

TEST REPORT

SCOPE: EMISSIONS AND OUTPUT

FUEL: EPA TEST FUEL (CRIBS)

TEST STANDARD: EPA

MODEL: OPTIMA WOOD STOVE

Notice to reader: Our Optima wood stove was tested as part of our S-27X Series firebox. Therefore, the S-27X Series is referenced throughout the attached test report.



(206) 859-8318 ■ 1315 S. Central Avenue ■ Unit C ■ Kent, WA 98032

United States
Environmental Protection Agency
Woodheater Certification
Test Report

HAUGH'S PRODUCTS
BRAMPTON, ONTARIO, CANADA
S-27% SERIES
NONCATALYTIC WOODHEATER

REPORT BY:

BILL NOWAK

TIM KELLY

CONFIDENTIAL

RELEASED ONLY BY AUTHORIZED PERSONNEL

DATE June 19, 1992

EEMC/BILLINGS 1744 Mullowney Lane Billings, Montana 59101

llings, Montana 5910 (406) 252-4450 EEMC/TUCSON 3925 Placita de la Escarpa

Tucson, Arizona 85715 [602] 290-8965 CONFIDENTIAL

* * * * * * *

The data and information in this test report is confidential, proprietary information and is not to be released to and/or discussed with any party who is not authorized by the manufacturer or the testing laboratory to receive such data.

CONFIDENTIAL

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Stove/Cat Aging Data	Aging	1
Individual Test Runs (Raw Data) See Introduction, Individual Test Run Page Index for a complete, sequential list of the data and data sequence in the individual test runs	<0.8kg/Hr 0.8-1.25 kg/hr 1.26-1.90 kg/hr >1.90 kg/Hr fan confirmation	r varies varies
Calibration Data See Test Report (Data) Page Number Index, Item 14, for a complete, sequential listing of the data in this section.	Cal Data	varies
Stove QC Stove QC Useable firebox volume dimensions and calcul Primary air inlet dimensions and settings Secondary air inlet dimensions and settings	Stove QC ations	varies varies varies varies
Blueprints Promotional (sales) brochure Laboratory verified blueprints	Blueprints	varies varies
Manual Manufacturer's Written Test Instructions Manufacturer's Operating Manual	Manual	1 varies

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PHOTOS

Photos

This section contains two photographs of the fuel load for each test run and two color photographs (side and front view) of the wood heater tested and any other photographs pertinent to testing the unit.

varies

Appendices:

A - Example Calculations

B - Installation Description and Operating Instructions

REPORT CERTIFICATION

The sampling and analysis for the woodstove described in this report verified out under my direction and supervision. I have also reviewed to the testing data and results found in this test report and here certify that the test report is authentic and accurate.

Date______ Signature Bill Mounk

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M5H INDIVIDUAL TEST RUN PAGE INDEX The Data Sheets in the Individual Test Runs Are Organized in the Following Sequence

Table 1 Field Data - Sampling Interval Data

Computer Printouts

	Table 2 Field Data	
	Table 3 Field Data Averages	
	Table 4 Calculations	
	Table 5 Proportional Rate Variation	
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	Data Sheet #2 Meterbox Data Sheets	Variable 1
	Data Sheet #3 Moisture Catch Sheet	T
	Data Sheet #4 Scale Sheets	
		variable
	#4-2 Initial Beaker Weights	variable
	#4-3 Constant Weights	variable
	#4-4 Scale QA Checks	v ariable
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	#5-1 Front Half Catch	1.
	#5-2 Back Half Catch	1
	#5-3 Blank Catch	1
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	#ID-4 BUZ	$ar{f 1}$
	Data Sheet #16 Quality Checks	

PACE NUMBER INDEX

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	4	Manufacturer's Testing Wood Heater Instructions	Operators Manual	P.1 of Section
-	'n	Test Chamber Installation Description	Installation Description	lon P. 1
÷	• 9	Wood Heater/Catalyst Aging Documentation	Stove/Cat Aging	
	7.	Wood Heater Dimensions and Useable Firebox Volume	Stove QC	
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Individual Test Rum Da	Installation Description Installation Description Installation Description
12. Test Run Heater Operation and Air Supply Settings	13. Detailed Description of Sampling Systems and Locations A. Method 5H B. Proportional Gas Flow Rate System C. Stack Gas Flow Rate Measurement System

Wood Type and Line Drawing

A. Photographs
B. Wood Type an

Test Fuel Crib Description

Load Moisture

Wood Density

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P.2 P.3 P.4

Data Sheet #9A,9A-1, or 9A-2

Photographs Individual Test Run

Data Sheet #10 Data Sheet #11

Individual Test Runs Individual Test Runs

91#	
Sheet #10	
P. 1 P. 2 Data	
Cal Data Cal Data Individual Test Run	
E E	
:	

Pre and Post Test

Semi Annual

Platform Scale

14. Calibrations

1. Initial

)
noonalisen parking park			WST6-Form5 Page 2 of 3 Rev 1/88
	B. Analytical Balance 1. Initial 2. Semi Annual	Cal Data Cal Data	P. 3 P. 4 Data Shoot #4
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Anne Bonn and and American	2. Semi Annual E. Barometer F. Draft Gauge		P. 11 P. 12
Sanutumikabbikissä			
gyężanicka Anakkini pago	, ,		
	3. Post Certification Test 4. Transfer Standard Calibrarion		
nhowest vocas	5. Wet Test Meter Calibration	Cal Data Cal Data	
	 Tracer was Modameter Combustion Gas (CO2, O2, CO) Train Response Check Tracer Gas (SO2) Train Response Check 		P. 20 P. 21
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	2. Zero/Span Control Chart 3. Pre and Post Test Zero/Span	Cal Data Individual Test Run	P. 23 Data Sheet #15—3
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	3. Pre and Post Test Zero/Span N. O2 Analyzer (Optional) 1. Calibration 2. Zero/Span Control Chart 3. Zero/Span Control Chart	Cal Data Cal Data Individual Test Run	P. 26 P. 27 Data Sheet #15-2
			P. 28 P. 29 Data Chest #15-4
	3. Pre and Post Test Zero/Span P. Calibration Gas Certificates of Analysis	Individual Test Runs Individual Test Runs	Data Sheets #15-1,15-2,15-3,15

2. Method 3 Verification of Analysis (CO2,O2, CO,N2) 3. Method 6 Verification of Analysis (SO2, N2)	Cal Data Cal Data	WST6-Form5 Page 3 of 3 Rev 1/88 P. 30-31 P. vari	
A. Leak Checks 1. Particulate Sampling Train 2. SO ₂ Injection System 3. Combustion Gas (OO ₂ ,O ₂ ,O) (CEM) Train 4. Tracer Gas (SO ₂) Train B. Proportional Checks	Individual Test Runs	P. 1 of Data Sheet #2 Data Sheet #16 Data Sheet #16 Data Sheet #16 Table 5 Computer Printout	
16. Sample Calculations A. Weighed Average Emission Rate	Data Summary	Weighted Average Calc Sheets, pp.1-3	2.5
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F. Particulate mussion rate 17. Raw Test Data		Computer Printout Data Sheets 1 - 16	
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TEST SERIES INFORMATION

Unit name and model number: S-27X Series

Type:

Cat

Non-cat XX

Pellet

Manufacturer: HAUGH'S PRODUCTS

Address:

10 ATLAS COURT

BRAMPTON, ONTARIO, CANADA L6T 5C1

Contact:

TOM DAVEY

RBERNIE CAPSTICK

Phone #:

416-792-8000

Observers:

NONE

Date Recvd: 4/10/92

Aged: 4/20/92

Tested:

5/13-19/92

Tested by: EEMC using EPA Methods 28 and 5H

Test Location: 1315 S. Central, Unit C, Kent, WA 98032

Test Site Elevation: 42 feet

EEMC Field Team:

Supervisor:

Bill Nowak

Other Members: Tim Kelly

Jerry Stoddard Darla Kingman

The following pages contain (1) test unit storage information, (2) a diagram showing the height and location of the stack components and sampling ports, and (3) copies of the certification test notices and cancellations sent to the EPA.

STOVE STORAGE INFORMATION

The tested unit was returned to the manufacturer via common carrier, and is being stored and held in custody by the manufacturer, unless otherwise noted.

A. Temporary storage at EEMC until certification is granted

A single strap of steel banding is placed around the stove, crossing the door horizontally, and making it impossible to open the door on the unit. If it is necessary to break the banding to check some internal dimension or component, the banding is immediately replaced after work on the unit has been completed.

B. Permanent storage after certification has been granted

The following measures are taken to seal the unit against tampering: Steel banding is placed around the stove in a manner which prevents the stove from being opened. At least two lengths cross at right angles. An EEMC address label is placed over each crossing point, and is taped to the stove with 2" clear packing tape. These labels have the name of the stove written on them.

C. The stored unit is identified as follows:

In addition to the EEMC labels mentioned above, warning labels are affixed to the sides and top of the unit clearly identifying it as a test stove being stored pursuant to 40 CFR Part 60. These labels also have the name of the stove written on them. A sample label follows below.

WARNING

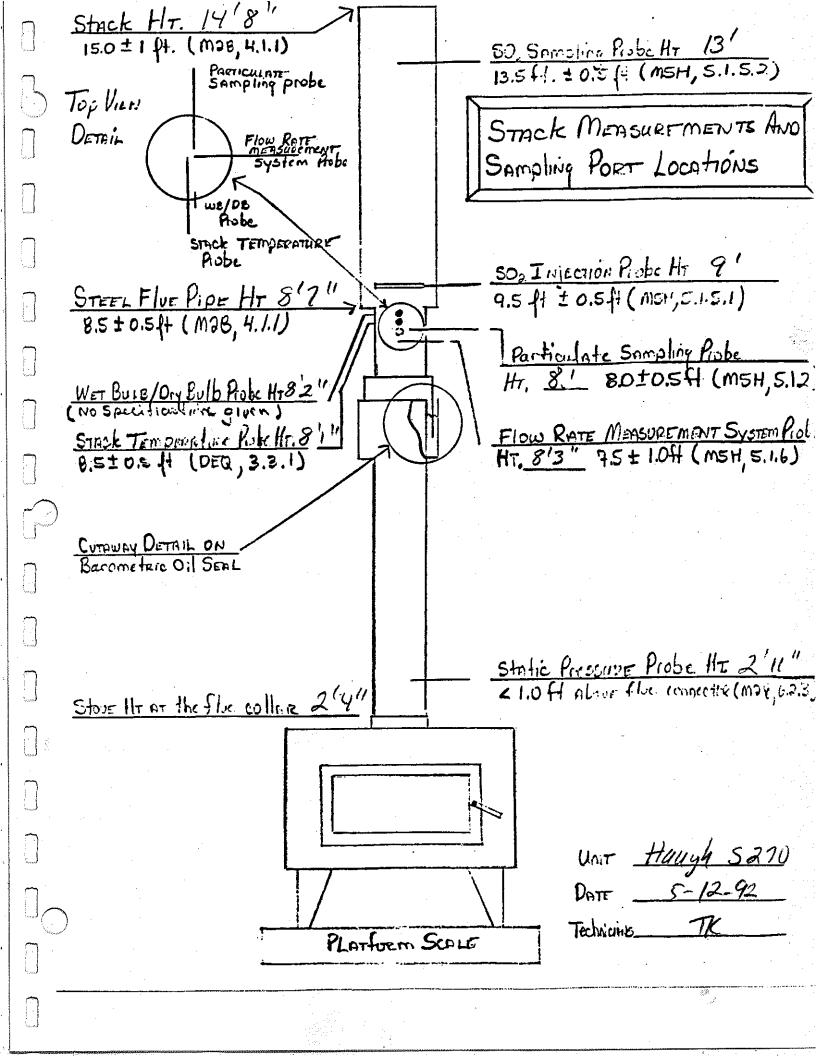
SEALED EPA TEST STOVE

DO NOT TAMPER WITH THE SEALS AND PACKAGING ON THIS STOVE

TO DO SO WILL VOID THE CERTIFICATION ON THIS STOVE

UNIT NAME

S-27X SERIES



Wood Heater Emission Test Summary

Laboratory/Wood Heater Information

HAUGHS PRODUCTS Stove Manufacturer: S-27X SERIES Model Identification:

Stove Type> 1=cat,

2 2=noncat, 3=pellet:

EEMC Laboratory Name:

Bill Nowak Laboratory Contact: 206-859-8318 Telephone no.:

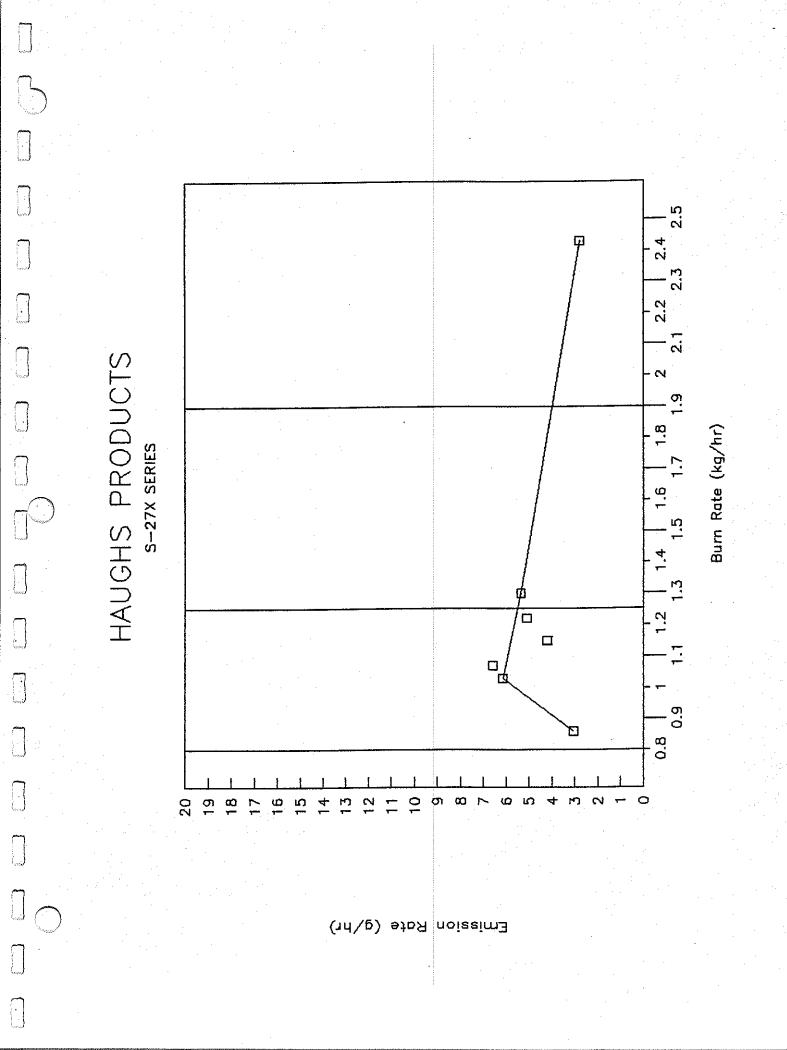
> 5/13-19/92 Test Dates:

Test Methods Used

Method 28/Other:

Sampling Method:

· · ·	·					=========
	: 	Run no.	Burn Rate (kg/hr)	Emission Rate (g/hr)	Heat Output (Btu/hr)	Wtd Avg (g/hr) 4.4
	1.		0.86	3.07	10370	
:	<u> </u>	2	1.03	6.14	12420	S12034
£	MM		1.30	5.34	15676	Door
	- -	1	2.43	2.78	29301	
· .	• .	5	1.15	4.21	fan confirmatio	n run
		6	1.22	5.09	door confirmati \$12033 Door	on run
		7	1.07	6.58	door confirmati 812032 Door	on run



Unit: HAUGHS S-27X Page 1 of 3 WST2-Form12

Woodstove Data Summary

	33	7	4					,
Particulate Emissions: Concentration: grains/dscf:	.1169	.2078	.1442	.0446		.1302	.1491	.1945
grams/m3: Emission Rate: grams/hr:	3.07	6.14	5,34	2.78		4.21	5.09	6.58
<pre>Emission Factor: gms/kg: (dry fuel weight basis)</pre>								
Front Half Catch: % of total	30.39	35.26	33.58	66.23		25.05	26.19	23.14 %
Frt & Bck Halves:	.6860	1.1913	.5836	6060.		.6224	.6855	.9627 mg
Efficiency Valves: Overall Appliance Efficiency								96
Combustion Efficiency								₩
Heat Transfer Efficiency					ŀ			eio
Heat Output: Avg. BTU/hr for test cycle								BTU
Fuel Burn Rates:							:	
Avg Kg/hr for test cycle (Wet basis)								Kg/h
Avg Kg/hr for test cycle (Dry basis)	98.	1.03	1.30	2.43		1.15	1.22	1.07 Kg/h

						Unit: Page 2 of 3	of 3	
						O 1 - 2 1 CM	7 111 7	
RUN # Ruel Moisture Content.	8	2	4			5	9	7
Kindling (Wet basis)	4.000	N/A	4.153	4.610		4.153	N/A	3.846 \$
Pretest Fuel (Wet basis)	16.574	18.145	16.897	16.620		16.620	16.874	16.690 %
Test Fuel (Wet basis)	17.752	18.279	18.306	18.256		17.582	17.167	17.207 %
Air/Fuel Ratio:								
lbs air/lbs fuel								
Average Stack Gas Composition:								
Avg. & CO2	5.21	5.82	6.10	7.29		6.18	6.21	5.38 %
Avg. \$ 02								ese
dР	1.07	96	.76	.45		.80	.78	.70 %
Avg. % Excess Air								80
Avg. % Moisture	6.52	6.70	7.29	7.94		6.91	6.62	6.26 %
Average Stack Gas Flow Rate:								·
Stack flow rate - EPA CMB	6.75	7.60	9.52	16.08	***************************************	8.31	8.78	8.70 dscfm
CHO balance								dscfm
Tracer Gas	5.981	6.628	7.875	8.555		6.157	6.725	7.317 dscfm
Draft (Static)	036	041	048	064		049	048	044 in. H20
Proportionality - Average	100	100	100	100		100	100	100
Average Stack Gas Emission Factors:	4.							
CO - g/Kg	169.89	142.24	111.79	59.77		115.71	113.71	113.71
	145,43	145.94	145.10	145.05		133.06	138.27	122.01

		Constant Constant			(April				
		e e				Unit: HAUGHS Page 3 of 3 WST2-forml2	AUGHS S-27X of 3 rm12	X	
RUN #	8	2	4	1		5	9	7	
Average Temperatures:									
Stack Gas	241	271	274	385		268	228	211 OF	F
Primary Combustion Chamber Gas	734	801	861	1114		820	864	810 OF	Гъ. Гъ
Catalytic Combustor Exit Gas									. ľv.
	272	297	349	469		382	363	323 OF	r
Stove Left Sidewall	316	319	360	472		369	359	332 OF	F
Stove Back	217	236	247	377		417	251	225 OF	fe.
Stove Right Sidewall	247	264	274	349		274	272	330 OF	Fr.
Stove Bottom	332	359	371	444		362	353	341 OF	F+.
Stove Temperature Change	-95	-33	-91	-74		-78	-47	-90 OF	r.
Test Chamber Environment:									
Avg. Barometric Pressure	30.01	30.11	30.12	30.14		30.08	30.01	30.03 in	ı Hç
Avg. Temperature	78	62	74	82		78	82	75 OF	r.
Avg. & Ambient Moisture	1.20	1.10	1.20	1.15		1.35	1.30	1.25 %	H ₂ (
Avg. % Relative Humidity	44	37	49	44		56	42	54 &RH	кн
Avg. Air Velocity	0							/w	m/sec
Avg. Dilution Tunnel Draft (If Applicable)	0							/uiin/	in/H2
Test Fuel Weight and Burn Time:									
Density (Dry basis)	.6561	.6171	.4732	.5604		.4693	4934	/mb 6659.	gm/cm
Coal Bed Weight	2.4	2.6	2.6	2.5		2.2	2.3	2.2 1k	lbs.
Pre Test Fuel Wt (Inc Kindling)	25.3	9.2	27.3	25.6		23.8	11.3	25.2 Ik	lbs.
Test Fuel Load Weight	10.7	10.6	10.5	10.9		10.5	9.7	10.7 1k	lbs.
Total Test Cycle Burn Time	280	230	180	100		205	180	225 mi	min.
								; 1 ; 1	

Unit	1440	UMJ	120		<u>ب</u>
Date		4/2	0/92		
Technicians	BN	TK	DK	- 22	
•	P	age		of _/	
			W	ST5-Fo:	rm3

CATALYTIC COMBUSTOR AGING DATA OR

STOVE AGING DATA WOODSTOVE TEST DATA SHEET #25

Hr. # Date Time Time Time Burn Temp Burn Temp Cat Cat			T/C#	8	9			
1	FI #	Date			Secondary Burn Temp			Comments
2 0900 1067 905 Acc FORL 3 1000 1123 1095 4 1100 945 846 5 1200 1941 1234 6 1300 1103 876 7 11400 439 464 ADD FUEL 8 1500 649 1096 9 1600 874 808 10 1700 146 673	/						<u></u>	
3 1000 1183 1095 4 1100 445 846 5 1900 1941 1934 6 1300 189 846 7 1400 439 464 ADD RIEL 8 1500 649 1096 9 1600 874 807 10 1700 146 673	-/-	772473			905			
4 1100 945 849 ADD FREE 5 1900 1841 1934 6 1300 188 876 7 1400 438 464 ADD FREE 8 1800 644 1896 9 1600 874 802 10 1700 146 673	2	ļ	1					
5 PD BULL 1934 6 1300 109 896 7 1400 439 464 ADD FUEL 8 1500 660 1096 9 1600 874 803 100 1700 746 673	3				016	,		ADD FUEL
6 13a 100 886 7 1400 439 464 ADD FUEL 8 1500 660 1096 9 1600 874 BOR 10 1700 746 673		<u> </u>					<u> </u>	700
7 1400 439 464 ADD FUEL 8 1500 660 1096 9 1600 874 807 10 1700 146 673					25/			
8 1800 Cab 1096 9 1600 274 802 10 1700 146 673	<u>ص</u>				116.66			ANN FUEL
9 1600 874 807 10 1700 146 673					1201			100
10 1700 146 673					0.0	·		
				7.				
	10		1700	746	6.13			
								·
								
		<u> </u>						
			<u> </u>					
	-		<u> </u>					
		<u> </u>		 				

HAUGHS PRODUCTS TEST No. : CLIENT :

5/14/92 DATE: MODEL: S-27X ******************************** PERCENT S02 DELTA METER PERCENT TIME METER TEMP. READING H CO CO2 COCENTR. (C F) (IN. H2O) (DEG. F) (%) (%) PPM (MIN.) 0 529.200 0.150 82 0.77 3.00 575 5 0.310 82 0.65 3.70 400 530.700 83 0.63 650 10 532.903 0.120 2.00 84 0.55 534.264 0.130 3.00 625 15 85 0.67 3.10 20 535.686 0.120 650 85 0.72 25 537.057 0.150 5.60 575 86 0.59 0.160 6.00 550 30 538.608 6.10 87 0.72 0.160 550 35 540.235 0.180 88 0.44 7.40 525 40 541.868 88 0.37 6.00 475 45 543.584 0.220 50 545.481 0.220 89 0.31 7.80 475 55 547.385 0.240 89 0.24 9.60 450 549.394 0.240 190 0.15 10.10 450 60 90 0.23 65 551.413 0.220 10.00 475 70 553.325 0.220 91 0.26 475 10.40 75 555.244 0.240 91 0.23 10.60 450 0.29 91 450 80 557.269 0.240 10.80 92 0.28 85 559.295 0.240 9.80 450 92 0.33 90 561.328 0.210 9.50 475 92 95 563.254 0.210 0.29 9.80 475 565.180 93 100 0.210 0.28 8.80 475 8.00 105 567.113 0.190 93 0.37 500 110 568.950 0.170 93 0.43 7.60 525 115 570.699 0.190 93 0.47 7.50 500 120 572.536 0.170 93 0.62 7.20 525 125 574.287 0.160 93 1.25 5.60 550 130 575.959 0.130 93 1.70 4.80 600 135 577.492 93 0.130 1.86 4.60 600 93 140 579.025 0.130 1.87 4.40 600 0.130 145 580.558 93 4.10 600 1.81 93 150 582.091 0.120 1.86 3.90 625 155 93 583.563 0.120 1.83 3.80 625 160 585.035 0.120 93 1.77 3.60 625 165 586.507 0.120 93 1.72 3.50 625 170 587.979 0.120 93 1.60 3.20 625 175 93 589.450 0.120 1.58 3.10 625 180 590.922 0.110 93 1.51 2.80 650 185 93 592.337 0.110 1.49 2.70 650 190 0.110 93 593.753 1.57 2.70 650 195 93 1.59 595.168 0.100 2.70 675 200 596.531 0.100 92 1.63 2.70 675 205 597.889 93 0.100 1.70 2.70 700 0.100 210 599.203 92 1.69 2.70 700 215 600.512 92 0.100 1.78 2.70 700 220 601.822 0.100 93 1.33 3.50 700 225 603.136 92 0.100 1.28 4.20 700

230	604.445	0.100	92	1.27	4.10	700
235	605.755	0.100	92	1.39	3.90	700
240	607.064	0.100	92	1.29	4.00	700
245	608.374	0.100	92	1.32	3.90	700
250	609.683	0.100	92	1.39	3.80	700
255	610.993	0.100	92	1.50	3.70	700
260	612.302	0.100	92	1.55	3.50	700
265	613.612	0.100	92	1.47	3.50	700
270	614.921	0.100	92	1.47	3.30	700
275	616.231	0.100	92	1.55	3.10	700
280	617.540	0.100	92	1.61	3.00	700
285			92			garage de la companya

No eta

TABLE 2 ---- FIELD DATA

	CLIENT : HAUGHS PR	ODUCTS	TEST No.	• 3	, ·
	MODEL: S-27X		DATE:	5/14/92	
	METER CAL. FACTOR (Y)	1.066	Wt. WOOD BURNED(LB)	10.7	Lbs
(see	BAROMETRIC PRESS.(Pb)	30.01 in Hg	WET, FUEL MOISTURE %	17.752	ક
	LEAK RATE POST (Lp)	0.002 cfm	Wt. PART. COLLECTED :	0.686	g
	WATER VOL. (V1c)	134.3 M1	METER VOLUME Vm :	88.34	mcf
	TEST TIME (MIN)	280 min	HC MOLE FRACTION	0.0132	

TABLE 3 ----FIELD DATA AVERAGES

)							
1920*	CLIENT :	HAUGHS PRO	DUCTS		TEST No.	:	3	
	MODEL: *****	S-27X ******	*****	*****	DATE:	5/14/92 *****		
	AVG DELTA H		0.15 in H2O	AVG PRCNT		1.	07	ક
	AVG METER TEMP. Tm		91 deg F	AVG PRCNT CO2		5.	21	ક
	AVG PPM SO2		595 PPM				e Section 1985	

TABLE 4 -- CALCULATIONS

		TABLE 4	CALCULATIONS	
	CLIENT: HAUGHS PRO	DUCTS	TEST No. :	3
	MODEL: S-27X **********	******	DATE:	5/14/92 *******
	STD SAMPLE VOL. Vm(std)	90.57 dscf	STACK GAS FLOW Qsd	404.988 dscf/Hr &
_				6.75 dscf/min
	VOL. WATER VAPOR Vw(std)	6.322 scf	PARTICULATE CONCTRT. C s	0.0076 g/dscf
	PRCNT MSTR Bws	6.52 %	PARTC.EMISS. RATE E	3.07 g/Hr
	BURN RATE BR	0.86 Kg/Hr	MOLES OF GAS PER Lb WOOD Nt	0.56 Lb-mole/Lb
	CO EMISSION RATE	145.43 g/Hr &	PART.EMISS. RATE	3.58 g/Kgdry fuel
		169.89 g/Kgdr fuel	Y	

TABLE 5 ---- PROPORTIONAL RATE VARIATION

HA	UGHS PRODI	JCTS				TEST	No.:	-	3	
	27X		*****	****	***	DATE:		5/14/92		****
	TIME NTEVAL Ti	PPM * Vm	PROPRTN. RATE VAR. PR		444	PROPI RATE AVERA	RTN VAR.	****		
==:			=======	====	====	====		======	== ==	======
	5	898.9	96				100		. 1	
	10	917.9	98							
	15	919.3	98						i i i	
	20 25	921.9 923.5	99 99			•				
	30	923.4	99							
	35	924.9		•						
	40	926.6	99							$\varphi_{i,j} = \varphi_{i,j} \varphi_{i,j}$
	45	928.7			•		<i>i</i>			
	50	928.1	99	Y .			•			
	55	930.7	100			$f_{1}+f_{2}=1$		•		
	60	929.5	99	14.4 14.4						
	65	933.3	100							**
	70	932.0	100				100			
	75	934.6	100							
	80 85	934.3 934.0	100 100							ar fe
900	90	934.0	100	in the				*		
J .	95	936.3	100		e.					
	100	935.4	100			* *				
	105	938.0	100			•	*			
	110	938.3	100				100		24	
	115	937.9	100				•			en e
	120	938.3	100							
	125	939.0	100							
	130	939.3	100							
	135 140	939.5	101			-				•
	145	939.5 939.5	101 101							4 - 4
	150	939.5	101							
	155	939.6	101							•
	160	939.6	101		-					
	165	939.6	101							
	170	939.6	101	•		4.5	· .			
	175	939.0	100							
	180	939.6	101							
	185	939.4	100							
	190 195	940.0	101							
	200	939.4 940.5	100 101							
	205	937.0	101							
	210	940.2	101	27.0						
	215	937.5	100		11		* .			
\	220	937.4	100							
	225	940.2	101							
4 minus	230	937.5	100	400		100				•

	235 240	938.2 937.5	
and the second	245 250 255 260	938.2 937.5 938.2 937.5	
<u></u>	265 270 275	938.2 937.5 938.2	· · .
	280 285 290	937.5	
The state of the s			
land)			

Client Haun's Proc	DATA WOODSTOVE DATA SHEET #1
Client Address 10 atlas C	
	Ontario, Canada LGT SCI
Client Phone 4/6-792-8	000
Project No Model N	Va. S 210X
Run No. 3 Date of Test 5	//y/92 Est Grams/Hr
Stove Type: Cat Non Cat	
Data To Be Submitted To: Oregon_	X Colorado EPA X
Burn Category: Low (<0.8 Kg/Hr) Med Low (0.8 - 1.2	Med Hi (1.26 - 1.90 Kg/Hr)
Fuel % Moisture (dry) 00.00) (Data Sheet #10)	33 %(wet) 17.750 % 2
Stack Static Pressure (0.000) (Data Sheet #12)	
Barometric Pressure(00.00) (Data Sheet #2)	
Temperature (Average Room) Combus (00) (Data Sheet #14)	tion Airof _
Flue Gas Moisture(00.000) (Data Sheet #7)	6.5051
Ambient Moisture (0.00) (Data Sheet #8)	
Stove Weight (000) (Data Sheet #8)	1bs
Stove Temperature Change (000) (Data Sheet #14)	<u>-95</u> of -
Particulate Emission(0.0000) (Data Sheet #7)	gr/dscf _
Fuel Higher Heating Value (dry) (0000) (CT&E Sheet)	BTU/16
Fuel Type: Wood: X Pellet	ts:
Total Fuel Consumed During Burn (00.0) (Data Sheet #8)	1007 lbs 2
Total Particulate Catch(0.0000) (Data Sheet #6)	
f ₂ O Captured(00.0) (Data Sheet #3)	
Dry Gas Meter Volume(00.000) (Data Sheet #2)	88.340 CF V

Page 1 of 3
Unit: 140615 S 27X
Run: 3 Date: 5/14/92
Operator(s): BD 58

Nozzle: Probe @ 3/8 " od

Initial Volume: 1,500

ROTO	PRESS:		Sampling	Ratio :	Ð0	: 1	BAROME	TER:	0.05
MN	TIME	METER READING	•	STACK DSCFM	DELTA H	METER TEMP	202 Mqq	ROTO TEMP	PUMP VACC
00	1115	509 200	,	6.091	15	82	575	75	0
05	D	530,700		8756	131	80	400	75	5
10	<i>0</i> 5	532903		5,389.	112	83	650	75	15
15	30	534.064		5594	/13	<i>84</i>	605	76	0
20	35	535.626		5.378	118	85	650	16	0
25	40	537.051		6069	115	25	575	17	٥
30	45	538.608		6345	16	26	650	77	15
35	52	540,935		6.345	16	87	<i>5</i> 50	77	10
40	కోన	541-868	;	6634	18	83	5,95	18	1:0
45	1200	543.584		2333	<i>39</i>	<i>8</i> 8	475	78	1-0
50	S	545,481		7333	188	89	475	18	1-5
55	0	547.395		7.740	24	89	480	18.	1.5
ROTO	PRESS:	<u></u>	TOTALS (79,007	2.16)	(100e)	BAROME	TER:3	
60	15	549.394	·	7.735	104	90.	450	18	1.5
65	<i>_()</i> 0	551413		7.308	.00	90	4/25	18	20
70	15	553 <i>38</i> 5		7.308	000	91	415	78	7-5
75	30	555,044		7.735	ad l	91	450	78	1.5
80	35	557-269		7-735	at 4	91	450	78	15
85	40	059.895		1.101	e24	90	2150	119	1-5
90	45	561.308		7314	4) 1	90	175	79	1-5
95	50	563854		7.301	001	42	475	80	1,5
100	555	565/180		1287	181	93	45	81	1-5
105		567.113	,	6,493	19	93	800	<u>81</u>	15
110	5	568,950		6.593	<u> </u>	93	585	81	15
115	10	5 7 0,699	/	6403	114	93	500	81	10
				87.933	(0-58)	(1101)	MAX VA		
TOTAL	CU FT		TOTALS:	166930	4.74	209	AV BP	(

Meter Box Data Sheet Page # 2

Meter Box 45 Y Factor 1066

Leak Checks: 5 " Hg @ 000 cfm cfm cfm cfm cfm cfm

Page d of D
Unit: HAUAHS SOOX
Run: 3 Date: 5/14/40
Operator(s): BN 35

Inject SO2 @ 100 cc/min

Nozzle: Probe @ 3/8 " od

Initial Volume: 1500

ROTO	PRESS:		Sampling	Ratio :	<u> 20</u>	. 1	BAROM	ETER:	9.99
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	SO2 PPM	ROTO TEMP	PUMP
120	15	522.536	. "	6572	117	93	595	83	1:0
125	00	574.487		6073	16	93	50	88	LO
130	25	575.959		5,751	.13	93	600	22	10
135	30	572442		5,751	/13	93	600	82	1.0
140	35	579.005		5,751	13	93	600	20	10
145	40	580,558		5.751	.13	93	600	82	10
150	46	582091		5501	.10	93	605	20	10
155	60	523563		55 0 1	118	93	65	80	10
160	65	585035		5.501	.12	93	625	88	1.0
165	1400	586-507		5501	112	98	695	8	10
170	5	587.979		5.501	110	93	605	80	1.0
175	10	589.450		5.501	o B	93	605	20	10
ROTO	PRESS:		TOTALS :(68,975	(1.52)	(1116)	BAROMI	ETER:	<u>999</u>
180	15	590,988		5.308	/11	93	650	80	10
185	Ð	590-337		5.308	ell	93	650	80	15
190	25	593753		5.308	111	93	650	84)	15
195	<i>3</i> 0	595-168		5,114	10	43	675	82	15
200	35	596.531		5-112	10	90	615	88	15
205	40	597.889		4,989	,10	193	100	88	15
210	46	599.803		4,909	/10	90	700	80	15
215	50	600,512		4909	10	90	100	89	15
550	<i>3</i> 5	601-200		4909	110	193	100	80	1:5
225	1500	603-136	1	4,909	10	90-	100	80	<u> </u>
230	5	604-445	<u> </u>	7,404	,10	92	100	80	3
235	10	605.755		4.909	10	92	100	182	12
			TOTALS:((1.A3)	(1110)	MAX V		
	_ CU FT		TOTALS:	TO TOTAL	080/	1000	AV BP		
en e		•		896,550	1,54/	4255	1200	1,06	

996.556 7.51 4355 100.00

 Meter Box Data Sheet Page # 2
 Page 3 of 3

 Meter Box 45 Y Factor 1066
 Unit: HAUGHS SD7X

 Leak Checks: 15 "Hg @ 1000 cfm
 Run: 3 Date: 5/14/4b

 Run: 3 Date: 5/14/4b
 Operator(s): BN 55

 Inject SO2 @ 100 cc/min
 Nozzle: Probe @ 3/8 " od

Initial Volume: 1,500

ROTO	PRESS:	118	Sampling	Ratio :	00	. 1	BAROME	ETER 🕹	999_
MN	TIME	METER READING,		STACK DSCFM	DELTA H	METER TEMP	502 PPM	ROTO TEMP	PUMP
240	.15	607-064		4909	10	92	700	80	5
245	20	608.374	·	4.484	10	99	700	80	-5
250	05	1009.683		4909	10	92	100	80	5
255	30	610993		4,909	110	90	100	20	5
260	35	618.302		4909	10	90	700	20	5
265	40	613.612	,	4909	110	90	200	80	5
270	45	614901		4.909	-10	90	700	80	.5
275	50	616.231		4.939	110	90	100	20	12
280	55	617-540		4909	-10	90	700	80	-5
285	1600			44.3619	(90)	(202)			
290	5								
295	10			340,4177	(8,447	51831	57%	<u> </u>	
ROTO	PRESS:		TOTALS :	\searrow			BAROM	ETER:	
300				5.4812	(11487	1(9)			
305			'						
310			•		2	(551)			
315			•						
320			•						
325									
330									
335			1						
340								<u> </u>	
345									
350									<u> </u>
355				1 - 100				<u></u>	
			TOTALS:					ACC =	
TOTAL	CU FT	88,340	TOTALS:				AV BP	: <u>30,0</u>	<u> </u>

MOISTURE SHEET Woodstove Data Sheet #3

Balance Balance		ance				
Initial: Level		oed		Unit: <u>Hu</u>	yyns	<u>5270x</u>
Final:		_6		Run:	<u>′3</u>	
IMPINGER #1			1	Date: <u>\$</u>	114/	92
Final Weight	6829	grams	Technicia	n(s): Init	ial:_	Th
Initial Weight_	575.2	grams		Fina	1:	55_
Net	1077	grams	Approved 1	Ву:	TK	
IMPINGER #2						
Final Weight	584.0	grams				
Initial Weight_	576.1	grams				
Net	7.9~	grams				
IMPINGER #3						-
Final Weight	495.6	grams		•		
Initial Weight	494.4	grams		•		
Net	1,2/	grams				
IMPINGER #4 (SIL	ICA GEL)		· .			
Final Weight	8 63,0	grams				-
Initial Weight	845.5	grams		•		
Net	17.5	grams			سا	/
	T	OTAL MASS	S OF H ₂ O CA	PTURED 13	3 <i>4.3</i> 0	grams
59	5.0g = 29 0.0g = 59 5.0g = 88	(50 g (50 g (50 g		lalf Filte lf Filter	#	262 F
Notes:						-

913_LGTm2,LR4,VEAT\2

Manufact	urer:	S	È 5' '		Size:	0 mm	Lot N	o Z	B882 0	Grade:	#25c	âL
					Second		·			 		-
Filter F # W		Date	Time	Ву	Wt	Date	Time	Ву	Third Wt	Date	Time	[:
261 FO.	6987	3/20	1608	DK	-6941	3/93	1380	8				
262 Fo.	7014		1610		.7017	1	1301		Hauarts	23		
263#0	.6988		1612		16985		1300					
264F0	.6893		1614	(.6894		1303					
265 FC	1.6912		1616	1	6917		1304					
266 FO	.6934		1618		16936		1395					
267FO.		1	1620	1	16937		Box					
268 FO.	7015		1622	V	1010		1307					
269 =0	6933		1624	A (4)	16436		1328					
270 FO.			1626	ł	16965		1300					
												Γ
271FO.	6953	3/ ₂₀	1628	DL	695		1330	-				
272FO.		7	1630		. 7005		1331	-				
273FO.	6978		1632		16980		(332	· Community				
274FO.		(1634		6903		1333	-				
275FO.	6975		1636	,,,	16975		1334	7				
276 A O.1	6978		1638		16999		1335	Ar eller				
277FO.	6975		1640		16974		1336					
278 FO.	6992		1642	1	.6991		1337					
279 FO.	90۱ م		1644	(6900		/332	· and · ·				
280FO.	6994	_)	1646		6997		1339	V				
												_
						·]			1 1			
Checked 1	by Z	11/	,				Dat	e :	3/24/91	Time	0900)

	QA RE	WEIGH	<u></u>	
Filter #	WT	Date	Time	Ву

√B	DB	%RH	Date	Time	Ву
60	74	44	3/20	1606	DK
59.	13	43	3/03	130	tes

WOODSTOVE DATA SHEET #4-1: INITIAL FILTER WEIGHTS (TARE WEIGHTS) Into Dessicator: Date 3/17/92 Time 0900 By DK Front Half Back Half Manufacturer: SES size: 8.2 cm Lot. No.: 78 901 Grade: 25 GLASS Second Third Filter First Time Date Time Date Time Ву Ву Date DK .3849 303 3/20 1526 2618 0.3846 1341 HAUGHE RN3 26280.3822 -3827 1528 26330.3805 3810 1530 264B0.3811 1532 13824 265B0.3821 138QN 266FO.3872 1536 3888 26780.3817 1538 1348 2680.3772 1540 3818 269HO.3875 1542 -3869 27080.3813 1544 2718.0.3884 3/20 1546 OK ,3882 272B0.3818 1548 27380.3825 27460.3856 275B0.3832 27680.3862 77B0.383b 1353 278B0.3801 1600 279B0.3827 1359 1602 1400 280B0.3821 1604 Checked by

	QA RE	WEIGH		
Filter #	WT	Date	Time	Ву
	· · · · · · · · · · · · · · · · · · ·			

BALA	NCE RO	OOM ENVI	RONMENTA	L COND	TION
WB	DB	%RH_	Date	Time	Ву
60	74	44	3/20	1524	DK
59	73	43	3/23	1340	5
 1					7

INITIAL BEAKER WEIGHTS (TARE WEIGHTS)

Beaker.			<i>m</i> .	F	Sec		Date	m	By.	Thi Wt	rd	Date	Time	
501	96-8870	Date 450	Time	By DK	96.80		401	Time 1332		WE		Date	TIME	+
	98,5625	720		14	48.5		101	1334	4				┪	†
	91.2041		1006	 	91.0			1336						\dagger
		/		 /-	95.00			1338			-		 	+
	95.0582	/	1010	/-	106.4			1						+
365	106.4506		1012	-	100.1	304		1340	╂┼					+
506	94.1600	9/20	1014	DK	94.11	604		134/2	╂┼	1				+
507	88.9867		1016	\	82,98	_		1344						1
508	103.1077)	1018		103.10			1346	1	51	Au	alls	22	1
	95.7024	/	1020	1	95.7			1348	$I \! \uparrow$		/ · · ·		1	\dagger
	104.8758	(1095		104-8			1350		シ				
511	107.7742	4/20	1024	ЭK	107,71	745		1352						
512	106.3852		1026	1	106.3			1354	\sqcap		٠			1
	99.2412		1028)	99.0			1356					1	1
	108.6340	/	1030	7	108 6			1358					1	7
	106.2259		1032	Ĺ	106 20		j	1400	4 400					
<i>حا</i> اک	105.6750	4/20	1034	01	105.6	745		1402	1					
	94.7160		1036		94 .?			1404	,		- 			
518	103.8296		1038		103 8	300		1400	1					
	100.0063	17	1040		100.0			1409	:					
	98.6266	(1042		98.6	967		1410						
							1							
521	97.7535	4/20	1044	DK	97.7	537		1412						
522	103,9227	1	1046	1	103.9	_	l I	1416	<u> </u>					
523	94.9397		1048		94.9			1418						
\	106.8567	/	1050		106 8		!	1490	1					
	95.1170		1052	1	9511		7	1439	N/					\int
hecked		4	23				Date:		Ł	92	•		1415	
		REWE	•	-1	1			1					CONDI	
Beaker	# W	T	Date	T	ime :	Ву	WB	DB		RH	Dat イル		lime	_
	ı		1	1	1	ì	159	72	4,	0	7/12	O = 1 h	003 1	1

					WOO	WOODSTOVE DATA SHEET	A SHEET	r #4-3;	CONS	CONSTANT FINAL WEIGHTS	EIGHTS			WST5-F Unit H	WST5-Form9, Pg1, Rev4/90 Unit //Auduls SOJK	1, Rev4/ 507X	06,
		,					FINA	FINAL BEAKER WEIGHTS	R WEI	GHTS			•	Kun # Date:	5/14/	190	
	Beaker #	Into Dessic	Date	Time	By	First	Date	Time	By	Second	Date	Time	Ř	Third	<u>ا</u>	T 1 me	å
٠	8		5/15		X	94.2410		938	DK(940407	3/5	15.0%	Ş				
													6				
	8		5/15	C6050	OK	89.1641	3/18	8 940	ΟK	1643	3/5	15.89	X				
٠										\bigwedge			7				
	8		8//5	0000	OK	163, 1823	13/19	930	DIC	03,1841	1/2	11711	S				
			-								7		0				
	B		5/18	0060	OK	95.8094	<i>5/13</i>	1934	04	95-8093	15/19	1713	*				
													0				
	000		15/5	ଉଧ୍ଚତ	성	104.9182	318	C45	DK	081 <i>6</i> 501	5/16	53	$\not \geqslant$				
											1) P				
		-			Ì			FIN,	AL FI	FINAL FILTER WEIGHTS			٠.				
	Filter Into	Into Dessic	Date	Time	By	First	Date	Time	By	Second	Date	Time	By	Third	Date	Time	Bv
	882		2 /4	,	.0	2858	2/12	9/C/	 	BU 0.8307	5//5	hhb	DK.	03	6/B	1534	8
	5				4	.											1
			6/lu	2 2 2 3 3 3 3 3 3	I	14637	5/12	h/C/	(ZB	0.4614	8/1/8	9776	DK OK	1615	3778	1535	R
		, <u> </u>															5
					-			•									
	VO.	OA REWEIGH:	-	FINAL WEIGHTS	HTS	<u> </u>	SCALE R	OOM ENV	IRONH	ROOM ENVIRONMENTAL CONDITIONS	IONS	32	ALE R	SCALE ROOM ENVIRONMENTAL CONDITIONS	NTAL CO	NDITION	2
						We1	Weighing					9					
	Date	Beaker	# Final	Wt	Ву	Ses	Session D	Date Time		WB DB	7.кн	7	\dashv				
-			\dashv	1			1 5	000/ 5/5		160 74	#	8				·	
		:					2	18 BC		DX 58 71	45	6					

Comments

5/14 1700 CO CO 141

4

A

Final Wr

Filter #

Date

WST7-Form1-Rev5/90

Dates: From 4 33/

Through

WOODSTOVE DATA SHEET #4-4 SCALE QA SHEET

Scale Sartorius Model A1205 SN 37010004

Control Cont	100g	108	1.08	100mg	Blank	Blank			 			
	00000/	Welght // Acce	Weight	Weight	Filter	Beaker	당	A te	ine			
Coccoo	***	(X)(C)(C)	722.0	0: 00			DK 4	1,93 11	000	70	56	
0.0000	2000		7.655	38			200	100%	130	24	50	177
0.0001 0.0001 0.00000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.00000 0.00000 0.0000 0.00000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000	1,000,000	2000	0500	0227				(PK	1830	5	7	In
10 10 10 10 10 10 10 10	1 4.74	00000	1.0001	000/00				15	104S	73	07	77
1900 1,000 0,00	188 88 83 83 83 83 83 83 83 83 83 83 83 8	2,000,0	1,999	55501			1 CAN	F	330	10	Ą	4/5
9 (1989) 1989 108	را. '	10,000/	1.0001	0.0999			7 76		07.0	7.7		
9.9998 0.9999 0.1000 0	1	(0.000)	1.0001	6060 (Γ	130	1000	100	1	7,7
1 47474 1000 1	86 66 66	8666.6		0.1000			十		1		/6/	//
10 coco 6 1989 0 c 099 0 c 0 c 0 c 0 c 0 c 0 c 0 c 0 c 0 c 0	44.99.7	4466	1000	0001			+	- - -		15	(9)	37
	99 9995	100001	0.9999	0 000			力	7		76		1,6
10,000 1,000 0,0999 1,000 1,	160,000	10.002	1,000,1	2007			1			100	80	0/7
10.0000 1,000	8,000	10,0001		1881			d	T di		7	(90)	1/2
	00 000	0000 0	198	10000						74	9	47
10.0001 1.0001 0.1003 1.000	200,00	2000	1000:1	2777			Ť	2	700	74	60	hh
Composition	00 000	1000	1300				+	3	250	100	b	*
10000 100000 100	00000	.1_	130	_			+	7	8	73	59	43
1440 10.000	100,00	1	1,0001	100112			7	1 //	757	27	3	6h
1996 10,000 0,0998 0,0998 0,0998 0,0998 0,0998 0,0998 0,0998 0,0998 0,0999 0,0	047,60	T	1997	10077			7	7	So	S	24	18/2
1 4948 1.0000 1.0	7000 00	L	0000	25000			7	7	8	30	M	40
1,000 1,000 0,00	000	1	g 2.55.0	0.040			y ∠ 2		000	67	ST	լլ գ
1,000 1,000 0,00		₫	0000	000010			2	1/2 6	000	14	09	25
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1	877.77	1	00001	0.0999			OK		SO	h/	3.0	7/2
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WST7-Form Tev5/90

Dates: From 2/4/92 Through 3/11/92

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorius Model A1205 SN 37010004

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WST7-Form Rev5/90

Dates: From 3/12

Through

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorius Model A1205 SN 37010004

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WOODSTOVE PARTICULATE CATCH PROCESSING WOODSTOVE DATA SHEET # 5

3	Unit:	HAUG	HS	SO)OX	
J	Run:	3	Dat	te: <u>5</u> /	14/9.	1
٠	Techn:	ician(s	;> : <u> </u>	<u> </u>		
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رو	•••	FINAL TARE NET	WT:	94.00	107/	. 9
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		FINAL	WT:		· · · · · · · · · · · · · · · · · · ·	9
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)		FINAL	WT:	104-9	1180	9
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			-			
	H-M	FINAL TARE	WT:			<u>g</u>
	_	NET	WT:			9

m1

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m1

		·
	FRONT HALF	
FILTER #: 00 F FINAL WT: 8303 ! TARE WT: 7017 ! NET WT: -1286 !	m1: desc: ACETONE	INAL WT: 94-8407 / TARE WT: 94-1601 / NET WT: 0803 /
FILTER #: ! FINAL WT: ! TARE WT: !	m1: desc: ACETONE	INAL WT: TARE WT: NET WT:
	TOTAL VOLUME OF ACETONE USED IN WASH	an/
	BACK HALF	
FILTER #: 960 B FINAL WT: 4615 TARE WT: 3847	desc: ACETONE	INAL WT: 89.1643- TARE WT: 88.9876- NET WT: 1773-
FILTER #: FINAL WT: TARE WT:	BEAKER #: 500 F ml: 75 desc: METHCHLOR	INAL WT: 103,1841- TARE WT: 103,1027- NET WT: 0744
	BEAKER #: F ml: John desc: H2O	INAL WT: 95,8093 TARE WT: 95,7006 NET WT: 1067
	ml: KD desc: H2O	TARE WT: 104-9180' TARE WT: 104-875 7 NET WT: 0483
	BEAKER #:F ml: desc:	TARE WT:
	BEAKER #: F ml:	TARE WT:
	TOTAL VOLUME OF ACETONE USED IN WASH	200
	TOTAL VOLUME OF DICHLOF USED IN EXTRACTION	RBMETHANE 75

TOTAL VOLUME OF DISTILLED

WATER DRIED

WSTAPP1-AppDoc19-page2 WOODSTOVE TEST DATA SHEET #6 Rev 6/90 Blank Audit: By: 1/m Kelly Date: 5/18/92
Blank Calculations: Blank Calculations: 10004 g € 200 m1 = 100000 g/m1 Acetone: Dichloromethane: , 0004 g = 75 ml = 00000533 g/ml Front Half Catch: Filters: 1086 g - (.0000 g) = 1866 g

Total Catch No. of filters Blank Value/ Net Catch ml of Acetone Back Half Catch: Filters: 0788 g - (.0000 g) = 0788 g

Total Catch No. of filters Blank Value/ Net Catch Beakers 1. Acetone/Impingers:

1. Acetone/Impingers: ml of Acetone 10004 2. Extract/Impingers:

OTUC g - 75 (2000533g) = 1010 g

Total Catch ml. of Blank Value/ Net Catch Dichloromethane ml of Dichloromethane Water/Impingers: $\frac{1490 \text{ g}}{\text{Total Catch}} = \frac{300 \text{ (000004 g)}}{\text{ml. of water}} = \frac{1478 \text{ g}}{\text{Net Catch}}$ ml of water Total Back Half Catch Total Catch % Front Half

NET PARTICULATE CATCH CALCULATION

HAUGHS SOTY

5/14/92

Technician(s): TX TK

Unit: Run:

EPA WETHOD SH PARTICULATE CALCULATIONS HODDSTOVE TEST DATA SHEET 1.7

meter box used for the test

in degrees Absolute

computer

dec fa

Run # 3

Date 5/14/92

Technician 3N TK DK JS

WST6-Form1, Rev11/89

MISCELLANEOUS TEST DATA WOODSTOVE DATA SHEET #8

Useable Firebox Dimensions: See QC Section Useable Volume: 1,473	_ft3
Dilution Tunnel Draft (If applicable): Start O Stop O	
Test Chamber Air Velocity: Start: O Stop: O Avg: O	
Wet Bulb/ Start: WB: 60 °F DB: 70 °F /. 4 % Amb Moisture 56	7RH
Dry Bulb Stop: WB: 59 °F DB: 78 °F 1.0 % Amb Moisture 32 % Ambient % Relative	7RH
$\overline{\mathbf{x}} = 1.2$ Moisture $\overline{\mathbf{y}} = 44$ Humidity (
Empty	
Stove Wt: 23/ 1bs.	
	bs.
Empty	
Stove Wt with Stack and Ash Ash: O lbs. Total: 0	bs.
Kindling Wt. Paper: 3 lbs. Wood: 6.2 1	bs.
Pre Burn Fuel Wt. 82 + 9.4 + 1.5 Total: 19.1 1	bs.
	bs.
Coal Bed Wt-lbs: Range (2.6 - 2.2) 306.9-306.51bs. Actual: 2.4 1	bs.
Allowable Amount of Charcoal that can be removed:	
Coal Bed Wt. Range $\left(\frac{2.6}{\text{Upper Wt.}} + \frac{2.2}{\text{Lower Wt.}}\right)$.25 =	bs.
Test Fuel Wt-1bs: Ideal 10.3 1bs. Range: 9.3 1bs. Actual: 10.7 11	bs.
1.1	<u>cs.</u>
	7
4 x 4's x N/A " N/A Pcs N/A 1bs. N/A;	<u>z</u>
Est. Dry Burn <u>10,7 - (10,7 x,17752)</u> x 60 = <u>,856</u> Rate (Kg/Hr.) 2.2025 Z80 Est. Dry Burn Rate (Kg/H	<u> </u>
Est EPA Heat Output(HO _E) (19,140) X <u>(3</u> x <u>)856</u> = <u>(0 324,7</u> (Avg BTU's/Hr) Est Heat Output(HO _E) BTU's/H	
Comments: 240 = ,999	
195 = 1,229	

	_	-1	100
Unit: 140645 S27X	Run:	_ Date: <u>5//9</u> .	/92_ Page 9
•	OODSTOVE OPERATIN		
FIRE STARTED: 0745	PST/P	DST	
WARM UP AND PREBURN: PR up/preburn fuel charges, preburn.	then set to <u>Q</u>	<u>03eD</u> a	ll warm- t start of
SECONDARY AIR:///	CAT BYPASS	: _ <i>D/H</i>	
CHARCOAL BED PREPARATION up/preburn charge. At 1 leveled. In stove	$\frac{1/2 \text{ min. prior to}}{1/2}$ sec.	loading last	ruei, rakeo ano
TEST: Door Wide Open du			
PRIMARY AIR: opened full setting of	<u> </u>	_ •	
SECONDARY AIR: NA	CAT BYPAS	s: <u>////</u>	
FAN: ON/OFF during warm-	up ON OFF duri	ng preburn	ance of test run
ON OFF first30 Fan speed set at			
ON OFF first Fan speed set at WOOD DATA: KINDLING: a			
Fan speed set at	mix of the grades		
WOOD DATA: KINDLING: a	mix of the grades	listed below	SPECIES s. arn D fir
Fan speed set at WOOD DATA: KINDLING: a SIZE	mix of the grades MILL Manke/Tacoma Packwood	listed below	SPECIES
Fan speed set at WOOD DATA: KINDLING: a SIZE PREBURN: 2X4 TEST: 2X4	mix of the grades MILL Manke/Tacoma Packwood Packwood	listed below GRADE Std or btr #2 or btr	SPECIES s. orn D fir s. orn D fir
Fan speed set at WOOD DATA: KINDLING: a SIZE PREBURN: 2X4 TEST: 2X4	mix of the grades MILL Manke/Tacoma Packwood Packwood	listed below GRADE Std or btr #2 or btr	SPECIES s. orn D fir s. orn D fir
Fan speed set at	mix of the grades MILL Manke/Tacoma Packwood Packwood Packwood	listed below GRADE Std or btr #2 or btr #2 or btr	species s. arm D fir s. arm D fir s. arm D fir inches.
Fan speed set at WOOD DATA: KINDLING: a SIZE PREBURN: 2X4 TEST: 2X4 4x4 PELLET FUEL APFI# All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel 1st warm up/preburn fuel	mix of the grades MILL Manke/Tacoma Packwood Packwood Packwood change (8.2	listed below GRADE Std or btr #2 or btr #2 or btr cher _/O or lbs) added	species s. orn D fir s. orn D fir s. orn D fir fir inches.
Fan speed set at WOOD DATA: KINDLING: a SIZE PREBURN: 2X4 TEST: 2X4 4x4 PELLET FUEL APFI# All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel 1st warm up/preburn fuel 2nd warm up/preburn fuel	mix of the grades MILL Manke/Tacoma Packwood Packwood Packwood charge (9.4	listed below GRADE Std or btr #2 or btr #2 or btr 10 or btr cher /// or or lbs) added	species s. grn D fir s. grn D fir s. grn D fir de d
Fan speed set at WOOD DATA: KINDLING: a SIZE PREBURN: 2X4 TEST: 2X4 4x4 PELLET FUEL APFI# All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel 1st warm up/preburn fuel 2nd warm up/preburn fuel 3rd warm up/preburn fuel	mix of the grades MILL Manke/Tacoma Packwood Packwood Packwood charge (9.4) charge (1.5)	listed below GRADE Std or btr #2 or btr #2 or btr cher /// or lbs) added lbs) added	species s. orn D fir s. orn D fir s. orn D fir s. orn D fir at 0845 at 0945 at 1040
Fan speed set at WOOD DATA: KINDLING: a SIZE PREBURN: 2X4 TEST: 2X4 4x4 PELLET FUEL APFI# All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel 1st warm up/preburn fuel 2nd warm up/preburn fuel	mix of the grades MILL Manke/Tacoma Packwood Packwood Packwood charge (9.4) charge (1.5)	listed below GRADE Std or btr #2 or btr #2 or btr cher /// or lbs) added lbs) added	species s. orn D fir s. orn D fir s. orn D fir s. orn D fir at 0845 at 0945 at 1040
Fan speed set at WOOD DATA: KINDLING: a SIZE PREBURN: 2X4 TEST: 2X4 4x4 PELLET FUEL APFI# All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel 1st warm up/preburn fuel 2nd warm up/preburn fuel 3rd warm up/preburn fuel	mix of the grades MILL Manke/Tacoma Packwood Packwood Packwood Packwood Charge (9.4 Charge (1.5 Charge (1.5) Charge (1.5)	listed below GRADE Std or btr #2 or btr #2 or btr 10 or lbs) added lbs) added lbs) added	species s. orn D fir s. orn D fir s. orn D fir s. orn D fir de orn D fir 18 1045 at 1040 at

FUEL MOISTURE WOODSTOVE TEST DATA SHEET #10

Unit: //4/00/43 0 & / / Run: 3 Date: 5//4/92 Technician: BN TK DK JS WST1-Form7-Rev11/89

Room Temperature: 70 of	Correction Factor:
NOTE: Record readings to the n Uncor Values are corrected for Time Test Fuel Moisture Reading Calibration Checks: XY_	temperature: Yes

Рc			Top			tom	Sid		Piece Avg
#	Dimen	Use	Uncor	Cor	Uncor	Cor	Uncor	Cor	Corrected
1	21418	K	4,0	40	4,5	4,5	4,0	4.0	4.167
2									
3		_							
4	2x4x8	9	18.0	A.6	18.0	19.6	18.5	20.1	19.767
5	21418	ρ	18.0	A.6	18.0	19.6	19,0	20.7	19,967
_6									39.733
7									
8									i
9	2141/834	T	19,5	21.3	19,5	21,3	19.0	20.7	21.100
10	244/83/4	\mathcal{T}	20,0	21.8	21.0	22.9	21.0	22.9	22,533
11	2x4x/834	T	19.5	21.3	18,5	20.1	18,5	20.1	20,500
12	244/83/4	T	20.0	21.8	21,5	23.5	19.5	21.3	22,200
13									(86,333)
14				-					
15									
16									-
17									
18							••	·	
19	FEET	T	19,5	21,3	19,5	21.3	19.0	20.7	21-100
20									

% Moisture - Dry Basis:

% Moisture - Wet Basis:

Kindling	Pretest Fuel	Test Load
4.1672	19.867 -	21.583
4.000 %	16,574-9	17.752-

To obtain Wet from Dry: $\frac{100 \times 7}{100 + 7}$ Dry Rdg. = % Moisture, Wet Basis

Acceptable Ranges: 16-20% wet; 19-25% dry (17.5 - 22.5 on Meter [Uncor reading] at 70°F)

Key for Use: K= Kindling P= Pretest Fuel T= Test Fuel

WOOD DENSITY DETERMINATION WOODSTOVE TEST DATA SHEET #11	Date: 5/14/92 Technician: BN TK DK JS WST2-form11-Rev 6/90
Wood Piece: Nominal Dimensions:	2 x 4 x 3/2
Depth (D):	3.91cm
Width (W):	9,00 cm
Length (L): 8.30 _cm	
<u>830</u> cm	- 8,30cm
8,30 cm Length X	
Volume:	<u>292,077</u> cm ³
MOISTURE: Room Temperature: 7/	OF Correction Factor:
Uncorrected Meter Readings Corrected	for temperature:Yes No
NOTE: Record moisture meter readings	to the nearest 0.5%
Uncor Cor Avg	7 Moisture (Dry) 2/8337
	% Moisture (Wet) 17,920 %
	A Moisture (wet)
	le: Leveled In V Out V
	Zeroed: In VOut
x. 21.833 z	Zeroed: In Out
Wet Weight: 226,4 g Dry Weight: 19	1.63 g
% Moisture Dried Basis: 15358 % [1 - (Dry Wt ; Wet Wt)] X 100	
Into Dryer 5/14/92 Time Out of Dryer 6/30/90 MUS (Minimum Time in Dryer: 24 hrs.)	OF OF
Density = 19163 g : 292,077 cm (dry wt) (volume)	
Pellet Fuel Moisture Content Determina	ation
Tare Beaker Wt.	
Wet Wt:s	z = g
Gross Wet Wt. Tare Beaker Wt	
Dry Wt:g :	
Gross Dry Wt. Tare Beaker Wt	
% Moisture Dried Basis: [1 - (Net Dry Wt - Net Wet Wt.)] X 100	

Floi 8 धु Flow **R** <u> Ŝ</u> Ŗ .5287 1. 6.7.V Press. 二三系 2055 :056 .055 :052 540. **BN.**3S Static -054 040: 240-2046 -054 -.054 052 140 **予KO** 035 :052 7052 -.038 -.042 2038 640-1053 640-037 150 475 475 625 450 450 475 450 475 500 525 500 575 9 50 575 550 550 475 250 475 525 400 47.5 tmit: Haughs 5270 Serus Date: 5/14/92 中的 25 ನೆ 20 100 <u>~</u> .20 <u>.</u> ∞. 23 8 <u>a</u> 7 26 7 22 8 5 ā 7 <u>a</u> <u>o</u> 3946 73437 34037 Stack 355 355 348 353 285 346 336 276 343 329 333 288 35 327 34,2 327 298 23 284 274 317 721 714 1/0(3) 126 139 138 <u>5</u> 133 35 136 6a1c 4/8 138 38 124 120 35 30 138 139 129 127 39 130 136 139 12 127 3 1-0 2.5 13.0 133 13.0 12.5 7. 3.5 3.5 13.0 7.3 **50** 13.0 13.2 12.5 13.0 11.2 3.2 13.2 7.0 -9 3 53 36 139 ਤ ਨ <u>و.</u> <u>و.</u> 62 三33 7,5 150 158 158 38 139 S S 15 145 154 09 <u>丁</u> اها <u>ত</u> 137 ď 137 <u>元</u> 126 12 126 25 0 1 80 90 J 0 lo 12 126 124 9 126 107 125 127 122 <u>م</u> 50 12 125 17.4 124 28.6 2.5 31.3 39.8 3.5 35.0 33.9 e_ ~ 5.9 8.5 16.8 18.9 39.9 25.2 4.6 Г 5.7 5.4 7.8 13 တ က် 9 ÷ .23 *.*65 e m .55 26 , 28 .28 8 77. .23 43 72 ह्र. .29 .31 59 ,72 37 ₹. 29 3 ت 77 m 因 02b 023 رمام. المام: 990 10,44 029 028 633 028 643 749 910 790 .637 **,**024 015 023 629 .037 054 858 110 Ē 631 . 18.2 ار د. د 12,3 12.6 V) 10.9 8.01 王3 12.6 10.2 <u>و</u> 9 12.8 5.5 0.7 恒 ج ج エゴ ナゴ 12.7 10.7 -:0 9 و <u>=</u> _ 3 16.5 18.2 Ŕ ---17.2 12.6 12.8 147 <u>4</u>.3 Š 10.7 S.S. 10.2 10.7 ان ان 12.3 12,6 6.0 12.7 五 <u>ه</u> و. -0. 4 22 679 433 <u>ا</u>روما *∂*Γ*a*]. 503 580 535 385 423 563 650 719 399 > Slot 425 415 404 . 429 498 617 485 459 499 504 2008 اه اه 3.0 3.0 <u>م</u> ة-9. N MODSTOVE DATA SEET 112 3,7 5 6 <u>ه</u> 9.0 0.0 ਕ ੦ <u>ر</u> S 8,0 و۔ 0 **500** Ø ĝ 3. 7. ~ ~ W <u>۔</u> ف 2. 9 6 ō N 그동 > 8 123 405 드 225 385 404 240 079 118 747 297 314 8/1 429 436 395 396 353 300 MST2-Form 14 Rev 1/88 281 381 364 321 ibs Burn left Rate 3 νŠ ۸ĺ **____** 2 S ΛÌ 3 Ø ₹. 7 و_ M و_ \varnothing 7. 3 3 ₹. 7 306.7 Scale 10s 0.5 10.2 0.0 <u>ہ۔</u> ض 8.3 10.7 16.7 ر م ا م 7.4 ن ف 63 ر ال ري ک 7.8 w J 2 Ŕή 7 ć 313.6 316.7 3163 317.4 317.2 313.0 316.9 315.9 34.5 317.4 312.5 309.8 309.2 315.4 315.0 312,1 311.6 311.0 310.5 310.2 38.5 308.9 314.1 369.1 분 8 8 પ્ર Ş 3,50 <u>|</u> 35 40 <u>_</u> 40 প্ত 8 2 જે, 8 0

HOLDSTOVE DATA SKEET 112 HST2-Form 14 Rev 1/88

片

BN, JS

Jate: 5/14/92 Technician(s):

Secres vates.

