



Certification Test Report

Hearth & Home Technologies Inc.

Freestanding Wood Stove
Model: 2100 ACC

Report Number: 061-S-70-3

OMNI-Test Laboratories Inc.
Product Testing & Certification

Mailing: Post Office Box 743
Street: 5465 SW Western Avenue • Suite G
Beaverton, Oregon 97075 USA

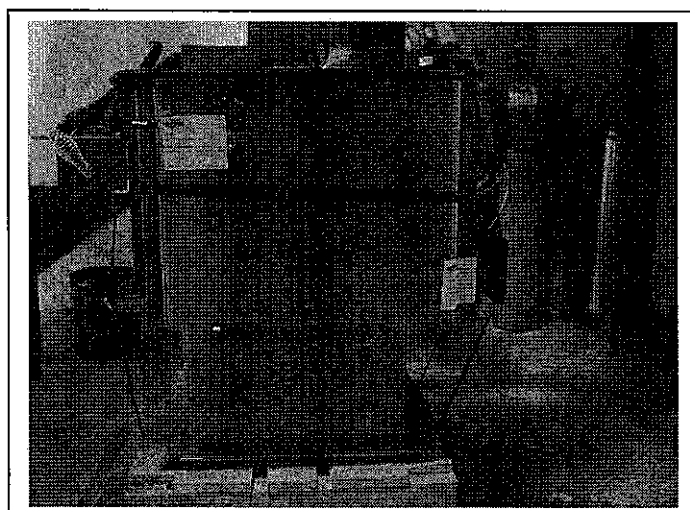
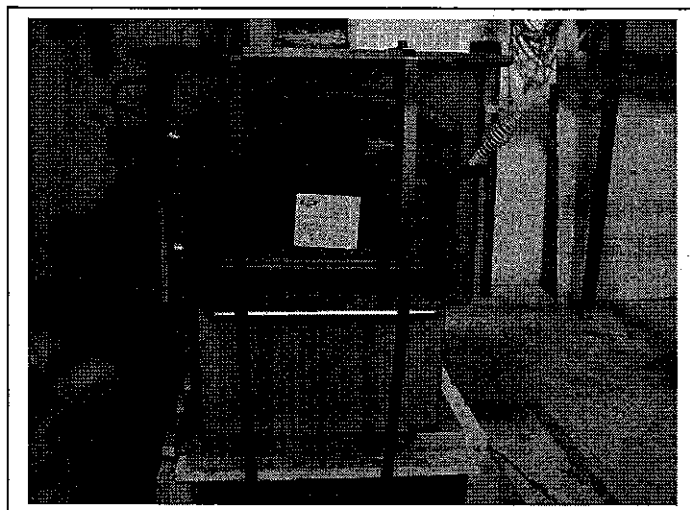


Phone: (503) 643-3788
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Model: 2100 ACC
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114

Hearth & Home Technologies
2100 ACC

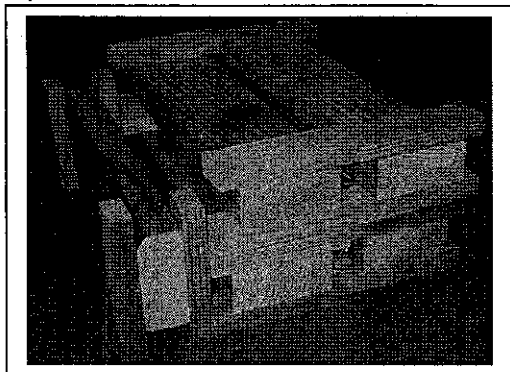
Test Dates: January 10, 2007 through January 12, 2007



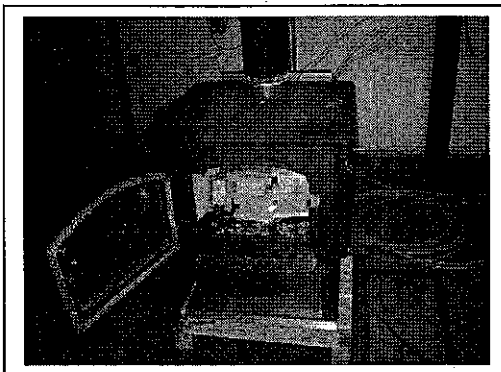
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Hearth & Home Technologies 2100 ACC

