subsequently measured by passing it through a calibrated dry gas meter. An "S" type pitot tube was attached to the sample probe to monitor the stack gas velocity in order to maintain isokinetic sampling conditions. Also attached was a type "K" thermocouple to measure the exhaust gas temperature (Figure 4-3).

After each run, the probe, nozzle, and all connecting glassware ahead of the filter were brushed and rinsed with acetone and the washings retained for analysis. The Teflon filter was placed in a container after each test run and retained. The impinger contents were measured after each test run for increase in volume and rinsed with distilled water and the contents and washings retained. The silica gel was returned to its original tared container and reweighed to determine moisture gain.

After returning the samples to the laboratory, the Teflon filters were desiccated for 24 hours and reweighed to determine weight gain. The acetone samples were evaporated in tared beakers, desiccated for 24 hours and reweighed in order to determine total particulate content.

4.5 Boron Trifluoride

An additional analysis of the particulate sampling train front half acetone wash and Teflon filter catch was conducted in determination of boron content. After the acetone washes were dried to constant weight in determination of particulate content, the collected particulate was resuspended in 0.1N HNO_3, digested and analyzed by atomic absorption

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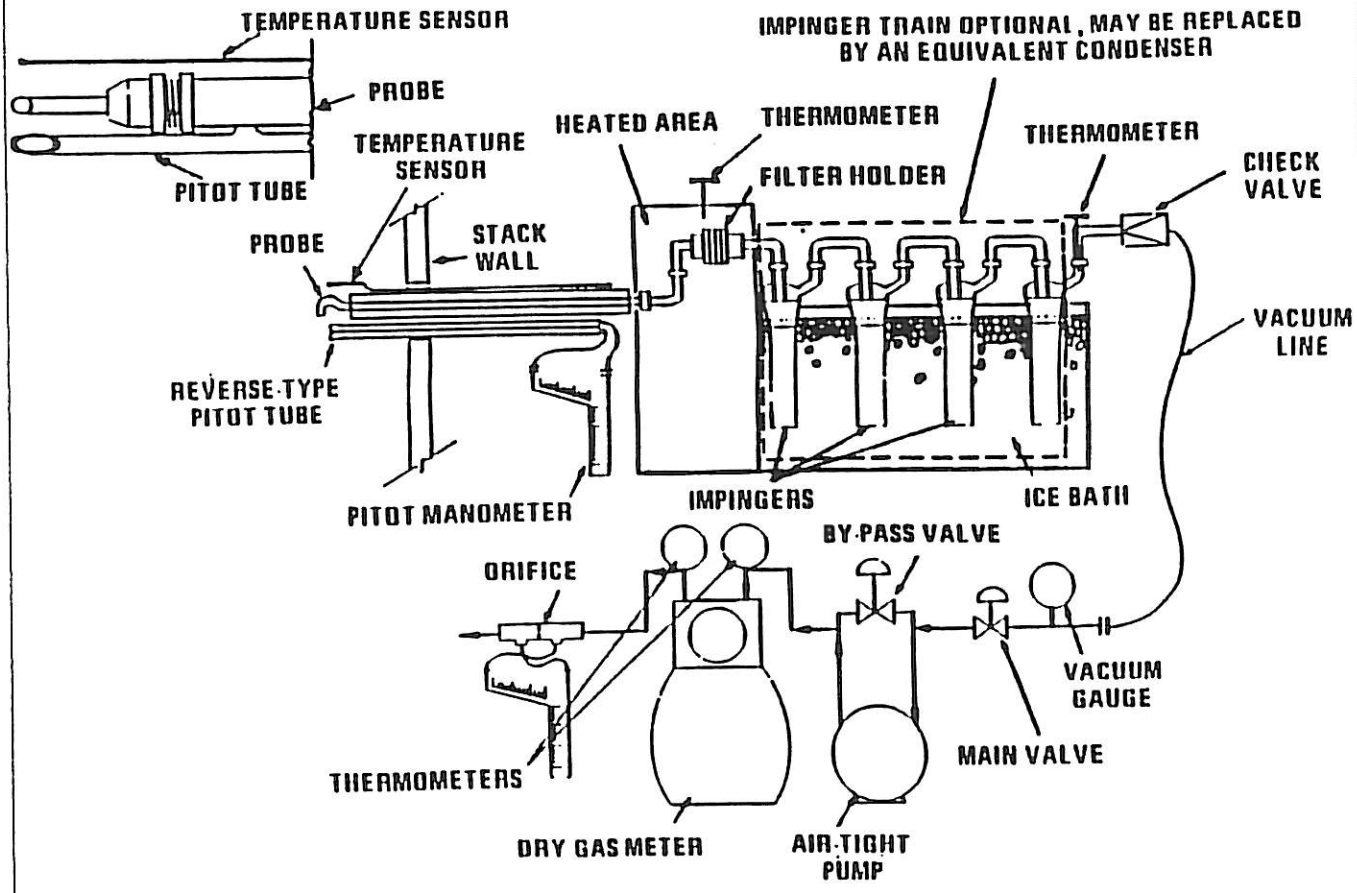