S270

Unit: HAUGHS

Run:

Flo 8 .en, Flow ह ş B 8 Z 280 -1.938 Statici -4137 -025 020 Press. -,023 -.027 -.022 -.036 -.023 :022 hh0: -039 036 :030 -.029 -027 -024 -024 -022 -042 -034 .033 7.032 102 .021 -031 S S S 625 513 200 8 929 8 902 525 550 625 250 675 700 9 009 625 625 8 歪 S 625 625 9 000 48 26 .26 .25 25 26 28 28 28 28 .25 % % 28 17 **E** 33 7 74 74 25 25 74 131 2102 2728 12173 Stack 2 266 207 178 60 % 2 2 203 173 174 285 249 239 232 225 192 183 172 214 187 180 __ 218 198 Calc And Sta <u>و</u> = 2 601 120 15 2 2 2 2 109 2 Ξ 2 9 8 <u>5</u> <u>~</u> 8 7 9 5 7.2 فالا S.S <u>و</u> د۔ 6.5 ė رب فـ و_ نهـ ا ان e.S 7.5 N) 7.3 و 7 9. 73 15 N. 7.5 7.3 8 3 ۲ 120 120 25 123 120 35 129 121 124 122 120 38 132 N N 39 138 137 38 ď 139 34 112 3 三 T/C(1)T/C(2) 103 Bulb 103 103 102 102 103 103 5 101 50 0 109 90 90 <u>र</u> 9 ₽ 10 70 80 [0] <u>0</u> 108 80 109 109 60 MQ 阳 2.5 2.3 3.3 3.3 8:2 8 7 8 2.3 2.0 2.0 2.0 <u>~</u> V) T T 9 ŵ Paget 7.1 2 8 1.39 -% 33 83 . 8 8 ,25 1.70 57 78 1.28 1.27 \$ <u>ن</u> س 員 62 1.87 00 8 <u>v</u>i -1.72 7日 <u>\</u>3 .125 *-*89 3 123 . 178 Q91: اه 75 .126 .183 154 167 137 15 180 15 149 <u>1</u>8 183 174 <u>下</u> 131 790 ٧. 6.5 18.6 15.8 <u>8</u> 6.3 ビ 15,7 5.0 ∞ <u>د</u> 3.0 14.2 15.6 0.9 8.9 ەن <u>د</u> ∞ 5.8 σ 2 و <u>=</u> ∞ Ξ 15.4 ∞ <u>ف</u> 亘 ف ف_ 15.0 ر ر 5.0 <u>2</u> 3 5.b ا<u>و</u>.3 <u>ہ</u>۔ ص <u>خ</u> 55. 1 段 13.0 14.2 ٥ ∞ فہ 16.2 ري. اد ص فہ 5,7 3 2 2 ₹. 8 3 N 5 576 959 14 512 583 663 660 512 562 9 **658** ماماماء روع 1 663 209 624 663 Tolo. 592 ٧. 609 3 639 619 479 Š 5,6 3,6 ტ ტ 4.8 4 ਹ ਹ 3.8 w N 3. ري م 2,7 2.7 W C 7:1 ____ <u>+</u> 9. ó ų, 3 $\overline{}$ 8 . 223 183 288 3 193 55. 122 空 .138 90, 126 113 107 108 108 ٥ 151 108 107 <u>چ</u> 151 15. 801 Ξ Rate FIE \mathcal{D} -Ø Ø \varnothing \varnothing \varnothing Ø \mathcal{C} _ left 306.7 Scale 1bs 'n 0: ا. 2.0 1.2 7. 0 σ 8 <u>ਤ</u> M Ó 6 oO, G \circ Ś 307.6 308.7 307.8 307.5 308.6 308.3 307.9 307.8 308.5 308.1 307.7 307.7 307.6 307.6 3073 307.3 308.2 308.0 307.9 307.7 307.5 307.4 308.4 301.2 프 8 2 40 (<u>5</u> 49 为 118 1315 প্র 36 ₹) 8 8 ુ $\vec{\mathbb{U}}_{l}$ 5, 0

57 뭐 뒴 Flow 282 占 88% 8 BN,JS,TK -2.045 - 03હ - 2077 Static Press. -,022 :023 -.023 -023 -.023 -.023 :023 -.024 700 700 902 00/ 002 900 8 8 8 8 S270 Senes uate: 5/14/92 Technician(8): 6 28 28 28 82 .28 28 .28 28 4 87 [1315] 1584 4117 Stack 176 او 100 7 7 九二 178 **T/C(3)** Calc M/B 2 2 2 9 9 2 2 2 9 Dry X I <u>د</u> ا s. S s S زلا 8.8 و. در ∞ עמ 122 122 122 <u>त</u> 7 (G) 121 7 T/C(1)T/C(2) Unit: HAUGHS ann 103 163 103 163 103 53 53 103 103 20 阳 2,5 2.8 2.3 6. 2.0 2.3 5.3 7.4 Rm: ..55 .32 1.85 39 1.47 ا و R 14. .158 148 153 8 53 745 145 127 <u>د</u> و 5 S <u>ه.</u> ا او:٥ 15.8 16.2 15.9 Je.3 7.5 回 او. 16.5 0.9 15.8 15.9 16.4 15.9 اة 3 は 8 625 1.655 628 -638 849 ,52 > **63** 629 1642 202 س (لا <u>ი</u> 3.5 4.0 3.0 HODOSTOVE DATA SHEET ALZ NST2-FORM 14 RBV 1/88 3.8 33.33 3.1 ŝ > 158 155 .153)H0 138 125 ₹ 120 .132 Rate Ø \varnothing _ \varnothing Scale 159 F 7 R Ø 307.2 306.9 307.0 306.9 306.8 30k.7 387 307.1 306.8 1515 20 9 265 છ્ય

Primary Air Set at CLOSE Pumps furned on at: 1045 Secondary Air Set at NA 376.8 BN. JS TK Check WB/DB: 129/166 Unit: HAUGHS S270 SECIES Date: 5/14/92 Run: 3 Comments Fan: ON 322.0 Static 649--.064 -,046 -.073 .057 -052 --,042 -1038 -634 -: 048 -.043 -.042 -044 -.638 Temp Room 78 ф Г 28 78 [78 28 78 200 80 7 78 5 Catalytio 2nd Burn 1188 و آ 356 2 0 0 4C01 9-1884 923 997 1081 Page: of | 961 792 6101 1021 Firebox 1263 1055 932 396 1026 e 2 1221 1103 903 978 1167 268 824 146 Φ Bottom 455 453 450 457 138 447 454 977 コナカ 71/17 426 424 6 7 œ Right 326 285 305 Side 367 337 349 303 367 292 3 28°E 381 31 281 Back 285 363 253 398 262 248 228 324 341 117 237 234 309 2411 Left Side 433 383 50b 393 453 375 515 7 694 403 = \$ 488 371 367 RECORD SHEET #13 4 Stove PRE BURN DATA 385 WST2-Form16 362 Top 333 bos 380 375 354 347 343 320 587 949 B 519 Stack 353 573 400 386 272 56c 265 309 294 282 278 9LC 791 274 306.9-306.51/C#-3 Rate Burn (C) w 3 و_ 6 4 ų Scale Weight 307.9 306.8 307.3 306.9 45 307. 8 367.5 306.9 306.7 307.0 307.3 306.8 306. 308. 367.1 8 36 ? 80-2 3 Minute ુ

EMPERATURES	CORD SHEET #14	r2-Form14 Rev1/88
TEMP	RECOR	WSI2-

S710 Senso Date: 5/14/92 Technician(s): BN JS .TE 3 Unit: HAUGHS
Run: 3
Page: Of

					MEVI/ 00			rages	 -	4			9	Pk Dk
1/2	4	2	9	7	8	6	10	=	12	13	14	15	16	17
unute Time	Stove	Left Side	Back	Right Side	Bottom	Firebox	2nd Burn Catalytic	Room Temp	Tube Furnace	Sample Box	Impinger Out	င်း Box Box	C. Gas Impinger	SO2 Impinger
% }	320	367	228	180	ተነሳ	የይዛ	ا 7 ا	77	1448	248	34	241		36
% % %	255	352	322	280	<u>-</u>	1117	357	77	8441	248	34	142	35	36
ड/ १४	243	333	321	275	404	01فا	545	77	Lhhl	248	34	241	35	36
₹ %	231	315	313	270	401	568	559	LL	ባከከተ	817	34	142	35	36
20 35/	220	297	307	257	344	532	599	LL	1445	248	34	241	35	36
57 20	230	283	305	246	384	526	883	TL	ከከከተ	248	34	142	35	36
8/ 3/	247	273	308	243	37b	527	1001	LL	1443	8hC	34	741	35	3b
N١	282	266	203	232	365	531	424	76	1442	248	34	241	35	36
5/ 8/	294	266	161	231	358	115	1268	مال	1441	8hC	34	147	35	36
₹/ \$\$	320	265	184	234	351	592	1029	ገገ	1441	248	34	241	35	36
50/08/	330	265	188	238	344	1891	1138	77	1441	8hC	34	141	35	36
\ \2 \2	350	269	193	248	338	abol	1251	77	1441	842	34	1hC	35	36
X	3322	3551	3068	30353	(4546)	(5217)	(IB27S)	422)						
0a SS	400	784	203	256	333	ገሪዛ	1224	78	1441	842	34	242	35	36
\ 3\	4010	307	214	272	329	804	1262	78	1441	248	34	242	35	36
2/ 2/	413	318	233	ILE	327	9Z8	1284	79	1441	348	34	243	35	36
5/ 18/	420	332	233	अन्त	32h	858	1254	79	ולולו	842	34	243	35	36
\mathcal{M}		개	자	287	325	905	1289	79	1441	848	hε	244	35	36
2 2 2	426	358	258	295	325	952	1220	<u>4</u>	1441	8hZ	h£	245	35	36
3/2 元	415	364	263	297	325	966	1229	79	1441	842	h£:	246	35	36
8/2		368	205	306	325	9101	1254	79	1441	842	hε	247	35	36
\$ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	017	374	271	305	326	1029	1118	79	1441	842	ħε	248	3.S	36
100 1300 1300		383	368	313	329	958	1017	79	1441	248	34	248	35	36
5/ \\\		390	262	307	336	935	1016	-14	1442	842	35	248	35	3k
23/ 23/ 23/ 23/ 23/ 23/ 23/ 23/ 23/ 23/	370	395	255	310	332	816	955	_ _ bL	ከተተበ	248	35	248	35	36
X	4878	प्रयहर्	2958	3493	3932)	(19601)	(141823)	K9146						
X	8200	שרדר	6026	6528	PTL48	18981		1868						

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Stove Left Back Side Bac		The second secon			TEM RECO WST2-	PERATUR AD SHEE -Form14	ES T #14 Revl/88			Unit: Run: Page:	HAUGHS	072	Seeles Date	Date: $5/14/92$ Technician(s): $6N$	192 11: GN.75	1 K
National Lieft Right Bacton Pitrabox Gates Pitr	Ľ	177	4	5	9	7	8	6	10	==	12	13	14	15	16	17
Sie 347 400 248 301 33e 43e 873 80 1448 750 345 34e 33e 33e 41e 87e 76e 34g 80 1448 75e 34e 25e 28e 33e 34e 71e 80 1448 75e 25e 28e 27e 28e 27e 26e 27e 26e 27e 26e 27e 26e 27e 26e 27e 26e 27e	Σ	Inute	Stove	Left Side	Back	Right Side	Bottom	Firebox	2nd Burn Catalytic		Tube Furnace	Sample Box	Impinger Out	C. Cas Box	C. Gas Impinger	SO ₂ Impinger
20	у	201315	367	400	248	301	336	929	873	_	8441	348	35	348		36
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28	<u> y</u>	55/ 38/	296	387	222	18C	341	870	177	80	8441	248	35	247	35	36
46 249 347 208 273 340 852 725 80 1448 4	X	है। १८	282	378	214	278	340	1 ગ8	749	80	8448	248	35	747	35	36
14 14 14 15 15 15 15 15		y F	269	367	208	273	340	852	725	80	1448	248	35	247	35	36
\$\sigma_{19}\$ \text{1.6} \text{ 3.49} \text{ 3.60} \text{ 6.82} \text{ 3.6} \text{ 1.44} \text{ 3.41} \text{ 1.65} \text{ 2.60} \text{ 3.39} \text{ 7.82} \text{ 6.60} \text{ 8.0} \text{ 1.44} \text{ 8.0} \text{ 8.0} \text{ 1.44} \text{ 8.0} \text{ 1.44} \text{ 8.0}		장/ /示	258	357	263	267	340	816	669	80	8441	248	35	248	38	36
55 244 341 195 246 339 782 6460 80 1448 56 327 338 189 252 335 747 598 79 1448 56 327 338 189 252 333 726 586 79 1448 50 203 301 183 234 330 726 549 79 1448 50 203 301 178 229 326 690 549 79 1448 50 203 301 178 229 326 690 549 79 1448 51 18 284 774 72 329 676 526 78 1448 52 198 274 176 323 323 676 520 78 1448 52 198 274 178 213 315 640 512 78 1448 53 180 277 181 213 315 640 525 79 1448 54 181 262 176 202 304 635 505 79 1448 55 180 267 176 203 304 636 557 79 1448 56 184 266 184 198 302 641 5265 79 1446 56 184 266 184 198 302 641 5265 79 1446 57 186 187 268 187 188 302 641 5265 79 1446 58 180 266 184 198 302 641 5265 79 1446 59 184 266 184 198 302 641 5265 79 1446 50 184 266 184 198 302 641 5265 79 1446 50 184 266 184 198 302 641 5265 79 1446 50 184 266 184 188 302 641 5265 79 1446 50 184 266 184 188 302 641 5265 79 1446 50 184 266 184 188 302 641 5265 79 1446	×	7		349	200	265	340	800	682	80	8441	248	35	248	35	3%
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500 181 265 176 203 304 636 557 79 1447 150 184 266 184 198 302 641 565 79 1446 1446 187 228 187 198 300 639 567 79 1444 1446 187 3346 2108 2569 37717 (1830) (6438) 643 187 187 187 187 187 187 187 187 187 187		V T		267	69	206	308	624	528	79	1448	246	35	247	35	36
65 184 266 184 198 362 641 565 79 1446 150 187 268 187 198 360 639 567 79 1444 (2281/3366/2108/2569/3771)/(7830)/(6438)/(443)		1	_	265	1-16	203	304	વકુવ	557	79	1447	७५८	35	747	35	36
(2281/3366/2108/2569/3771) (1830) (6438) (443)		ΛL	•	266	184	861	302	149	565	79	9441	246	35	247	35	36
3366 2108 2569 3771) (7830) (6438)		100 V		268		N	300	639	, 567	79.	1444	246	35	247	35	36
154481101231173571173017 21 11 27 20 100 /		$\langle \rangle$	1872	,जुनहर	2108	4	. 1	(18	$\overline{\lambda}$	(0±0)						
		$\langle $	1370 1	115448	10063	-1	163067	364681	39499	3768						

TYPERATURES PROTECTION TYPERAPORES TYPERA		TEMPE	ا الله الله الله	WATURA CUERT				Lait:	Unit: Haughs	SZ70 SECIES	EELES DATE	te: 5/4/92	Date: 5/14/92	1
			WST2-	RECORD SHEET WST2-Form14 1	RECURD SHEET #14 WST2-Form14 Rev1/88			Run: 3 Page: 3	3 3 of	8	Jec	hnician(s	A DN JS	12, 14 14, 14
4 5	2		9	7	8	6	10	=	12	13	14	15	16 322.	71 0
1)	3 3	ge r	Back	ragne Side	Bottom	Firebox	2nd Burn Catalytic	Room Temp	Tube Furnace	Sample Box	Impinger Out	C. Gas Box	C. Gas Impinger	SO ₂ Impinger
188 269	26	<u>o-</u>	881	195	248	625	571		ነባባተ	०५८	35	747		36
189 272	77	7	190	195	296	617	569	78	9441	247	35	247	35	36
190 273	7	13	192	194	296	519	570	78	トサウト	247	35	247	35	3%
192 275	27	Ŋ	192	192	295		564	78	1447	747	35	747	38	36
TTC 591	ايم	~	192	192	794	009	551	18	1447	747	35	247	35	36
193 2	Ň	280	95	193	293	592	559	78	Lhh!	1	35	Lh7	35	36
193 28	%	282	188	196	292	581	556	78	Lhhl	Lh7	35	LHZ	35	36
	2	285	186	188	290	569	248	78	Lhhl	247	35	747	35	3,6
_	N	285	183	188	284	Sb2	243	18	Lhhi	147	35	247	35	36
172.12	バル	2498		(127)	(2643)	53697	(5030)	703						
55117	\ 	1796	[23ઓ	14084)	18949)	KT5811)	(44529)	出記						
2723(3	ഗ്ര		7-17	75-12	(332)	(134X)	(181)	(183)						
	J													
	ı							AT	START	322.0.				
							-		STDP	227.21				
	ı									-87b-	7			
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			!:											

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EE	MC - West	Kent,	WA 9803	<u>2</u> Date:	: <u>5/14/9</u>	2 Analy	te: <u>CO₂ (</u>	(15-1)	
Source:	HAUGHS	S270	Seeie	S Run #	: <u>3</u>			· ····	
Zero Cyl	#: <u>T13</u>	2257	C	onc. <u>00.0</u> %	CO2_	Cyl Pre	ess: <u>800</u>	psi	
Certi	fied by: _	LIQUI	O ALE	<u> </u>			Date: 10)	1/91	
Span Cyl	#: <u>290</u>	104	C	onc. 12.68	CO2	Cyl Pre	ess: <u>900</u>)psi	
Certi	fied by: _	MATH	IESON				Date: 10/3	191	
Analyzer	: Make:	Horiba		Model:P	IR-200	0	SN: 4070	169	
Range:	0 - 25.0%	CO2	Aı	nalyzer Ou	tput:_	0 - 1.0		v.	
Flow:	1.5 SCFH	·	Meası	ured by:	Rotame	ter: X	Flowmete	r:	
	Value = 2								
EPA Cont	rol Limits	$s = \pm 2$.	.5% of 2!	5.0% CO ₂ =	± 0.6	25% CO ₂			
Pre Run	Audit: By	7 :	DK	Tim	e:	035	Temp: <u>77</u>	o _F	
				Audit Resu					
Point #	Expec Meter	ted Res		Act	ual Res	sponse	+ Conc. Difference	1	
				00.0				.217	
Zero			00.0 ما 12		.499	 	237	-1.879	
Span	8		<u> </u>	, , , ,	. / / /			1	
Comments	<u>:</u>								
								·	
Post Run Audit: By: 0K Time: 16/0 Temp: 77 OF									
				Audit Resu			, <u></u>		
Point		ted Res	ponse	Act	ual Res	ponse	+ Conc	[A]	
##	Meter	DVM	*	Meter	DVM	8	Difference		
Zero	00.0	.000	00.0	0.00	.000	.054	. 054	.217	
Span	50.4	.504	12.6	49.9	. 499	12.363	237	-1.879	
Comments									
	Difference ifferece =				m) v 10	١0	 	1	
were a Di	rrrerece	ALL T	(PPM) =	mark a (hb)	11. A T	, ,			

⁺ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EEMC	- West,	Kent,	WA 98032	Date:	5/14/92	Anal	yte: <u> </u>	15-2)	
source: HA	UGHS S	270	Series	Run #:	3_				
Zero Cyl #:	T 13:	2257	Coi	nc. <u>00.0</u> %_	02	Cyl Pre	ess: <u>800</u>	psi	
Certifie	d by:	Liau	10 AI	<u>e</u>			Date: <u>10/7</u>	191	
Span Cvl #:	2900	24	Co	nc. 12.48	02	Cyl Pro	ess: <u>900</u>	psi	
Certifie	d by:	MATH	HESON				Date: 10/3	1/91	
Analvzer:	Make: 7	eledyn	e	Model: 32	20 Ax		SN: 3746	5	
Range: 0 -	25.0%)2	An	alyzer Out	put:	0 - 1.	0	v.	
							Flowmete:		
DD3 - 0 17-	7 25	. 09 00						•	
EPA Control	Limits_	= + 2.	5% of 25	.0% O ₂ = -	0.625	8 O ₂			
Pre Run Aud	<u>it</u> : By:	·	DK.	Time	≥: <u>10</u>	145	Temp: <u>78</u>	of	
				udit Dogu	1+0				
Point	Expect		ponse	Acti	al Res	ponse	+ Conc. Difference	Δ.	
#	Meter	DVM		Meter	DVM	- 5	Dillerence		
Zero	00.0	.000	00.0	00.0	.003	7.028	028	114	
Span							.148 <u>• + 48</u>	1.192	
Comments:	Teledyne	∍#2. <u>Cy</u>	<u>1 * E</u>	XD & A	CL 6	AG C	<u> </u>		
		,,,,							
Post Run Audit: By: DK Time: 1620 Temp.: 77 of									
FOSC Kun Ac	urc. D			udit Resu			•		
Point	Expec	ted Res		Act	ual Res	sponse	+ Conc.	8	
#	Meter	DVM	8	Meter	DVM	8	Difference	77 g	
Zero	00.0	.000	00.0	0.00	.002	-,054	-,054	-, 216	
Span	12.4	,496	12.4	12.4	.493	12.471	.671	.575	
Comments:	Teledyn	e#2 Cy	1 % F	xp & A	ct %	Adj t	<u>ο</u> + Δ %		
		_	 -	 -					
		·							
+ Conc. Dif	ference	= Act	% - Exp	(Std) %			•		

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100 Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EEM	C - West,	Kent,	WA 98032	Date:	5/14/9	2 Anal	yte: <u>CO (</u>	15-3)	
	LAUGHS								
Zero Cyl	#: <u>T13</u>	2257	Co	nc. <u>00.0</u> %	со	cyl Pr	ess: <u>800</u>	psi	
Certif	ied by: _	LIGU	110 AIR	2			Date: 10/7	191	
Span Cyl	#: 2900	74	Со	nc. 4.96%	CO	Cyl Pr	ess: 900)psi	
Certif	ied by: _	MATH	ESON				Date: 10/3	1/91	
Analyzer:	Make:	Horiba		Model: P	IR-2000) .	SN: 408	005	
Range: 0	- 10.0%	со	An	alyzer Ou	tput:	0 - 1.	0	v.	
							Flowmet		
EPA Span	Value = 1	0.0% CC)						
	ol Limits		~ .				- 0		
Pre Run A	udit: By	:	<u>UK</u>	Tim	e: <u>10</u>	50	Temp: <u>78</u>	o _F	
	· · · · · · · · · · · · · · · · · · ·			udit Resu					
Point #	Expec Meter		ponse %	Act Meter	ual Res		<pre>+ Conc. Difference</pre>	△ %	
Zero	00.0					 		044	
Span		.496						1.174	
Comments:		<u> </u>							
	•								
Post Run Audit: By: OKTime:1625Temp.:77or									
				udit Resu	lts				
Point		ted Res	sponse	Act	ual Res		+ Conc.	۸۰	
#	Meter	DVM	8	Meter	DVM	8	Difference		
Zero	00.0	.000	00.0	00.2	.002	.016	.016	.160	
Span	49.6	. 496	4.96	48.8	.488	4.967	.007	.147	
Comments:							. · · · · · · · · · · · · · · · · · · ·	ı	
	ifference fferece =				m) X 10		·		

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

\						$\frac{Z}{A}$ Anal	yte: <u>SO2</u>	(15-4)	
Source: HF	NUGHS	S270	SERIE	S Run #	: 3				
Zero Cyl #:	<u>T13:</u>	2257	Co	nc.00.0 p	om SO ₂	Cyl Pr	ess: <u>800</u>	psi	
Certifie	d by: _	Liqui	O AIR	··			Date: 10/	7/91	
	-						ess: <u>45</u>	•	
							Date: 9/2		
							SN: 403		
							0		
							Flowmete		
					c				
EPA Span Va EPA Control	lue = 2 Limits	500 ppr = $+2.5$	n SO2 5% of 250	0 ppm SO ₂	= +62	.5 ppm	SO ₂		
i							Temp:		
				.udit Resu	lts				
Point	Expec	ted Res		Act	ual Re	sponse	+ Conc.		
#		DVM		Meter	DVM	ppm	Difference	Δ 8	
Zero	00.0	.000	00.0	•	, ·	1	8.432	. 337	
Span	49.3	.493	1232	49.3	. 493	1234.	2.000	.162	
Comments:									
	·								
Post Run Audit: By: DK Time: 1605 Temp: 78 of									
·			P	udit Resu	lts				
Point		ted Res	ponse		ual Re		+ Conc.	₽ 8	
#	Meter	DVM	ppm	Meter	DVM	ppm	Difference		
Zero	00.0	.000	00.0	00.1	.001	5.936	5.936	. 237	
Span	49.3	.493	1232	49.1	.491	1229-	- 2.992	243	
Comments:									
+ Conc. Dif	ference	= Act	ppm - Ex	p (Std) p	pm				

⁺ Conc. Difference = Act ppm - Exp (Std) ppm

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Run: 3
Date: 5/14/92
Technicians: BN TL DK TS
WST6-Form3-Rev11/89

QUALITY CHECKS WOODSTOVE DATA SHEET #16

Ambient = Tr:		61.2	· ·	of T/	C#30:	<i>63</i> ,3	
Thermocouple Ch	eck (at a	mbient):	T/C#1:			2: <u>64.3</u>	0
T/C #3: 64,5	°F;	T/C #4	: 630	o _F ;	T/C #	5: 62,2	o
r/c #6: 62,2	°F;	T/C #7	: 62.0	°F;	T/C #	8:6116	0
T/C #9: 63.0	°F;	T/C #1	0: 63.1	o _F ;	T/C #1	1: 6/12	o
r/c #12: 65.5	or;	T/C #1	3: 64	√_o _F ;		4:64.9	o
r/c #15: 646	o _F ;	T/C #1	6: 59,3	o _F ;		1:61.4	o
r/c #18: <u>68./</u>	o _F ;	T/C #1	9 :	o _F ;	T/C #2	0 :	o
T/C #21:	o _F ;	T/C #2	2:	o _F ;	T/C #2	3 :	o
r/c #24:	o _F ;	T/C #2	5:	o _F ;	T/C #2	5 :	0
Comments:							
					_		
						:	
Thermocouple Rea	adout:						
Zero (0°F) : <u>,2</u>	Adj oF to:	0				7 Differ 신년	
Span (2000°F):/999/7	Adj OF to:	2000.	Spar of (2	1 2000°F):_	2005.0°F	<i>i95</i>	<u> </u>
(Allowable % Dii	ference	= 1.5%.	Use for	mulas or	Woodstor	re Data Si	heet
15 to calculate	. % Diffe	rence)			* .	. •	
Thermocouple Rea	dout Pre	test Line	earity (heck	•		
00F = 00					00F = 3	99.6	F;
$600^{\circ} = \frac{60/.2}{}$	o _{F;} 8	00°F =	801.2	 _°F; 100	00F = /	000.3 0:	F;
1200°F= //97,8					10°F = /3		F
1800°F= 1799.6	o _F ; 20	00°F = 3	7000.0	o _f			•
		4				21 A.	**;
racer Gas (SO ₂)	Injecti	on Train	Leak Ch	eck: Pr	e / Po	st /	• •
ombustion Gas (O) Train	Leak Ch	eck: Pr	e Pr	st /	
racer Gas (SO ₂)				ck: P+	e / Pr	ost /	
Praft (Static) (P+	e / Po		
Coracte, 6	rest ver	JACORI		. L'I			•**
Scale Check Pre	(W+_ #'s	3.5.	2-305	T2 = 10			
Post	(Wt, #'	s): 316	.0 301	0.5 = 11	2.0		
Stack cleaned pr						:	
Creaned pr	_01 00 0			-			

2 TEST No. : CLIENT : HAUGHS PRODUCTS DATE: 5/13/92 S-27X MODEL: ***************************** PERCENT PERCENT S02 DELTA METER TIME METER CO C02 COCENTR. TEMP. READING H (DEG. F) (%) (%) PPM (IN. H2O) (C F) (MIN.) _____ ======== ====== 4.60 625 80 1.14 0.150 0 443.500 400 80 0.66 2.50 0.370 5 445.000 625 2.80 0.150 81 0.55 10 447.377 650 2.80 448.906 0.140 82 0.60 15 0.140 82 0.67 3.00 650 20 450.382 83 0.63 3.80 625 0.150 25 451.858 0.72 3.80 650 83 453.398 0.140 30 0.72 3.90 650 84 0.140 454.879 35 5.90 600 85 0.67 456.365 0.160 40 550 6.30 85 0.71 457.981 0.190 45 0.73 8.00 525 85 459.744 0.210 50 525 0.68 8.60 461.591 86 55 0.210 9.70 500 86 0.53 60 463.444 0.230 500 86 0.39 9.90 65 465.391 0.230 475 87 0.37 10.00 70 467.338 0.260 0.37 9.70 475 0.260 87 75 469.395 0.32 475 88 10.20 80 471.452 0.260 475 88 0.30 10.00 0.260 85 473.516 88 0.27 10.10 475 0.260 90 475.581 475 89 0.25 9.70 0.260 95 477.645 475 88 0.28 9.90 100 479.717 0.260 475 8.50 481.781 0.260 89 0.35 105 0.230 89 0.57 7.60 500 110 483.853 500 89 0.73 7.00 115 485.822 0.230 500 120 487.790 0.230 89 0.76 6.60 500 125 489.760 0.230 89 0.82 6.30 89 0.53 7.10 500 130 491.730 0.230 88 1.08 5.90 500 135 493.700 0.230 88 1.13 5.60 500 0.230 140 495.663 500 88 0.99 5.80 145 497.625 0.230 525 88 1.47 5.20 150 499.588 0.210 88 525 155 501.457 0.210 1.40 5.10 0.210 503.327 88 1.40 5.00 525 160 88 1.52 4.70 525 505.196 0.210 165 88 525 170 507.066 0.210 1.62 4.60 175 508.935 0.210 88 1.62 4.40 525 0.210 88 1.64 4.00 525 180 510.805 88 525 185 512.675 0.210 1.64 4.00 87 1.74 3.70 525 190 514.546 0.210195 516.410 0.210 87 1.69 3.50 525 200 518.274 0.190 87 1.62 3.50 550

0.190

0.190

0.190

0.190

0.170

205

210

215

220

225

520.053

521.832

523.612

525.391

527.170

87

87

87

87

87

1.66

1.64

1.47

1.42

1.38

3.40

3.40

3.40

3.40

3.30

550

550

550

550

575

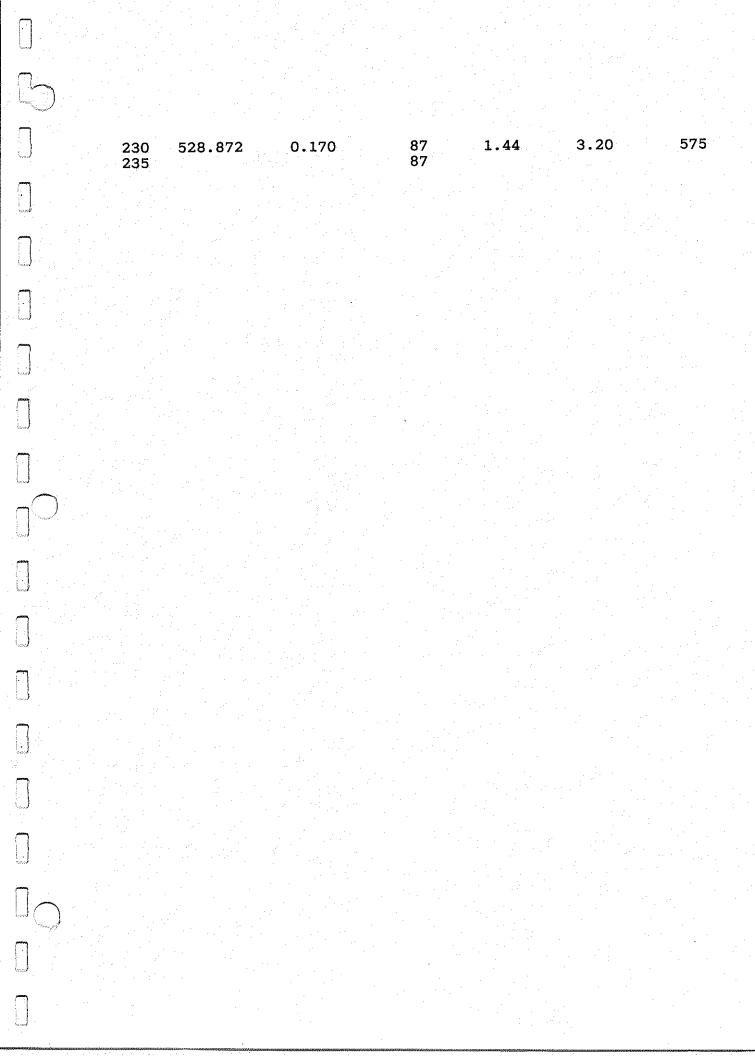


TABLE 2 ---- FIELD DATA

	e						
		T	ABLE 2	FIELD DATA			
leaners J	CLIENT :	HAUGHS PRO	DUCTS		TEST No.	2	
(_{men})	MODEL:	S-27X ******	****		DATE:		
ares had	METER CAL. FACTOR (Y	·	1.066	Wt. WOOD BURNED(LB)		10.6	Lbs
	BAROMETRIC PRESS.(Pb	S)	30.11 in Hg	WET, FUEL MOISTURE %		18.279	ક
	LEAK RATE POST (Lp)		0.006 cfm	Wt. PART. COLLECTED		1.1913	g
	WATER VOL. (V1c)	135 Ml	METER VOLUME Vm		85.372	mcf
	TEST TIME (MIN)	230 min	HC MOLE FRACTION		0.0132	

TABLE 3 ----FIELD DATA AVERAGES

(maring)	CLIENT :	HAUGHS PRODUCTS		TEST No. :	2
	MODEL:	S-27X ***********	****	DATE: 5/1	13/92 ******
	AVG DELTA H	0.21 in H20	AVG PRCNT		0.96 %
The same of the sa	AVG METER TEMP. Tm		AVG PRCNT CO2		5.82 %
No. Astron	AVG PPM	522 PPM	COZ		3.02

TABLE 4 ---- CALCULATIONS

1)					
Konn's Street	CLIENT : HAUGHS PRO	DUCTS	TEST No. :	2	
	MODEL: S-27X *********	*****	DATE:	5/13/92 *****	*****
· ·	STD SAMPLE VOL. Vm(std)	88.53 dscf	STACK GAS FLOW Qsd	456.275	dscf/Hr &
		·		7.60	dscf/min
	VOL. WATER VAPOR Vw(std)		PARTICULATE CONCTRT. C s	0.0135	g/dscf
	PRCNT MSTR Bws	6.70 %	PARTC.EMISS. RATE E	6.14	g/Hr
	BURN RATE BR		MOLES OF GAS PER Lb WOOD Nt	0.52	Lb-mole/Lb
	CO EMISSION RATE	145.94 g/Hr &	PART.EMISS. RATE	5.98	g/Kgdry fuel
		142.24 g/Kgdry fuel			
(a)					

TABLE 5 ---- PROPORTIONAL RATE VARIATION

miles and	HAUGHS	S PRODU	CTS			TEST	No.:		2	
	S-27X	*****	****	******	****	DATE:	: 5 *****	/13/92 *****	****	****
	TII INTEV T:	ME VAL i	PPM * Vm	PROPRTN. RATE VAR. PR		PROPI RATE AVER	RTN VAR.		· ·	
\Box	=====	==== == 5	983.9	97	===		100			-,,-
		10	997.5	99						
iI		15	1000.1	99	. A transfer of the contract o	•				
enation.		20	1003.1	99			173		+ +	
		25	1002.2	99	-					
(mos)		30	1004.6	99						
		35	1003.8	99	e e					
		40	1005.3	99:						
Land Control		45 50	1008.3	100 100			+2			
	•	55	1007.6	100	•					
\Box		60	1007.0	100				•		•
		65	1010.6	100						
64774		70	1009.7	100						
$\overline{}$		75	1012.6	100			•	•		
		80	1011.7	100				•		
light)		85	1014.2	100						
$\mathcal{A}^{(+)}$		90	1014.7	100						
NI Plant August		95	1013.2	100						
land)		100	1017.2	101 100			·			
		105 110	1013.2 1016.2		•		•		* *	
\bigcap		115	1016.5	100						
i.	*	120	1016.0	100						
		125	1017.0	101						
\cap		130	1017.0	101	•					
		135	1017.9	101	<i>a</i> .		(x,y) = (x,y)			
		140	1015.2	100						
\cap		145	1014.7	100						
		150	1015.2	100						
*Seriel		155	1014.9	100 100		. "				
لب		160 165	1015.4 1014.9	100						
		170	1014.9	100		,		•	1.7	÷
Come		175	1014.9	100						
		180	1015.4	100			٠.			
		185	1015.4	100						
() .		190	1016.9	101	•					•
		195	1014.0	. 100	·. ·					
i l		200	1014.0	100						
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	-	205	1013.8	100						•
		210	1013.8	100				•		
		215 220	1014.4 1013.8	100 100				•	*	
	•	225	1013.8	100						•
Secretary of the Secret		230	1014.0	100						

Client Haugh's Produc	A WOODSTOVE DATA SHEET #1
Client Address 10 atlas Cour	nt ,
Bramp Ton, On	tario, Canada LGT SCI
Client Phone 4/6-192-8000)
Project No Model No,_	S 210X
Run No. 2 Date of Test 5/13	3 <u>/92</u> Est Grams/Hr
Stove Type: Cat Non Cat	
Data To Be Submitted To: Oregon 🗶	• • • • • • • • • • • • • • • • • • • •
Burn Category: Low (<0.8 Kg/Hr) Med Low (0.8 - 1.25 K	Med Hi (1.26 - 1.90 Kg/Hr) g/Hr) <u>log(Max (>1.9 Kg/Hr);</u>
Fuel % Moisture (dry)	
Stack Static Pressure(0.000) (Data Sheet #12)	
Barometric Pressure (00.00) (Data Sheet #2)	30,11 — "Hg
emperature (Average Room) Combustio (OO) (Data Sheet #14)	
lue Gas Moisture(00.000) (Data Sheet #7)	6.7018
mbient Moisture (0.00) (Data Sheet #8)	1, 1- %
tove Weight(000) (Data Sheet #8)	1bs
tove Temperature Change(000) (Data Sheet #14)	<u>-33′</u> •
articulate Emission(0.0000) (Data Sheet #7)	
uel Higher Heating Value (dry) (0000) (CT&E Sheet)	BTU/16
uel Type: Wood: 🗶 Pellets:	
otal Fuel Consumed During Burn (00.0) (Data Sheet #8)	10.6 lbs
otal Particulate Catch(O.0000) (Data Sheet #6)	
Captured (00.0) (Data Sheet #3)	135.0
ry Gas Meter Volume (00.000) (Data Sheet #2)	85.37b CF

Meter Box Data Sheet Page # 2

Meter Box 4 Y Factor 1006 Unit: 100 Unit: 100

Run: 0 Date: 5/13/90
Operator(s): 55

Inject SO2 @ 100 cc/min

Nozzle: Probe @ 3/8 " od

Initial Volume: <u>1500</u>

ROTO	PRESS:	132	Sampling	Ratio :	_18.5_	. 1	BAROM	ETER:3	0,14
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	SO2 PPM	ROTO TEMP	PUMP
00	1410	443,500		5600	115	80	605	17	0
05	15	445,000		8,753	,37	80	400	27	5
10	20	447.377		5,602	115	81	605	77	1-5
15	25	448906		5,396	114	80	650	77	15
50	30	450,382		5-386	,14	80	650	22	0
25	35	451.858		5,600	, 15	<i>9</i> 3	605	17	0
30	40	453,398		5.386	114	83	650	17	5
35	45	454.279		5,386	14	84	650	77	0
40	50	456.365		5.894	16	25	600	78	0
45	- 55 ·	457.981		6354	,19	25	550	18	15
50	1500	259.744		6655	01	85	525	18	10
55	5	461.591		6650	121	86	595	1/8	1/5
ROTO	PRESS:		TOTALS :	OD-5932	(2/15)	(996)	BAROM	ETER:3	0,12
60	10	463.444		6,985	<i>√</i> ∂3_	86.	500	18	15
65	15	465,391		6-985	<i>-03</i>	26	500	78	1.5
70	10	467.338		1350	126	81	4/15	18	1-5
75	. 05	469-395		7.350	<i>196</i>	87	7,15	18	0.0
80	20	471-452		7,350	196	88	415	78	00
85	35	473.516		7.350	196	88	415	18	00
90	40	475.531		1350	<i>-86</i>	روي	4/5	72	20
95	45	477.645		1-350	126	89	45	78	20
100	50	479,717		7/35/	196	88	45	78	00
105	55	481.781		7.352	126	89	425	18	20
110	1600	483,853		6.985	183	01	500	78	
115	. 3	485.800		6445	113	102	800	18	1)0
			TOTALS:	(86750°	3.00	10547	MAX V		<u> </u>
TOTAL	CU FT		TOTALS:	154,344	5/15/	205D	AV BP	(0.0	

Meter Box Data Sheet Page # 2

Meter Box 45 Y Factor 1.066

Leak Checks: 15 " Hg @ 200 cfm

/5 " Hg @ 200 cfm | 16.0 " Hg @ cfm | cfm | cfm | cfm |

Inject SO2 @ 100 cc/min

Page 2 of Unit: 144045 Run: 2 Date: 5/13/90Operator(s):

Nozzle: Probe @ 3/8 " od

Initial Volume: 1500

ROTO	PRESS:	34	Sampling	Ratio:	185	: 1	BAROME		1
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	SO2 PPM	ROTO TEMP	PUMP
120	10	407,790		6,990	<i>B</i> 3	29	500	18	40
125	15	189.760		6980	03	89	500	(8)	20
130	10	491730		6480	-03	89	500	72	00
135	25	493.700		6980	123	28	800	18	100
140	30	495443		6.980	183	88	00	18	(NO)
145	35	492605		6920	193	88	500		20
150	40	499-588		6648	01	28	505	18	00
155	45	501.467		6-648	181	88_	555	18	11-5
160	50	503.397		6.648	101	88	505	70	115
165	55	505,196		12640	181	180	000		1/2
170	1700	507.066	1	6648	101	88	505	78	1.5
175	5	508.935		6640	201	99	525	78	1000
ROTO	PRESS:	<u></u>	TOTALS :	181:1683	0.64	1000	BARUM	ETER:	
180	10	510,805	1	6-643	· ()	183	220	18	1.5
185	15	510.615]	6643	181	80	200	78	15
190	90	514.546	1	9643	<u> 191</u>	0	20	18	1/5
195	15	516,410	<u> </u> - 	6643	-61	18/	000	78	1.5
200	30	518,094]	1 2/1	10	10/	527	18	110
205	35	590.053	1	1201	119	186	(32)	78	110
210	40	501.830	1	6.091	.19	87	550	18	1/5
215	45	523.610	1	6.341	19	10/	550	78	1,5
220	50	600.00	<u> </u>	6341	110	101	575	18	15
225		507.170	7	Calla	17	187	525	12	1-5
230		58812	4	(10'70t)	<u></u>	1959	1		1
235	<u> </u>		TOTALS:		(990)	4068	MAX V	ACC =	DC
TOTA	L CU FT	85.37			1011	82.	AV BF	: 30	11/
НСОГ		10006		The second		(डपी			/

MOISTURE SHEET Woodstove Data Sheet #3

Moisture Determination	•		0
	lance roed	Unit:	ways Szzy
Final:	_ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Run:	2
IMPINGER #1		Date: 5	13/92
Final Weight 6004	_ grams	Technician(s): Ini	
Initial Weight 574.4	grams	Fin	al: 55
Net 1080	_ grams	Approved By:	TIL
IMPINGER #2			
Final Weight 5799	grams		
Initial Weight 57210	_ grams		
Net	grams		
IMPINGER #3			
Final Weight 4956	_ grams		
Initial Weight 4945	grams		
Net	grams		
IMPINGER #4 (SILICA GEL)			
Final Weight 8459	_ grams		
Initial Weight 827,9	grams		
Net	_ grams		
1	TOTAL MASS	S OF H ₂ O CAPTURED 13	35.0 grams
Scale Check: 295.0g = 295.0	00 g	Front Half Filte	- #261 F
590.0g = <u>540</u> 885.0g = <u>88</u> 5		Back Half Filter	#
Notes:	9		" - (() 1 1) -
		·	

WOODSTOVE DATA SHEET #4-1: INITIAL FILTER WEIGHTS (TARE WEIGHTS)

Into Dessicator: Date 3/17/92 Time 0900 By DK Front Half Back Half Size: 110 mm Lot. No.: ZB882 Grade: #25 GLASS Manufacturer: SES Third Second Filter First Date Time Time Date Time Ву Wt Date Ву Wt Ву 1300 HAUGUS enia 3/20/1608 DK 261 -10.6987 1990 1301 26290.7014 .7017 1610 263#0.6988 1300 16925 11012 -6894 1307 <u>264 FO. 6893</u> 1614 1394 265F0.6912 6917 1616 1395 16936 266 F 0.6934 1618 267F0.6936 16437 1620 268 F0.7015 1010 1307 1622 16936 269 FO.6933 1624 1329 16965 270H0.6965 1300 1626 3/20 6951 DL 1628 1330 271 Flo.6953 | . 7005 272FO.7002 1630 16980 1334 273F0.6978 1632 <u> 1333</u> 274HO.6900 10903 1634 275 FO. 6975 10915 334 1636 1335 1699 276 A0.6978 1638 16914 277#0.6975 1640 278 FO. 6992 1699 1642 6900 1339 279 10.6901 11044 .6991 1339 280F0.6994 1646 Date: 3/24/91 Time 0900 Checked by

	QA RE	WEIGH		
Filter #	WT	Date	Time	Ву
	· -			

BALA	NCE R	OOM ENVI	RONMENTA	L COND	TIONS
WB	DB	%RH	Date	Time	Ву
60	74	44	3/20	1606	DK
59	13	43	3.63	130	Hz.

Into D									EIGHTS (T	-	_	. :
									B 901 c			
#		Date	Time	Ву		Date					Time	Ву
	0.3846		1526	DK		303		20	Haual:	5 en	12	<u> </u>
2628	0. 3822		1528		-38A7		1342	لبا		<u> </u>	<u> </u>	
	0.3805		1530		.32/0	'	1343			!		<u> </u>
264B	0.3811		1532		-38/A		1344			!	<u> </u>	<u> </u>
265B	0.3821		1534		-3824		1345	\Box		!	<u> </u>	<u> </u>
2106F	0.3822		K36	/	138aN		1346				<u> </u>	<u> </u>
267P	J. 3817	T	1538		3888		1347	Ш				<u> </u>
2680	0.3772		1540		13770		1348					<u> </u>
2694	0.3875		1542	$\prod I$	3810		1340					
270H	0.3813		1544		-3869		1350				<u> </u>	
	- 1											
2718	0.3884	3/20	1546	1016	13884		1351		·			<u> </u>
	30.3818		1548		-3813		1354					
	0.3825		1550	$\overline{\ \ }$	3821		1353					
	0.3856		1552	7.1	<i>3</i> 8 <i>5</i> 3		1354					<u> </u>
_	0.3832		1554		3830		1355					Ĺ
	0.3862	/_	1556		3864	ĺ	1356					
	0.3836	\overline{T}	1558		383A		1357					<u> </u>
	0.3801		1600)	380A		/353					i
	0.3827		1602	7	3882		1359					
	30.3821	T	1604		3218	V	1400	V				i
			/ * - / 			,						
			-				1					·
			7						, ,			i
hecked	d hy	1//	<i>7</i> 5		<u> </u>		Dat		3/24/91	Time	1911	,,

QA REWEIGH

Filter #	WT	Date	Time	Ву
				-

ne By	Time	Date	%RH	DB	WB
4 DK	1524	3/20	44	74	60
クレ	1340	3/23	43	73	59
	10,10	10/200		ري	37

INITIAL BEAKER WEIGHTS (TARE WEIGHTS)

	Into D	essicato	r: Da	ate:	4/1:	1/92		Ti	me: <u>/</u> (200	<u> </u>	В	7: <u> </u>)K	_
	Beaker #		Date	Time	Ву	Second Wt	Date	, ,	Time	Ву	Th Wt	ird	Date	Time	
	501	96-8870			DK	96.8274	41	11:11	332	Ro					
		98.5625		1006	$\overline{}$	98.5630			334			_			
		91.2041		1008	7	91.2044			1336		Ź	HAU	US	PD	
		95.0582		1010		95.0584			1338						
		106.4506		1012		106.4504			340	١. ر					_
														ļ	_
		94.1600		1014	<u>OK</u>	94.1604			34/2					ļ	-
		88.9867		1016	7	82,9870		1	344			_			_
		103.1077		1018	1	103.1017		\perp	346				_		
	509	95.7024		1020	/	95,7026			1348					1	_
	510	104.8758	(1022		104-8757			350					ļ	_
			1,77			0-1-						_		 	-
		107.7742			_	107,71745			<u>352</u>					<u> </u>	-
		106.3852		1026	\rightarrow	106.3855			354					<u> </u>	_
		99.2412	/	1029	_/	99.0417			1356					<u> </u>	_
	<i>y</i>	108.6340		1030	/_	108,6344		_	358	1				ļ	_
	515	106.2259		1032		106,2064		\dashv	1400					<u> </u>	_
	516	145.6750	4/20	1034	OI(105.6745		1	402						
		94.7160	1	1036		94.7160		_	404						
		103.8296)	1038.		103 .8300			1400						•
	519	100.0063	/	1040		100,0063			408				_	1	
		98.6266		1042		98.6967			1410						
							1			;					_
	521	97.7535	4/20	1044	DK	97.7537	İ		1412						_
	522	103.9227		1046	1	103.9209	,		1416	:]				<u> </u>	
•	523	94.9397		1048	1	94.9400			1418	;					
	524	106.8567	/	1050		106 ,8571	1		1430	4					_
	<u>\$25</u>	95.1170		1052	1	95-1173	V		1439	ليبا				<u> </u>	_
	Checked	Ву:	-//	2/		***************************************	Date	·	4/6	21/4	92	Tim	ie:	1415	_
		<u>A</u> Q A	REWE	LCH	-		BAL	ANC				RONME	NTAL	CONDI	i
•	Beaker	# W	T	Date	T:	lme By	WB	_	DB	% F		Dat		ime	i
				<u> </u>	-		50		72	41		4/2		003	ļ
				<u> </u>	↓_		(0)		74	40	ĺ	4/8		<u>330</u>	
															l

WST5-Form9, Pg1, Rev4/90 Unit JAUGHS SON Run # A Date: S/13/40 Time <u>S</u> 0/P Date 01<196.993 Third Ş By Ş を否 S 65 SS Time 40H <u>に</u> **Date** 5//8 61/5) 5/2 8 WOODSTOVE DATA SHEET #4-3: CONSTANT FINAL WEIGHTS 106,5091, 98.8019 95.00 14L 8D 96.9923 DK(191.3307 Second FINAL BEAKER WEIGHTS 入 入 By 930 DK **で**/で/ 926 UX 4 106.5290 5/18 932 Time 8C6 5/18 5/18 Date 4/18 91.3306 98.8082 1858 July 95.2141 96,9931 First 0900 DK 5/15 10900 DK By Time 5/14 3/15 5/4 Dessic Beaker Into B B

						i	FIN/	IL FI	FINAL FILTER WEIGHTS			٠.	-			
Filter Into	nto							Γ								
(D)	essic	Dessic Date	Time	By	Time By First	Date	Time	By	By Second	Date	Time	By	Date Time By Third	Date	Time	By
201F		5/13	<i>CS3</i> 1	CAS	2019	M/S	1736 4	S	1,0135	5//2	1225	BA	9/	18 934	934	X
				Ŏ	(DO146)	5/18	1530	Q.								
1618		5/13	8 8	37	155.08	13/14	1739	40	(4855)	5/15	CB OCCI 71/2	3				
))				0								

	Weig	Sess	 2	6	7	
HTS		By		By		. *
FINAL WEIGHTS		Final Wt		Final WT		
QA REWEIGH		Beaker #		Filter #		
ΨO		Date		Date		_

SCALE ROOM ENVIRONMENTAL CONDITIONS	ROOM	ENVIR	ONMEN	TAL C	ONDIT	IONS	
ghing							
selon	Date Time	Time	By	WB	DB	%RH	
1	2//ط	1718	178	<i>ħ</i> S	20	177	
2	51/5	Boo	$\frac{1}{2}$	09	74	ħħ	
3	8//5	$\theta \beta \beta$	ĐΚ	58	11	45	
4	9/9	1820	K.	55	73	43	

SCALE KOUM ENVIKONMENIAL CONDITIONS	KUUM 1	ENV LK	JUMEN	Y TY	MULLI	ONS
9	,					
7						
8						
6						
Comments						

WST7-Form1-Rev5/98

Dates: From 4 23 92

Through

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorfus Model A1205 SW 37010004

1000	100	, O.	10000	1 0 1 1	0101		<u> </u>	-			
Weight	Weight	Weight	Weight	Filter	Beaker	Tech	Date	Time	Dry Bulb	Wet Bulb	Z RH
97777	10.0000	0.9997	0.1001			Ż	4/23	009	K	10	
9,44,67	00000	656	8				1.601	1130	24	50	777
2000	20000	0500	,1820				1/8//	1830	20	60	חמן
1 hhh .hh	10.0000	1.0001	0. 1000			NOK	4,57	1045	73	09	77
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	7000'0	, 9998	55501			on Const	33/h	1330	11	\$	49
~ :	10,0001	1.0001	0.0999			ИGI	1/20	0/0/	74	10)	Gran 17
	(0.0000	1.0001	0.0909			1	08/	7480	66	7.7	90
86.00.00	9.9998	66660	0.1000				3/1	956	77	10)	35
11.99.7	9.4999	\$\$/	, 1000			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1/8	E	17	55	1/2
99 9995	100001	6.9999	0.0999				7	730	78	(0)	077
180,087	10,000	1000'1	000/			S	2	0/0	1	(20)	4/
808	10,0001	0000	1001			9	1 \	亦不	14	9	45
6666 65	000001	1.0061	0.0999			Y	5/6	430	44	(20)	74
	DOSOC	10001	,1000				から	1840	THE STATE OF THE S	20	77
800 00	10.0001	10001	0.1003				5/17	800	73	53	43
83668	1000001	10007	0,1001			10	1012	757	10	2	200
786.96		1000	/100/				5/8	los los	S	72	46
334,46	_	6666/	daboi			SA SA	2/5	83	000	27	45
99.996		0.9998	0.0998			H	5/11	000/	67	130	72/
803,66		1-0000	00010			2	5//2	0000	Ph.	07	
09.80		1,0000	,000			S	6/18/	20/5	7.0	a a	44
\$666.66	٦	1.0000	0.0999			OK	<i>\$1</i> 13	950	711	59	9,5
800°00	7	2007	10011			S	S.744	1636	70	30	/b
97,438	\perp	19997	1,099			B√	S	000	74	50	7:17
700.000		10001	0.0999			ĎΚ		0000	11	58	45
100/003	000000	1,000	1001				9	8	73	65	45
							,				
							İ				
			_								

Long Control

WST7-Form Rev5/90

Dates: From 3/19.
Through 403

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorfus Model A1205 SN 37010004

	1008	108	1.08	100mg	Blank	Blank		-			
	Me I gn C	Weight	Weight	Weight		Beaker		H			
Control Cont	4277	77777	1 0000	25500			1/2 3-1	2 1257	73	(0)	42
Court Cour		1444	0000-1	0.0445				13/14/5	ħL	0%	44
Control Cont	シングレング	0,003	1000	689				0 88 91	20	3	70
1,000 1,00	/00.000/	10.0001	7.0002	0.100				1 0900	70	177	1707
1960 1960	18,000	10,000,01	(200 <i>6</i>)	100/0			tz	(100)	7	4	7/2
10000 0.	19.63.2 19.63.2	100001	1,000	0001			1	5 EM	711	1	7
Cooco Cooc	,8666 66	l	-	8660.0			1	1500 Se		1	27.00
1,0000 0,0000 1,0003 0,1003 1,000 1,0000 1,	00,000	10,000	5555'	0,600			•	-	122	200	7,73
1,000 1,00	100,000	0000.01	1.0003	A 1003			ч-	\vdash		, O 3	4/5
9 9999 1,0001 0 1002 0 1002 0 1003 0 1004 0 1005 0 1000 0	1556	100000	1,0001	188				-	30		3/5
10 10 10 10 10 10 10 10	1000001	6 9999	1.0001	0.1002				1>	120	\$ \ \$\sigma\$	13.
1987 9,9899 1,0001 0,1000 1,	100,001	16550	1.000A	001.				- - -	77	7/2	2/2
	7 899 7	9. 9999	1.0001	000 0					, 0,		202
	06886	10,000	1000/	, 1880 3					17	78	
10 0000 10	94.749	p000'01	1000/	1,100			NA VA	101	73		
1945 1920cc 1,000c 1900c 190	100.0003	10.0000	/ 0000	0.1000				V/00/	7,	Flo	435
10 000 0.9999 0.9999 0.4999 0	99995	10.0cc	00007	, 1000				2000	26	D.	<u> </u>
10 cool		9.9997	0.9997	0.7000			7	-	7.2	76%	7/7
1949 12,000 1,90	99.9997	10.0001	0.9999	6.6999			7		OL	26	78
1900 9,111 0,999 0,1000 1,00	66 66 66	10000	09999	0444			1 2 1	7860 9	87	25	30
44443 044443 044443	000007	9.9999	0.9998	0'1000			4		90	Ę	77
1.310.00	000000	20006	0 9999	8080			グ		16	23	30
1000 1,000	54565	7, 9,996	י מתמת	\$2998			方の	וצמצי	57)	5	Z/C
10000 1,	1000 1000	8,666,6	4999	6650'			76 147	4 1025	82	C	27
1000 1000	980-58	(0.000)	10000	7			771 00	0 093	8	200	1/2
0.000 10.0003 0.0003 0.0003 0.0003 0.0004 0.0004 0.0009 0.00009 0.00009 0.0000 0.0000 <t< td=""><td>100 0000</td><td>366.5</td><td>0000</td><td>10000</td><td></td><td></td><td>//k >/[</td><td>0011 0</td><td>12</td><td>6</td><td>45</td></t<>	100 0000	366.5	0000	10000			//k >/[0011 0	12	6	45
4978 10000 0.0998 4/12 1015 1.0000 1.0000 0.0998 35 4/15 1015 1.0000 37 4/15 1015 4/15 1.0000 37 4/15 4/15 1.0000 37 4/15	100.000	50003	1.0002	0.1003			DK 41	3 1945	73	58	th d3
1000 1,000 0.000	200,000	C 200, 5	10000	97.50°			1500 A	N 1030	B	\$5	3/4
1000 1, 244 1, 1000 0 0.1001	1227 P	`T.	1000	0.0978			7 3	15/10/5	89	5%	47
44444 1,0000 0,1001 0,1001 0,1001 0,1001 0,1001 0,1000 0,1001 0,1000 0,1001 0,	1777	7.53.67	2000/	10201			John 41	1000	B	Ê	dir
10.0000 1.0000 0.0999 0.1001 0.0001 0.0000 0.0999 0.0001 0.0000 0.0999 0.0001 0.0000 0.0999 0.0001 0.0000 0.0999 0.0001 0.0000 0.0999 0.0001 0.0000 0.0999 0.0001 0.0000 0.0000 0.0000 0.0000 0.000000	100.0001	46666	7.0000	0.1001			OK U	2/6/5	70	57	7/7
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	99.9999	10,0003	Gooor 1	1001.					16	6	000

WST7-Form Rev5/90

Daces: From 2/6/92 Through 3/11/92

WOODSTOVE DATA SHEET #4-4 SCALE QA SHEET

Scale Sartorius Model A1205 SN 37010004

% RH	7	47	4/8	87	4	87	ľ,	77	43	47	60	3/7	82	No.	5)7:		45	4.8	<i>C/p</i>	80 ア	46	45	24	414	76	96	1,6	27	95	6/2	Ch	45	49	46	(7)
Wet Bulb		\S\c	15	58	25	7	B		12	19	(,,	88	62	79	63	62	69	۲۷	B		55	58	63	QO	6.7	63	64	160	65	8	(10)	(g)	6,5	\$50	09
Dry Bulb	(V	39	<u>6</u> 2	70	68	75	72	12/	87	71	74	70	15	75	77	16	76	65	37	105.	67	7.1	11	hL	17	ニ	18	73	12	$\mathcal{I}_{\mathcal{C}}$	73	No	$ \lambda_{i} $	7.8	75
e I	930		10915	_	0410	-	1 00 m	- 222 = -	0670	150	のがどの	3 5900	3 1230	3 1535	086 /50	1240	00911	0830	7 1035	19580 18	2000	<u>5</u>	0500	5 1015	6 1025	7 7	\$ 1230	3 1000	/ //30	0935	0830	1 (1400) 1 E		340	0000 0
Tech Dat	OK a/6	3/B CS	18/2	DK 217	TK 2110	DK 2/10	10 CX	(A) (S)	10 1	51/c XO		110 10	1/2	1/61 00	110 76	1/2 1/1	1015 2114	TK 2111	De 1961	1 TO 2/1	1/6 13/1	12 3/2	16 2/24	DK Jálas	W 2/23	OK 3/12	16 213	DK 3/	7 3/1	1 PW 3K	1 576 3/6	- 1	(70 3/9	80 3A	DI 3/10
Beaker																																			
Filter																																			
Veight	0.0999	<u>8</u>	, (σας	. 1000	1000	0. 1000	0,1000	1001	0001'	Ó. 1000	1000	0.1000	0,1000	000100	0.1000	0001.0	0.0999	0000	,/αος,	1000	200/	0.0999	D 1000	0.7000	6660'	0.0999	0.0999	0.1000	0, (000	000/	0.0999	6060-	000/	0001	0.0998
Weight	1.0000	10001	1,0000	1.000.1	10000	86660	10000	1,000	1.0001	0.9999	00001	1,0000	10001	10001	1.0000	1.0000	1.0001	10000	1000/	9490	1,000	1.0000	0000	1,000,1	4999	00001	0000	1.0000	1,000	1,0000	,9999	6666	6556	5336/	1.0000
Weight	9.999	0,0003	0000,0	6 9999	10 0000	9.9999	10:000	10,000 1	10.0000	16.0000	0000	10.000.01	10.0001	0,000,01	9.9999	10.0000	10.0000	100001	0000001	10 0000	10000,01	7.4999	didde	7	1	8,665.5	10,000		L	0,000	10.0000	10000	10.0000	0000	4.4444
We ight	0000.007	de la la la la la la la la la la la la la	74.7777	100000	666666	1000.001	0000:00	06.7.87	100.000	100.0003	75/8/65	86666	(00:000	45,375	100 000		60 000	100 0000	644.45	the contract	29,99,92	0000-000					29 794		3666	シカラカウ	736666	25.55	83666	\$13.75 \$1.75	100 OCD

WOODSTOVE PARTICULATE O	PATCH BRACECING	Unit: 7	HAUGHS	SOTY
WOODSTOVE PARTICULATE O		Run	Date:	5/13/92
	r	Technic	ian(s): ^	<u> </u>
	FRONT HALF		•	
FILTER #: 001 9 FINAL WT: 70146 9 TARE WT: 6997 9 NET WT: 3155 9	BEAKER #: 50/ ml: 400 desc: ACETOR) .	TARE WT: 90	6.9913-9 2.8974-9 1049-9
FILTER #: FINAL WT: 9 TARE WT: 9 NET WT: 9	BEAKER #: ml: desc: ACETON	F: : NE	TARE WT:	g
	TOTAL VOLUME OF USED IN WASH	ACETONE	6	<u> 20 / m1</u>
	BACK HALF			
FILTER #: DUB FINAL WT: 5504 g TARE WT: 13849 g NET WT: 1695 g	BEAKER #: 00 ml: desc: ACETON	Fi	NAL WT: <u>98</u> TARE WT: <u>98</u> NET WT:	3.8079 g 3.5630 g 2449 g
FILTER #: g FINAL WT: g TARE WT: g NET WT: g	BEAKER #: 503 ml: 75 desc: METHCH	٦	NAL WT: 9 FARE WT: 9 NET WT:	1-0044
	m1: 200 desc: H20	_ FI	INAL WT: 99 PARE WT: 95 NET WT:	5 0 144 g
	BEAKER #: M1: H20	F1 7	NAL WT: 100 TARE WT: 100 NET WT:	6.5091
	ml: ml:	<u> </u>	NAL WT: FARE WT: NET WT:	
	BEAKER #: ml: desc:			g
	TOTAL VOLUME OF USED IN WASH TOTAL VOLUME OF TOTAL VOLUME OF WATER DRIED	DICHLORO		75 ml

		WOODSTOVE	BLONKE	noncessi	NIC	Unit:	HAUGH	5 5071	<u> </u>
base J		WOODSTOV	E DATA	SHEET # 5		Run:	0	Date: <u>5 /</u>	13/92
	В	LANKS DONE	: <u>5/1</u> 1	190	_	Techni	cian(s)	ZS DK	TK_
	200	m1 FISHER OPT		#: <u>4 389</u>	 6	FINAL WT TARE WT NET WT	: [06.25 :	04/9	
	15	ml DICHL FISHER OPT	BEAKER OROMETH	#:	 'a	FINAL WT	96.8		•
	İ		IMA LOT BEAKER :		<u>o</u> _	FINDI WT	· 66.5	1111	
		ml Distil <u>VEARL (G</u>	LED WATE	ĘR	_	TARE WT NET WT	96.5	06/9	
		BEAKER	TARES	ום סדאו		IME: <u>0900</u>	DATE		1
rang)	BKR #	1ST WT	TIME	2ND WT	TIME	3RD WT	TIME	4TH WT	TIME
	D	106.0938	 	106.2235					
	E	96-8404	i -	96.8424)					
	F	96.5109	·	96.5106)	1040				
		CALE ROOM (1			: FINALS	
	DATE 3/A3	TIME B	1	DB %	! ∟	DATE TII		WB D1	
	3/24	1034 81	سسمين فيستال بمساوعة الأستا	72 42		5/14 163 5/15 120	C 900	60 74	
7									
	. '		BEAKERS	: FINAL V	! ∟ √EIGHTS				
	BKR #	IN DSC	TIME	1ST WT	TIME	2ND WT	TIME	3RD WT	TIME
	D	5/12	0900	106.2243	1048	106,0039			
	3	5/12	0900	96 8431	1050	96.2422	1781		
	F	5/12	1330	96,5112	1700	96.5114	1230		
To the second se	BKR #	4TH WT	TIME	STH WT	TIME	6TH WT	TIME	7TH WT	TIME
						-			
	<u> </u>					<u> </u>		· · · · · · · · · · · · · · · · · · ·	<u>. </u>
			٠.						

WSTAPP1-AppDoc19-page2 WOODSTOVE TEST DATA SHEET #6 Rev 6/90 Blank Audit: By: 11m Kelly Date: 5/18/92 Blank Calculations: 200 m1 = 200 m1 = 20000 g/m1 Acetone: Dichloromethane: $\frac{10004}{9} = \frac{2}{75} = \frac{1}{10000533} = \frac{1}{10000533}$ Front Half Catch: Filters: $\frac{.3155 \text{ g}}{\text{Total Catch}} = \frac{(.0000 \text{ g})}{\text{No. of filters Blank Value}} = \frac{.3155 \text{ g}}{\text{Net Catch}}$ filter Beakers: $\frac{1049}{\text{Total Catch}} = \frac{200}{\text{Ml of Acetone Blank Value}} = \frac{1045}{\text{Net Catch}}$ ml of Acetone Total Front Half Catch 1400 g Back Half Catch: Filters: $\frac{1675}{\text{Total Catch}} = \frac{1}{\text{No. of filters Blank Value}} = \frac{1675}{\text{Net Catch}} g$ filter Beakers: 1. Acetone/Impingers: $\frac{2449 \text{ g}}{\text{Total Catch}} = \frac{2445 \text{ g}}{\text{ml of acetone Blank Value/}} = \frac{2445 \text{ g}}{\text{Net Catch}}$ ml of Acetone ____ 2. Extract/Impingers: $\frac{1003 \text{ g}}{\text{Total Catch}} = \frac{75}{\text{ml. of}} = \frac{1059 \text{ g}}{\text{Net Catch}}$ Dichloromethane ml of Dichloromethane 3. Water/Impingers: $\frac{\cancel{9347} - g}{\text{Total Catch}} - \frac{\cancel{300} - (\cancel{000004} g)}{\text{ml. of water}} = \frac{\cancel{9334} - g}{\text{Net Catch}}$ ml of water Total Back Half Catch Total Catch % Front Half

NET PARTICULATE CATCH CALCULATION

HAUGHS SOTX

Technician(s): TC TK

Unit: Run:

I PARTICULATE CALCULATIONS	SHFFT # 7
ICULATE	T NATA
PART	75.
2 E	70.07
WETHOD SH I	
EP A	

Run: 2 Date: 5/13/98 Unit: HALLands SOOK Technician(1): TKS

116, H20

884636 400t WST3-Form 1

8/28/91

0000,0000 1) Vacetd): (85,370 Vanc 17.65) (106/ met) (30,11 " Hg: 13.6

C SULTIN > 2) VH(114): (.04707)(135,0 / 11 H20): 6,3545-

000.000

- Bue x 100 : 6.2013 000,000 00001 . 0000 (6.3545 60t 1 88.4636 dect) (6.3545 est)

· 800c (88,436 deef) (15,43): (. p. 8/6/ //)

0,0000

6.95 - g/hr 00,0000 - decfa) (60): 000,000 6.698 decty 5) Estinated g/hr:

Computer printout Y factor) of the meter box used for the test for the test in degrees Absolute particulate eatch for the test average stack flow during the test noter caught during motor correction factor Tah ai H20 4 8 C 144

Unit <u>HAUGAS SJ/X</u>
Run # 2
Date <u>5//3/92</u>
Technician <u>BN 776 DE TS</u>
WST6-Form1, Rev11/89

MISCELLANEOUS TEST DATA WOODSTOVE DATA SHEET #8

Dilution Tunnel Dra	aft (If applicable)	: Start O	S	top O	
Test Chamber Air Ve				Avg: O	
•					
Dry Bulb Stop:		bient		% Relati	
Empty Stove Wt:	X = /· mols	237.3	1bs.	Humidity	_(
Empty Stove Wt with Stack	(Inc. Oil Seal) W		lbs.Dry	. 244.5	1
Empty Stove Wt with Stack				304,5	1
Kindling Wt. Hor	_	<u> </u>		0	1
Pre Burn Fuel Wt.	7.9 + 1.3		Total:	9.2	1
Total Kindling and	Pre Burn Fuel Wt		•	9.2	11
Coal Bed Wt-lbs: Rai	nge(2,6 -2,2)36	7.1 - 306.71	bs. Actua	1: 2.6	1
Allowable Amount of	Charcoal that can	be removed	d:		
Coal Bed Wt. Range	Upper Wt. Lower	$\frac{2}{\text{Wt.}}$ /2	.25 =	,6	11
Test Fuel Wt-1bs: Ic	deal lbs. Rar	ige:	lbs. Actua	1: 10.6	11
Test Fuel Size (pcs.	, -	langes)		14	Po
2 x 4's x /8 3/4	4 " 4 Pc	:s 10.4	lbs.	100.0	
4 x 4's x \(\mu/A\)	" <i>N/A</i> Pc	s N/	2 1bs.	NA	
Est. Dry Burn /0,6	- (/0.6 x 1.278) x		//026 Dry Burn	Rate (Kg	
Rate (Kg/Hr.)					
Est EPA Hest Output((Avg BTU's/Hr)		<u>63</u> × //6		2371.9 t Heat Ou O _E) BTU's	
Est EPA Heat Output((Avg ETU's/Hr)	но _E) (19,140) x _		Es		

Unit: HAUGHS S27X Run: 2 Date: 5/3/92 Page 9
WOODSTOVE OPERATING DATA
FIRE STARTED: HOT START PST/PDST
WARM UP AND PREBURN: PRIMARY AIR: set wide open for all warm- up/preburn fuel charges, then set to <u>CLOSED</u> at start of preburn.
SECONDARY AIR: NA CAT BYPASS: NA
CHARCOAL BED PREPARATION: raked and leveled prior to each warm- up/preburn charge. At 1 1/2 min. prior to loading last fuel, raked and leveled. In stove sec.
TEST: Door Wide Open during loading 0 min 39 sec
PRIMARY AIR: opened full for first min. , then set to run setting of
SECONDARY AIR:NA CAT BYPASS:NA
FAN: ON OFF during warm-up ON OFF during preburn ON/QFF first 30 minutes of test ON OFF balance of test run Fan speed set at
WOOD DATA: KINDLING: a mix of the grades listed below
SIZE MILL GRADE SPECIES
PREBURN: 2X4 Manke/Tacoma Std or btr s. orn D fir
TEST: 2X4 Packwood #2 or btr s. orn D fir 4x4 Packwood #2 or btr s. orn D fir
PELLET FUEL APFI#:
All grades WCLB rules
WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches.
1st warm up/preburn fuel charge ($\frac{7.9}{100}$ lbs) added at $\frac{1220}{1000}$.
2nd warm up/preburn fuel charge (13 1bs) added at 1309 .
3rd warm up/preburn fuel charge (lbs) added at
4th warm up/preburn fuel charge (lbs) added at
5th warm up/preburn fuel charge (lbs) added at "

FUEL MOISTURE WOODSTOVE TEST DATA SHEET #10

72

٥F

Run: 5/13/92 Date: Technician: BN TK DK WST1-Form7-Rev11/89

Correction Factor: _

Roo	m Temper	ature	: <u>72</u>	°F		Cor	rection	Factor	: <u> </u>
Unc Tim	or Value e Test F	s are	adings to correct loisture	ed for Readin	tempera gs taker	ture: '	1300		· · ·
Рc			Top)	Bot	tom	Sid	е	Piece Av
#	Dimen	Use	Uncor	Cor	Uncor		Uncor	Cor	Correcte
1				HO	<u> </u>	TART			
2									
3									
4	2448	P	18.5	20,1	21.0	22.9	21.5	23,5	(22,167)
5				<u> </u>					
6									
7									
8									
9	214/834	7	21,0	22.9	22.0	24.1	21.5	23,5	23,500
10	2441834	T	19.5	21.3	21.0	22.9	20.0	21.8	22.000
11	2+41834	T	20.5	22.4	21.0	22.9	18,5	20,1	21,800
12	244,183/4		21,0	22.9	21.0	22.9	19.0	20,7	22.167
13		, , , , , ,							89.467
14									
15									
16									
17									
18									
19	FOET	T	<i>20.0</i>	21.8	205	22.4	19.5	21,3	21.833
20	·			<u> </u>					
% M	oisture	- Dry	Basis:	Kind1		etest 1 2.167	7	est Los 2,367	ad 7
% м	oisture	- Wet	Basis:	N/F	7 7 /	18.145	7, /	8.270	17

To obtain Wet from Dry: $\frac{100 \times \%}{100 + \%}$ Dry Rdg. = % Moisture, Wet Basis

Acceptable Ranges: 16-20% wet; 19-25% dry (17.5 - 22.5 on Meter [Uncor reading] at 70°F)

Key for Use: K= Kindling P= Pretest Fuel T= Test Fuel

	· •	Run#:	۷
WOOD DEN	SITY DETERMINATION	Date: 5//	3/92
WOODSTOV	E TEST DATA SHEET #11	Technician: BN 78	DIL J
		WST2-fo	rmll-Rev
		z x 4	x 3
Wood Piece:	Nominal Dimensions:		<u>A</u>
Depth (D):		<u> 3,95 </u>	cm :
Width (W):		9,00	cm
	0112		
Length (L):	8.48 cm	•	
	8 45 cm Length	x = 8,478	cm
	8.50 cm	·	
	Volume	: 301. 375 cm ³	•
		(D X W X L)	
MOISTURE:	Room Temperature:	3 OF Correction F	actor: (
HOLDIOKE.	ROOM TEMPORALITY		*
Uncorrected	Meter Readings Correcte	d for temperature:Ye	s No
		•	
NOTE: Recor	d moisture meter readir		
	Uncor Cor	vg % Moisture (Dry)	21,267
!			
Top:	19.5 21.3 2	ug % Moisture (Wet)	<u> 11,53 l</u>
Bottom:	19,0 20,7 2		
i	770	cale: Leveled In \(\bullet	/ one /
Side:	20,0 21,8 2	cale: Leveled In /	
	012672	Zeroed: In	Out
<u>X</u> :	0100 /2		
Wet Weight .	221.5 g Dry Weight:	185,99	
		• •	
% Moisture D	ried Basis: 16030 7		
[1 - (Dr	y Wt 5 Wet Wt)] X 100		
	Date Time	Temp	
Into Dry		XO Temp	•
Out of D	1 100 140 1VU	999 or	
(Minimum	Time in Dryer: 24 hrs.) Minimum Dryer Temp	100°C 🤃
Density =	18595 g : 301.375	_cm3 = 16171 g/	′сш3 ✓
(d	(volume)		
•			
.	Market Dates	dination.	
reliet fuel	Moisture Content Determ	Hativi	
	Wt. g	· ·	
Tare Beaker			g
Tare Beaker	<u>.</u> •		o
Wet Wt:	g ÷		
Wet Wt:	g :g :g :g :	Wt. Net Wet Wt.	
Wet Wt:	s Wet Wt. Tare Beaker		
Wet Wt: Gros	g ÷	g **	g
Wet Wt: Gros Dry Wt: Gros	s Wet Wt. Tare Beaker	g **	g

				The same of the sa																	
		HOODSTOVE		17 ST 17 ST 19 ST	HIND FLIE GINS UNIN DATA SIEET #12	2					Unit:	Unit: Haughs	THEAT.	İ	527	Z LEE	Sec. 2/13/9	5/13	\sim	\ _\ z	-
		KSTZ-Form		t Rev	14 Rev 1/68						6			 - -	ď	Į.			11		
- -	Odieniko.	307.1					2				E	1/0/1	(1)T/C(2)	2)	i	1/0(3)	3)	4			
	100	At at		Rate	× ×	2 XCD2	ج ح	202	Tel	\ \ \		Bal	Het Bulb	y 1h	7 × 7	Calc MA	77.00 15	S,	1100	Static	
-	_\\	317.7	10.6	Ø	184	4.6	. bo4	15.3	15.3	<u>ر</u>	=	_	! 		 _	+	259	25	1	-03d	Flaw
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	317.7	10.6	Ø	.100	2.5	.700	17.8	17.8	Salo.	ી	3.8	191	30	5.7	15	251	9		-037	28%
	92 02	317.5	10.4	.2	.116	2.8	b89.	17.5	17.5	hSO.	.55	5.0	102	77.	- 9	╌	714	25	625	-035	58.7
:	52 25	317.3	10.2	.2	=	2.8	1691	17,5	17.5	.059	ଦ୍ୱ .	4.7	103		7.9	 	205	276	053	-034	2
	λ	317.1	10.0	.2	61.	3.0	.683	17.3	17.3	ବାବାଦ -	Fol.	4.5	101	125	7.3		107	276	650	-033	8
	8\2 %	316.9	9.8	.2	.150	3.8	, loslo	ોહ. હ	16.b	.062	.63	0.0	112	132	8.5	20	217	25	625	-035	
·.	음 /		9.5	65	.152		.1,52	16.5	16.5	1170,	.72	5.3	7-	134 (9.1	21	214	.26	920	-035	
	M		9.2	65	156	3.9	- Lo47	16.4	16.4	ורט.	.72	5. t	115	135 (9.3	122	218	,26	650	.03હ	
	\		84	٤,	.235	5.9	.573	고 S	14,5	JO66	. b.7	8.7	L11	17	10.01	127	259	124	009	040-	
	3/2	315.5	ন %	N.	-254	6.3	.559	14.2	14.2	070.	٦.	8.9	120	150	11.0	131	292	.22	550	-044	
	2/ 2/ 2/ 2/ 2/ 2/ 2/ 2/ 2/ 2/ 2/ 2/ 2/ 2		7.9	λ.	.322	8.0	765	12.4	12.4	270.	.73	0.11	123	151	12.0	136	329	.21	525	840:	
	3/	314.5	고 -	5	-347	9	468	8.	. .8	.0te7	. lo8	12.7	121	151	11.3	135	332	.21	525	640.	
																	29913	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		- 460	F10
	2\ 2\ V	313,8	г 9	-	.392	0	428	8.01	10.8	.052	.53	18.3	124	159	12.3	138	360	.20	200	052	1802
	\mathbf{V}	313.3	6.7	v)	340	6.6	.423	۲۰۵۱	10.7	. 639	.39	25.4	121	160	12.3	138	365	,20	500	-,053	202
	VT)		5.1	ن.	1. 185	000	124.	JO.6	10.6	.037	.37	27.1	12	153	11.3	137	369	1.19	475	:054	現
	5/3 55/	_	<u>.</u>	۱ و	.333	<u>_</u>	.432	10.9	10.9	.037	.37	26.3	8 :	57	10.3	135	364	91.	475	053	图
	(1)		ه و - ز	<u>ز</u> ٔ -	412	10.2	113	T.01		.632	.32	31.9	Ξ	146	0.0	134	364	61:	475	:053	
		_	7.7	7	TOT :	0.0	<u> :</u>	10.5	10.5	.030	.30	33.4	9 -	引	9	134	365	6/	47.5	:053	
		_	- '	?	406	- io	417	16.5	10.5	.027	.27	37.3	112	135	8.5	131	362	<u>6</u>	475	:053	_
	()		3.3	=	.392	9.7	426	16.8	10,8	.025	.25	38.9	607	130	ر ا	130	365	91.	475	053	
	۱۱)		b.7	-	5 m	5.5	.415	10.5	10.5	.028	.28	35.3	901	125		130	371	19	475	:053	
	A I .		9.2	6	-	8.5	494	1.8	11.8	.035	.35	24.3	102	119	_ _ \do	126	352	61.	475	-053	
	\		2.3	一	-	7.6	.500	12.7	12.7	.056	.57	13.3	99	113	5.7	121	333	. 20	200	150:	
	烈	309.2	2.1	٠,	282	7.0	.519	13.1	13.1	.672	.73	9.6	9b	911	5,4	120	312	.20	500	7.047	
			1	1	1												4282			- 1928	_
	X		_	- ;													7772			-1 000	Ť

		Ministrue	_	AND FLIE G	-	W LIMIN					5	,	Нөмен	- 1	SJ70 Series	1	Uate:	5/13	1929		
	· 	KST2-Form	-	14 Rev 1/88		4					24		7 M	 	ત	ŀ	Technician(s):	c(an(s	11 BN	0.17 0.74	H
		307.1	-				2		•	!	m	1/0/1)T/CC	23		T/E(3)	-	4			
					3	32	2				8		_	-		-	ľ	SE		Static	
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	_			265	S - S	16	Z '	10 2	3 \f			_		_	ml.			_		Com
	Ę Į	308.9	_	_	751	, v) A	<u> </u>	5 5		9 5	o r	╁	-1	ρ r	╌	276	╅			
	\ <u>®</u>	2000		-	5 33	9 ,	5,75	7.01	- 6-	180-	78.	+	;	7	=	9	787	2	200	740	S
٠.	\\\\ \\\	308.b		7,	TR7.		:517	13.1	13.1	.052	.53	13.3	42	<u> </u>	4.3	<u> </u>	280	20	500	:043	CC
	M		ر. ري	.2	.237	5.9	549	13,9	13.9	901.	1.08	5.5	īb	-	4.2	112	269	20	200	042	85
	3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/	_	 3	Ø	.225	5.હ	555	14.2	14.2	=	.13	50	90	122	3.6	011	264	20	500	040	68 0
	//X/		1.2	-	.232	5,8 8	.552	14.0	14.0	860.	66.	5.8	96	129 1	4.6		260		500	.039	
		_			.207	5.2	.5lo8	14.4	1.4	.145	1.47	3.5	86	131 8	5.0	12	254	_	525	-039	
	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		0		.204	5.1	.573	三の	14.5	. 138	1.40	3.6	901	133	5.3	13	250	17	525	.039	
	18/ 18/ 18/	308	٥.		.201	5.6	.517	14.6	ও <u>।</u>	.138	1.40	3. la	100	133	5.3	113	248			-037	
	3/5	307 9	δ.	-	58	7	.58%	14.8	14.8	. 150	1.52	3.1	101	133	5.6		744	12		1.037	
1 N 1 1 N 1 N 1	12/2/26/26/26/26/26/26/26/26/26/26/26/26/			-	181	9 7	589	14.9	14.9	,159	1.62	2.8	101	132	5,b	112	239	.21	_	J.03b	
	3/\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	3078	г.	8	571.	コゴ	.598	15.2	15.2	159	1.62	2.7	101	132	5.b	112	237			03b	
•																	3128			177	F10
	ΛL		9		1161	4.0	10	15,5	15.5	161	164	2.5	102	131	5.9	112	231	17:	525	350:	80,
	5 (S)	_	3	7	191.	4.0	19	15.5	15.5	161.	1.64	2.5	102	130	5,9	112	226	.21	_	-634	25
	S (2)		v;	Ø	677		129	15.7	15,7	171.	1.74	2.1	101	139	5.1		کجد	.21	525	034	R
	λL_{c}	_	ਕ	1	=		1629	15.9	15.9	.166	1.69	2.1	100		5.5		218	.21	525	:033	83
	11		wi c	_	139	۷) -	. le33	160	0.9	159	1.62	2.2	90	176	5.5	Ξ	213	.22	550	.033	
	۱IJ		٠; د	9	90	J .	.63c	16.1	- <u>9</u>	.163	1.66	7	8	125	5.4	9	211	.22	550	:033	
	$\mathbf{L}\mathbf{L}$		7.	- 7	134		. 138	16.2	16.2	101	19-	2.0	8	124	<u>۲</u>	9	207	.22	550	032	
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		7.	9	135		\neg	16.2	16.2	145	1.47	2.3	86	122	5.3	601	204	.22	550	032	
	UU		-	-	135	-	.642	- 6.3	16.3	140	1.42	2.4	86	121	5.3	109	201	.22	550	031	
	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	307.2	- -	8	133	70	.b47	16.4	7.9	.136	1.38	2.4	97	120	5.2	601	199	.23	575	2030	ħ
	1800	367.	a	1	177	3.2	95,7	16.5	16.5	142	1.44	2.2	97	119	5.2	109	861	.73	575	-,030	
			十	1	1												2330)			- 357	
		1	1	1	1												(12731			-1.922	_
				: ,						7						_	7717			VIOV.	7