Run 1 – Fuel



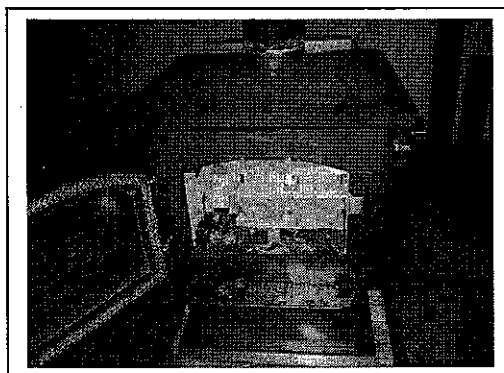
Run 1 - Newly Loaded Stove



Run 2 – Fuel

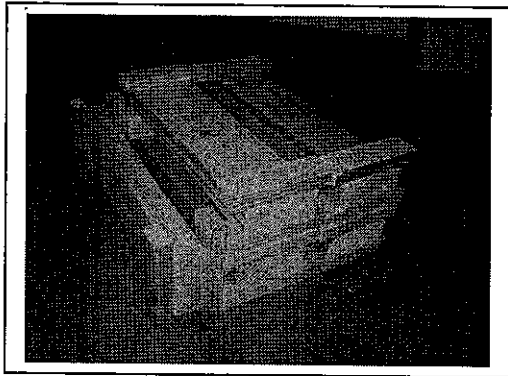


Run 2 - Newly Loaded Stove

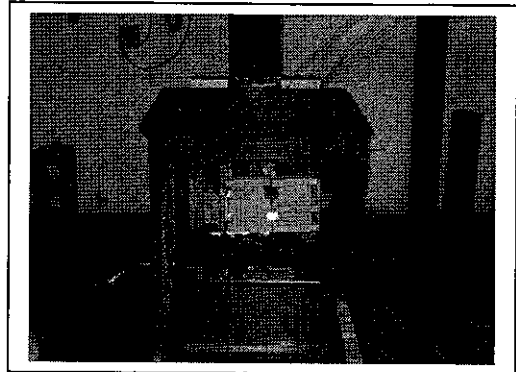


Hearth & Home Technologies 2100 ACC

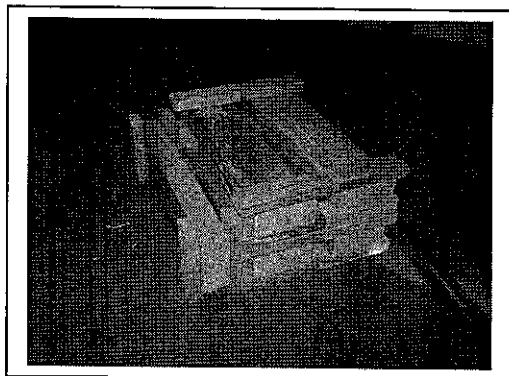
Run 3 – Fuel



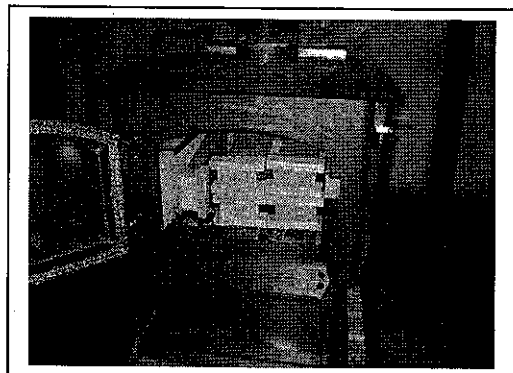
Run 3 - Newly Loaded Stove



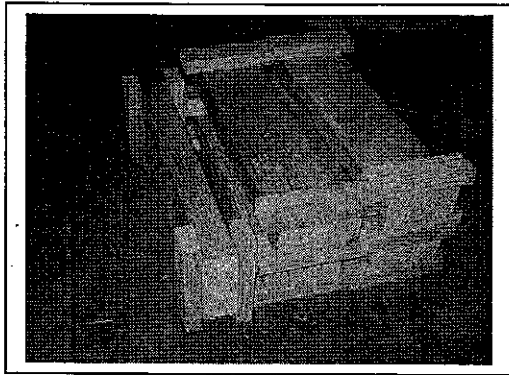
Run 4 – Fuel



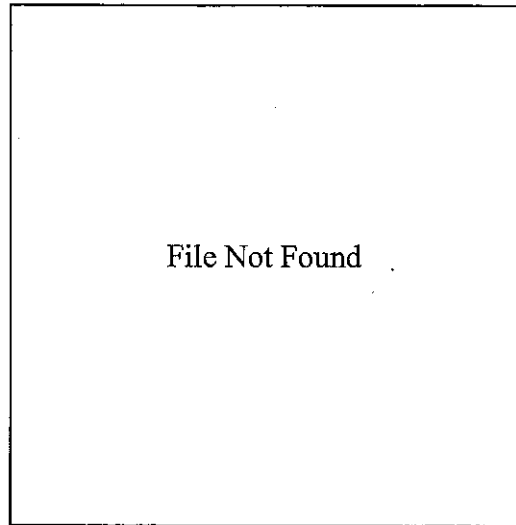
Run 4 - Newly Loaded Stove



Run 5 – Fuel



Run 5 - Newly Loaded Stove



*Model: 2100 ACC
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Section 4

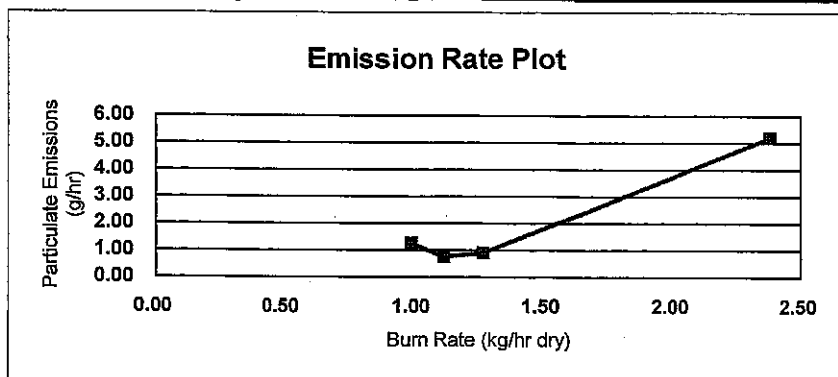
Test Data by Run

EPA Weighted Average Emissions

EPA Method 28

Client: Hearth & Home Test Status: Final
 Stove Model: 2100 ACC Stove Type: Non-Catalytic Stove
 Test Dates: January 10 through January 12, 2007
 Project Number: 061-S-70-3
 Tracking Number: 959
 Signature/Date: *BD - 2-9-07*

Weighted Average (g/hr) 2.1



Run #	1	
Burn Rate (dry kg/hr)	0.99	<i>Low</i>
Category	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	1.26	
Cap (g/hr)	15	
Weighting Factor	0.472	29.79%
Heat Output (BTU/hr)	11963	

Run #	3	
Burn Rate (dry kg/hr)	1.12	<i>ML</i>
Category	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	0.75	
Cap (g/hr)	15	
Weighting Factor	0.222	13.99%