Figure 4-3 Particulate Sampling Train

spectrophotometry. The total sample weight was calculated as boron trifluoride.

4.6 Hydrogen Fluoride

The impinger solutions and washings resulting from the particulate sampling train were additionally analyzed for total fluoride content by specific ion electrode as specified in EPA Method 13B Section 7.2.1. The total sample weight was calculated as hydrogen fluoride.

Appendix A

Field Data and Calibration

AirNova, Inc.
5845-A Clayton Avenue
Pennsauken, New Jersey 08109

PLANT SHC
DATE 3-26-91
SAMPLING LOCATION Outlet
SAMPLE TYPE Particulate
RUN NUMBER 1 OPERATOR JC - TM
BAROMETRIC PRESSURE 30.21 STATIC PRESSURE +.25
FILTER NUMBER(S) 0056 / 0057 / 0054
GEL NUMBER(S) —
THIMBLE NUMBER — PLATE NUMBER —
H_2O PICKUP (ml) -12

CO_2 1%
O_2 20%
CO

PYROMETER NUMBER 1
THERMOCOUPLE NUMBER 1
PROBE NUMBER 3' TYPE GLASS
NOZZLE NUMBER #6 I.D. .25
METER BOX NUMBER — $\Delta H_@$ 1.71
PITOT NUMBER S-type C_p .85
SAMPLE BOX NUMBER(S) 1
ASSUMED MOISTURE (%) 3%
ASSUMED METER TEMPERATURE 100
C FACTOR 1.1 REFERENCE Δp .48

READ AND RECORD ALL DATA EVERY _____ MINUTES

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O		STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE		PUMP VACUUM, in. Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	Filter Temp
				DESIRED	ACTUAL		INLET ($T_{m\,in}$), °F	OUTLET ($T_{m\,out}$), °F				
1	1300	680.129	.47	1.6	2.6	97	69	69	11	259	49	251
2	05	684.413	.61	2.4	2.6	97	69	69	11	260	49	250
3	10	688.778	.63	2.4	2.4	96	71	70	9	257	50	250
4	15	693.019	.49	1.9	1.9	97	74	71	6	257	51	253
5	20	696.875	.43	1.7	1.7	97	76	71	6	257	51	252
6	25	700.493	.43	1.7	1.7	97	78	71	6	254	52	250
	1400	704.068										
7	1405 30	704.068	.57	2.2	2.2	95	76	72	8	254	53	251
8	35	708.060	.59	2.25	2.25	95	79	73	8	253	54	250
9	40	712.143	.59	2.25	2.25	95	81	74	8	252	54	250
10	45	716.235	.58	2.2	2.2	95	82	75	8	250	55	251
11	50	720.321	.55	2.1	2.1	95	83	75	6	252	56	250
12	55	724.349	.51	2.0	2.0	95	83	75	6	250	57	250
	1435	728.272										
		48.093	.558		2.16	95.1		74.4				
Final	Leak OK	OK 1012 AT 17"										