				TEN RECO WST2	TEMPERATURES RECORD SHEET WST2-Form14 R	TEMPERATURES RECORD SHEET #14 WST2-Form14 Rev1/88			Unit: Run: Page:	H AVEATES	5 527	Serie Date:	Date: 5/13/92 Technician(s): GN		7 - Y
	T/C#	4	ស	9	7	8	6	10	=======================================	12	13	14	15	16	17
	Minute Time	Stove Top	Left Side	Back	Right Side	Bottom	Firebox	2nd Burn Catalytic	Room Temp	Tube Furnace	Sample Box	Impinger Out	C. Gas Box	C. Gas Impinger	SO ₂ Impinger
	이 이	ያዛያ	333	209	266	385	777	P02	79	1448	848	ऋ	243		36
•	δ/ /Σ	321	323	302	259	383	588	350	79	1448	847	34	247	35	3b
	0 0 0 1	211	305	302	257	380	512	084	79	8441	842	34	842	35	36
	اگا	207	288	797	248	376	507	08h	Ь L	Lhhl	862	34	848	35	36
	8/ %	201	27ዛ	292	240	310	490	7,61	79	9441	848	34	842	35	36
	71	201	262	289	225	364	વાવા	503	78	ከተተተ	248	34	248	35	36
	30 40	261	251	288	219	358	Loh	648	8۲	ከተተበ	248	34	248	35	3k
	왕 (국	306	242	189	214	351	ሀሬክ	0hg	٦8	প্রদা	842	34	842	35	36
· `	10 50	216	235	176	214	345	495	કગઠ	18	<u> १</u>	842	34	842	35	36
	マ (S)	2ዛገ	230	ا ا	212	340	ટ્યા	850	28	ባተተነ	248	34	842	35	36
,	50 1500	279	227	178	212	335	ખ્ડવ	1121	18	1447	848	34	842	38	36
	ξλ Σ		230	187	217	334	772	1105	18	1448	248	34	248	38	36
•	X	公正9 分下2		7885	2783		(67453)	(8137)	(941)	`					
	} %	346	243	201	240	332	887	1227	18	1448	248	34	248	35	36
•	ζζ /Σ	385	257	213	251	333	953	1180	79	1448	248	34	248	35	3to
÷	20/2/20/20/20/20/20/20/20/20/20/20/20/20		الرو	220	262	332	981	1231	79	1448	248	34	248	35	36
	75/	399	289	234	282	333	1050	1189	80	1448	248	34	248	35	36
	%\ %\ %\	-	302	242	287	335	1069	1202	80	1448	248	34	248	35	36
	XI		317	248	301	337	11011	1221	18	1448	248	34	248	35	36
	M_c	_	334	259	317	340	T111	1201	8	1448	248	35	248	35	36
٠	文 法 人	~	348	Slob	327	343	1115	1189	-58	1447	ንዛያ	35	248	35	36
	ος/ δς/	452	359	273	319	347	0111	1017	18	1446	248	35	248	35	36
	\$\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	र पप्	369	275	327	351	1094	993	81	1445	248	35	248	35	36
	00 2/ 2/		375	273		356	HL01	957	8	ותמת	248	35	248	35	36
	元 (2)	393	318	268		- P	1052	928	8	ነባዛዛ	248	35	248	35	36
Ē	X_{λ}	(4018)	3842	23-122	3546	\sim	(121,033)	(13593)	063						
-		17667	7047	5857	163291	84197	193487	21732	1904			-			

) ———————————————————————————————————											
	9)			TEM RECO	TEMPERATURES RECORD SHEET #14	TEMPERATURES RECORD SHEET #14 WEIT-Enem 4 Doi: 1/80			Unit:	HANGH 3	ء ا	S210 Surabate:	Date: Technician(s): <u>BN</u>	SA SIN	JSJTK
	Ş	•	ı		,	7		1	i Ding	5	d d		ı		
	Minute	Stove	Teft	ٳؖ	Right	»	5	10 2nd Brem	III	12	13	Turni name	—	16288.4	
	Time	Top	Side	Back	Side	Bottom	Firebox	Catalytic	Tenp	Purnace	Box	Out	i Box Sox	Impinger	Impinger
	0 91	363	377	८७५	313	365	1026	188	18	1444	248	35	842	35	36
•	ر ارة	352	374	260	310	367	1011	852	81	1445	842	35	842	35	36
	130 20	340	370	257	299	371	89b	938	18	9441	8/12	35	248	35	36
	<u>يَّ</u> اح	327	369	154	303	373	63 8	862	18	LHHI	248	35	247	35	36
	를 (유	318	369	249	298	375	923	848	80	8441	248	35	246	35	36
	表 (%	366	369	244	293	378	906	815	80	8/11/1	248	35	245	35	36
	S) F)	297	370	242	2810	380	986	184	80	8441	248	35	245	35	36
	》 为	293	369	235	284	381	શું જ	759	80	나하	247	35	ከተሪ	35	36
	05/09/	285	367	232	282	381	848	9hL	80	8441	246	35	244	35	3%
	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	27.7	364	229	276	379	678	729	80	8441	24b	35	244	35	36
	8-1-185/ 1-186	177	360	225	ጋገዛ	378	814	719	80	8661	245	35	243	35	36
	5/2	269	355	1221	260	376	795	1697	80	8hhl	245	35	244	35	36
	X	3698	413	2912	3478	(4504)	(1081)	(9630)	(h9b)						
	85 √5	263	349	218	256	373	772	77	۲۹.	8441	SHC	35	ንዛሳ	35	36
	Ş √Ω	255	343	717	257	371	757	الم	79	1448	245	35	ንተዛ	35	36
-	12 12 13	249	338	214	252	368	738	(o.57	79	8441	245	35	ጋዛዛ	38	36
	12/2 12/2	243	332	214	248	365	ماال	०५०	78	1448	245	35	245	35	36
	2 2 2 2 2 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3	238	32b	213	241	363	ી	629	18	1448	246	35	245	35	36
		234	321	210	235	360	678	ماام	78	1448	246	35	245	35	36
•			316	209	233	356	2010	P09	٦8	1448	247	35	246	35	36
	(5) (元)	93k	312	268	229	352	040	109	78	1448	247	35	2ዛሴ	35	36
		223	308	208	223	348	631	598	28	8441	247	35	246	35	36
	55/	220	303	206	219	343	1017	585	18	1448	247	35	246	35	36
:	1800	717	300	205	213	340	595	570	18	1448	247	35	346	35	36 4
	À	25983		2322	2606	(3939)	(1508)	G8537	6198	VTS.	TART	288.4	<u></u>		
	X	13963		110911	12413	16862)		38215)	3729	S		255.0			
•	X	(297)	(319)	(236)	(264)	(3.59)	(801)	(813)	(64)			- 33 4			

Site: EE	MC - West	, Kent,	WA 9803	2 Date:	: <u>5/13/</u> 9	Q Analy	yte: <u>CO₂ (</u>	15-1)	
Source:	Haughis	S270	SEEIE	S Run #	: <u>2</u>				
Zero Cyl	#: <u>T13</u>	2257	С	onc. <u>00.0</u> 9	CO2 _	Cyl Pre	ess: <u>800</u>	psi	
Certi:	fied by:	Liqui	O AIR) -	-		Date: 10)	1/91	
							ess: <u>900</u>		
							Date: 10/3	1	
							SN: 4070	•	
Range:(0 - 25.0%	CO ₂	A	nalyzer Ou	itput:_	0 - 1.0)	v.	
Flow:	1.5 SCFH		Meas	ured by:	Rotame	ter: <u>X</u>	Flowmete	r:	
	Value = 2							·	
				5.0% CO ₂ =					
Pre Run A	Audit: By	7:	<u>DK</u>	Tim	ie:	<u> </u>	Temp: 81	o _F	
				Audit Resu	lts			.	
Point #	Expec Meter	ted Res	ponse %	Act Meter	ual Res	ponse	+ Conc. Difference	1	
Zero		.000		00.0				.217	
Span 50.4 .504 12.6 50.2 .502 12.437 -163 -1.292									
Comments:									
	-								
Post Run	Audit: B	у:	0	Tim	e:/	815	Temp:	7o <u>∓</u>	
	····			udit Resu				<u> </u>	
Point #	Expec Meter	ted Res	ponse %	Act Meter	ual Res	ponse %	<u>+</u> Conc Difference	4	
Zero	00.0	.000	00.0	00.0	,000	.054	.054	.217	
Span	50.4	.504	12.6	50.0	.500	12.388	-, 212	-1.683	
Comments:					, -				
						•			
	ifference				\				
∡ero * Di	.rierece =		(ppm) - ull Scal	Exp % (pp e Value	m) X 10	0			

Span % Difference = $\frac{\text{Act } \% \text{ (ppm)} - \text{Exp } \% \text{ (ppm)}}{\text{Exp } \% \text{ (ppm)}} \times 100$

Site: EEMC	- West,	Kent,	WA 98032	Pate:	5/13/	92 Ana 1	yte: <u>02 (</u>	15-2)
Source: H	aughs S	3270	Series	Run #	: <u> </u>			
Zero Cyl #:	T 13	2 <u>257</u>	Co	nc.00.0 %	02	Cyl Pr	ess: <u>800</u>	psi
Certifie	ed by:	LIO	010 A1	<u>e</u>		<u></u>	Date: <u>/0/7</u>	191
							ess: 900	
	-						Date: 10/3	1
Analyzer:	Make:	'eledyn	e	Model: 3	20 Ax		SN: 3746	5
Range: 0 -	25.0%)2	An	alyzer Ou	tput:	0 - 1.	0	v.
Flow: 1.5	SCFH		Measu	red by:	Rotamet	ter: <u>X</u>	Flowmete	r:
EPA Span Va				.0% O ₂ =	+ 0.625	5% O ₂		
Pre Run Aud	it: By:		OK	Time	e:	335	Temp: <u>79</u>	o _F
			A	udit Resu	lts			
Point #	Expect Meter	ed Res	ponse %	Act: Meter	ual Res	sponse %	+ Conc. Difference	Δ 8
					i		7.003	-012
Zero								
Span							, २२५	1.809
Comments:	Teledyne	#2 <u>Cy</u>	1 * E	xp % A	Ct &	Adj t	<u>o</u> + <u>∆</u> &	
Post Run Au	dit: By	':	DK	Time	e: <u>18</u>	325	Temp.: 77	o _F
			A	udit Resu	lts			
Point #		ed Res	ponse %	Act: Meter	ual Res	ponse %	+ Conc. Difference	A 8
	Meter	DVM					028	
Zero	00.0	.000	00.0	00.0	,003	028		-,114
Span	12.4	1496	12,4	12.3	.490	12.395	005	042
Comments:	Teledyne	#2 <u>CY</u>	1 5 E	xp & Ac	ct %	Adj t	<u>ο</u> + Δ &	
+ Conc. Dif	ference	= Act	% - Exp	(Std) %				

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Site: <u>EE</u>	MC - West,	Kent,	WA 98032	Date:	<u>5/13/9</u>	Q Anal	yte: <u>CO (</u>	L5-3)		
Source:	HAUGHS	S270	SERIE	<u>S</u> Run #	: <u>a</u>					
Zero Cyl	#: <u>T13</u>	2257	Co	nc. <u>00.0</u> %	co	Cyl Pr	ess: <u>800</u>	psi		
							Date: 10/7	1		
							ess: <u>900</u>			
Certi	fied by: _	MATH	ESON				Date: 10/3	1/91		
							SN: 408			
Range:	0 - 10.0%	со	. An	alyzer Ou	tput:	0 - 1.	0	v.		
Flow:	1.5 SCFH		Measu	red by:	Rotamet	er: <u>X</u>	Flowmet	er:		
EPA Span	Value = l rol Limits	0.0% CC) S& of 10.	0% CO = +	0.25%	CO				
							Temp: 80	OF		
Pre Run	Audit: By						1emp			
	·			udit Resu	its_		+ Cong	 		
Point #		ted Res		Meter	DVM	& Sponse	<u>+</u> Conc. Difference	△ %		
Zero	00.0	.000	00.0				004			
Span 49.6 .496 4.96 49.4 .494 5.028 .068 1.380										
Comments:										
Comments:										
	·····		 							
Post Run	Audit: B	y:	<u>OK</u>	Tim	e: <u>18</u>	30	Temp.: 7	7o _F		
				udit Resu						
Point		ted Res			ual Res	ponse	+ Conc. Difference	Δ %		
#	Meter	DVM	8	Meter	DVM					
Zero	00.0	_000	00.0	00.0	.000	-004	004	044		
Span	49.6	. 496	4.96	49.1	.491	4.998	.038	.764		
Comments	•			,						
	, "									
+ Conc.	Difference	= Act	% - Exp	(Std) %						
	ifferece =	Act %	(ppm) -	Exp % (pp	<u>m)</u> x 10	0		er Programmer Programmer		
		I	ull Scal	e Value						

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

						2 Anal	yte: <u>SO2</u>	15-4)		
Source: HA	AUGHS	S270	SERIE	S Run #	: <u>a</u>			·		
						Cyl Pr	ess: <u>800</u>	psi		
Certifie	-		\wedge				Date: 10/	\		
				onc. 1232 p	om SO2	Cyl Pr	ess: <u>45</u>	O psi		
Certifie			•				Date: 9/21			
							SN: 4030			
Range: 0 -	2500 p	pm SO2	An	alyzer Ou	tput:_	0 - 1.	0	v.		
Flow: 1.5	SCFH		Measu	red by:	Rotamet	er: <u>X</u>	Flowmete	er:		
EPA Span Va	lue = 2	500 ppn	n SO ₂			E	go-			
EPA Control										
Pre Run Aud	it: By	:	DK_	Time	e:	3 <u>20</u>	Temp: 8	/_o _F		
				udit Resu						
Point "		ted Res		Act: Meter		sponse	+ Conc. Difference	Δ &		
#	Meter	DVM	ppm							
zero 00.0 .000 00.0 00.2 .002 8.432 8.432 .337										
Span 49.3 .493 1232 49.3 .493 1234. 2.000 .162										
Comments:			·				•			
Post Run Au	dit: B	y:	OK	Time	e: <u>/</u> /	310	Temp:77	o _F		
·		-		Audit Resu	lts					
Point	Expec	ted Res		Act	ual Res		+ Conc.	Λ.		
#	Meter	DVM	ppm	Meter	DVM	ppm	Difference	∇ 8		
Zero	00.0	.000	00.0	00.1	.001	5.936	5.936	.237		
Span	49.3	.493	1232	49.1	.491	1229.	-2.992	-,243		
Comments:						·	•			
+ Conc. Dif	ference	= Act	ppm - Ex	cp (Std) p	pm					

+ Conc. Difference = Act ppm - Exp (Std) ppm

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

 $\frac{\text{In } \$ \text{ Difference} = \underbrace{\text{Act } \$ \text{ (ppm)} - \text{Exp } \$ \text{ (ppm)}}_{\text{Exp } \$ \text{ (ppm)}} X 100$

Run: 2
Date: 5//3/92
Technicians: ON TR DR JS
WST6-Form3-Rev11/89

QUALITY CHECKS WOODSTOVE DATA SHEET #16

Ambient = Tr:OF T/C#30:O
Thermocouple Check (at ambient): T/C#1: 83.3 of; T/C#2: 87.6 of
T/C #3: 594.3 of; T/C #4: 411.1 of; T/C #5: 372.6 of
T/C #6: 229.8 of; T/C #7: 296.0 of; T/C #8: 402.5 of
T/C #9: 1051.8 of; T/C #10: 1213.2 of; T/C #11: 78.6 of
T/C #12: 1268.1 of; T/C #13: 1226 of; T/C #14: 84.3 of;
T/C #15: 188.1 of; T/C #16: 54.7 of; T/C #17: 61.6 of;
T/C #18: 90.1 of; T/C #19:of; T/C #20:of;
T/C #21:oF; T/C #22:oF; T/C #23:oF;
T/C #24: OF; T/C #25: OF; T/C #26: OF;
Comments: Hot START
Thermocouple Readout:
Pretest Zero/Span Check and Calibration: Zero Adj Post Test Check 7 Difference
Zero (0°F):
Span Adi Span
(2000°F): 2003.9 °F to: 2000.0 °F (2000°F): 2003.9°F 195
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF; 200°F = 202.2 °F; 400°F = 399.9 °F;
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = 200.2 °F; 400°F = 399.9 °F; 600°F = 600.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F;
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = 200.2 °F; 400°F = 399.9 °F; 600°F = 602.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F; 1200°F = 1200.3 °F; 1400°F = 1401.7 °F; 1600°F = 1603.8 °F
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = 200.2 °F; 400°F = 399.9 °F; 600°F = 600.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F;
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = 200.2 °F; 400°F = 399.9 °F; 600°F = 602.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F; 1200°F = 1200.3 °F; 1400°F = 1401.7 °F; 1600°F = 1603.8 °F
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = OOOOF; 400°F = 399.9 °F; 600°F = 600.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F; 1200°F = 1200.3 °F; 1400°F = 1401.7 °F; 1600°F = 1603.8 °F 1800°F = 1803.5 °F; 2000°F = 000.0 °F Tracer Gas (SO ₂) Injection Train Leak Check: Pre Post
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = OOOOF; 400°F = 399.9 °F; 600°F = 600.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F; 1200°F = 1200.3 °F; 1400°F = 1401.7 °F; 1600°F = 1603.8 °F 1800°F = 1803.5 °F; 2000°F = 000.0 °F Tracer Gas (SO ₂) Injection Train Leak Check: Pre Post
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check O°F = O°F; 200°F = OOOOF; 400°F = 399.9 °F; 600°F = 600.5 °F; 800°F = 803.0 °F; 1000°F = 1000.3 °F; 1200°F = 1200.3 °F; 1400°F = 1401.7 °F; 1600°F = 1603.8 °F 1800°F = 1803.5 °F; 2000°F = 0000.0 °F Tracer Gas (SO ₂) Injection Train Leak Check: Pre Post Combustion Gas (CO ₂ ,O ₂ ,CO) Train Leak Check: Pre Post Tracer Gas (SO ₂) Analyzer Train Leak Check: Pre Post
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check 0°F = .O °F; 200°F = .O °F; 400°F =
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = DOO OF; 400°F = 399.9 °F; 600°F = 600.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F; 1200°F = 1700.3 °F; 1400°F = 1401.7 °F; 1600°F = 1603.8 °F; 1800°F = 1803.5 °F; 2000°F = 2000.0 °F Tracer Gas (SO ₂) Injection Train Leak Check: Pre Post Combustion Gas (CO ₂ ,O ₂ ,CO) Train Leak Check: Pre Post Tracer Gas (SO ₂) Analyzer Train Leak Check: Pre Post Post Draft (Static) Guage Zero Check: Pre Post Post
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = O OF; 200°F = DOO OF; 400°F = 399.9 OF; 600°F = 600.5 OF; 800°F = 803.0 OF; 1000°F = 1002.3 OF; 1200°F = 1700.3 OF; 1400°F = 1401.7 OF; 1600°F = 1603.8 OF 1800°F = 1803.5 OF; 2000°F = DOO O OF Tracer Gas (SO ₂) Injection Train Leak Check: Pre Post Combustion Gas (CO ₂ ,O ₂ ,CO) Train Leak Check: Pre Post Tracer Gas (SO ₂) Analyzer Train Leak Check: Pre Post Draft (Static) Guage Zero Check: Pre Post Scale Check Pre (Wt, #'s): 321.5 - 311.5 - 10.0
(Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check OF = OF; 200°F = DOO OF; 400°F = 399.9 °F; 600°F = 600.5 °F; 800°F = 803.0 °F; 1000°F = 1002.3 °F; 1200°F = 1700.3 °F; 1400°F = 1401.7 °F; 1600°F = 1603.8 °F; 1800°F = 1803.5 °F; 2000°F = 2000.0 °F Tracer Gas (SO ₂) Injection Train Leak Check: Pre Post Combustion Gas (CO ₂ ,O ₂ ,CO) Train Leak Check: Pre Post Tracer Gas (SO ₂) Analyzer Train Leak Check: Pre Post Post Draft (Static) Guage Zero Check: Pre Post Post

TEST No. :

5/15/92 DATE: S-27X MODEL: *************************** PERCENT S₀2 DELTA METER PERCENT METER TIME COCENTR. CO C02 TEMP. H READING (%) PPM (용) (DEG. F) (IN. H20)(MIN.)(C F) ________________ 475 77 0.78 5.10 0 617.800 0.150 77 400 3.20 619.300 0.67 5 0.210 475 77 0.69 2.90 10 621.099 0.150 525 622.615 0.120 78 0.75 3.20 15 79 0.89 3.20 525 623.992 0.120 20 80 0.64 6.20 475 25 625.374 0.150 400 626.907 83 0.15 8.20 0.200 30 400 84 0.19 7.80 0.200 628.747 35 10.30 425 85 630.593 0.19 0.180 40 425 85 0.12 10.40 0.180 45 632.338 0.09 10.40 425 88 50 634.083 0.180 350 0.10 11.00 55 635.847 0.260 84 0.07 10.00 350 84 60 637.957 0.260 86 0.12 9.10 350 65 640.067 0.260 375 70 642.192 0.230 86 0.09 9.70 350 644.176 0.260 87 0.09 10.00 75 375 86 0.14 8.60 80 646.310 0.220 86 0.33 8.00 375 0.220 85 648.294 0.28 400 86 8.50 0.200 90 650.278 400 86 0.25 8.30 95 652.138 0.200 400 653.999 0.200 86 0.33 6.70 100 86 0.70 5.90 450 105 655.859 0.160 0.79 86 5.70 475 110 657.513 0.140 500 115 659.080 0.130 86 1.09 5.60 500 120 660.569 0.130 86 1.40 4.70 86 1.29 4.40 500 125 662.058 0.130 4.20 500 130 663.547 0.130 86 1.40 665.035 86 1.35 3.90 500 0.130 135 86 3.70 525 1.48 0.120 140 666.524 86 1.48 525 145 667.942 0.120 3.50 86 3.30 525 150 669.360 0.120 1.46 525 155 670.778 0.120 86 1.50 3.20 85 1.46 3.10 525 160 672.196 0.120 525 85 1.46 3.10 165 673.609 0.120 1.45 3.40 170 675.022 0.110 85 550 175 85 1.39 3.60 550 676.370 0.110 85 180 677.719 0.110 1.40 3.50 550 185 85

TABLE 2 ---- FIELD DATA

tour (CLIENT : HA	AUGHS PRO	DUCTS		TEST No.	: 4	
	MODEL: S-	-27X ******	*****	*****	DATE: *****	5/15/92 ******	
	METER CAL. FACTOR (Y) -		1.066	Wt. WOOD BURNED(LB)	10.5	Lbs
Name of the state	BAROMETRIC PRESS.(Pb)		30.12 in	WET, FUEL Hg MOISTURE	%	18.306	ફ
210	LEAK RATE POST (Lp)		0.005 cfr	Wt. PART. n COLLECTED		0.5836	g
Sec. C	WATER VOL. (V1c)		104.2 Ml	METER VOLUME Vm	and this was used two saids but	59.919	mcf
	TEST TIME (MIN)		180 mi:	HC MOLE FRACTION		0.0132	get e

TABLE 3 ----FIELD DATA AVERAGES

	CLIENT :	UNITOUS DE	PODUCES		TEST No.	. 4	
	MODEL:	S-27X	******		DATE:	• 5/15/92 ******	***
arwas)	AVG DELTA		0.17 in H2O	AVG PRCNT			
	AVG METER	· ·	84 deg F	CO AVG PRCNT		0.76	8
iven.	AVG PPM		64 deg r	CO2		6.10	ક
	S02		• 457 PPM				

TABLE 4 CALCULATIONS

	TABLE 4 (CALCULATIONS	
CLIENT : HAUGHS PRO	DUCTS	TEST No. :	4
MODEL: S-27X ************	******	DATE: !	5/15/92 ********
STD SAMPLE VOL. Vm(std)	62.40 dscf	STACK GAS FLOW Qsd	571.338 dscf/Hr
		J.	& 9.52 dscf/min
VOL. WATER VAPOR Vw(std)	4.905 scf	PARTICULATE CONCTRT. C s	0.0094 g/dscf
PRCNT MSTR Bws	7.29 %	PARTC.EMISS. RATE E	5.34 g/Hr
BURN RATE BR	1.30 Kg/Hr	MOLES OF GAS PER Lb WOOD Nt	0.52 Lb-mole/Lb
CO EMISSION RATE	145.10 g/Hr &	PART.EMISS. RATE	4.12 g/Kgdry fuel
Tanada a sa sa sa sa sa sa sa sa sa sa sa sa	111.79 g/Kgdry fuel		

TABLE 5 ---- PROPORTIONAL RATE VARIATION

		TABLE 5	PROPOR	CTIONAL R	ATE VA	KTATT	ON			
record .	HAUGHS PRO	DUCTS			TEST	No.	:	4	•	
	S-27X		****	ملد ملد داد داد داد داد داد داد داد داد داد د	DATE	: 	5/15/	92		**
	**************************************	PPM	PROPRTN.	*****	PROP	RTN				
	INTEVAL Ti	* Vm	RATE VAR. PR		RATE AVER	VAR. AGE				
	=======		========			=====	=====	====	=====:	====
	5	752.2	98			100	L C	•		
	10	759.8	99	-	*					
	15	759.5	99						, i	
	20	761.0	99.		**	* .			•	
	25	762.4	9 <u>9</u> 99			•				
	30 . 35	762.3 767.8	100			200				
	40	768.9	100		•					
	45	771.5	100							
	50	769.4	100							
	55	778.5	101							
	60:	769.8	100	e.				2		
	65	768.4	100	•						
	70	772.4	100							
	75	771.9	100			7				
	80	775.0	101			42.5				
	85 90	772.6 772.6	100 100		4	11 - 1				
	95 95	772.6								
	100	773.0	100						Section 1	
	105	772.6	100		1 1		,			
	110	772.8		er Line and						
	115	772.8°	100	. :						
	120		100	The second secon						
•	125	773.0	100							
	130		100							
	135	772.5	100					Service .		٠.
	140 145	773.0 772.9	100 100			•	18 17			
	150	772.9	100							
	155	772.9								
	160	773.6	100							
	165	771.6	100							
	170	771.6	100							
	175	771.1	100							
	180	771.7	100							
	185							2.0		
	190									. *
			and the second second							

	WST
COMPUTER INPUT DATA	WOODSTOVE DATA SHEET #1
Client Haugh's Production Court	
Client Address 10 Otlas Cou	
Bramp Ton, On	tario, Canada 16T SCI
Client Phone 4/6-192-8000	
Project No Model No.	
Run No. 4 Date of Test 5/13	/ 92
Stove Type: Cat Non Cat	Pellet
Data To Be Submitted To: OregonX	Colorado EPA X
Burn Category: Low (<0.8 Kg/Hr)	Med Hi (1.26 - 1.90 Kg/Hr) 1.39
•	g/Hr) Max (>1.9 Kg/Hr)
Fuel % Moisture (dry) 00,408	"(wet) 18,306
(00.00) (Data Sheet #10)	== == 10 (:
Stack Static Pressure	<u>,048 / "+</u>
(0.000) (Data Sheet #12)	· 30,12
Barometric Pressure	00/12
(00.00) (Data Sheet #2)	$2/\sqrt{2}$
Temperature (Average Room) Combustio (00) (Data Sheet #14)	n Air 4
Flue Gas Moisture	7.2824
(00.000) (Data Sheet #7)	
Ambient Moisture	LA-
(0.00) (Data Sheet #8)	
Stove Weight	
(000) (Data Sheet #8)	01/
Stove Temperature Change	<u> </u>
(000) (Data Sheet #14)	W.12 /
Particulate Emission(0.0000) (Data Sheet #7)	<u>,1442 </u>
Fuel Higher Heating Value (dry) (0000) (CT&E Sheet)	BTU/
Fuel Type: Wood: X Pellets:	
Total Fuel Consumed During Burn	10
(00.0) (Data Sheet #8)	1
Total Particulate Catch	_ , <i>5</i> 836 ⁄
(0.0000) (Data Sheet #6)	1010
H ₂ O Captured	104.2
(00.0) (Data Sheet #3)	
Dry Gas Meter Volume	59,919
(00.000) (Data Sheet #2)	
Dry Gas Meter: Y Factor: 4J-1.066	Post Test Leak Rate 005 C
1)PV God Massas V Massas 711 7 / //4/4	- FIRST LOST LOSV PSTG /L//) - P!

Meter Box Data Sheet Page # 2

Meter Box 4 Y Factor 1.066

Leak Checks: 15.0 " Hg @ .005 cfm cfm cfm cfm

Unit: HAUGHS SQ7X

Run: $\frac{4}{}$ Date: $\frac{5/15/92}{}$ Operator(s): $\frac{716}{}$

Nozzle: Probe @ 3/8 " od

Inject SO2 @ 100 cc/min

LITCIA									
ROTO	PRESS:	/8	Sampling	Ratio :	_25_	. : 1	BAROME	ك: TER	
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	902 PPM	ROTO TEMP	PUMI
00	1005	612.800	<i>,</i>	7. 433	15	77	475	12	02
05	n l	69.300		8 826	,21	72	400	12	0.5
10	15	621.899		1.433	,15	77	475	72	2.5
15	20	622615	;	6725	12	18	525	72	05
20	25	623,992		6.725	1/2	74	252	72	05
25	30	L25,374	[.	7-433	115	80	475	72	05
30	75	626.901		8826	, 20	83	400	72	0.2
35	YU	628.147		8-816	,20	84	400	72	10
40	45	630 593	[8291	.18	85	425	23	10
45	50	632.338		8.291	118	85	425	13	10
50	N	634.083		8-291	.18	88	425	23	15
55	1100	6358Y1		10.068	126	87	320	73	1 / 5
ROTO	PRESS:	18	TOTALS :	(97.168)	(2.10)	977	BAROM	_ , _ , , , , ,	30/
60	5	637.957	-	10068	, 26	84.	350	73	2,6
65	10	440.067		10.049	,26	86	330	74	2.0
70		642.192	<u> </u>	9.379	,23	86	375	//	2.0
75	20	624.176		10,049	,26	87	350	74	20
80	25	646,310	<u>[</u>	9.379	,22	86	375	27	2.0
85	30	648294	<u>[</u>	9.379	,22	86	325	24	2.0
90	35	650.218	I	8793	.2D	86	700	74	20
95	70	652138		8-777	,20	86	400	25	2,
100	45	653.999		8-177	,20	86	400	75	2.0
105	10	1	1	7.802	1/6	86	450	25	20
110	Ó	657.513	1	7391	14	86	475	25	1-5
115	1200	659.080	1	7.021	./3	86	500	15	10
			TOTALS:				MAX V		
TOTÁ	L CU FT		TOTALS:	204032	1 (4.58/	2003	AV BP	:	

Nozzle: Probe @ 3/8 " od

Initial Volume: _/-500____

BOTO	PRESS:	18	Sampling	Ratio :	25	: 1	BAROME	TER:	0/2
MN	TIME	METER		STACK	DELTA	METER	S02 Mqq	ROTO TEMP	PUMP
711.4		READING	_	DSCFM	H 10	TEMP	500	25	10
120	1205	660.569	-	7.021	,13	86		15	05
125	10	662058		7-021	<u>, 13</u>	86	500	15	0.5
130	15	663.547	-	7021	./3		500	25	
135	. 20	665 035		7021	, /3	86	500	25	0.5
140	25	1066 527	ļ .	6687	,/2	86	325	105	
145	30	667.942		6.682	1/2	86	525	2)	05
150	35	669360	<u>.</u>	6687	, /2	86	525	()	0.5
155	40	670 178		6.687	1/2	86	525	25	1
160	45	612.196]	6687	,12	85	525	25	05
165	10)	673-1009		6687	,/2	85	252	25	0.5
170	ις	625,122	Ţ	6383	.11	85	220	25	0.5
175	1300	676370		6383	, 11	85	225	75	05
ROTO	/ / _ / _ / _ / _ / _ / _ / / / / / 		TOTALS :	(a80.97	1.46	1028	<u> </u>	ETER:	1
180	5	622.719		6383	11	85	220	7-	0.5
185	~			ļ					
190			1	(87.355	1.57	11113			
195							37		<u> </u>
200			7					<u> </u>	-
205			1				<u> </u>		
210			1					<u> </u>	—
215		,	T				<u> </u>	<u> </u>	
220			T						
225		,	7						
230	 		7						1
235			7						<u> </u>
			TOTALS:					ACC =	
тота	L CU FT	59919	TOTALS:	291.38	6.150	3/2/	AV BI): <u>3</u>	0-12-

7.875 (166) (SYV)

MOISTURE SHEET Woodstove Data Sheet #3

Moisture Determination

	lance roed	Unit: #	auch 5270X
Final:		Run:	4
IMPINGER #1		Date:	5/15/92
Final Weight 658,2	_ grams	Technician(s): I	nitial: 7
Initial Weight 573.5	_ grams	·	inal: TK
Net <u>84.7</u>	_ grams	Approved By:	R
IMPINGER #2			
Final Weight 590.0	grams		
Initial Weight 583.4	grams		
Net	grams		
IMPINGER #3	•	· · · · · · · · · · · · · · · · · · ·	
Final Weight 495.2	grams		
Initial Weight 491.4	grams		· .
Net	grams		
IMPINGER #4 (SILICA GEL)			3
Final Weight 874.8	grams		
Initial Weight 862.7	grams		
Net	grams		
ı	OTAL MAS	S OF H ₂ O CAPTURED	1040 grams
Scale Check: 295.0g = 295 590.0g = 590	<u>C_D</u> g	Front Half Fi	lter # 2 (3 F
885.0g = <u>888</u>		Back Half File	ter # 263B
Notes:			·
·			
		,	

		WOODSTO									· /		
, coases	Into Des	sicator	Date	3 <i> 17 91</i>	Z Time	<u> 0900</u>	_ By_	DK (F)	ont	Half.	Bac	k Hali	E
	Manufact	urer:	<u>S & S</u>	<u> </u>		Size:	<u>0 mm</u>	Lot.No	·: <u>Z</u>	B882	. Grade	<u>#250</u>	<u>GUASS</u>
, command of	Filter F					Second	Date	Time	Ву	Thir Wt	d Date	Time	Ву
	# W 261 FO.	1097 3				4699	2/03	1300		W.L.	Date	TIME	Dy .
-	262 FD.	7011	1/2	10		7017	1	1301	(7)				
:	26340		7	12	- / [985		1300		HAU	WES EN	4	
	264F0			14	1	894		1303					
	265 FC			16		917		1304					
	266 FO		<u> </u>	18	1,	6936		1395					
	267FO	.6936	1 162	0	/ /	0937		Boc					
:.)	268 FO.	7015	16	22	1/	1010		1307					
	269 50	.6933 \	16	<u> </u>		,436		1328				<u></u>	
	270HO.	6965	16	26	1/1	0965		1300					<u> </u>
, moreon			,			I			-				
	271FO.		20 16	28 L	<u>) 10</u>	_		1330					
	272FO.		r	30	7	7005		1331		·			
	273 6.			32		660		1330					
	274HO.			34	• ""	903		1333		 			
	275F0.			36		975		1334					
toud	276 flo.			38		999 914		1335	1		 		
	277FO.		7	10		99/		133G 1337					
·)	279FO.			12		900		1332		.			
	280F0.	1.904		46	16	997		1339		.			
	20010	9171	- '''	7()		17.1.	- 4	· • • • • • • • • • • • • • • • • • • •	- \lambda				
							••••						
			7							1	,		
Transfer of the second	Checked	by	1/					Dat	e :	3/24	/9/ Time	090	ıÙ
-										• •	-		E.
			WEIGH		<u> </u>			LANCE R	i i		ONMENTAL	CONDI	
	Filter #	WT	Date		Time	Ву	WB	DB		RH	Date	Time	By
						4	60	74	4	4	3/20	1606	DK-

	QA KE	WEIGH	 	
Filter #	WT	Date	Time	Ву
		•		

ŴВ	DB	%RH	Date	Time	Ву
60	74	44	3/20	1606	DK
59	13	43	303	130	1/co

WOODSTOVE DATA SHEET #4-1: INITIAL FILTER WEIGHTS (TARE WEIGHTS)

anufa	cturer:_	<u></u>	<u> 55 </u>		_ Size: <u>\</u>	<u>. Z cm</u>	Lot.No).: <u>±</u>	<u>B 901</u>	rade:	the Cr	AS:
	First	2		Ву	Second Wt	Date	Time	Ву	Third Wt	Date	Time	Ву
	0.3846	Date		DK				90	<u> </u>	2022		-27
	0.3872		1528	-	3827	Y	1342	ارميال				
	0.3805		1530	1	.32/0		1343		HAUle	MS.	204	
	0.3811	/	1S32	1	-3218		1344					
	0.3821	/	1534	1	-3824		1345					
	0.3822	1	1536		138aN		1346					
	0.3817		1538	1	-3888		1347					
	0.3772		1540		13770		1348		i			
	0.3875		1542		3810		1340		!			
	0.3813	1	1544		-3869		1350					
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	-											
2718	0.3884	3/20	1546	1014	13884		1351		,			
272	8185.0		1548		-3813		1359	_				
<u> 2736</u>	0.3825		1550		,3821		1353					
2748	0.3856	/	1552		/3853		1354	_				
<u> 2750</u>	0.3832		1554	_/_	<u> 3830</u>		1355					
2769	0.3862	_/_	1556	/	386H		1356					·
	<u>0.383b</u>		1558	<u> </u>	323A		13s?					
	0.3801	_	1600		380A		/3空					
	0.3827		1602		3822	-	1359	_	<u> </u>			
<u> </u>	0.3821		1604		3218	V	1400	1				
			1					e:(_ / _ /		190	

	QA RE	WEIGH	·	
Filter #	WT	Date	Time	Ву

BALA	NCE R	OOM ENVI	RONMENTA	L COND	ITIONS
WB	DB	%RH	Date	Time	Ву
60	74	44	3/20	1524	DK
559	23	43	3/03	1340	5
,					

INITIAL BEAKER WEIGHTS (TARE WEIGHTS) Into Dessicator: Date: 4/17/92 Time: 1000 By: DK Beaker First Second Third Date Wt Time By Date Time B Date Time Ву Wt Wt 4/01 1330 Por 96-8870 501 4001004 DK 96.8874 502 98.5625 1334 48.5630 1006 91.2044 503 91,2041 1008 1336 95.0584 504 95.0582 1010 1338 106.4504 505 106.4506 1340 1012 134/2 506 94.1600 420 1014 DK 94.1604 507 88.9867 82.9870 1344 1016 508 103.1077 103.1017 1346 1018 509 A5.7024 95,7026 1348 1020 104-8757 1350 510 104.8758 1033 511 107.7742 4/20 1024 DX 107,7745 1352 106.3855 1354 512 106.3852 1026 HAUGHS EN4 513 199.2412 99.0417 1356 1028 514 108 6344 1358 108.6340 1030 106,2264 106.2259 1032 1400 1 5/6 105.6750 4/20 1034 01(105.6745 1402 517 194.7160 194 2160 1036 1404 518 103.8296 103 .8300 1406 1038 519 1408 100.0063 100,0063 1040 198.6266 98.6267 1410 1042 97.7535 4/20 1044 DK 97.7537 1411 522 103,9227 103 9209 1416 1046 523 94.9397 94.9400 1048 1418

Checked By:

QA REWEIGH

Date: 4/21/92 Time: /4/5

BALANCE ROOM ENVIRONMENTAL CONDI

106 2571

Beaker #	WT	Date	Time	Ву
,		_		

1050

524

106.8567

Time	Date	%RH	DB	WB
1003	4/20	46	72	59
1330	4/01	44	74	(0)
1550	4/41	44	714	ω
	1000 1330			

					MO	WOODSTOVE DATA SHEET	SHEET	#4-31	CONS	CONSTANT FINAL WEIGHTS	ICHTS			WST5-F Unit	orm9,Pg 42064	WST5-Form9,Pg1,Rev4/90 Unit_ <i>//ハいちH</i> S Sコア) 2 7
														Run #		7	
J.E					-		FINAL	FINAL BEAKER WEIGHTS	K WEI	GHTS				Date:	5//3	15/92	
<u>ا</u> ي	beaker into # Dess	ပ္	Date	Time	By	First	Date	Time	By	Second	Date	Time	By	Third	Date	Time	BV
	21/2		5//8)(O) 00b0	D	107. 8712	5/19	938		DK (107,8717	5/19	138	8				
1																	
	275	-	5/18	0000 DK	ğ	106, 5011	5/19	940	OΚÜ	14.5019	5/19	717	No.				
]										\\\			5				
<u>.</u>	273		2/18	5/18 0900 DY	Q	99,2960 5	5/19	Chb	0K /	199.8955	5/4	MU	No.				
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						FIN	AL FI	FINAL FILTER WEIGHTS							
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TONS		%RH	77.77	7	43	777	
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ONMEN		By	경	3	\$	ΟĶ	\$
ENVIR		Time	1600	115 948 BN	33	Be	12
ROOM		Date	09/1/21/60	5//8	61/5	919	1 Kg 12 00 00 15
SCALE ROOM ENVIRONMENTAL CONDITIONS	Weighing	Session Date Time By	1	2	3	4	ır
 -							
HTS		Ву			By		: :
WEIG		Wt			WT		
FINAL		Final			Final		
QA REWEIGH: FINAL WEIGHTS		Beaker # Final Wt By			Filter # Final WT		
8		Date			Date	\neg	

SCALE	SCALE KUUM ENVIKUNMENTAL CONDITIONS	ENVIK	JUMEN.	EAL C	UNDLT	ONS
9	,					
7						
8						
6						
Comments	_					

WST7-Form1-Rev5/90

Dates: From 4 33 3

Through

WOODSTOVE DATA SHRET #4-4 SCALE QA SHRET

Scale Sartorius Model A1205 SN 37010004

100g	10g	1.00	100mg	H lenk	Rlonk	- -	}-	+			
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el A1205 SN 37010004 Sartorius 學 7 \mathbb{C} 25 350 17 WST7-Form 4/3 444 J Mode 1 B Scale Bulb न्य प्रमुख स्टिश्रिय प्रस्कार में सि 2003 BY \$557 \$98 30 Bulb 4岁 382200000 4538 20 120 0400 570 9 630 600 Date | Time **5-5#** 3/26 WOODSTOVE DATA SHRET SCALE QA SHEET Tech SP))) が Beaker Blank Filter Blank 09999 0998 0.1003 0.0998 0.0998 0.0999 0.0998 0.0978 0.0978 0.1003 , 1000 0.1000 0.6791 0999 0660 1000/ 0.1000 8 0001.0 0001'0 48) 8 Weight 0.1002 000 3660 -1001 01/0 0.1001 0.1000 100mg 0.1001 4994 5555' ,000 A 86660 0000 0,9999 Weight 0.0007 0000 0000 .0000 100 10001 0.9999 90, 900 4000r 1000 1000 6000 0002 1.0g 000 dona a 000001 Weight 00000 0003 10,0003 9.9999 10,000 10,000 10.0000 9.9997 0.000 000000 10,0003 88/0 0.0000 9.9999 0.000.0 67999 16550 10.0001 10.0001 0000 000 0,000 Dates: From 3/ 108 0000 001 100.0003 44,9945 99.9998 0000'001 Through 80,000 19 AS12 0000 <u>00,000 0</u> 400000 00.000 0000.000 49 9999 8 - 88 1000 001 99.9999 1000,001 9499 700.000 364555 555555 49.9997 4.497 00.000 Weight 1000001 100g

WST7-Form Tev5/90

WOODSTOVE DATA SHRET #4-4 SCALE QA SHRET

Dates: From

Through

Scale Sartorius Model A1205 SN 37010004

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Dry Bulb	[4]	30)	59	70	(b)	75	12	1)	dir.	177	70	15	1	7-	16	11/2	59	67	20	67	1/	11	þĽ	12	17	13	73	12	70	13	0,0	λ,	18	75	0%
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Blank Beaker																																				
Biank Filter																																				
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WOODSTOVE PARTICULATE CATCH PROCESSING WOODSTOVE DATA SHEET # 5

Unit:	Ha	rugh	Sa	10 X
Run:	4	Date:	5	15/92
Technic	cian(s	5):	Z	,

	To	chnician(s):	
	ı e	ennician(s):	
	FRONT HALF		
FILTER #: 267 F FINAL WT:	BEAKER #: 500	FINAL WT:_/C TARE WT:_/C NET WT:	27.7745
FILTER #: g FINAL WT: g TARE WT: g NET WT: g	BEAKER #: ml: desc: ACETONE	TARE WT:	g
	TOTAL VOLUME OF AC	ETONE	
	BACK HALF		
FILTER #: 2638 FINAL WT: 4740 g TARE WT: 3810 g NET WT: 10930 g	BEAKER #: 5/2 ml: 780 desc: ACETONE	FINAL WT: <u>/0</u> TARE WT: <u>/0</u> NET WT:	6.5009 6.3855 1154
FILTER #: g FINAL WT: g TARE WT: g NET WT: g	BEAKER #: 5/3 ml: 75 desc: METHCHLOR	FINAL WT: TARE WT: NET WT:	19-8955
	BEAKER #: 57/ m1: 150 desc: H20	FINAL WT: /0 TARE WT: /0 NET WT:	8.7011
	BEAKER #: 575 m1: /50 desc: H20	FINAL WT: 10 TARE WT: 10 NET WT:	16.2871 g 16.8964 g 1.0607 g
	BEAKER #: ml: desc:	FINAL WT: TARE WT: NET WT:	
	BEAKER #: ml: desc:	TARE WT:	
	TOTAL VOLUME OF ACEUSED IN WASH TOTAL VOLUME OF DIGUSED IN EXTRACTION TOTAL VOLUME OF DIGUSTER	CHLOROMETHANE	180 m1 75 m1 300 m1

		WOODSTOVE	E BLONK	= opnces	SING	Un	it:	HAUGH	5 50	7 X
		WOODSTOV	JE DATA	SHEET #	5A	Ru	ın :	4	Date: 5	115/96
	1	BLANKS DONE	: <u>5/</u>	1/90		Te	chnic	cian(s)	. 22 De	CTK
	1 9	MI FISHER OPT MI DICHL FISHER OPT MI DISTIL WEAR OF	ACET IMA LOT BEAKER IMA LOT BEAKER LED WAT	#: <u>5</u> HANE 9163 #: FR	26	TAR NE FINA TAR NE FINA TAR	E WT: T WT: E WT: T WT: E WT:	96.8	40-8 40-4 10-6	9 9 9
		BEAKER	TARES	INTO	DESSC:	TIME: <u>O</u>	900	DATE	: <u>3/17/</u>	92
	BKR #	1ST WT	TIME	2ND WT	TIME	3RD	WT	TIME	4TH W	TIME
	<u>D</u>	106,0038		106.223	<					
	E	96-8424	1308	196.8424	1) 1038					
,	F	196.5109	1330	96.5106	0040					
	s	CALE ROOM (QC : TA	RES		SCA	ALE RI	DOM QC	: FINAL	.s
	DATE	TIME B		DB %		DATE	TIM		WB	DB %
	3/A3 3/24	1300 /te		72 43		5/13 5/14	1630	- SW3	56	74 40
						5/15	/200) かい	60	74 44
									•	
!			BEAKER!	S: FINAL				·		
	BKR #	IN DSC	TIME	1ST WT	TIME	SND	L	TIME	3RD WT	TIME
	D	5/12	0900	106.2243	_ I	106,00	- ' '	८६५		
	ω -	5/12	0900	96 8431	1050	96.84		1781		
į	F	5/12	1330	96.5112	1700	96.51	14	1230		
	BKR #	4TH WT	TIME	STH WT	TIME	6ТН	WT	TIME	7TH WT	TIME
<u> </u>			· .							

NET PARTICULATE CATCH CALCULATION WOODSTOVE TEST DATA SHEET #6

Unit: HAUGHS SD7 Run: 7 Date: 5/5/92 Technician(s): TX TK WSTAPP1-AppDoc19-page2 Rev 6/90

Blank Audit: By: Im Kelly Date: 5/18/92
Blank Calculations:
Acetone: /0004 g = 200 m1 = -00000 g/m1
Dichloromethane: , 0004 g = 75 m1 = 0000533 g/m1
Distillted Water: g =
Front Half Catch:
Filters: 10990 g - (0000 g) = 10990 g Total Catch No. of filters Blank Value/ Net Catch filter
Beakers: 1972 g - 100 (00000 g) = 10970 g Total Catch ml of Acetone Blank Value/ ml of Acetone
Total Front Half Catch
Back Half Catch:
Filters: 0930 g - (.0000 g) = 0930 g Total Catch No. of filters Blank Value/ Net Catch filter
Beakers
1. Acetone/Impingers: Cooperation
2. Extract/Impingers: OS38 g - 75 (2000533g) = 0534 g Total Catch Dichloromethane ml of Dichloromethane methane
3. Water/Impingers: 1274 g Total Catch ml. of water Blank Value/ ml of water Met Catch ml of water
Total Back Half Catch Total Catch Total Catch 7836 g 7 Front Half

EPA WETHOD SH PARTICULATE CALCULATIONS NOODSTOVE TEST DATA SHEET #7

Bun: Hauch's SDJK
Run: 4 Date: 5/15/90

NST3-Form 1 8/28/91 Technician(c): IS TK 166 - H20

1-Shh-00 0000,0000 13.6 1) Vacetdo: (59,919 Vanc 17.65 201066 Tachte 30,18" Hgi (But 1/18)

- decf

1505T 000 000 2) VH(8td): (.04707)(|04.9 ... H20):

13839 . BH X 100 = ,018B. 0000 ' 4 9047 set : 69,4451 deets (4.9047 ···

4) Co: (-5836-9.) (15.43): (1442 grideof

00,0000 - dsofm)(50)= 000,000 deof> 5) Estinated g/hr:

computer printout meter correction factor (Y factor) of the meter box used for the test average barometric preseure during the test or the test in degrees Absolute ater box during test cought during dec fa

Run # 4

Date 5/15/92

Technician RN TS.TK. DK

WST6-Forml, Rev11/89

MISCELLANEOUS TEST DATA WOODSTOVE DATA SHEET #8

Useable Firebox Dimensions: See QC Section Useable Volume: 1.473 ft
Dilution Tunnel Draft (If applicable): Start O Stop O
Test Chamber Air Velocity: Start: O Stop: O Avg: O
Wet Bulb/ Start: WB: 56 °F DB: 66 °F /. 2 % Amb Moisture 54 %
Dry Bulb Stop: WB: 58 °F DB: 72 °F 1.2 % Amb Moisture 44 % Relative
$\overline{x} = 1.2$ Moisture $\overline{x} = 49$ Humidity (RH
Impty 220
Stove Wt: 237 lbs.
stove Wt with Stack (Inc. Oil Seal) Wet: 305.2 lbs.Dry: 304.4 lbs
Impty Stove Wt with Stack and Ash Ash: Ø lbs. Total: Ø lbs
Cindling Wt. Paper: .3 lbs. Wood: 8.0 lbs
re Burn Fuel Wt. 10.0 + 9.3 Total: 19.3 1bs
otal Kindling and Pre Burn Fuel Wt 27.3 lbs
oal Bed Wt-lbs: Range(2.6 - 2.1) 367.0 -306.5 lbs. Actual: 2.6 lbs
Illowable Amount of Charcoal that can be removed: oal Bed Wt. Range $\left(\frac{2.6}{\text{Upper Wt.}} + \frac{2.1}{\text{Lower Wt.}}\right)^2$.25 =
est Fuel Wt-lbs: Ideal lbs. Range: lbs. Actual: 10.5 lbs
est Fuel Size (pcs.) (.75 x 1.5 x 5" Flanges) / Pcs
2 x 4's x 18 ³ /4 " 4 Pcs 10,5 1bs. 100 7.
4 x 4's x NA " NA Pcs NA 1bs. NA 7
st. Dry Burn 10,5 - (10,5 x,18306) x 60 = 1,9982 ate (Kg/Hr.) 2.2025 80 Est.Dry Burn Rate (Kg/Hr
st EPA Heat Output(HO _E) (19,140) X <u>63</u> x <u>1898</u> = <u>15653</u> Avg BTU's/Hr) Est Heat Output (HO _E) BTU's/Hr
Omments: 125 = 1.869 185 = 1.263

Unit: HAUGHS	5 <u>S27X</u>	Run:4_	Date:	5/15/92	Page 9
	WOO	DSTOVE OPER	ATING DATA	e e	
FIRE STARTED:	0725	P:	STOPDST		
WARM UP AND P up/preburn fu preburn.	REBURN: PRIM el charges, t	ARY AIR: se hen set to	t wide open 	for all war at star	m- rt of
SECONDARY AIR	: <u>NA</u>	CAT BY	PASS: <u>NA</u>		•
CHARCOAL BED up/preburn ch leveled. In s	arge. At 1 1/ tove	2 min. prior sec	r to loading	, last fuel,	raked and
TEST: Door W					
PRIMARY AIR: setting of	opened full f	or first	5 min-	, then set	to run
SECONDARY AIR	NA	CAT B	YPASS:	<u> </u>	
FAN: ON OFF d ON OFF first Fan speed set	30 mi	nutes of te	during orebust	irn F balance (of test run
WOOD DATA: K	INDLING: a mi	x of the gr	ades li sted	below	
WOOD DATA: K	INDLING: a mi SIZE	x of the gr MILL			ECIES
	SIZE		GRADE	SPE	ECIES orn D fir
	SIZE PREBURN: <u>2X4</u>	MILL	GRADE ma <u>Std or</u>	SPE btr 5.	
	SIZE PREBURN: 2X4 TEST: 2X4	MILL Manke/Taco Packwood Packwood AM	GRADE Ma Std or	SPE btr 5.	arn D fir
	SIZE REBURN: 2X4 TEST: 2X4 4x4 FUEL APFI#:	MILL Manke/Taco Packwood Packwood AM	GRADE Ma Std or	SPE btr 5.	arn D fir
PELLET All grades WC WARM UP INFOR All pre-burn/	SIZE REBURN: 2X4 TEST: 2X4 4x4 FUEL APFI#: CLB rules RMATION: Warm up fuel	MILL Manke/Taco Packwood Packwood AAA pieces were	GRADE Ma Std or #2 or #2 or	spectros. otr s. otr s.	grn D fir grn D fir grn D fir
PELLET All grades WC WARM UP INFOR All pre-burn/ 1st warm up/p	SIZE REBURN: 2X4 TEST: 2X4 4x4 FUEL APFI#: LB rules RMATION: warm up fuel oreburn fuel co	MILL Manke/Taco Packwood Packwood AAA pieces were	GRADE Ma Std or #2 or #2 or 2 or 2 or 3 or 3 or	btr 5. otr 5. otr 5. otr 5. added at (grn D fir grn D fir grn D fir grn D fir
PELLET All grades WC	SIZE REBURN: 2X4 TEST: 2X4 4x4 FUEL APFI#: LB rules RMATION: warm up fuel oreburn fuel co	MILL Manke/Taco Packwood Packwood AAA pieces were	GRADE Ma Std or #2 or #2 or 2 or 2 or 3 or 3 or	btr 5. otr 5. otr 5. otr 5. added at (grn D fir grn D fir grn D fir grn D fir
PELLET All grades WC WARM UP INFOR All pre-burn/	SIZE REBURN: 2X4 TEST: 2X4 4x4 FUEL APFI#: CLB rules RMATION: warm up fuel preburn fuel coreburn fuel coreburn	MILL Manke/Taco Packwood Packwood Packwood pieces were thange (#2 or ! #2 or ! #2 or ! #2 or ! #2 or ! #3 or !	btr 5. otr 5. otr 5. added at (grn D fir grn D fir grn D fir grn D fir
PELLET All grades WC WARM UP INFOR All pre-burn/ 1st warm up/p	SIZE REBURN: 2X4 TEST: 2X4 4x4 FUEL APFI#: LB rules RMATION: warm up fuel preburn fuel coreburn MILL Manke/Taco Packwood Packwood pieces were charge (#2 or #2 or #2 or #2 or #2 or #2 or #3 or #3 or #4 or	btr 5. otr 5. otr 5. otr 5. added at () added at () added at ()	grn D fir grn D fir grn D fir grn D fir	
PELLET All grades WC WARM UP INFOR All pre-burn/ 1st warm up/p 2nd warm up/p 3rd warm up/p	SIZE REBURN: 2X4 TEST: 2X4 4x4 FUEL APFI#: LB rules RMATION: warm up fuel breburn fuel coreburn MILL Manke/Taco Packwood Packwood Packwood pieces were charge (#2 or #2 or #2 or #2 or #2 or #2 or #3 or	btr s. otr s. otr s. added at cadded rn D fir grn D fir grn D fir 3 inches.		

FUEL MOISTURE WOODSTOVE TEST DATA SHEET #10

Run: 4
Date: 5/15/92
Technician: RN, JS, TK, DK

WST1-Form7-Rev11/89

Room Temperature: 70 °F Correction Factor: Ø

NOTE: Record readings to the nearest 0.5% moisture
Uncor Values are corrected for temperature: Yes _____. No___.

Time Test Fuel Moisture Readings taken at: 0900

Calibration Checks: X Y 12.0 12.0 22.0

Рc			Top		Bot	tom	Sid	e Cor	Piece Avg
#	Dimen	Use	Uncor	Cor		Cor			
1	2x4x8	K	4,5	4.5	4,5	4,5	410	4.0	4,333
2									
3									
4	2x4x8	P	18.0	19.6	18.5	20.1	18.0	19.6	19.767
5	2×4×8	ρ	19.0	20,7	19.5	21.3	19,0	20.7	20,900
6	·								(40,667)
7									
8									
9	2×4×183/4	1	21.5	23,5	21,5	232	21.0	22.9	<u>23.300</u>
10	2×4×183/4	T	19.0	20.7	20,0	21.8	19,0	20,7	21,067
11	2x4x183/4	T	21.5	23.5	21.0	22.9	21.0	22.9	23.100
12	2x4 x18314	Τ '	21,0	22,9	21.0	2219	19.0	20.7	22,167
13									(89,633
14									
15									
16									
17				·					
18							•,		
19	FEET	T	19.5	21.3	20.0	21.8	19.0	2017	21.267
20			· · · · · · · · · · · · · · · · · · ·						

% Moisture - Dry Basis:

7 Moisture - Wet Basis:

Kindling	Pretest Fuel	Test Load
4.333 %	20,333 -	22,408 7
4.153%	16.897 /2	18.306 7

To obtain Wet from Dry: $\frac{100 \times \%}{100 + \%}$ Dry Rdg. = % Moisture, Wet Basis

Acceptable Ranges: 16-20% wet; 19-25% dry (17.5 - 22.5 on Meter [Uncor reading] at 70°F)

Key for Use: K= Kindling P= Pretest Fuel T= Test Fuel

1 * 1					_	HHUGHO	SKI A
			VINATION		Run#:	5/15/92	
		SITY DETER	(MINATION (A SHEET #1	.1 T		· BN.JS.T	K, OK
	#00 <i>D</i> D101					WST2-form	11-Rev 6/90
17	l Benne	V 1 1)imensions:		á x	4	x 31/2
		NOMINAL 1	JIMENSIONS.			2 <i>0</i> cm	
•	h (D):				<u> </u>	1	:
	h (W):	010			<u> </u>	<u>/5</u>	
Leng	th (L):	8,68	cm		•	_	•
		8.70	cm Len	gth X	- 8,6	570cm	
		8.65	cm		222 18	0 -3	
			401	.ume:	333,/8	X L)	
					·		a
MOIS	TURE:	Room Temp	erature: _		oF Corr	ection Fac	tor:
Unco	rrected	Meter Read	lings Corre	cted f	or temper	ature:Yes	No
•						•	
NOTE	: Recor	d moisture	meter rea			arest 0.5%	212-
	1	Uncor	Cor	Avg	% Moistur	e (Dry) <u>2</u>	3.100 %
	Top:	21,0	22.9 2	Aug	Z Moistur	e (Wet) _/	8.765-8
	Bottom:	21,5	23.5 %				
	<u> </u>	2110	22.9 2	Sool			Out
	Side:	UIIU	221	9041	 F: TeAele	d In	000
	Ī:		23.100 2		Zeroed	: In	Out
		100 22		10-6	10		. •
Wet	Weight: _/	8.1.23 B	Dry Weig	ht: <u>157</u>	760 g		
% Mo	isture D	ried Basis	: 15.783	 %			
	[1 - (Dr	y Wt 🖁 Wet	wt)] x 10	0			
		Date	T 1	.me	_ Temp		
	Into Dry		5/92	0815		3/of	
	Out of D:	ryer 5/	90/4 0	1445		OF Temp 1	00°C (212°F
	1/200		. 227 /	38	3 _ 4	730 g/cm	3 /
Dens		rv wt)	(volum	ie)		voo.	
•							
Do 13	or Fuel	Vadatura (ontent Det	erminat	rion	<u>.</u>	
rell	er taet	Wolernie (Ontent Dec				
Tare	Beaker	Wt		_g			
Wet	Wt:	g	:	g	*		g
	Gros	s Wet Wt.	Tare Bea	ker Wt.	. Net We	t Wt.	
Dry	Wt:	g	:		=		8
	Gros	s Dry Wt.	Tare Bea	ker Wt.	. Net Dr	y Wt.	4
% Mo	isture D	ried Basis	:				%
[1 -	(Net Dr	y Wt - Net	Wet Wt.)	X 100			
and the second		and the second s				*	

									·									[_] 			
	Samuel Services	HOUDSTOVE		DATA SHEET	PATA SHEET #12	ын [2					Critti Run:	N	490H		523	×	uate: 5//5 Technician(s)!	Sland	- <u>2</u>	2/2/2	لا
	•			99/T ASU 6T							Pa	Pages			18	ŀ				IJ	35
	Mirtita	507.0 Scale	PH PH	THE STATE OF		-18	7				m	1/0/1	T/C(1)T/C(2)	23		1/0(3)	3)	4			
	7				3 >	XCDZ	Š ;	202	191	;	3 2	Bal e	Het Bulb	y Ib	2 2 2 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Calc W/A	Stark	S ,	71280	Static Press	
•	S)	317.5	50	0	.206	5.1	.995	15.1	- <u>5</u>	710.	+-	_	+		4		 	十	1	7/70	1 1 1
	8 2	317.4	<u>ੋਂ</u>	-	129	3.2	.685	17.4	17.4	JO10.	10.		116	9/11	9.4	129	299	2	007	153	25
	5/	316.9	6.6	3.	.117	2.9	. 695	17.71	17.6	890.	69.	4.3	Ξ		0.0	2 2	259	_	1	840-	25.7.
	() () () () ()	316.5	9.5	7	126	32	889	h'L!	17.4	hL0.	.75	4.2	55		9.3	133	230	7	_	hho:	3
	3/8/	316.2	9.2	.3	129	3.2	.682	17.3	17.3	880.	-89	3.b) - -	133 (9.0	! 	225		! 	hh0-	23
	8		8.8	4.	.249	6.2	.572	14.5	14.8	.063	/		115		9.4		262	61.	475	840-	
	3/ 汉	315.3	8,3	3.	.329	8.2	502	12.7	7	510.	15	54.5	120	142	11.0	32	320	<i>ا:</i>	┾┷	.05lo	
	M	34.7		9	.313	7.8	.516	13.1	13,1	910.	- 19	40.9	120	144	0.11	133	328	و۔	400	-057	
	71	314.0	7.0	۲-	-417	16.3	416	10.5	10.5	. 619	. 19	54.4	123	150	12.5		360	1	425	2062	
	3/e		ار	٩	420	10.4	7117	10.c	10.4	.012	.12	8 98	124	152	13.0	140	369	<u>-</u>	425	:063	
	180		5.7	7-	419	10.4	P07	10.3	10.3	600.	60.	115.4	123	152	12.5	139	370	<u></u>	425	063	
	3/ 3 3	312.0	5.0	<u></u>	.445	11.6	384	9.1	9.7	010.	01.	110.3	122	152	12.0	138	373	71.	350	:063	
				1					43)	3673			F. 645)	F10
	3/2/	311.5	4.5	iد,	H0h.	10.0	421	10.6	10.6	F00.	10.	143.1	120	148	11,0	135	368	7-	350	-042	180,
	9 E	311.0	0.7	ν̈́	.365	9	.±. \$\$±.	=: S:	<u> </u>	210.	.12	75.5	7-	142	8,9	131	349	14	350	. જાણ	¢b2
	5/ \2/	310.6	3.b	7.	.390	9.7	.432	\$ 0	10.9	600.	.09	S.701	113	7	8,6	130	347	.15	375	0୩0:	165
		310.2	3.2	7	.403	10.0	.420	10.c	10.6	600 .	50.	1:1	112	138	8.3	130	352	14	350	-,059	켭
٠	8/X	309.8	, so	-	348	ا ا ا	.473	12.0	12.0	P10.	声!	L . 1 a	801	132	7'7	128	330	.15	375	7 50;	
			7.7	7]	321	8.0	. ₄ 93	12.5	12.5	.033	.33	74.7	101	129	4.4	123	311	.15	375	1054	
	$^{\prime}1$		7.7	2	344	8.5	- 47년	12.0	12.0	.028	.28	36.5	103	128	6.2	122	311	16	400	-,054	
	X\ €	_	<i>∞</i> !	બ	334	8.3	784.	12.2	12.2	.625	.25	33.2	101	125	5.8 8	120	306	16	400	053	
	₹/ ₹/	_	9	7	268	١٥	.540	13.7	13.7	.033	.33	20.2	47	124	5.0	117	285	91	001	051	
	R A	_	1.5	1	. 735	5.9	515	14.3	14.3	Pal0.	.70	8.4	86	128	5.1	115	269	81.	450	048	
	\$\ \\	308.4	파	1	727	رج ر	.573	₹.5 2.5	14.5	. 078	. ٦٩	7.2	101	130	5.1	116	261	61.	475	aho:	
		308.3	5.	-	.123	5.6	570	コゴ	7.71	107	1.09	5.	102	131	5.9	116	255	.20	500	P40	
	$\sqrt{}$																37447			(449)-	
					P data										-	-	トレリナ	7		-1.794-	7

Flow 뎚 훵 윱 2月 S 器 189L 1-- 048 Be TR 14741 1443 £03B Static Press. -038 -.035 :035 040: -.03b -033 -042 1.032 :03) -.043 1:037 1.03) 37 중: 550 900 525 525 525 550 550 200 525 525 500 525 臣 500 Uate: 5/5/9 Technician(s)! 4 7 .22 . 20 .22 (3) .22 20 20 20 7 77 7 7 7 K112 K 681 27317 2542 10148 Stack 236 229 225 190 189 241 207 202 198 2 212 प्रि <u>5</u> **1/C(3)** E E E 2 9 2 <u>5</u> 2 2 7 2 7 <u>三</u> 112 XLC Dry X L 9 6.3 **(** <u>د</u> و 9 Q 6,9 122 131 129 28 125 120 120 120 5 <u>ه</u> 123 ō 129 [c]t, T/C(1)T/C(2) Bulb 104 103 503 103 103 00 70 5 103 0 2 102 Bal 23 2.5 ارا (ع ر اه 3,0 25 3.4 Paget 3. T 2.9 2.4 Unit: 7.7 7 39 1.46 3. 1.29 - 48 <u>.</u> 8 .38 <u>4</u> 1.46 140 <u>4</u> R 9.49 48 る四 138 .138 133 127 146 841 137 138 垩 ある ₹ 144 3. S 16.3 15.2 15.7 0.9 ∞ فہ is S F. 3 回 <u>ب</u> <u>۔</u> ف ā S اء 0. 16.3 اد 3 5 5 5 5,7 ۆـ S .598 **63**6 646 653 549. اهـ 630 **6**62 245 183 .e | |-3 و 超光 3.3 HOODSTOVE DATA SHEET 112 HST2-Form 14 Rev 1/88 3.7 3,7 3.5 オーナ 4.2 3.9 ري م 7 3.4 3 98 .157 33 118 <u>168</u> 138 136 941. 122 五3 127 .123 <u>=</u> Burn Rate \varnothing -Scale Ins B 0 00 م v, တု J Ø 307.6 307.0 307.5 1307.1 307.3 308.1 308.0 97.9 307.8 3678 307.4 367.2 307.0 **L.**(8) 300 \\$ ક જ B 9 B) B ③

 Primary Air Set at ,380 Pumps turned on at: 935 -.065 secondary Air Set at N. HWH Check WB/DB: 116/145 527X Date: 5/15/92 Technician(s): 80 ð Static | Comments 350.4 Fan: -063 -050 -062 - 059 -064 -064 100: -051 Temp Room Catalytic 2nd Burn Unit: 14001415 Page: / of / Firebox Q, Bottom Right Side S <u>ه</u> <u>ح</u> Back Side Left 4 LhhRECORD SHEET #13 Stove PRE BURN DATA WST2-Form16 Top Stack 7/14 T/C#-3 Rate Burn ازيدا ∞ و σ ∽ \sim (4 307.0 - 306.5 Scale 313,0 Weight 312,6 307.a 307,0 308.8 311.0 311.7 **308.3** 2/309, 4 45/307.6 20/310, 2 <u>40</u> 307. 9 367. 1 Time $\bar{\lambda}$

			TEM	TEMPERATURES RECORD SHEET	UES 37 #14			Unit	HAVEHS	VCS S		Date: 5//3	2/92	ş
			WST2	WST2-Form14 Revl,	Rev1/88			Page	/ of	A			. '	45
T/C	4	2	9	7	8	6	10	11	12	13	14	15	16 350.4	4 17
- 0	Stove Top	Left Side	Back	Right Side	Bottom	Firebox	2nd Burn Catalytie	Room Temp	Tube Furnace	Sample Box	Impinger Out	C. Gas Box	C. Gas Impinger	SO ₂
8 8 8	336	417	262	316	421	982	808	74	1441	842	34	842		36
<i>Q</i> ≥	301	403	376	307	420	674	720	13	1hh1	248	34	8the	35	36
5/ 1/2	304	386	378	297	422	615	899	73	1441	8th	34	8hC	35	36
₹/ %	270	355	360	275	416	574	h 19	73	1441	248	34	248	35	36
3	259	340	350	262	410	56b	719	72	1441	248	34	248	35	36
13 18	OLE	324	341	249	402	554	مامااا	72	Ihhi	848	þε	848	35	36
S S		314	341	239	394	560	1245	72	ihhi	842	hε	842	35	3%
<i>y</i> y	399	311	220	239	388	591	ከትሮ፣	72	hhhl	8hC	hε	842	35	36
多	다다	311	204	242	376	653	1451	72	8hh1	248	hE	248	35	36
5) (8)	न १८	325	213	250	371	725	1451	73	1448	248	34	248	38	36
8/ 8/	511	344	222	258	363	838	1394	73	1448	248	3 4	842	35	36
y 高	521		232	269	357	940	1406	73	1448	248	hε	842	35	3b
M	1446 IX	4191	3499	3203	(4737)	(8269)	(12844)	872						
3/	520	371	239	277	354	1003	1399	74	1448	842	hE	248	35	36
<u>S</u>	486	383	ንዛባ	286	351	1028	1368	기년	1448	248	34	248	35	36
4	다그러	388	248	290	352	1658	የተዛ	שר	1448	248	hE	248	35	3%
2/2	164	394	255	295	352	1138	1441	74	1448	842	h£	842	38	36
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	りしょ	398	262	300	352	PT(1	L267	75	1448	248	hε	248	38	36
	430	707	263	368	354	1180	1201	75	8441	8/12	34	248	38	36
	415	400	764	311	357	1162	1228	76	1448	248	34	348	35	36
\$ P	419	398	266	314	359	1125	1159	76	1447	248	35	248	35	36
\{\}\ \\$\		400	1961	314	36ા	1070	1010	75	1446	248	35	248	35	36
(Z)	_	348	253	313	364	1047	970	75	1448	248	35	248	35	36
5/1 5/3	334	395	244	305	366	1005	424	75	8441	248	35	248	35	36
	319	396	237	301	367	983	888	76.	8441	248	38	842	35	36
	5114		3036	3614	CH2893	(12978)	(14244)	\$ bg						
X	9575	39077	1,535	L817	902P	21247	/	FE						

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EE	MC - West	, Kent,	WA 9803	2 Date	: <u>5 15 9</u>	2 Analy	yte: <u>CO2</u>	(15-1)
Source:	Haughs	S270	SERIE	S Run	#: <u>4</u>		···	
Zero Cyl	#: T13	32257	с	onc. <u>00.0</u>	CO ₂	Cyl Pre	ess: <u>800</u>	psi
			_		_		Date: 10)	
							ess: 900	
							Date: 10/3	
							•	•
							SN: 4070	
Range:	0 - 25.0%	<u>co</u> 2	A:	nalyzer Ou	tput:_	0 - 1.0)	v.
Flow:	1.5 SCFH		Meas	ured by:	Rotame	ter: <u> X</u>	Flowmete	r:
EPA Span	Value = 2	25.0% CC)2 E% of 31	5.0% CO2 =		058 GO		
Pre Run	Audit: By	7: <u>BU</u>		Tin	ne: <u>(</u>	<u>430</u>	Temp: <u>77</u>	°F
Point	T			Audit Resu				
#	Expec Meter	DVM		Meter	DVM	sponse %	+ Conc. Difference	Δ 8
Zero	00.0	.000	00.0					,217
Span	50.4		1	49.6				-2.466
Comments				**************************************	-			
	-	* .				•		
							•	
Post Run	Audit: B	By:	DK	\Tim	e: /	320	Temp: <u>77</u>	o _F
·		-		Audit Resu			<u>-</u>	
Point	Expec	ted Res			ual Res		+ Conc	
#	Meter	DVM	용	Meter	DVM	8	Difference	△ 8
Zero	00.0	.000	00.0	00.0	.000	.054	.054	,217
Span	50.4	.504	12.6	50.0	.500	12.388	212	-1.683
Comments	· · · · · · · · · · · · · · · · · · ·							
	•							
+ Conc. D	ifference	= Act	% - Exp	(Std) %				

Zero % Difference = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET \$15

Site: EEMC - West, Kent, WA 98032 Date: 5/15/92 Analyte: 02 (15-2)
source: HAUGHS 5270 Series Run #: 4
Zero Cyl #: 132257 Conc.00.0 % 02 Cyl Press: 800 psi
Certified by: 1000 A18 Date: 10/7/91
Span Cyl #: 39004 Conc. 13.4 % 02 Cyl Press: 900 psi
Certified by: MATHESON Date: 10/31/91
Analyzer: Make: Teledyne Model: 320 Ax SN: 37465
Range: 0 - 25.0% O2 Analyzer Output: 0 - 1.0 v.
Flow: 1.5 SCFH Measured by: Rotameter: X Flowmeter:
EPA Span Value = 25.0% O ₂ EPA Control Limits = + 2.5% of 25.0% O ₂ = + 0.625% O ₂
Pre Run Audit: By: BU Time: 940 Temp: 77 of
a 211 Parrala
Point Expected Response Actual Response + Conc. Meter DVM % Meter DVM % Difference \(\Delta \) %
Metel Div
Zero 00.0 .000 00.0 0.0 .001 7.079079318
Span 124 496 12.4 12.4 12.497 1097 1781
Span Comments: Teledyne#2 Cyl % Exp % Act % Adj to + \Delta %
Post Run Audit: By: DK Time: 1330 Temp.: 77 of
Audit Results
Point Expected Response Actual Response + Conc. Meter DVM & Meter DVM & Difference & 8
Meter DVM 8 Meter DVM 8
zero 00.0 .000 00.0 00.0 .002054054216
Span 12.4 1496 12.4 12.5 1498 12.599 199 1.604
Comments: Teledyne#2 Cyl & Exp & Act & Adj to + A &
4 Conc. Difference = Act % - Exp (Std) %

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EE	MC - West,	Kent,	WA 98032	Date:	5/15/92	<u>Anal</u>	yte: <u>CO (</u>	15-3)
	HAUGHS							
Zero Cyl	#: <u>T13</u>	2257	Co	nc. <u>00.0</u> %	со	Cyl Pr	ess: <u>800</u>	psi
			_				Date: 10/7	1
							ess: 900	•
							Date: 10/3	
	•						SN: 408	
							0	
				red by:	Kotamet	.er	Flowmet	- · · ·
EPA Span EPA Cont	Value = l rol Limits	$0.0\% \text{ CC} = \pm 2.5$) % of 10.	0% CO = ±	0.25%	со		
Pre Run	Audit: By	· BL)	Tim	e: <u>9</u>	45	Temp: <u>77</u>	o _F
				udit Resu				
Point		ted Res	ponse	Act	ual Res	ponse %	+ Conc. Difference	Δ %
#	Meter	DVM	8	Meter		 		. ,
Zero	00.0	.000	00.0	00.0			-,004	-,044
Span	49.6	.496	4.96	49.1	1491	4,448	- ,038	1764
Comments	<u>; :</u>							÷
				: '				
	7-721		OK	Tim	. 1	225	Temp.: 77	
Post Kun	Audit: B	у:			•		. 1emp	-
Point	Fynec	ted Res		udit Resu Act	its ual Res	ponse	+ Conc.	<u></u>
#	Meter	DVM	8	Meter	DVM	8	Difference	∆ 8
Zero	00.0	.000	00.0	00.0	.000	-004	004	044
Span	49.6	. 496	4.96	49.4	. 494	5.028	.068	1.380
Comments							, ————————————————————————————————————	
	-							
+ Conc.	Difference	= Act	% - Exp	(Std) %	m) Y 10) n		
)ifferece =]	ull Scal	e Value				
Span % D	ifference	= Act S	k (ppm) -	Exp % (p	<u>pm)</u> X]	L00		