Heat Output (BTU/hr)	13534	

Run #	2	
Burn Rate (dry kg/hr)	1.27	<i>MH</i>
Category	3	
Overall Efficiency (%)	63%	
Emissions (g/hr)	0.9	
Cap (g/hr)	15	
Weighting Factor	0.482	30.42%
Heat Output (BTU/hr)	15346	

Run #	5	
Burn Rate (dry kg/hr)	2.38	<i>High</i>
Category	4	
Overall Efficiency (%)	63%	
Emissions (g/hr)	5.19	
Cap (g/hr)	18	
Weighting Factor	0.409	25.80%
Heat Output (BTU/hr)	28759	

*Model: 2100 ACC
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114*

Run 1

Wood Heater Test Data
EPA Method 5H

Run Number 1

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	2100 ACC	Test Meter 'y':	0.972
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH@:	1.965
Project Number:	061-S-70-3	Pilot Tube Cp:	0.99
Test Date:	09-Jan-07	Average Barometric Pressure:	28.31
Test Start Time:	15:21	Average Fuel Moisture (dry basis %):	21.07
Recording Interval (minutes):	10	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	220		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8		Initial
Initial dP	0.039	0.040	0.038	0.032	0.035	0.038	0.040	0.036	"H2O	137.6
Initial Temp	95	95	95	95	95	95	95	95	oF	scf/minute

Signature/Date: B. J. 2-6-07
Post-Test Leak Check: .004@5 cfm@"Hg

Initial/Assumed Values			
Dilution Tunnel	MW (lb/lb-mol)	28.56	Ambient CO2 (%)
	H2O (%)	4.00	Preferred Initial Sampling Rate (cfm/minute)
			0.034
			0.32