AT 15"

13.7

PLANT SHC DATE 3-26-91 RUN NUMBER 2 Ap 30.19 H2O Pickup - -12 mL

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24-hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX TEMPERATURE, °F	IMPINGER TEMPERATURE, °F	Filter Temp
1	1500	728.590	.59	2.25	2.25	81	74	74	5	248	54	251
2		732.745	.59	2.25	2.25	85	76	74	9	250	53	250
3		736.693	.55	2.1	2.1	85	79	74	9	253	54	250
4		740.672	.57	2.2	2.2	85	81	75	10	251	55	249
5		744.725	.57	2.2	2.2	86	82	75	10	250	55	251
6	↓	748.803	.56	2.2	2.2	86	83	75	10	252	56	250
	1530	752.842										
7	1533	752.842	.68	2.6	2.6	84	79	75	11	254	56	252
8		757.231	.67	2.6	2.6	85	81	76	11	253	57	251
9		761.685	.63	2.4	2.4	85	82	76	10	254	58	251
10		766.214	.63	2.4	2.4	84	83	76	10	255	60	250
11		770.269	.47	1.8	1.8	84	83	76	8	256	61	250
12	↓	774.105	.44	1.7	1.7	84	83	76	8	252	63	251
	1603	777.742										
		49.152	.579		2.23	84.5		77.4				
Final	Leak ck OK	.010 @ 10"										
1	1700	778.733	.63	2.4	2.4	85	68	68	5	249	37	250
2		782.864	.63	2.4	2.4	85	68	68	5	251	39	250
3		787.124	.59	2.25	2.25	90	71	68	5	250	40	250
4		791.239	.58	2.2	2.2	90	73	68	4	250	41	250
5		795.337	.53	2.0	2.0	90	74	68	4	253	43	251
6	↓	799.301	.56	2.2	2.2	89	75	68	5	251	44	249
	1730	803.355										
7	1735	803.355	.67	2.6	2.6	91	69	66	7	256	45	250
8		807.495	.67	2.6	2.6	89	69	66	7	250	46	248
9		812.328	.65	2.5	2.5	82	69	66	7	248	47	250
10		816.781	.47	1.8	1.8	82	69	66	3	249	49	250
11	↓	820.855	.47	1.8	1.8	71	69	65	3	249	49	250
12	11	824.931	.44	1.7	1.7	68	71	65	3	250	49	250
	1805	828.[illegible]										
		49.277	.574		[illegible]	82.5		68.6				

AirNova, Inc.

DRY MOLECULAR WEIGHT DETERMINATION BY MDD

SAMPLING TIME (24-hr CLOCK) _____

SAMPLING LOCATION BAGHOUSE OUTLET

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) _____

ANALYTICAL METHOD USEPA 3A

AMBIENT TEMPERATURE 60

RUN 1 / GAS	1		2		3		AVERAGE NET VOLUME
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET	
CO_2	0.5	0.5	1.0	1.0	1.0	1.0	1.0
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.0	19.0	21.0	20.0	21.0	20.0	20.0
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	21.0	0.0	~	~	~	~	0.0
N_2 (NET IS 100 MINUS ACTUAL CO READING)							79.0

RUN 2 / GAS	1		2		3		AVERAGE NET VOLUME
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET	
CO_2	0.9	0.9	0.9	0.9	~	~	0.9
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.4	19.5	20.7	19.8	20.7	19.8	19.8
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	20.7	0.0	~	~	~	~	0.0
N_2 (NET IS 100 MINUS ACTUAL CO READING)							79.3