Exp % (ppm)

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

					•	<u>a</u> Anal	yte: <u>SO2</u>	(15-4)
Source: HAUGHS S270 SERIES Run #: 4								
	Zero Cyl #: T132257 Conc.00.0 ppm SO ₂ Cyl Press: 800 psi							
Certifie	•						Date: 10/	.
	·						ess: <u>45</u>	-
			_				Date: 9/2	
							SN: 4030	
Range: 0 -	- 2500 p	pm SO ₂	Ar	alyzer Ou	tput:	0 - 1.	0	v.
Flow: 1.5	SCFH	<u></u>	Measu	red by:	Rotame	ter: <u> X</u>	Flowmete	er:
EPA Span Va	alue = 2	500 ppr	n SO2			_		
EPA Control	Limits	= +2.						<u> </u>
Pre Run Aud	<u>lit</u> : By	· BL)	Time	e:	0925	Temp:	<u> </u>
				udit Resu				
Point #		ted Res		Act Meter		sponse ppm	+ Conc. Difference	A &
#	Meter	DVM	ppm					
Zero	00.0	.000	00.0	0,1				,237
Span	49.3	-493	1232	49.5	,495	1238	6.992	1568
Comments:				. 4				
				•	4			
·								
Post Run Au	ıdit: E	By:	Ol	C Time	e: <u>13</u>	315		7o _F
				Audit Resu	lts			
Point	Expec	ted Re	sponse	Act	ual Re		+ Conc.	₽ 8
#	Meter	DVM	ppm	Meter	DVM	ppm	Difference	
Zero	00.0	.000	00.0	00.2	.002	8.432	8.432	. 337
Span	49.3	.493	1232	49.4	.494	1236. 496	4.496	.365
Comments:			· .					•
		•						
+ Conc. Di	ference	= Act	ppm - Ex	p (Std) p	pm			

+ Conc. Difference = Act ppm - Exp (Std) ppm

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Run: 4
Date: 5/15/92
Technicians: BN, JS, TK OK
WST6-Form3-Rev11/89

QUALITY CHECKS WOODSTOVE DATA SHEET #16

Ambient = Tr:	<u> </u>	8,4	of	T/C#3	0 ႏ ပ	9, 5	°
Thermocouple Ch	eck (at a	mbient): T	/c#1: <u>60</u>	<i>0,2</i> 01	F;T/C#2:	60,3	_o _F
T/C #3: 60,2	oF;	T/C #4:_	59.7	F;	T/C #5:	59.4	_o _F
T/C #6: 59.4	°F;	T/C #7:_	59.4	F;	T/C #8:	58.9	o _F
T/C #9: 60./	o _F ;	T/C #10:	60.0	or,	r/c #11:	58.9	o _F
T/C #12: 63,5	o _F ;	T/C #13:	60,9	o _F ,	r/c #14:	61,2	o _F
T/C #15: 6/5	or,	T/C #16:		-	c/c #17:		o _F
T/C #18: 644	o _F ;	T/C #19:			C/C #20:		o _F
T/C #21:	o _F ;	T/C #22:_		-	C/C #23:		o _F
T/C #24:	o _F ;	T/C #25:_		•	:/C #26:		o _F
Comments:		_	<u></u>	<u>-</u>			
<u> </u>				· · · · · · · · · · · · · · · · · · ·			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
		· ·		""			
		*		· · · · · · · · · · · · · · · · · · ·			
Thermocouple Rea	idout:				•	•	
Pretest Zero/Spa		and Calibra					
Zero (0°F) :,2_	Adj OF to:	O of		st Check OF): ./		Differe	nce
Span 100	_		Span	- F) t		7005	
(2000°F):/999,2	Adj of to:	2000,0 °F		°F): 200	1.3 °F _	1065	
(Allowable % Dif			e formul	as on Wo	odstove	Data Sh	eet
#15 to calculate	% Diffe	rence)				•	
Thermocouple Res	dout Pre	test Linear	ity Chec	k.			
0°F = 0	oF; 2	00°F = <u>20</u>	/,3 °F	; 400°F	- 398	7.6 of	;
600°F = 600,8	o _F ; 8	00°F = 800),9 o _F	; 1000°F	- 999		
1200°F= //97,5			- A				
1800°F= 1799,2				,			
			*				٠
Tracer Gee (SO.)	Injecti	on Train Le	sk Check	. P	./ Post		
Tracer Gas (SO ₂) Combustion Gas (Tracer Gas (SO ₂))) Train Le	ak Check	· FFE	Post		
Tracer Gas (SOA)	Angluze	r Train Les	k Check.	· + FE	Pass	_	
Draft (Static) G			UNCORI		Post		
ure (beatie) G	uage seri	oneck:		rre	rost	·	:
Scale Check <u>Pre</u>	(W+ #!=	1. 3/5/-	305.1	=10			
Dant Dant	(W+ #1	s): 316.8	301- 8	~100			
Stack cleaned pr	107 41	37. JIG. V	<u> </u>	Yo 1/			
Stack creaned pr	TOT TO LI	ie rans, le	°				

CLIENT: HAUGHS PRODUCTS

TEST No. :

The state of the s	MODEL:	S-27X	******	:****	DATE:	5/13/92 *****	*****
	TIME	METER READING	DELTA H	METER TEMP.	PERCENT CO	PERCENT CO2	SO2 COCENTR.
t _{orone})	(MIN.)	(C F)	(IN. H2O)	(DEG. F)	(%)	(%)	PPM
		410 600	0 150		0.25	======================================	400
	0 5	412.600 414.100	0.150 0.170	80 79	0.25 0.64	5.10 8.70	400 375
	=						
	10	415.718	0.150	80	0.30	8.90	400
· ·	15 20	417.241 418.865	0.170 0.150	80 82	0.06 0.06	10.00 11.40	375 400
.	25 25	420.399	0.150	82	0.09	12.10	400
Unand	30	421.933	0.150	83	0.20	12.10	400
473575	35	423.473	0.130	84	0.28	13.10	425
	40	424.927	0.150	85	0.15	12.90	400
	45	426.478	0.150	86	0.10	7.30	400
	50	428.029	0.150	87	0.13	6.80	400
	55	429.592	0.130	87	0.25	6.30	425
	60	431.063		87	0.51	5.50	425
TWO WE	65	432.535	0.130	87	0.59	5.30	425
	70	434.007	0.130	87	0.77	4.90	425
	75	435.479	0.130	87	0.86	4.30	425
Comme	80	436.951	0.130	87	0.87	3.70	4 25
	, 85	438.423	0.130	87	0.85	3.50	425
	90	439.895	0.130	87	0.83	3.30	425
and .	95	441.368	0.130	86	0.84	3.50	425
:	100	442.834	0.130	86	0.80	3.50	425
<i></i>	105	•		86			
()							

TABLE 2 ---- FIELD DATA

And the second	CLIENT: HAUGHS PRODUCTS	5	TEST	No.:	1	
	MODEL: S-27X ***********	******	DATE:		3/92	٠.
in percent	METER CAL. FACTOR (Y) 1.06	••	. WOOD RNED(LB)		10.9	Lbs
	BAROMETRIC PRESS.(Pb) 30.1		I,FUEL ISTURE %		18.256	8
	LEAK RATE POST (Lp) 0.00		. PART. LLECTED	·	0.0909	g
	WATER VOL. (V1c) 57.	MET 7 Ml VOI	rer LUME Vm		30.234	mcf
\neg	TEST TIME (MIN) 100		MOLE ACTION		0.0132	

TABLE 3 ----FIELD DATA AVERAGES

CLIENT:	HAUGHS PRODUCTS	TEST No.	: 1
MODEL:	S-27X **********	DATE:	5/13/92 *******
AVG DELTA H	0.14 in H2O	AVG PRCNT CO	- 0.45 %
AVG METER TEMP. Tm	85 deg F	AVG PRCNT CO2	- 7.29 %
AVG PPM	411 DDM		

TABLE 4 ---- CALCULATIONS

CLIENT: HAUGHS PRO	DUCTS	TEST No. :	1 .	
MODEL: S-27X *********	*****	DATE: 5	/13/92 ********	**
STD SAMPLE VOL. Vm(std)	31.49 dscf	STACK GAS FLOW Qsd	964.573 dscf/Hr & 16.08 dscf/min	
VOL. WATER VAPOR Vw(std)	2.716 scf	PARTICULATE CONCTRT. C s	0.0029 g/dscf	
PRCNT MSTR Bws	7.94 %	PARTC.EMISS. RATE E	2.78 g/Hr	
BURN RATE BR	2.43 Kg/Hr	MOLES OF GAS PER Lb WOOD Nt	0.47 Lb-mole/	Гþ
CO EMISSION RATE	145.05 g/Hr &	PART.EMISS. RATE	1.15 g/Kgdry	
	59.77 g/Kgdr fuel			

TABLE 5 ---- PROPORTIONAL RATE VARIATION

HAUGHS	PRODUCTS
IIVOOIID	LIODOCIO

TEST No. :

S-27X		. . 		DATE:	5/13/92
TIME INTEVAL Ti	******** PPM * Vm	PROPRTN. RATE VAR. PR	******	PROPRTN RATE VAR AVERAGE	**************************************
=======================================				=======================================	
5	630.9	98		100)
10	638.0	99	•		
15	640.0	99		•	
20	638.6	99	•	•	
25	642.2	100	•		
30	641.6	100			
35	643.0	100			
40	643.8	100			
45	645.2	100			•
50	644.0	100	egist to		
55	648.4	101			
60	648.3	101			
65	648.8	101		1.5	
70	648.8	101			
75	648.8	101	**		
80	648.8	101			
85	648.8	101			
90	648.8	101	•		
95	649.8	101			
100	647.3	100	•		
105		,	e.		
110					

COMPUTER INPUT DATA WOODSTOVE DATA SHEET #	1
Client Address 10 atlas Court	
Bramp Ton, Ontario, Canada LGT	501
Client Phone 4/6-792-8000	
6.44.44	
Run No Date of Test Est Grams/Hr	
Stove Type: Cat Non Cat Pellet	·
Data To Be Submitted To: Oregon X Colorado EPA	<u>*</u>
Burn Category: Low (<0.8 Kg/Hr) Med Hi (1.26 - 1.90 Kg/Hr) Max (>1.9 Kg/Hr)	
Fuel % Moisture (dry) <u>90.333 %(wet) 18956</u> (00.00) (Data Sheet #10)	<u>%</u>
Stack Static Pressure -064 (0.000) (Data Sheet #12)	"H ₂ 0
Barometric Pressure 30,14 (00.00) (Data Sheet #2)	"Hg
Temperature (Average Room) Combustion Air (00) (Data Sheet #14)	
Flue Gas Moisture 7.9446 (00.000) (Data Sheet #7)	<u> </u>
Ambient Moisture	%
Stove Weight	lbs
(000) (Data Sheet #8)	
Stove Temperature Change (000) (Data Sheet #14)	oF
Particulate Emission (0.0000) (Data Sheet #7)	gr/dscf
Fuel Higher Heating Value (dry)(0000) (CT&E Sheet)	BTU/16
uel Type: Wood: X Pellets:	
otal Fuel Consumed During Burn 10,9 (00.0) (Data Sheet #8)	1 bs
otal Particulate Catch	9
1 ₂ 0 Captured 57.7 (00.0) (Data Sheet #3)	g
Ory Gas Meter Volume	CF 4
(00.000) (Data Sheet #2) Try Gas Meter: Y Factor: 45-1066 Post Test Leak Rate	204 CFM

Meter Box Data Sheet Page # 2 Meter Box 4 J Y Factor 1.066	Page 1 Unit: 4
Leak Checks: 400 " Hg @ 1003 cfm 1400 " Hg @ 2004 cfm cf	Run:/

Nozzle: Probe @ 3/8 " od

Initial Volume: 1,500

Inject SD2 @ 100 cc/min

MN TIME READING OO 1030 4/2.600 OS 35 414.600 SECTION DELTA METER SD2 ROTTD PURCHES OO 1030 4/2.600 OS 35 414.600 OS 36 414.600 OS 37 414.600 OS 37 414.600 OS 37 414.600 OS 37 414.600 OS 37 414.600 OS 37 414.600 OS 37 414.600 OS 37 415.600 OS 37 414.600 OS 37 415.600 OS 418.605 OS 418.60					B 1.5	09		DODOM	TER. 3	05
00 1030 4/12-600 8804 15 80 400 74 0 05 35 414-600 9391 17 79 375 74 5 10 40 415.718 8804 15 80 400 74 0 20 50 418.85 8804 15 80 400 74 0 20 50 418.85 8804 15 80 400 74 0 30 1100 491.933 8.787 15 83 700 75 0 35 5 493.473 8.55 13 84 765 76 5 35 5 494.910 8.711 15 85 400 76 16 55 35 494.910 8.711 15 85 400 76 16 55 35 49.910 885 13 87 45 76 16 55 35 43.635 8831 13 87 45 77 16 80 30 43.603 8.711 15 87 495 77 16 80 30 43.603 8.711 13 87 495 77 16 80 30 43.603 8.711 13 87 495 77 16 80 30 43.635 8.816 13 87 495 77 16 80 60 30 43.635 8.816 13 87 495 77 16 80 60 43.635 8.816 13 87 495 72 16 80 60 43.635 8.816 13 87 495 72 16 80 60 43.635 8.816 13 87 495 72 16 80 60 43.635 8.816 13 87 495 72 16 80 60 43.635 8.816 13 87 495 72 16 80 60 43.635 8.816 13 87 495 72 16 80 60 43.635 8.816 13 87 495 72 16 80 60 43.645 8.816 13 87 495 72 16 80 60 43.645 8.816 13 87 495 72 16 80 60 43.645 8.816 13 87 495 72 16 80 60 43.645 8.816 13 87 495 72 16 80 60 43.645 8.816 13 87 495 72 16 80 60 43.645 8.816 13 87 495 72 16 80 60 43.645 76 16 80 10 449.034 8.817 13 86 465 76 16 110 100 10 449.034 8.817 13 86 465 76 16 110 100 10 449.034 8.817 13 86 465 76 16 110 100 10 449.034 8.817 170 (915)	ROTO		126	Sampling	r		_ : 1			
05 35 4 4 00 10 40 4 5 18 15 45 4 194 20 50 4 8865 25 55 400399 30 1100 40 433 35 5 403,473 40 10 40 40 77 45 15 40,478 50 10 40,478 5	MN	TIME	METER READING		STACK DSCFM		METER TEMP	SD2 PPM	ROTO TEMP	PUMP
10 40 415.718 15 45 417.941 20 50 418.865 25 55 410.399 30 1100 491.932 35 5 43.473 40 10 401.997 45 15 496.478 50 20 418.904 55 25 419.535 70 410.434.007 75 45 435.479 80 60 43.403 80 60 436.951 80 60 43.895 80 6	00	1030	412.600		8804	115	80	400	14	0
15 45 417.941 20 80 418.865 25 65 490.359 30 1100 491.933 35 5 493.473 40 10 494.937 45 15 496.478 8.791 15 80 400 76 5 8.791 15 80 400 76 6 8.791 16 80 400 76 6 8.791 16 80 400 76 6 8.791 16 80 400 76 6 8.791 16 80 400 76 6 8.791 16 80 400 76 6 8.791 16 80 400 76 6 8.791 16 80 400	05	35	414/100	,	9.391	117	19	375	74	15
20 50 41845 25 55 490.399 30 1100 491-933 35 5 493.473 40 10 494-97 45 15 496.478 50 10 498.999 8.771 15 80 400 76 16 50 10 498.999 8.771 15 80 400 76 16 50 10 498.999 8.771 15 80 400 76 16 50 10 498.999 8.771 15 80 400 76 16 50 30 431.063 65 35 439.535 70 40 434.007 75 45 435.479 80 60 436.451 85 65 438.493 90 1700 439.895 95 5 441.368 100 10 449.024 105 15 110 90 115 15	10	40	415.718		8.804	15	80	400	14	
25 65 400399 30 1100 491932 35 5 403.473 40 10 204997 45 15 496.478 50 20 -08.099 8.711 15 86 400 76 16 50 20 -08.099 8.711 15 86 400 76 16 55 25 43.535 70 40 435.479 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 436951 80 80 80 80 80 80 80 80 80 80 80 80 80 8	15	45	417.841		9,391	117	80	325	14	0
30 1100 491933 35 5 493.473 40 10 494997 45 15 496.478 50 10 498.994 8.711 15 85 400 76 16 50 10 498.994 8.711 15 86 400 76 16 55 15 497.570 8.85 13 87 495 77 16 60 30 431063 65 35 438.535 70 40 434.007 75 45 435.479 80 60 436951 80 60 436951 80 60 436951 80 60 438.493 90 1900 439.895 95 5 441388 100 10 449.834 100 10 449.834 100 10 10 449.834 110 100 115 15	20	50	418,865	_	8804	-15	88	400	1/4	15
35 5 493.473 8 8 5 76 5 76 5 76 76 76 76 76 76 76 76 76 76 76 76 76	25	55	400,399		804	15	80	×100	14	
40 10 49497 8,11 15 85 400 16 5 45 15 496.478 871 15 86 400 76 16 50 20 498.099 871 15 87 400 76 16 55 25 49.535 8,331 13 87 45 77 16 60 30 431.063 8,331 13 87 45 77 16 60 30 43.6951 80 80 13 87 45 78 16 80 60 436.951 80 80 13 87 45 78 16 80 60 436.951 80 80 13 87 45 78 16 80 60 436.951 80 80 13 87 45 78 16 80 60 436.951 80 80 13 87 45 78 16 80 60 436.951 80 80 13 87 45 78 16 80 60 436.951 80 80 13 87 45 78 16 80 80 436.951 80 80 13 87 45 78 16 80 80 436.951 80 80 13 87 45 78 16 80 80 436.951 80 80 13 87 45 78 16 80 80 436.951 80 80 13 87 45 78 16 80 80 436.951 80 80 13 87 45 78 16 80 80 40 436.951 80 80 13 87 45 78 16 80 80 40 436.951 80 80 13 87 45 78 16 80 80 40 436.951 80 80 13 87 45 78 16 80 80 40 400 80 10 80	30	1100	401-933	<u>.</u>	8,787	115	83,	700	15	0
## ## ## ## ## ## ## ## ## ## ## ## ##	35	5	403.473	·		/13	84	165	16	5
50 DD - 18.049 8.77	40	10	404907		8,771	15	25	400	16	5
55 05 19.590 80.591 80.585 13 87 185 76 16 60 30 431.063 80.535 80.31 13 87 195 77 10 65 35 435.479 80.60 436.951	45	15	426.478		8171	15	80	400	- 77	10
ROTO PRESS:	50	10	408.009		8.771	_/6	87	400	16	10
60 30 431063 8331 .13 87 465 77 1.0 65 35 439.535 8.931 .13 87 465 77 1.0 70 40 434.007 8.916 .13 87 465 78 1.0 80 60 436.951 8.916 .13 87 465 78 1.0 85 65 438.403 8.931 .13 87 465 77 1.0 90 1000 439.895 8.931 .13 87 465 77 1.0 95 5 441.368 8.947 .13 86 465 76 1.0 100 10 440.934 8.947 .13 86 465 76 1.0 110 100 10 440.934 8.947 .13 86 465 76 1.0 1115 15 15 1948	55	05		<u> </u>			897	45		
55 35 439.535 8.931 13 87 495 77 10 40 434.007 8.0 60 436.951 8.0	ROTO	PRESS:	136	TOTALS :	(105,608)	(1.80)	9453	BAROM	ETER:	
70 40 434.007 8816 113 87 495 18 16 80 60 436.951 8816 13 87 495 18 16 85 65 438.403 88.816 8.817 8.818 8.818 8.817 8.818 8.818 8.817 8.818 8.818 8.818 8.818 8.817 8.818 8.818 8.818 8.818 8.818 8.818 8.818 8.818 8.818 8.818 8.817 8.818 8.81	60	30	431-063	<u>[</u> .	8331	173	87.	45	77	1,0
75 45 435419 80 60 436951 80 65 13 87 45 18 16 80 60 436951 80 80 60 436951 80 80 60 436951 80 80 80 80 80 80 80 80 80 80 80 80 80	65	35	430,535	<u>[</u>	8931		87	495	77	10
80	70	40	434-007	<u>.</u>	8216		87	495		10
85 65 438,403 8,316 8,316 8,315 78 12 90 1900 439,895 8,31 13 87 45 77 12 95 5 441368 8,347 13 86 465 76 12 100 10 449,934 8,347 13 86 465 76 12 110 90 115 15 170519 (1-17) (1914) 115 115 115 115 115 115 115 115 115 11	75	45	435,479	<u>[</u> .	8216	<u> </u>		45		10
90 1900 - 39.895 8.831 13 87 85 77 10 8.831 13 86 45 76 10 8.847 13 86 45 76 10 100 10 449.234 8.847 13 86 45 75 10 110 100 1010 1010 1010 1010 1010	80	60	436951	<u>.</u>	806		<u> </u>	765		
95 5 441-368 100 10 449.234 105 15 110 00 115 05 TOTALS: 000 1179.659 (0.97) (1716) (915)	85	65	438,403	<u>k</u>	8,216		-	245	78	1.0
100 10 449.234 8847 13 86 46 75 74.0519 (1-17) (1919) 110 90 115 95 MAX VACC = 1	90	1000	439.895	<u>k</u>	8,031			765	7/	1,0
105 (5 74.05 19 (1-17) (1819) 110 00 115 05 MAX VACC = 1	95	5	441.368	<u> </u>	8,041		86	765	76	10
110 00 115 05 TOTALS: 119.659 (097) (1716) (915)	100		440-234	1	0.047	1/3	86	45	1/5	~
115 13 139.654) (097) (1716) (015) TOTALS: 129.654) (097) (1716) (015)	1.05	()			740514	(1-17)	(1814)			ļ
TOTALS: P5 MAX VACC =	110			1				1	-	ļ
	115	9<		<u> </u>	119,659	(24))		(4/2)		
TOTAL CU FT (3043 CM) TOTALS (8,5557) (1417) (545) AV BR. 3014				I				1		D
	TOTAL	CU FT	(304361	TOTALS:	[<i>8</i> .555]	(41)	(5454)	AV BR	3211	1>

MOISTURE SHEET Woodstove Data Sheet #3

Moisture Determination	1-1			
	Balance Seroed		Unit: HAUG	SHS SATX
Final:			Run:	/ .
IMPINGER #1	 "		Date: 5/	13/92
Final Weight 640.8	grams	Technici	an(s): Init:	_)
Initial Weight 593,4	grams		Final	1. <u>35/B</u> /
Net 47.4~	grams	Approved	Ву:	TK
IMPINGER #2			en en en en en en en en en en en en en e	
Final Weight 591,3	grams			
Initial Weight 588,4	grams			
Net 99	grams			
IMPINGER #3				
Final Weight 479,4	grams		•	
Initial Weight 479,3	grams	·		
Net ·//	grams			
IMPINGER #4 (SILICA GEL)				
Final Weight 827.9	grams			•
Initial Weight 820.6	grams		•	
. Net <u>7.3</u> ~	grams			
	TOTAL MASS	о г н ₂ о с	APTURED <u>5</u>	7.7. grams
Scale Check: 295.0g = 295.0g = 590.0g = 590	5,00 g	Front	Half Filter	+260F
885.0g = <u>8</u> 8	<u>5.0</u> 8	Back H	alf Filter	# 260B
Notes:		··		
		. ·		٠.
			······································	

nto D	essicato	r: Da	c e <u> </u>	14 Ti	ше <u> 0900</u>	v _ вà [_] ;	UN F	ront	Half	sac	K HAII #クピュ	
lanufa	cturer:_	<u>38</u>	<u>></u>		Size:	<u>nm</u>	Lot.No	> • • <u></u>	<u>8882</u>	rade:	<u> </u>	ias
ilter #	First Wt	Date	Time	Bv	Second Wt		Time	By	Third Wt	Date	Time	B,
	16927				0.6926			Dχ				
	1450		1641.		0.6955		1606	7				
	17007		1640		0.7023		1608					
	6906		1643		0.6905	7	1610	7				
	,7000		1644	1	0.6996)	(1612					
246F	,6930		1645	7	0.6932		1614					
	,7000		1646		0.7004)		1616					
248F	16941		1647	1	0.6938)		1618					
249 F	690		1648		0.6920		1620				·	L
250F	,6963		1649		0.6960) (1622					
												<u> </u>
	•											
251F	. 6977		1650		0.6974)		1624	ĎΚ	·			<u> </u>
252F	. 6481		1651		0.6978)		1626		· · · · · ·			<u> </u>
253F	.7011		1650		0.7014)		1628	_/_				
254 F	6911		1653		0.6913)		1630	/_				_
355 F	1/2970		1654		0.6965		1632					<u> </u>
	.6965		1655	-	0. 6963)		1634					
	06947		1056	14	0.6950)		1636	_\				_
258F	.7008		1657		0.7007	_/_	1638]			<u> </u>	_
259F	·6493		1659		0.6980)		1640			<u> </u>		<u> </u>
260F	US941D	4	1659	4	0.6943	_ \	1642		HAUGHS	eni		
											 	_
												L
									/_/		h :	Ļ_
hecke	d by		11/4	7			Dat	e:(3/13/92	Time	1700).

	QA RE	WEIGH		
Filter #	WT	Date	Time	Ву
	· 			
	······			

BALA	NCE R	OOM ENV	RONMENTA	L COND	TIONS
WB	DВ	%RH	Date	Time	Ву
57	20	44	3/11	1640	Has
60	74	44	3/13	1602	DK

WOODSTOVE DATA SHEET #4-1: INITIAL FILTER WEIGHTS (TARE WEIGHTS)
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Into D	essicato	or: Da	te <u>3/9/</u> 9	<i>[2</i> Ti	me 0900) By_!)K Fr	ont	Half	_ Bac	k Half	
Manufa	cturer:_	<u>څ ک</u>	S		_ Size: 8	<u>.2cm</u>	Lot.No	<u>₹</u>	<u> 6901</u> 6	radei	#25g	<u>ass</u>
Filter	First				Second				Third		m.t	77
#	Wt	Date	Time	Ву	Wt	Date		By	Wt	Date	Time	Ву
	13811	3/11			0.3812		1	ĐΚ				
	,3789		1701	$\overline{}$	0.3792	1 1	1524	-) 				
	.3767		1700		0.3764)	, , , , , , ,	1526	-/				
	-3810		1703		0.3807)		1528	 (-
245 B	,382A		1704	_	0.3819	1	1530					<u> </u>
246 B	-38AO		1705	16	0.3819)		1532					
247 B	.3950		1706		0.3847)		1534	/				
248 B	.3810		1707	(0.3810)		1536	_/_		-		
249 B	3830		1708		0.3826)	/	1538					<u> </u>
250B	13813		1709	(0.3811	\	1540					
· · · · · · · · · · · · · · · · · · ·												
	_											
251 B	13817		1710		0.3817	3/13	1542	DK				
	3801		1711		0.3822		1544	7				
	-3810		1712		0.3808		1546					
	3826		1713		0.3824		1548					
255B			1714		0.3761		1550					
	13850		1715		0.3848)		1552					
	-3760		1716		0.3762		1554					
	13830		1717		0.3826	Ì	1556	/				
259B	13818		1718		0.3813		1558					
260B	,3870	4	1719	77/	0.3872		1600	\	HAUWIS	RNI		
KUV1)	12010	**	1 6 1 7	_ <u>, </u>	0.00.20	-	,000		<u> </u>			
			1						, .			
Checke	d by	1	1/11/9	7	<u> </u>	<u> </u>	Dat	نا ناد:_ر	3/13/gr	Time	1700)
-1 M C	J							_	(_		
	^ 4	ייוושת	TCU			RA	LANCE 1	ROOM	ENVIRON	(ENTAI	CONDI	TIC
	QA.	REWE	1911			· ~		1				

	QA RE	WEIGH		
Filter #	WT	Date	Time	Ву
	•	,		
				
	· · · · · · · · · · · · · · · · · · ·			
1		i	1	

BALA	NCE R	OOM ENVI	RONMENTA	L COND	TIONS
WB	DB	%RH	Date	Time	Ву
57	20	44	3/11	1700	83
100	74	44	3/13	1520	DK

INITIAL BEAKER WEIGHTS (TARE WEIGHTS)

eaker	ssicato		1			ond						nird				
#	Wt		Time	Ву			Dat		Time	By	W	<u> </u>	Dat	e	Time	+
176	106. 2307	4/13	958	DX	1062		4/	Ч	104	Sw	_			-+		+
1	104.8297		1000	\mathcal{L}	104.8	ļ			10013		_		ļ			+
	108.8855		1002	_/		859	- 1		1045	1	4		<u> </u>			4
479	109.8650		1004		109.8	653			1047		/_					4
480	107.7999		1006		107:	2978	'	-	1049		<u> </u>			-		\dashv
481	96.1065	4/13	1008	DK	96.				1051		/					
424	106.3740	7	1010		106:	3744			1053		/		<u> </u>	_	<u> </u>	_
	107.0673		1012		107.	0678			1055		/	<u></u>				_
404	104.1716	17	1014	1		1780			1057		/					_
7.2.	105.3500	1	1016	1	105	3502			1059	11	/	· · · · · · · · · · · · · · · · · · ·				-
196	106.3125	4/13	1018	OK	106	3199	-	1	1101							
27	101. 1758		1020		101.			1	1103		/					
16.3	9 5.5598	4	1022	1 7		5593			1105		/					
129	97.1357	 	1024	_		1357		1	1107		/					
490	108.2140		1026	_		0144			1109		/					
:41	105.7272	4/,3	1025	DK	105,	1072		<u> </u>	1111	1						
490	108.3612		1030			3607			1113	,	V					
463	106.975		1032	1		9746			1115	1,79	/			\Box		
444	98.8124	1	1034	T /		8122		1	1117		/					
445	94.9435		1034			944C			1119	, , , , , , , , , , , , , , , , , , ,						_
496	106.7929	14/12	1038	$\frac{1}{10^{K}}$	106.	1934	-	1	1121	1 1						_
117	104.8081	+==	1040		_	2016	_	1	1183							
498	103.8561	1 +	104%			18565		1	1125	7	V	HAU	ans	RN)	
464	107. 3430		104	1 /	_	<i>343</i> 9		Ť	1107	1			1			
<u> </u>	98.355		104			3561	1		117		1		1			
			Nous		. , , , ,				4/15/			Ti	me:	0	745	
	/ Q.	A REW	EIGH				В	ALA	NCE RO	МОС	ENV	IRONM	ENT	AL	CONDI	T
eaker	#	WT	Date	T e	lime	Ву	W		DB	_	RH		te	, 	ime	_
		-		1			- 1	58	172	1 4	12	- L J/	13	10	56	Ĺ

				WOO	WOODSTOVE DATA SHEET #4-3:	SHEET	#4-3:	CONS	CONSTANT FINAL WEIGHTS	ICHTS			WSI5-F Unit H	orm9, Pa	WST5-Form9, Pg1, Rev4/90 Unit みんしんれく スのス	8.
						FINAI	VAL BEAKER WEIGHTS	R WEI	GHTS				Dates	5/13/40	20	1
Beaker	r Into Dessic	Date	Time	Ву	First	Date	Time	By	Second	Date	Time	By	Thirty Control	Date	Time	2
11/2		5/14	0600	ă	C608'901	SIS	D32	B	1808.901	2/18	913		16.3080	8/8) pas	S
\$		5/14	0060	X	104.8201	5//5	1234	BO	104,8195	5/18	414	OK	104.89co)	3/6	300	Day.
<u> </u>																6
140 24 20		5)14	0980	R	73,8624	5/15	1336	ВЛ	103.8618	5/18	916)) (103,8619	200	80	Zi.
-															ł	
037		2/14	0960	K	0900 DK 107,3492	5/15	956/	$ \mathcal{C}_{\mathcal{B}} $	18487	5/18	816	Z	(101.3490)	5/18	0/5	8
											·					
8		5/14	0900 DX	췽	98,3610	3/12	ዕታሮ/	82	1098.86	5/18	920	Š	98,3603	1/2	1512	3
	-															
		:												-		
[FIN	AL FI	FINAL FILTER WEIGHTS							
Filter Into	Into Dessic	Date	Time	By	First	Date	Time	B	Second	Date	Time	BA BA	Third	Date	7.1 mo	2
38		6/13	1885	2	90kV;	5/14		Sago	(24/03)	5//2	1	S.J.				, ,
)		,)							
250 B	- 2	6/13	6/13 1255 920	S	13929	2/14	1336		(3655)	5//5	/223	BU				
	_			7		-		2								

LIONS							
CONDI	_						
ENTAL			_	_			Î
VIRONM	-		-				
OM EN	-	-		_			
SCALE ROOM ENVIRONMENTAL CONDITIONS	9	7	8	6	Commenta		
CONS		ZRH	15	44	45	4	
SCALE ROOM ENVIRONMENTAL CONDITIONS		DB	જ	74	7	72	
TAL C		WB	B	17 09	JK 58 71	25	
CONFIEN		By			X	Þ	0
ENVI		Date Time By	1184 F	(A) 0021	016 81/	8	
ROOM		Date	2/14	21/5	2/18	6/18 150 80 80 69 72	
SCALE	Weighing	Session	1	2	3	4	Ľ
ļ							
HTS		Ву			By		
QA REWEIGH: FINAL WEIGHTS		Beaker # Final Wt By			Final WT		
REWEIGH		Beaker #			Date Filter # Final WT		
¥ŏ		Date			Date		_

WST7-Form1-Rev5/90

Dates: From 4 33 93

Through

WOODSTOVE DATA SHEET #4-4 SCALE QA SHEET

Scale Sartorius Model A1205 SN 37010004

100g	10g	1.0g	100mg	Blank	Rlank		-			
Weight		Weight	Weight	Filter	Besker	Tech Dat	te Time	Dry Bulb	7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	no 4
97777		0.4447	0,100			DK 4/6	1600	KJ	10	
19.15.75.75	ユ	. 959.7	88			110 011	2 - 14C	20	1.00 V	7,7
となれた	0000	0550	1000			ST CS	2 (EAC)	1	7	1,///
1664 461	0000.01	1.0000	0. 1000			₹	27 1040	7.2		777
/80'8)	0,000	, 9998	55501			F	1420	· 宋	OB C	7,
69 999	10,0001	1.000.1	0.0999			-	1		5	27
60bb bb	0000 01	1.0001	0000			7	1	77	(0)	4.7
866.66	8666.6	0000 V				7	* 24.	77	(e)	76
44,996.7	9,4999					1	220		. [<i>o</i>]	38
00 00 C	10000	4 909	1			200 00 00 00 00 00 00 00 00 00 00 00 00	(A)	7	57	1/2
160,003	200.00	0. 7. 7. 7.	0.075			(DK S14	1730	78	63	9/5
	7000/6	1000//	, (88)			0	0101 9	75	(70)	1/2
3000	0000.0	2000	/@/`			N OF	1 COK	776		1
64.64.65	(0.0000	1000	0.0999			SDK S/	6 430	75-		
CANAL.	2000	10001	2000			(A)		74	00	7,7
800.00	10.000.01	1000	0 1003			1	\ \ \ \	6.5		×.
866666	1	10001	(000)			1	7007	Ç/	35	43
100,00		1 200	1001			7	25.7.1 25.7.1.1	77	3	65
04/2/20		0000				0/5 mx	7	(Se	84	6/2
00 000		した。	12.5			┪	88	GB)	S	40
-11	70.0001	0.994 ×	0.0448			0K 5/1	1 7000	77	7	127
	03.66	0000-	00010			//-2	0000 2	7/	07	
Ù	(000/0	,000	0999			SE SE	B 120K	7.8	No.	7,7
8746 74	/0000/0/	1.0000	0.0999				3 050	774	70	
8000 0000 0000 0000 0000 0000 0000 000	0,000	1,000	10011			言しく		77	, 23	747
99,998	9,9999	6666	6660			ħ	1	7/2	3	///
100.0000	10.0002	1.0001	6660 Q			V	+			*
100/003	0000001	000/	1001				2000	= 0,7	20	45
						J	?	7	04	ķ

WST7-Form Rev5/90

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Dates: From 3

Through

Scale Sartorfus Model A1205 SN 37010004

100g	108	1.0g	100mg	Blank	Blank		-				
Welght	—	Weight	Weight	Ŧ	Beaker	Tech	Date	Tine	Dry Bulb	Wet Bulb	Z RH
26666	5	10000	0.0998			1/4	3/2	72.27	k .	N	22
5/8/6/3/5	9.9999	1.0000	6.0998			DY D	3/13	14/5	77	0")	44
365,55	10,0003	1000)	(ශුර			S	3/16	300	74	G.	7,1
/00.0000	10.0001	1.0002	0.1000			9K	3/17	0060	9/	57	777
(8,000	10,000/01	<i>6007</i>	0.1001			3	1	200	7	44	46
19 692	100001	1,000	0001			S	2/20	シア	74	\$	7/7
.8666 66	6 6 6 6 6	0.9999	0.0998				3/96	1500	74	100/	7,75
000000	į	5555′	6,660			S	3/1/3	BICK	73	8	2/7
100.000	0.0000	1.0003	0.1003			¥ã	3/24	0945	12	58	6/7
25.55		1.0001	100g			Q	4.KK	035	26	[6]	7/0
1000001	9.9999	10001	0 1002			UNK	3/26	1045	73	59	43
100,001	76566	1.000A	001			140	3/27	11:40	77	63	The
4 9997	9. 9999	1.0001	0.1000			CO	3/30	Q.133	87	35	47
983556	00:00:00	1000/1	1000			(2)(A)	3/8	35	16	50	1,17
5 M.L. 16	10,000	10001	1/009			STATE OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDR	3/8/	19/01	73	Ą	2/7
100.0003	10.0000	0000/	0.1000			(S)K		5760	7/2	00	38
· •	10.0000	2000-7	, 1000			S. W.	476	0800	72	55	4/2
8,556 56	9.9997	0.999.7	0.7000			0K	4/3	0000	ري/ (د)	59	9/2
44.9997	1000.001	0.9999	0.0999			OK.	1/3	0591	70	58	48
666666	1000.01	09999	0660			76	9//5	7860	83	کې	30
700.000	6.9999	0,9998	0'1000			BN	9/15	1600	SC.	53	77
400000	20006	0 9999	0990			AK	1//5	1300	16	25	35
49984		9999	0998			S	188	545	87)	Ş	7)/2
10% 3070	9.9	9999	6650'			126	146	1025	68	22	43
60 - 600	1000 00)	1000	88			S	0///	0435	20)	1/2
100 000	bhhh	9999	7000			¥	7/10	1400	12	83	1/2
100.000	5000 0	1.0002	0.100ai			ă	4/13 6	945	73	58	ድ <i>ի</i>
700,000	_	/0001	9740			3	4/14	1030	7.8	25	9//
874.75	/000 0/	10001	0.0998			X Ø	41.15	5/0/	80)	5	Lit
127.5	7,447	2655,	1,044.5			682	11/16	900	ରୁ	(c)	dr
/00.000/	4666 h	7.0000	0.1001	-		ØK	4/11	516	OL.	57	717
2,74.0	いからかった	0000	, <u>8</u>			S F	11	15ck	2	S S	2/2
1000 001	0000	0,9974	0.1001		•		05/1	0060	73	59	46
3255 55	<i>6000</i> ′01	10003	1001-				<i>6/ </i> p	ObG	74	3	17/2
100.0000	0000.0/	1.0000	0.0 999			Z Z		006	73	59	43
49.9995	10,0003	€000r1	1001			S	4/03	(ca)	76	ુ	38

WST7-Form Rev5/90

Dates: From 2/4/92

Through

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorius Model Al 205 SN 37010004

na 2	Þ	44	4/8	78	1/2	87		777	47	177	5	3/7	82	No.	1		2,7	X.	45	807	4/2	45	24	414	46	46	9%	47	95	8/7	52	44	64	46	47	777
Ver Builb	L	Sto) X	58	75	2	70		12	19	(2.1	58	62	79	63	62	62	2	Ą	2,5	88	58	80	3	6.7	63	64	,0%	65	8	(10)	4	65	સ્ક	60	8
Drv Bulb	Į¥.	50	59	70	68	75	72	12/2	87	77	74	70	15	75		16	76	65	67	65	67	71	11	hL	12	77	21	73	72	70	13	No	η,	7.9	75	P
Time	10	1315	15160	2115	04/0	1500		222	97.60	1500	DXX	0060	1230	1535	930	0421	1600	0820	1038	2580	88	945	0500	1015	1025		1230	000/	1130	0435	0830	1400	1) 800	1340	0650	レきと
ch Date	K 2/6	\sim	U/8 5	K 217	2110	ı ~	3/60	S A S	11/2 2/12				Ė	۳	7 3114	!	7/18 7	_	Jun 19617	8112 3	18	OK 12/21	14× 3	>K 5/25	2/26	7/2/27	4 2128	K 313	7/2/	12 3K	11/8 3/6	٦,		2 3/9	0/16	<u> </u>
Te		\$		0	77	ď	Ŕ	*	P	0	Þ	Ø	7	\$ \$	Q	72	0	7/4	(W .	7 *	0	7	Δ	7/	ā	7		7	2	2	*	9	8	2	<u>¥</u>
Blank Beaker	ı i																																			
Blank Filter																																				
100mg Weight	0.0999	1001	, 1000	. 1600	1000	0. 1000	1000	1001	2001	ð. 1000	7000) /	0.1000	0,1000	00/100	0001.0	0001.0	0.0999	6000	000/1	1000	200/°	0.0999	B 1000	0./000	,0999	0.0999		0.1000	0, (000	000/	0.0999	8350	000/	0001	0.0448	2550
1.0g Weight	1.0000	10001	1,0000	1.000.1	1.0000	0 9998	10000	1000	1.0001	0.9999	00001	1.0000	1.0001	1,000/	1.0000	1.0000	1.0001	10000	10001	99990	1,0000	1.0000	1.0000	1,000.1	6666	1.0000	0000)	1.0000	dono!	0000'	9999	60000	4999	55567	0000	ر کرکر
108 Weight	9,9999	10,0003	0,0000	60666	10.0000	6 6666	10:000	100001	10.0000	16.0000	00000	10.000.01	1000.01	00000	9.9999	10.0000	10.0000	100001	000001	10000	1000,01	4.9999	debada	0000 0/	0000 07	8665.5	10.0000	1	-	0,0000	000001	10000	00000	00000	7. 44.14	<u>8</u> 8
100g Weight	133.0000	×1998	46.6664	1000001	666666	1900,001	00000	1.54.7.60	100.000	100.0003	7535765	84555	(00.000)	37.47.5	100.0000	100000	6666 66	104 4000	63.48.3	00000	66,666		100 000	AND ON	0366 65	76.00	1000 A	44.4748	24 1999	るがあれ	26666	12 12 12 12 12 12 12 12 12 12 12 12 12 1	222.27		100.00 10	25,25

HODBOTOUR BOOTFOLL OFF C	ores proceesing	Unit: HAU	GHS 5	27X
WOODSTOVE PARTICULATE C WOODSTOVE DATA S		Run: 1	Date: 5	5/13/92
		Technician	(s): BN	55
	FRONT HALF			-
FILTER #: 260 F FINAL WT: 17403 9 TARE WT: 16943 9 NET WT: 10460 9	BEAKER #: 496 ml: 4970 desc: ACETON	_ FINAL _ TARE E NET	WT: 106.8 WT: 106.7 WT:	1080 - 9 1934 - 9 1146 - 9
FILTER #:	BEAKER #: m1: desc: ACETON	_ TARE	WT: WT: WT:	9
	TOTAL VOLUME OF USED IN WASH	ACETONE	01	<u>0′</u> m1
FILTER #: 260 B FINAL WT: 3996 9 TARE WT: 3872 9 NET WT: 60059 9	BACK HALF BEAKER #: 47 ml: 165 desc: ACETON	TARE	WT: 104.8 WT: 104.8 WT:	3026 <u> </u>
FILTER #: g FINAL WT: g TARE WT: g	BEAKER #: 400 ml: 75 desc: METHCH	TARE	WT: 103.8 WT: 103.8 WT:	5651 9
	BEAKER #: 4GG m1: 150 desc: H20	_ TARE	WT: 107.3 WT: 107.3 WT:	139 =
	m1: H20	_ TARE	WT: 98.3 WT: 98.3 WT:	040/ 9
	BEAKER #: ml: desc:	_ TARE	WT:/	
	BEAKER #: ml: desc:	TARE	WT:	9
	TOTAL VOLUME OF USED IN WASH TOTAL VOLUME OF USED IN EXTRACT TOTAL VOLUME OF WATER DRIED	DICHLOROMET	16 HANE	75 ml

								Un	it:	HA	UZH	5 56	10 Y	/
	TZCCOW ZCCOW	OVE I	BLANKS DATA	PROC SHEET	:ESSI * # 5	NG A			n: -	ľ		Date:		
E	LANKS D	ONE:	5/1	1/90	`	_		Te	 chni	cia		. <u> </u>		
15 200	ml FISHER ml DI FISHER ml DIS	OPTIN E CHLOF OPTIM BE TILLE	BEAKER ROMETH IA LOT BAKER ID WAT	#: #: ANE 9 #:	1382 E	6		TARI NE FINAI TARI NE	E WT WT WT E WT	9	06.25 100 6.20 6.20	39/ 135/ 108/ 106/ 106/		
	BEAK	ER	TARES	IN	ומ סד	ESSC :	נד	ME: <u>0</u>	900		DATE	: 3/17	1/92	
BKR #	1ST I	WT	TIME	SND	WT	TIME		ЗRD	WT	T	IME	4TH	WT	TIME
D 106.8938						1036						·		-
E	-				1038								. 	
F	96.51	09/1	<u>330 (</u>	96.5	106)	1040				<u> </u>				
S(CALE ROO	OM QC	: TAI	RES	,			SCF	LE I	ROOM	1 QC	: FIN	ALS	
DATE	TIME	BY	WB	DB	74			ATE	TI			WB	DB	
3/03 1300 70 3/24 1034 B			59 58	73	43	<u> </u>	5	/13 /M	163	6	OK	59 56	74	41
						<u>-</u>	5	115	/20	<u>o</u>	カル	40	74	44
						-								
*						<u> </u>						<u> </u>		_
		B	EAKERS	3: FIN	VAL V	EIGHT	5							
BKR #	IN DS	SC	TIME	15T	WT	TIME		SND	WT	TI	ME	3RD (ĄΤ	TIME
D	D 5/12		900	106.2	243	1048		106,0039		1654				
3	5/12	0	900	96 84	31	1050		96.2422		1781				
F	5/12	3	1330	96.5	112	190		96.51	14	ร์ว่	30			
BKR #	4TH W	T TIME		STH WT		TIME		6ТН МТ		TIME		7TH V	JT	TIME
							+					<u> </u>	_	
	<u> </u>				-		+			"		<u>.</u>		
					'		:		f	_	I			

Rev 6/90 Blank Audit: By: Tim Kelly Date: 5/18/92 Blank Calculations: 10004 g = 200 m1 = 100000 g/m1 Acetone: , 2004 - g ÷ 75 m1 = 20000533 g/m1 Dichloromethane: Front Half Catch: Filters: $\frac{.0460 \text{ g}}{\text{Total Catch}} = \frac{1 - (.0000 \text{ g})}{\text{No. of filters Blank Value}} = \frac{.0466 \text{ g}}{\text{Net Catch}}$ Beakers: $\frac{0146 \text{ g}}{\text{Total Catch}} - \frac{210 \text{ (} \infty \infty \text{Q} \text{ g})}{\text{Ml of Acetone Blank Value/}} = \frac{10142 \text{ g}}{\text{Net Catch}}$ ml of Acetone Total Front Half Catch 10600 g Back Half Catch: Filters: ________ g - _______ (.0000 g) = ________ g No. of filters Blank Value/ Net Catch Beakers 1. Acetone/Impingers:

Obd/g

Total Catch

Total Catch

Total Catch ml of Acetone __0004 2. Extract/Impingers:

OSU g

Total Catch ml. of Blank Value/ Net Catch Dichloromethane ml of Dichloromethane 3. Water/Impingers:

OQ3 g

Total Catch

Total Catch

Total Catch ml of water Total Back Half Catch

Total Catch

% Front Half

NET PARTICULATE CATCH CALCULATION WOODSTOVE TEST DATA SHEET #6

HAUGHS SOTX

Technician(s): TX TK
WSTAPP1-AppDoc19-page2

Unit:

Date:

EPA WETHOD SH PARTICULATE CALCULATIONS NOODSTOVE TEST DATA SHEET 137

Unit: 4/4441/5 SOJY
Run: 1 Date: 5/13/99

Tochnician(1): TC55

8/28/91 dect NST3-Form 1 31.4698 0000,000 //// H20 1) Vacetd): (30,934 Va)c 17.65 xc 1066 mofx (30,14 " Hgi 13.6 このなどと言い

2) VH(etd): (.04707)x 57,7 "11 H20): 8.7159-000 0000

Jhh56 - BM X 100 = 70,00 0000 (D) 159 60t + 31-4698 600t) 1997/89/est 3) Asu:

4) Ce: (31,4(48 dect) (15,43): 0,0000 gr/dec

00, 000 decfa) (60): de of > 5) Estinated g/hr:

notor correction factor (Y factor) of the motor box used for the test everage barometric pressure during the test average meter temperature for the test in degrees Absolute leter box during test otal mater caught cubic fool

particulat

computer prin

MISCELLANEOUS TEST DATA WOODSTOVE DATA SHEET #8

Useable Firebox Dimensions: See QC Section Useable Volume: 1.473	_ft ³
Dilution Tunnel Draft (If applicable): Start () Stop ()	 -
Test Chamber Air Velocity: Start: O Stop: O Avg: O	
Wet Bulb/ Start: WB: 58 °F DB: 71 °F /. 2 % Amb Moisture 46	7RH
Dry Bulb Stop: WB: 58 °F DB: 73 °F /./ 7 Amb Moisture 42	7.RH
$\overline{X} = 1.15$ Ambient $\overline{X} = 44$ Relative Empty Humidity (
Stove Wt: 237,3 lbs.	
	bs.
Empty Stove Wt with Stack and Ash Ash: O lbs. Total: 1	bs.
Kindling Wt. Paper: 13 lbs. Wood: 6.0 1	bs.
Pre Burn Fuel Wt. 10,0 + 9.6 Total: 196 1	bs.
Total Kindling and Pre Burn Fuel Wt 256 1	bs.
Coal Bed Wt-1bs: Range (2.7 - 2.2)307.2-306.71bs. Actual: 2.5 1	bs.
Allowable Amount of Charcoal that can be removed:	
Coal Bed Wt. Range $\left(\frac{2.7}{\text{Upper Wt.}} + \frac{2.2}{\text{Lower Wt.}}\right)$.25 =	.ad
Test Fuel Wt-1bs: Ideal /0.3 lbs. Range: 9.3 lbs. Actual: 10.9 1	bs.
•	cs.
2 x 4's x /8 3/4 " H Pcs /0.9 1bs. /00	7.
4 x 4's x N/A " N/A Pcs N/A 1bs. N/A	7
	<u> </u>
Est. Dry Burn $\frac{10.9 - (10.9 \times 10.56)}{2.2025}$ X $\frac{60}{100}$ = $\frac{2.427}{Est.Dry Burn Rate (Kg/$	Hr)
Est EPA Heat Output(HO _E) (19,140) $\times \frac{2427}{100} \times \frac{63}{63} = \frac{29268}{\text{Est Heat Out}}$ (Avg BTU's/Hr) Est Heat Out (HO _E) BTU's/	
Comments: 190 = 127	

Unit: //AUSHS 527X Run: Date: _5//3/92 Page 9
WOODSTOVE OPERATING DATA
FIRE STARTED: 0730 PST PDST
WARM UP AND PREBURN: PRIMARY AIR: set wide open for all warm- up/preburn fuel charges, then set to <u>WIPE OPEN</u> at start of preburn.
SECONDARY AIR: NA CAT BYPASS: NA
CHARCOAL BED PREPARATION: raked and leveled prior to each warm-up/preburn charge. At 1 $1/2$ min. prior to loading last fuel, raked and leveled. In stove sec.
TEST: Door Wide Open during loading $_{-}$ $_{D}$ min $_{-}$ $_{32}$ sec
pRIMARY AIR: opened full for first 5 min., then set to run setting of WIDE OPEN
SECONDARY AIR: NA CAT BYPASS: NA
FAN: ON OFF during warm-up ON OFF during preburn ON OFF first 30 minutes of test ON OFF balance of test run Fan speed set at
WOOD DATA: KINDLING: a mix of the grades listed below
SIZE MILL BRADE SPECIES
PREBURN: 2X4 Manke/Tacoma Std or btr s. orn D fir
TEST: 2X4 Packwood #2 or btr s. orn D fir 4x4 Packwood #2 or btr s. orn D fir
PELLET FUEL APFI#:WA
All grades WCLB rules
WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either/O or/8 inches.
1st warm up/preburn fuel charge (10.0 lbs) added at 0825.
2nd warm up/preburn fuel charge (9.6 16s) added at 0930 .
3rd warm up/preburn fuel charge (lbs) added at
4th warm up/preburn fuel charge (lbs) added at
5th warm up/preburn fuel charge (lbs) added at "

FUEL MOISTURE WOODSTOVE TEST DATA SHEET #10

69

oF

Unit: /THUOMO Run: 5/13/92 Date: Technician: BN TK DK WST1-Form7-Rev11/89

Correction Factor: _

Roc	om Temper	catur	e: <u>67</u>	— of		Cor	rection	Factor	: <u> </u>
Und	or Value	es are	eadings to correct doisture the correct of the corr	ed for: Readin	tempera gs taker	iture: ' : at:	7es 0900		<u>~</u> .
Pc			Top)		tom	Sid		Piece Av
#	Dimen	Use	Uncor	Cor	Uncor	Cor	Uncor	Cor	Corrected
1	2x4x8	K	5.5	5.5	415	4.5	4,5	4.5	4,833
2					ļ			<u> </u>	
3		1	_						
4	21418	P	18.5	20.1	18.5	20.1	18.0	19.6	19.933
5	1. / .	ρ	18.5	20.1	18.0	19.6	18.5	20.1	19,933
6									(39, 867)
7					ļ			<u> </u>	
8									
9									
10	2x4x/834	T	19.0	20.7	19.0	20.7	18,5	20,1	20,500
11	2x4x1834	T	21.0	22.9	21.5	23,5	19.0	20,7	22.367
12	2x4x/834	T	22.0	241	21.5	23.5	21,0	22.9	23,500
13	2x4x/834	T	22.0	24.1	22.0	24,1	19.0	a0.7	22,967
14									(89,333)
15									
16									·
			i					<u> </u>	Į.

% Moisture - Dry Basis:

18 19

% Moisture - Wet Basis:

Kindling	Pretest Fuel	Test Load
4,833 2	19.933 - 7	22,333
4.610 %	16.620 -2	18.256 2

21.8

21,3

To obtain Wet from Dry: $\frac{100 \times \% \text{ Dry Rdg.}}{100 + \% \text{ Dry Rdg.}} = \%$ Moisture, Wet Basis

20.0

Acceptable Ranges: 16-20% wet; 19-25% dry (17.5 - $2\overline{2}$.5 on Meter [Uncor reading] at 70° F)

21,3

Key for Use: K= Kindling P= Pretest Fuel T= Test Fuel

Unit: 1440111 3211
Run#:
WOOD DENSITY DETERMINATION Date: 5/13/92
WOODSTOVE TEST DATA SHEET #11 Technician: BUTK DK JS WST2-form11-Rev 6/90
WST2-iormil-Rev 6/90
Wood Pieces Nominal Dimensions: 2 x 4 x 3½
WOOD Tiete: Rominal Discussions
Depth (D):cm
Width (W): 9,00 cm
Length (L): 8,60 cm
$\frac{8.60}{8.60}$ cm Length $\overline{X} = 8.60$ cm
S.60 cm Eengen X - 3,60
Volume: 301,860 cm ³
$\frac{\text{D} \times \text{W} \times \text{L}}{\text{D}}$
\sim
MOISTURE: Room Temperature: 70 of Correction Factor:
Uncorrected Meter Readings Corrected for temperature: Yes No
mann n
NOTE: Record moisture meter readings to the nearest 0.5%
Uncor Cor Avg % Moisture (Dry) <u>22.000</u> %
Top: 22.0 24.1 % Aug % Moisture (Wet) /8,033 %
Bottom: 20.0 21.8 %
Side: 18.5 20.1 % Scale: Leveled In Out
$\frac{1}{x}$: $\frac{2000}{x}$ $\frac{2eroed: In \nu}{\nu} \frac{1}{\nu}$
Wet Weight: 202,9 g Dry Weight: 109,17 g
% Moisture Dried Basis: 16.604 7
[1 - (Dry Wt 5 Wet Wt)] X 100
$\frac{\text{Date}}{5/3/92} = \frac{\text{Time}}{O900} = \frac{\text{Temp}}{233} \text{ or}$
Out of Dryer 500/40 1445 Property 24 hrs.) Minimum Dryer Temp 100°C (212°F)
(Minimum Time in Dryer: 24 Mis.) Minimum Dryer Jemp 200 0 (222 -)
Density = 169-17 g : 301,860 cm ³ = 5604 g/cm ³
(dry wt) (volume)
Pellet Fuel Moisture Content Determination
retief thei woisture content pereimination
Tare Beaker Wtg
Wet Wt:g =g
Gross Wet Wt. Tare Beaker Wt. Net Wet Wt.
Dry Wt:g =g
Gross Dry Wt. Tare Beaker Wt. Net Dry Wt.
% Moisture Dried Basis:%
[1 - (Net Dry Wt - Net Wet Wt.)] X 100

Flo ह ਨੂੰ 寒 $\bar{\mathfrak{O}}$ Flow **8** ä 图 -1.334 - 824° 512 Static Press. 2055 :053 505 -063 2076 1:065 000 .058 (20°) -067 .076 30, 150: H9: -073 075 :07% 1.00. 110-107 192 BXD SC1 \$3 \$3 425 425 438 42S \$3 425 435 400 37.5 375 435 00/7 歪 400 99/1 425 700 92 460 00/ Uate: 5/13/9 B 9 5 91 ف _ Ĺ 15 <u>۔</u> ١ (8085 66612 528W 385 356 286 Stack 343 455 8CH 306 480 495 333 (N 80 980 433 345 107 280 (S) 501 321 381 32 (6)3/ SS ع 2 139 (K) 746 8 $\overline{\delta}$ <u>7</u> 139 134 131 5 123 ā <u>|</u>-149 g 5 × 527 5.6 0.0 〇 下 10.0 5. (S) 7,6 9,0 2 36 (5,0) 63 38 10.5 8,9 و 65 % (V) *S*≤ Dry (S) SS 5 53 <u>13</u>4 269 43 8 70 184 9 137 9 99 148 7 9 6 181 0 T/C(1)T/C(2) HAU645 35 <u>و</u> __ 107 28 103 53 90 ල0/ 70/ 2 133 34 E 3 801 130 Ξ 98 3 <u>a</u> 26.3 6 Bal 26.3 86.0 **○** 29.7 N N 73,1 52,0 19.7 9 S はさ 144 3 7 5 (V) ر ف 90 2 Paget Hun: **-**.30 . مح 25 S S 8 異 20 5 28 8 Ń Ņ 8 30, 60 8 ود 2 .13 ŏ MB 020 .025 980. 05 . 683 .013 .058 3 0/0 280 **689** 679 510 676 B 00 900 , 90 020 1884 028 75. 25. 16.9 ص قــ 13.2 五.3 <u>5</u>0 16.7 0,CI ろい 0,0 17.0 6,0 9 0. ∞ 7 9 0 <u>v</u> <u>ئې</u> 1.0 12.0 15.0 0 0/2 9 7 9.9 ر م 14.3 Ę 0 = 3.2 ج اخ 5 7.0 60 60 <u>ふ</u> <u>:</u> $^{\circ}$ N 2 وكمح 473 434 52 .668 929 349 52.4 .293 17 , 孠 38 85 597 634 S S 199 S 310 797 3 いい ۲ خ 6.3 S S (ე (ე 3. (A) 8 3 3 <u></u> → = 33 Q Q HOODSTOVE DATA SHEET 412 MST2-Form 14 Rev 1/88 8.9 0.0 ∞ فہ <u>ر</u> Q^{-} 3 37 <u>ن</u> خ 3 3. 5 Ś ⇉ DATA SHEET #12 14 Rev 1/88 -1음 **,** 346 359 7 ELC. 578 204 ठ्ठ 23 호 자 489 520 る 3 .213 25 533 797 子 9£ 운. Rate 區 $\tilde{\omega}$ ó <u>ر</u> ュー 0: 3 0 റ Ś 0 a ٥ \circ 3 ત ß left 10.6 0.0 0.1 6. 83 60 ر 6 φ, Scale 1bs T 0 = 3 $^{\circ}$ 7 3 \circ S 3179 317.6 313.0 315.3 3083 307.0 3.89.8 314.0 367.8 307.6 310.7 309.7 308.6 307.9 367.5 307.3 311.7 368.1 367.4 307.1 二 元 S P 300 40 S 83 40 12 6

Primary Air Set at OPEN7007 Secondary Air Set at /// Pumps turned on at: 108/ 192 324 Check WB/DB: Date: 5//3/ Technician(s): Comments 405.4 22 429 Fan: 163 1066 Static ,073 106.7 £ 062 1901 062 -.043 020 UNY ,073 120 76 Chural. Room 6 28 B 18 8 B 30 SZZX 6 Catalytic 2nd Burn 576 1044 1389 1775 1002 1276 278 1583 1227 1284 2897 of 13/3 Unit: //12/645 Firebox 1083 Page: 7 1315 1/62 1325 1220 869 22% 1216 1321 223 @ 9 Run: 6 Bottom いなか 453 456 745 asc 5 250 رک るとか ない 101 **₹** ブガ 77/ 8 380 Right 308 Side 368 363 330 328 332 360 3 43 79% 296 326 210 38) Back 2%6 323 287 307 353 567 23 200 506 350 188 34 449 431 Side 744 Left Z Z 282 6/h 482 804 32 807 z, ध RECORD SHEET #13 Stove PRE BURN DATA 285 817 345 32 616 Top **58**h 382 313 WST2-Form16 43% 392 22 4 S S 3 **6**83 276 322 69h Stack 424 763 405 540 374 839 52 25 32 T/C#-3 Rate Burn 7 K 80 O 6 0 307.2-306.7 Weight Scale 6×18 369 Jun 309.2 3012 315.7 3170 308.5 3000 3116 300.5 3070 310.4 307.0 Time S $\overline{\varepsilon}$ 3 3 /ਫ Minute

TEMPERATURES
RECORD SHEET #14
WST2-Form14 Rev1/88

Unit: HW6445 S 27 X Date: 5/3/92 Run: / Technician(s):

Site: EEMC - West, Kent, WA 98032 Date: 5/13/92 Analyte: CO2 (15-1)									
source: HAUGHS S270 SERIES Run #: /									
Zero Cyl #: T132257 Conc.00.0 % CO2 Cyl Press: 800 psi									
Certi	Certified by: LIQUID AIR Date: 10/7/91								
							ess: <u>900</u>		
Certi	fied by:	MATH	ESON	· · · · · · · · · · · · · · · · · · ·			Date: 10/3	191	
Analyzer	: Make:_	Horiba		Model: I	PIR-200	0	SN: 4070	169	
Range:	0 - 25.0%	CO2	A:	nalyzer Ou	tput:_	0 - 1.0	<u>) </u>	v.	
Flow:	1.5 SCFH		Meas	ured by:	Rotame	ter: <u>X</u>	Flowmete	r:	
EPA Span	Value = 2 rol Limits	25.0% CC) ₂ 58 of 2	5 09 00) F % - CO -			
1)				Temp: 8	() 05	
Te Run	Mudre. D	· _/ <u>/)</u> ~		Audit Resu		<i>70</i> 0	remp: O	<u></u>	
Point	Exped	ted Res		Act	ual Res	nonse	+ Conc	1	
#	t Expected Response Actual Response + Co Meter DVM % Meter DVM % Differ							4	
Zero	00.0	.000	00.0	00.0	1000	1054	,054	,217	
Span	50.4	.504	12.6	50.0	,500	12.388	-,212	-1.683	
Comments	<u>:</u>								
Doct Doc	3224 - 7		\bigcirc		10	2	_ 70		
Post Run	Audit: E	ıу:					Temp: <u>78</u>)o _F	
Point	Evnec	ted Res		Audit Resu					
#	Meter	DVM	8	Meter	ual Res	ponse %	+ Conc Difference	4	
Zero	00.0	.000	00.0	00.0	.000	.054	.054	. 217	
Span	50.4	.504	12.6	<i>ડ</i> ઠ,	.502	12.437	163	-1.292	
Comments	•								
								İ	
	Difference								
	ifferece =	F	ull Scal	e Value					
Span % Di	ifference	= Act %	Exp % (_ Exp % (p	<u>om)</u> X 1	00			
,	Lasp v (ppm)								

Site: EEMC	- West,	Kent,	WA 98032	2 Date	: <u>5/3/4.</u>	Anal	lyte:	02 (15	5-2)
Source: HAUGHS S270 SERIES Run #: /									
Zero Cyl #:	Zero Cyl #: <u>T132257</u> Conc.00.0 % O2 Cyl Press: <u>800</u> psi								
Certifie	ed by: _	Liqui	O AIR				Date:	10/7/9	1
Span Cyl #:								_	
Certifie	ed by: _	MATH	IESON		····		Date: _	10/31/	91
Analyzer:	Make:	reledyn	e	Model:	320 Ax		SN:_	37465	
Range: 0 -	25.0%	02	Ar	alyzer O	utput:_	0 - 1.	0		v.
Flow: 1.5	SCFH		Measu	red by:	Rotamet	ter: <u>X</u>	Flow	wmeter:	
EPA Span Va	lue = 2: Limits	5.0% O ₂ = + 2.	5% of 25	5.0% O ₂ =	+ 0.62	5% O ₂			
Pre Run Aud			7					80	o _F
	_	<u></u>		udit Resi			·		
Point			ponse	Act	tual Rec	sponse	+ Co	onc.	Λ
#	Meter			Meter	DVM	- 8	Differ	ence	<u>∠</u> 8
				0.5					090
		1		12.5			,275		1221
Comments:	Teledyne	≇#2 <u>Cy</u>	1 % E	xp & 2	Act &	Adj t	<u>:0 </u>	<u>∆ </u>	
								: -	
				 -					
Post Run Au	dit: By	7:	DK	Tin	ne: <u>/</u> 6	25	Temp.:_	78	o _F
				udit Resu					
Point #	Expect Meter	ed Res	ponse %	Meter	tual Res	ponse 8	+ Con Differe	nce f	7 8
Т	Merel		þ						
Zero	00.0	.000	00.0	00.4	.004	7003	-,003		015
Span	12.4	.496	12.4	12,5	.504	12.752		- 1~	.838
Comments:	Teledyne	#2 <u>Cy</u>	1 % E	xp % /	Act %	Adj t	0 + 1	7 8	
				 -					
t Cong. Dif	forence			(C+3) %					

\frac{\frac{1}{2} \text{Conc. Difference} = \text{Act \cdot - Exp (Std) \cdot

Site: EEMC - West, Kent, WA 98032 Date: 5/8/92 Analyte: CO (15-3)								
Source: HAUGHS S270 SERIES Run #:/								
Zero Cyl	#: <u>T13</u>	2257	Co	nc. <u>00.0</u> %	со	Cyl Pr	ess: <u>800</u>	psi
Certi	fied by: _	Liqu	110 AIF	2	· · · · · · · · · · · · · · · · · · ·		Date: 10/7	191
							ess: 900	
							Date: 10/3	
	•						SN: 408	•
Range:	0 - 10.0%	CO	An	alyzer Ou	tput:	0 - 1.	0	v.
Flow:	1.5 SCFH		Measu	red by:	Rotamet	er: <u>X</u>	Flowmet	er:
EPA Span	Value = l rol Limits	.0.0% CO						
Pre Run	Audit: By	: <u>By</u>	<i>t</i>	Tim	e:/	015	Temp: 8	/o _F
	• • • •			udit Resu				
Point #		ted Res	ponse %	Act Meter			+ Conc. Difference	A &
Zero							004	1
Span	49.6							1,380
Comments								· · · · · · · · · · · · · · · · · · ·
Commences	<u>-</u>							
		<u></u>						
Post Run	Audit: B	y:	DK	Tim	e: <u>1</u> 2	140	Temp.:	7 <u>8 </u>
				udit Resu	lts			
Point #		ted Res	ponse %	Act Meter	ual Res	ponse	<u>+</u> Conc. Difference	Δ &
	Meter		· · · · · · · · · · · · · · · · · · ·	00,0	.000	:004	004	-044
Zero	90.0 49.6	. 496	4.96	49.4	.494	5.028	.068	1.380
Span	77.4	. 716	1.10	7 1) 7	- / / /	<u> </u>		
Comments	:							
<u></u>				(0) 35 2				
	Difference				m\ ▼ 10	١0		•

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Site: EEMC - West, Kent, WA 98032 Date: 5/3/92 Analyte: SO2 (15-4)								
	Source: HAUGHS S270 SERIES Run #: /							
	•						ess: <u>800</u>	psi
Certifie	d by: _	LIQUI	O AIR				Date: 10)	7/91
Span Cyl #:	AL2	892	Co	onc. 1232 p	om SO ₂	Cyl Pr	ess: 45	<u>O</u> psi
			_				Date: 9/2	
Analyzer:	Make:	Horiba		Model: P	IR-200	0	SN: 403	019
							0	
							Flowmet	
EPA Span Va EPA Control	lue = 2	500 ppn	n SO ₂					
Pre Run Aud	<u>it</u> : By	: BD	<u>.</u>	Time	e: <u>9</u>	55	Temp:	% of
Point	Fynec	ted Res		udit Resu		enonse.	+ Conc.	
#	Meter			Meter	DVM	ppm	Difference	₽ 8
Zero	00.0	.000	00.0				8.432	, <i>3</i> 37
Span	49.3	.493	1232	49.4	,494	1236.	4,496	1365
Comments:								
			-					;
·	······································			<u> </u>				
Post Run Au	dit: B	у:	<u>OK</u>	Time	e: <u>)</u>	<u> </u>	Temp:78	o _F
	·			udit Resu				
Point #	Expec Meter	ted Res	ponse ppm	Meter	ual Res	sponse ppm	+ Conc. Difference	₽
Zero	00.0	.000	00.0	00.2	.002	8.432		.337
Span	49.3	.493	1232	49.3	.493	1234.	2.000	.162
Comments:	<u> </u>				<u> </u>			. :
	foronco		non - Fr	n (C+4) n		·		

+ Conc. Difference = Act ppm - Exp (Std) ppm
Zero % Differece = Act % (ppm) - Exp % (ppm) X 100
Full Scale Value

Span % Difference = $\frac{\text{Act } \% \text{ (ppm)} - \text{Exp } \% \text{ (ppm)}}{\text{Exp } \% \text{ (ppm)}}$ X 100

Run: /
Date: 5//3/92
Technicians: BN TK DK JS
WST6-Form3-Rev11/89

QUALITY CHECKS WOODSTOVE DATA SHEET #16

Ambient = Tr:	65.3		OF T/C	#30: <u>64</u>	0,6	—_°F
Thermocouple Check	k (at ambien	t): T/C#1:_	65,1	oF;T/C#2:	<u>.65,2</u>	_of;
T/C #3: 65.8	of; T/C	#4: <u>65.9</u>	o _F ;	T/C #5:	65.9	_°F;
T/C #6: 65.8	o _{F.;} T/C	#7: <u>65.5</u>	°F;	T/C #8:	65.4	oF;
T/C #9: 65.7	PF; T/C	#10: 65.6	o _F ;	T/C #11:	<i>65</i> .3	o _F ;
T/C #12: 66.0	_of; T/C	#13: <u>65.6</u>	o _F ,	T/C #14:	65,5	_of;
T/C #15: 65,8	of; T/C	#16: 62.7	°;	T/C #17:	64,3	_°F;
T/C #18: <u>68.0</u>	_of; T/C	#19:	°F;	T/C #20:		_of;
T/C #21:	_o _F ;	#22:	o _F ;	T/C #23:		_°F;
T/C #24:	_of; T/C	#25:	o _F ;	T/C #26:		oF;
Comments:						
						·.
				<u> </u>		
					· ·	
Thermocouple Read	out:		•			
Pretest Zero/Span Zero	4.2.5	Dane	Test Che	not %	Differe	nce
(0°F) : -,3 °	F to:	oF Zero	(0°F):_	6of	1030	
Span (2000°F):2000.7	of to: 2000	OF (2)	000°F): <u>Q</u>	604.2°F	<i>i</i> 41	
(Allowable % Diffe	erence = 1.5					eet
#15 to calculate 7	Difference)	•		•	
Thermocouple Reado	out Pretest	Linearity C	heck			
0°F =	oF; 200°F	= 201.6	_°F; 400)°F = <u>398</u>	<u> 8 </u>	;
600°F = 1,01,2	o _F ; 800°F	= 801.4	_ _°F; 1000	of = 1000	0,5 of	3
1200°F= 1/98.2						
1800°F= 1800,5	_				· · · · · · · · · · · · · · · · · · ·	
	-		•		÷	
Tracer Gas (SO2)	Injection Tr	ain Leak Ch	eck: Pre	Pos	t	
Combustion Gas (CO						
Tracer Gas (SO ₂) A	inalyzer Tra	in Leak Che	ck: Pre	Pos	t	
Tracer Gas (SO ₂) A Draft (Static) Gua	ige Zero Che	ck:	Pre	Pos	t	- 2
·	-			•		
Scale Check Pre (V	/t, #'s):	315.2 - 30	05.2=	10		
Post	(Wt, #'s):	316.8 - 30	6.8 = 16	0,0		
Stack cleaned price	or to the ru	n: Yes	No_			
			. 			

MODEL:	S-27X		*****	DATE:	5/18/92 ******	*****
TIME	METER	DELTA	METER	PERCENT	PERCENT	S02
TIME	READING	Н	TEMP.	CO	CO2	COCENTR.
(MIN.)	(CF)	(IN. H2O)	(DEG. F)		(%)	PPM
=======	=======	=======			=======	=======
0	678.000	0.150	77		4.90	625
5	679.500	0.260	77		3.40	475
10	681.495	0.170	79		2.50	600
15	683.086	0.170	81		2.90	600
20	684.690	0.160	82		3.10	600
25	686.299	0.180	83		5.60	575 550
30	687.985	0.190	84		6.80 7.30	550 550
35	689.753	0.190	85		10.80	500 500
40	691.528	0.230	86 87		11.00	500
45	693.487	0.230 0.230	87		11.70	500
50 55	695.454 697.420	0.230	88		12.00	500
60	699.394	0.230	. 88			500
65	701.369	0.230	88		10.10	500
70	703.344	0.230	89		10.50	500
75	705.326	0.210	9(10.30	525
80	707.221	0.210	9(9.80	525
85	709.116	0.210	90		9.80	525
90	711.011	0.210	90		9.40	525
95	712.908	0.190	9:	0.31	7.90	550
100	714.721	0.190	9:		6.80	550
105	716.537	0.170	9:		5.80	575
110	718.274	0.170	9:		5.60	575
115	720.010	0.170	91		5.50	575
120	721.747	0.160	9:			600
125	723.412	0.160	9:			600 600
130	725.076	0.160	90			600
135	726.734	0.160	90		4.80 4.70	575 ·
140	728.393	0.170	89 90		4.60	600
145	730.117 731.775	0.160 0.160	90		4.50	600
150 155	733.434	0.160	9(4.30	600
160	735.434	0.160	90			600
165		0.150	90			625
170		0.150	90			625
175		0.150	90			625
180		0.150	9(625
185		0.150	90			625
190		0.150	9:			625
195	746.310	0.140	9:			650
200		0.130	9:			650
205		0.130	9:		3.40	650
210			9.	l.		