Flue Gas	
Impinger liquid, Vlc (g)	122.2
Volume of Water Vapor, Vw(std) (ft3)	5.76
Moisture Content, Bws	0.069

Elapsed Time	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel					Laboratory
	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg.)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)	
0	0.000		0.32		65	0	88	231	9.7		-0.024	14.0	5.6	1.29	198	14.7	277	397	338	461	429	380	95	0.037	-0.40	0.390	77	
10	3.316	0.332	0.75	100.0	65	1	59	230	8.8	-0.9	-0.048	10.4	9.2	0.46	333	11.1	357	391	274	410	383	363	105	0.037	-0.40	0.940	69	
20	8.121	0.481	0.77	97.4	64	1	57	231	7.6	-1.2	-0.052	10.4	9.7	0.35	390	10.7	512	380	252	404	362	382	113	0.037	-0.40	1.010	75	
30	12.930	0.481	0.64	97.5	64	1	64	231	6.4	-1.2	-0.052	7.8	12.4	0.51	415	8.5	608	367	277	423	390	413	116	0.037	-0.40	1.170	77	
40	17.346	0.442	0.55	99.0	64	1	64	231	5.2	-1.2	-0.050	7.9	12.3	0.29	383	8.7	601	357	302	469	439	434	113	0.037	-0.40	1.080	76	
50	21.396	0.405	0.55	98.0	64	1	66	230	4.3	-0.9	-0.050	9.5	10.8	0.23	370	10.0	605	349	323	509	484	454	111	0.037	-0.40	0.930	77	
60	25.502	0.411	0.54	99.8	63	1	64	231	3.6	-0.7	-0.044	10.8	9.4	0.26	326	11.1	514	342	330	526	504	443	107	0.037	-0.40	0.820	75	
70	29.584	0.406	0.54	99.6	63	1	61	231	2.9	-0.7	-0.045	10.4	9.8	0.34	334	10.6	527	335	337	531	516	449	107	0.037	-0.40	0.850	76	
80	33.684	0.412	0.48	101.3	63	1	61	231	2.3	-0.6	-0.042	12.3	8.0	0.27	306	12.7	485	330	345	530	534	445	104	0.037	-0.40	0.860	76	
90	37.503	0.382	0.44	99.6	62	1	62	231	1.9	-0.4	-0.035	13.8	6.4	0.69	258	14.4	406	325	351	518	519	424	100	0.037	-0.40	0.510	73	
100	41.182	0.368	0.41	100.6	62	1	63	231	1.7	-0.2	-0.031	14.5	5.1	1.11	222	16.1	331	321	340	493	489	395	96	0.037	-0.40	0.400	74	
110	44.807	0.383	0.43	102.0	62	1	64	230	1.5	-0.2	-0.027	14.7	3.9	1.87	200	17.0	283	318	326	453	465	369	84	0.037	-0.40	0.320	74	
120	48.388	0.358	0.39	98.4	64	1	64	230	1.3	-0.2	-0.025	14.7	4.1	1.65	187	17.1	254	316	302	423	430	345	93	0.037	-0.40	0.320	72	
130	51.832	0.344	0.44	99.1	65	1	65	230	1.2	-0.1	-0.023	14.8	4.0	1.69	178	17.2	236	316	292	401	402	329	92	0.037	-0.40	0.330	74	
140	55.406	0.357	0.45	96.9	66	1	58	230	1.1	-0.1	-0.021	14.7	4.2	1.46	173	17.3	225	317	291	385	384	320	92	0.037	-0.40	0.350	74	
150	59.154	0.376	0.51	100.1	67	1	56	230	0.9	-0.2	-0.020	14.6	4.2	1.80	171	17.0	218	318	290	376	374	315	92	0.037	-0.40	0.370	74	
160	63.101	0.394	0.49	98.5	68	1	56	230	0.8	-0.1	-0.020	14.5	4.4	1.68	169	16.3	214	319	292	371	369	313	92	0.037	-0.40	0.380	74	
170	67.007	0.391	0.41	99.3	69	1	58	230	0.7	-0.1	-0.019	14.3	4.8	1.45	169	16.0	213	320	299	370	366	314	92	0.037	-0.40	0.380	73	
180	70.616	0.361	0.39	100.0	69	1	59	231	0.6	-0.1	-0.019	14.4	4.8	1.62	169	15.6	213	319	308	371	366	316	90	0.037	-0.40	0.370	74	
190	74.105	0.349	0.36	99.4	69	1	60	230	0.4	-0.2	-0.019	14.2	5.0	1.72	168	15.0	211	319	321	371	364	317	90	0.037	-0.40	0.370	72	
200	77.495	0.339	0.34	100.8	69	1	60	230	0.3	-0.1	-0.019	14.4	4.8	1.84	169	15.2	214	319	329	371	367	320	89	0.037	-0.40	0.350	72	
210	80.779	0.328	0.34	99.4	69	1	61	230	0.2	-0.1	-0.019	14.5	4.4	1.94	167	15.7	213	319	332	371	365	320	89	0.037	-0.40	0.320	71	
220	84.049	0.327	0.36	100.1	69	1	62	229	0.0	-0.2	-0.019	14.5	4.4	1.95	164	15.7	209	320	332	368	362	318	89	0.037	-0.40	0.330	71	
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (%) O2	Average Carbon Dioxide (%) CO2	Average Carbon Monoxide (%) CO	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF)	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg/End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)	
220	84.049	0.382	0.47	99.39	65.4	1.00	62.26	230.39	9.70	-0.44	-0.03	12.87	6.59	1.14	244.22	14.07	344.61	335.39	312.35	430.65	420.13	62	98.30	0.04	-0.40	0.56	73.61	