RUN 3 / GAS	1		2		3		AVERAGE NET VOLUME
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET	
CO_2	0.7	0.7	0.7	0.7	0.7	0.7	0.7
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.7	20.0	20.8	20.1	20.8	20.1	20.1
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)	20.8	0.0	~	~	~	~	0.0
N_2 (NET IS 100 MINUS ACTUAL CO READING)							79.2

1-94

PLANT SMU DATE 3-16-94 RUN NUMBER 1 + Limit + Cyclonic

TRAVERSE POINT NUMBER	SAMPLING TIME, min / CLOCK TIME (24 hr CLOCK)	GAS METER READING (V_m), ft^3	VELOCITY HEAD (Δp_s), in. H_2O	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O DESIRED	ORIFICE PRESSURE DIFFERENTIAL (ΔH), in. H_2O ACTUAL	STACK TEMPERATURE (T_s), °F	DRY GAS METER TEMPERATURE INLET ($T_{m\,in}$), °F	DRY GAS METER TEMPERATURE OUTLET ($T_{m\,out}$), °F	PUMP VACUUM, in Hg	SAMPLE BOX ~~TEMPERATURE, °F~~ / Cyclonic	IMPINGER TEMPERATURE, °F
1	1		.62			79				+4°	
	2		.63			80				- 1°	
	3		.62			81				+ 2°	
	4		.60			81				+ 3°	
	5		.58			81				+ 6°	
	6		.57			80				0°	
2	1		.65			79				+ 3°	
	2		.67			81				- 2°	
	3		.66			81				- 1°	
	4		.56			82				- 2°	
	5		.51			81				- 1°	
	6		.48			80				- 1°	
			.60			80					
										3.9	
		STATIC	+.25								

TC

PITOT TUBE CALIBRATION DATA

Pitot Tube Identification Number: 3 ft probe #2 Date: 4/19/88

Calibrated By: R. McKinney

	"A" SIDE CALIBRATION			
Run No.	ΔP_{std} cm H_2O (in. H_2O)	$\Delta P_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	Dev.
1	.162	.185	.1846	0.002
2	.162	.185	.1846	0.002
3	.162	.186	.1841	-0.003
		Average	.1844	

	"B" SIDE CALIBRATION			
Run No.	ΔP_{std} cm H_2O (in. H_2O)	$\Delta P_{(s)}$ cm H_2O (in. H_2O)	$C_{p(S)}$	Dev.
1	.162	.185	.1846	0
2	.162	.185	.1846	0
3	.162	.185	.1846	0
		Average	.1846	

$$C_{p(s)} = .99\sqrt{\frac{\Delta P_{std.}}{\Delta P_{(s)}}}$$

Dev. = $C_{p(S)} - C_{p(S)(avg.)}$ = _____ (MUST BE ≤0.01)

C_p Difference = $A_{avg.} - B_{avg.}$ = _____ (MUST BE ≤0.01)

A5
Q8

STACK SAMPLER CALIBRATION SHEET

Calibrated by JAY

Date 3-21-91 Box No. 5

Pump ✓ Pump Oil ✓

Clean Quick Connects ✓ Valves ✓

Manometers ✓ Dry Test Meter ✓

Thermometers ✓

Lights _____ Buzzer _____

Electrical Check - Amphenol _____

Variac _____ Vacuum Gauge ✓

Leak Check at 27" Hg. - Leakage .000 CFM 0.00

Remarks _____

CALIBRATION - ORIFICE AND METER

Man Orifice	CF_w	CF_d	T_W	IT_d	OT_d	T_d avg.	Pb	$Time_t$
0.5	2.071	2.088	518.5	—	—	522	30.04	5
1.0	2.899	2.915	519.5	—	—	523.5	30.04	5
2.0	7.923	7.956	519.5	—	—	528.5	30.04	10
3.0	9.630	9.689	519.5	—	—	529.5	30.04	10
4.0	11.093	11.138	520	—	—	530	30.04	10
5.0	12.481	12.512	520	—	—	532	30.04	10