TABLE 2 ---- FIELD DATA

Secretary of the Secret	CLIENT : H	HAUGHS PRO	DUCTS		•	TEST No.	: 5	
		S-27X *****	·****	*****		DATE: *****	5/18/92 *****	
	METER CAL. FACTOR (Y)		1.066		Wt. WOOD BURNED(LB)		10.5	Lbs
	BAROMETRIC PRESS.(Pb)		30.08		WET, FUEL MOISTURE %	~	17.582	8
	LEAK RATE POST (Lp)		0.002		Wt. PART. COLLECTED		0.6224	g
	WATER VOL. (V1c)		116.2		METER VOLUME Vm		71.383	mcf
	TEST TIME (MIN)		205 ı		HC MOLE FRACTION		0.0132	

TABLE 3 ----FIELD DATA AVERAGES

		TABLE 3	-FIELD DATA A	AVERAGES		
	CLIENT :	HAUGHS PRODUCTS		TEST No. :	5	•
	MODEL: *****	S-27X *********	****	DATE: 5	/18/92 *******	k**
	AVG DELTA H	0.18 in H2O	AVG PRCNT	400 MAA 1000 MM 4000 MM	0.80	ફ
lum)	AVG METER TEMP. Tm	88 deg F	AVG PRCNT CO2		6.18	ફ
	AVG PPM SO2	573 PPM				
Togge-						. •

-- CALCULATIONS TABLE 4

		TABLE 4	CALCULATIONS		
	CLIENT: HAUGHS PRO	DUCTS	TEST No. :	5	•
	MODEL: S-27X *********	*****	DATE: 5	/18/92 ******	****
	STD SAMPLE VOL. Vm(std)	73.73 dscf	STACK GAS FLOW Qsd	498.754	dscf/Hr &
				8.31	
(1000)	VOL. WATER VAPOR Vw(std)	5.470 scf	PARTICULATE CONCTRT. C s	0.0084	g/dscf
	PRCNT MSTR Bws	6.91 %	PARTC.EMISS. RATE E	4.21	g/Hr
	BURN RATE BR	1.15 Kg/Hr	MOLES OF GAS PER Lb WOOD Nt	0.51	Lb-mole/Lb
	CO EMISSION RATE	133.06 g/Hr &	PART.EMISS. RATE	3.66	g/Kgdry fuel
()		115.71 g/Kgdr fuel			——————————————————————————————————————
Street Street					

in the second

TABLE 5 ---- PROPORTIONAL RATE VARIATION

		IABLE 3	PROPORTIO	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	- VIII(IIII I	011		
* Samuel	HAUGHS PRO	DUCTS			TEST No.	:	5	
.]	S-27X	******	*****	****	DATE:	5/18/9: *****	2 *****	****
	TIME INTEVAL Ti	PPM * Vm	PROPRTN. RATE VAR. PR		PROPRTN RATE VAR. AVERAGE			
		=======	=======================================	=====	=======	=====	=== ==	======
oct of the second	5 10 15 20 25 30 35 40 45 50 55 60 65	988.4 997.5 1000.9 1006.3 1007.5 1009.9 1011.2 1013.3 1014.9 1018.1 1016.7 1019.9 1020.4 1019.5	97 98 98 99 99 99 99 100 100 100 100		100			
	75 80 85 90 95 100	1021.2 1024.3 1024.3 1024.3 1024.4 1024.7	100 100 100 100 100					
22-11	105 110 115 120 125	1026.4 1026.3 1025.7 1026.3 1026.5	101 101 101 101					
	130 135 140 145 150 155	1026.8 1024.1 1025.6 1021.4 1024.1 1024.7	101 100 101 100 100					
	160 165 170 175 180 185	1024.1 1024.7 1024.2 1024.2 1024.2 1024.2	100 100 100 100 100 100	·			**************************************	
ton)	190 195 200 205 210 215	1023.9 1026.2 1026.5 1025.8	100 101 101 101					
. 1								

COMPUTER INPUT DATA WOODSTOVE DATA SHEET #1 Client Houn's Products	
Client Address ID Otlos Court	
Bramp Ton, Ontario, Canada LGT 5C1	<u> </u>
Client Phone 4/6- 792 - 8000	
Project No. Model No. 5210X	·
Run No Date of Test Est Grams/Hr	
Stove Type: Cat Non Cat Pellet	
Data To Be Submitted To: Oregon X Colorado EPA X	
Burn Category: Low (<0.8 Kg/Hr) Med Hi (1.26 - 1.90 Kg/Hr) Med Low (0.8 - 1.25 Kg/Hr) 1/1500 Max (>1.9 Kg/Hr)	
Fuel % Moisture (dry) 01.333 %(wet) 17.589 (00.00) (Data Sheet #10)	<u>%</u> ~
Stack Static Pressure -049 (0.000) (Data Sheet #12)	_"H ₂ O _
Barometric Pressure 50.08 (00.00) (Data Sheet #2)	"Hg //
Temperature (Average Room) Combustion Air	°F ~
Flue Gas Moisture 6.9039 (00.000) (Data Sheet #7)	% <i>-</i> _
Ambient Moisture 1/35 (0.00) (Data Sheet #8)	
Stove Weight 237 (000) (Data Sheet #8)	_lbs ~
Stove Temperature Change	OF ~
Particulate Emission (1302 gr/	dscf
Fuel Higher Heating Value (dry)BT (0000) (CT&E Sheet)	U/16
Fuel Type: Wood: X Pellets:	
Total Fuel Consumed During Burn 05 (00.0) (Data Sheet #8)	_1 bs /
Total Particulate Catch (0.0000) (Data Sheet #6)	9 ~
H ₂ O Captured (00.0) (Data Sheet #3)	g _/
Dry Gas Meter Volume 71-283 (00.000) (Data Sheet #2)	CF //
Dry Gas Meter: Y Factor: 45-1.066 Post Test Leak Rate 1007	_CFM _

Meter Box Data Sheet Page # 2

Meter Box 4J Y Factor 1.066

Leak Checks: \(\frac{5.0}{16.0} \) " Hg @ \(\frac{.001}{.002} \) cfm \(\frac{16.0}{16.0} \) " Hg @ \(\frac{.002}{.002} \) cfm \(\frac{16.0}{16.0} \) " Hg @ \(\frac{16.0}{.002} \) cfm

Inject SO2 @ 100 cc/min

Page 1 of 0 Unit: HAU6HS S 27X Run: 5 Date: 5/18/92 Operator(s): 38

Nozzle: Probe @ 3/8 " od

Initial Volume: //500

ROTO	PRESS:		Sampling	Ratio :	185	: 1	BAROM	ETER:2	0.10
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	802 PPM	ROTO TEMP	PUMP VACC
00	1035	678.000		5645	15	17	635	20	0
05	40	679.500		2414	.26	17	475	13	5
10	45	621-495		5-869	117	79	600_	73	10
15	50	623096		5,869	17	8/_	600	13	15
20	55	684-690		5.869	16	82)	600	73	5
25	1100	696.099		6.185	. <i>18</i>	83	575	73	12
30	5	687.985		6.391	,19	84	550	74	10
35	10	629.753		6.391	119	85	550	74	10
40	15	691-508		7.030	193	86	500	74	10
45	20	693.487		7030	,23	87	500	20	1-0
50	25	(95H54		7030	193	87	500	74	1.0
55	30	692496		1030	.23	28	500	701.	10
ROTO	PRESS:	<u> </u>	TOTALS :	(7.693)	(2,39)	(996)	BAROM	ETER:	30.08
60	35	699.394		7-006	13	<i>8</i> 8 ·	500	14	10
65	40	701.369		7-000	<i>d</i> 3	88	<u>500</u>	74	1-0
70	. 45	103.344		2010	123	89	<u> </u>	75	1-0
75	50	705.306		10679	.21	90	505	15	1.5
80	58	707,001		10-679	167	90	505	75	1,0
85	100	109-116		6679	01	90	525	25	1.0
90	5	711-011		6679	-01	90	525	15	10
95	10	712908		6.363	19	91	550	16	1.0
100	15	214-201		6.363	-19	91	550	76	1-0
105	Đ	716.537		626	117	91	5%	10	1-0
110	25	718.074		6.06	17	91	575	76	10
115	30	100010		608	17	91	575	76	10
			TOTALS:	78,7640	(D.UB)/	(1080)	MAX V		
TOTAL	. CU FT		TOTALS:	156,457	481/	12076	AV BP		

Meter Box Data Sheet Page # 2

Meter Box 45 Y Factor 1-066

Leak Checks: 150 " Hg @ 201 cfm cfm cfm cfm

Unit: Hauards SON X

Run: 5 Date: 5/0/46

Operator(s): 55

Nozzle: Probe @ 3/8 " od

Initial Volume: _/500___

Inject SO2 @ 100 cc/min

					10-	· ·	222245		2011
ROTO	PRESS:	<u> </u>	Sampling		18.5	. 1		ETER: 3	
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	902 PPM	ROTO TEMP	PUMP
120	35	291.747	·	5807	16	91	600	.73	10
125	40	203,412		5.807	16	91	600	70	1-0
130	\$	25076		5,818	16	90	(CO)	27	1-0
135	60	106-734		5.818	-16	90	600	17	1-0
140	55	708393		6071	-17	89	515	72	1.0
145	1300	730,117		5818	16	90	600	77	1-0
150	5	131-774		5818	16	90	600	17	10
155	10	733.434		5.818	16	90	600	77	1.0
160	15	735,092	ţ	5818	16	90	600	77	1-0
165	DO	136.751		5585	115	90	995	77	10
170	26	738,343	Ī	5.585	-15	90	65	177	10
175	30	739935		5,525	-15	90	625	77	1.0
ROTO	PRESS:	-20	TOTALS :	(69.348)	(190)	(1801)	BAROM	ETER:	1 .
180	35	741.507		5.575	115	90	625	18	10
185	40	143,119		5,575	15	90	605	10	10
190	45	744712		5/5/15	15,	91	65	18	1.0
195	50	146.310	1	5,361	114	91	650	18	10
200	55	747.847	1	5.351	113	91	650	19	1.0
205	1400	749,383		5.351	13	91	650	79	10
210	5			32782)	(85)	(544)	<u> </u>	<u> </u>	
215	10							<u> </u>	<u> </u>
220	15			D58,593	(756)	(370)	×10-	<u> </u>	<u> </u>
225	D					88/		<u></u>	<u> </u>
230	85			6,157	(180)	(548)	<u> </u>		
235	-		<u> </u>				<u> </u>	<u> </u>	
			TOTALS:		V	1/		ACC =	1-5
TOTA	L CU FT	71.383	TOTALS:				AV BP	: 30,0	122

MOISTURE SHEET Woodstove Data Sheet #3

Moisture Determination Balance Bal	ance	11
_,	oed	Unit: Haugh 5270
Final:		Run:
IMPINGER #1		Date: 5/18/92
Final Weight 673.8	grams Technici	an(s): Initial: Tk
Initial Weight 580.0	grams	Final: TK/S
Net 93,80	grams Approved	By: 76
IMPINGER #2		
Final Weight 592,3	grams	
Initial Weight 5855	grams	
Net6,8/	grams	
IMPINGER #3		
Final Weight 500.2	grams	
Initial Weight 498.4	grams	
Net	grams	
IMPINGER #4 (SILICA GEL)		
Final Weight	grams	
Initial Weight 188.5	grams	
Net 138/	grams	·
т	OTAL MASS OF H ₂ O	CAPTURED 1160 grams
Scale Check: 295.0g = 295 590.0g = 590	g Front	Half Filter # 264 F
885.0g = 88C	g Back	Half Filter # 2648
Notes:		
	<u> </u>	

ilter	First				Second				Third			Τ
		Date			Wt	Date			Wt	Date	Time	By
261 FC	0.6987	3/20	1608	DK	-6991	393		80				↓_
262A	0.70 14		1610		.7017		1301			ļ		_
263#	0.6988		1612		16985		1300					<u> </u>
2641	0.6893		1614		.6894		1303		Haual	5 PN	3	<u> </u>
<u> 265 F</u>	0.6912		1616		16917		1304					<u> </u>
266 F	0.6934		1618				1385		<u> </u>		·	ļ
267 FC	0.6936	/	1620	1	16937		BAC				<u></u>	<u> </u>
268F	0.7015	/	1622	1	1010		1307	1				_
269 F	0.6933		1624		16436		1308					
270 FC	1.6965		1626	į	16965		1300					L
							·					
271FC	1.6953	3/20	1628	DL	6951		1330		,			
_	7002	7	1630	T	. 7005		1331	- Linear				
).6978		1632		6980		1330					
	1.6900		1634		6903		1333					L
A 1 -).6975		1636		16975		1334					
).6978)	1638		1999		1335					Ĺ.,
	6975	/	1640	j	16974		1336					
	. 6992		1642	7	16991		1337	1				
279HO			1644		6900		1332	1				
280F	1.6994)	1646		6997	8	1339	V				
								- 7				
												
									<u></u>			
			· · · · · · · · · · · · · · · · · · ·						1 .			

	QA RE	WEIGH		
Filter #	WT	Date	Time	Ву
	· - · · · · · · · · · · · · · · · · · ·			

, Arm

BALA	NCE R	OOM ENVI	RONMENTA	L COND	TIONS
WB	DB	%RH	Date	Time	Ву
60	74	44	3/20	1606	DK
59	13	43	3.63	130	H/s
					,

M212-LOLM2'L&Y'KEAT\An

WOODSTOVE DATA SHEET #4-1: INITIAL FILTER WEIGHTS (TARE WEIGHTS)

Into Dessicator	: Date 3/17/92 T	ime 0900 By DK	Front Half	Back Half
Manufacturer:	SèS	Size: 8.2 cm Lot	.No.: ZB 901	Grade: \$25 GLASS

ilter #	First Wt	Date	Time	Ву	Second Wt	Date	Time	79	Third	7-4-	m 2	Γ
	0.3846	3/30	111111	DK	1 -	303	1341	By	Wt	Date	Time	В
	0.3872	100	1526	DK ¬	3827	000 1		20	· 			╀
	0. 3805		1528 1530	1	·32/O		1342					├
21. UR	0.3811	 	1532	 	32/A		1344		HALLUKS	eu s		├
	0.3821	- /-	1534	-	3824		1345		VIHOUS	£03		├-
	0.3872	/	1536	+	38 aN		1346				<u> </u>	├
	J. 3817	 	1538	1	3888		1347					⊢
	0.3772		1540	1	13770		1348					_
	0.3875		1542	1	381A	}	1340					-
	0.3813		1544	-	13809		1350					-
2104	0. 20,2		1744		7509			-				\vdash
2710	0.3884	3/20	15/1/	10V	13884		1351	++				·
	0.3818	/20	1548	U/C	3813		1354					
	0.3825	/	1550	$\overline{}$	3821		1353					
	0.3856	- 	1552		3853	-	1354					
	0.3832	-/	1554		3230 3230	- 		++				
	0.3862	- / 	1556		386H		1355 1356					· .
	0.383b	-/-	1558		303A		13s?					
	0.3801		1600		3804							
	0.3827	1	1602		3822	-{	<u> 1359 </u> 1359					
_	0.3821	-	1604		3218		1400	\overrightarrow{J}				
~ 00 D	U. JB & 1		1007		210	<u> </u>	1700	- 				
			7									
	by	1//	1/2					e : _ (2/2/6		Deur	

QA REWEIGH

				
Filter #	WT	Date	Time	Ву
<u> </u>		<u> </u>	4	

BALA	NCE R	OOM ENVI	RONMENTA	L COND	ITIONS
WB	DB	%RH	Date	Time	Ву
60	74	44	3/20	1524	OK
59	73	43	3/23	1340	2
					7

				WOO	WOODSTOVE DATA SHEET #4-3:	A SHEE!	r #4-3:	CONS	CONSTANT FINAL WEIGHTS	NAL WE	ICHTS			WST5-1 Unit	WST5-Form9, Pg1, Rev4/90 Unit HALLARS SOJX	81, Rev4	06/1
Rootor	1210					FIN	FINAL BEAKER	ER WEI	WEIGHTS					Date:	16115	[]	
	ပ	Date	Time	By	First	Date	Time	By	Second	(Date	Time	BV	Third	t at	, i	
516	*/	5/19	0900	K	105.7142		~	_	105714	(निर्ड)	5/1	1007	10		79.0	7	à
													2				_
SS	12	2/16		S	94,9163	<u>5</u>	à	9	94.9154	54	80%	1012	OK (c	94,9153	80	B	\$
				,				2	Y								2
55	2	61/€	0000	N N	103.8672	5/20	958	X	03,8673	673	TO ST	1009	Carlo				
													7				
210	0	5/19	#15 80	SZ.	100,001	6/9	CB21	A C	100.0	0731	Sp.	1019	X	(48,00,00)	130	583	3
		- }		2				2					,				2
270	"/	8/19	900	싱	98.6557	15/20	000/	DX	8.65SD	05	1695	10	S.				
										1							
		:											-				
							FI	FINAL FI	FILTER WEIGHTS	IGHTS			1				
Filter II	Into Dessic I	Date	Time	By	First	Date	Тіте	BC	Second		Date		å	14 d an 3			
204F		~	16 6	Γ,	0.9053	5/19	├		1208	7	2/2	707	+-	TITE	nare	Time	2
			4	6		_	├						\$		-		
DUMB	NJ.	5/16	哌	3	0.5193	5//5	653	07/2	10/0	4	5/4	28,7	, 5	1512	5/20	5W1	Ċ
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QA RI	QA REWEIGH:	FINAI	FINAL WEIGHTS	HTS		SCALE R	OOM EN	TRONM	ROOM ENVIRONMENTAL CONDITIONS	NDITTO	SNS	ν.		SCALE DOOM ENTIDOMORRAL			ç
					Wet	l .				-		9	7	A V V	11.		200
Date Be	Beaker #	Final	Wt	Ву	SeB		Date Time	le By	WB	DB	ZRH	7	-	2		2	1
						1	8/16 61/6	XQ 8	155		777	8		}. 			
						2	5/4 1707	K	_	2		6					
Date F	Filter #	Final	WT	Ã		م ا	120 954	10 1-	56	70 1	11	Comments	nts				
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		,				5	5/23 1111	Ž	100	a a	T.						
	A Commence of the Commence of						Constitution of the Consti	of the second					l				'

SN 37010004 \$ 11.19 Scale Sartori. Mode 1 WST7-FOF. WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET Dates: From 4 33 13

Through

松即 等 ्रर 7/2 3 7 Wet Bulb ESE OF San San S विविध 3828 go (e 9 3 3 Dry Bulb 结的 877-14981878 000, がある 0060 Time 300 Date 437 11/5 V Tech H₂ 39 SIG S 9 Beaker Blank Filter Blank 0.0999 0001-0.0999 4090 0001:0 0.0997 0.0998 1800 1001, Weight 0. 1000 0.0999 8 0,100 0.0999 100mg 188 0.100 1001, 0.1003 0.9997 98867 0.9996 2000 0000 1656 9000 P 2995, 2000, 2000, 2000, 0,000, 0,000, 1-0000 1-0000 1-0000 1000' 88 1000 10001 8 1.08 1000 1000 9,9999 10,0000 0,000,0 9.9997 10000 Weight 26666 0000 0.000c 0000 0/ 0,000,0 10.0002 10.0001 10.0000 0.000 10.000 4484 100001 50000 2000 000 7000'01 0000 108 1000 01 10.0001 8666.6 46.18.ht 00.000 00.000 00.000 00.000 00.000 99 999 5 180,000 20 100,000 10 80,00g 00.0000 99,998 4 4966 Q 1000,00 49. 4909 100 cm3 19.996 96.5698 99.9998 50.00 C 00 g 3

WST7-Form Rev5/90

Dates: From 3/12.
Through. 403

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorfus Model A1205 SN 37010004

	Z RH	- 47	44,	44	44	56	7,7	44	45	7,5	1	42	70		7/7	7.5	×12		78	20	1.P	15 Ja	da	\$5	1/2	72	43	4/6	47	7/6	7/7	2/2	46	72/5	1. S. S. S. S. S. S. S. S. S. S. S. S. S.
	Wet Bulb	QP)	09)	\ <u>G</u> '	3.7	77	P)	00	* L	- R-C-	900	2/2		28		Fo	S C	767	200	2	\$	25	S	S	Sc	\$	58	5 \$	57,	200	57	3 3	59	3	59
	Dry Bulb	73	77	1,7	9	1		27	45		140	177	, 67	100	13	-	200	5	10	8)	90	16	60	80	B	12	73	SA SA	80)	ୟୁ	OL.	22	73	25	5)
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Blank	Beaker																																		
Blank	Filter																																		
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WST7-Form Tev5/90

Dates: From

Through

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorius Model A1205 SN 37010004

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#_MO

WOODSTOVE PARTICULATE CATCH PROCESSI WOODSTOVE DATA SHEET # 5

TOTAL VOLUME OF DICHLOROMETHANE

TOTAL VOLUME OF DISTILLED

USED IN EXTRACTION

WATER DRIED

FILTER #: 844 FINAL WT: 805 TARE WT: /6894 NET WT: /169

FILTER #: DlalB FINAL WT:__ /5176 TARE WT: /

FILTER #:_____

FINAL WT:____ g TARE WT:______ 9

NET WT:______g

NET WT:

FILTER #:_____

TARE WT:_____ g

NET WT:_________

ATCH PROCESSING HEET # 5	Unit: HAUGHS SON Run: 5 Date: 5/19/40 Technician(s): 5
FRONT HALF	
BEAKER #: 5/6 m1: 50 desc: ACETONE	FINAL WT: 105,7145 g TARE WT: 05,6745 g NET WT: 0900 g
BEAKER #: ml: desc: ACETONE	TARE WT:
TOTAL VOLUME OF USED IN WASH	ACETONE m1
BACK HALF	1
m1: 255 desc: ACETONE	FINAL WT: 94-9153 g TARE WT: 94-7160 g NET WT: 1993 g
BEAKER #: 5/8 ml: 75 desc: METHCHL	
BEAKER #: 5/9 m1: <i>960</i> desc: H20	FINAL WT: 100,0734 B TARE WT: 100,0063 B NET WT: 10671 B
BEAKER #: 500 ml: 100 desc: H20	FINAL WT: 98.6559 0 TARE WT: 98.6067 0 NET WT:
BEAKER #: ml: desc:	TARE WT:
BEAKER #: ml: desc:	TARE WT:g
TOTAL VOLUME OF USED IN WASH	ACETONE 050 / m1

m 1

	WOODSTOV	E Di ONIZA	- 0000	'EE61	· N/C		Un	it:	HA	UGH	5 56	Y	<i>t</i>	
	WOODSTO	VE DATA	SHEET	T # 5			Ru	n: -	5	I	ate:	5 1/	8/96	, ,
E	BLANKS DON	e: <u>5/l</u>	1/40				Te	chni	cia	ກ(ຣ):	<u> </u>	DKT	K	
15 200	mi FISHER OP mi Dichu FISHER OPT mi Distil WERK C	BEAKER OROMETH IMA LOT BEAKER LED WAT	#: H: IANE 9 #: #:	1382 E	ط		TARI NE FINAI TARI	E WT WT WT WT WT WT	9	6.24	35 24 108 104 114			
	BEAKER	TARES	IN	TO D	ESSC:	TI	ME : <u>0</u>	900		DATE	: 3/17	192		_
BKR #	1ST WT	TIME	SND	WT	TIME		3RD	WT	T:	IME	4TH	WT	TIME	
D	106,0038	1306	106.2	235	1036	,	_							
E	96-8484	1398	96.81	124)	1038								····	_
F	96.5109	1330	96.5	106)	1040									=
S	CALE ROOM	QC : TA	RES		, ,		SCA	LE	700h	1 QC	: FIN	ALS		
DATE		Y WB	DB	%	ļ -		ATE	TIT		BY	WB	DB 74	40	
3/A-3 3/24	1300 Pa		73	43		5	113	163	4	OK	59 56	10		
						⊅ /	115	120	0	カル	60	74	179	
								· · · · · ·						
		BEAKERS	3: FIN	VAL V	NEIGHTS	3 		<u>,</u>						=
BKR #	IN DSC	TIME	1ST	WT	TIME	1	CNS			ME	3RD W	1T	TIME	_
P	5/12	0900	106.2	243	1048	+	%, &		165	4			****	_
3	5/12	0900	96 84		1050		<u>16.84</u>	28	170	51				_
F	5/12	1330	96.5	112	1700	9	76.51	14	ร์วร์	30				=
BKR #	4TH WT	TIME	5TH	ωт	TIME		6ТН	ωт	ΤI	ME	7TH V	JT	TIME	=
						-								
		<u> </u>						1	•			1		=

NET PARTICULATE CATCH CALCULATION WOODSTOVE TEST DATA SHEET #6

Unit: HHUGHS STAPP1-AppDoc19-page2
Rev 6/90

Blank Audit: By: Tim Kelly	
Blank Audit: By: //m Kelly	Date: 5/18/92
Blank Calculations:	
Acetone:	-00000 g/m1
Dichloromethane: , oood g = 75 ml =	/00000533 g/m1
Distillted Water: coop g ÷ 200 ml = _	,000004 g/m1
Front Half Catch:	
Filters: /// g - (.0000 Total Catch No. of filters Blank Value filter	
Beakers: O400 g - 150 (0000 Q Total Catch M1 of Acetone Blank Value/ m1 of Aceton	$g) = \frac{\sqrt{397} g}{\text{Net Catch}}$
Total Front Half Cat	ch /1559/g
Back Half Catch:	
Filters: 1358 g - (.0000 Total Catch No. of filters Blank Value filter	$g) = \frac{1358}{\text{Net Catch}}g$
Beakers	
ml of Aceton	$g) = \frac{1988}{\text{Net Catch}}g$
2. Extract/Impingers:	
Total Catch ml. of Blank Value Dichloromethane ml of Dichl methane	
3. Water/Impingers: Odd 2 g Total Catch ml. of water ml of water	g) = 0950 g Net Catch
mz vz water	
Total Back Half Catch Total Catch % Front Half	h 4665 8 (6024 8 05,05 %

co.
NOI
UL AI
E CALCULATION SHEET #7
ATE TA
TICULATE ST DATA
Par Ti
SH TOVE
WETHOD SH HOODSTOYE
EPA

Date: 5/18/9 Unit: HAUGHS SOOX Technician(s): 55 TK

NST3-Form 1 8/28/91 13,1539-180 - H20 1) Vacet do: (7/383 Va)(17.65)(/066 act)(30,08 " Hg: 13.6 C SUBJUNE >

0000,0000

6,4695 000,000 2) VH(std): (.04707)(168 11 H20): -

65039 000,000 - BH X 100 = . 0000 5,4695 - est 1 73,7534 deet) 1 5ylles/ 1012 3) A&H:

. (302 0.0000 4) Ce: (13,7539 dect) (15,43): (16024/9)

g/hr 000.000 - decfa)(50): 000 000 deof 5) Estimated g/hr: -

100 > (computer print factor) of the meter box used for the test emperature for the test in degrees Absolute particulate catch for the test average stack flow during the test factor (Botor correction dec Fa

TEMPERATURES
RECORD SHEET #14
WST2-Form14 Rev1/88

ä Unit: Run: Page:

Date: 5/18/9

									;	ĕ			j	7
17C	4	5	9	7	8	6	10	11	12	13	14	15	16	17
nute Time	Stove	Left Side	Back	Right Side	Bottom	Firebox	2nd Burn Gatalytic	Roam Temp	Pube Purnace	Sample	Impinger Out	Ses Box	C. Gas Incineer	SO2 Implifier
S()	" 1	383	453	762	ተነተ	366	hel	ماد	1441	1 1 1	35	IhC		25
چ اچ ا	334	376	קילן	288	412	623	<i>LS9</i>	75	1441	142	35	241	35	3%
<u>タ</u> 表	313	360	386	275	412	552	51,7	76	1441	142	35	145	38	36
18	294	341	360	2 60	405	523	ags.	مار	144	ያሳነ	35	243	35	36
3/ X	283	325	345	248	344	516	599	76	1441	bhc	35		35	36
100	295	310	335	242	390	520	883	76	1441	348	35	74C	35	36
8/ S	347	307	33.1	רגג	380	528	798	76	1443	8hC	35	8hC	35	36
\2\ \2\	363	310	340	227	370	Sylv	1254	76	1446	8hC	35	8hC	35	36
3/ Y	197	318	357	578	361	596	1400	76	1446	248	35	248	35	36
15/ 15/	530	331	379	239	352	743	1412	이스	1447	8hZ	35	248	35	36
16.	204	348	344	247	346	836	1482	77	8441	8hC	35	8hC	35	36
3	594	_	473	263	340	910	1481	LL	8441	ShC	35	Shc	35	36
X	4736	4075/	4538	30412	(4581)	(1759)	(11887)	413						
3/ (%)	leble	390	449	277	336	386	1476	78	8441	348	35 SS	8hc	35	3%
\mathbf{M}		404	7/17	290	334	297	1474	79	१५५८	8hC	35	348	38	36
7/ 法/		م <u>ا ۲</u>	473	297	333	930	אואו	79	8५५।	8hC	38	348	35	36
2) (8)		430	485	302	333	968	1307	80	1448	8hC	35	8hC	35	36
	575	439	496	304	334	1038	1131	80	1448	8 ተረ	36	8hC	35	36
	500	寻	504	308	338	1067	1145	80	1448	8hC	36	8hC	35	36
5/15 S	490	448	512	314	338	0101	1132	80	1448	848	36	8hC	35	38
	468	456	<u>5</u>	717	342	1132	1002	98	1448	348	36	348	35	36
	7	구구	503	323	348	1059	843°	80	1448	8hC	36	8hC	38	36
19 20 20 10		435	487	320	353	1009	872	98	8441	348	ሳ운	8hC	35	36
	_ t	423	<u>ال</u> م	321	357	484	849	18	8441	8hC	श्	L hC	35	36
100 TO	31	413	355	310	362	070	833	18	844	8h€	3%	2116	35	36
X_{i}^{\prime}	59113	5135	2885	31.83	(मा६ट्री((12013)	(1351P)	688	,					
X	116647	19210	1021	124	9696	747TP1	25412d	18717						

TEMPERATURES
RECORD SHEET #14
WST2-Form14 Rev1/88

Unit: #

į	•	ı	,		•					5			1	2
T/C	4	5	9	7	ها	6	10	=	12	13	14	15	8	8 17
Time			Back	Side	Bottom	Firebox	and Burn Catelytic	Moorn Temp	Tube Furnace	Sample Box	Impinger Out	C. Gas Box	C. Gas Impinger	SO2 Impinaer
	-	401	440	301	365	946	LC8	81	Shbl	248	36	Sho		36
3/5	-	393	430	295	367	927	815	81	१नेत	318	36	ShC	35	36
<u>8</u> ∧	- t	386	121	293	398	905	794	80	ነሳ ዛገ	8h©	36	ShC	35	36
30	331	379	917	388	369	891	775	79	Lphi	8hC	36	Sho	35	35
	331	371	43.1	385	369	874	762	779	1448	Sus	36	ShC	35	36
M		364	467	Src	368	858	766	79	8441	348	35	Sho	35	36
71	85 369	359	404	ררב	368	853	758	19	8ħh1	8hC	35	Sho	38	36
3	365	354	40h	896	366	832	138	79	84/71	247	35	246	35	36
\mathbf{M}	15 300	349	400	2 61	366	817	727	79	8441	246	38	246	35	3b
	20 295	ह	341	259	364	306	לור	79	1448	ShC	35	247	35	36
列		अध	393	262	363	789	693	19	1448	গ্ৰন্	35	Lhc	38	36
7	39 283	335	389	255	36)	775	673	79	1448	9hC	35	Lhe.	35	36
X	3801	4315		3325		(Tolon)	(9039)	953						
11	35 275	339	384	JSS1	358	761	969	<i>bL</i>	8551	246	35	740	35	36
		326	381	840	357	15.	638	bL	1448	9hC	35	Lhe	38	36
大学	_	333	378	243	353	738	هروما	79	1448	246	35	247	35	36
VΤ		319	375	೯ಗಿರ	348	730	019	79	1448	246	35	247	35	36
	58 258	315	371	335	345	مالا	601	81	१४५८	246	38	7 L L C	35	36
多	;		370	भेड़र्द	342	וונ	294	18	8441	3hC	35	247	35	3.6
3/	15847	1813)	338	(453)	(2103)	(4467)	$(3711)^{-1}$	4723						
	5385	8529	7691	877.	\ P	MUTH	12750	1425						CA
	TE8971	15,508	17516	11502	(15183)	34448)	\mathcal{I}	3296	1010	Pet	386.8			
d	3827	<u>_4</u>		(214)	(362)	(820)	(910)	(18)	رن	401	362.4			
								1			- 4.8L-			
X														
X														

Site: EE	MC - West	Kent,	WA 9803	<u>2</u> Date:	5//8/92	<u> Analy</u>	yte: <u>CO</u> 2	(15-1)
Source:	HAUGHS	S270	SEEIE	S Run #	:	5		
Zero Cyl	#: <u>T13</u>	2257	C	onc.00.0 9	CO2_	Cyl Pre	ess: <u>800</u>	psi
Certi	fied by: _	Liqui	O AIR	2			Date: 10)	7/91
							ess: <u>900</u>	
							Date: 10/3	1
							SN: 4070	•
				·)	
						•	Flowmete	
	Value = 2			-		 _		
EPA Cont	rol Limits	$= \pm 2$	5% of 2	5.0% CO ₂ =	<u>+ 0.63</u>	25% CO2		
Pre Run	Audit: By	' :	BN	Tim	e: <u>l</u>	005	Temp: <u>7</u> 6	o _F
	_			Audit Resu	1+e			_
Point	Exped			Act	ual Res	ponse	+ Conc.	1
#	Meter	DVM	₹	Meter			Difference	ì
Zero	00.0	.000	00.0	00.0	1000	1054	1054	,217
Span	50.4	-504	ما 12	50.0	1200	12.388	-,212	-1.683
Comments								
Post Run	Audit: B	у:	<u>DK</u>	Tim	e:	415	Temp: 7	<u>7</u> °₽
		·		Audit Resu				
Point #	Expec Meter	ted Res	ponse %	Act Meter	ual Res	ponse %	<pre>+ Conc Difference</pre>	4
				00.0	.000	.054	.054	. 217
Zero	00.0 ろんり	.000 .504	00.0 12.6	49.9	.499	12.363	237	-1.879
Span	50.4	. 507	1λ.Ψ	77.1	.777	72.000	. 4.31	1.011
Comments:								
+ Conc. I	Difference	= Act	% - Exp	(Std) %				

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Run # 5

Date 5//8/92

Technician BN/TH DK J5

WST6-Forml, Rev11/89

MISCELLANEOUS TEST DATA WOODSTOVE DATA SHEET #8

Useable Firebox Dimensions: See QC Section Useable Volume: 1,473 ft3
Dilution Tunnel Draft (If applicable): Start (Stop (
Test Chamber Air Velocity: Start: O Stop: O Avg: O
Wet Bulb/ Start: WB: 59 °F DB: 66 °F 1.4 % Amb Moisture 68 % % TRH
Dry Bulb Stop: WB: 62 °F DB: 77 °F 1.3 % Amb Moisture 44 7RH
$\overline{x} = 1.35$ Moisture $\overline{x} = 56$ Humidity (RH)
Stove Wt: $\frac{237.3}{}$ lbs.
Stove Wt with Stack (Inc. Oil Seal) Wet: 305,4 lbs.Dry: 304,4 lbs.
Empty Stove Wt with Stack and Ash Ash: O lbs. Total: 304.4 lbs.
Kindling Wt. Paper: 13 lbs. Wood: 6.5 lbs.
Pre Burn Fuel Wt. 7,2 +8,6 + 1,5 Total: 17.3 1bs.
Total Kindling and Pre Burn Fuel Wt 23.8 1bs.
Coal Bed Wt-1bs: Range (2,6 - 2,1)307.0-30651bs. Actual: 2.2 1bs.
Allowable Amount of Charcoal that can be removed:
Coal Bed Wt. Range $\left(\frac{\partial l}{\text{Upper Wt.}} + \frac{\partial l}{\text{Lower Wt.}}\right)^2$.25 =
Test Fuel Wt-1bs: Ideal 10.3 1bs. Range: 11.3-9.31bs. Actual: 10.5 1bs.
Test Fuel Size (pcs.) (.75 x 1.5 x 5" Flanges) /4 Pcs.
2 x 4's x /8 3/4 " 4 Pcs /0.5.1bs. /00.07
4 x 4's x D/A " N/A Pcs N/A 1bs. N/A %
Est. Dry Burn 105 - (10,5 x,17582) x 60 = 1,1500 Rate (Kg/Hr.) 2.2025 Est.Dry Burn Rate (Kg/Hr)
Est EPA Hest Output(HO _E) (19,140) x <u>163</u> x <u>11500</u> = <u>13667</u> (Avg BTU's/Hr) Est Heat Output (HO _E) BTU's/Hr
Comments: /90 = 1,240

Unit: 180645 S27X Run: 5 Date: 5/18/92 Page 9
WOODSTOVE OPERATING DATA
FIRE STARTED: 0245 PST PDST
WARM UP AND PREBURN: PRIMARY AIR: set wide open for all warm- up/preburn fuel charges, then set to 1300 at start of preburn.
SECONDARY AIR: UA CAT BYPASS: NA
CHARCOAL BED PREPARATION: raked and leveled prior to each warm- up/preburn charge. At 1 1/2 min. prior to loading last fuel, raked and leveled. In stove sec.
TEST: Door Wide Open during loading 4 min 30 sec
primary Air: opened full for first min. , then set to run setting of
SECONDARY AIR: WA CAT BYPASS: WA
FAN: ON OFF during warm-up ON/OFF during preburn ON/OFF first minutes of test ON/OFF balance of test run Fan speed set at <u>FAN CON FIRM ATTON</u>
WOOD DATA: KINDLING: a mix of the grades listed below
SIZE MILL GRADE SPECIES
PREBURN: 2X4 Manke/Tacoma Std or btr s. orn D fir
TEST: 2X4 Packwood #2 or btr s. grn D fir 4x4 Packwood #2 or btr s. grn D fir
PELLET FUEL APFI#:
All grades WCLB rules
WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either _/O or _/8 inches.
1st warm up/preburn fuel charge (7/2 1bs) added at 08/5
2nd warm up/preburn fuel charge (8.6 lbs) added at 0858 .
3rd warm up/preburn fuel charge (15 lbs) added at 1051 .
4th warm up/preburn fuel charge (lbs) added at
5th warm up/preburm fuel charge (lbs) added at "

\(\)

FUEL MOISTURE WOODSTOVE TEST DATA SHEET #10

Run: 5
Date: 5/8/92
Technician: BN,JS,TK, DK

Rọc	om Temper		· 70			Cor	WST rection		7-Rev11/89 : <u>Ø</u>
Unc	TE: Reco cor Value me Test F libration	s are	correct	ed for: Readin	e tempera es taker	iture:) 1 at:	1 es <u>1900</u>		<u>/</u> .
Рc			Top)	T	tom	Sid	e	Piece Av Correcte
#	Dimen 2448	Use_	Uncor 45	45	4,5	4,5	40	40	4,333
1	2X7X 8		7/3	113_	1//	1770	770	 	7,000
2			<u> </u>						
3	2x4x8	P	10=	20,1	18.0	19,6	18.5	20.1	19,933
4	244.8	ρ	18.5 18.5	20.1	18.5	20.1	18.0	19.6	19,933
	de TX a		18.3	20.1	78.5	au.	70,0	7110	(39, 8/2)
6				-					Strang
7									
8 9	2x4x 53/4		210	22.9	21.5	23.5	19.5	21.3	22.567
	244x1834		18,5	20,1	19.0	20.7	18.0	19.6	a0,133
1	2 / (0.3)	4	21.0	22.9	21.0	22.9	20.0	2/18	22.533
_	DX4X1834		18.5	20,1	18.5	20,1	18.5	20.1	20.100
	(XX / X / 2 · 14	1	18.5		7870	0.07	7		CS5.333
3									
<u>4</u> 5									
6						<u> </u>			-
7			<u> </u>						
. 8							٠.		
9	FEET	T	19.5	21.3	19.0	20,7	19,0	20.7	20.900
20	1								
7. м	oisture	_		Kind1 4,33 4,15	32 /	9,933 6,620	7. 0	est Lo 21,333 7,582	3 7
		,,	,	ļ———					<u></u>

To obtain Wet from Dry: $\frac{100 \times 7}{100 + 7}$ Dry Rdg. = 7 Moisture, Wet Basis

Acceptable Ranges: 16-20% wet; 19-25% dry (17.5 - 22.5 on Meter [Uncor reading] at 70°F)

Key for Use: K= Kindling P= Pretest Fuel T= Test Fuel

W	OOD DEN	SITY DETE	RMINATION		Date:		192 TE
W	OODSTOV	E TEST DA	TA SHEET #1	l Tec	hnician:	WST2-form	11-Rev 6
Mood	Piece	Nominal	Dimensions:	á) <u>x</u>	af.	x 3 1/2
	(D):				4.1	cm	
-	(W):			-	9.15	C m	
	h (L):	9,15	c m	•			
mengr	.11 (1):	9,12		gth X = _	9.13	5 cm	
		9,15	C fm "				
		,	Vol	ише: <u>34</u>	(D x w x	L) cm ³	
MOIST	URE:	Room Tem	perature: _	72	PF Corre	ction Fac	tor:
Uncor	rected	Meter Rea	dings Corre	cted for	tempera	ture:Yes_	No 🗸
NOTE:	Recor	d moistur	e meter rea				
		Uncor	Cor	Avg % 1	Moisture	(Dry) _o	10.100
т	op:	18.5	20.1 2	Aug Z 1	Moisture	(Wet) _/	6,736
	ottom:	18,5	20.1 2			-	
	ide:	18,5	20.1 2	Scale:	Leveled	In_	Out $ u$
•		70,0			Zeroed:	In /	Out
X			20.100 z				
Wet W	leicht:	186.3	g Dry Weig	ht: 1608	2 2		
					/		
% Moi	sture D	ried Basi y Wt ; We	$t = \frac{3677}{1200}$	_ 2			
		Dat	718/92 Ti	me W AGO	Temp 23	۰۵ ۵۳	•
Ω	nto Dry	TUOT Z	THY KULL	1 CLUK	770	OF OF	
(Minimum	Time in	Dryer: 24 h	rs.) Min	imum Dry	er Temp 1	00°C (21
Densi	ty = 📈	<u>00180-</u> g	: <u>342.70</u>	<u>O</u> _cm ³	= 1464	<u>3/g/cm</u>	3
	(d	ry wt)	(volum	e /			
			D.A				
Pelle	t Fuel	Moisture	Content Det	erminati(on		٠
Tare	Beaker	Wt.		_g			·
Wet W	/t:			g =			.
	Gros		Tare Bea	ker Wt.	Net Wet	Wt.	
Dry W	/t:			g =			,g
			Tare Bea		Net Dry	Wt.	
							97
		ried Basi	t Wet Wt.)]				.7.

									-					Ű			,,,,,,	 	~		
		HOODSTOVE		HNV FLIE GAS D DATA SHEET #12 14 RBY 1/88	TEET .	GHS UNIN ET #12 188					Unit: Run: Page		SHAWAHS	e, l	S27X		Jechni	S main	10(ノス	اع
·	- 1	30k.b	٥_			-1	•4	, Al			M	760	117/6	. (2	j		F	•	•		
	Time	Scate At At	las	Rate Bate	^	CO2 XCO2	V.	1	Tel	3	32	Bal	Het Dry Bal Bulb Bul	Ory	¥ 5	15 E/A	Stack	S,		Static Press.	C THE
	S/ SS/	317.1	10.5	Ø	197	4.9	.593	15,0	15.0	.115	1.17	_	107	136		 	25%	25	625	10-	Flaw
	(S)	316.9	8 3	7.	.135	3.4	1677	17.2	17.2	150.	.52	6.5	113	139	8 6	126	287	<u>61</u> .	475	:053	B
	5 हि	316.6	-	ń	990.	2.5	,709	18.0	18.0	₽50.	.55	۲ <u>۰</u>	110	128	8.0	120	226	.24	207	pho:	252
	50/ Sp	316.4	9.8	7	=	2.9	283	17.6	17.6	. 062	,63	4.6	107	hريا الم	7.6	117	714	hZ"	00°)	:043	75
	\ 1			7	.123	3.)	-686	17.4	17.4	. Ola3	pg.		106	123	7.3	117	210	. 24	000	-042	E
	\mathcal{H}			=	.226	5.6	<u>\$</u> 2.	15.0	15.0	180.	,52	10.8	109	126	7.9	121	254	23	575	640:	
	8/s		-	و	17.		.58	13.9	13.9	.052	.53	12.9	Ξ	128	8.4	124	276	.22	955	:052	
	8/2 2	_	_	7.	.295	-+	.572	13.2	13.2	159.	.52	14.1	112	130	શ.િ	126	289	.22	550	05y	
	3/i \⊼\		7.5		143	10.8	- F	10.1	10,1	800.	.08	135.4	118	137	10.2	133	351	.20	905	190:	
	2/2		8 9	<u></u>	44.		.392	9.6	9.9	800.	.08	137.6	611	137	Sal	135	367	.20	500	1064	
	3/1/2/	312.8	6.2	اد	177		13°C.	9.2	9.2	10	=	1013	117	135	10.0	135	379	.20	330	990-	
	(%) (%)	312.1	5,5	-	.483	12.0	32	8.8	8.8	10.	=	8.801	113	131	9.0	133	385	.20	500	L90-	
	XΙ		_														ઉપવન	\sim		-,639	F101
	3/2		_	s.	.482	5	.348	8.8	8.8	110.	=,	18.6	110	127	8.1	132	381	.20	500	कीय:	500
	3/8		4.7	5.	406	16.1	파	14.5	14.5	100.	70.	143.8	108	124	1.8	130	365	.20	500	h90:	, Edz
	之 态/		با م	7.	.43a	اة. ال	907	10.1	101	.006	·06	174.4	108	123	7.8	130	3હા	.20	200	:063	707
	G (2)		3.3	λi.	=	10,3	1407	10.2	10.2	.006	00	172.3	167	122	7.6	129	351	.21	525	062	8
	2/2 2/2			7.	395	% (3	410	10.4 T	P. 0.	.018	. 18	54.4	104	811	8,9	126	335	.21	515	090-	
	۱ ا۲	7 : S		ر,	7	ρ. 5	45	7·0	70.4	S. 16.	.15	45.10	[0]	골	6.2	ትሮ፤	327	17.	525	:058	_
	3/3/	_		7-	218	7	.438 857			.613	.13	72.1	98	<u>6</u>	5.9	<u>@</u>	318	12	525	:056	
	2/2	308.6	2.0	ري	13.7		<u>a</u>		12.4	.031	.31	25.4	95	106	5,1	119	303	.22	550	<u> 150:</u>	
		_		~	.273		.530	5	13.4	ትት0.	717	15.4	47	66	\$ 7	118	287	.22	550	:053	
	۱ /		-		, 232	5.8	.562	14.2	14.2	.078	.79	1.3	88	100	4.1	113	110	.23	575	.050	
	//		٥	-	ट्र		569	71.11	7.1	. 087	.86	6.3	8k	163	3.6	110	704	.23	575	340:	
		308.1	<u>.</u>		330	5.5	.573	<u>デ</u> の	こらい	090.	16.	6.0	28	106	3.3	109	256	.23	575	2046	Ì
	$\sqrt{}$																(3814)			087:	
					***************************************	The second secon											7212	7		-1 219	+

FIG 훤 वै Flow 克 B B 101 [-2.042] Static PPM Press. -527-1502 -.03b 219: BN 712 940- 009 -038 -.03b .03k -037 -037 -043 7697 -043 :043 :043 040-040: :039 hho: 009 7040-140: 625 পু 625 88 009 009 SS. 529 S S 8 575 125 00% S 000 Vate: 5//8// Technician(s): S S 25. .25 155 <u>ي</u> 1 J.C. 26 त् 23 .25 عالا. 26 J.C. ٦٢ तृ > त्र 26837 Conzil 3956 2750 206 Stack 202 210 96 9hC 233 233 25 200 237 229 207 10C 197 249 <u>で</u>る Lee ನಿವ 218 106 8/8 SZZX Calc 28 8 10 108 <u>8</u> 801 107 00 709 601 107 109 109 90 Š 109 60 Dry & C 30 4.7 4.0 <u>۲</u> و 3.0 77 47 و۔ -ゴゴ a 2 33 77 113 5 2 ت ا 113 =3 <u>ਵ</u> \mathbb{R} HHV645 2 <u>ر</u> 3 Ξ T/C(1)T/C(2) જ **Bulb** 4 47 7 <u>۵</u> द 9 ॐ G 92 93 93 7 7 76 9 3 9 Bal % % છ. 8 3,7 2.4 33 3 77 3 ر اب .× ∞ 7, 5 Uniti \sim .20 ₹: 1.38 . 8 34 1.39 .년3 49 \overline{C} 員 = 33 1.27 8 ?: 了一 **~**因 - 147 <u>.</u> & 199 . FS 88 136 23 .123 . 118 1110 .125 12 137 (A) 138 137 죠. <u>-</u> 3. 3. <u>|</u> 6.5 ₹. رة ا 18.2 ام. م ا ا 五 8 3 <u>(</u> 46 <u>√</u> . | | | | 15.8 <u>~</u> 101 ピュ <u>√</u> S.b _ =±.€ 16.S <u>ر</u>ة ج ₹ .8 15.5 ٥.٥ ر ار ا ا I 5. 0. 15.2 5,2 C.71 019. Ş 15.8 586 र् 632 Lh a 51% 519 .le2S 593 599 <u>ج</u> <u>.</u> 3 09 9 153 249 149 さ 3.5 4.3 بى ھ ω (γ 2.5 HOCOSTOVE DATA SHEET 112 HST2-Form 14 Ray 1/88 1 <u>က</u> 3.3 0 V) φ 7 ا ال ع (ان ا ج 39 <u>___</u> 图 200 173 <u>چ</u> .133 200 283 .182 134 88 <u>ئ</u> .137 <u>ج</u> . 139 142 9 Ξ 7 134 left Rate ~ Ø Ø Ø $\boldsymbol{\varepsilon}$ w) a 9 **丁**. Scale 155 ک ∞ δ, w a Ø 306.b 56 306.1 367.9 307.6 301.3 307.2 307.8 <u>...(%)</u> 307.0 306.8 307.5 306.9 30 307.0 200 rates 306.6 307.7 3074 40 306.9 1300 307.4 불 1235 8 12 Ş S 9 8 9 3

					Name of the last								
•	0.		PRE BU RECORD WST2-	PRE BURN DATA RECORD SHEET WST2-FORM16	*13				Unit: ## Run: Page: /	HWBHS S	X752	Date:	Date: $5/8/92$ Technician(s): $80.7k$
307.0	""	T/	T/C#-3	4	ស	9	7	ထ	6] 			
5 k		Burn Rate	Stack	Stove Top	Left Side	Back	Right Side	Bottom	Firebox	2nd Burn		Statto	Commonte
15 CENT		0	437	109	527		-38c	144	128	12/6		-,068	Primary Air Set at 200
B 1		2	346	385	517	hbh	186	445	88/1	1162	82	-,060	
ラ/ 点/	_	5	छ	ħbh	497	21	374	844	T5//	1089	78	-058	Fan: $OF\mathcal{F}$
\setminus		G	33%	462	479	808	355	448	1016	E00/	77	-,055	8
3/	308,4	23	335	453	468	930	347	944	1,654	027/	7	-060	23
	1000 3V7, 9	2	333	514	8	900	334	hhh	1059	1331	76	-058	
8/2 8/	3	23	318	496	443	503	331	438	6501	1/80	2/2	-056	Pumps turned on at: 1000
\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	307.2	.4.	304	468	425	684	330	431	1028	082/	7/6	-,055	
M	367.0	لار	302	455	414	087	3/6	456	1101	1236	77	-,055	
3/2	30e.8	.2	791	450	404	476	310	421	816	8611	76	1-924	Check WB/DB: N7/WA
12/2	30k.7	-		413	395	41	306	418	9Eb	916	76	- 152	J
8V S	366.6	_	256	375	387	197	302	416	916	888	76	840:-	
XL	- 1];	ì					<u></u>					
M	306.6	8	25%	358	383	453	394	414	918	hel	76	370.	380.8
3/2 3/2													
\prod													
3/8													
9/33 3/3													
17													
$\sqrt{}$													
1													
$\sqrt{}$													
$\sqrt{}$						1							•
						1							
										·			

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EEMC	- West,	Kent,	WA 98032	Date:	5/18/9	Analy	yte: <u>02 (1</u>	5-2)			
source: HA	UGHS S	270	Series	Run #:		5					
Zero Cyl #:	T 13:	2257	Co	nc. <u>00.0</u> %	02	Cyl Pre	ess: <u>800</u>	psi			
Certifie	d by:	LIQU	10 A1	<u>e</u>		····	Date: 10/7/	191			
							ess: <u>900</u>				
Certifie	d by:	MATH	NOZSH				Date: 10/3	1/91			
Analyzer:	Make: T	eledyn	e	Model: 3	20 Ax		SN: 37465	5			
							0				
							Flowmeter				
EPA Span Va EPA Control											
							Temp:	O _F			
Pre Run Aud	<u>it</u> : By:					<u> </u>	16mb				
	<u>,</u>			udit Resu	lts		+ Conc.				
Point	Expect	ed Res	ponse	Meter	DVM	& Sponse	Difference	∆ 8			
# Meter DVM &											
Zero 00.0 .000 00.0 .3 .005 .023 .023 .1090 Span 12.4 .496 12.4 12.5 .501 12.675 .275 2.221											
Span	12.4	.496	12.4	12,5	.801	12.675	1275	2,22)			
Comments:	Teledyne	#2 <u>Cy</u>	1 % E	xp % A	ct %	Adjt	<u>ο + Δ</u> &				
							<u> </u>				
Post Run Au	dit: By	7:	OK	Time	e: <u>14</u>	25	Temp.: 77	o _F			
ļ			A	udit Resu	lts						
Point	Expect	ed Res	ponse		ual Res		+ Conc.	₽ ∆			
#	Meter	DVM	*	Meter	DVM	- 8	Difference				
Zero	00.0	.000	00.0	00.0	.004	7,003	003	-0.12			
Span	12.4	1496	12.4	12.4	.494	12.497	.097	.781			
Comments:	Teledyne	#2 Cy	1 % E	xp & A	ct %	Adj t	<u>ο + Δ %</u>				
K		-									
											
. Com - D3 5			9 - Eyn	(043)							

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EE	MC - West,	Kent,	WA 98032	Date:	5/18/92	Anal	yte: <u>CO (</u>	15-3)					
Source:	HAUGHS	S270	SERIE	S Run #	•	5							
Zero Cyl	#: <u>T13</u>	2257	Co	nc. <u>00.0</u> %	co	Cyl Pr	ess: <u>800</u>	psi					
Certi	fied by: _	Liqu	110 A16	2			Date: 10/7	191					
Span Cyl	#: _2900	24	Co	nc. 4.96 %	co	Cyl Pr	ess: 900	psi					
Certi	fied by: _	MATH	IESON				Date: 10/3	31/91					
Analyzer	: Make:_	Horiba		Model: P	IR-2000		SN: 408	005					
Range:	0 - 10.0%	со	An	alyzer Ou	tput:	0 - 1.	0	v.					
Flow:	1.5 SCFH		Measu	red by:	Rotamet	er: <u>X</u>	Flowmet	er:					
	Value = 1 rol Limits			0% CO = ±	0.25%	со		·					
Pre Run	Audit: By	7:	BN	Tim	e: <u>105</u>	20	Temp: <u>76</u>	o _F					
	_			udit Resu	lts	<u>-</u>							
Point #		ted Res		Act Meter			<u>+</u> Conc. Difference	A &					
Zero 00.0 .000 00.0 00.0 1000 -004004044													
Span	110 1 1101 1102 1103 (110 150 1.171)												
Comments	<u></u>												
COMMETTES	•												
							·						
Post Run	Audit: B	y:	O K	Tim	e:	430	Temp.: 7	7o _F					
				udit Resu									
Point #	Expec Meter	ted Res	sponse	Act Meter	ual Res	ponse %	+ Conc. Difference	Δ &					
		.000	00.0	00.0	.000	-,004	:004	044					
Zero Span	00.0 49.6	. 496	4.96	49.2	.492	5008	.048	969					
	<u> </u>				, ·								
Comments	:												
+ Conc.	Difference	= Act	% - Exp	(Std) %			<u> </u>						
	ifferece =				<u>m)</u> X 10	0							

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EEMC	- West,	Kent,	WA 98032	Date:	5/16/	21 Anal	Lyte: <u>SO</u> 2	(15-4)				
Source: H												
	•						ress: <u>800</u>	psi				
Certifie	ed by: _	Liau	O AIR				Date: 10	7/91				
				_			ess: <u>45</u>					
			•				Date: 9/2					
							SN: 403	•				
							. 0					
Flow: 1.5	SCFH		Meası	red by:	Rotame	ter: X	<pre>flowmet</pre>	er:				
EPA Span Va	alue = 2	2500 ppr	n SO2									
Pre Run Aud	lit: By	7:	3N	Tim	e: _ /	000	Temp: <u></u>	Ø o _F				
			•	Audit Resu								
Point		ted Res		Act			+ Conc. Difference	Λ a				
#	Meter	DVM	ррш	Meter		ppm						
zero 00.0 .000 00.0 00.0 1000 3.440 3.440 .138												
Span	49.3	.493	1232	49.5	.495	1/238.	6.992	,568				
Comments:	•				4							
Post Run Au	dit: E	y:	DK	Tim	e: <u> </u>	110	Temp: 78	o _F				
				Audit Resu								
Point #	Expec Meter	ted Res		Act Meter	ual Re		+ Conc. Difference	₽ &				
Zero	00.0	.000	ppm 00.0	00.3	.003	ppm 10.928	10.928	.437				
Span	49.3	.493	1232	49.3	.493	1234.	2.000	.162				
	I			<u> </u>	 							
Comments:												
+ Conc. Dif	ference	= Act	ppm - Ex	p (Std) p	om.							

Run:

Date: 5/8/92

Technicians: BN 72 DK J5

WST6-Form3-Rev11/89

QUALITY CHECKS WOODSTOVE DATA SHEET #16

Ambient = Tr:	10,0	_of T/C	#30: <u>/3,</u>	<u>7</u> °F
Thermocouple Check (at	ambient): T/C#1:	72.4	_°F;T/C#2:	<i>72,4</i> °F;
T/C #3: 73,2 °F;	T/C #4: 73,0	o _F ;	T/C #5:	<i>72.8</i> °F;
T/C #6: 72,8 °F;	T/C #7:	°F;	T/C #8:	<i>72.7</i> _°F;
T/C #9: 72.9 °F;	T/c #10: 12.	o _F ;	T/C #11:	12,2 °F;
T/C #12: 73,2 of;	T/C #13: 72.6	°;	T/C #14:	72,7 of;
T/C #15: 73.3 °F;	T/C #16: 71.7	oF;	T/C #17:	72.1 °F;
T/C #18: 73,0 °F;	T/C #19:	°;	T/C #20:	o _F ;
T/C #21:OF;	T/C #22:	oF;	T/C #23:	oF;
T/C #24:OF;	T/C #25:	°;	T/C #26:	o _F ;
Comments:				
	•			
Thermocouple Readout:				
Pretest Zero/Span Check Zero Adj	10	Table 01.	eck % D:	ifference
(0°F) : // °F to:	O of Zero	(0°F):_	. ம °F	<u>,030 </u>
Span (2000°F): 200/,4 °F to:	2000.0 °F (2	000°F):2	003.6°F	180
(Allowable % Difference			•	
#15 to calculate % Diffe	rence)			
Thermocouple Readout Pre	test Linearity C	heck		
0°F = oF; 2	00°F = <u>201.8</u>	_°F; 40)°F = 3991	/o _F ;
600°F = 60/6 °F; 8	00°F = 801.8	_oF; 1000)°F = /00/.	<u>2</u> ∘ _F ;
1200°F= //98.8 °F; 14)°F = /600.	Cor
1800°F= /80/,0 °F; 20	00°F = <u>2000.0</u>	o _F		
			•	
Tracer Gas (SO ₂) Injecti	on Train Leak Ch	eck: Pro	Post_	_
Combustion Gas (CO ₂ ,O ₂ ,C Tracer Gas (SO ₂) Analyze	O) Train Leak Ch	eck: Pro	Post	_
Tracer Gas (SO ₂) Analyze	r Train Leak Che	ck: Pre	Post	<u> </u>
Draft (Static) Guage Zer			Post_	
				•
Scale Check Pre (Wt, #18		_		
Post (Wt. #'): 316.2 - 300	6,2 = 10)	
	s): 316.4-301	o.4 = 10	. 0	
Stack cleaned prior to t	s): 316.4-301	o.4 = 10	. 0	

CLIENT: HAUGHS PRODUCTS

TEST No. :

DATE: 5/18/92 MODEL: S-27X ******************* **METER** PERCENT PERCENT S02 **DELTA** TIME METER CO CO2 COCENTR. READING Н TEMP. (%) PPM (%) (C F) (IN. H20)(DEG. F) (MIN.) _____ ======= _____ 0 750.000 0.150 87 0.84 4.90 625 87 0.45 2.80 475 5 0.260 751.500 88 0.50 2.40 600 10 753.537 0.160 89 0.49 3.20 600 755.156 0.160 15 20 756.780 0.160 90 0.53 3.20 600 0.180 90 0.51 3.90 575 25 758.411 91 5.10 550 30 760.113 0.190 0.57 91 35 761.898 0.190 0.69 6.00 550 91 0.58 40 763.683 0.210 8.90 525 92 45 765.553 0.240 0.27 10.20 500 50 767.524 0.260 92 0.23 10.60 475 0.260 55 769.598 92 0.22 10.90 475 0.260 93 0.18 10.60 475 60 771.672 65 773.754 0.260 93 0.39 11.70 475 93 500 70 775.836 0.240 0.31 11.90 93 475 75 777.815 0.260 0.21 10.00 0.260 94 9.70 475 80 779.897 0.13 94 85 781.986 0.260 0.149.00 475 94 90 784.076 0.260 0.15 8.50 475 95 786.166 0.260 94 0.37 7.70 475 100 788.256 0.240 94 0.59 7.10 500 105 790.241 0.240 94 0.77 6.10 500 792.226 94 0.96 5.90 500 110 0.240 794.212 94 115 0.2401.03 5.60 500 120 796.197 0.240 94 500 1.09 5.60 93 1.13 125 798.185 0.240 5.30 500 1.16 5.00 130 800.165 0.230 94 500 94 135 802.153 0.230 1.37 4.80 500 140 804.140 0.230 95 1.39 4.60 500 145 806.135 0.230 95 4.30 500 1.39 150 95 808.129 0.230 1.44 4.00 500 155 810.124 0.210 95 1.47 3.80 525 160 812.024 0.210 95 1.54 3.40 525 165 813.924 95 0.210 1.49 3.30 525 170 815.824 95 0.190 1.48 3.20 550 3.30 175 817.638 0.190 95 1.50 550 180 819.451 0.190 95 1.45 3.10 550 185 95

TABLE 2 ---- FIELD DATA

second .	CLIENT : HAUGHS PR	ODUCTS	TEST No. :	6
(m)	MODEL: S-27X ********	*****	DATE: ********	5/18/92 *****
	METER CAL. FACTOR (Y)	1.066	Wt. WOOD BURNED(LB)	9.7 Lbs
	BAROMETRIC PRESS.(Pb)	30.01 in Hg	WET, FUEL MOISTURE %	17.167 %
	LEAK RATE POST (Lp)	0.004 cfm	Wt. PART. COLLECTED	0.6855 g
J	WATER VOL. (V1c)	106.8 Ml	METER VOLUME Vm	69.451 mcf
	TEST TIME (MIN)	180 min	HC MOLE FRACTION	0.0132

TABLE 3 ----FIELD DATA AVERAGES

$V \rightarrow$	1				•		
`\	CLIENT :	HAUGHS PRO	DUCTS		TEST No.	: 6	
	MODEL:	S-27X ******	*****	****	DATE:	5/18/92 :*****	****
The state of the s	AVG DELTA H		0.22 in H2O	AVG PRCNT CO	·	. 0.78	8
	AVG METER TEMP. Tm		93 deg F	AVG PRCNT CO2		6.21	ક
	AVG PPM SO2		516 PPM				e.

- CALCULATIONS

Name of the last

		TABLE 4	CALCULATIONS		
	CLIENT : HAUGHS PRO	DUCTS	TEST No. :	6	:
1	MODEL: S-27X ********	****	DATE:	5/18/92 ******	*****
	STD SAMPLE VOL. Vm(std)	70.97 dscf	STACK GAS FLOW Qsd	526.627	dscf/Hr
				8.78	
	VOL. WATER VAPOR Vw(std)	5.027 scf	PARTICULATE CONCTRT. C s	0.0097	g/dscf
	PRCNT MSTR Bws	6.62 %	PARTC.EMISS. RATE E	5.09	g/Hr
The second secon	BURN RATE BR	1.22 Kg/Hr	MOLES OF GAS PER Lb WOOD Nt	0.51	Lb-mole/Lb
	CO EMISSION RATE	138.27 g/Hr &	PART.EMISS. RATE	4.18	g/Kgdry fuel
7 to 2 to 2		113.71 g/Kgdr fuel			

TABLE 5 ---- PROPORTIONAL RATE VARIATION

HAUGHS PRODUCTS

TEST No. :

6

TIM INTEV Ti	AL	PPM * Vm	PROPRTN. RATE VAR. PR		PROPE RATE AVERA	VAR.				
=====						100	=====	===	====	
	5	968.1	96 99			100				-
	10 15	998.5 1000.4	99							
	20	1000.4	99.							:
	25	1001.0	100	•		•				
	30	1003.0	. 99		4				•	
	35	1004.2	100		4					
	40	1006.5	100							:
	45	1005.6	100				• •			
•	5 0	1008.7	100				**			
	55	1008.3	100							
	60	1007.4	100							
	65	1010.4	100	•						
	70	1010.4	100							
	75 75	1010.9	100							
	80	1009.5	100			1.0				
	85	1012.0	100				,			:
	90	1012.5	100							
	95	1012.5	100				• * •			:
	100	1012.5	100							
	105	1012.1	100							•
	110	1012.1	100							
	115	1012.7	100	•		*	4.5			
	120	1012.1	100			7	•			
	125	1014.6	101					4,11		:
	130	1010.5	100	1.0		*				
	135	1013.7	100							
	140	1012.2	100							:
	145	1015.4	101			-				
	150	1014.9	101					. *		
	155	1015.4	101	e en en en en en en en en en en en en en					* •	
	160	1015.3	101							
	165	1015.3	101	4.5						
	170	1015.3	101	•						
	175	1015.5	101				+			
	180	1014.9	101							
	185						•			-
100	190									. :

Client Haughs Produ		· · · · · · · · · · · · · · · · · · ·
Client Address 10 Otlas Cou Bramp Ton, On	tario. Canada 16T	561
Client Phone 4/6-192-800	6	
Project No Model No	S 210X	
Run No. 6 Date of Test 5	8/92 Est Grams/Hr	
Stove Type: Cat Non Cat		•
Data To Be Submitted To: Oregon	X Colorado EPA X	•
Burn Category: Low (<0.8 Kg/Hr) Med Low (0.8 - 1.25	Med Hi (1.26 - 1.90 Kg Kg/Hr) <u> 06 Max</u> (>1.9 Kg/	/Hr) Hr)
Fuel % Moisture (dry) 00.705 (00.00) (Data Sheet #10)		<u> </u>
Stack Static Pressure (0.000) (Data Sheet #12)	-048	"H ₂ 0
Barometric Pressure(00.00) (Data Sheet #2)	30.01	"Hg
Temperature (Average Room) Combusti (00) (Data Sheet #14)	, - /	o _F
lue Gas Moisture (00.000) (Data Sheet #7)	6.6165	%
Ambient Moisture (0.00) (Data Sheet #8)	1.3 /	<u>"</u> ".
Stove Weight(000) (Data Sheet #8)	231	lbs
Stove Temperature Change (000) (Data Sheet #14)	-47	o _F
Particulate Emission(0.0000) (Data Sheet #7)	1491	gr/dscf
Fuel Higher Heating Value (dry) (0000) (CT&E Sheet)	·	вти/1ь
Fuel Type: Wood: X Pellets	i	
otal Fuel Consumed During Burn(00.0) (Data Sheet #8)	9,7	lbs
otal Particulate Catch(0.0000) (Bata Sheet #6)	16855/	9
1 ₂ 0 Captured(00.0) (Data Sheet #3)	106.2	9
ry Gas Meter Volume(00.000) (Data Sheet #2)	69.451	CF /
Pry Gas Meter: Y Factor: 45-1066	_ Post Test Leak Rate /O	OU CFM
DOOD CONF #		

Page 1 of Unit: 1406145 507X

Run: 6 Date: 5/18/92

Operator(s): 55

Nozzle: Probe @ 3/8 " od

Initial Volume: 1,500

Inject SO2 @ 100 cc/min

ROTO	PRESS:	180	Sampling	Ratio :	18	: 1	BAROM	ETER:3	003
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	S02 PPM	ROTO TEMP	PUMP
00	1605	750,000		5,518	15	87	625	83	0
05	10	151,500	•	7.061	126	87	475	23	0.5
10	15	753,537		5.748	16	88	600	83	10
15	D	155.156		5,748	16	29	600	83	15
20	26	156,180	•	5,748	-16	90	600	<i>8</i> 3	-5
25	30	758,411		5,998	, 18	90	575	<u>83</u>	15
30	35	760.113		6271	, 19	91	550	<i>2</i> 3	10
35	40	761.898	•	6071	-19	91	550	23	1.0
40	45	763.683		6.569	01	91	525	83	1.0
45	50	165,553		6898	.24	90	500	<u>8</u> 3	1,0
50	55	167.504		2261	126	90	475	<i>2</i> 3	1.0
55	1700	161598		1261	26	99	475	83	115
ROTO	PRESS:	_20	TOTALS :	16.552)	(D4B)	(1080)	BAROM	ETER:	3008
60	5	771.672		7.872	106	93	X25	<u>ea</u>	1-5
6 5	10	113.154		7270	-26	93	425	80	15
70	. 15	775.836		6999	124	93	520	<u> 20</u>	15
75	Đ	111.815		1295	186	93	4,15	81	1-5
80	25	179.897		7085	-26	94	415	81	15
85	30	781.986		7-085	106	94	475	18	15
90	35	184.096		2085	196	94	415	81	15
95	40	786.166		7-285	106	94	475	21	1.5
100	45	128.256		6901	124	94	500	21	1-5
105	50	190,041		6.901	04	94	500	81	15
110	- 55	198.886		6.901	184	94	800	181	1-5
115	1800	794212	-	4.901	124	94	500	8	15
			TOTALS:		(3.00)		MAX VI		
TOTAL	. CU FT		TOTALS:	1621131	5,44/	220cl	AV BP	205	

60.05

Meter Box Data Sheet Page # 2

Meter Box 45 Y Factor 1.066

Leak Checks: 150 " Hg @ .0001 cfm cfm cfm cfm cfm cfm cfm cfm cfm

Unit: $\frac{HAUGHS}{SON}$ Run: 6 Date: $\frac{518190}{SON}$ Operator(s): $\frac{5}{SON}$

Nozzle: Probe @ 3/8 " od

Initial Volume: 1500

Inject SD2 @ 100 cc/min

ROTO	PRESS:	.80	Sampling	Ratio:	_18	: 1	BAROME	ETER 2	9-99
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	202 Mqq	ROTO TEMP	PUMP
120	5	196-197		6.914	A4.	94	80	.81	1-5
125	10	798.185		6-914	124	93	200	81	15
130	15	800,165		6.901	, D3	94	SX)	80	15
135	20	202153		6901	43	94	800	20	15
140	<i>D</i> 5	804-140		6.888	23	95	<u> </u>	<u>83</u>	15
145	30	800.135		6.888	-03	95	500	23	15
150	<u>35</u>	808-109		6-888	103	95	500		1-5
155	40	210104		6560	121	195	565	83 Ø1	15
160	ŲŞ	810,004	[6.548	2	95	565	24 24	
165	<u> </u>	813.904		6.542	.01	95	200	84	15
170	<u> 55</u>	85.844	}	020	-19	95	(30)	84	10
175	1900	1217-638		6005	0 1 18	75	BODOM	<u>ГОЧ</u> ETER: <u>¢</u>	
ROTO	PRESS:	<u> </u>	TOTALS:	180,450	(4)-64°)	(1135)	550	184	1.0
180	3	819.451	1	6051	19-	(95)	<u> </u>	001	
185	10		 	6.8513	191		<u> </u>		
190	15		-	048,816	8.073	3434	1375		
195	10		-	240,010	01012	301	017	1	
200	25	<u> </u>	-	6705	(1204)	1934			
210	30		1	(0,10)	7009				
215	25		†		//	553	15		
550	- GO Tic	<u> </u>	†						
225	50		†						
230	55		†						
235	· · · · · · · · · · · · · · · · · · ·		1						
	()(A.1.)		TOTALS:				. L	ACC =	
TOTAL	_ CU FT	69.451	TOTALS:				AV BP	: 30.0	<u> </u>
								.,/	

MOISTURE SHEET Woodstove Data Sheet #3

	lance roed		Unit: H	rughi S2	10x
Final:		<u></u>	Run:	6	
IMPINGER #1	•		Date:	5/18/9	2
Final Weight 6658	_ grams	Technici	an(s): Ir	itial:	7k
Initial Weight 5808	_ grams		·Fi	.nal:	5
Net	grams	Approved	Ву:	TK	" " "
IMPINGER #2	•				
Final Weight 5981	grams				
Initial Weight 5915	grams				
Net	_ grams				:. :
IMPINGER #3					,
Final Weight 4999	grams				
Initial Weight 499.	grams				
Net	grams				
IMPINGER #4 (SILICA GEL)					
Final Weight 8172	grams				
Initial Weight 8023	grams				
Net14.9	grams		e e		
T	OTAL MAS	5 OF H ₂ O C	CAPTURED	106-8	grams
Scale Check: 295.0g = 29 590.0g = 59 885.0g = 88	50 g 00 g 5-0 g		Half Fil	ter #2(#2(er #2(5 B
Notes:					
		·····			<u> </u>
	· · · · · · · · · · · · · · · · · · ·	-	·		

MDID toimply Brischally

nto Dessicat	-					-					
anufacturer:	<u>_</u>	<u> </u>				Lot.No	· : <u>*</u>		Grade:	-256	LHS
ilter First # Wt	Date	Time	Ву	Second Wt	Date	Time	Ву	Third Wt	Date	Time	Ву
261 F 0.6987		1608	DK		2/93	1300	A S				-27
262H0.7014		1610		.7017	1	1301	1	·			
263#0.6988	7	1612	1	16985		1300				·	
26470.6893		1614		.6894		1303					
265 FO.6912	1	1616		6917		1304		Housels	RNL		
266 + 0.6934		1618	7	16936		1305					
267170.6936		1620	1	16937		Boc					
268 F0.7015		1622	\	1010		1307					
269 -0.6933	7	1624		16436		1328					
270 FO.6965		1626	1	16965		1300					
								· · · · · · · · · · · · · · · · · · ·			
271F0.6953		1628	DK	6951		1330					
272F0,7002		1630		. 7005		133 1					
273F0.6978		1632		16980		/33.0	Ì				,-
274F0.6900		1634		6903		1333	1				
2751F0.6975		1636	`\	16975		1334	1				
276 A 0.6978		1638	/	1699		1335	1				
277\$0.6975	/	1640	/	16974		1336		·			
278 FO. 6992		1642		16991		1337					
279 AO. 6901		1644		6900		1332	1				
2801F0.6994	1-/	1646		6997	4	1339	4				
	 										
											
											
necked by				1				3/24/91		21 84	`

	QA RE	WEIGH		
Filter #	WT	Date	Time	Ву
<u> </u>	·			

BALA	NCE R	OOM ENVI	RONMENTA	L CONDI	TIONS
WB	DB	7RH	Date	Time	Ву
60	74	44	3/20	1606	DK
59	13	43	3.63	130	JES!