Wood Heater Calculation Data
EPA Method 5H

Run	1
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	2100 ACC
Test Date:	09-Jan-07
Project Number:	061-S-70-3

Burn Rate (dry kg/hour) =	0.99
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Emission Rate (grams/hour) =	1.26
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Note: When using the CO2 tracer-gas method, 1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.5	1.10		137.6	8.8	0.114				
10	13.6	1.11	11.1	136.0	13.4	0.074	3.070	0.349	100.0	0.750
20	13.7	1.06	14.3	135.0	13.6	0.073	4.453	0.331	97.4	0.773
30	13.7	1.03	11.4	134.7	12.4	0.081	4.466	0.328	97.5	0.636
40	13.7	1.04	11.7	135.0	11.5	0.087	4.099	0.331	99.0	0.551
50	13.7	1.06	10.0	135.3	11.5	0.087	3.759	0.326	98.0	0.547
60	13.6	1.06	8.6	135.8	11.4	0.088	3.811	0.332	99.8	0.541
70	13.6	1.05	8.3	135.8	11.3	0.088	3.777	0.332	99.6	0.536
80	13.6	1.06	8.5	136.1	10.7	0.093	3.831	0.338	101.3	0.477
90	13.6	1.08	6.4	136.6	10.2	0.098	3.550	0.332	99.6	0.435
100	13.5	1.12	3.6	137.1	9.9	0.101	3.426	0.335	100.6	0.409
110	13.5	1.24	3.8	137.3	10.2	0.098	3.376	0.341	102.0	0.431
120	13.5	1.22	3.8	137.5	9.7	0.103	3.335	0.328	98.4	0.389
130	13.5	1.22	1.9	137.6	10.3	0.097	3.195	0.330	99.1	0.438
140	13.5	1.22	1.9	137.6	10.4	0.096	3.310	0.322	96.9	0.451
150	13.5	1.22	3.8	137.6	11.1	0.090	3.473	0.333	100.1	0.509
160	13.5	1.19	1.8	137.6	10.9	0.092	3.633	0.327	98.5	0.491
170	13.5	1.17	1.8	137.6	10.0	0.100	3.597	0.330	99.3	0.411
180	13.4	1.14	1.7	137.8	9.7	0.103	3.316	0.332	100.0	0.389
190	13.4	1.13	3.4	137.8	9.3	0.107	3.206	0.330	99.4	0.358
200	13.4	1.12	1.7	138.0	9.1	0.109	3.115	0.334	100.6	0.345
210	13.4	1.16	1.8	138.0	9.0	0.111	3.017	0.330	99.4	0.336
220	13.4	1.16	3.5	138.0	9.4	0.107	3.004	0.332	100.1	0.360
Averages/Totals	13.5	1.13	5.7	136.8	10.6	0.096	3.537		99.4	0.480