Tolerances

Y = 0.99 - 1.00 - 1.01

ΔH = 1.6 - 1.84 - 2.1

CALIBRATION CALCULATIONS METER BOX Calibrated by JAY Date 3-21-91 Box No. 5

$0.0317 \text{ (Man. orifice)} \left(\frac{(T_w + 460)t}{P_b\ (T_{d\ avg.} + 460)}\right)\left(\frac{}{CF_w}\right)^2$	Man.	$\Delta H_@$	$\frac{CF_w\ P_b\ (T_{d\ avg.} + 460)}{CF_d\ (P_b + \frac{\text{Man. orifice}}{13.6})(T_w + 460)}$	Man.	Y
0.01585 (58.5 + 460) 5 / 30.04 (62 + 460) 2.071	.5	1.60	2.071 x 30.04 (62 + 460) / 2.088 (30.04 + 0.0368) (58.5 + 460)	.5	.997
0.0317 (59.5 + 460) 5 / 30.04 (63.5 + 460) 2.899	1.0	1.62	2.899 x 30.04 (63.5 + 460) / 2.905 (30.04 + 0.0735) (59.5 + 460)	1.0	.999
0.0634 (59.5 + 460) 10 / 30.04 (68.5 + 460) 7.923	2.0	1.71	7.923 x 30.04 (68.5 + 460) / 7.956 (30.04 + 0.147) (59.5 + 460)	2.0	1.008
0.0951 (59.5 + 460) 10 / 30.04 (69.5 + 460) 9.630	3.0	1.74	9.630 x 30.04 (69.5 + 460) / 9.689 (30.04 + 0.221) (59.5 + 460)	3.0	1.006
0.1268 (60 + 460) 10 / 30.04 (70 + 460) 11.093	4.0	1.75	11.093 x 30.04 (70 + 460) / 11.136 (30.04 + 0.294) (60 + 460)	4.0	1.005
0.1585 (60 + 460) 10 / 30.04 (72 + 460) 12.481	5.0	1.72	12.481 x 30.04 (72 + 460) / 12.512 (30.04 + 0.368) (60 + 460)	5.0	1.008

LT

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
GAS MEASUREMENT DEPARTMENT

PROOF TEST RECORD

METER SIZE: CL175 DATE RECEIVED: 09/14/90 INSPECTOR: C. RIZZA

DATE TESTED: 10/03/90 MANUFACTURER: ROCKWELL

PROVER NO. 4402 TEMPERATURE: PROVER AIR: 74° F.

METER NUMBER: 6837018

	180 C.F.H.	PERCENT PROOF
TEST # 1	2.0 CU. FT.	100.2
TEST # 2	2.0 CU. FT.	100.1
TEST # 3	2.0 CU. FT.	100.2

	30 C.F.H	PERCENT PROOF
TEST # 1	2.0 CU. FT.	99.9
TEST # 2	2.0 CU. FT.	100.0
TEST # 3	2.0 CU. FT.	99.9

A calibration and accuracy test was performed on test meter number 6837018 for:

AirNova Inc
5845-A Clayton Avenue
Pennsauken, N.J. 08109

Carmen Rizzia
METER REPAIR SUPERVISOR

CARMEN RIZZA

A-8

Appendix B

Laboratory Data and Calculations

PROJECT 1394 - SMC Fluoride Determination Continued From Page _____

4/29/91

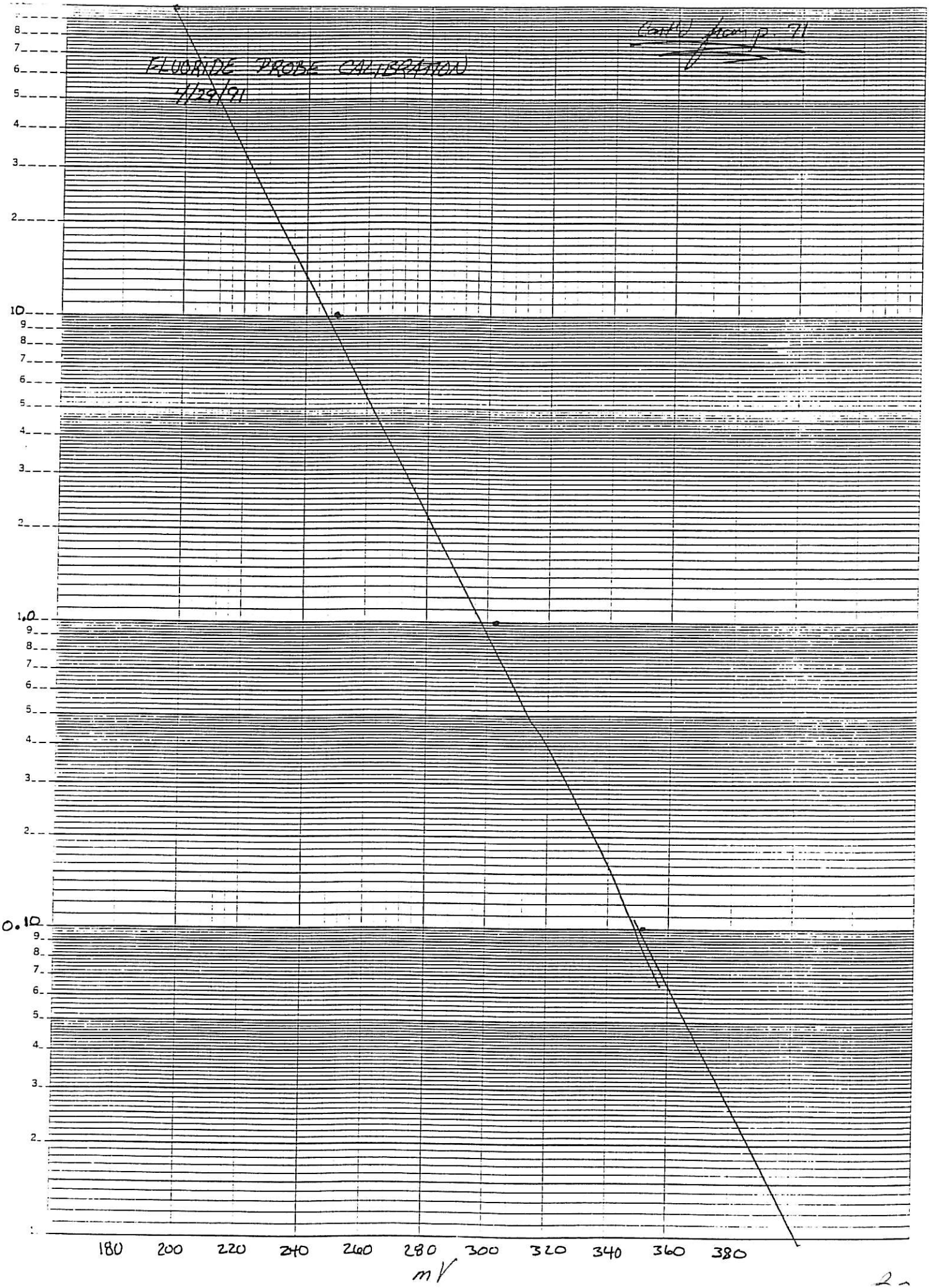
Ref: Ion Specific Electrode: Fisher 13-620
50 TISAB : 50 sample

Sample	vol. collected (ml)	mV	mg/L (ppm)	x 1.05 F	Total mg F	HF
Blank	-	369				
0.10 ppm	-	355	curve on p. 72			
1.0 ppm	-	305				
10 ppm	-	250				
100 ppm	-	195				
Run 1 - Front	53 ml	367	<0.1		< 0.1	< 1.05
Run 1 - Back	315	257	~~0.45~~ 0.60		0.32	6.64
Run 2 - Front	54	374	<0.1		< 0.1	< 1.05
2 - Back	312	264	4.5		4.74	4.98
Run 3 - Front	49	392	<0.1		< 0.1	< 1.05
3 - Back	318	260	5.4		5.69	5.97
Shield Alloy Front Blank	49	461	<0.1		<0.1	