WOODSTOVE DATA SHEET #4-1: INITIAL FILTER WEIGHTS (TARE WEIGHTS) Into Dessicator: Date 3/17/92 Time 0900 By DK Front Half Back Half Manufacturer: SES Size: 8.2 cm Lot. No.: 78 901 Grade: 25 GLASS Third Second First Date Time Ву Date Time Time Ву Wt Date 303 .3849 3/20 1526 1341 DK 90 261810.3846 -38A7 1342 26280.3822 1528 26330.3805 .3210 1343 1530 3218 1532 264Blo.3811 HAUGHS RUG 3824 1534 1345 26580.3821 <u>26680.3822</u> 1536 138 an 3800 1538 26790.3817 1348 26840.3772 1540 1340 1542 3818 269HO.3875 1544 270HO.3813 2718 0.3884 3/20 01/3882 351 1546 272**B**0.3818 1548 3821 27380.3825 <u>274B0.3856</u> 275B0.3832 276B0.3862 293A <u>277B0.383b</u> 1353 278B0.3801 1600 13802 1359 27960.3827 1602 1400 280B0.3821 1604 Date: 3/24/96 Time 1900 Checked by

	QA RE	WEIGH		
Filter #	WT	Date	Time	Ву
	- <u>-</u> -			
	····			
	 			

WB	DB	%RH	Date	Time	Ву
60	74	44	3/20	1524	01
559	178	43	3/23	1340	5

INITIAL BEAKER WEIGHTS (TARE WEIGHTS) Into Dessicator: Date: 4/17/92 Time: 1000 By: DK Third Beaker First Second Date Time Date Time By Date Time By Wt Wt By Wt 96-8870 4/20 1004 DK 96.8874 401 1332 Ru 501 1334 7 98.5630 502 98.5625 1006 91.2044 1336 91.2041 1008 503 95.0584 1338 504 95.0582 1010 106.4504 1340 505 106,4506 1012 1340 506 94.1600 420 1014 DK 94.1604 1344 82,9870 507 | 88.9867 | 1016 1346 103.1017 508 103,1077 11018 509 A5.7024 1000 95,7026 1348 104-8757 1350 510 104.8758 1023 511 107.7742 4/20 1024 DX 107,7745 1352 106.3855 1352 512 1026 106.3852 513 99.2412 99.0417 1356 1028 514 108 6344 1358 108.6340 1030 106,2064 106.2259 1032 1400 516 105.6750 4/20 1034 DK 105.6745 1402 517 94.7160 194 2160 1404 1036 518 103.8296 1400 103 2300 1038 1408 519 100,0063 100.0063 1040 98.6967 520 1410 198.6266 1042 1412 197.7535 4/20/1044 DX 97.7537 522 103.9227 1416 1 103 9209 1046 HAULIE ENC 523 194.9397 1418 94.9400 1048 1490 524 106.8567 1050 106 ,2571 95.1173 0 1420 S25 95.1170 1052 Date: 4/21/92 Time: /4/5 Checked By:___ BALANCE ROOM ENVIRONMENTAL CONDITION QA REWEIGH Date Time By %RH Time Beaker # DB. Вy Date WB WT 59 72 4120 01 46 1003 4/01 74 1330 (α) 44

			3				Min			-		~~~))	WOOD,			
				WOOI	WOODSTOVE DATA SHEET	IA SHEE	* *	6	TANT F	CONSTANT FINAL WEIGHTS	SICHTS			WST5 Unit Run		Pg1, Rev	2,5 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2 1,2
ker	Into			<u> </u>		L TUUT	٦L_	DEALER WELGHIS	GHIS		_		\vdash	Date:	<u>}</u> _	27/40	-
* <	Dessic	Date	Time		First	<u> </u>		A P	Second	P 000	Date	Time	À A	Third	Date	Time	À
, X		517	(0)10		4.1. 2024		9001	4_		120011	100	5	3				-
511		5/19	MIKE	Ş	१८५ । प्रेडन	188	250	S	104.1419	419	3/22	1018	13	1924	989	88	2
7					.00			2	10		1	-	4				7
202		61/0	0000	7	44.4862	3 %20	80010	<u> </u>	7.65	525	1200	1018			\\		
NIS		5/19	NIK.	3	0966, 201	- CA	<u> </u>	\$ S	106.	9816	5/22	0001	, <u>Z</u>	106.9189	1) K200	500	ď
		i i						2				1					2
SS SS		2/16	3	1	8.12	1	1033	S	9,5	1611	5	1033	V Q	02/50	2000	2 163%	7
				2				2								-	0
				<u> </u>								_					_
						_							4				4
54145	Table					-	FI	NAL F	LTER W	FINAL FILTER WEIGHTS					•		
##	Dessic	Date	Time	By	First	Date		By	Second		Date	Time	_A By	Third	Date	e Time	By
26SF		200	夏	S	0.8163	5/16	1 956	ă	1000 1000 1000 1000 1000 1000 1000 100	55	8	1286					
							-					-		,			
 25		2/0	ŽŽ.		20017	2/0	252		01687	0		133		0.5145	00/0	0/0/ 0	
	-			1	1 1												
¥6	REWE ICH :	Ì	FINAL WEIGHTS	HTS		SCALE	ROOM ENVIRONMENTAL	VIRONE		CONDITIONS	LONS	ς J	CALE	SCALE ROOM ENVIRONMENTAL	MENTAL	CONDITIONS	ONS
					Eg	Weighing							9	5,00 ISIS	000	20	M
Date	Beaker #	Final	五	By	Sei	Session	Date Ti			-	ZRH		7		0		-
					<u> </u>	-1	5 ,	_ /		\dashv	77		8		-		
					<u> </u>		-	200	~ -	8	41		6		_		
Date	Filter #	Final	T.M.I.	By	<u> </u>		2 2	$\geq U$	75	0/6	1/7	CO	Comments				
					<u> </u>	9 "		S 2 €	8 - 8 -	3.7							

SN 37010004 Scale Sartori 7 N. D 7 RH 松 ्रीर Model 34 WST7-FOF. Wet Bulb पूर्व विश्व 300 अविद्व S S 9 O 50 Bu 1 b 66 1000 0060 COGI WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET Date 5/18 Tech 18/3 SSES 紫 黎 Besker Blank Filter Blank 0.0999 0.0999 0.0000 1.0809 0.1000 0.0998 0.097 0.097 0.0999 0.0999 66601 , 1000 00010 Weight 0,100 100 0.0999 1001 100mg 0.1003 0000 0, 9996 9999 2220 Weight 0.9997 100000 .0003 .0003 0.0008 9699.0 1.0000 1000' 1000 1000 000 1.08 1000 1000 Dates: From 4 33 /32 9,9999 9.9997 000000 10,000 00000 26666 0.0005 Weight 0,000,0 0000 0/ 10.0002 000001 0000 10.000 0.000 10000.01 10 x 20 C 10.0001 1000/01 10,0000 5556 10.0000 6000'01 0000 10.0000 100001 108 8666.6 वर कुर्वाट वर चुरवाट वर चुरवाट 8000,000 99,998 6 000-00 99,9998 Through 60,000 00000.00 100 cm3 100,000 99,999 99.9998 95.5898 1999. 9999 S Weight

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WST7-Form Rev5/90 A1205 SN 37010004 Sartorius 3838 Scale Sa Model Wet Bulb 3256 युर्विद्यक्ष 70 36 3 Bu 1 b 243 7 525 1600 0820 1035 500 340 Date SHRET SHEET Tech SA SA No. SCALE QA WOODSTOYE DATA Beaker Blank Filter Blank 0.0999 1000 0001.0 0.1000 0.0999 8 1000 0,1000 00/100 0.0999 00011 0.0998 Weight 000/ Ó. 1000 0.1000 1000 0.1000 0.1000 0001 38/ 80 100mg 0./000 0.0999 0.0999 8 1000 0.0999 1000 1000 10001 9 1.0000 800 0000 0000 9490 000 Weight 800 0000 8666 800 8 9000 0900' 9999 0000 2000 0000 4000 1000 1000 1000 0000 0000 1000 0000 QUQ 1.08 10.000 0,000 0000'0 0000 0000 99999 16.0000 0000 9.9999 00000 1000.0 10,000 Weight 0.000 000 00000 10.0000 9.9999 9.9999 0.000 00000 D.000 G bobbb 10000 2000 0000 8666 00000 0,0000 0,0000 108 Dates: From 99.990 L555' 99,9999 Through 11998 000000 45.99.20 99 999 100.0003 49.998 000000 00.000 66666 8666 26,996 100.00° 1000.00 000.00 eight 00000

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WOODSTOVE PARTICULATE CATCH PROCESSING WOODSTOVE DATA SHEET # 5

Unit: Run: Technician(s): 9 9 9 ₽ П 9 9

		FRONT HALF		
FILTER #: #5F FINAL WT: 18165 TARE WT: 1948		BEAKER #: 50/ m1: 15- desc: ACETONE	TARE	WT: 97,8087-
FILTER #: FINAL WT: TARE WT: NET WT:		BEAKER #: ml: desc: ACETONE	TARE	WT: WT: WT:
		TOTAL VOLUME OF ACETO USED IN WASH	NE	
		BACK HALF		
FILTER #: DOB FINAL WT: 15198 TARE WT: 13824 NET WT: 11374		ml: 546 desc: ACETONE	TARE	WT: 109,1404 WT: 103,9809 WT: 0195
FILTER #: FINAL WT: TARE WT: NET WT:	<u>0</u>	BEAKER #: 503 ml: 75 desc: METHCHLOR	TARE	WT: 94.9859 WT: 94.9408 WT: 20457
		m1: 500 desc: H20	TARE	WT: 106.9189- WT: 106.8571- WT: 10618-
		BEAKER #: 105 ml: 105 desc: H20	TARE	WT: 95.1610 WT: 95.1173 WT: 0437
		BEAKER #: ml: desc:	TARE	WT:
	٠	BEAKER #: ml: desc:	TARE	WT:
		TOTAL VOLUME OF ACETON USED IN WASH TOTAL VOLUME OF DICHLOUSED IN EXTRACTION TOTAL VOLUME OF DISTIL WATER DRIED	ROMETH	040 / m = 75 m = 305 / m = 75

		ผถกรรร	IVE BLANK!	s proces	SING	Uı	nit:	HAUGH	<u>s 50</u>	<u>1 X</u>	
lad.		WOODST	OVE DATA	SHEET #	: 5A	R	ın:	6	Date:	5 /k	3/94
	1	BLANKS DO	INE: 5/1	1/92		Τε	echnic	ian(s)	727	KT	K
	200	O ml FISHER O	BEAKEI ACET PTIMA LOT	R #:	<u>966</u>	FINA TAF NE	AL WT: RE WT: ET WT:	106.86 106.80	39.	ā ā	
	7	5 ml DIC FISHER O	BEAKER HLOROMETH PTIMA LOT	#:_E	306	FINA TAR NE	L WT: E WT: T WT:	96.86 96.89 00	100 1001 04	9	
	200 <u>Ro</u> uz	ml DIST INEAL (BEAKER ILLED WAT GRIFIE			FINA TAR NE	L WT: E WT: T WT:	96.5	114	8 8	
, entry	- <u>', </u>	BEAKE	R TARES	INTO	DESSC:	TIME: (900	DATE	: 3/17	92	
	BKR #	1ST W	T TIME	SND M.	TIM	E 3RD	WT	TIME	4TH V	JT	TIME
	D	106.0038	1396	106.223	5) 103(0					
(may)	E	96-8400	1308	96.842	4) 1038	}					
	F	96.510	9 1330	96.5100	0 1040)					
	5	CALE ROOM	1 QC : TA	RES		SC	ALE RO	OM QC	: FINA	LS ——	·
	DATE 3/03	TIME	BY WB	DB 7	j i	DATE 5//3	TIME		WB 59	DB 74	*
	3/24		9K 58	73 4		5/H 5/15	1636	900	60	70	44
:)							7200				
									,		
			BEAKERS	3: FINAL	WEIGHT	S					
	BKR #	IN DSC		1ST WT			ωт	TIME	3RD ₩	- 	TIME
	D	5/12	0900	106.2245	5-13	106.00		154			
<u></u>	8	5/12	0900	96 8431	1050			781		+	
	F	5/12		96,5118				230			
	BKR #	4TH WT	TIME	5 ТН WT	TIME	6ТН	WT	TIME	7TH W	т .	TIME
				<u> </u>					<u> </u>		<u> </u>
bos		-				<u> </u>			 	<u> </u>	

NET PARTICULATE CATCH CALCULATION WOODSTOVE TEST DATA SHEET #6

Unit: HAUGHS 507
Run:
Date: 5/8/90
Technician(s): 1x 7k
WSTAPPI-AppDoc19-page2
Rev 6/90

	. 4.	/ / / / / / / / / / / / / / / / / / /
Blank Audit: By:	Im Kelly	Date: 5/18/92
Blank Calculations:		ę t
Acetone:	<u>о</u> Ч g ÷ 200 m	1 = <u>~00000A</u> g/m1
Dichloromethane: , a	004 g ÷ 75 m	1 = <u>~~~~~~~</u> g/m1
Distillted Water:	∞ <u>8</u> g <u>† 200</u> m:	1 = <u>~~~~~~4 g/m</u> 1
Front Half Catch:		
Filters: 1048 g - Total Catch	No. of filters Blank V	g) = 1948 g Net Catch
Beakers: 70550 g - Total Catch	M1 of Acetone Blank Vand of Acetone Blank Va	$\frac{\partial Q}{\partial Q}g$ = $\frac{\sqrt{547}}{\text{Net Catch}}g$
	Total Front Half	Catch
Back Half Catch:		
Filters: 1374 g - Total Catch	No. of filters Blank V filter	
Beakers		
1. Acetone/Impingers:	D40 (-000	OD g) = 10190/g
Total Catch	ml of acetone Blank Va ml of Ac	•
2. Extract/Impingers:	75 (2000)	4 (5320) = 10453
Total Catch D	ml. of Blank V ichloromethane ml of D	alue/ Net Catch ichloro-
3. Water/Impingers:	305 (2000C	04g) = 1043/g
Total Catch	ml. of water Blank V ml of w	
	Total Back Half Total Catch % Front Half	Catch

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SH PAR TOVE TE
NETHOD SH HOODSTOVE
EPA

6 Dote: 5/18/12 Technician(1): 357K Unit: HAUGHS SOOK

NST3-Form | 8/28/94 1987 - HSD 1) Vacet d): (69.45/ Va)(17.65)()066 not)(300/ " Hg: 13.6

(553 Tan)

10,95121 0000,0000

> 6,00 2) VM(etd): (.04707)(/06,8 " 1 H20):

000,000

262 Bus x 100 : 6-6165 0000

5087/cen

3) Яви:

00, 0000

0.0000

4) Ce: (70,9518 dect) (15,43):

- decfa)(60): 6.73

000.000

deofy

5) Estynated g/hr:

g/hr 00, 0000 Y factor) of the meter box used for the test the test in degrees Absolute

computer prin

dec Fa

Run # 6
Date 5/16/92
Technician BN TR DE TS
WST6-Forml, Rev11/89

MISCELLANEOUS TEST DATA WOODSTOVE DATA SHEET #8

Useable Firebox Dimensions: See QC Section Useable Volume: /473 ft3
Dilution Tunnel Draft (If applicable): Start O Stop O
Test Chamber Air Velocity: Start: O Stop: O Avg: O
Wet Bulb/ Start: WB: 63 °F DB: 79 °F 1, 4% Amb Moisture 42 % RH
Dry Bulb Stop: WB: 60 °F DB: 75 °F /. 2 % Amb Moisture 42 %RH
$\overline{x} = 1.3$ Moisture $\overline{x} = 42$ Relative
Stove Wt: 237/3 lbs.
Empty
Stove Wt with Stack (Inc. Oil Seal) Wet: lbs.Dry: 3/1/8 lbs.
Stove Wt with Stack and Ash Ash: O lbs. Total: 3/1.8 lbs.
Kindling Wt. HOT START Paper: O lbs. Wood: O lbs.
Pre Burn Fuel Wt. 10,0 + 1,3 Total: 1/.3 1bs.
Total Kindling and Pre Burn Fuel Wt //. 3 lbs.
Coal Bed Wt-1bs: Range (2.4 -2.0)3/4.2-3/3.8 1bs. Actual: 2.3 1bs.
Allowable Amount of Charcoal that can be removed:
Coal Bed Wt. Range $\left(\frac{2.4}{\text{Upper Wt.}} + \frac{2.0}{\text{Lower Wt.}}\right)$.25 =
Test Fuel Wt-1bs: Ideal 10.3 lbs. Range: 9.3 lbs. Actual: 9.7 lbs.
Test Fuel Size (pcs.) (.75 x 1.5 x 5" Flanges) / Pcs.
2 x 4's x /8 3/4 " 4 Pcs 9,7 lbs. 100,0 %
4 x 4's x N/A " N/A Pcs N/A 1bs. N/A 7
Est. Dry Burn 9.7 - (9.7 x17167) x 60 = 1,216 Rate (Kg/Hr.) 2.2025 80 Est. Dry Burn Rate (Kg/Hr)
Est EPA Heat Output (HO _E) (19,140) x <u>63</u> x <u>11216 = 14663</u> (Avg BTU's/Hr) Est Heat Output (HO _E) BTU's/Hr
Comments: 80 = 1,216

Unit: HAUGHS SOTX Run: 6 Date: 5/18/92 Page 9
WOODSTOVE OPERATING DATA
FIRE STARTED: HOT START PST/PDST
WARM UP AND PREBURN: PRIMARY AIR: set wide open for all warm- up/preburn fuel charges, then set to at start of preburn.
SECONDARY AIR: NA CAT BYPASS: NA
CHARCOAL BED PREPARATION: raked and leveled prior to each warm-up/preburn charge. At 1 1/2 min. prior to loading last fuel, raked and leveled. In stove
TEST: Door Wide Open during loading 4 min 30 sec
PRIMARY AIR: opened full for first min. , then set to run setting of
SECONDARY AIR: NA CAT BYPASS: NA
FAN: ON/OFF during warm-up ON OFF during preburn ON/OFF first 30 minutes of test ON/OFF balance of test run Fan speed set at 17764
WOOD DATA: KINDLING: a mix of the grades listed below
SIZE MILL GRADE SPECIES
PREBURN: 2X4 Manke/Tacoma Std or btr s. orn D fir
TEST: 2X4 Packwood #2 or btr s. grn D fir
PELLET FUEL APFI#:
PELLET FUEL APFI#:All grades WCLB rules
All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either // or /8 inches.
All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches. Ist warm up/preburn fuel charge (10.0 lbs) added at 1420.
All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches. 1st warm up/preburn fuel charge (10.0 lbs) added at 1420. 2nd warm up/preburn fuel charge (13 lbs) added at 1527.
All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches. Ist warm up/preburn fuel charge (100 lbs) added at 1420. 2nd warm up/preburn fuel charge (1/3 lbs) added at 1527. 3rd warm up/preburn fuel charge (1bs) added at
All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches. 1st warm up/preburn fuel charge (10.0 lbs) added at 1420. 2nd warm up/preburn fuel charge (13 lbs) added at 1527.

FUEL MOISTURE WOODSTOVE TEST DATA SHEET #10

Run:

Date: 5//8/92

Technician: 8N.JS.TK.DK

WST1-Form7-Rev11/89

Rọc	m Temper	ature	70	of		Cor	rection	Factor	: Ø
	TE: Reco or Value ne Test F ibration		• •		nearest tempera gs takes	0.5% me ature: ' a at: .0 <u>/2</u> ,3	oisture Yes <u>U20</u> 22.0 <u>22</u>	. No_	<u>/</u> ·
Pc			Top)	Bot	ttom	Sid	e	Piece Avg
#	Dimen	Use	Uncor	Cor	Uncor		Uncor	Cor	Corrected
1	2x4x8	K		146	p 7	STA	7		
_2			<u> </u>						
3									
4	2x4x8	0	18.5	<u>ڪ0. ا</u>	18.5	20.1	19,0	20.7	20,300
5	2x4x8	4							(a0.300)
6									
7									
8									
9	2×4×183/4	T	18.5	20.1	19.0	20.7	19.0	ع٥.7	20.500
10	2×4×1834		18.5	20,1	19,0	20.7	19.0	20.7	20,500
11	2x4x183/4		18.5	20.1	18.5	20.1	18.5	20.1	20.100
12	2x4 x18314	Τ	20,0	21.8	20,0	21.8	Z0.0	21.8	<u>ब्रा.४००</u>
13									(82,900)
14									
15									
16									
17				<u> </u>					
18							٠		,
19	FEET	T	19.5	21.3	21.5	23.5	19.5	21.3	(22,033)
20									
\ <u></u>	<u></u>			Kindl	ing Pr	etest I	uel T	est Lo	ad
				NIA		20.300	/- 1	0.725	-

% Moisture - Dry Basis:

% Moisture - Wet Basis:

Kindling	Pretest Fuel	Test Load
N/A 2	20.300/2	20.725 7
N/A Z	16.874 /2	17.167

To obtain Wet from Dry: $\frac{100 \times 7 \text{ Dry Rdg.}}{100 + 7 \text{ Dry Rdg.}} = 7 \text{ Moisture, Wet Basis}$

Acceptable Ranges: 16-20% wet; 19-25% dry (17.5 - 22.5 on Meter [Uncor reading] at 70°F)

Key for Use: K= Kindling P= Pretest Fuel T= Test Fuel

Unit: MININGS COM/A
WOOD DENSITY DETERMINATION Run#: 6 Void Control
WOOD BERSIII BETERATARITOR WOODSTOVE TEST DATA SHEET #11 Technician: BU TK, DK, JS
WST2-form11-Rev 6/90
Wood Pieces Nominal Dimensions: 2 x 4 x 3/2
HOUR TIELE: NUMINAL PLACES - CO
Depth (D):
Width (W): $\frac{7iO}{Cm}$
Length (L): Some
$\frac{8.50}{8.50}$ cm Length \overline{X} = 8.50 cm
9 50 cm
Volume: $306,000$ cm ³
MOISTURE: Room Temperature:OF Correction Factor:O
Uncorrected Meter Readings Corrected for temperature: Yes No
NOTE: Record moisture meter readings to the nearest 0.5%
Uncor Cor Avg % Moisture (Dry) 19.933 %
Top: 18.5 20.1 % Aug % Moisture (Wet) 16.620 %
Bottom: /8.5 20.1 %
Side: 18.0 19.6 % Scale: Leveled In Out Zeroed: In Out
x. 19.933 Z Zeroed: In Out
*· <u> </u>
Wet Weight: 17414 g Dry Weight: 15098 g
% Moisture Dried Basis: 13,409 %
[1 - (Dry Wt Wet Wt)] X 100
Date . Time Temp
Into Dryer 5/18/92 1430 329 of
Out of Dryer 500 100 100 1000 (2120)
(Minimum Time in Dryer: 24 hrs.) Minimum Dryer Temp 100°C (212°F)
Density = $\frac{150.98}{(\text{dry wt})}$ g = $\frac{306.000}{(\text{volume})}$ cm ³ = $\frac{4934}{\text{g/cm}^3}$
(dry wt) (volume)
Pellet Fuel Moisture Content Determination
Tare Beaker Wtg
Wet Wt:g =g
Gross Wet Wt. Tare Beaker Wt. Net Wet Wt.
Dry Wt:g =g
Gross Dry Wt. Tare Beaker Wt. Net Dry Wt.
% Moisture Dried Basis:
[1 - (Net Dry Wt - Net Wet Wt.)] X 100

Fig 18 夏 FIOW , g 克 Ä 8 Ŋ . 580 Static .089 -12.6 -.050 م م م -.0b5 Press. .055 240: 1-064 :057 -052 **747** -045 -054 -.042 :063 -063 -062 -047 -054 :039 110--,041 -001 -90, 1/10: BC 475 909 625 475 475 550 200 475 475 500 475 500 525 475 475 475 8 500 550 500 475 900 575 009 Uate: 5//8/92 Technician(s): 4 5 70 20 19 5 7 <u>5</u> .20 20 75 23 5 22 ā 5 20 20 <u>6</u> 9 <u>5</u> 7 त् 31967 59227 2726 Stack 303 258 250 233 295 hee 22 332 186 312 269 242 242 700 295 286 300 7 195 302 183 284 چ $\frac{\infty}{2}$ T/C(3) 9 0 1 122 122 120 155 $\frac{8}{2}$ 90 | | 124 901 105 9 19 112 9 2 801 <u>8</u> 122 127 121 601 169 129 1/C(1)1/C(2)
| Het | Dry | % | Car 527X 5.b 5.5 (S) 7.6 6.5 .એ છ 5.0 <u>구</u> 5.0 4.9 S, 0 <u>8</u> 5.1 <u>۔</u> ف 5.7 3 8 93 128 125 103 <u>8</u> 133 20 <u>م</u> 109 200 112 123 125 134 102 99 3 ď 109 137 9 = Unit: 1/1016 HS 102 98 9 93 200 $\frac{2}{2}$ 107 98 12 15 104 5 86 2 <u>ه</u> 109 မွ 47 7 42 9 σ 0.49 74.6 49.4 47.8 12.0 6.3 . 'S 37.7 58,7 29.9 38.4 20.7 ار 1 459 Ø.0 و. و 9.0 5,4 8 Run: . <u>2</u> ñ 58 .23 39 .37 èS, 9 良 53 3 34. S 72 .22 <u>...</u> 5. N 57 <u>م</u> 8 .2 三 8 , 622 850 599. 652 150 039 083 950 270 88 056 890 023 031 .021 613 137 P#0. % 장 FZ9. 8/0 0.15 2 12.5 73 V) اة ا <u>-</u>9 <u>و</u> __ . :-:8 3.8 14.0 0.8 17.3 10.2 8.0 13.6 14.2 7.7 اه. اه. æ. ₩. ₽.0 0.01 18 <u>0</u> 8.7 V) __ 8.0 <u>ه</u> ج <u>ج</u> 7 0 12.5 Ŕ 7.3 ري د 13.0 V) ふ 0.0 8.4 15.9 ₹ S 3.8 <u>1</u> 10.2 200 <u>ن</u> 7.7 8.7 N 515 58 807 453 426 .495 .682 9 7 014 466 189 .395 335 769 546 .560 . = 152 403 341 344 553 513 471 台 10.b 10.2 10.0 و. و. ₽, 0 <u>=</u> Ŋ HOUDSTOVE DATA SHEET 112 5.8 3.5 3.2 S S 7.4 ж 6. <u>ہ</u> و \$ \$ 9 وـ ز**۷** 5.9 o: a, 26-> , 438 126 197 750 . 156 205 240 426 405 127 359 **0**!} 3 480 344 <u>---</u> 361 KSTZ-Form 14 Rev 1/88 308 285 246 235 .225 39 Rate Ŗ w 7 و Ø ف ٩ Ø ۹ ┰. OO ب N 7. -3 laft 9,5 314.1 Scale lbs 4.5 6 9.0 80 80 و۔ و۔ رة 9. 7. 5,3 0. <u>⊸</u> 7.9 <u>ه</u> -J 323.8 323.8 321,5 323.3 322,5 323.6 319.4 316.6 322.9 326.7 321.9 318,7 317.5 316.3 323.1 320.0 318.1 317.0 315.9 315.7 315.4 315.2 315.5 1800 315.1 ကို 32 윽 08 35 প্ত 1605 <u>\5</u> \2 2 9

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•		HOODSTOVE	_	HIND FLIE GHS UNIA DATA SPEET #12	E 133	E 23					Units Rens	t	344		XZZ	\downarrow	Uate: 5/18/9	5//8		7	¥
u*		KSTZ-Form	•	14 Rev 1/88	1/88						e d		37	ا قر	Ц	ŀ			11		Z
		314.1					2				3	1/6(1	T/C(1)T/C(2)	2)		1/0(3)	3	4		•	
		SCALE HE	left	E Rate	٧.	13.7 1 XCD2	S .	202	181			Bal E	Het Bulb	Į,	2 2 ± 2 €	2 E	Stark	司,	7104	Static Press.	Com
•	25/ 18/8/	314.9	8.	77	1224	5.6	.56b	7 7	14.2	<u> </u>	 	1	 		4	1	213	2	┪	245	1 4
	₹] S	314.8	٦		212	5.3	.570	コニュ	コヨ	Ξ	_	5	87	+-	+	105	210	.20	1	동이	20,
	8 12	314.8	<u></u>	Ø	797	5.0	.580	14.7	다	Ξ	10	4.3	9 9	-	}	ᇗ	207	20	500	-043	B
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	М	314.6	יא	Ø	17.	4.3	J606.	15.4	15,4	137	1.39	3.1	85	107	3.3	102	198	.20	500	040-	
	<u>函</u> 以	314.5	7	-	اها(.	4,0	. le12	15.5	15.5	142	1.44	8.2	8 ₄	107	3.1	101	196	30	500	-039	
	₹ }		.3	;	151	3.8	-622	15.8	15.8	145	1.47	2.6	કૈત	101	3.1	001	192	17.	T.,	-038	
	夏(天)	3 교	હ	Ø	.134	3.4	.637	١٠,	16.1	.152	1.54	2.2	83	T01	3.0	001	188	17.	·	-036	
	3		7		. 130	3.3	.lo4Z	5.3	16.3	147	1.49	2.2	83	101	3.0	991	184	12.	525	-,036	
	5/ 8/ 8/				129	3.2	643	14.3	16.3	46	1.48	2.2	83	107	3.0	109	181	.12	550	:035	
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			Compression and Compression an					17,144						
BURGOS		$\overline{\leftarrow}$		PRE BURD RECORD	PRE BURN DATA RECORD SHEET	#13					<u>م</u> ا .	XTES	Date:	Date: $5//8/92$ Technician(s): $6\sqrt{7}$
	342-	2-3138		-21cm	WS12-FORMUD	ı	,			Page: /	- of			PK 75
CONTRACTOR AND ADDRESS OF THE ADDRES	Ministe			7.7.5	4	5	9	7	8	5	10	11		
CONTRACTOR OF THE PROPERTY OF	Time	32	Rate	Stack	Top	Side	Back	Kight Side	Bottom	Firebox	2nd Burn Catalytic	Roall Tello	Static	Comments
D-4-03-1-4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	35.2	0	374	599	505	626	380	380	1238	1138	25	-blo3	Primary Air Sot at 386
200020000000000000000000000000000000000	2 2 2	315.0	r	389	538	805	375	386	389	7611	1068	87	000-	1 7
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	XI.	_	ų	243	→C+	477	298	369	80 h	1092	796	87	-053	
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·	3/3 3/3		د .	737	381	433	263	343	413	482	1132	86	-052	
and the second second	37/ 33/	-	رة	235	385	4)8	253	333	413	962	9401	98	190:	Pumps turned on at: 1535
	3/2 5/2	- 1	3	230	380	406	249	325	4)0	954	816	98	.050	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3/ 法/	<u> </u>	6	नल्ल	366	396	ካስሮ	314	104	936	976	38	8/10-	
أستنا والمستعودة	18/28/28/28/28/28/28/28/28/28/28/28/28/28	<u>교</u>	رة	331	358	384	242	308	403	923	938	85	7.047	Check WB/DB: 92/107
	1/3		رة	716	348	384	3세	302	00h	920	893	88	2046	†
Sanakaya (Sala	》 图	34.2	-	60C	333	379	236	98C	368	368	810	83	:043	
	\\\{\cdot\}													
spark displaying a publik disp	31/ S S	314.1	-	नाल	319	374	331	STA	968	832	703	82	.04I	318.4
	3/8													
	4													
	4													
AUDINIO POR AGRICO GARAGO														
والمراجعة والمراجعة والمراجعة والمراجعة والمراجعة والمراجعة والمراجعة والمراجعة والمراجعة والمراجعة والمراجعة														
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 .				TEM RECO WST2-	TEMPERATURES RECORD SHEET WST2-Form14 R	TEMPERATURES RECORD SHEET #14 WST2-Form14 Rev1/88		The same	Unit: Run: Page:	HAVEHS	XTGZ S	\mathbf{J}_{\cdot}	Date: 5/18/ Technician(s)	1. 820 200	K.
	T/C	4	5	9	7	8	6	10	11	12	13	14	15	16	17
	Minute Time	Stove Top	Left Side	Back	Right Side	Bottom	Firebox	2nd Burn Catalytic	Room Temp	Tube Furnace	Sample Box	Impinger Out	C. Gas Box	C. Gas Impinger	SO ₂ Impinger
	8/	319	374	231	272	396	832	703	82	8441	8hC	34	Lh0		36
	A	300	364	329	263	344	547	285	8	1448	8hC	34	247	35	36
	<u>Θ</u> /⊼	160	344	334	258	392	542	635	81	1448	348	34	8hC	35	36
	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	276	322	325	238	388	530	859	90	1 पेप 8	248	34	8hC	35	36
	8) %	30g	306	320	231	379	547	નેવન	80	1448	248	34	8hc	38	36
	12 12 13 13	757	391	314	338	371	558	१५५	18	1448	248	34	8hC	35	3િ
	8J %	369	279	315	226	3kı	555	843	18	1442	348	34	348	35	3lo
	88 €	ઝવન	275	199	225	348	0 ما ما	750	81	1441	348	34	8hC	35	36
	라 (국	334	275	191	227	341	760	1263	18	Ihhi	8hC	34	248	35	36
	(S)	434	219	130	OHE	332	961	1331	98	।नेत्रा	8hc	34	8hC	35	ે બદ
	8) (3)	468	291	3]	255	325	816	1389	98	1442	348	34	8hC	38	36
	12/2	499	303	בכצ	268	320	956	1398	18	ነተሳተ	8hC	34	348	35	36
	X	4009	3703	3190	2933	4347)	820ch	(1881d)	696						
	0] } }		324	339	283	317	1054	1336	18	1447	8hC	34	348	35	36
,	B ≥	532	338	250	393	317	1128	1440	8	1448	8hC	34	248	38	36
	5/ /s	549	359	265	304	318	1179	1324	28	1448	248	34	348	35	36
	6/3 /g		374	278	313	320	1174	1247	82	1448	248	34	348	35	36
	3// } }	516	386	283	326	324	1163	1224	82	1448	248	34	348	35	3%
			101	287	327	329	1143	1154	82	1448	348	35	348	35	36
		3 467	=	786	322	333	1139	1121	82	1448	248	35	248	35	36
	M		417	280	317	339	1093	414	18	१५५8	348	32	8hC	35	36
	3/ 元	5 478	473	ברב	316	346	1044	912	81	1448	248	35	8hC	35	36
	\$\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	404	428	264	311	351	1016	872	82	1448	348	35	248	35	36
	15 15	3	428	258	30b	357	986	847	83	१५५८	248	38	8hC	35	36
	₹/ \$ \$	357	A23	250	299	360	9 le le	817	83	1448	348	35	8hC	35	36
	X_{λ}	5625	77117	3210	2017	ヽヽ	(13085)	(13268)	187 187						
•		46347	184151	164001	18499)	83581	213517	24082	19.5 7.58 7.						

Stove 339 3314 3314 3314 306 306 306	m, e (a c e c e c e c		S3 =			Unite	Unit: 14000445	XCC 8		Date: 5/18/92	ેલ્	**
17/Cf 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	m, , , () () () ()	7 Right Side							•	ローロベビンド	ŀ	米
Time Stove Time			Rev1/88			Run: Page:	8 of	u	bar.	- · · · · · · · · · · · · · · · · · · ·	200	
Time Stove Time The Top			8	6	10	==	12	13	14	15	16 318.4	17
12 33 33 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Bottom	Firebox	2nd Burn Catalytic	Room Temp	Tube Furnace	Sample Box	Impinger Out	C. Gas Box	C. Gas Impinger	SO ₂ Implinger
33 33 33 33 35 35 35 35 35 35 35 35 35 3			365	953	30c	83	1448	348	35	248	_	36
18 23 33 314 35 36 36 36 36 36 36 36 36 36 36 36 36 36		240	366	943	۳43	83	१५५८	ShC	38	348	35	36
306 306 306 300 300 300 300 300 300 300		283	367	414	ከተተ	83	1448	247	35	8hC	35	36
30 298		1 278	369	885	758	83	1447	247	35	247		36
30 298	-	ברכונ	368	843	743	83	ማከተ፣	247	35	247		36
200	54 725	5 272	366	822	718	82	1447	241	35	247		36
27.4	377 Daa	1 362	366	800	703	82	8441	348	35	747	35	36
0 285	715 8º	258	365	181	789	28	8441	8hC	36	ጋባገ	35	36
\ J	00 213	196	362	761	اماما	82	የተተነ	8hC	36	Lhc	35	36
165 50 268 352	52 209	1351	359	748	849	82	8448	248	3%	248	35	36°
100 55 De 1 344	1d 206	243	357	737	639	82	1448	248	36	248	35	3િ
175 1900 255 336	36 263	, 238	354	131	ا 19 اما	82	1448	248	36	842	35	36
3548 4532	32 22,719	3200	(43b4)	64183	(8532)	686						
TCS 848 337	27 198	334	350	705	109	82	1448	248	36	348	35	3 lo
248~	861 -17	7	(350)	7053	(109)	82						
90 3796 4859	59 2817	3434	17114	104,23	9133	71101	Δπ.	STARET	318.47			
13436	13274 9277		13072	319743	332157	3022		STOP	271.4	V		
3635	359/251	3(272)	(353)	(364X	7	(82)			-0'Lh-			
A A							_					
200												
82												
20							٠				37	
É												
	_											
	_											
X	-											

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EE	MC - West	, Kent,	WA 9803	2 Date:	5/18/9	2 Analy	/te: <u>CO₂ (</u>	15-1)		
Source:	Haughis	S270	SEEIE	S Run #	: <u>lo</u>					
Zero Cyl	#: <u>T13</u>	2257	C	onc. <u>00.0</u> %	CO2	Cyl Pre	ess: <u>800</u>	psi		
Certi	fied by: _	LIQUI	O ALE	<u> </u>			Date: 10/-	1/91		
Span Cyl	#: 290	104	C	onc. 12.6 %	CO2	Cyl Pre	ess: <u>900</u>) psi		
Certi	fied by: _	MATH	ESON				Date: 10/3	191		
Analyzer	: Make:	Horiba		Model: P	PIR-200	0	SN: 4070	69		
Range:	0 - 25.0%	CO ₂	Aı	nalyzer Ou	tput:_	0 - 1.0)	v.		
Flow:	1.5 SCFH		Meas	ured by:	Rotame	ter: X	Flowmete	r:		
EPA Span EPA Cont:	Value = 2 rol Limits	25.0% CC = <u>+</u> 2.)2 5% of 2!	5.0% CO ₂ =	<u>+ 0.6</u> 2	25% CO ₂				
Pre Run	Audit: By	7:	DK	Tim	ie: _ /	53 <u>5</u> _	Temp: 84	o of		
				Audit Resu	lts					
Point #	# Meter DVM % Meter DVM % Difference 4 %									
# Expected Response Actual Response + Conc. # Meter DVM % Meter DVM % Difference 4 % Zero 00.0 .000 00.0 00.0 .000 ,054 .054 .217										
			12.6				-, 237	-1.879		
Span	50.4	-001	12.0	71,1	1 . 7 . ,	, 2.303		1.0.1		
Comments	<u>:</u>									
Post Run	Audit: B	SV:	OK	Tim	e: l	920	Temp: 8	2 o _F		
				Audit Resu						
Point	Expec	ted Res	ponse	Act	ual Res	ponse	+ Conc			
#	Meter	DVM	8	Meter	DVM	8	Difference	Q &		
Zero	00.0	.000	00.0	00.0	, 000	.054	.054	.217		
Span	50.4	.504	12.6	49.9	.499	12.363	237	-1.879		
Comments:			•	·				ļ		
	Difference			(Std) %	m) v 10	· · · · · · · · · · · · · · · · · · ·				

Span % Difference = Act % (ppm) - Exp % (ppm) X 100
Exp % (ppm)

⁺ Conc. Difference = Act % - Exp (Std) %
Zero % Differece = Act % (ppm) - Exp % (ppm) X 100
Full Scale Value

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET \$15

Site: EEMC	- West,	Kent,	WA 98032	Date:	<u> 5/18/93</u>	Analy	yte: <u>02 (</u>]	5-2)
source: HA	ughs S	270	Series	Run #:	10			
Zero Cyl #:	T 13:	2257	Co	nc. <u>00.0</u> %	02	Cyl Pre	ess: <u>800</u>	psi
Certifie	d hv.	1100	no Au	و			Date: 10/7	191
00101110	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	~!!	Co	nc 174s	00	Cvl Pre	ess: 900	psi
Span Cy1 #:	_2400	<u> </u>			<u> </u>	0,1	Pates 10/3	Jai
Certifie	d by:	MATH	NOC31				Date: 10/3	· · · · · · · · · · · · · · · · · · ·
Analyzer:	Make:	eledyn	e 1	Model:32	20 Ax		SN: 3746	2
Range: 0 -	25.0%	2	An	alyzer Out	put:	0 - 1.	0	v.
Flow: 1.5	SCFH		Measu	red by: I	Rotamet	er: <u>X</u>	Flowmeter	:
EDA Coon Vo	1vo - 25	. 0.2 0.0				•		
EPA Control	Limits	= + 2.	5% of 25	.0% O ₂ = -	H 0.625	8 O2		ectro-re-
Pre Run Aud	it: By:		DK	Time	∍: <u>15</u>	545_	Temp: 86	°F
				udit Resu	lts			
Point				Acti	al Res	ponse	+ Conc.	△ ¾
# Meter DVM % Meter DVM % Difference 23 %								
Zero	00.0	.000	00.0	00.0	-004	:005		
					.494	12.441	.097	. 181
Comments:	Teledyne	#2 <u>Cy</u>	1 % E	xp & A	ct *	Adj t	<u> + 4</u>	
·								
	· 							
Post Run Au	dit: By	- 7 :	٥ĸ	Time	e: 19.	30 _	Temp.: 82	o _F
		· · · · · · · · · · · · · · · · · · ·		udit Resu				
Point	Expect	ed Res			ual Res	sponse	+ Conc.	V 8
#	Meter	DVM	8	Meter	DVM	- 8 -	Difference	
Zero	00.0	.000	00.0	00.1	.005	.023	. 023	.090
Span	12.4	,496	12.4	12.4	.491	12.420	. 020	.164
Comments:	Teledyn	=#2 <u>Cy</u>	1 % E	xp & A	ct &	Adjt	<u>ο + Δ %</u>	
						<u></u>		
								
+ Conc. Dif	ference	= Act	& - Exp	(Std) %				

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: <u>E</u> E	MC - West,	Kent,	WA 98032	Date:	5/18/9:	<u>)</u> Anal	yte: <u>CO (</u>	15-3)
Source:	HAUGHS	S270	SERIE	<u>S</u> Run #	: 6			
Zero Cyl	#: <u>T13</u>	2257	Co	nc. <u>00.0</u> %	CO	Cyl Pr	ess: <u>800</u>	ps:
Certi	fied by: _	Liqu	110 AIR	ર			Date: 10/7	191
Span Cyl	#: 2900	74	Co	nc. <u>4.96</u> %	CO	Cyl Pr	ess: 900	ps:
Certi	fied by: _	MATH	ESON				Date: 10/3	1/91
Analyzer	: Make:	Horiba		Model: P	IR-2000) .	SN: 408	005
Range:	0 - 10.0%	СО	An	alyzer Ou	tput:	0 - 1.	0	v
							Flowmet	
EPA Span	Value = 1	0.0% CC)					
	rol Limits							
Pre Run	Audit: By	·	•			55 <i>0</i>	Temp: <u>8</u> 5	<u>) </u>
Point	1 Eypec	ted Res		udit Resu Act	lts ual Res	ponse	+ Conc.	l
#		DVM	ક	Meter			Difference	△ శ
Zero	00.0	.000	00.0	00.0	.000	004	:004	044
Span	49.6	.496	4.96	49.2	.492	5.008	.048	.969
Comments			•			·		
								• •
					10	مر د	_ 0	2 01
Post Run	Audit: E	У:				35	Temp.: 8	<u> </u>
Point	Evnec	ted Res		udit Resu	lts ual Res	ponse	+ Conc.	<u> </u>
#	Meter	DVM	8	Meter	DVM	8	Difference	△ 8
Zero	00.0	.000	00.0	00.1	.001	ما٥٥.	۵۵۵.	. 058
Span	49.6	. 496	4.96	48.9	.489	4.978	,018	. 353
Comments	:							
		,						
+ Conc.	Difference	= Act	% - Exp	(Std) %	m) v 10	10		
	ifferece =	I	ull Scal	e Value				
Span % D	ifference	= Act 9	Exp % (Exp % (p	pm) X 1	-00		
			nut o (E. Farri				4.7

PRE AND POST TEST ZERO/SPAN CHECK WOODSTOVE DATA SHEET #15

Site: EEMC	- West,	Kent,	WA 98032	Date:	5/18/9:	⊋ Anal	yte: <u>SO</u> 2	(15-4)	
Source: H	AUGHS	S270	SERIE	<u>S</u> Run #	: 6	· · · · · · · · · · · · · · · · · · ·			
Zero Cyl #	: <u>TI3</u>	2257	Co	onc.00.0 p	om SO ₂	Cyl Pr	ess: <u>800</u>	psi	
			_				Date: 10	١	
Span Cyl #	_						ess: 45	. •	
							Date: 9/2	_	
	-								
							SN: 403		
Range: 0	- 2500 p	pm SO ₂	An	alyzer Ou	tput:_	0 - 1.	0	v.	
Flow:1.	5 SCFH		Measu	red by:	Rotame	ter:_X	Flowmet	er:	
EPA Span Va	alue = 2	500 ppr	n 50 ₂						
EPA Contro									
Pre Run Au	<u>lit</u> : By	' :	DK	Time	e:	1530	Temp:	% of	
				udit Resu					
Point Expected Response Actual Response + Conc. # Meter DVM ppm Meter DVM ppm Difference \$\Delta\xi\$ \[\lambda \lambda \rightarrow \rightarrow \lambda \rightarrow \rightar									
2.50									
Span	49.3		1232	49.3	.493		2.000	.162	
	<u> </u>			,					
Comments:									
Post Run A	adit. F	w.	DK	Time	a : 1	915	Temp: 8	2 o _f	
lobe Run III	aure. z	· · · · · · · · · · · · · · · · · · ·		udit Resu		<i>.</i>			
Point	Expec	ted Res			ual Re	sponse	+ Conc.		
#	Meter	DVM	ppm	Meter	DVM	ppm	Difference	Δ &	
Zero	00.0	.000	00.0	00.3	. 603	10.928	10.928	.437	
Span	49.3	.493	1232	49.2	.492	1231. 504	-:496	040	
Comments:		-							
+ Cong Di	Fforonge	= 7.5+	nnm - Ev	p (Std) p	nm				

⁺ Conc. Difference = Act ppm - Exp (Std) ppm

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Run:	6
Date:	5/18/92
Technicians:	BN, TK, DK, JS
WST	6-Form3-Rev11/89

QUALITY CHECKS WOODSTOVE DATA SHEET #16

Ambient = Tr:	79	or T/C	:#30: 80.	9	o _F
Thermocouple Check (a	<u> </u>			~	— ·
T/c #3: 232.6 °F;			T/C #5		· ·
T/c #6: 357.7°F;	· · · · · · · · · · · · · · · · · · ·	··· ·	T/C #8		o _F
T/C #9: 700.6 °F;	·		T/C #11		o _F
T/C #12: 175.4 °F;			T/C #14		— о _г ,
T/C #15: 162.6 °F;	T/C #16: 5		T/C #17		一。' o _F ;
T/c #18: 89.3 of;	 -		T/C #20		o _F ;
T/C #21: oF;	T/C #22:		T/C #23		o _F ;
T/C #24: oF;	T/C #25:	·	T/C #26		o _F ,
Comments: HOT START					 · :
Thermocouple Readout: Pretest Zero/Span Che Zero (0°F): 0°F		ost Test Ch		% Differe . <i>030</i>	nce
Span	Adi S	- Dan			
(2000°F): 2003.5 °F	to: <u>2006.0</u> °F	(2000°F):_	<u>2004.4</u> °f _	, 220	·
(Allowable % Difference	ce = 1.5%. Use	formulas on	Woodstove	e Data Sh	eet
#15 to calculate % Di	fference)				
		-			
Thermocouple Readout			4.4		:
	$200^{\circ}F = 202.$				
$600^{\circ}F = \underline{602.6}^{\circ}F;$. ·
1200°F= 1200.3 °F;			00F = 160	02.5 °F	,
1800°F= 1803.2 °F;	$2000^{\circ}F = 2000.$	O of			
m					
Tracer Gas (SO ₂) Injec					
Combustion Gas (CO2,0	2,00) Train Leak	Check: Pr	e Pos	st_/	
Combustion Gas (CO ₂ ,O ₂) Tracer Gas (SO ₂) Analy	₂ ,CO) Train Leak yzer Train Leak	Check: Pr Check: Pr	e Pos	st /	
Combustion Gas (CO2,0	₂ ,CO) Train Leak yzer Train Leak	Check: Pr Check: Pr	e Pos	st /	
Combustion Gas (CO ₂ ,O ₂) Tracer Gas (SO ₂) Analy Draft (Static) Guage 2	2,CO) Train Leak yzer Train Leak Zero Check:	Check: Pr Check: Pr Pr	e Pos e Pos e Pos	st /	
Combustion Gas (CO ₂ ,O ₂) Tracer Gas (SO ₂) Analy Draft (Static) Guage 2 Scale Check Pre (Wt, 4)	2,00) Train Leak yzer Train Leak Zero Check:	Check: Pr Check: Pr Pr - 323.1 =	e Pos e Pos e Pos	st V	
Combustion Gas (CO ₂ ,O ₂) Tracer Gas (SO ₂) Analy Draft (Static) Guage 2 Scale Check Pre (Wt, 4)	2,00) Train Leak yzer Train Leak Zero Check: #'s): 333.1 #'s): 324.0	Check: Pr Check: Pr Pr - 323.1 = - 314.0 =	e Pos e Pos e Pos 10.0	st V	

TEST No. :

CLIENT : DATE: 5/19/92 S-27X MODEL: ************************* PERCENT S02 METER PERCENT **DELTA** TIME METER CO CO2 COCENTR. H TEMP. READING (%) (%) (IN. H2O) PPM (DEG. F) (C F) (MIN.)====== 5.20 500 78 0.47 0 819.700 0.150 400 78 3.00 5 821,200 0.240 0.46 2.60 79 525 0.140 0.46 10 823.102 0.130 79 0.46 2.60 550 15 824.557 825.946 0.130 80 0.49 2.70 550 20 81 0.54 2.80 550 0.130 25 827.340 575 81 0.66 2.80 30 828.740 0.120 425 81 0.33 7.40 0.220 35 830.078 7.20 475 82 0.55 0.180 40 831.888 8.60 425 0.220 83 0.20 45 833.514 0.220 425 9.50 50 835.338 84 0.11 425 55 837.168 0.220 84 0.17 10.70 0.220 11.20 838.998 85 0.25 425 60 400 0.250 85 0.18 10.40 65 840.836 0.17 70 842.788 0.220 85 9.70 425 85 0.18 9.60 425 0.220 75 844.626 10.20 425 0.220 86 0.18 80 846.463 0.29 450 848.308 0.200 86 9.10 85 425 86 0.25 8.60 0.220 90 850.050 425 0.220 86 0.18 8.60 95 851.894 87 0.26 7.90 450 100 853.739 0.190 450 855.487 0.190 87 0.30 7.00 105 0.160 87 0.79 6.10 500 110 857.236 525 115 858.810 0.140 88 1.01 5.20 120 860.314 0.140 88 1.10 4.70 525 88 1.07 4.40 500 0.160 125 861.819 88 1.09 4.10 500 130 863.400 0.160 89 3.90 500 0.160 1.16 135 864.980 89 140 866.566 0.160 1.13 3.70 500 89 145 868.152 0.160 1.14 3.50 500 89 3.40 500 869.738 0.160 1.08 150 871.324 0.160 89 0.96 3.50 500 155 0.150 872.910 90 3.50 500 160 1.01 89 165 874.504 0.150 1.01 3.70 500 0.150 3.70 170 876.088 89 1.01 500 175 877.674 0.150 89 0.99 3.70 500 89 180 879.260 0.160 0.99 3.60 500 88 0.93 185 880.847 0.160 3.70 500 88 0.93 190 882.429 0.160 3.60 500 195 884.011 0.160 88 1.01 3.40 500 200 885.593 88 0.160 1.07 3.10 500 205 887.175 0.160 88 1.06 3.20 500 210 888.756 0.160 87 500 1.14 3.10 0.160 87 215 890.332 1.07 3.00 500 220 891.909 0.160 87 1.09 3.10 500 225 893.485 0.160 87 1.12 500 3.10

HAUGHS PRODUCTS

TABLE 2 ---- FIELD DATA

	CLIENT : HAUGHS PR	ODUCTS	TEST No. :	7
	MODEL: S-27X ********	*****	DATE: ********	5/19/92 ******
	METER CAL. FACTOR (Y)	1.066	Wt. WOOD BURNED(LB)	10.7 Lbs
- Control of the Cont	BAROMETRIC PRESS.(Pb)	30.03 in Hg	WET, FUEL MOISTURE %	17.207 %
	LEAK RATE POST (Lp)	0.003 cfm	Wt. PART. COLLECTED	0.9627 g
	WATER VOL. (V1c)	108.5 ML	METER VOLUME Vm	73.785 mcf
	TEST TIME (MIN)	225 min	HC MOLE FRACTION	0.0132

TABLE 3 ----FIELD DATA AVERAGES

Samuel Service of the	CLIENT :	HAUGHS PRO	DUCTS		TEST No.	: 7	
	MODEL: :	S-27X *****	*****	*****	DATE: ******	5/19/92 *****	****
	AVG DELTA H		0.17 in H2O	AVG PRCNT CO		- 0.70) %
	AVG METER TEMP. Tm		86 deg F	AVG PRCNT CO2		- 5.38	ક સ્ટ
	AVG PPM SO2	-	482 PPM				

TABLE 4 ---- CALCULATIONS

.

CLIENT: HAUGHS PRO	DUCTS	TEST No. :	7	
MODEL: S-27X ********	*****	DATE: 5	5/19/92 ******	*****
STD SAMPLE VOL. Vm(std)	76.41 dscf	STACK GAS FLOW Qsd	522.083	dscf/Hr &
			8.70	dscf/min
VOL. WATER VAPOR Vw(std)	5.107 scf	PARTICULATE CONCTRT. C s	0.0126	g/dscf
PRCNT MSTR Bws	6.26 %	PARTC.EMISS. RATE E	6.58	g/Hr
BURN RATE BR	1.07 Kg/Hr	MOLES OF GAS PER Lb WOOD Nt	0.57	Lb-mole/Lb
CO EMISSION RATE	122.01 g/Hr &	PART.EMISS. RATE	6.13	g/Kgdry fuel
	113.71 g/Kgdr	Y		

TABLE 5 ---- PROPORTIONAL RATE VARIATION

								_	
-1-	HAUGHS PRO	DUCTS	-		TEST	No.	:	7	
	S-27X				DATE:	:	5/19/92	2	
Sand.	*****	****	******	*****	****	****	*****	****	****
	TIME	PPM	PROPRTN.		PROP				
}	INTEVAL	*	RATE VAR.		RATE				
A.m.)	Ti	Vm	PR		AVERA	AGE			
	=======		=======	=======	_=====	====	======	===	
\bigcap	5	787.9	97			100			
	10	798.7	98						
	15	801.0	99						
\Box	20	800.3	99		•	•		•	4
	25	801.7	99	•					
in accord	30	804.4	99				-		
	35	803.7	99 99						
ļ. ļ	40 45	803.1 804.8	99						
()	50	806.3	99				•		•
	55	808.2	100						
	60	807.5	100				•		
	65	810.3	100	•					
	70	810.0	100						
	75	810.3	100						
	80	809.1	100				•		
bound	85	811.9	100						
\neg	90	811.6	100	*		•	•		. "
· Landing	95	811.4	100		•				
land.	100	811.1	100						*
	105	812.9	100						
	110	813.3	100						
	115	812.5	100						
	120	814.4	100	•		•			. •
\Box	125 130	814.9 815.4	100 101			-			
	135	814.1	100						
Second .	140	816.4	101						
	145	816.4	101						
	150	816.4	101				•		
L.J	155	816.4	101						
	160	815.7	101			-		-	
	165	819.8	101			•			
	170	815.4	101						
	175	816.4	101	•					
\Box	180	816.4	101						
	185	817.7	101				•		
"comed	190	815.9	101						
	195	815.9	101						
	200	815.9	101						
(_)	205	815.9	101						
	210 215	816.1	101 100						
	215 220	814.3 814.8	100						
(J)	225	814.3	100						
Same of the same of	230	27-1-0	±00						
<u> </u>	200								

	Bramp Ton	Ontario, Canada LGT	501
Client Phone	416-1792-8	8000	
	Model		
_		<u> </u>	
	Cat Non Cat_	*_ *_ * *	
Data To Be Su	bmitted To: Oregon	X Colorado EPA	<u>k</u>
Burn Category	: Low (<0.8 Kg/Hr)_ Med Low (0.8 - 1.		g/Hr) /Hr);
Fuel % Moistu (00.00)	· \ ~ ~ \	33 / (Wet) 17,207 /	
Stack Static	Pressure_ (Data Sheet #12)	-044	
	essure (Data Sheet #2)	30.03	
	Average Room) Combus ta Sheet #14)	stion Air 75	
Flue Gas Mois (00.000)	ture (Data Sheet #7)	6,365 6.2669	
Ambient Moist	ure Data Sheet #8)	1.05	· · · · · · · · · · · · · · · · · · ·
Stove Weight_ (000) (Da	sta Sheet #8)	231	
Stove Tempera (000) (Da	ture Change ata Sheet #14)	-90/	
Particulate En (0.0000)	nission_ (Data Sheet #7)	1945	gr/ds
Fuel Higher He (0000) (0	eating Value (dry) CT&E Sheet)		. ВТО
Fuel Type: Wo	ood: <u> </u>	ets:	
	nsumed During Burn <u> </u>	1017	1
Total Particu] (0.0000)	ate Catch (Data Sheet #6)	.4607	
H ₂ O Captured (00.0) (E	ata Sheet #3)	1085	
Dry Gas Meter	Volume	13.785/	

Meter Box Data Sheet Page # 2

Meter Box 45 Y Factor 1,066

Leak Checks: 150 " Hg @ 1001 cfm

Run: 7 Date: 5/19/92
Operator(s): 38

Inject SO2 @ 100 cc/min

Nozzle: Probe @ 3/8 " od

Initial Volume: 1500

ROTO	PRESS:	, 19	Sampling	Ratio :	AD 5	<u>: 1</u>	BAROM	ETER: 3	0.05
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	802 M44	ROTO TEMP	PUMP
00	1030	819.700	·	6.889	15	18	500	23	0
05	35	891,200		8,612	Del	18	400	73	15
10	40	203.101		6.501	114	19	505	13	1.0
15	45	204.551		6263	/13	79	550	13	15
20	50	805,946		6.416	113	80	<u>030</u>	71	.2
25	55	807-340		6-416	- 13	81	<u>550</u>	71	15
30	1100	888,740		6.137	112	81	575	71	2
35	5	230,078		8.304	100-	81	405	71	-5
40	10	<i>831-8</i> 88		7.409	.18	89	475	71	10
45	15	833514		8.304	199	<i>2</i> 3	405	1/	1.0
50	ĐO.	835.338		8,304	180	24	405	71	1-0
55	95	837-168		8,304	100	84	405	71.	10
ROTO	PRESS:		TOTALS :	(8)4347	(2-10-5	(970)	BAROM	ETER:	7
60	30	238.49 8		8,070	199	85	75	13	10
65	35	940.836		8,186	185	85	400	73	1-0
70	40	840,788		8,010	<i>A</i>	25	905	13	15
75	45	844.696		8090	100	25	405	73	1-0
80	50	246.463		8.20	<i>•</i> 20	25	105	13	10
85	55	848,308		7,810	.80	26	450	73	10
90	1200	850,050	<u> </u>	8,000	199	86	965	73	10
95	5	851.894		8,270	192	86	105	1/3	1.5
100	(0	S3739		7.781	119	181	450	1/5	10
105	15	855,487	4	1.781	119	181	450	10	10
110	// /	857,230	1	7,003	10	187	000	1/0	10
115	85	83810		6.669	14	188	395	1 75 255 =	15
			TOTALS:		(D)45)	1633)	, -	ACC =	<u> </u>
TOTAL	L CU FT		TOTALS:	183,389	4.55	10003	AV BP		

60,09

Nozzle: Probe @ 3/8 " od

Initial Volume: 1500

ROTO	PRESS:	<u>, 19</u>	Sampling	Ratio:	<u> </u>	_ : 1	BAROME	=1EK: <u>C</u>	2005
MN	TIME	METER READING		STACK DSCFM	DELTA H	METER TEMP	SO2 PPM	ROTO TEMP	PUME
120	30	860,314	·	6667	-14	88	505	15	15
125	35	241.219		7001	16	<i>28</i>	500	75	-5
130	40	063,000		6.988	16	82	200	76	15
135	45	864-980		6998	.16	291	300	76	15
140	50	Ellastolo	. .	6.988	-16	89	200	16	5
145	55	868,152		6975	16	89	500	77	15
150	1300	869.738	_	6.975	16	89	<u>000</u>	77	25
155	5	271-304		6.975	16	29	30	77	15
160	10	278910.	_	6-960	15	40	30	18	5
165	15	214504		6-960	15	89	500	20	3
170	20	276.00		6-960	15	89	800	10	15
175	05	877-674		6960	15	89	500	18	15
ROTO	PRESS:		TOTALS :	(83,405)	(1.86)	1066)		ETER: _	3000
180	30	279.860		6981	16	89	500	16	1/2
185	35	880,847		6.981	16	88	500	16	15
190	40	880-409		6981	16	150	800	76	15
195	45	884.011		6.981	16	80	500	16	15
200	50	885.593	<u>Į</u>	6.981	.16	88	500	16	5
205	55	887.175]	6.981	.16	88	30	16	1.5
210	1400	888.756		6,481	. 16	87	500	76	15
215	5	890,334	1	6.491	u 16	87	500	76	15
550	10	891.909	1	6.981	116	37	500	16	10
225		893,485	‡	6.98	16	000	1200	16	15
230	40	,	1	(6510)	(1.60)	(21)	11/2		-
235	95			336.6047	(801)	3946		<u> </u>	1,2
			TOTALS:	000	(01)	26	MAX V	: <u>30.0</u>	11/2
TOTA	L CU FT	13.785	TOTALS:	(7.317)	(-1743	(546)	HO BP	<u>ي.رين</u>	<u> </u>

MOISTURE SHEET Woodstove Data Sheet #3

	lance roed	Unit: Haughe .	S270
Final:		Run: 7	
IMPINGER #1		Date: 5/19/92	2
Final Weight <u>6635</u>	_ grams	Technician(s): Initial:_	Th
Initial Weight 576.4	_ grams	Final:	55
Net_ 87.1~	_ grams	Approved By: T	
IMPINGER #2			
Final Weight 5906	grams		
Initial Weight S848	_ grams		
Net	grams		
IMPINGER #3			
Final Weight 4999	_ grams		
Initial Weight 498.5	_ grams		
Net 14	_ grams		· .
IMPINGER #4 (SILICA GEL)			
Final Weight 8310	_ grams		
Initial Weight_ 816.8	_ grams	•	
Net14,8	grams		
1	TOTAL MAS	ss of H ₂ O CAPTURED 10075	_ grams
590.0g = 590	<u>Γ0</u> g <u>0.0</u> g <u>0.0</u> g	Front Half Filter #	CG&F
Notes:			:
	·		<u> </u>

										M913-10	ŕm2'ιF	32, Kevi	770
		WOODS	TOVE D	ATA SH	EET	#4-1: I	NITIA	L FILTE	R WE	IGHTS (TARE V	VEIGHTS	•
I	nto D	essicat	or: Da	te3/17/	<u> 12</u> Ti	me 0900	_ ву_[K Fr	ont	Half.	Bac	k Half	
M	anufa	cturer:	<u></u>	5		Size:	<u>0 mm</u>	Lot.No	<u>Z</u>	B882	Grade:	±250	<u>uass</u>
F	ilter #	First	Date	Time	Βv	Second Wt	Date	Time	Bv	Third Wt	Date	Time	Bv

	First	l i		<u> </u>	Second				Third			
#	Wt	Date	Time	Ву	Wt	Date	† 	Ву	Wt	Date	Time	Ву
261 F	0.6987	3/20	1608	DK		303	1380	80		<u> </u>		
2621	0.7014	1	1610	γ	.7017	1	1301	j				
263	0.6988		1612	/	16985		1300					
2641	0.6893		1614		.6894		1303					
265	F0.6912		1616		6917		1304					
266	F0.6934		1618		16936		1395		HAUGHS	RNI	7	
2671	F0.6936		1620	- J	16437		Box					
2681	F0.7015		1622	\	,7010		1307	1				
269	-0.6933	ĺ	1624	1	16436		13/19					
270F	0.6965		1626	1	16965		1300					
271F	0.6953	<i>3</i> / ₂₀	1628	D	695		1330					
272F	0.7002	1	1630		. 7005		1331					
	0.6978		1632		16980		/330	ļ				
274F	0.6900	(1634	,	6903		1333					
2751	0.6975		1636	\	16975		1334	1				
276 F	0.6978		1638		1699		1335	a a a a a a a a a a a a a a a a a a a				
277F	0.6975	/	1640		14141		1336	1				
2788	0.6992		1642		6991		1337					
	0.6901		1644		6900		1332	-				
	0.6994)	1646		6997	V	1339	V				
									1			

Checked by

Date: 3/24/91 Time 0900

QA RE	WEIGH		
WT	Date	Time_	Ву
	1		
		QA REWEIGH WT Date	

BALA	NCE R	OOM ENVI	RONMENTA	L COND	TIONS
WB	DB	%RH	Date	Time	Ву
60	.74	44	3/20	1606	DK
59	13	43	303	130	JE3
					•

WOODSTOVE DATA SHEET #4-1: INITIAL FILTER WEIGHTS (TARE WEIGHTS)

QA REWEIGH BALANCE ROOM ENVIRONMENTAL CONDITION Filter # WT Date Time By WB DB %RH Date Time \[\lambda 0 \] 74 44 3/20 1524	1anu fa	cturer:	<u> </u>	<u>\$5</u> _		_ Size:	8.2	<u>cw</u>	Lot.No).: <u>7</u>	B 401	_ G	rade	*25 GL	<u>ASS</u>
2016 0.3846 350 1526 0K 3849 383 1341 96 26280.3822 1528 3827 1344			Date	Time	By			ate	Time	Ву	1		Date	Time	Ву
26280.3822		1 3846	3/20	15712	nx	3849									
26 3 6 0 3 8 0 5				4	1			7		177					
264B 0. 3811					1										
265 © 0.3821			1												
210 10		T	1/_	-											
216 P d d d d d d d d d d d d d d d d d d			1		1	138 ax	1		1346		HAU	443	PRUT	F	
210 8 10 . 3772		I	í			-3808	\perp							<u> </u>	
210 10 13 15 15 15 15 15 15 15		7			1					$\prod '$				<u> </u>	<u> </u>
270F0.3813														<u> </u>	
2718 0.3884 3/20 1546 0K 3280 1351 2728 0.3818 1548 3213 1354 2738 0.3825 1550 324 1 1353 2748 0.3856 1552 3253 1354 2758 0.3856 1552 3253 1354 2758 0.3832 1554 3280 1355 27168 0.3832 1554 3280 1355 27168 0.3835 1558 3230 1355 27168 0.3835 1558 3230 1355 27168 0.3821 1600 3800 1360 1359 279 0.3827 1602 32892 1359 2808 0.3821 1604 3218 1400 1600 1600 1600 1600 1600 1600 1600					_				1350						
27360.3818														<u> </u>	
27360.3818						· .								<u> </u>	<u> </u>
27360.3818	2718	0.3884	3/20	1546	OK	13882									<u> </u>
27360.3825 1550 384 1353 27460.3856 1552 3853 1354 27560.3832 1554 3850 1355 271680.3832 1556 3864 1355 27760.3836 1558 3834 1357 27860.3801 1600 3804 1357 27960.3827 1602 3892 1359 28080.3821 1604 3218 1400 1400 28080.3821 1604 3218 1400		4 - 1				-3813									<u> </u>
274 50.3856	l l)										
275B0.3832				1552	1	/3853			1354						<u> </u>
277 60.3836	275	50.3832		1554		3830	1							ļ!	<u> </u>
278 6 0 3801	2760	30.3862		1556			11							<u> </u>	<u> </u>
278	2774	60.383b	, /	1558										<u> </u>	
28080.3821 1604 3818 1400				1600	[]'	13800	11							·	
28080.3821 1604 3218 1400	2791	50.3827		1602										ļ	<u> </u>
QA REWEIGH BALANCE ROOM ENVIRONMENTAL CONDITION Filter # WT Date Time By WB DB %RH Date Time 60 74 44 3/20 1524	280	30.3821				13218	V		1400	1				<u> </u>	<u> </u>
QA REWEIGH BALANCE ROOM ENVIRONMENTAL CONDITION Filter # WT Date Time By WB DB %RH Date Time 60 74 44 3/20 1524					!									<u> </u>	<u> </u>
QA REWEIGH BALANCE ROOM ENVIRONMENTAL CONDITION Filter # WT Date Time By WB DB %RH Date Time 60 74 44 3/20 1524		<u> </u>							ļ					 	<u> </u>
QA REWEIGH BALANCE ROOM ENVIRONMENTAL CONDITION Filter # WT Date Time By WB DB %RH Date Time \[\lambda 0 \] 74 44 3/20 1524				12		<u></u>								<u></u> !	_
Filter # WT Date Time By WB DB %RH Date Time 60 74 44 3/20 1524	Jhecke	d by		<u> 22 </u>					Dat	:e:	3/24	<u> 91</u>	Time	: <u> 190</u>	10
Filter # WT Date Time By WB DB %RH Date Time 60 74 44 3/20 1524			la								•	,			
60 74 44 3/20 1524		AQ	REWE	IGH			_	BAJ	LANCE F	KOOM	ENVIR	ONM	ENTAL	CONDI	TI
	lilter	# W'	T	Date	Tir	me B	У							Time	B
59 73 43 3/03 1340							_	6		+		3/	ಎ೦		\mathcal{Q}
		1	į.	I		Ì	- 1	1	i	1	1			1	. /

INITIAL BEAKER WEIGHTS (TARE WEIGHTS) Into Dessicator: Date: 4/22/92 Time: 0945 By: OK Second Third Beaker First Date Time Time Ву Wt Вy Wt Date Date Time Ву Wt DK 106.0506 4/DE 1417 9M 106.0504 4/27 1130 526 104-1497 1419 527 104,1494 1132 > HAULIES @ 7 1401 106-6818 106.6814 1134 1483 100 19088 100.9086 529 1136 105,0431 1405 <u>530</u> 105.0427 1138 1407 DK 95,5979 531 95.5983 4/27 1140 1409 103,7920 532 103.7918 1142 98,4397 533 98.4393 1431 1144 1433 106.7309 106.7326 / 534 11146 535 99.9873 99,9818 1435 1148 1437 536 96.3688 427 1150 DK 96.3690 1439 105:5587 105.5585 1152 1441 1 105-4854 538 105.4849 1154 107.4794 1443 539 107.4790 1156 107.3581 14UK 107.3581 1158 1447 97.6250 7/27 1200 DX 97.6249 542 100.2292 1444 100.0091 1202 96.6808 1451 543 96.6807 1204 99,9735 1453 544 99.9736 1206 545 1107.5087 80GI 107,5091 1455 96.7157 4/27 1210 DX 96.7159 1457 547 97.4338 97.4343 1459 1212 107.5898 548 1001 107.5893 1214 549 107.3100 107-3105 1503 1216 1505/4 106.1514 1218 106-1517 Date: 4/29/92 Time: 1350 Checked By:____ BALANCE ROOM ENVIRONMENTAL CONDITION QA REWEIGH

QA REWEIGH
Beaker # WT Date Time By

BALANCE ROOM ENVIRONMENTAL CONDITION

WB DB 7RH Date Time By

60 73 47 4/27 1128 0K

59 79 46 4/22 1415 84

				WOO	WOODSTOVE DATA SHEET		#4-31	CONS	CONSTANT FINAL WEIGHTS	IGHTS			WST5-1	WST5-Form9, Pg1, Rev4/90 Unit_AMUANS SOX	1. Rev4/	82
						FINAL	L BEAKER WEIGHTS	R WEI	CHTS				Run # Date:	10/10/10	60	1
реакет	r into Dessic	Date	Time	By	First	Date	Time	By	Second	Date	7.5 110	Page 1	AR (To	-	, E	
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SCALE ROOM ENVIRONMENTAL CONDITIONS	ROOM	ENVIR		FF. C	CONS
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Scale Sartori, Model A1265 SN 37010004 raity WST7-FOE. WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Dates: From 4 23 12

Through

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WST7-Form Rev5/90

Dates: From 3

Through.