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	9.7
Average Moisture (% dry basis)	21.07
Average Moisture (% wet basis)	17.40
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	84.049
Pb (inches Hg)	28.31
Tm (avg oF)	65.43
dH (avg inches wc)	0.47
Vm (scf)	77.772
Qf by carbon balance (avg dscf/minute)	5.67
Analytical Data	
Probe/Front Wash (mg)	28.0
Front Filter (mg)	59.1
Impinger PM (mg)	182.5
Back Filter (mg)	19.6
Total Weight (mg)	289.2
Emission Results	
Cs (g/dscf)	0.0037
ER (g/hour)	1.26

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth & Home Technologies Equipment Numbers: _____ Run No.: 1
 Model: 2100 ACC Date: 01/10/07
 Project No.: 061-S-70-3
 Tracking No.: 959

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	N267	697.2	638.1		59.1
B. Rear filter catch	Filter	D483	172.1	152.5		19.6
C. Rinse of probe and filter assembly (FRONT)	Acetone	90	114799.3	114771.3	0.0000	28.0
D. Rinse of Impinger Set	Distilled Water	325	143096.5	143020.5	0.0000	76.0
E. Rinse of Impinger Set	Dichloromethane	155	108468.0	108427.5	0.0000	40.5
F. Rinse of filter assembly and gas train (BACK)	Acetone	125	111650.4	111584.4	0.0000	66.0
Total Particulate, mg :						289.2

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights		
	Final, g	Initial, g	Net, g
1	734.6	655.7	78.9
2	670.7	652.0	18.7
3	448.9	444.9	4.0
4	890.2	869.6	20.6
TOTAL, g:			122.2

Analyst: W.D.Date: 1-26-07

STOVE TEMPERATURE TEST DATA - METHOD 5G

Page 1 of 1

Client/Model: Health & Home Tech 2100 Acc Project #: 061-S-70-3 Tracking #: 959

Date: 1-9-07 Test Crew: B. Davis Run #: 1

OMNI Equipment ID #: _____

Preburn ☒		Coal Bed:				Actual:					
Test ☐		Data:		0 = $\emptyset$		Range: 2.0-2.4		Coal Bed: 2.4			
		TEMPERATURES (oF)									
Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
0	4.9	—	-0.30	68	348	494	444	587	571	235	WA
10	4.3	0.6	-0.40	66	392	489	423	551	522	244	
20	3.7	0.6	-0.38	75	395	465	400	532	496	233	
30	3.2	0.5	-0.37	73	402	441	391	514	481	238	
40	2.7	0.5	-0.32	75	410	417	388	526	480	220	
50	2.5	0.2	-0.25	76	326	404	357	491	457	179	
60	2.4	0.1	-0.24	75	281	398	340	464	432	197	
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											V

Technician signature:  Date: 1-15-07

FUEL DATA

Client: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3 Tracking #: 959

Date: 1-10-06

Test Crew: B DAVIS

Run #: 1

OMNI Equipment ID #: _____

FUEL LOAD PREPARED BY: B DAVIS

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER,
DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings	Type
1	<u>24"</u> ft	<u>22.6</u>	<u>2x4</u>
2	_____ ft	_____	_____
3	_____ ft	_____	_____

Length of cut pieces: 3 @ 8" inches

Pre-Burn Fuel Average Moisture: 21.20 %

Time (clock): 12:55 Room Temperature (F): 70 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 5 4 x 4 0
CALCULATED LOAD WEIGHT: 10.01 ACTUAL LOAD WEIGHT: 9.7 (2 x 4)
FUEL PIECE LENGTH: 14" 0 (4 x 4)
9.7 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS	TYPE
1	<u>20.9</u> <u>22.3</u> <u>22.1</u>	<u>2x4</u>
2	<u>22.0</u> <u>20.1</u> <u>20.1</u>	<u>2x4</u>
3	<u>23.0</u> <u>22.8</u> <u>23.8</u>	<u>2x4</u>
4	<u>20.2</u> <u>18.7</u> <u>20.2</u>	<u>2x4</u>
5	<u>18.4</u> <u>18.9</u> <u>20.4</u>	<u>2x4</u>
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 21.07