Continued on Page 72

Read and Understood By

Signed	Date	Signed	Date
[signature]	4/29/91		


FLUORIDE PROBE CALIBRATION
4/29/91
Cont'd from p. 71
46 6010
KEUFFEL & ESSER CO MADE IN U.S.A.
8
7
6
5
4
3
2
10
9
8
7
6
5
4
3
2
1.0
9
8
7
6
5
4
3
2
0.10
9
8
7
6
5
4
3
2
180
200
220
240
260
280
300
320
340
360
380
mV

NOTEBOOK NO. _____

PROJECT 1394 - SHIELD ALLOY

Continued From Page _____

PARTICULATE ANALYSIS

FILTERS

I.D.#		TARG WT (g)	FINAL WT (g)	Δ WT (g)
0056	RUN 1	.5658	.5659	0.0001
0057	RUN 2	.5517	.5520	0.0003
0054	RUN 3	.5726	.5728	0.0002

FRONT WASH - ACETONE

DISH #	I.D.	TARG WT (g)	FINAL WT (g)	Δ WT (g)	VOLUME (ml)	ALIQUOT (ml)	
20	1-OUT	98.7097	98.7123	0.0026	170	170	0.0023
10	2-OUT	100.3502	100.3533	0.0031	80	80	0.0029
2	3-OUT	97.2134	97.2146	0.0012	90	90	0.0010
17	BLANK	97.1843	97.1845	0.0002	100	100	—

SILICA GEL

RUN #	TARE WT (g)	FINAL WT (g)	Δ WT (g)	CONDENSATE GAIN (ml)	TOTAL (g)
1	240.0	258.0	18.0	-12	6.0
2	262.7	281.0	18.3	-12	6.3
3	234.7	246.0	11.3	-5	6.3

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

Environmental Testing & Technologies Inc.
of South Jersey

Air Nova
5845-A Clayton Avenue
Pennsauken, NJ 08109

Sample ID: Aqueous&Filters
Lab ID: #12408-#12415
Received: 04-17-91
Reported: 04-29-91

Attn.: John Deemer

Lab ID	Air Nova ID	Boron
Aqueous, ug:		
#12408	SMC-1	<2,500
#12409	SMC-2	<2,500
#12410	SMC-3	<2,500
#12411	SMC-4	<2,500
Filters, ug:		
#12412	SMC-5	<2,500
#12413	SMC-6	<2,500
#12414	SMC-7	<2,500
#12415	SMC-8	<2,500

Reviewed and approved by

Sherree A. Baker

Sherree A. Baker
Laboratory Manager

3 Cooper Street, Westmont, New Jersey 08108 • (609) 858-9573

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1394-01
PARTICULATE TEST

Source: Baghouse Outlet

FIELD DATA

Run Number	1	2	3
Date	03/26/91	03/26/91	03/26/91
Test Period	1330-1435	1500-1607	1700-1805
Stack Area(sq ft)	6.68	6.68	6.68
Nozzle Diameter(inches)	0.250	0.25	0.25
Barometric Pressure(in Hg)	30.21	30.19	30.21
Volume of Gas Sampled(DCF)	48.093	49.152	49.278
Meter Temperature(deg F)	74.4	77.8	68.6
del H(in H2O)	2.160	2.230	2.200
Test Time(minutes)	60	60	60
Pitot Vel. Head(in H2O)	0.56	0.58	0.574
Stack Gas Temp(deg F)	95.1	84.5	83.5
Stack del P(in H2O)	0.3	0.3	0.3
Water Collected(ml)	6.0	6.3	6.3
Gas Analysis			
Carbon Dioxide(%)	1.00	0.90	0.70
Carbon Monoxide(%)	0.00	0.00	0.00
Oxygen(%)	20.00	19.80	20.10
Nitrogen(%)	79.00	79.30	79.20
Particulate Wt-Front Half(mg)	2.40	3.20	1.20
HF Wt-Total(mg)	6.64	4.98	5.97
BF3 Wt-Total(mg)	< 15.7	< 15.7	< 15.7