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Scale Sartorius Model A1205 SN 37010004

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WST7-Form Rev5/90

WOODSTOVE DATA SHRET #4-4 SCALE QA SHEET

Dates: From

Through

Scale Sartorius Model A1205 SN 37010004

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WOODSTOVE PARTICULATE (CATCH REACTESTING	Unit:	HAU	its	SONX	
WOODSTOVE PARTICULATE C		Run:	7	Date:	5/19/	<u> </u>
		Technic	cian(s	;): "	22	
	FRONT HALF				-	
FILTER #: DOGF FINAL WT: 8615 g TARE WT: 16936 g NET WT: (1679 g	m1: ACETON	_	TARE	WT: LO	6.050G 0.050G 0.0553	
FILTER #: 9 FINAL WT: 9 TARE WT: 9	BEAKER #: ml: desc: ACETONI	_	TARE	WT:		_ g
, 	TOTAL VOLUME OF USED IN WASH	ACETONE	.	_9	<u> </u>	m l
	BACK HALF					
FILTER #: 068 FINAL WT: 76104 g TARE WT: 78804 g NET WT: 7850 g	ml: desc: ACETONS	<u></u>	TARE	WT:_ <u>LQ</u>	4.4669- 1.1997- 19529-	
FILTER #: 9 FINAL WT: 9 TARE WT: 9	BEAKER #: 500 ml: 75 desc: METHCHL	_ F	INAL TARE NET	WT: <u> 00</u> WT: <u> 06</u> WT:	7699- -6018- -0001-	9 9
	BEAKER #: 500 ml: 700 desc: H20	_ F	TARE	WT: JCC	19030 19088 1900	
	BEAKER #: 530 ml: 100 desc: H20	_ F	TARE	WT : 105	.0906- .0431- .0475-	9 9 9
	BEAKER #: ml: desc:	_	TARE	WT :	1617-	. 9
	BEAKER #: ml: desc:	_	TARE	WT:		. 🖫
	TOTAL VOLUME OF USED IN WASH TOTAL VOLUME OF USED IN EXTRACTITOTAL VOLUME OF WATER DRIED	DICHLOR	OMETH	ANE 3	80 - 80 -	ml ml

	WOOD: BLANKS 1 O m1 FISHER	BTOVE:	BEAKER	SHEET				Ru	n:	7		<u>5 56</u> Date:	5 /	19/9	4
	00 ml FISHER	OPTI	BEAKER			-		Te	chni	ria		_			_
		OPTI		: #:	_						n(S)	<u> </u>	DK (<u> </u>	
200 <u>Ro</u> f	FISHER ml Dis	CHLO ITQO B JJIT	BEAKER IROMETH MA LOT EAKER ED WAT	#: 9 #: 9 #: 9 #: 9	1389 E	6		TAR NE FINA TAR NE FINA TAR	E WTT L WTT L WT	- <u>9</u>	06.20 100 6.21 6.21	114			
			TARES				_								
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<u>E</u>	96-848	24	1398												
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,	SCALE RO	OM Q	C : TAI	RES		, ,		SCA	LE F	400F	1 QC	: FIN	ALS ,		-
DATE		BY	WB	DB	%			ATE	TI)		BY	WB	DB		
3/ 0 3 3/24	1300	BK	59 58	73	472		5	/13 /14	163	6	OK	59 56	74) 41	
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		E	BEAKERS	: FIN	NAL W	EIGHT	S								
BKR #	IN D	SC	TIME	1ST	WT	TIME		SND	WT	TI	ME	3RD V	JT	TIME	<u>-</u>
D	5/12	10	1900	106.2	243	1048		30 , 201	139	165	4				
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BKR #	4TH U	JT	TIME	STH	WT	TIME		6ТН	WT	TI	ME	7TH &	JT	TIME	
<u> </u>							-								
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WOODSTOVE TEST DATA SHEET #6 WSTAPP1-AppDoc19-page2 Rev 6/90 Tim Kelly Blank Audit: By: Blank Calculations: 10004 Acetone: $g \div 75 m1 = 20000533 g/m1$ Dichloromethane: Distillted Water: _______ g = ________ 200 ____ m1 = ________ g/m1 Front Half Catch: Filters: /1674 g - (.0000 g) = /1679 g

Total Catch No. of filters Blank Value/ Net Catch filter Beakers: 0553 g - 000 (0000 g) = 0549 g

Total Catch M1 of Acetone Blank Value/ Net Catch ml of Acetone Total Front Half Catch g Back Half Catch: Filters: 0350 g - (0000 g) = 0350 g

Total Catch No. of filters Blank Value/ Net Catch filter Beakers 1. Acetone/Impingers: $\frac{(\ \ \ \ \ \)}{\text{Blank Value}}g) = \frac{1}{N}$ Total Catch ml of acetone ml of Acetone . ,0004 Extract/Impingers: $\frac{(\ \infty 000533g)}{\text{Blank Value}/} = \frac{0877 \text{ g}}{\text{Net Catch}}$ 10881-8 ml. of Dichloromethane ml of Dichloromethane Water/Impingers: Total Catch ml. of water $\frac{(\sqrt{00000} \text{ g})}{\text{Blank Value}} = \frac{\sqrt{605 \text{ g}}}{\text{Net Catch}}$ ml of water Total Back Half Catch Total Catch % Front Half

NET PARTICULATE CATCH CALCULATION

Unit:

Run: Date:

Technician(s):

HAUGHS SAIX

Run: 7 Date: 5/19/92	\ \ =	69669 x H20		000
PARTICULATE CALCULAT TEST DATA SHEET #7	174 1066 11010 30,03 " Hg: 13.6	0): 5.1071 - 66f 00,0000 . 0000 - 66f 6f) . 0000	0,0000	7.317 00.000 deefn)(60):00.0000
EPA WETHOD SH NOODSTOVE	(13.785 VINC 17.65)C	5.107/ Feet 1 20.3867 dee	(19620) 9.3 (16.3867 deet)	Estimated g/hr: (g.) (-
	1) Yacetd):	2) Yucetd): (÷5 ÷	5) Estjuat

(p. 2) (000,000 Vm) (p. 2) (0,000 mef) (p. 2) (00,00 " Hg) (p. 2) (000 mef) (p. 2) (000 mef) (p. 2) (000 mef)	(p. 6) (00,000 g.) ntout) (00,000 decfs)
tal cubic feet pulled on meter box during test ter correction factor (Y factor) of the meter box u erage barometric presente during the test arage delta H for the test arage meter temperature for the test in degrees Abso	g. : total particulate catch for the test decfa : average stack flow during the test

Run # 7
Date 5/19/92
Technician BN 7K PK JS
WST6-Forml, Rev11/89

MISCELLANEOUS TEST DATA WOODSTOVE DATA SHEET #8

Useable Fin	rebox Dimensions: See QC Section	Useable Volume: 1.473 f
Dilution To	unnel Draft (If applicable): St.	art O Stop O
Test Chambe	er Air Velocity: Start:	Stop: O Avg: O
Wet Bulb/	Start: WB: 58 °F DB: 65 °F	1.4 % Amb Moisture 66 %
Dry Bulb	Stop: WB: 59 °F DB: 74 °F	1.1 % Amb Moisture 42 % 7.1 t
	$\bar{x} = 1.25$ Moisture	
Empty		
Stove Wt:		37,3 1bs.
Empty		2001 2010
	ith Stack (Inc. Oil Seal) Wet: 3	305,4 lbs.Dry: 304,9 lbs
Empty Stone Wt mi	th Stack and Ash Ash:) lbs. Total: lbs
Scove we wi	th Stack and Ash Ash: () lbs. Total: lbs
Kindling Wt	Paper: 3	1bs. Wood: 6.4 1bs
Pre Burn Fu	1el Wt. 8.4 + 8.9 + 1.5	Total: 18.8 1bs
	ing and Pre Burn Fuel Wt	. 25.2 lbs
Coal Bed Wt	:-1bs: Range(2.6 - 2.2)307.5 -	307. 1bs. Actual: 2.2 1bs
	mount of Charcoal that can be r	
Coal Bed Wt	Range $\left(\frac{2.6}{\text{Upper Wt.}} + \frac{2.2}{\text{Lower Wt.}}\right)$	$\frac{1}{2}$.25 = $\frac{1}{2}$ lbs
Test Fuel W	//, /t-lbs: Ideal/0,3 lbs. Range:	39,3 1bs. Actual: 10.7 1bs
Test Fuel S	ize (pcs.) (.75 x 1.5 x 5" Flang	ges) /4/ Pcs
2 x 4's	x /834 " 4 Pcs	10,7 lbs. 100,0 7.
4 x 4's	* N/A " N/A Pcs	N/A 1bs. N/A 7.
Est. Dry Bu Rate (Kg/Hr Est EPA Hea (Avg BTU's/	t Output (HOE) (19,140) x 63	× 1006 = 19933 Est Heat Outpu
Comments	195 = 1,238	(HOE) BIU's/Hr

10/00
Unit: HNOHS S27X Run: 7 Date: 5/19/92 Page 9
WOODSTOVE OPERATING DATA
FIRE STARTED: 0745 PST/PDST
WARM UP AND PREBURN: PRIMARY AIR: set wide open for all warm- up/preburn fuel charges, then set to at start of preburn.
SECONDARY AIR: U/A CAT BYPASS: U/A
CHARCOAL BED PREPARATION: raked and leveled prior to each warm- up/preburn charge. At 1 1/2 min. prior to loading last fuel, raked and leveled. In stove sec.
TEST: Door Wide Open during loading 4 min 30 sec
PRIMARY AIR: opened full for first 5 min., then set to run setting of
SECONDARY AIR: NA CAT BYPASS: NA
FAN: ON OFF during warm-up ON OFF during preburn ON OFF first 30 minutes of test ON OFF balance of test rur Fan speed set at 464
Fan speed set at
WOOD DATA: KINDLING: a mix of the grades listed below
· · · · · · · · · · · · · · · · · · ·
WOOD DATA: KINDLING: a mix of the grades listed below
WOOD DATA: KINDLING: a mix of the grades listed below SIZE MILL GRADE SPECIES
WOOD DATA: KINDLING: a mix of the grades listed below SIZE MILL GRADE SPECIES PREBURN: 2X4 Manke/Tacoma Std or btr s. grn D fir TEST: 2X4 Packwood #8 or btr s. grn D fir
WOOD DATA: KINDLING: a mix of the grades listed below SIZE MILL GRADE SPECIES PREBURN: 2X4 Manke/Tacoma Std or btr s. qrn D fir TEST: 2X4 Packwood #8 or btr s. qrn D fir 4x4 Packwood #8 or btr s. qrn D fir
WOOD DATA: KINDLING: a mix of the grades listed below SIZE MILL GRADE SPECIES PREBURN: 2X4 Manke/Tacoma Std or btr s. grn D fir TEST: 2X4 Packwood #2 or btr s. grn D fir Ax4 Packwood #2 or btr s. grn D fir PELLET FUEL APFI#: All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches.
SIZE MILL GRADE SPECIES PREBURN: 2X4 Manke/Tacoma Std or btr s. grn D fir TEST: 2X4 Packwood #2 or btr s. grn D fir All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches. 1st warm up/preburn fuel charge (8.4 lbs) added at 08/5
WOOD DATA: KINDLING: a mix of the grades listed below SIZE MILL GRADE SPECIES PREBURN: 2X4 Manke/Tacoma Std or btr s. grn D fir TEST: 2X4 Packwood #2 or btr s. grn D fir 4x4 Packwood #2 or btr s. grn D fir PELLET FUEL APFI#: All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either /// or //// inches. 1st warm up/preburn fuel charge (8.4 lbs) added at 08/5 2nd warm up/preburn fuel charge (8.9 lbs) added at 0905
SIZE MILL GRADE SPECIES PREBURN: 2X4 Manke/Tacoma Std or btr s. grn D fir TEST: 2X4 Packwood #2 or btr s. grn D fir PELLET FUEL APFI#: All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either 10 or 18 inches. 1st warm up/preburn fuel charge (8.4 lbs) added at 08/5 2nd warm up/preburn fuel charge (8.9 lbs) added at 0946 3rd warm up/preburn fuel charge (15 lbs) added at 0946
WOOD DATA: KINDLING: a mix of the grades listed below SIZE MILL GRADE SPECIES PREBURN: 2X4 Manke/Tacoma Std or btr s. grn D fir TEST: 2X4 Packwood #2 or btr s. grn D fir 4x4 Packwood #2 or btr s. grn D fir PELLET FUEL APFI#: All grades WCLB rules WARM UP INFORMATION: All pre-burn/warm up fuel pieces were either /// or //// inches. 1st warm up/preburn fuel charge (8.4 lbs) added at 08/5 2nd warm up/preburn fuel charge (8.9 lbs) added at 0905

Suame).

Total Carlo

FUEL MOISTURE WOODSTOVE TEST DATA SHEET #10

Run: Date:_ Technician: RN. JS, TK, DK WST1-Form7-Rev11/89

N

Рc			Top	•	Bot	tom	Sid	e	Piece Av
#	Dimen	Vse	Uncor	Cor	Uncor		Uncor	Cor	Correcte
1	2x4x8	K	4,5	4.5	3,5	3,5	40	4.0	4.000
2									
3									0.00
4	2x4x8	P	18.0	19.6	18.5	20.1	18.5	20.1	19.933
5	2×4×8	ρ	19.0	20,7	18.5	20.1	18,0	19.6	20.133
6									40,067
7									
8				<u></u>					
9	2x4x183/4	T	19.0	20.7	19.5	21.3	19,0	20.7	20.900
LO	2×4×1834	T	18.5	20.1	19.0	20.7	19.5	201	20.300
11	2x4x183/4	T	18,5	20.1	21.0	22.9	18.5	301	21.033
l 2	2x4 x 18314	T	19.0	26.7	19,5	21.3	19.0	20.7	20,900
13									83,133
.4									
L 5									<u> </u>
16									
17									
18									D. 1.5
19	FEET	T	19.5	21,3	19.5	21,3	19.0	20.7	21.100

% Moisture - Dry Basis:

19 FEET

20

7 Moisture - Wet Basis:

Kindling	Pretest Fuel	Test Load
4,000 %	20.033/2	20.783
3,846 7.	16,690-2	17.207

To obtain Wet from Dry: 100 X % Dry Rdg. = % Moisture, Wet Basis 100 + % Dry Rdg.

Acceptable Ranges: 16-20% wet; 19-25% dry (17.5 - 22.5 on Meter [Uncor reading] at 70°F)

Key for Use: K= Kindling P= Pretest Fuel T= Test Fuel

	Unit: HHUDHS Carr
	Rung:
	SIII DEIDAMIAMILON
WOODSTOV	E TEST DATA SHEET #11 Technician: BN TE DE JS WST2-form11-Rev 6/90
	5 V
Wood Piece:	Nominal Dimensions: 2 x 4 x 3/2
Depth (D):	<u> 3,92</u> cm
Width (W):	8,85 cm
-	9 (4
Length (L):	<u> </u>
-	$\frac{8}{19}$ cm Length $\overline{X} = \frac{8}{19}$ cm
	8.85 cm 20/10/12 3
	Volume: 304,943 cm ³
	(DA H A Z)
MOISTURE:	Room Temperature:OF Correction Factor:O
	Was Compated for the Was Was
uncorrected :	Meter Readings Corrected for temperature:YesNo
NOTE: Recor	d moisture meter readings to the nearest 0.5%
,	
	Uncor Cor Avg % Moisture (Dry) 19.933 %
Top:	18.5 20.1 Z Aug Z Moisture (Wet) 16.620 Z
- ,	
Bottom:	18.5 20.1 2
Side:	18.0 19.6 7 Scale: Leveled In Out
_	19933 Zeroed: InOut
<u>X</u> :	1/1/1997
et Weight:	234,4 g Dry Weight: 001,03 g
Moisture D	ried Basis: 14.15/ 7 V
[1 - (Dr	y Wt ; Wet Wt)] X 100
	Date / Time Temp
Into Dry	er 5/19/92 0830 725 °F
Out of D	5/40/90)445 of
(Minimum	Time in Dryer: 24 hrs.) Minimum Dryer Temp 100°C (212°F
Density =	9013 8 = 304.943 cm3 = 16599 g/cm3
(d:	ry wt) (volume)
Pellet Fuel :	Moisture Content Determination
Tare Beaker	
Wet Wt:	g ÷8 =8
Gros	s Wet Wt. Tare Beaker Wt. Net Wet Wt.
Danes III	g :g =g
	s Dry Wt. Tare Beaker Wt. Net Dry Wt.

....

HOODSTOVE DATA SPEET 112 HSTZ-FORM 14 RBY 1/88

C Unit: 1/12/6/45 Run: Pages / of

Uate: 5//9 Technician(s)!

`	-			!								 	6	Į.			7		
Miraika 14	507.7	He IB	Bitma	-12		2	Ĭ	ľ	2	1991	2	2		T/C(3)	3)	4			
imi		- 19	Rate v.	. XDD2	×.	2	lei	ב ג'י		8a1	Het Beist	Ory Bulber	2 × 4	Selc K/A	S. Port	S)	neg	Static	
\ <u>8</u>	317.8 1) .20q	9 5.2	.598	15.2	15.2	.047	17	1	+	<u>. </u>	+	 	216	. 8	_		Flow
	317.6 11	16.5	2 .118	3.0	.693	17.6	176	940.) 2 1	6.4	107	154 16	64	त्टा	225	 	400	840	500
(i)	_	10.2	3 .103	-	.708	\sim	18.0	.046	.46	5.6	110	44 7	1.5	<u>,</u> v	261	17	525	:043	25.
(A)	317.2		1 .102	2 2.6	707.	17.9	17.9	. 046	46	5.6	1 601	39 17		14	182	~	550		8
_	317.0 9		2 109	-	.702	17.8	17.8	.048	49	5.6	110	36 7	.3	13	177	~	550	040	B
	316.7	9.6	3 .11		જુગ	17.7	17.71	.053	54	5.2	891	32 7	7	12	172	~	555	.038	
- X	3165 9			2.8	969.	17.7	17.71	Søl6.	opo).	4.2	108	30 1	<u> </u>	12	169	一	575	:036	
88 S		8.9	5 .799	9 7.4	515	13.0	13.0	.033	,33	22.5	1 511	9 Sh	9.0	22	230		_	:650	
9/2	315.5 8	9.4 8.4	5 .289	9 7.2	.525	13.3	13.3	<u>، 84</u>	55	13.1	119	(a)h(10.2	26	225	<u>61</u> .	475	150:	
\ <u>\</u>	_		1,345	-	84.	12.1	12.1	.020	.20	42.8	الحدا	S2 1	11.8	\vdash	264	<u> </u>	425	,057	
8	314.3 7	7	5 ,382	2 9.5	130	10.9	10,9	110.	11	86.2	123 1	156	2.1	33	284	11	425	.059	
84 84	313.6 6.	7)	7 .430	7 10.7	.34	9.9	9.9	110.	. 17	12.7	125 1	189	12.4	34	295	11.	42S	290:	
$\sqrt{}$		_													2631			-567	Flo
8	312.8 5	_	8 .451	1 11.2	13let	9.2	9.2	.625	.25	ተዛ-ገ	1 LCI	63	130 1	36	307	Ξ.	425	-064	SEL
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- /		귀	\dashv	<u> </u>	10.5	10.5	810.	8	57.7	٦d	160	12.7	35	160	51.	00 <i>h</i>	P00.	200
		4. b	5 .393	- i	814.8	10.6	10.6	F10.	. 17	57.3	121	57	11.4	32	283	1.17	425	062	25
)	_		\dashv	0	143	10.9	10.9	.018	81,	53.3	120	58	16.8	30	280	-11	425	اما <u>ن</u> :	ß
8		. ^	\dashv	-	9 7	10.4	10.4	.618	8	56.8	119	157	10.2	30	284	11	425	-1061	
[₹] 3\		╬		- +	찬.	9:1	ا. اه	.629	:29	31.2	프	N.	8.5	77	273	81	450	:058	
		_	Ť	4	479	12.1	12.1	,025	.25	34.3	109	140	7.3	10	265	Ξ.	425	:057	
(8)	_	-	+	8	476	11.9	11.9	810-	<u>8</u>	48.0	105	131	0.0	119	258	11	425	.05G	
2/2	309.2 2.1	4	<u>~</u>		.506	12.8	12.8	.626	, 26	30.4	101	121	5.8	ا ا	251	.18	450	hS0:	
<u> </u>		+	╬	0.1	,532	13.5	13.5	.030	.30	23.2	41	124	4.9	113	242	.18	450	053	
20/		7 7	\dashv	ف	568	77.77	14.4	.078	.79	7.7	43	173	3.9	60	231	.20	500	-050	
义	308.7	<u>-</u> ا-	-210	5.3	.584	14.8	14.8	.100	1.61	5.2	86	125	3.3	105	220	1,21	525	Lh0-	
	+	+													3190			-1897	١.,
X	_	_	_					-	-					_	E6014	7		1 2511	

F 505 EB Z 46 CD | 8 2 呂 1.464 2.038 2.038 - 320 7847 Static Press. -030 -036 7.034 .033 -035 P.039 -033 -.03A -032 -104° -042 -034 :03) -.038 -034 **1034** -.038 :039 -031 -037 140-BE 5/19/12 8 500 580 8 800 S 200 525 300 200 58 8 500 8 臣 80 80 SS 28 500 500 8 8 Technician(s): 92. 名 .20 20 .20 2 20 2 2 2 30 3 2 .20 8 20 20 7 20 2 20 9685 3864 16327 1232 **Uate:** Stack 73 205 7 159 159 168 S <u></u> 210 193 رم ا 169 168 ات 200 82 199 89 187 118 <u>=</u> 1/0(3) 93 93 E/H 96 9 9 21 BS 102 8 8 $\frac{2}{\infty}$ <u>9</u> 9 95 93 93 93 E 101 001 101 701 9 2 XTCS Dry % C م اح 29 3.2 3.2 Q. 87 28 2.8 33 3.0 7.9 2.9 29 3 α 3.7 2.9 3 3. 50 125 <u>اه</u> = 126 125 2 118 7(C <u>2</u> 200 127 133 <u>2</u> <u>约</u> = 7 127 \equiv H.N. 145 T/C(1)T/C(2) **%** Bulb 8 8 N ₹ 84 86 ₹ 8 800 8 6 84 ₹ 8 \$ 18 8 2 88 5 5 2 8 5 Page: Hal 35 30 2.8 \$ \$ ري وب ر اف 77 43 3,7 3, 37 3 3.9 2.7 33 ι. 40 30 29 3,7 Unit: ď Pin. 1.07 1.07 1.0° 7 1.67 جي ا 93 <u>-</u> 9 .09 63 .09 <u>,</u> 三 80.1 70. 9 1.01 <u>~</u> <u>6</u> 3 m 因 20 185 .092 35 00/ .098 104 2 . 108 185 289 860 100 107 00) 942 (2) <u>9</u> 107 77 = Ξ 16.3 15.5 <u>ة</u> 5 -N 5.3 5 ا ق-5 5.3 16.9 ا دی ر ق <u>ئے</u> 9 و 16.8 76.8 16.8 فيح <u>6</u>. ⊗ σ <u>ح</u> و _ <u>ئ</u> 回 \overline{n} 15.5 16.8 = 5.00 76.5 <u>-9</u> 9 <u>.</u>8 SE SE <u>7</u> (n) خ 650 16.5 S) <u>₹</u> 5 <u>آ</u> و <u>د</u> وح <u>|</u> ۇ. ئە 605 15.3 જુ. 2 Lo13 روم পু 2000 کوما 642 STS STS S 53 543 ٧. 127 র্থু £, 3 رهاما 953 er er 634 FT# IJITING CHIPYON 200 3.5 ω N ω N アゴ 7 33 3. 6 HIND FLIE GAS LIAIN ш <u>а</u>. 3,7 3.4 3 جـ ش 3.2 3.7 3.4 3.1 9 0 3 <u>ج</u> m) ઌઁ 一台 DATA SHEET #12 14 Rev 1/88 .178 188 ٧. 146 ₹ -: <u>₹</u> 35 55 137 240 74 왕. 35 142 136 123 126 123 .123 王. F 121 त्र Rate Ø \varnothing Ø \mathscr{E} Ø Ø left HOCOSTOVE C Scale 1153 0 N ٩ ٥. HSTZ-Form o 7 R 3 ര Ø 308.5 308.6 308,3 307.5 308.4 308.0 307.9 3078 307.7 367.6 307.6 307.2 307.2 308.2 307.8 307.5 307.4 307.3 307.3 368.1 888 367.1 87 જી 8 S C 2 置 2 B 同

1		PRE BU	PHE HURN UNTA JECKED SHEET WST2-FORM 6)13 C					F. S. S. S. S. J.	7.	Techn:	Technician(s): 2 7/2
- 2075	_)	/aye;	- H			D/ 13
		T/C#-3	4	5	9	7	8	6	10	דו		
or A		Stack	Top	Side	Back	Right Side	Bottom	Firebox	2nd Burn	Room	Statio	Commonte
8	<u> </u>	372	484	528	371	497	427	OLE	1399	1/2	100 S	Primary Air Sot at 200
308	.3	88	0/9	975	333	500	439	1243	1294	22	-,065	,
-201.8 -201.8	5	296	949	518	336	493	433	1206	1193	72	-070	Fan: On 14161
307,	13	272	496	335	397	180	435	28//	11/3	76	-058	١,
308	.5	273	501	483	290	464	437	116	1311	26	-658	2
308	w)	261	181	469	282	482	435	1077	1163	76	-056	
	3	256	450	456	275	439	431	1057	080/	75	1054	Punos turned on at: 1000
- 4	G	242	423	442	368	428	426	1039	1059	76	-053	3
307	-	233	406	432	261	418	421	1637	hbb	76	-051	
25 15 307.4	-	919	373	418	252	404	LIP	1001	L88	76	-,048	Check WB/DB: 93/14/b
20307.3		212	347	700	341	398	413	981	853	76	940-	7
25 25 307.2	-	206	330	396	233	384	111	956	838	75	540:	
	-											
301.	-	716	318	386	900	378	408	404	699	トし	-242	342.6
2/2												
1/2 1/2 1/2												
\S												
8												
8												
												•
										_	_	

			RECORD	TEMPERATURES RECORD SHEET	TEMPERATURES RECORD SHEET #14 LETT2-Forth 1 Port 100			Unit: Run:	444	15 S	27X Dat	Date: 5/19 Technician(s):	19/92	R
								rage:	4	A			K	7
T/C	4	5	9	7		6	2	11	12	13	14	15	91	17
Time	Top	Side	Back	Kight Side	Bottom	Firebox	2nd Burn Catalytic	Room Temp	Tube Furnace	Sample Box	Impinger Out	C. Gas Box	C. Gas	SO2 Implinaer
-\=\	315	386	gee	378	408	404	699	나	1441	241	34	142	_	310
% % /%	160	374	331	368	404	159	643	거네	1441	١٣٥	34	1hC	35	360
<u>의</u>	275	353	333	350	700	578	563	73	1441	146	34	IhC	35	35
で え	704	336	324	334	347	550	543	73	1442	ान्ट	34	JHC	35	36
150	250	317	314	316	392	529	548	73	1441	243	34	146	35	36
18 P	243	299	305	398	382	508	527	72	lhhl	243	34	(hC		36
8/ 18/	233	385	398	283	373	490	523	72	1441	ካኮሮ	34	243		36
18 S	Joh	275	187	910	36 y	510	925	11	lhhi	245	34	Sho	35	3b
3 °	295	27/C	175	अ64	355	040	1109	7.1	Ihhl	246	34	9 hC	35	36
5/و أح	400	278	179	275	ગુમુદ	720	ા3ગ્રપ	72	Shhl	247	34	8hC	35	36
3/ 3/	中一	283	183	287	340	780	1353	73	8441	8hC	34	8hC	38	36
₩ \%	780	295	195			864	1378	73	8448	8hC	34	848	35	36
X	37693	3757	3050	3728	COPUL	(7736)	10102	870						
3 / (%)	536	311	भाट	326	330	988	०८५।	73	1448	8hC	34	8h8	35	36
6) (2)	508	328	2000	339	325	935	1193	14	1448	8hC	35	8hC	38	36
2/ 2/	08 h	343	234	353	324	1013	1185	74	8441	868	35	348	35	36
N٢		357	ठमठ	367	323	1046	1165	72	8441	348	35	848	35	36
M	1_	368	गुमुल	381	323	1090	1175	76	1448	248	35	8h8	35	36
28/5 28/5		374	255	395	325	1119	1178	79	1448	8hC	35	348	35	36
g/ g/	489	578	263	402	320	1178	1156	76	1448	348	35	348	35	36
3/2/	امرار	385	265	410	327	0181	1176	76	8441	348	35	870	35	36
2/2 2/2	450	393	263	413	324		1058	-	1448	248	35	8hC	35	36
Λ	_	395	256	비녀	333	1103	166	77	1448	348	35	348	35	36
100 N		397	348	4108	336	L891	936	78	1447	8hC	35	348	35	36
利思		392	334	197		1055	890	78.	1445	247	35	8hC	35	36
	5548	是	2025	LЛ	39403	(12839)	(13SIT)	910	, Y					
X	9307		0000	8337	8436	205697	13619	1780-L						

												Vanish Control of the		
			TEM RECO WST2	TEMPERATURES RECORD SHEET WST2-Form14 R	TEMPERATURES RECORD SHEET #14 WST2-FOUNT Rev1/88			Unit: Run: Page:	14206118 7	78	S 27X Date	Date: 5/19 Technician(s):	19/92 11: 30	1/2 275
T/C	4	2	9	7	æ	6	10	11	12	13	14	15	16 342,6 17	0 17
Time	Top	lert Side	Back	Right Side	Bottom	Firebox	2nd Burn Catalytic	Room Temp	Tube Furnace	Sample Box	Impinger Out	c. Gas Box	C. Gas Impinger	SO2
<u>3</u> ₹	335	379	328	389	343	C8 b	825	77	1442	7h2	35	248	_	36
3/3/3/	320	373	233	384	344	689	800	11	Chhl	74C	35	248	38	36
8 <u>/</u> 3	309	366	ZIT	317	346	616	111	7.1	1445	547	38	348	35	36
38 公	394	357	209	362	346	819	735	77	9441	247	35	8hC	35	36
VI	283	349	५०%	350	346	843	709	77	Shhl	247	35	8 hC	35	36
है। १८	गुर	344	200	342	344	813	693	77	Shhi	LhC	35	8hC	35	36
67 0051	7164	335	195	334	340	<i>LPT</i>	673	77	1444	247	35	348	35	36
87 ; (S)	257	329	192	324	337	773	bS1	77	ባր ከ	747	35	247	35	36
2 2 3	251	394	192	316	335	757	۳5 <i>9</i> ا	77	Lhhl	LhC	36	7 7 7	35	36
<u>S</u>	1. TO	316	<u></u>	311	332	744	147	76	1448	LhC	36	747	35	35
2) 20 20	338	310	195	302	328	733	ગ દ ગ	76	1448	247	36	747	38	36
写 以 以		308	195	56C	327	727	৮৯৭	76	8441	Lhe	36	247	38	36
X	33047	4030	記る	4090	(40108)	(9914)	(क्षित्रक्रे	(176)						
88/ 18/		305	195	293	324	713	とての	75	1447	Lhe	36	LhC	38	36
\$ (%)	232	305	196	580	323	697	519	75	8441	Lhe	36	7 1 1	38	36
	_	304	195	784	321	L89	800	75	1448	Lhe	36	2H7	35	36
VL		304	961	C8C	320	919	595	75	1448	Lኮሮ	36	ShC	38	36
18/ 18/		301	193	TLC	319	671	588	75	1448	8hC	36	8ስሮ	38	36
3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/3/		299	191	274	318	lo74	583	75	1447	8 hC	3 le	8hC	38	36
\$/ \$/		29 le	189	ELC	317	(062	577	75	1448	248	36	8ኮሮ	38	36
3/	و ج	293	186	267	315	673	512	75	1448	248	45	842	38	36
		ই	185	Stole	314	٦	570	75	1448	8/17	36	248	35	36
5	<u>्</u>		185	263	314	653	559	75	1448	842	36	248	38	36
	2227	1	1911	2767	3185	GL17	(5889Y)	7507						
		1011	4354	16857	7253	16991	143187	المار	AT S	THRT	342.6	\		410
	TH8381		15E01.	151947	156897	37260	(37937)	3451	S	407	252.8			
X	323	332	225	330	3417	-(810)	(825)	75)			-86.8-	l		

Site: EE	MC - West	, Kent,	WA 9803	2 Date	: 5 <u>/19/9</u> .	2 Analy	yte: <u>CO2</u>	(15-1)			
Source:	HAUGHS	S270	SEE18	S Run	:	7					
Zero Cyl	#: <u>T13</u>	2257	с	onc. <u>00.0</u> 9	5_CO2_	Cyl Pre	ess: <u>800</u>	psi			
			-				Date: 10)				
	_						ess: 900				
							Date: 10/3	1			
							SN: 4070	,			
)				
							Flowmete				
	Value = 2			4 -		<u> </u>					
EPA Cont	rol Limits	= <u>+</u> 2.	5% of 2!	5.0% CO ₂ =	<u> + 0.6</u> 2	25% CO2					
Pre Run	Audit: By	7:	BN	Tin	e: <u>10</u>	05	Temp: 74	o _F			
	•			Audit Resu	lts		<u> </u>				
Point #		ted Res		Act Meter	ual Res	sponse %	+ Conc. Difference	Δ			
Zero			00.0			1	,054	712,			
Span .	50.4				 	 	· · · · · · · · · · · · · · · · · · ·	-2,075			
Comments	•					•					
	-		·								
				·-··	·						
Post Run Audit: By: DK Time: 1430 Temp: 75 OF											
			Į	Audit Resu	lts						
Point #	Expec Meter	ted Res	ponse %	Act Meter	ual Res		+ Conc	4			
				00.0	MVD.	.054	Difference	.217			
Zero	00.0 50.4	.504	12.b	49.7	.497	12.314	286	-2.271			
Span		- 00		1 1 1 1		1,2,2,1		7			
Comments:											
+ Conc. T	Difference	= Act	% - Exp	(Std) %			·				
				Fyn & (nn							

+ Conc. Difference = Act % - Exp (Std) %
Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Site: EEMC -	- West,	Kent, V	WA 98032	Date:	5/19/92	Anal	yte: <u>02 (</u>]	15-2)
Source: HAL	IGHS S	270	Series	Run #:		7		
Zero Cyl #:	T 13:	2257	Co	nc. <u>00.0</u> %	02	Cyl Pro	ess: <u>800</u>	psi
Certified	d by:	LIQU	10 AI	<u>e</u>			Date: <u>10/7</u>	191
Span Cv1 #:	2900	14	Co	nc. 12.4 %	02	Cyl Pr	ess: <u>900</u>	psi
Certified	i bv:	MATH	HESON				Date: 10/3	1/91
Analyzer: N		eledyn	e	Model: 3	20 Ax		SN:_3746	5
Range: 0 -	25.0% 0	12	 An	alyzer Out	put:	0 - 1.	0	v.
							Flowmete:	
EDA Coon Mai	lua = 25	08 00						
EPA Control	Limits	= + 2.	5% of 25					
Pre Run Audi	<u>Lt</u> : By:		BN .	Time	<u>∍: _10</u>	15	Temp: 76	o _F
				udit Resu	lts		i Cong	
Point	Expect			Meter	lal kes	ponse	+ Conc. Difference	Δ ક
#	Meter			× O	201			
Zero	00.0	.000	00.0	0.3	1004	7.003		012
Span	12.4	.496	12.4	12,5	,497	12.513		1.398
Comments: '	reledyne	#2 <u>Cy</u>	1 % E	XD 8 A	<u>CT 8</u>	Adj t	<u>ο + Δ</u> §	
		 						
	-				· · · · · · · · · · · · · · · · · · ·		<u> </u>	
	7.1. D-		DK	Time	٠ ا ١	140	Temp.: 75	$\mathbf{o_{F}}$
Post kun Aud	are: P			udit Resu				
	73	ed Res			ual Res		+ Conc.	^
Point #	Meter	DVM	8	Meter	DVM	*	Difference	₹ Д
Zero	00.0	.000	00.0	00.0	,001	:079	-, 079	-,318
Span	12.4	1496	12.4	12.4	.494	12.497	.097	.781
	Teledyne	#2 Cy	1 % E	A gar	Ct %	Adj t	<u>ο + Δ %</u>	į
		-				. 		
		· -		7043) 9				

+ Conc. Difference = Act % - Exp (Std) %

Zero % Differece = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Exp % (ppm)

Site: EEM	iC - West,	Kent,	WA 98032	Date:	5/19/9	2 Anal	lyte: <u>CO</u>	(15-3)				
Source:	HAUGHS	S270	Seeie	S Run #	:	7						
Zero Cyl	#: <u>T13</u>	2257	Co	onc. <u>00.0</u> %	CO	Cyl Pr	ess: <u>800</u>	psi				
Certif	ied by: _	Liau	no An	R			Date: 10/	7/91				
Span Cyl	#: 2900	04	Co	nc. 4.96	CO	Cyl Pr	ess: <u>90</u>	<u>psi</u>				
Certif	ied by: _	MATH	ESON				Date: 10)	31/91				
Analyzer:	Make:	Horiba		Model: P	IR-200) .	SN: 40	8005				
Range: 0	- 10.0%	со	An	alyzer Ou	tput:_	0 - 1.	. 0	v.				
Flow: 1	.5 SCFH		Measu	red by:	Rotamet	ter: <u>X</u>	<u> Flowme</u>	ter:				
	Value = 1			09 60 - 1	0 250	70						
	ol Limits		_				·	No on				
Pre Run A	udit: By	*				720	Temp:	- CF				
Point	Expec	ted Res	nonse	udit Resu	ual Res	nonse	+ Conc.					
# -	Meter		8		DVM		Difference	e 🛆 %				
Zero	00.0	.000	00.0	00.0	1000	-,004	004]				
Span	49.6	.496	4.96	49.6	1496	5.049	.089	1.791				
Comments:		,			-							
							•					
Post Run Audit: By: DK Time: 1445 Temp.: 75 of												
Audit Results Point Expected Response Actual Response + Conc												
Point Expected Response Actual Response + Conc.												
#	Meter	DVM	8	Meter	DVM	ક્ર	Difference					
Zero	00.0	.000	00.0	00.0	.000	- 004	004	-044				
Span	49.6	. 496	4.96	49.2	.492	5.008	.048	1.969				
Comments:	·											
	·			<i>(</i> - <i>- - - - - - - - -</i>								
+ Conc. D Zero % Di		Act %	(ppm) -	Exp % (pp	<u>m)</u> X 10	0						
Coon a pi	ffaur		ull Scal		_ \	00						
Span % Di	rrerence	= ACT %	Exp % (m x r	.00						

Site: EEMC -	West,	Kent,	WA 98032	Date:	5/19/9:	Anal	lyte: <u>SO</u> 2	(15-4)
Source: HAU	GHS	S270	SER18	<u>S</u> Run #	:	7		
Zero Cyl #:	<u>T13:</u>	2257	Co	onc. <u>00.0</u> p	pm SO ₂	Cyl Pr	ess: <u>800</u>	psi
Certified	by: _	Liaui	O AIR	···	·		Date: 10	7/91
Span Cyl #:	AL2	892	Cc	nc.1232p	pm SO ₂	Cyl Pr	ess: <u>45</u>	<u>O</u> psi
Certified	by: _	LIQU	D AIR				Date: 9/2	4/91
Analyzer: Ma	ake:	Horiba		Model: P	IR-200	0	SN: 403	019
Range: 0 - 2	2500 p	pm SO2	Ar	nalyzer Ou	tput:_	0 - 1.	. 0	v.
Flow: 1.5 S	SCFH		Measu	red by:	Rotame	ter: <u> </u>	Flowmet	er:
EPA Span Valu				00 ppm SO ₂	= +62	.5 ppm	SO ₂	
Pre Run Audit	<u>:</u> By	:	BN	Time	e: <u>10</u>	00	Temp:	<u>5</u> _o _F
				udit Resu				
Point		ted Res	ponse	Act	ual Re	sponse	+ Conc.	Λ.
4 #	Meter	DVM	ppm	Meter			Difference	
Zero (0.0	.000	00.0	00.0	1000	3,440	3.440	,138
Span	19.3	.493	1232	49,5	1495	1288. 992	6.992	1568
Comments:				•				
					•			
Post Run Audi	lt: B	y:	DK	Time	e: <u>/</u>	125		5o _F
				udit Resu				
Point M	Expec Meter	ted Res		Act:	DVM		+ Conc. Difference	₽ ₹
	0.0	.000	ppm 00.0	00.0	.000	3.440	3.440	.138
	19.3	.493	1232	49.3	.493	1234.	2.000	.162
Comments:								

Span % Difference = Act % (ppm) - Exp % (ppm) X 100
Exp % (ppm)

⁺ Conc. Difference = Act ppm - Exp (Std) ppm

Zero % Difference = Act % (ppm) - Exp % (ppm) X 100

Full Scale Value

Span % Difference = Act % (ppm) - Exp % (ppm) X 100

Run:

Date: 5/19/92

Technicians: BU TK PK TS

WST6-Form3-Rev11/89

QUALITY CHECKS WOODSTOVE DATA SHEET #16

T/C #6: 71.6 °F; T/C #7: 70.5 °F; T/C #8: 71.3 °F T/C #9: 71.9 °F; T/C #10: 69.6 °F; T/C #11: 69.4 °F T/C #12: 72.3 °F; T/C #13: 70.5 °F; T/C #14: 70.8 °F T/C #15: 71.9 °F; T/C #16: 69.0 °F; T/C #17: 67.0 °F T/C #18: 73.3 °F; T/C #19: °F; T/C #20: °F T/C #21: °F; T/C #22: °F; T/C #23: °F T/C #24: °F; T/C #25: °F; T/C #26: °F Comments: Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (0°F): 3 °F to: 0°F Zero (0°F): 6°F 70.0 °F Span (2000°F): 199.9 °F to: 2000.0 °F (2000°F): 2003.0 °F 150 (Allowable 7 Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate 7 Difference) Thermocouple Readout Pretest Linearity Check °F; 400°F = 399.0 °F;	Ambient = Tr:	69.4	o _F	T/C#30:_	71.0	
T/C #6: 716 oF; T/C #7: 70.5 oF; T/C #8: 71/3 oF T/C #9: 71/4 oF; T/C #10: 696 oF; T/C #11: 61.4 oF T/C #12: 72.3 oF; T/C #13: 70.5 oF; T/C #14: 70.8 oF T/C #15: 71.4 oF; T/C #16: 64.0 oF; T/C #17: 67.0 oF T/C #18: 73.3 oF; T/C #19: oF; T/C #20: oF T/C #18: 73.3 oF; T/C #19: oF; T/C #20: oF T/C #21: oF; T/C #22: oF; T/C #23: oF T/C #24: oF; T/C #25: oF; T/C #26: oF T/C #24: oF; T/C #25: oF; T/C #26: oF Comments: Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (0°F): 3 oF to: oF Zero (0°F): 1/0 #26: oF Comments: Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (10°F): 1/10 oF; T/C #26: oF T/C #26: oF T/C #26: oF T/C #27: oF T/C #27: oF T/C #28: 0F T/C #27: oF T/C #28: 0F T/C #28: OF T/C #28: OF T/C #28: OF T/C #28: OF T/C #28: OF T/C #28: OF T/C #28: OF T/C #18: 70.8 oF	Thermocouple Che	ck (at ambient):	T/C#1:	<u>/, / °F; T</u>	/c#2: <u>· 7/,3</u>	o
T/C #9: 71.4 of; T/C #10: 67.6 of; T/C #11: 61.4 of T/C #12: 72.3 of; T/C #13: 70.5 of; T/C #14: 70.8 of T/C #15: 71.4 of; T/C #16: 64.0 of; T/C #17: 67.0 of T/C #18: 73.3 of; T/C #19: of; T/C #20: of T/C #21: of; T/C #22: of; T/C #23: of T/C #24: of; T/C #25: of; T/C #26: of T/C #24: of; T/C #25: of; T/C #26: of T/C #24: of; T/C #25: of; T/C #26: of T/C #24: of; T/C #25: of; T/C #26: of T/C #24: of; T/C #25: of; T/C #26: of Gomments: Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (0°F): 10 of to: 0 of Zero (0°F): 10 of (2000°F): 13 of to: 2000.0 of (2000°F): 2003.0 of (Allowable Z Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check 0°F = 0 of; 200°F = 201.8 of; 400°F = 399.0 of; 600°F = 00.2 of; 800°F = 801.3 of; 1000°F = 1000.3 of; 1200°F = 1400°F = 1398.9 of; 1600°F = 1599.5 of Tracer Gas (S02) Injection Train Leak Check: Pre Post Tracer Gas (S02) Injection Train Leak Check: Pre Post Tracer Gas (S02) Analyzer Train Leak Check: Pre Post Draft (Static) Guage Zero Check: Pre Post Post (Wt, #'s): 318.6 38.6 = 10 Post (Wt, #'s): 317.0 307.0 = 10.0	T/C #3: 71.3	_o _F ; T/C #4	:	'; T/	c #5: 7/16	oF
T/C #12: 72.3 oF; T/C #13: 70.5 oF; T/C #14: 70.R oF T/C #15: 7/.4 oF; T/C #16: 44.0 oF; T/C #17: 67.0 oF T/C #18: 73.3 oF; T/C #19: oF; T/C #20: oF T/C #21: oF; T/C #22: oF; T/C #23: oF T/C #24: oF; T/C #25: oF; T/C #26: oF T/C #24: oF; T/C #25: oF; T/C #26: oF Gomments: Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero oF to: oF Zero (0°F): oF Zero oF Zero (0°F): oF Zero (0°F): oF Zero (0°F): oF Zero (0°F): oF	T/C #6: 7/16	o _F ; T/C #7	: <u>70.5</u> °I	'; T/	c #8: <u>7//3</u>	o _F
T/C #15: 71.4 of; T/C #16: 64.0 of; T/C #17: 67.0 of T/C #18: 73.3 of; T/C #19: of; T/C #20: of T/C #21: of; T/C #22: of; T/C #23: of T/C #24: of; T/C #25: of; T/C #26: of T/C #24: of; T/C #25: of; T/C #26: of Comments: Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (0°F): 3 of to: of Zero (0°F): 0 of Zero (0°F): 0 of Span (2000°F): 999.9 of to: 2000.0 of (2000°F): 2003.0 of 150 (Allowable % Difference = 1.5%. Use formulas on Woodstove Data Sheet #15 to calculate % Difference) Thermocouple Readout Pretest Linearity Check 0°F = of; 200°F = 201.8 of; 400°F = 399.0 of; 600°F = of; 200°F = 201.8 of; 400°F = 1000.3 of; 1200°F = of; 1400°F = 1398.9 of; 1600°F = 1000.3 of; 1200°F = 199.0 of; 1400°F = 1398.9 of; 1600°F = 1599.5 of Fracer Gas (SO2) Injection Train Leak Check: Pre Post Combustion Gas (CO2,02,CO) Train Leak Check: Pre Post Tracer Gas (SO2) Analyzer Train Leak Check: Pre Post Draft (Static) Guage Zero Check: Pre Post Draft (Static) Guage Zero Check: Pre Post Fracer Gas (SO2) Analyzer Train Leak Check: Pre Post Draft (Static) Guage Zero Check: Pre Post Post (Wt, #'s): 317.0 307.0 = 10.0	T/C #9: 71.4	o _F ;	0: <u>69.6</u>	F; T/C	#11: 69.4	of
T/C #18: 73.3 of; T/C #19: of; T/C #20: of T/C #21: of; T/C #22: of; T/C #23: of T/C #24: of; T/C #25: of; T/C #26: of T/C #24: of; T/C #25: of; T/C #26: of Comments: Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (0°F): 3 of to: of Post Test Check of Z Difference (0°F): of Zero (0°F): of Jero (0°F): of Jero (0°F): of Jero (2000°F):	T/c #12: 72.3	o _F ; T/C #1	3: <u>70,5</u>	F; T/C	#14: <u>70.8</u>	o _F
T/C #21:	T/C #15: 71.4	or; T/C #1	6: <u>840</u>	F; T/C	#17: <u>67.0</u>	o _F
T/C #24:	T/c #18: 73.3	o _F ; T/C #1	9:9	F; T/C	#20:	of
Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (2007): 3	T/C #21:	o _F ; T/C #2:	2:	F; T/C	#23:	o _F
Thermocouple Readout: Pretest Zero/Span Check and Calibration: Zero (O°F): 3	T/C #24:	oF; T/C #2:	5 : 0	F; T/C	#26:	o _F
Pretest Zero/Span Check and Calibration: Zero (10°F):	Comments:					
Pretest Zero/Span Check and Calibration: Zero (10°F):						
Pretest Zero/Span Check and Calibration: Zero (0°F):		·				
Pretest Zero/Span Check and Calibration: Zero (0°F): 3 °F to: 0 °F Zero (0°F): 6 °F Zero (0°F): 7 °F Zero (
Combustion Gas (CO ₂ ,O ₂ ,CO) Train Leak Check: Pre Post Tracer Gas (SO ₂) Analyzer Train Leak Check: Pre Post Draft (Static) Guage Zero Check: Pre Post Scale Check Pre (Wt, #'s): 318.6-308.6=10 Post (Wt, #'s): 317.0 307.0=10.0	Span (2000°F): 1999.9 (Allowable % Dif #15 to calculate Thermocouple Rea 0°F = 0 600°F = 601.2 1200°F = 1/98.0	Adj of to: 2000.00 ference = 1.5%. % Difference) dout Pretest Line of; 200°F = 20	Span (2000° Use formula earity Check (20/,8 °F; (30/,3 °F;	F): 2003.0 s on Wood: 400°F = 1000°F =	of <u>/150</u> stove Data \$ 399.0 0 /000,3	Sheet OF;
	Combustion Gas (co ₂ ,o ₂ ,co) Train	Leak Check:	Pre /	Post /	
	Draft (Static) G	Analyzer Train I uage Zero Check:	eak Check:	Pre	Post	
				•	-	

Next Ir	Make inspec	3	
Inspection Due	Make Weight: Inspected By This certifies t when tested or	EEM	
n Due	hands		
	spected By Rewark 1 Quelies SIN Old 409 This certifies that the above scale met all State Highway Weighing Requirement tested on the above date with 875. Ibs. of test wits		
	(scale		2
	met all State		SCALE COMPANY
	SIN State HI	E .	
	Dateghway Welgibs. c	THE STATE OF THE S	OMP
Date b	yp9		ANY,
6-20	- 3.0-1 ng Requi		NC.
87	77 rements		

Hall Book Ochbeston

Next Inspection Due	150 Lbs 150	Load heading	This certifies that	Inspected By Ken Jackson	Make Weigh TROKIX	coEEMC	(Je	Phil	となっていていています。
	3co Lbs 3co	200 Lbs 200	크용	chion	NS SIN	At:	Certificate of Inspection	hillips SCALE COMPANY, INC.	
7-2	25.7 Per 72.7 Per 73.	-	Veighing Requirements tte.	Date /- シータス	016409	KENT WA.	aecting.	MPANY, INC.	

V-15-00

Next Inspection Due Inspected By Ken he Make_ 150 lbs 150 TED TPS TED Load 50 lbs 50 This certifies that the above listed device met all Weighing Requirements WeighTRONIX - LUI-110 Reading EEMC issicate of Inspection lips SCALE COMPANY, INC. Kaon - Philappiscale Co. Date _ when tested on the above date. कुट कि उटि उट्ट की उटि 300 lbs 300 Load Reading SIN 604310 KenT WA. 350 lbs 350 25 rps 485 Load 700 1 ps 400 500 th 500 01-3-97 Reading

State of Washington
Department of Agriculture
Weights & Measures Section
406 Gen. Admin. Bldg., AX-41
Olympia. WA 98504-0641

CERTIFICATE OF ACCURACY

Olympia, WA 98504-0641		(2nd copy)		Page of
BWILLED BA COUNTA OL	8/20/90	CODE NO. ⁰ 42923	SET B	CERTIFICATE NO.

TO:

Phillips Scale Co. Attn: Ken Jackson 934 Elliott Ave. W Seattle WA 98119

IMPORTANT

The items described below have been compared with the Standards of the State of Washington in accordance with National Institution of Standards and Technology recommendations and requirements. The comparisons will result in appropriate action to insure tolerance compliance.

											CRI				,	•		, ,	_,			
	MASS			ER				*	100	KON See State	RPASS	MON		rux rux	DUPOIS						CLASS	NOMINAL VALUE OR RANGE
I. D. NUMBER	NO. OF ITEMS IN SET	NO. OF LINETTEMS	BLOCK	2	CUBE	KNOB	GRE	HANGE			RPACS	ALUM	CLASS	TANAT	AVOIR	METRIC	TROY	GRAIN	CARAT	EGG		
Foledo s/n01505 s/n20505	7 20	1						,	1	X_					_	_					F	50#
s/n2U5U5	/		_	_				4	1	4	-	1	_				_		_			
s/n21505	7 1	1				_		1		X	_	1	_	L			_				F	2.5#
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Principal State Metrologist (Signature)	Mannel Marc	11-19-90
rincipal state Metrologist (Signature)	some and and a great training training to the action	***************************************
ACID 2427 B. (Pay 480)		

DENAMINATION VOLUME DAIRY AND FOOD DIVISION WEIGHTS AND MEASURES SECTION NBS Sets A & B CERTIFICATE NO. Certificate of Accuracy state of washington Test #42923 DATE 7/27/89 CODE NO. SUBMITTED BY COUNTY OF FOR GOVERNMENTAL AGENCY/FIRM Phillips Scale 934 Elliott Ave. W., Seattle, WA 98119 THE ITEMS. DESCRIBED BELOW HAVE BEEN COMPARED WITH THE STANDARDS OF THE STATE OF WASHINGTON IN ACCORDANCE WITH NATIONAL BUREAU OF STANDARDS RECOMMENDATIONS AND REQUIREMENTS. THE COMPARISONS RESULT IN APPROPRIATE ACTION TO INSURE TOLERANCE COMPLIANCE. DESCRIPTION MASS NOMINAL NO. OF LINE NO. OF ITEMS CLASS VALUE OR HANGE 1. D. NO. ITEMS IN SET SERVICE TRUCK | # | 5057-01 | THRU (20) Cast Iron Test 50 lbs. Cast IroniTest SERVICE TRUCK # 5057-21 25 lbs. (1) Ride Lake SERVICE TRUCK # 5057 10 mg - 5 kg - 22 pcs Nt Ride Lake SERVICE TRUCK # 5057 .001 lb - 5 li 32 pts REMARKS: INSPECTED BY lames H. Cammel, Metrologist AGR 020-24378 SEE ATTACHED DATA

QUALITY CONTROL SERVICES

SALES AND SERVICE OF ANALYTICAL & PRECISION BALANCES AND SCALE

CERTIFICATE OF CALIBRATION THE FOLLOWING BALANCES HAVE BEEN SERVICED BY Q.C. SERVICES

SERVICE CONSISTS OF ACCURACY TESTS, CLEANING, LUBRICATION, COMPLETE CALIBRATION AND ADJUSTING TO ORIGINAL MANUFACTURERS' SPECIFICATIONS.

ALL TEST WEIGHTS ARE CLASS "S", OR BETTER, AND ARE TRACEABLE TO WEIGHTS CERTIFIED BY THE NATIONAL BUREAU OF STANDARDS CERTIFICATES #737/233864 AND #737/228509.

DATE OF SERVICE	TYPE	MAKE	SERIAL NO.	TECHNICIAN
1-20-88	\$ 170 S	SART	39010004	((H)).

QUALITY CONTROL SERVICES

SALES AND SERVICE OF ANALYTICAL & PRECISION BALANCES AND SCALES

T., ,		/ICE AND CALIBRATION	1-20-89
CUSTOMER FEMC		DATE AMBIENT TEM	00
ADDRESS $\frac{1315}{}$	5. CEVIMAL UNI	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
KENT ICH.	48037	Make SHUT Model AL	Astro- Spring
Function Tested	As Found	Manufacturer's Tolerance	After Service
Cornerioad	+/6 M6	t/- ,7m6	+/- Om/
Optical Range	_		
Optical Range with Ta	ire		
Linearity or 50-50	+/- , Z hu6-		+/- Muf.
Hysterisis	+/ 2146	+1 Oice	+/· . Onch
Calibration	4111N6	+/= , z inc	+/- , Alle
Individual Wt. Readings	As Found	Manufacturer's Tolerance	After Service
30 m 6	79.9 m.6	7-2m6	t/ i mb
	A) 1 m6 .	4214.	+/ 0 M/-
500 mb	5000 m6	+/Zm6	+/- 0 12/
	1.000 Z EM	+/zm.	+1 D mb
1 6111		+/ Z.m.G.	+10mE
10 C iii	10.0001 GW	+/Zuh.6	11 0 lu6
100 BM	100.00016111	7- 200	1
brotion is tracpable to	n the National Reference	used as references for this case Standards maintained by the re 737/233864 and 737/228509.	Mational Dates of
Manufacturer	Serial Number	Date of Last Calibration	Next Calibration 1/88 -
Rice Lake Rice Lake	5735 5736	1/5/87 1/5/87	1/88
Rice Lake	5737	1/5/87	1/88
Rice Lake	6023 /	3/3/87 3/3/87	1/88 3/88
See attached sérvice/r	naintenance procedure	for complete description of ser	vice and calibration.
Technician:	(1/1/2)	Date: 1/ You All SEERING	

WEIGHT CALIBRATION CERTIFICATE

Purchase Order Number

00247

mpany ~ddress

Q C SERVICES P.O. BOX 14831

City & State

97214 PORTLAND, OR

Report Number

0465

Density

7.95 g/cm³

Temperature

22.1°C

RH

55%

mmHg

734.8 Not Corrected

Date

1-5-87

Description Of Weights

S/N 5735, Class "S", 1mg-100g

Tested With Weights Certified By NBS Certificate Number 737/233864

Calibrated By Deb Heldstab

Weighing Design double substitution

Weights Used: 82104

	NOMIN MASS V		AS FOUND vs. 8.0 g/cm ³	CORREC AM vs. 8.0 g/cm ²	TION IN MG AM vs. 8.3909 g/cm³	UNCERTAINTY MILLIGRAMS	TOLERANCE	TRU MA:
	1	mg		0.0025	0.0025	0.007	0.014	0.00
	2	mg		0.0050	0.0050	0.0 06	0.014	0.00
	2		w/dot	0.0040	0.0040	0.006	0.014	0.1
	5	mg		0.0055	0.0054	0.006	0.014	0.00
	10	mg		0.0055	0.0054	0.010	0.014	0.00
	20	mg	•	0.0005	0.0004	0.006	0.014	0.00
(20	мg	w/dot	0.0045	0.0044	.0.006 °	0.014	0.00
`	50	mg	·	0.0020	0.0016	0.006	0.014	0.00
	100	mg		0.0054	0.0047	0.007	0.025	0.0
	200	mg		0.0128	0.0114	0.007	0.025	0.0
	200		w/dot	0.0053	0.0039	0.007	0.025	0.0
	500	mg		-0.0049	-0.0084	0.008	0.025	-O. t
	1,	g		0.0195	0.0125	0.010	0.054	0.0
	2	g		0.0036	-0.0104	0.011	0.054	0.00
	2		/dot	0.0201	0.0061	0.011	0.054	0.00
	5	g		0.0242	0.0107	0.016	0.054	0.0
	10	ġ		0.0200	-0.0499	0.023	0.074	0.00
		ġ		0.0249	-0.1149	0.023	0.074	0.0
	20		ı/dot⊢	0.0288	-0.1110	0.023	0.074	0.0
		g	•	0.0645	-0.2875	0.105	0.12	0.4
	100	g		0.1727	-0.5262	0.115	0.25	0.2

Mettler M5 Balance: lmg - 20g

50g - 100g Mettler H51AR Balance:

Prepared By:

RICE LAKE WEIGHING SYSTEMS

DIVISION OF RICE LAKE BEARING INC.

Metrology Lab 230 West Coleman P.O. Box 272 Rice Lake, WI 54868 715-234-9171 Dated

THE WEIGHING S

Richard Calkins

Metrologist

Weight Division Supervisor

TRACEABLE CERTIFICATE

Sold To Q C SERVICES

P.O. BOX 14831

PORTLAND, OR 97214

Ship To Q C SERVICES

516 SE MORRISON SUITE 213

PORTLAND, OR 97214

Purchase Order Number

DESCRIPTION

Traceable Certificate Number 2076

Traceable To NBS Through NBS Report Number 737/233864

.

NOMINAL VS 8.0g/cm³
VALUE AS FOUND

TOLERANCE

Hational Bursey

THE WEIGHING S

1 only 1 kg Weig	ht	+2.4 mg
1 only 1 kg Weig		6 mg
1 only 2 kg Weig		+18 mg
1 only 5 kg Weig		+34 mg
1 only 5 kg Weig		+32 mg
Serial No.: 602		

Temperature: 22.2°C

RH: 55%

mmHg: 743.6 Not Corrected

Date: 3-3-87

Balances Used: Mettler H315 - 1 kg

Voland J3000 - 2 kg

Voland HCE25 - 5 kg

Last Date STD were Calibrated: 11-84

Last Date Working STD were Calibrated: 9-16-86

Tolerance Tested By: Russ Schnacky

Comply to MIL STD 45662

Prepared By:

RICE LAKE WEIGHING SYSTEMS

DIVISION OF RICE LAKE BEARING INC.

Metrology Lab 230 West Coleman P.O. Box 272 Rice Lake, WI 54868 715-234-9171 Dated

3-3-8

Richard Calkins

Metrologist

Weight Division Supervisor

CUSTOMER: EEMC 1315 S. Central-Unit C Kent, Wa. 98032 Attn: Ben Myron/Jerry Stoddard CERTIFICATION

QUALITY CONTROL SERVICES

LABORATORY AND METROLOGY EQUIPMENT: SALES AND SERVICE

CERTIFICATE OF CALIBRATION

THE FOLLOWING BALANCES HAVE BEEN SERVICED & CALIBRATED

BY

QUALITY CONTROL SERVICES

SERVICE CONSISTS OF ACCURACY TESTS, CLEANING, LUBRICATION, COMPLETE CALIBRA-TION AND ADJUSTING TO ORIGINAL MANUFACTURERS' SPECIFICATIONS.

One or more of the following standards were used as references for this calibration. Their calibration is traceable to the National Reference Standards maintained by the National Institute of Standards and Technology. Our N.I.S.T. Certificate Reference Number is 523/240932.

Manufacturer	Description	Serial No.	Date of Last Calibration	Next Calibration Due
Rice Lake Rice Lake Rice Lake	1kg-5kg 1mg-100g 2kg-5g	C4488 A45 3275	6/13/91 7/16/91 7/22/91	6/92 7/92 7/92
DATE OF SERVICE	TYPE	MAKE	SERIAL NO.	TECHNICIAN
1-9-92	Al20S	Sartorius	37010004	L. Lawrence
•	G4000D	Ohaus	4163	11
			-	
	<u></u>			
	<u></u>		****	
· · · · · · · · · · · · · · · · · · ·		-		
·		 		

QUALITY CONTROL SERVICES

LABORATORY AND METROLOGY EQUIPMENT: SALES AND SERVICE

)	•		<u>R</u>	EPORT (OF SERV	ICE AND CALIBRAT	<u>ION</u>	
	CUSTOMER	EEn	nc.				Ma	ake Sartorius
	ADDRESS	1315	3	Centr	0/	Unit C		ndel A/205
		Kent	11)+		032		 	
	Date of This	7 1	-/ 00			t Service <u>7-22-91</u>	. 	Service Due 7/92
	Function Teste	<u>ed</u>	As	Found		Manufacturer's To	lerance	After Service
	Cornerload			±0.	2mg	±0,2 mg		± 0.0mg
	Optical Range			MA		- N/A		
	Optical Range	with Tare						NI
	Linearity or 50	D 50		±0.0) ma	± 0.2mg		±0.0mg
	Hysteresis			±0.1	ma	±0.1mg		±0.1mg
	Calibration			±0,	4ma	±0.1mg		± Oilma
					<u> </u>	<u> </u>		
	Individual Wt.	Readings		Found		Manufacturer's Tol	erance	After Service
		g _	-0	1.4mg		=0.1mg		= 0.1mg
	<u>50</u>	ğ	~ (0,2mg		±0.1mg	[±0.1mg
(්_ <i></i>	Og .	-0).Ing		+ Oilma		±0.0mg
	10.	σ 3	- ().lmg		+ Oilma		±0,0mg
Same.	59	()	<u>+</u>	0.1mg		+ Dilma		±0,0 mg
		ſ		đ		0		0
	OTHER INFOR	MATION_A	ND C	OMMEN	S PERT	AINING TO THIS SEF	RVICE AI	ND CALIBRATION:
	Ambient Temp	Kel	Am	bient		Other Comments:		
	Balance Locati	on//	Yok.					•
	Contact Person	7	1811	Stod	ine			
			1	114.00				
	INFORMATION	ON STAN	DARE	S USED	IN THIS	SERVICE AND CAL	IBRATIO	V:
		eable to th	e Nat	ional Ref	ference S	ed as references for Standards maintained ate Reference Numbe	by the N	lational institute of
	Manufacturer	Descript	ion	Serial N	lumber	Date of Last Calib	ration	Next Calibration Due
	Rice Lake	1mg - 5	kg	. 776	4	1/9/89		1/94
1								
1					Λ			
)	TEO 15 1107 5 5 1	<i></i>	J.		//	DATE: /-	9-92	2
•	TECHNICIAN: _	100	CENT			<i></i>		
	516 S.Ę. M	OPTRISON, SI	UITĘ 2	13/ / 6 P.C	D. BOX 148	331 • PORTLAND, OR	EGON 9721	14 • (503) 236-2712

QUALITY CONTROL SERVICES

LABORATORY AND METROLOGY EQUIPMENT: SALES AND SERVICE

);			REF	ORT	OF SERV	ICE AND CALIBRAT	ION	
	CUSTOMER	EEC	nC				Mai	ke Ohaus
	ADDRESS	1315	5 ('e	entre	2/ 6	Unit C	Mo	del <i>640</i> 00 D
		Kent	. USA		8032		S/N	4/63
	Date of This	Service -	9-92	Dat	e of Las	t Service <u>7-22-9</u>	/ Next	Service Due 7/92
	Function Tests	ed	As Fo	ound		Manufacturer's Tol	erance	After Service
	Cornerioad	_		±0.	<u>2 a</u>	± 0.2	<u> </u>	±0.1q
	Optical Range			N/A	0	11/4		- 11/A
	Optical Range	with Tare				<u></u>		
	Linearity or 5	0-50	-	-01	9	I O, lg		±0.1g
	Hysteresis			<u> ±0.</u>	<u> </u>	± 0.19		±0.1g
	Calibration	,	<u>+0</u>	105g	9+0,49	±0.01g fo.1	9	±0.01g/±0.1g
	Individual Wt.	Readings	As Fo	und	- 	Manufacturer's Tol	erance I	After Service
	니	1a		49		± 0./a	Title the court of	± O, la
	2	A CO		20		± 0.1g		± 0.10
		VS	,	10		± 0.19		± 0.14
1	30	04		099	÷ .	± 0.0/a		± 0.0%
1	20	700		0%		± 0.0/a		± 0.0/a
	10	N	+ 0	0(4		± 0.0%		± 0.0%
		ð	L-/	9	-	ſ		f
	OTHER INFOR	MATION A	ND CO	MMEN	TS PERTA	AINING TO THIS SEF	IVICE AN	ID CALIBRATION:
	Ambient Temp	Lab	· Um	bre	<u>t</u>	Other Comments:	Lab	has Vibrations
	Balance Locati	ion <u>Upp</u>	er. L	ab_	-77- 7	10	1000 100	g, 10g, + /g place
	Contact Person	Je	ry	Stode	lard	a	lecima!	starting to fade
	INFORMATION	ON STAN	DARDS	USED	IN THIS	SERVICE AND CAL	BRATION	<u>'</u>
	One or more of	of the follo	wing sta	indards	were us	ed as references for	this calib	oration. Their cali-
	bration is trac	eable to th	e Natio	nal Re	ference S	standards maintained ate Reference Numb	by the N	ational institute of
	Manufacturer	Descript			Number	Date of Last Calib		Next Calibration Due
	Rice Lake	1mg - 5		776		1/9/89		1/94
		9	9			., .,	·	
ĺ								
•		1		/2				
)	TECHNICIAN:	Tandon	/ La) VKOMS	10	DATE: /- 9	7-92	
	-	/1000				31 • PORTLAND, ORE		4 • (503) 236-2712

WOODSTOVE DATA SHEET #33

		Therm	ocouple Cal	<u>i bra</u>	tion Recor	<u>d</u>	
TO		Ice Water	Boiling	TC		Ice Water	Boiling
#_	Location	Bath (OF)	Water (OF)	#	Location	Bath (OF)	<u>Water (^OF)</u>
1_	Wet Bulb	304	211.7	21		····	
2	Dry Bulb	3g.5	211.6	22	····		
3	Stack	39.7	B11.9	<u>23</u>			
4	Stove Top	39.5	211.6	24			
5_	<u>Left Side</u>	3.9.7	2115	<u>25</u>		-	
<u>6</u>	Back	32.4	B116	26			
7_	Right Side	32.3	2114	<u>27</u>			
<u>8</u>	Bottom	39,5	211.5	28			
9	Firebox	39.2	211.8	29	Oven ·	39.4	211.7
	2nd Burn			<u>30</u>	N/A-Calib	rator	
10	Catalytic	3D,H	Q11:7:	31			
<u>11</u>	Room	39,3	<u>a11.3</u>	32			
12	Tube Furnac	:e 326	B11.5	<u>33</u>			
<u>13</u>	Sample Box	325	B11.8	34			
14	Impinger Ou	it 395	2114	<u>35</u>	Rear Top		
<u>15</u>	C Gas Box	39.6	216	<u>36</u>	Reat L Sid	<u>ie</u>	
<u>16</u>	C Gas Out	<u> 399</u>	2115	<u>37</u>	Rear R Sid	ie	
<u>17</u>	SO ₂ Gas Out	39.3	811.4	<u>38</u>	Rear Firet	oo x	
18	Extra			<u>39</u>	Rear 2nd/c	at	
19	Extra			40			
20	Extra						
	• • • • • • • • • • • • • • • • • • •						

Thermocouples checked against	
Reference Thermometer #: FISHER#	<u> 1183454 </u>
Ice Water Bath $O^{\circ}C = 3A^{\circ}F$	
Boiling Water 100°C = 213°F	of
Room Temp <u>68</u>	
B.P. 30.12	"Hg
Data: 1/2/92 Toobarder \$	AN /BN

KESSLER INSTRUMENTS, INC.

CALIBRATION

SERVICES



HYDROMETERS

MAILING ADDRESS. POST OFFICE BOX 640 WESTBURY, NEW YORK 11590 516-334-4083 FAX 516-334-2689

TESTING EQUIPMENT

PLANT ADDRESS ONE-SIXTY HICKS STREET WESTBURY, LONG ISLAND **NEW YORK 11590**

CERTIFICATE OF CALIBRATION

This is to certify that the instrument listed below has been certified in our calibration laboratory using the most sensitive constant temperature equipment available. This calibration has been performed against National Institute for Standards and Technology (formerly NES) certified master instruments in accordance with the procedures outlined by ASTM E77-89 and NBS (NIST) Monograph 150.

TESTED FOR: FISHER

THERMOMETER CAT#15041B

15041B

RANGE: -1/101C

DIVISIONS: .1 IMMERSION: TOTAL

INSTRUMENT SERIAL NUMBER 9123454

DATE CERTIFIED: 04-04-1991

MARKED: FISHER

POINT(S) TESTED	READING OF THIS INSTRUMENT	CORRECTION
0.000	0.000	0.000
10.00C	10.00C	0.000
20.000	20.05C	-0.05C
30.00C	29.980	0.020
40_00C	40.00C	0.000
50.00C	50.00C	0.000
60.000	60.00C	0.000
70.00C	70.03C	-0.03C
80_00C	80.01C	-0.01C
90.00C	90.000	0.000
100.08C	99.98C	0.02C

ESTIMATED UNCERTAINTIES IN THE ABOVE CORRECTIONS DO NOT EXCEED 0.030 FOR A DISCUSSION OF ACCURACIES ATTAINABLE WITH SUCH THERMOMETERS SEE NBS (NIST) MONOGRAPH 150, LIQUID-IN-GLASS THERMOMETRY

All temperatures in this report are based on the International Practical Temperature Scale of 1968

SERIAL AND TEST NUMBERS OF NATIONAL INSTITUTE OF STANDARDS CERTIFIED INSTRUMENTS REFERENCED IN CERTIFICATION OF THE INSTRUMENT LISTED ABOVE:

769543,217368

P14452,176240

P14452,176240

M44165,176240

M44165,176240

791544,220391

Q.A.MANAGER: J. KELLY CALIBRATION TECHNICIAN: FRANK BURGHARDT

KESSLER INSTRUMENTS, INC.

J. Jeff Kélly

Quality/Assurance Manager

JK/ak

TEST NUMBER 91 843

DATE COMPLETED:04-04-1991

KESSLER INSTRUMENTS, INC.

CALIBRATION

SERVICES





HYDROMETERS

MAILING ADDRESS. POST OFFICE BOX 640 WESTBURY, NEW YORK 11590 516-334-4063 FAX 516-334-2689

TESTING EQUIPMENT

PLANT ADDRESS ONE-SIXTY HICKS STREET. WESTBURY, LONG ISLAND **NEW YORK 11590**

CERTIFICATE OF CALIBRATION

This is to certify that the instrument listed below has been certified in our calibration laboratory using the most sensitive constant temperature equipment available. This calibration has been performed against National Institute for Standards and Technology (formerly NBS) certified master instruments in accordance with the procedures outlined by ASTM E77-89 and NBS (NIST) Monograph 150.

TESTED FOR: ENERGY ENVRMNTL

THERMOMETER CAT#2064

JENA

RANGE: -10/510C DIVISIONS: 2 DEG

IMMERSION: 76MM

INSTRUMENT SERIAL NUMBER 9164606

DATE CERTIFIED: 08-08-1991

MARKED: KESSLER

READING OF THIS INSTRUMENT

CORRECTION

0.00

POINT(S) TESTED

-0.2C

0.20

100.0C 410.0C

100.0C 409.2C 0.00 0.80

THE ABOVE READINGS WERE MADE UNDER 10X MAGNIFICATION AND RESOLVED TO THE NEAREST

ESTIMATED UNCERTAINTIES IN THE ABOVE CORRECTIONS DO NOT EXCEED

0.20

FOR A DISCUSSION OF ACCURACIES ATTAINABLE WITH SUCH THERMOMETERS SEE NBS (NIST) MONOGRAPH 150, LIQUID-IN-GLASS THERMOMETRY

All temperatures in this report are based on the International Practical Temperature Scale of 1968

THIS THERMOMETER WAS TESTED IN A CLOSED TOP, ELECTRICALLY HEATED, LIQUID BATH AT AN IMMERSION OF 76MM THE TEMPERATURE OF THE ROOM WAS APPROXIMATELY 25 DEGREES C (77 DEG F). IF THE THERMOMETER IS USED UNDER CONDITIONS WHICH WOULD CAUSE THE AVERAGE TEMPERATURE OF THE EMERGENT LIQUID COLUMN TO DIFFER MARKEDLY FROM THAT PREVAILING IN THE TEST, APPRECIABLE DIFFERENCES IN THE INDICATIONS OF THE THERMOMETER WOULD RESULT.

SERIAL AND TEST NUMBERS OF NATIONAL INSTITUTE OF STANDARDS CERTIFIED INSTRUMENTS REFERENCED IN CERTIFICATION OF THE INSTRUMENT LISTED ABOVE:

769543,217368

788600,219606

769543,217368

CALIBRATION TECHNICIAN: FRANK BURGHARDT Q.A.MANAGER: J. KELLY

KESSLER INSTRUMENTS, INC.

J. Jeff Kelly

Quality Assumence Manager

JK/ak

TEST NUMBER 91 1947

DATE COMPLETED: 08-08-1991

COMMON TYPES OF THERMOMETERS AND FACTORS AFFECTING THEIR USE

TOTAL IMMERSION thermometers are designed with scales calibrated to indicate their true temperature when the bulb and the mercury column to just below the temperature being read is exposed to the temperature being measured.

PARTIAL IMMERSION thermometers are designed with scales calibrated to indicate the true temperature when the thermometers are immersed to specified depths. The portion that should be immersed is indicated on the back of each thermometer.

DETERMINATION OF EMERGENT STEM CORRECTIONS FOR TOTAL IMMERSION THERMOMETERS

When total immersion thermometers are used in a condition other than outlined above, a stem correction should be applied to the reading to obtain the true temperature. This difference between the reading for total versus partial immersion of the mercury column is known as the stem correction and may be computed for any given temperature and immersion as follows:

1. Note the number of degrees of the column above the liquid surface (N) 2. Note thermometer reading (T) 3. Suspend alongside the main thermometer an secondary thermometer. Place this thermometer adjacent to the main thermometer so that the bulb of the second thermometer is centered halfway betwen the surface of the liquid and the temperature indicated on the main thermometer. The temperature indicated on the second thermometer will be the average temperature of the emergent mercury column (ST) 4. Find the stem correction from the following formula:

Stem correction $=(0.00016 \times N) \times (T-ST)$ for Centigrade temperatures

=(0.00009 x N) x (T-ST) for Fahrenheit temperatures Example: a thermometer graduated 80/100C, immersed to the 80 degree mark, temperature of emergent column 60C, reading on

thermometer 90C. then N=10, T=90. ST=60. Stem correction = $(0.00016 \times 10) \times (90-60) = +0.048$ Rounding this to an observable correction of +0.05, the true temperature of the liquid being measured is 90 + 0.05, or 90.05C

GENERAL CONSIDERATIONS FOR MAKING AN ACCURATE READING

The error due to parallex may be eliminated by taking care that the reflection of the scale can be seen in the mercury thread, and by adjusting the line of sight so that the graduation of the scale nearest the meniscus exactly hides its own image; the line of sight will then be normal to the stem at that point. In reading thermometers, account must be taken of the fact that the lines are of appreciable width. The best practice is to consider the position of the lines as defined by their middle parts.

PERFORMING A CALIBRATION AT THE ICE POINT (O DEGREES C or 32 DEGREES F)

Select clear pieces of ice, preferably made from relatively pure water. Discard any cloudy or unsound portions. Rinse the ice with distilled water and shave or crush into small pieces, avoiding direct contact with the hands or any chemically unclean objects. Fill a Dewar or other insulated vessel with the crushed ice and add sufficient distilled and preferably precooled water to form a slush, but not enough to float the ice. Insert the thermometer, packing the ice gently about the stem, to a depth sufficient to cover the OC (32F) graduation. As the ice melts, drain off some of the water and add more crushed ice.

Raise the thermometer a few millimeters after at least 3 minutes have elapsed, tap the stem gently and observe the reading. Successive readings taken at least one minute apart should agree within one tenth of one graduation.

APPLYING THE CORRECTION AT ICE POINT

Record the readings and compare with previous readings. If the readings are found to be higher or lower than the reading corresponding to a previous calibration, readings at all other temperatures will be correspondingly increased or decreased.

Reproduced in part from ASTM E77-84

3925 Placita de la Escarpa Tucson, AZ 85715

Date: 1/2/92	Thermocouple No.: TC READOUT
Ambient Temperature: 68 °F	Barometric Pressure: 30,18 "Hg
Calibrator: Particular	Reference: Mercury-in-glass: fisher #913452
READOUT ZERCED S SPANNED	Other: OMEGA CA 300

Pelor T	to check			,
Reference point No.	Source ^b (specify)	Reference thermometer temperature, or	Thermocouple potentiometer temperature, OF	Difference, c
ICE WATER	Hao	33	33.3	-,06
33 RM TEMP HOO 68	H00	68	62.2	04
BOILING WATER	HOO	811	211.4	7.06
250	OMEGA	<i>85</i> 0	250,1	-,01
360		300	300.3	-,04
400		400	399,9	+101
500		500	499.8	4.00
600		600	600.1	-,01
700		700	700.0	0.00
800		800	800.1	-01
960		900	900.0	01
1000		1000	1000,3	-02
1800		1800	1800,12	01
1400		1400	1400.1	01
1600		1600	1600,2	-,01
1800		1800	18004	01
8000	7/	9000	ACC0,3	-,01

Every 30°C (50°F) for each reference point bType of Calibration system used c(Ref. temp: °C + 273) - (Test therm. temp. °C + 273 x 100<1.5% Ref. Temp. °C + 273

	TRACEABILITY D	DCUMENTATION		
FOR: SO2 INJECTION THERMOMETERS IN LAB	N ROTAMETER, DI . CHECKED AGAIN: LOCATION: KENT.	ST FISHER SN# 9	(NIST) 123454 (NIST)	PBYCHROMETE
FISHER SN# 9123454 (NIST TRACEABLE) ACTUAL C= ADJ C= 18.5 = 18.49 = 25.5 = 25.44 = 25.5 = 25.44 =	F 13.4 13.4 11.4 - 11.4 - 11.3	SO2 INJECTION TR F -45 -73 -78	ROTAMETER (TR)
DATE: 1/8/98	LOCATION: KENT	, WA TECH	INICIANI <u>Sat</u>	stalelan)
185 = 8.49 = 18.5 = 18.49 = 18.5 = 18.49 = 18.	F 65.3 134 779 99.3	DRY GAS METER 4J IN OUT F F 45 72 73 79 78 90	THERMOMETERS SH IN OU F F F 45 44 70 74 70 79	KK F - 45 - 73 - 78 - 90
DATE: 1/0/41	LOCATION: KENT	, WA TECH	NICIAN:	Cocklaid
ACTUAL C= ADJ C= 185 = 18.49 = 05.5 = 05.49 = 33.5 = 32.49 =	56.3 73.4 77.9 98.3	SLING PSYCHROM WB DB F F	IETER	

C-DEGREES CENTIGRADE F-DEGREES FARENHEIT

CONVERSIONS: F=(Cx1.8)+32

C=(F-32)/1.8

ADJUSTED TEMPERATURES ARE DERIVED FROM AN ELEVEN POINT CALIBRATION OF FISHER SN# 9123454 BY KESSLER INC. SEE ENCLOSED LETTER DATED 4/4/91

KESSLER INSTRUMENTS, INC.