Time (clock): 12:55 Room Temperature (F): 70 Initials: BD

Technician signature: B DAVIS Date: 1-15-07

Run Notes

Client/Model: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3

Tracking Number: 959

Run #: 1 Date: 1-10-07

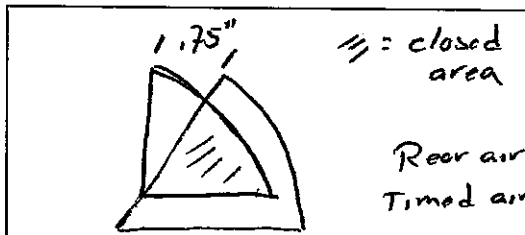
Test Crew: B & Davis

OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:



SECONDARY: fixed

TERTIARY: NA

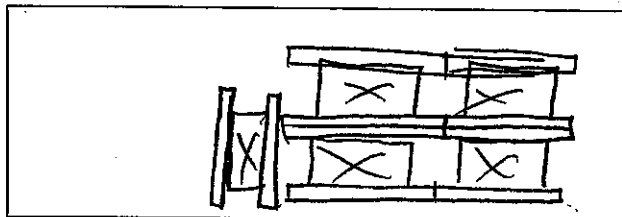
FAN: on High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0 51	Test setting				x	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NA

FUEL LOADING: By 60 sec.

DOOR: closed by 75 sec.

PRIMARY AIR: At Test setting full 5:00

Rear Air closed.

Timed air pushed prior to landing

OTHER: NA

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

Same As Above
Rear Air is closed
Timed Air operates for 20 min
before automatically closing

SECONDARY: fixed

TERTIARY: NA

FAN: on High full test duration

Technician signature: B & Davis

Date: 1-15-07

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 2100 ACC

Project No.: 061-S-70-3

Tracking No.: 959

Date: 1-9-07 Run No.: 1 Booth: 1

Test Crew: B Davis Start Time: 15:21 Stop Time: 19:01

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (^{Low CO₂} Method ~~5G~~ Only):

Initial: good

Final: good

Calibrations: Span Gas CO₂: 9.9 O₂: 10.48 CO: 6.25 CO₂(DT): 1.249

Time	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
	<u>Ø</u>		<u>EOT</u>					
O ₂	<u>0.0</u>	<u>10.4</u>	<u>0.0</u>	<u>10.3</u>				
CO ₂	<u>0.0</u>	<u>9.9</u>	<u>0.0</u>	<u>9.3</u>				
CO	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.20</u>				
CO ₂ (DT)	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.25</u>				

Stack Diameter (inches): 6"

Air Velocity (ft/min): Initial: 250 ft/min Final: 250 ft/min

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 3.0 Post: 0.0 @ 3.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 1-8-07 Initials: BD

	Initial	Middle	Ending
Pb (in. Hg)	<u>28.30</u>	<u>28.31</u>	<u>28.31</u>
Room Temp (°F)	<u>77</u>	<u>74</u>	<u>71</u>

Technician signature: BD Date: 1-15-07

*Model: 2100 ACC
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114*

Run 2

Wood Heater Test Data
EPA Method 5H

Run Number 2

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	2100 ACC	Test Meter 'Y':	0.972
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH@:	1.965
Project Number:	081-S-70-3	Pitot Tube Cp:	0.99
Test Date:	11-Jan-07	Average Barometric Pressure:	28.73
Test Start Time:	10:24	Average Fuel Moisture (dry basis %):	22.56
Recording Interval (minutes):	10	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	170		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8		Initial
Initial dP	0.034	0.042	0.046	0.039	0.039	0.043	0.042	0.034	"H2O	143.8
Initial Temp	91	91	91	91	91	91	91	91	oF	scf/minute

Signature/Date: BD 2-6-07
Post-Test Leak Check: .008@6 cfm@1Hg

Initial/Assumed Values			
Dilution	MW (lb/lb-mol)	28.56	Ambient CO2 (%)
Tunnel	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)
			0.034
			0.32

Flue Gas	
Impinger liquid, V _{ic} (g)	64.8
Volume of Water Vapor, V _w (std) (ft ³)	3.06
Moisture Content, B _{ws}	0.077