CALCULATED RESULTS

Run Number	1	2	3
Volume of Gas Sampled(DSCF)	48.40	49.13	50.14
Test Time(minutes)	60	60	60
Stack Area(sq. ft.)	6.68	6.68	6.68
Stack Gas Velocity(fpm)	2596.3	2621.4	2607.7
Stack Gas Temperature(deg F)	95	85	84
Stack Gas Moisture(%)	0.6	0.6	0.6
Stack Gas Mol. Wt.(lb/mole)	28.90	28.87	28.85
Stack Gas Flow Rate(DSCFM)	16628.7	17101.4	17056.2
Nozzle Diameter(inches)	0.25	0.25	0.25
Isokinetic Variation(%)	95.1	93.8	96.0
Particulate Rate-Total			
Loading(gr/DSCF)	0.0008	0.0010	0.0004
Emission Rate(lb/hr)	0.109	0.147	0.054
Fluoride Rate-Total			
Loading(mg/DSCF)	0.1372	0.1014	0.1191
Emission Rate(lb/hr)	0.301	0.229	0.268
BF3 Rate-Total			
Loading(mg/DSCF)	< 0.3244	< 0.3196	< 0.3131
Emission Rate(lb/hr)	< 0.712	< 0.721	< 0.705

Appendix C

Emission Test Production
Report Form

EMISSION TEST PRODUCTION REPORT FORM

I. Company Name SHIELD ALLOY METALLURGICAL CORP. APC Plant ID# 55048
Plant Location NEWFIELD, N.J.
Certificate Number PERMIT LOG NO. 90-1302
Designation of Equipment STACK NO 018

II. Emission Test Date(s) 03/26/91
Tests Conducted By:
Name of Firm AIR NOVA, INC.
Business Address 5845 CLAYTON AVE PENNSAUKEN NJ
Phone Number 609/486-1500
Test Team Representatives J. MAY
M. CONNAIRE
M. DALY

Length of Test 60 MIN.

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	1330/1435	1500/1607	1700/1805

III. Certificate Operating Conditions

A. List Conditions	Achieved (Yes or No)
2a CONDUCT MASS EMISSION RATE STACK TESTS FOR PARTICULATE, BF_3 + HF DURING MAX PROD.	YES
2b PROTOCOL	YES
2c NJDEP WITNESS	YES
2d EMISSION TEST REPORT	

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording

Type of Waste Constituents _____

Auxiliary Fuel N/A

Burning Rate _____

D. Other:

Description of Operation and Process Rate

V. Control Equipment Parameters

CEMs Required (Yes/No) _____

Contaminant? _____

STACK TEST CEM READING

Parameter Cont/Read	Parameter Cont/Read	Parameter Cont/Read	Time	Test Run #
	N/A			

A. Control Equipment performance Parameter

Parameter	Reading	Time	Run #
BAGHOUSE PRESSURE DROP			

B. Additional Observations

Fugitive Emissions (Yes/No) (No) _____

Equipment Location _____

Visible Emissions From Stack (Yes/No) (No) _____

Odors Noticeable

Vicinity of Equipment (Yes/No) (No) _____
Near Exhaust Stack (Yes/No) (No) _____
Off Property (Yes/No) (No) _____

VI. Samples

Type of Sample _____

Time of Sampling _____

Sampled By _____

Sample Taken From _____

To Be Analyzed For _____

Analyzed By _____

Form Information Supplied by: Name/Title (Please Print)

MARK D. DALY
ALENUSA INC.

Signature(s)/Date Mark D. Daly 5/3/94

DEP Usage Only
Rec'd By Sample Rec'd Date/Time Rev'd By