CALIBRATION

SERVICES





HYDROMETERS

MAILING ADDRESS. POST OFFICE BOX 640 WESTBURY, NEW YORK 11590 516-334-4063 FAX 516-334-2689

, TESTING EQUIPMENT

PLANT ADDRES ONE-SIXTY HICKS STREE WESTBURY, LONG ISLAN **NEW YORK 1159**

CERTIFICATE OF CALIBRATION

This is to certify that the instrument listed below has been certified in our calibration laboratory using the most sensitive constant temperature equipment available. This calibration has been performed against National Institute for Standards and Technology (formerly NES) certified master instruments in accordance with the procedures outlined by ASTM E77-89 and NBS (NIST) Monograph 150.

TESTED FOR: FISHER

THERMOMETER CAT#150418

15041B

RANGE: -1/101C

DIVISIONS: .1 IMMERSION: TOTAL

INSTRUMENT SERIAL NUMBER 9123454

DATE CERTIFIED: 04-04-1991

MARKED: FISHER

POINT(S) TESTED	READING OF THIS INSTRUMENT	CORRECTION
0.000	0.000	0.000
10.00C	10.00C	0.000
20.00C	20.050	-0.05C
30.00C	29.98C	0.020
40.00C	40.00C	0.000
50.00C	50.00C	0.000
60-00C	60.00C	0.000
70.00C	70.03C	-0.03C
80.000	80.01C	-0.01C
90.000	90.000	0.000
100.00C	99.98¢	0.02C

ESTIMATED UNCERTAINTIES IN THE ABOVE CORRECTIONS DO NOT EXCEED 0.03C FOR A DISCUSSION OF ACCURACIES ATTAINABLE WITH SUCH THERMOMETERS SEE NBS (NIST) MONOGRAPH 150, LIQUID-IN-GLASS THERMOMETRY

All temperatures in this report are based on the International Practical Temperature Scale of 1968

SERIAL AND TEST NUMBERS OF NATIONAL INSTITUTE OF STANDARDS CERTIFIED INSTRUMENTS REFERENCED IN CERTIFICATION OF THE INSTRUMENT LISTED ABOVE:

769543,217368

P14452,176240

P14452,176240

M44165,176240

M44165,176240

791544,220391

CALIBRATION TECHNICIAN: FRANK BURGHARDT Q.A.MANAGER: J. KELLY

KESSLER INSTRUMENTS, INC.

J. Jeff Kelly

Quality/Assurance Manager

JK/ak

TEST NUMBER 91 843 DATE COMPLETED:04-04-1991

VANEOMETER CALIBRATION

EEMC uses a Dwyer Model #480 Vaneometer to measure test chamber air velocity. The manufacturer's specifications for accuracy are $\pm 5.0\%$ to 100 FPM and $\pm 10\%$ from 100 FPM to top of scale. EEMC insures that the instrument is level and clean prior to taking each reading. According to EPA personnel (Westlin, RTP) no further calibration of the instrument is necessary.

DRAFT GAUGE CALIBRATION

EEMC uses a Dwyer Model 115-AV 0 - 0.25" inclined water manometer (readi- bility resolution ± 0.001 " of water) to measure the static pressure in the stack. Once leveled and zeroed as per the manufacturer's written operating instructions, the Dwyer 0 - 0.25" manometer is a primary standard and needs no additional calibration.

The manometer is leveled and zeroed at the start of each test run, checked as necessary during the run to verify that the settings have not changed and again at the end of each test run. The results of each check are recorded on Woodstove Data Sheet #16 in each individual test run.

BAROMETER CALIBRATION

EEMC uses a Princo Model 469 NOVA Mercury Barometer to measure Barometric Pressure at the Kent, WA Lab. When installed and maintained as per the manufacturer's written operating instructions, the Princo Model 469 NOVA Mercury Barometer is a primary standard and needs no additional calibration.

MOISTURE METER CALIBRATION

The Delmhorst Model RC-1C, SN 16152 Moisture Meter is calibrated each time the meter is turned on using the two (2) calibration settings (Zero and Span). The potentiometers for each calibration point ($X=Zero,\ Y=Span$) are adjusted until the meter is correctly calibrated. Then the operation of the meter is checked in the normal operating range used during testing (11-25%) with a Delmhorst Model MCS-1 Moisture Content Standard at 12.0% and 22%.

EEMC also has a second Moisture Meter - Delmhorst Model G-30 SN 2477 - to use as a backup and as means of checking the readings on the Model RC-1C.

Post Test Meter Box Audits Woodstove Data Sheet #32

Date: 5/19/90 Technician: 5 WST9-Form2, Rev12/88

METER BOX CALIBRATION AUDIT

	MEIEK DU	X CALIBRATION Test Data	AUDIT	
Run # 1	2 3 4	5 6	7 8	9 10
	<u> </u>		1 174	
	<u>D.O. D.O. D.</u>		1.5	^ ~
Avg. Test Serie:	s △ H: <u>///8</u>	in H ₂ O. Test	Series Max	Vac: <u>O.O</u> in Hg
Audit Dry Gas Me	eter: KK	Correct	ion (Y) Fac	tor: 1.010
Test Dry Gas Me	ter: 45	Correct	ion (Y) Fac	tor: 1-066
		Audit Data		
		Audit #1	Audit #2	Audit #3
BP:		<u> </u>	<u> 9996</u>	<u> 4996</u>
Vac:		<u> </u>	<u> </u>	<u> </u>
Audit Meter:	Final Vol	050-238	05548	9 060,747
	Initial Vol	045,000	050,038	160
	Vol (Vw,ft ³)	5,038	5A5	
Audit Meter:	Initial	78	28	79
Temp (°F)(Tw)	Mid	76	79	<u> </u>
	Final	78	79	$\frac{-\omega}{\omega_I}$
	Avg (°F/°A)	75/535	19/52	9 80 1540
△ H (in H ₂ 0)	Initial	1178	.178	178
	Mid	_178	-178	178
	Final	1178	.178	178
	Avg	1178	178	178
Dry Gas Meter:	Final Vol	899,000	904.000	909.000
,	Initial Vol	294,000	899.00c	
	Vol (V _d ,ft ³)	5,000	500)
Dry Gas Meter	Initial			
Temp (OF):Inlet	Mid			
•	Final			
	Avg (°F/°A)			
Dry Gas Meter	Initial	22	87	90
Temp (OF):Outlet		85	99	- 41
	Final	81	90	$\frac{1}{Q\Omega}$
	Avg (°F/°A)	85 /545	89 /54	91/551
Avg Dry Gas	.			
Meter Temp (Tm-0)	F/OA)	PS 1545	89, 1549	91/121
Time (minutes)		88:15	DA: 15	40:
			1-4	

Volume Metering System Leak Check: 0,000 inch H20 in one minute

 $\frac{-00108}{F} \times \frac{7.800}{G} + \frac{10780}{C} = \frac{10680}{Interpolated Y Factor}$

DRY GAS METER CALIBRATION

			•				DI y das never	
BARO	METRIC PRESSURE, Pb =	30,48	in.Hg.					
Ori Set	ifice Manometer tting , AH, in. H ₂ O		.1	.2	.3	.5	.75	1.0
g _{ae}	Volume Unt Toet Mateu	Final	956.742	962,002	967.217	972.452	917.625	982,94
Gas Volume Wet Test Meter Vw ft 3		Initial		956.742	0	967.212	970-1152	977.68
		Vw, ft 3	(5.341)	(5860)	(5015)	(5.235	5-233	7
Gas	Volume Dry Test Meter	Final	72.100	17.200	20.500	87.700	93.000	98,500
	vd ft3	Initial	67.100	19200	72500		88,000	93,500
		Vd ft3	(5,000)	(5,000)	(5,000)	(5,000)	(5,000)	(5,000
	WET	Initial	70	69	10	10	70	71
Ţ	TEST METER	Middle	69	10	69	10	27	21
E H p	tu	End	69	20	20	20	71	71
E R		Average	69/529	(10/53D)	(10/530)	(70/530)	(70/53D)	21/53
A	DRY	Initial	71	76	17	19	81	17
U R	GAS METER	Middle	14	17	18	82	80	78
E	tu	End	26	77	29	83	79	19
		Average	(14/534)	17/537	(78 /538)	(21/54D)	(BO1540)	(Je/539
-0-	Time, Minutes		475 7 5	19.25	16,333	13/25	10-67	9,500
y =	(Vw) (Pb) (tm) Vd (Pb+ AH 13.5) (tw)		1.0782	1.0654	L0580	10674	1,0604	10641
¦H @=	0317 (AH) (tw)+Pb (tm) (tw)+Pb (tm)	2	1.4707	14573	1-5980	1.7997	1600	1-1753
Ко =	$\frac{Vw}{-8} = \frac{\frac{(p_b + \frac{\triangle H}{13.6})}{t_{10} + 460}}{\frac{(p_b + \frac{\triangle H}{13.6})}{t_{10} + 460}}$	-) (28. 97) H)						
_	= 1.0659 = 1.6805							

Ko = Factor for HP-65

$$p_b + \frac{\triangle H}{AB} = p_m$$

13.6

28.97 - molecular weight of air
y = ratio of accuracy of wet test meter to dry test meter. Tolerance = 0.01
H = Orifice pressure differential that gives 0.75 cfm of air at 70 F and 29.92 inches of mercury, in H O.
Tolerance 0.15.

		•	• •					
BAROMETRIC PRES	SURE, Pb =	30.83	in.Hg.			*: :		
Orifice Manon Setting , AH	eter , in H ₂ O		1	11	11	2	1	
Gas Volumo Hot	Tost Motor	Final	170,059	175430	180.616	195,788	190.888	
Gas Volume Wet Test Meter Vw ft 3		Initial	165,000	170,059	175430	180.616	185.789	
		Vw, ft ³	5.059	5,371	5-186	5.112	5100	ļ
Gas Volume Dry	Test Meter	Final	581.900	501,200	539,300	 	549,300	
vd ft3		Initial	516,900	501,900	527,200	530300		
		Vd ft3	5,000	5300	5-100	5:000	5,000	
WET		Initial	86	89	89	90	91	
T TEST		Middle	87	89	89	90	91	
E METER M P tw		End	89	89	90	91	91	
E R		Average	87/547	89 1549	89/549	90/550	91/551	
A DRY		Initial	77	83	<i>83</i> :	83	85	
U GAS R METER		Middle	81	83	84	85	25	
E tu		End	<i>8</i> 3	<i>8</i> 3	85	85	85	
		Average	80/540	23/543	24/544	25/545	85/8/5	
-0-Time, Minu	tes		28:10	30,00	19:000	22:15	08:00	
$y = \frac{(V_W) (Pb)}{Vd (Pb + \frac{\triangle}{13})}$	H (tw)		19986	10001	1,0074	10189	10086	
H @=	i) (tw)()	2		V	:			
Ko = \frac{Vw}{8} \sqrt{-1}	(Pb + AH 13.6 tm + 460 (-) (28. 97) H)						
verages: y = \ldots \cdot C H = \ldots	059			·				

<sup>13.6

1.97 -</sup> molecular weight of air
y = ratio of accuracy of wet test meter to dry test meter. Tolerance = 0.01
H = Orifice pressure differential that gives 0.75 cfm of air at 70 F and 29.92 inches of mercury, in H O. Tolerance 0.15.

	24.00		·				•
BAROMETRIC PRESSURE, Pb =	30.83	in Hg.		· ·	i	i	·
Orifice Margueter Setting , AH, in. H ₂ O		12	1,5	12	,0	12	
Sas Volume Hot Tost Motor	Final	195,095	201.276	206.371	011.470	216.571	
Gas Volume Wet Test Meter Vw ft3	Initial	190,900	195,995	101.876	26.371	011.470	
·	₩, ft ³	5.095	5281	5095	5,101	5099	
Gas Volume Dry Test Meter	Final	547.400	559.600	557-600	568.600	567.600	
va ft3	Initial	542,400	547.400	552.600	557.600	560.600	
	Vd ft3		5A00	5,000	5,000	5,000	
	Initial	90	90	90	90 -	90	
T TEST E METER	Middle	91	91	90.	91	90	
N! . !	End	90	90	90	90	90	
P tw	Average	91/551	90/550	90/550	90/550	90/550	
a! I	Initial	85	86	86	86	26	
T DRY U GAS R NETER	Middle	86	86	86	86	86	
Ε ! !	End	86	86	26	26	25	
S tu	Average	26/546	26/546	86/546	86/546	86/596	
-0-Time, Minutes		20:10	01:00	00:15	80:80	A0:00	
$y = \frac{\text{(Vw)} \text{ (Pb)} \text{ (tm)}}{\text{Vd} \text{ (Pb+} \frac{\triangle H}{13.6})} \text{ (tw)}$		1,0093	10077	6111	1.0183	1.0119	
H @= .0317 (ΔH) (tw)0 Pb (tm) (Vw)			/	<i>'</i>		V	
$Ko = \frac{Vw}{-G} - \frac{(pb + \frac{\triangle H}{13.6})}{tw + 460 \text{ (}}$	-) (28. 97) H)				٠		
verages: y = <u>10105</u> H = Ko =							

13.6

d.97 - molecular weight of air
y = ratio of accuracy of wet test meter to dry test meter. Tolerance = 0.01
H = Orifice pressure differential that gives 0.75 cfm of air at 70 F and 29.92 inches of mercury, in H O.
Tolerance 0.15.

			- , <u> </u>	•			-	
BAROMETRIC	PRESSURE, Pb =	30.03	in.Hg.	i in the		**.*	~ .	
Orifice P Setting ,	lanometer AH, in H ₂ O	* v	,3.	/3	/3	/3_	13	
Sac Volume	Hot Tost Motor	Final	920.050	897,139	930950	937-349	240.462	
Gas Volume Wet Test Meter Vw ft 3		Initial	916.700	200.050	292139	139850	137,349	
		Vw, ft ³	5,35A	5-087	5:111	5,099	15/113	1
Gas Volume	Dry Test Meter	Final	578,900	57,900	580,900	587900	590,900	
Vd	ft3	Initial	567.700	570,900	577.900	520,900	527.900	
		W ft3		5,000	5.000	5,000	5.000	
	MET	Initial	90	88	88	88	89	
T i	TEST METER	Middle	89	<i>9</i> 8	88	88	<i>9</i> 8	
H	th	End	වර	99	28	89	89	
P E R		Average	89/549	EB /548	88/598	88 /548	89/549	
AI	DRY	Initial	96	85	83	පි 3	24	
ul (as Eter	Middle	26	93	84	84	24	
E	in .	End	85	23	23	24	23	
		Average	66 /546	24 /544	e3 /543	841544	24/544	
-8-Time,	Minutes		17:30	16:00	16:30	16:40	16:45	
(Vw) ((Pb) (tm)				·			
Vd (PL	$+\frac{\triangle H}{13.6}$ (tw)		1,0009	10092	10121	10116	1.0125	
н 0= <mark>-0317</mark> Рь ((AH) (tw)0	2	/	V			V	
Ko = Vw -	$\frac{(Pb + \frac{\triangle H}{13.6})}{tm + 460}$	-) (28. 97) H)						
y =	0137	·						
Ko =					Ž.			

$$p_b + \frac{\triangle H}{A} = p_x$$

13.6

d.97 - molecular weight of air
y = ratio of accuracy of wet test meter to dry test meter. Tolerance = 0.01
H = Orifice pressure differential that gives 0.75 cfm of air at 70 F and 29.92 inches of mercury, in H O.
Tolerance 0.15.

		·	• • •	•				•
BARON	ETRIC PRESSURE, Pb =	<i>3088</i>	in.Hg.			· · ·		
Ori Set	ifice Manameter iting , AH, in. H ₂ O		-4	,4	,4	14	14	
Rag	Fac Volume Wet Test Meters	Final	147693	150,197	057.898	A63011.	168,114	
Gas Volume Wet Test Meter Vw ft호		Initial	342600	27-693	1950.797	1952998	163.011	
		Vw, ft ³	5.093	15-104	5.101	5,113	5.103	
6as	Volume Dry Test Meter	Final	597.900	500,90c	607.900	610,900	67.900	
	M 45	Initial	590,900	597-900	609,900	607-900	612900	
		w #3	5,000	5,000	5-000	5,000	5,000	ļ
	NET	Initial	89	91	92	92-	91	1
Ī	TEST METER	Middle	90	91	92.	92	91	
EMO	tu	End	91	90	90	91	91	·
PER		Average '	90/550	91/551	90 1550	90/550	91/661	
A	DRY	Initial	83	84	تان	124	84	
U R	GAS METER	Middle	83	84	94	85	84	
E	tu	End	84	80:	34	<i>શ્ર</i> ા	95	
		Average	83 /543	ed 1544	84/844	84 K44	24 /544	
4	Time, Minutes		14:50	14:30	14:40	14:40	14540	
=	$\frac{\text{(Vw)} \text{(Pb)} \text{(tm)}}{\text{Vd} \text{(Pb+} \frac{\triangle H}{13.6})} \text{(tw)}$		12047	1,0069	1,0वंद	1.0068	10067	
H @=	.0317 (ΔH) (tw)0	-			Ý			
Ko =	$\frac{\text{Ver}}{\text{G}} = \frac{\text{(Pb} + \frac{\triangle H}{13.6})}{\text{$t_{\text{min}} + 460 \text{ (}}}$	-) (28. 97) H)				· •		
ZH =	10059				;			

13.5

26.97 - molecular weight of air
y = ratio of accuracy of wet test meter to dry test meter. Tolerance = 0.01
H = Orifice pressure differential that gives 0.75 cfm of air at 70 F and 29.92 inches of mercury, in H O.
Tolerance 0.15.

			-					:
BAROMETRIC F	RESSURE, Pb =	30,30	in Hg.			· ·	• •	
Orifice Ma Retting	nometer ∆H, in H ₂ 0), **	15	15	15	15	15	
Ras Volume	Wet Test Meter	Final	273.307	978.610	983.715	288.801	198,932	
Gas Volume Het Test Meter Vm ft 3		Initial	268,000	973.307	278.610	083.715	08880-1	
<u> </u>		Vw, ft ³	5:107	5.303	5.105	5.106	5-111	
	Dry Test Meter	Final	683.010	688212	633,810	638,212	643,212	
Vd fi	ŧ3	Initial	618,000	603012	CAB-012	633.010	638212	
		Vd ft3	5,012	5,000	5,000	5,000	5,000	
i.E	:i	Initial	91	187	27	27	27	
T TE	ST TER	Middle	89	27	8.7	87	87	
P	iw	End	87	87	<i>8</i> 7.	87	27	
E R		Average	89 1549	87/547	87/547	87/547	87/547	
A DR	Υ	Initial	24	25	84	24	84	·
	S TER	Middle	25	25	84	85	<i>84</i>	
E tu		End	85	84	24	94	84	
		Average	05/515	85 1545	84 /s44	24 1644	24/544	
-G-Time, M	Inutes		13:30	14:00	13:85	13:30	13:30	
- (Vw) (Pb+	b) (tm) AH 13.6 (tw)		10103	10148	10140	10144	101501	
Pb (ta		2	/		Ý	/		
Ko = Vw -	(Pb + △H 13.6 ‡m + 460 (-) (28. 97) H)						
verages: y = H = Ko =						······································		

<sup>13.6

26.97 -</sup> molecular weight of air
y = ratio of accuracy of met test meter to dry test meter. Tolerance = 0.01

H = Orifice pressure differential that gives 0.75 cfm of air at 70 F and 29.92 inches of mercury, in H O.

Tolerance 0.15.

		•		·	-			٠
BARD	ETRIC PRESSURE, Pb =	30,34	in.Hg.				- ,•	
Ori Ret	ifice Manometer ting , AH, in. H, O	e sanger og green er er men	175	175	175	175	175	
Bas Volume Het Test Meter Vw ft 2		Final	099,208	304318	309.430	314-540	319.752	
		Initial	894100	999,008	304-318	309-430	314540	
		₩, ft ³	5.108	5,110	5-110	5-110	5,012	
6as	Volume Dry Test Meter	Final	648.400	1.53.400	658.400	C63 400	668,500	
	ware3	Initial	643.4000	648,400	653,400		663,400	
		w ft3	5,000	5,000	5,000	5,000	5.100	
	WET	Initial	87	97	97	86	86	
Ī	NET Test Neter	Middle	127	27	86	86	86	
E M	tu	End	127	87	86.	20	25	
E R		Average .	27/547	27/547	86/546	E6 1546	26/546	
Ä	DRY	Initial	184	80	82	22	2	
U	GRS METER	Middle	23	32	88	81	21	
Ë	tu	End	22	92	88	81	21	
		Average	83 /543	20/540	80 BHD	81 541	21/54/	
-0-	Time, Minutes		11:00	11:00	11:00	11:00	11:00	
=	(Vw) (Pb) (tm) Vd (Pb+ AH) (tw)		1.013	8010,	10131	10108	L0108	
∫ H @=	.0317 (AH) (tw)0	2	V					
Ko =	$\frac{\text{Ve}}{-B} = \frac{\sqrt{\text{Pb} + \frac{\triangle H}{13.6}}}{\frac{1}{12} + 460 \text{ (}}$	H)				•		
Averag y = AH = Ko	10116				.	<u> </u>	-	

13.6
28.97 - molecular weight of air
y = ratio of accuracy of met test meter to dry test meter. Tolerance = 0.01
H = Orifice pressure differential that gives 0.75 cfm of air at 70 F and 29.92 inches of mercury, in H O.
Tolerance 0.15.

Ambient Temperature of Equilibyate Liquid in Wet Test Heter and Reservoir Range of Wet Test Meter Flow Reat Wet Test Meter Serial Number Volume of Test. Flask Vs. Satisfactory Leak Check?

			•			
Test Number	nanometer Reading, a mm H2O	Final Volume (V£), 1	Initial Volume (Vi),	Total Volume (Vm),b	Flask Percent Volume (Vs); Error,	Percent Error,
-	Gio man	0,5262	0 (Rela +)	0,5262 O(Relat/ 0,5262 0,5284 0,42	P875.0	0,42
2	6.0 mm	0,52500	, s	0. \$250	5250 0.5284 0.65	0,65
3	6,0 MM MA	05245	 0	0.524K	10, (284 O. 74	0.74

a - Must be less than 10 mm H2O (0,4 "H2O)

Calculations:

b - Vm - Vf - V1

% error = 100(Vm - Vs)/Vs--

XF3 =0.60

WET TEST METER CALIBRATION LOG

Range of Wet Test Meter Plow Rate O-0 4 44 /M.
Volume of Test Flask Vs - 200.5294 ft Wet Test Heter Serial Number AAJSS

Date__

Satisfactory Leak Check?

Ambient Temperature of Equilibrate Liquid in Wet Test Meter and Reservoir

a - Must be less than 10 mm H2O (0.4 "H2O)

Calculations:

b - Vm - Vf - Vi

c - % error = 100(Vm - Vs)/Vs = 0.4

WET TEST METER CALIBEATION LOG



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY WASHINGTON, D.C. 20460

MAR - 4 1991

OFFICE OF AIR AND RADIATION

Mr. Alben T. Myren Jr. Woodstove Testing Coordinator Energy and Environmental Measurement Corporation 1315 S. Central Avenue, Unit C Kent, Washington 98032

Dear Mr. Myren:

This letter is in response to your concern expressed at the lab manager's seminar on January 8, 1991 that your rotameter calibration technique is acceptable although it differs from the regulatory requirement of Method 5H, Section 6.6.

The way in which your rotameter calibration differs from theregulation is that your calibratation runs are less than five minutes whereas the regulation requires calibration runs of at least ten minutes. This is acceptable because you use a soap film volumetric flow meter as the standard as opposed to a conventional volume standard such as a dry gas meter.

If you have any further questions concerning this matter, please contact Dwight Poffenberger at (703) 308-8696.

Sincerely,

Robert J. Lebens, Chief Federal Programs Section

Stationary Source Compliance Division

cc: Mamie Miller, SSCD Peter Westlin, EMB MANUFACTURER: COLE PARMER BUBBLE TUBE MAKE & ID: 5KC 125/250

BAROMETRIC PRESSURE:

20,04

TEMPERATURE: 8/ F

CALIBRATION AT: EEMC

" Hg KENT, WASHINGTON LAB

SPAN #	VOLUME	MIN or SEC	RTMTR	VOLUME cc/min
	<i>05</i>	34.81 3435 3494	100	VOLUME X 60 =
		3460		AVERAGE
		30,91 33,48		105 x 60=
	TOTAL	275.8300		217.505
A	VERAGE	34.478		cc/min
g.	125	63.61 65.52 63.81	50	VOLUME X 60 =
		106,08		AVERAGE
		64.23 (03.27 84.76 63.04		105 x 60=
	TOTAL	51492		116.523
A	VERAGE	64-365		GC/Min
3	125	157.40 155.48 154.11 153.31	<i>95</i>	VOLUME X 60 =
		153.47 155.72 155.48		195 155,356 × 60=
	TOTAL	1248,850		48.876
А	VERAGE	155.356		cc/min

SETTING	CC/MIN
0	0
25	48.076
50	116.52 3
100	1915,505

2.1844800 -,4900000 ,9980704 1996 1445

ROTAMETER SETTING FOR 100 cc/min :

WST6-form16, Pg2, . .9/88

WOODSTOVE DATA SHEET #26 CEM GAS TRAIN RESPONSE TIME

		Conc. (V)																
		Conc. (V)																
A	A	02 Conc. (V)	166	88	82,	,837	,833	,83g	, 332	BA	837)				213	oha	4
- Carlot and Market Control and Carlot and the State of t	and described the constant and the second	0 ₂ Conc. (V)		,538	,285	12013	,839	,833	,833	,833	,833					2 IS	OFM	
		02 Conc. (V)		(SM)	12%	æ8′	1881		,833	,93B	,839					~ 3	010	The state of the s
	· · · · · · · · · · · · · · · · · · ·	CO (V)	1.16	10h,	, ०४५	600'	100,	000'	000'	000/	000'				•	110	N35	
The state of the s	e designation of the second se	00 Conc. (V)	14671		1001			000		cas,	co'				·	11 م	N35	
	The state of the s	conc. (V)	7366	o@h'	5401	0001	8001	000'	000'	0001	000'					110	N35	
		∞_2	SB 2	7447	1028	,013	,003	∞	000	ريش,	OM,					5	435	
		ω ₂ Conc. (V)	12051	, cl48	,030	110,	100'	œ,	,000	,000	رين					15	235	
18/19	80 %	Ω ₂ Conc. (V)	300	,450	980'	<u>\o</u>	400	8	s,), (200/	000'					oonse is) \sim //	s w35	Jow Rate S SCFH
Date	lans	Elapsed Time	0 Seconds	15	30	45	09	75	90	105	120	135	150	165	180	Initial Response Time (Seconds) $\lambda / $	95% Response 735	Analyzer Flow Rate

Comments

WST6-forml(3v9/88

WOODSTOVE DATA SHEET #27 TRACER GAS TRAIN RESPONSE TIME

	SO ₂																
	SO ₂																
	SO ₂ Conc. (V)			-													
	SO ₂ Conc. (V)																
	SO ₂ Conc. (V)																
AA	SO ₂ Conc. (V)	493	.302	1037	1001	6001	600'	·6001	100	100'					ĮΙα	OhΩ	
	SO ₂ Conc. (V)		499	oho'	900)	gas'	BOB	100'	100'	100'					II ∨	aha	
1/8/18.	SO ₂ Conc. (V)				500'	6001	Boo'	100	100'	100')I (V	opa	
	SO ₂ Conc. (V)	1	999	,038	Loo'	7001	1002	, ash	1001	100'					110	OHO	4
	SO ₂ Conc. (V)		.998	1601	sas,	$\delta \infty'$	600'	1001	100'	1001					νI	opa	5 SCFH-
1183191 BN/EW	SO ₂ Conc. (V)	1510	105'	<i>b</i> E0′	. ∞6	,003	$, \infty, $	1001	, 00 /	1001					ponse II	e ds) λυψυ	ow Rate 1
Date Technicians	Elapsed Time	0 Seconds	15	30	45	90	75	90	105	120	135	150	165	180	Initial Response Fime (Seconds)	95% Response Fime (Seconds) $\lambda U/U$	Analyzer Flow Rate 15 SCFH.

Comments



Lab No. KENT Date 1/2/92 Source @ \$18N

TEST	1	1		1		1	
NO.	GAS	1	2	3	4	5	AVERAGE
	TOTAL/CO	Ø	0	0	X= 0	100%	T&19170
1	CO ₂	0	0	0	X= 0	No	LIQUID ALL
	02	0	0	0	$\bar{x} = 0$		8/8/91
	TOTAL/CO	0	0	0	X = 0	1006	T132257
2	co ₂	0	0	0	X = O	NQ	LIQUID AR
	02	0	0	0	X= 0		11/20/90
	TOTAL/CO	5.0	4,9	5.0	X = 4,979	4,96800	£9004
3	CO ₂	10.6	18-6	12.5	X= 18.51%	18.6% 000	
	02	10.4	10.5	10.4	X= 18.43%	12.4% 00	9/4/91
	TOTAL/CO	0	0	0	X = 0	212%	R34098
4	co ₂	21.2	81.2	81.2	X=21.2%		LIQUID ALE
	02	0	0	0	X = 0		4/27/88
	TOTAL/CO	0	0	0	X=0	401%	A155A9
5	co ₂	4.0	4-0	4,0	X=40%	COA	SCOTT
	02	0	0	O	X=0		10/00/04
	TOTAL/CO	0	0	0	X=0	19.93%	X ASS LO
6	co ₂	0	0	0	X=0	09	SCOTT
	02	90	00	80	T=80%		10/20/84
	TOTAL/CO	0	0	0	X=0	5.03%	R35693
7	co ₂	0	0	0	X=Ω	02	LIQUID AIR
	02	5	5	5 8	X=5%		6/29/89
_	TOTAL/CO	8	ව		X=8%	8.05%	A1682
8	co ₂	0	0	0	X=0	CO	SCOTT
	02.	0	0	O	X=0		12/5/84
	TOTAL/CO	.2	Д	2.1	X=203%	200%	A10199
9	co ₂	0	0	0	X = 0	0	
	02	0	J	ಲ	X =0	1.	
	TOTAL/CO	85	8.5	8,4	I=8.47%	8,4967. CO	CC6084100
10	co ₂	01-0	D1.3	812	K=0143%	21.2537000	LIQUID AIR
	02	21.2	01.0	A13	X=01.03%	91.3447.0g	11/19/90
	TOTAL/CO	2.5	2,5	2.4	X=2.47%	2.49% 60	T201070
11	co ₂	68	6.3	6.3	X =627%	625/2Cg	Heuid Ale
	02	6,2	6.3	6.3	X = 627%	6251800	11/19/90

NOTES:

EEMC

HANGH'S

CO2 ANALYZER

1,			MU	LTIPOI	NT CAL	IBRATI	ON REP	ORT FO	RM			
Site:_	EEM	<u> </u>	KENT	, WA	Da	te: <u> ح</u>	12/92	,		_		
Analyz	er: Mak	:e:_ <u>}</u>	ORIBA		Mod	el: <u>P</u> I	R 2000	<u> </u>	_ sn:_	407069		
Calibr	ation b	y:	D.	Kingr	man		•					
BP Te	mp:	<i>3</i> 0	7a 7a		<u> </u>	nstrum	ent ID	一方		Flowmeter		
Analyz	er last	cal	ibrate	d:	5/8/9	<u>a</u>	_ By:_	D.K.	namo	<u>^</u>		
Cylind		Con	centra	tion:	Λ 00	% C	:02 Cvl	. Pres	s.:	800	_PS:	
2. # <u></u>	29004 ertified	Con i by:	centra Ma	tion_ rheson	12.6		O2 Cyl	. Pres ate:_/	# 	900	PS:	
3. # <u>R34098</u> Concentration 21.2 * CO2 Cyl. Press.: 200 PS: Certified by: Liquid AiR Date: 4/27/88												
4. #A 5529 Concentration 4.01 % CO2 Cyl. Press.: 900 PS: Certified by: Liquid Aik Date 10 22 84												
1											• ,	
Ar Fl	alyzer:	Ca 5 501	ilibrat FH	ed Rai	ige:G sured	by: Ro	otamete	r: <u>X</u>	Mass	Flowmete	r:_	
							Result					
Point	Cyl.	ક	Exped	ted	Acti	ıal	Ac	ij.	\$	Potenti	one	
#	#	CO2	Meter	DVM	Meter	DVM	Meter	DVM	Dif.	Unadj.		
1	1	0.00	00.0	.000	00.0	.000				7.78	<u> </u> _	
2	2,	12.6	50.4	.504	50.5	.505	50.4	.504		2.08	2-	
3	3	1	84.8	.848	86.0	.860					<u> </u>	
4	4	4.01	16.0	.160	16.0	.160					-	
5	1	0.00	00.0	.000	00.0	.000	_				<u> </u>	
Comment	ts:		= 12.	388							-	

Y = MX + B0.0405364 Slope (M) =Y Intercept (B) = -0.0021700 0.9999615 Correlation Coefficient (r) = r2 = 0.9999231 Analyzer Output (volts) 1.0 0.9 (9) 0.8 0.7 0.6 0.5

0.4

0.3

0.2

0.1

0

2.5

7.5

5

10

12.5

15

17.5

20

EPA Span Value = $\pm -2.0\%$ of 25% CO2 = $\pm -5\%$ Cal Volts = Cal Volt Conc - Std Conc = $\pm -5\%$ Color = $\pm -21.500 - 21.2\%$. 300 = 1.415

LOCATION KENT, WA 98032 OPERATORS NA NOWAK/JASTODDARD CONTROL CHART

ITE EEMC - WEST

/407069 RANGE -0,0- 25.0% COR INSTRUMENT/SH HORIBA PIRBODO ARAMETER COA

EFERENCE MATERIAL OR METHOD ZERGES AND SPANS WITH CERTIFIED CYLINDER GASES

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2世 - 7	97×
LI IN COLUMN THE HALLOWS	\$97¥
6181 - 111111111111111111111111111111111	<i>97</i> ¥
19 8 0 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7×
HAVAKS	<u>597</u> ×
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Span Respons Span Actual Span Actual Span Actual Span Actual Span Actual Actions	

EEN

O2 ANALYZER MULTIPOINT CALIBRATION REPORT FORM

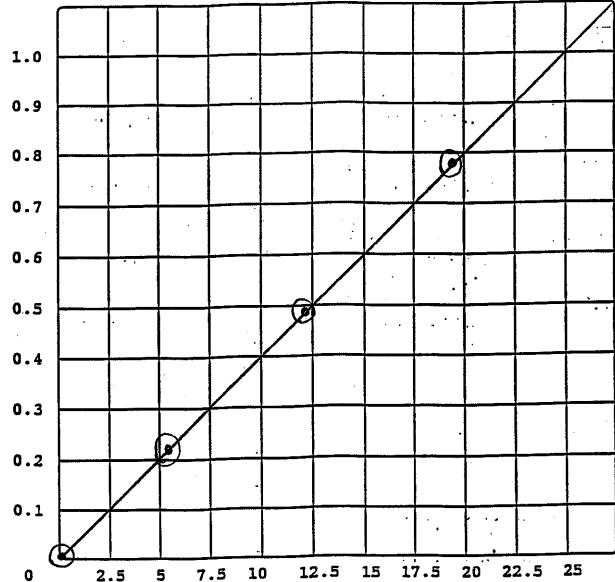
			MO	77.72.02									
Site:_	EEMO		KE.	UT,W	A Da	te:	5/12/9	<u>a</u>	-		••		
Analyz	er: Mak	e: <u>1</u>	electy	ue	Mod	el: <u>3</u>	20 A		_ sn:_	37400	 ,		
Calibr	ation b	y:		C). Kino	man				<u>· </u>			
Cal Ga BP Te	s Flow: :	<u>1,5</u> 30.3	SCFH 16 78	Mea	sured I	by: Ro nstrum nstrum	tamete lent ID lent ID	I: X : <u>Pein</u> : Tr	_ Mass	Flowmeter			
	er last									<u>~</u>			
Cylind 1. #] Ce	ers: 13225 rtified	Con	centra L16	tion:	0.00 AIR		oz Cyl.	Press ate:	10/7/91	800 E	PSI .		
2. # <u>/</u> Ce	2. # 29004 Concentration 12.4 % 02 Cyl. Press.: 900 PSI Certified by: MATHESON Date: 10/31/91												
3. #XA2212 Concentration 19.93 % 02 Cyl. Press.: 400 PSI Certified by: Liquid Air Date: 10/22/84													
4. ‡ <u> </u> Ce	4. # <u>R35693</u> Concentration <u>5.03</u> % 02 Cyl. Press.: 1700 PSI Certified by: <u>L10010 AIR</u> Date <u>6/29/89</u>												
An Fl	alyzer: .ow:_//	: Ca <u>ნ ქ</u>	librat CFH	ed Ran	asured	DA: W	1 COME LE	·- ·	Mass	· I-O Flowmeter	F:		
							Result			Potentio			
Point	Cyl.	8	Exped		Actu				8	Unadj.	Ac		
#	#	02	Meter	DVM	Meter	DVM	Meter	DVM	Dif.	unadj.	-		
1	1	0.00	00.0	.000	00.0								
2	2	12.4	12.4	.496	12.2	. 491	12.4	.496					
3	3 .	19.93	19.9	.797	19.4	.781							
4	4	5.03	5.0	.201	5.0	.204							
5	1	0.00	00.0	.000	0.00	-000				,			

Comments:

.5= 12.650

Y = MX + B Slope (M) = 0.0391922Y Intercept (B) = 0.0041946Correlation Coefficient (r) = 0.999397 $r^2 = 0.9997794$

Analyzer Output (volts)



Span Gas Concentration (% 02)

EPA Span Value =
$$+/-$$
 2.0% of 25% O2 = $+/-$.5% Cal Volts = Cal Volt Conc - Std Conc = $+/-$ Conc Diff = $+/-\Delta$ % .781 = 19.525 - 19.93 = $-$.405 = $-$ 2.032 .204 = $5.100 - 5.03 = .070 = 1.392$

CONTROL CHART

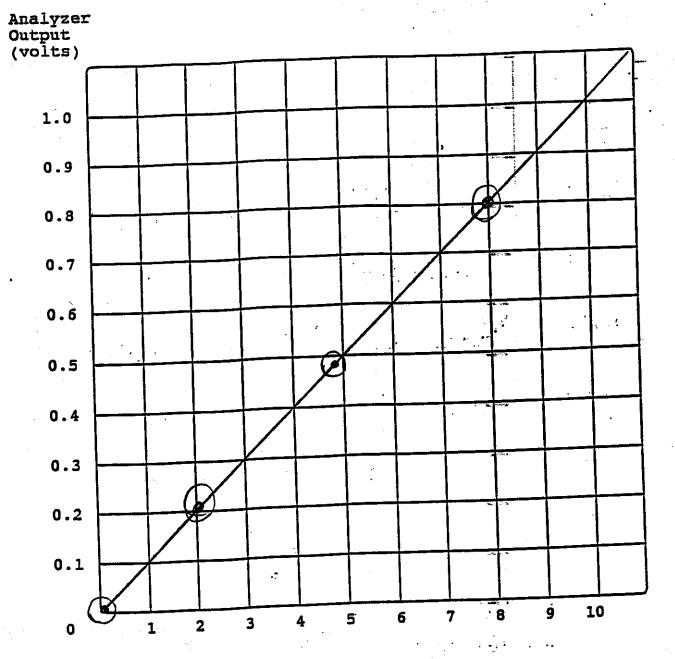
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. 1	8				b	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		<u> </u>		721		11 :			POST
	MA NOWAK/JASTODDARD		•							18.4				1	•
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	2	0								H				900	Dem
	N	16			01.			<u> </u>						5.0	POST
	4	Ó	- 1		0					180				Fi	Pas ·
	D	RANGE -0,0-45,0%		i						19:त					• .
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	Ž	35	9		0		11111			मिष्रा				+35%	Post
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	OPERATORS.		Ē	2/3	0			<u> </u>	19.60	38				폴롤	HAUGHS 5074
	MI	ارا	ಲ		•	2111111		<u> </u>	- 1	748		1/		77	Hahans S&7X
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	٠,	37465	द्री	5/2E	ols		111/11		 12 130	77		<u> : i</u>	<u> </u>	ទីក្រុកពេះ -	HAUGHS 5074
		w	Cochfied	2/5	iol s	<u>શા : </u>	111 1	<u> </u>		<u> </u>				20	Post (5
	S	7	ပီ	503	ol			<u>! </u> 	1460	72 8					HAUGHS 387X PEGG
	98032	ુ	ı i		<u> </u>	111111									HAUGHS 307X
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2 2 2 3 3 3 3 3 3	E A	390a	म्याक	2010		0[<u> </u>	1263	7 3	1:111:11			20%	HAWAHS SOTX
₹	3	심			1 i .	2 1111111		<u> </u>			<u> </u>	V:::::		+	HAUGHS SO7X
LUNI KUL	+	lectune	Spans	沒	o i	<u> </u>		<u> </u>	PSSF4	707	#111: 111	XIII:		55	POST4
3	5	3	S	no					- 12	7				_	HAUGHS SOOK
	تد	19		ী		8 : 1111	4 1 1 1 1	i	<u> </u>	3/6					PES 4
		INSTRIMENT/SH TE	AND AND	SIS.		9	1111	<u>: </u>		野然				-0-0	HAUGHS SOTY
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	LOCATION	章	OR METHOD ZEROES	38	O	<u> </u>				15 B				1	Per 3
	<u>-</u>	E	25		-			1111111		3 8	Hills	!!!Nii		7 4	HALLEHS SATX
		INS	14	問題	0	*	!!!!	<u> </u>		<u> </u>	· · · · · · · · · · · · · · · · · · ·			골곡	Per II
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		- 1		6 0 8	•	THE STATE OF		<u>: </u>				: 1 : 1 1 1		ä.	PLBD . HAUGHS SD7X
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	ITE EEMC - WEST	ଧା	EFERENCE MATERIAL	Se		,	0	ī '	nse	_ g	5.0	0	52-		3
	5	اے	πi. 		Actual				Response	Actual Ference	1		• •		COMMENTS ACT LONS
	回	ETE	ENC	<u> </u>	2 3	=	ZERO		E E	원률	₫ ₫	3			
	쁘	ARAMETER	FER	MTE Gro Response	61.0		3 E		Shan	Span Actual 9: Difference	1	SPAII			752
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EEMC

CO ANALYZER MULTIPOINT CALIBRATION REPORT FORM

	EEMC								_				
								<u> </u>	_ sn:_	408005	—		
Calibr	ation h	у:		D.K	ungm	an_		-	. 				
Cal Ga BE	s Flow:	30	SCFF	Mea	sured I	by: Ro	tamete ment ID	FEI PRI	Mass NCO	Flowmete:			
Te	: <u></u>		/ &	. F	5/0/02		B.,,	OV		<u>^</u>			
		: cal	Librate	:a:	7/0/10		by·_	<u> </u>	nonna	<u> </u>			
Cylind 1. #_ Ce	lers: <u> 3225</u> rtified	7 Cor	centra LiQ	tion:	0.00 IR		co cyl.	Press ate:	0 7 9	8001	PSI		
										001			
									•				
Ce	3. #A1692 Concentration 8.05 % CO Cyl. Press.: 600 PSI Certified by: Liquid Air Date: 12/5/84												
4. #A10199 Concentration 2.02 % CO Cyl. Press.: 800 PSI Certified by: Liquid Air Date 12/5/84													
	Analyzer: Calibrated Range: O-10.0 % Output: O-1.0 Flow: 1.5 5CFH Measured by: Rotameter: X Mass Flowmeter:												
							Result						
Point	Cyl.	ક	Exped	ted			Ac		1	Potenti			
#	#	CO	Meter	DVM	Meter	DVM	Meter	DVM	Dif.	Unadj.	i		
1	1	0.00	100.0				-						
2	2		49.6	.496		.495	49.6	. 496		1.32	1.3		
		4.96		.496			49.6	. 496		1.32	13		
2	2	4.96 8.05	49.6	.496 .805	49.5	.786	49.6 —	.496 —		1.32	 		
2	2	4.96 8.05 2.02	49.6 80.5	.496 .805 .202	49.5 78.6 19.5	.786	49.6			1.32	 		

Y Intercept (B) = 0.0005456Correlation Coefficient (r) = 0.9996889



Span; Gas Concentration (% CO)

EPA Span Value = $\pm 1.2.0\%$ of 10% CO = $\pm 1.2\%$ Cal Volts = Cal Volt Conc - Std Conc = $\pm 1.2\%$ Conc Diff = $\pm 1.2\%$. 195 = ± 1.950 -

CONTROL CHARI

OPERATORS MA NOWAK/JASTODDARD RANGE .0,0-10.0% CO CREHHED CYLINDER GASES 1408005 98032 EFERENCE MATERIAL OR METHOD ZEROES AND SOANS WITH INSTRIMENT/SH HORLEA PIR 8000 LOCATION KENT, WA ITE EEMC - WEST 'ARAHETER CO

0 1051 166 O O POST LIGHT PAGE 44 O O מכה בים. 0 POST 23% 0 237 +35% 0 O 1444415 5074 롤 O HAUGHS SATX 300 Span: PRG 2 4978 HAUUHS SOTY গ্রীত 5/6 HAUGHS 587X 5008 5/18 .004 0 HAUGHS 387X +20% POST 5 HAUGHS O 多多 PLES Haughs 5/6-1 5.03 겁 HAUGHS SOTK peg 4 Haugis PST3 HANGHS Scott Scott ă ठ् Peri 3 Haughs Sanx 523 물 HOURIS SON PABS tero: HAUGHS 8 498 SE 8 HAUGHS-507) 88 <u>શુ</u> 5/13 -384 0 S ĩ Span Response ero Nesponse COMMENTS/ ACTIONS % Difference nifference. Span Actual Actua 61.0

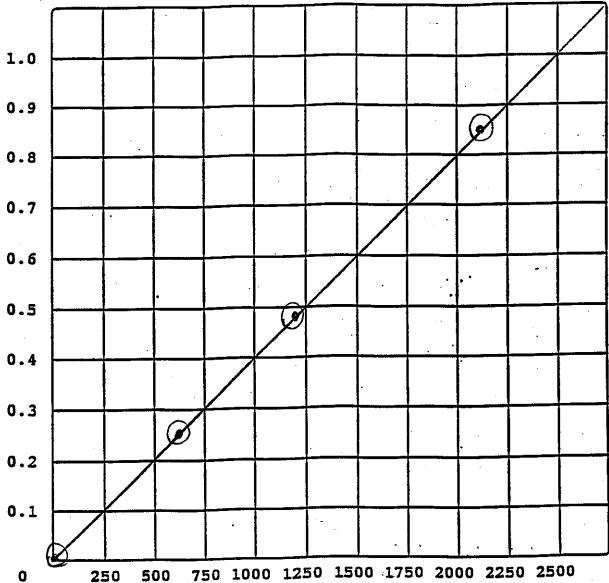
REMC

SO2 ANALYZER MULTIPOINT CALIBRATION REPORT FORM

Site: EEMC KENT, WA Date: 5/12/92											
Analyzer: Make: HORIBA Model: PIR QOOO SN: 403019											
Calibr	ation l	by:_	0.	King	man	· · · · · · · · · · · · · · · · · · ·	•			• • •	
Cal Gas Flow: 1.5 SCFH Measured by: Rotameter: X Mass Flowmeter: BP: 30.36 Instrument ID: PRINCO Instrument ID: TR Analyzer last calibrated: 5/8/92 By: 0. Kungman											
Analyz	er last	t cal	Librate	:d:	<u>5/8/93</u>	ર	By:_	<u>O. k</u>	ingn	an	.
Cylind	·	7 Cor	.contr=	tion:	0.00	PPM S	502 Cv1	. Pres	s.: {	300	_PSI
2. #AL 2892 Concentration 1232 PPM SO2 Cyl. Press.: 450 PSI Certified by: LIQUID AIR Date: 9/24/91											
3. # CC 44776 Concentration 2)27 PPM SO2 Cyl. Press.: 1000 PSI Certified by: Liquid AiR Date: 5/13/98											
4. #AAL 5858 Concentration 626 PPM SO2 Cyl. Press.: 1500 PSI Certified by: Liquid AiR Date 11/2/87											
Analyzer: Calibrated Range: 0-0500 PPM Output: 0-1.0 Flow: 1.5 SCFH Measured by: Rotameter: X Mass Flowmeter:											
Point	Cyl.	PPM	Expe	ted	Acti	Actual		Adj.		Potenti	omet
#	#	1	Meter	DVM	Meter	DVM	Meter	DVM	Dif.	Unadj.	A
1	1	00.0	00.0	.000	00.1	.001	0.00	.000		4.44	4.
2	2	+	49.3	.493	49.9	.499	49.3	.493		3.53	3.7
3	3	2127	85.1	.851	85.1	.851					
4	4	626	25.0	.250	24.7	. 247					
5	1	0.00	00.0	.000	100.0	.000					
Commen	ts:		.5=	1251.	473						ŧ

Y = MX + B Slope (M) = 0.0004000 Y Intercept (B) = -0.0013695 Correlation Coefficient (r) = 0.9999893 r² = 0.9999787

Analyzer Output (volts)



Span: Gas Concentration (PPM SO2)

EPA Span Value = $\pm 1/2.0\%$ of 2500 PPM SO2 = $\pm 1/2.0\%$ PPM Cal Volts = Cal Volt Conc - Std Conc = $\pm 1/2.0\%$ RS1 = $\pm 1/2.$

OPERATORS MA NOWAK/JASTODDARD PANNEE .O.O - ASO DOM SOA O 2851 2851 2851 2851 2851 2851 **多** 0 1920 O רכו 0 1330 EFERENCE MATERIAL OR NETHOD ZERGES AND SPANS WITH CERTIFIED CYLINDER GASES O +35% 030 0 133 0 Hacials 2014 3 Ø HAWAIS SON 1320 1039 1403019 Span: HAULUIS 233 **6**/8 HAUGHS 98032 5/18 5/16 Pec6 Hauris 30 INSTRUMENT/SH HORUBA PIR ACCO 093 2.0% +20% HAUGHS CONTROL CHART ker, wa 5/16 HANAHS SEO SEO 겁 POST4 HAUGHS 5/15 PRS 4 Haug45 0,07 POST 3 HANGHS LOCATION 1330 Peri3 HALLEHS SATX 5/3 골 골 목 HOUWIS SON Zero: 贸 ITE EEMC - West 35 HAUGHS. 5/13 'ARAHETER SOA S ĩ Span Response aro Response % Difference COMMENTS/ ACTIONS nifference Span Actual Actual INTE



ANALYSIS OF CALIBRATION GAS MIXTURES

TEST DATE <u>4/29/9</u>	SOURCE TESTED Take	LOCATION Kent IVA
REFERENCE METHOD	USED EPA Method	
SPECIES <u>502</u>	CALIBRATION GAS MIXTURE SAMPLE #1 /2/7 PPM SAMPLE #2 /220 PPM SAMPLE #3 /2/9 PPM AVERAGE /2/9 PPM	GIVEN VENDOR TANK VALUE AL 2892 1232
SPECIES SO2	CALIBRATION GAS MIXTURE SAMPLE #1 2081 PPM SAMPLE #2 2/04 PPM SAMPLE #3 2090 PPM AVERAGE 1093 PPM	GIVEN VENDOR TANK VALUE ### 1776 ### 776
SPECIES 502	CALIBRATION GAS MIXTURE SAMPLE #1 622 PPM SAMPLE #2 666 PPM SAMPLE #3 607 PPM AVERAGE 612 PPM	GIVEN VENDOR TANK VALUE AH L 5858 626 ppm
SPECIES	CALIBRATION GAS MIXTURE SAMPLE #1 2/48 PPM SAMPLE #2 2/90 PPM SAMPLE #3 2/99 PPM AVERAGE 2/72 PPM	GIVEN VENDOR TANK VALUE 2065 2202 pron-
SPECIES 502	CALIBRATION GAS MIXTURE SAMPLE #1 505 PPM SAMPLE #2 520 PPM SAMPLE #3 504 PPM AVERAGE 572 PPM	GIVEN VENDOR TANK VALUE CC 97188 497 ppn
Data Taken By	il W	•

Triplicate analyses of the gas mixtures shall be performed within two weel prior to use of gas, using ref. methods 6 or 7. Analyze each mixture (50 90%). Each test must be within 20% of the 3 test mean. This form applies to extractive systems only.

SOZ TANK CALCULATIONS

```
Tank ID <u>AL 2892</u>
                                              1232 gays ...
Test # 1
Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
Vm(std) = ( \frac{1.48}{0.000} cf) 17.65 ( \frac{1.01}{0.000} mcf) ( \frac{30.17}{0.000} + \frac{.0213.6}{0.000} 
        = <u>//488</u>_dscf
Concentration SO2 - ppm v/v dry

Normality (N) = 0.0099 ml Ba++ = 430

ppm v/v dry = (ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])
                          Vm(std)
ppm v/v dry = (4/30)(32)(.0099)(13.29 \times 10[-6])(10[6])
= (1.488)
Test # 2
Gas Volume - Dry Standard Conditions
Vm \text{ (std)} = VmKY[Pb+(\Delta H/13.6)]/Tm
= /.5/9 dscf
Concentration SO2 - ppm v/v dry
                                              ml Ba++ = \frac{440}{}
Normality (N) = .0099 ml Ba++ = ppm v/v dry = (ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])
                          Vm(std)
ppm v/v dry = (440)(32)(.0099)(13.29 \times 10[-6])(10[6])
= (220)
Test # 3
Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
Concentration SO2 - ppm v/v dry
                                              ml Ba++ = ______
Normality (N) = _______
ppm v/v dry = (ml Ba++)(32)(N)(13.29 \times 10[-6])(10[6])
ppm v/v dry = (\frac{439}{1219})(32)(.0099)(13.29 \times 10[-6])(10[6])
= \frac{1219}{1219}
```



24-Sep-91 PACIFIC RIM OXYGEN P.O. NO.: 15626 TUKWILA, WA

CERTIFICATION OF CYLINDER # AL-2892

COMPONENT:

MEAN CONCENTRATION:

Sulfur Dioxide NITROGEN 1232 +/- 19 ppm BALANCE

Cylinder pressure: Expiration date: 2000 psi 26-Mar-93

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Sulfur Dioxide was determined by direct comparison with NBS SRM 1662a, Sample No.:93-9-D, S/N FF-28200, 1013 +/- 10 ppm Sulfur Dioxide in Nitrogen, dated March 19, 1991. The analysis was performed on a Tracor Atlas 825R-D Hydrogen Sulfide Gas Analyzer, and a 856 Total Sulfur Hydrogenator, Serial #3725, with furnace 001419, s/n 9009115 operated at @1265 deg C. The last multipoint range calibration was done on August 14, 1991.

Authorized signature



```
EPA PROTOCOL NO.1 DATA SHEET COMPONENT: SULFUR DIOXIDE
                                                            304-1317
NBS SRM 1662a
                    FF-28200 93-9-D
                                            1013 +/- 10 ppm SO2 in N2
         TRIAD #1 TRIAD #2 TRIAD #3 TRIAD #4 TRIAD #5 TRIAD #6
         109/17/91 109/17/91 109/17/91 109/24/91 109/24/91 109/24/91 1
DATE
         ! VDC X10 : VDC X10 : VDC X10 : VDC X10 : VDC X10 ! VDC X10
UNITS
                               7.470 :
             7.450 :
FF-28200 :
                       7.460
                                           8.000 :
                                                     7.950 !
                                                               7.900
                       0.000 1
                                 0.000 :
                                                     0.000 1
ZERO
             0.000 :
                                           0.000 1
                                                               0.000 :
                       9.120 L
                                 9.140 :
                                                     9.630 1
AL-2892
             9.120 I
                                           9.590 1
                                                               7.620 :
```

```
EPA PROTOCOL NO.1 WORK SHEET COMPONENT: SULFUR DIOXIDE
                                                            304-1317
NBS SRM 1662a
                    FF-28200 93-9-D
                                           1013 +/- 10 ppm SD2 in N2
         TRIAD #1 TRIAD #2 TRIAD #3 TRIAD #4 TRIAD #5 TRIAD #6 TRIAD #6
    DATE :09/17/91 :09/17/91 :09/17/91 :09/24/91 :09/24/91 :09/24/91
   UNITS !VDC X10
                  :VDC X10
                             IVDC X10
                                       IVDC X10 IVDC X10
                                                           :VDC X10
FF-28200 :
                                 7.470 :
             7.450 :
                       7.460 1
                                           8.000 |
                                                     7.950 :
ZERO
                       0.000 :
                                 0.000 :
                                           0.000 |
             0.000 :
                                                     0.000 :
                                                               0.000
AL-2892
             9.120 |
                       9.120 :
                                 9.140 :
                                           9.590 :
                                                     9.630 :
                                                               9.620
 ASSAYS: | 1240.08 | 1238.41 | 1239.47 | 1214.33 | 1227.07 | 1233.55
                            IVALID
         :VALID
                   :VALID
                                       :VALID :VALID
                                                           :VALID
                                                              1225.0
         TRIADS 1,2,3 MEAN:
                                1239.3 TRIADS 4,5,6 MEAN:
                                       CONCENTRATION IN ppm:
```

VARIABILITY VDC X10 PPM x PPM

ZERO: 0.0005 0.8724

MIXd: 0.0005 0.8724

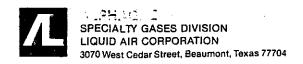
LINEARITY: 0.0100 348.94

TOLERANCE SQRT SUM: 19 ppm

(EEIMIG)

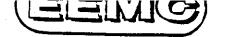
SOZ TANK CALCULATIONS

```
Date 4/29/92 Tank ID CC 44 776
 Test # 1
 Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
= /.535_dscf
Concentration SO2 - ppm v/v dry
Normality (N) = \frac{2099}{\text{ppm v/v dry}} ml Ba++ = \frac{760}{\text{ppm v/v dry}} ml Ba++ = \frac{760}{\text{ppm v/v dry}}
                        Vm(std)
ppm v/v dry = (\frac{160}{1.535})(32)(.099)(13.29 \times 10[-6])(10[6])
= 1085
Test # 2
Gas Volume - Dry Standard Conditions
V_m (std) = V_mKY[Pb+(\Delta H/13.6)]/T_m
= 1.529 dscf
Concentration SO2 - ppm v/v dry
ppm v/v dry = \frac{.0099}{\text{(ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])}}
ppm v/v dry = (\frac{164}{2104})(32)(.0099)(13.29 \times 10[-6])(10[6])
= \frac{2104}{2104}
Test # 3
Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
= /.55/_dscf
Concentration SO2 - ppm v/v dry
Normality (N) = .0069 ml Ba++ = ppm v/v dry = (ml Ba++)(32)(N)(13.29 \times 10[-6])(10[6])
                                         ml Ba++ = 770
ppm v/v dry = (770)(32)(.0099)(13.29 \times 10[-6])(10[6])
= 2090
```



ANALYSIS CERTIFICATION

CANDIDATE GAS STANDARD		
SERIAL NUMBER	SULFUR DIOXIDE NITROGEN	CC-44776 2127 PPM BALANCE
BALANCE GAS		
PRESSURE (PSIG)		E_19_00
DATE OF ASSAY/CERTIFICATION		J-13-00
DATE OF ASSAY/CERTIFICATION CERTIFICATION EXPIRATION DATE		3-2-67
SRM REFERENCE STANDARD		
STANDARD REFERENCE MATERIAL N	IUMBER	18203
SKI CONCENTRATION	•	•
ANALYZER READINGS FOR CALCULA	ATIONS:	
FIRST ANALYSIS SECOND ANAL	YSIS	
DATE 5-4-99 DATE 5-13-8	38	
DATE 5-6-88 DATE 5-13-8 (1) 2137 (1) 2118	.	
(1) 2137 (1) 2118 (2) 2133 (2) 2122		
(2) 2133 (2) 2122		
(3) 2127 (3) 2125		
MEAN 2132 MEAN 2122	REPORTED ME	AN 2127
MEAN 2132 MEAN 2122	REPORTED ME	AN 2127
	REPORTED ME	AN 2127
MEAN 2132 MEAN 2122 ANALYZER USED	REPORTED ME	AN 2127
ANALYZER USED		
ANALYZER USED MAKE	AIR LAB	
ANALYZER USED MAKE	AIR LAB	
ANALYZER USED MAKE	AIR LAB	
ANALYZER USED MAKE	AIR LAB	CONDUCTIVITY
ANALYZER USED	AIR LAB	CONDUCTIVITY
MAKE	AIR LAB TC 100 003 THERMAL BRATION5-5-88	CONDUCTIVITY D ACCORDING TO
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF	AIR LAB TC 100 003 THERMAL BRATION 5-5-88 TION WAS PERFORME	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF	AIR LAB TC 100 003 THERMAL BRATION 5-5-88 TION WAS PERFORME	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE	AIR LAB TC 100 003 THERMAL BRATION 5-5-88 TION WAS PERFORME	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF THIS NBS-TRACEABLE CERTIFICATEPA PROTOCOL 1, SECTION 2.0.0 G1: ASSAY AND CERTIFICATION	AIR LAB TC 100 003 THERMAL BRATION 5-5-88 TION WAS PERFORME	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF THIS NBS-TRACEABLE CERTIFICATEPA PROTOCOL 1, SECTION 2.0.01: ASSAY AND CERTIFICATION WITHOUT DILUTION.	AIR LAB TC 100 003 THERMAL BRATION 5-5-88 TION WAS PERFORME	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF THIS NBS-TRACEABLE CERTIFICATEDA PROTOCOL 1, SECTION 2.0.0 G1: ASSAY AND CERTIFICATION WITHOUT DILUTION. CERTIFIED BY:	AIR LAB TC 100 003 THERMAL BRATION5-5-88 FION WAS PERFORME 7, SUBSECTION 2.0 OF A COMPRESSED	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF THIS NBS-TRACEABLE CERTIFICATEDA PROTOCOL 1, SECTION 2.0.0 G1: ASSAY AND CERTIFICATION WITHOUT DILUTION. CERTIFIED BY:	AIR LAB TC 100 003 THERMAL BRATION5-5-88 FION WAS PERFORME 7, SUBSECTION 2.0 OF A COMPRESSED	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF THIS NBS-TRACEABLE CERTIFICATEPA PROTOCOL 1, SECTION 2.0. G1: ASSAY AND CERTIFICATION WITHOUT DILUTION. CERTIFIED BY: LABORATORY: ALPHAGAZ- BEAUMOR	AIR LAB TC 100 O03 THERMAL BRATION5-5-88 TION WAS PERFORME 7, SUBSECTION 2.0 OF A COMPRESSED	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE
MAKE MODEL SERIAL NUMBER MEASUREMENT PRINCIPLE DATE OF LAST MULTIPOINT CALIF THIS NBS-TRACEABLE CERTIFICATEDA PROTOCOL 1, SECTION 2.0.0 G1: ASSAY AND CERTIFICATION WITHOUT DILUTION. CERTIFIED BY:	AIR LAB TC 100 O03 THERMAL BRATION5-5-88 TION WAS PERFORME 7, SUBSECTION 2.0 OF A COMPRESSED	CONDUCTIVITY D ACCORDING TO .7.1 PROCEDURE



SO2 TANK CALCULATIONS

```
Tank ID AAL 5858 (626 ppm)
 Test # 1
 Gas Volume - Dry Standard Conditions
 Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
= 1,488 dscf
Concentration SO2 - ppm v/v dry
Normality (N) = 0099 ml Ba++ = ppm v/v dry = (ml Ba++)(32)(N)(13.29 \times 10[-6])(10[6])
                                       ml Ba++ = 220
                      Vm(std)
ppm v/v dry = (\frac{220}{1.488})(32)(\frac{.0099}{13.29})(13.29 \times 10[-6])(10[6])
Test # 2
Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
= /,50% _dscf
Concentration SO2 - ppm v/v dry
                                       ml Ba++ = \frac{2/6}{}
Normality (N) = ________
ppm v/v dry = (ml Ba++)(32)(N)(13.29 \times 10[-6])(10[6])
Test # 3
Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(ΔH/13.6)]/Tm
= 1.484 dscf
Concentration SO2 - ppm v/v dry
Normality (N) = \frac{.0099}{\text{ppm v/v dry}} ml Ba++ = \frac{\frac{1}{4}}{\text{ppm v/v dry}}
ppm v/v dry = (2/4)(32)(.0099)(13.29 \times 10[-6])(10[6])
= (-1.484)
```

E17.5	.EF:.488100	1. DA 92411	7919 E : 7	14-187-187	71	FAX : 714-897-	3549		Expir	ation :	1 1 / 3
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		AAU-5359		12 C 1 C 1 C	MITE	525.51 PP	7	HITREGEN		1986 osi	······································
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	REFE	25465 57	3		8	AS ANALY	ZER				
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	-	AAL-17847 91	9.2 PPK		4	и 70 кт 00 7 2 9		34/14/38		ULIRA-VI	er per
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TEET	345	REFERENCE	2572 345		REBULTE	i i tëst gas	REFERENC GAS	E I	ERB BAE		52
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				AVETAGE :						AVERNIE STO BEVA	

Adenéhas chin

Jane H. Sion



SO2 TANK CALCULATIONS

```
Date 4/29/92
                            Tank ID <u>CC97188</u> (497 ppr-)
 Test # 1
 Gas Volume - Dry Standard Conditions
 Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
 = 1.506 dscf
 Concentration SO2 - ppm v/v dry
Normality (N) = \frac{0.099}{\text{ml Ba++}} ml Ba++ = ppm v/v dry = \frac{\text{(ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])}}{\text{ml Ba++}}
                                         ml Ba++ = 180
                       Vm(std)
ppm v/v dry = ( /80 )(32)(.0099)(13.29 \times 10[-6])(10[6])
Test # 2
Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
= /-506 dscf
Concentration SO2 - ppm v/v dry
                                        ml Ba++ = 186
Normality (N) = 0.099
ppm v/v dry = (ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])
ppm v/v dry = ( /86 )(32)(,0099)(13.29 \times 10[-6])(10[6])
= ( ... /.506 )
Test # 3
Gas Volume - Dry Standard Conditions
Vm (std) = VmKY[Pb+(ΔH/13.6)]/Tm
= /,540 dscf
Concentration SO2 - ppm v/v dry
                                         ml Ba++ = 188
Normality (N) = .0099
ppm v/v dry = (ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])
ppm v/v dry = ( /88 )(32)(.0099)(13.29 \times 10[-6])(10[6])
= 5/4
```



08-Aug-91 PACIFIC RIM OXYGEN P.O.#: 155901 TUKWILA, WA

CERTIFICATION OF CYLINDER # CC-97188

COMPONENT:

MEAN CONCENTRATION:

Sulfur Dioxide NITROGEN

497 +/- 19 ppm BALANCE

Cylinder pressure: Expiration date:

2000 psi 07-Feb-93

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Sulfur Dioxide was determined by direct comparison with NIST SRM 1661a, Sample No.:94-36-E, S/N FF28536, 485 +/- 5 ppm Sulfur Dioxide in Nitrogen, dated May 14, 1990. The analysis was performed on a Tracor Atlas 825R-D Hydrogen Sulfide Gas Analyzer, and a 856 Total Sulfur Hydrogenator, Serial #3725, with furnace 001419, s/n 9009115 operated at @1265 deg C. The last multipoint range calibration was done on July 24, 1991.

Authorized signature



```
EPA PROTOCOL NO.1 DATA SHEET
                              COMPONENT: SULFUR DIOXIDE
                                                            0-600 ppm
                                             485 +/- 5 ppm
                                                           502 in N2
                    FF28536
                              94-36-E
NBS SRM 1661a
         TRIAD #1 TRIAD #2 TRIAD #3 TRIAD #4 TRIAD #5 TRIAD #6
         107/19/91 107/19/91 107/19/91 108/08/91 108/08/91 108/08/91 1
DATE
         ; VDC X10 ; VDC X10 ; VDC X10 ; VDC X10 ; VDC X10 ; VDC X10 ;
STINU
                                  8.82 |
                                                      8.82 :
                                                                8.83 :
                        8.82 :
                                            8.80 ;
              8.83 |
FF-28536 :
                        0.00 1
                                  0.00 |
                                            0.00 |
                                                      0.00 :
                                                                0.00 |
              0.00 1
    ZERO :
                                  9.07 1
                                            9.02 |
                                                      9.04
                                                                9.03 :
                        9.05
              9.03 :
CC-97188 |
```

```
EPA PROTOCOL NO.1 DATA SHEET
                             COMPONENT: SULFUR DIOXIDE
                                                          0-600 ppm
                             94-36-E
                                            485 +/- 5 ppm SO2 in N2
                   FF28536
NBS SRM 1661a
         TRIAD #1 TRIAD #2 TRIAD #3 TRIAD #4 TRIAD #5 TRIAD #6
         :07/19/91 :07/19/91 :07/19/91 :08/08/91 :08/08/91 :08/08/91
  UNITS : VDC X10 : VDC X10 : VDC X10 : VDC X10 : VDC X10 : VDC X10
                                                              8.83
                                 8.82 |
                                           8.80 :
                                                    8.82
                       8.82 |
FF-28536 1
             8.83 :
                                           0.00 :
                                                              0.00 :
                                 0.00
                                                    0.00
ZERO
             0.00 |
                       0.00 |
                                                    9.04
                                           9.02 1
CC-97188
             9.03 |
                       9.05 |
                                 9.07
                                                            495.99
           495.99 |
                     497.65
                              498.75
                                      1
                                        497.13 | 497.10 |
 ASSAYS: 1
                                             :VALID
                                                         :VALID
                            :VALID
                                      IVALID
         :VALID
               IVALID
                                                             496:7
                               497.5
                                      TRIADS 4,5,6 MEAN:
         TRIADS 1,2,3 MEAN:
                   SULFUR DIOXIDE
                                      CONCENTRATION IN ppm:
```

```
PPM x PPM
VARIABILITY
              VDC
                        0.0885
     ZERO :
             0.0005
                      318.6225
      SRM :
             0.0300
                        0.3540
              0.0010
     SRMd :
                        0.3540
             0.0010
     MIXd:
                       35.4025
              0.0100
LINEARITY :
                             19 ppm
           SQRT SUM :
TOLERANCE
```

(ELIMICS)

SO2 TANK CALCULATIONS

```
Date 4/29/92 Tank ID 2065
                                                                                                                  (2208 ppm)
   Test # 1
   Gas Volume - Dry Standard Conditions
   Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
   = 1.525 dscf
   Concentration SO2 - ppm v/v dry
                                                                                                                         ml Ba++ = 178
  Normality (N) = \frac{.0099}{\text{ml Ba++}} ml Ba++ = ppm v/v dry = \frac{\text{(ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])}}{\text{ml Ba++}}
  ppm v/v dry = ( 778 )(32)(.0099 )(13.29 \times 10[-6])(10[6])
= 2/48
  Test # 2
 Gas Volume - Dry Standard Conditions
  Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
 = /,499_dscf
 Concentration SO2 - ppm v/v dry
                                                                                                                         ml Ba++ = 180
 Normality (N) = 0.099 ml Ba++ = ppm v/v dry = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ = 0.099 ml Ba++ =
ppm v/v dry = (750)(32)(.009)(13.29 \times 10[-6])(10[6])
 Test # 3
 <u> Gas Volume - Dry Standard Conditions</u>
 Vm (std) = VmKY[Pb+(\Delta H/13.6)]/Tm
= 1.519 dscf
Concentration SO2 - ppm v/v dry
                                                                                                                       ml Ba++ = <u>786</u>
Normality (N) = \frac{0.099}{\text{(ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])}} ml Ba++ = ppm v/v dry = \frac{\text{(ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])}}{\text{(ml Ba++)(32)(N)(13.29 X 10[-6])(10[6])}}
ppm v/v dry = (\frac{186}{10099})(32)(\frac{10099}{1009})(13.29 \times 10[-6])(10[6])
= \frac{2179}{10099}
```



DATE:

March 3, 1990

EXPIRATION DATE:

September 3, it

CUSTOMER: A L Compressed Gas

P. O. NUMBER:

202

CERTIFICATION OF CYLINDER AL 2065, PRESSURE 1990 psig

- 1. These gases were analyzed and certified according to EPA protocol =
- 2. Thermo-Electron Model 43a Analyzer using EPA method EQSA 0486 060 winsed for the analysis. The date of the analyzer's last audit was 12/5/1989.
- 3. National Institute of Standards and Technology's standard reference material 1664a which is 2339. ppm in sulfur dioxide in cylinder FF18327, which expires 12/27/91 was used as the reference.
- 4. Brooks flow controllers, model 5850 which was calibrated 3/5/90 was used to dilute the sample into the range of the analyzer.

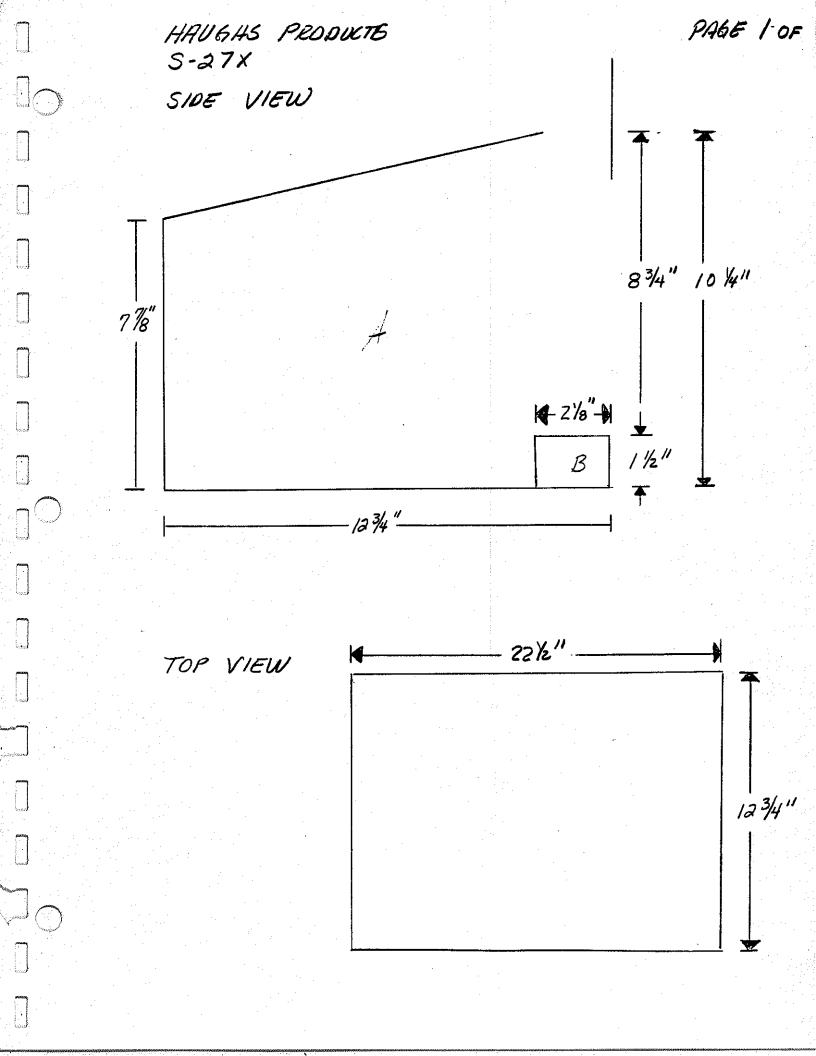
DATA

2/27/91 Blank SRM AL2065	0.000 1.086 1.033	0.000 1.087 1.028	0.000 1.088 1.028	Indicated	SO2	2212	mqg
3/9/91 Blank SRM AL2065	0.000 1.164 1.093	0.000 1.051 1.094	0.000 1.054 1.091	Indicated	SO2	2204	ppm

Average 2208. ppm Sulfur Dioxide In NITROGEN balance

Jun Der

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VOLUME CALCULATIONS

$$A = \frac{7.875 + 10.25}{2} \times 12.75 \times 22.5 = 2599.805$$

$$B = 2.125 \times 1.5 \times 22.5 = 71,719$$

$$A - B = 2599,805 - 71.719 = 2528.086$$

∡a Court pion, Ontario ada L6T 5C1 40NE: 418-792-8000 AX: 416-792-8053



Forest Home Industrial Park Orillia, Ontario Canada L3V 6H1 PHONE: 705-325-4155 FAX: 705-325-8816

S270X STOVE LAB INSTRUCTIONS

Air settings for the various burn categories are as follows:

Maximum Burn:

Primary air fully open

Medium High:

Slider set 1/4 - 1/2 inch from closed

position

Medium Low:

Slider set 1/8 inch from closed position or completely closed for minimum burn rate possible (below

1.00 kg/hr.)

During First 5 min:

Medium High & Medium Low Keep door cracked between 1/2 inch to 1 inch. Close door at 4½ minutes.

Adjust door if wood does not seem to be

igniting.

Air setting fully open until 4 minutes 50 seconds then slowly adjusted to burn

rate setting at 5 minutes.

Maximum Burn Rate:

Keep door cracked between 1/2 to 1 inch. Adjust door if wood does not seem to be igniting. Air setting fully open. Close door at 5 minutes.

-All dimensions are taken from left primary opening. NOTE:

-Fan is turned off for first 30 minutes of test and

then turned on to high.

Ref Geroux

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EEMC

FAX to EPA - 5/13
UPS TO EPA - 5/13 1727 3316 096