Elapsed Time	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel				Laboratory
	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg.)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	0.000		0.32		69	0	77	230	9.7		-0.038	12.5	6.8	0.88	247	13.5	312	444	342	500	509	421	91	0.040	-0.40	0.810	70
10	3.040	0.304	0.39	100.0	70	1	62	231	8.3	-1.4	-0.066	6.1	14.1	0.36	485	7.7	560	436	299	458	490	449	116	0.040	-0.40	1.370	70
20	6.376	0.334	0.29	100.1	70	1	57	230	6.5	-1.8	-0.065	5.4	14.9	0.55	483	7.2	681	419	312	489	506	481	119	0.040	-0.40	1.270	69
30	9.256	0.288	0.25	99.3	70	1	57	231	5.0	-1.5	-0.066	4.5	15.9	0.89	463	6.7	707	403	333	437	547	486	116	0.040	-0.40	1.250	70
40	11.837	0.258	0.22	97.2	71	1	59	230	3.7	-1.3	-0.060	6.4	13.9	0.14	438	7.9	709	391	351	594	580	525	112	0.040	-0.40	1.030	70
50	14.258	0.242	0.23	97.4	71	1	60	230	2.9	-0.8	-0.052	9.2	11.1	0.12	368	9.7	578	381	359	595	596	502	105	0.040	-0.40	0.840	70
60	16.696	0.244	0.23	98.7	72	1	63	230	2.2	-0.7	-0.053	8.2	11.1	0.10	372	9.7	568	374	365	586	589	468	104	0.040	-0.40	0.830	70
70	19.197	0.250	0.21	100.2	73	1	64	230	1.7	-0.5	-0.050	11.6	8.3	0.24	328	12.3	497	367	365	568	572	474	99	0.040	-0.40	0.600	71
80	21.809	0.261	0.16	108.0	73	1	62	230	1.4	-0.3	-0.040	13.4	5.9	1.07	276	14.6	403	361	346	538	531	436	94	0.040	-0.40	0.390	70
90	24.096	0.229	0.15	105.4	73	1	61	230	1.2	-0.2	-0.036	13.7	5.6	1.14	251	15.0	338	356	329	502	496	402	91	0.040	-0.40	0.360	70
100	26.356	0.226	0.12	106.9	74	1	61	230	1.0	-0.2	-0.032	14.4	5.1	1.22	230	16.6	300	353	313	447	449	372	89	0.040	-0.40	0.300	70
110	28.291	0.194	0.12	101.5	74	1	62	230	0.9	-0.1	-0.030	14.7	4.8	1.26	218	16.4	273	350	303	454	456	367	87	0.040	-0.40	0.280	69
120	30.304	0.201	0.11	106.6	74	1	64	230	0.8	-0.1	-0.029	14.9	4.6	1.29	206	16.8	246	344	298	428	403	344	86	0.040	-0.40	0.260	69
130	32.226	0.192	0.10	105.5	74	1	65	230	0.6	-0.2	-0.028	14.5	5.0	1.18	204	16.1	237	338	301	417	396	338	85	0.040	-0.40	0.270	69
140	34.024	0.180	0.10	102.5	74	1	65	230	0.5	-0.1	-0.028	14.6	5.0	1.24	201	16.0	233	332	311	412	391	336	84	0.040	-0.40	0.270	69
150	35.850	0.183	0.10	103.7	74	1	66	230	0.3	-0.2	-0.028	14.5	5.3	1.10	202	15.7	233	327	336	414	319	328	84	0.040	-0.40	0.280	69
160	37.694	0.184	0.10	106.1	74	1	67	230	0.1	-0.2	-0.028	14.7	4.9	1.30	198	16.1	228	324	342	410	392	339	84	0.040	-0.40	0.260	68
170	39.505	0.181	0.09	104.6	74	1	67	230	0.0	-0.1	-0.027	14.7	4.9	1.17	195	16.4	124	322	343	402	395	317	83	0.040	-0.40	0.250	69
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF)	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference In (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
170	39.505	0.232	0.18	102.44	72.4	1.00	63.28	230.11	9.70	-0.57	-0.04	11.61	8.18	0.85	267.94	12.99	401.50	367.89	330.44	480.51	478.17	104	96.06	0.04	-0.40	0.60	69.56

Wood Heater Calculation Data
EPA Method 5H

Run	2
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	2100 ACC
Test Date:	11-Jan-07
Project Number:	061-S-70-3

Burn Rate (dry kg/hour) =	1.27
---------------------------	------

Emission Rate (grams/hour) =	0.90
------------------------------	------

Note: When using the CO2 tracer-gas method, 1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.8	1.15		143.8	12.2	0.082				
10	14.2	1.04	11.8	141.1	13.4	0.075	2.834	0.231	100.0	0.387
20	14.2	1.02	14.3	140.7	11.7	0.085	3.105	0.232	100.1	0.295
30	14.2	1.00	11.1	141.1	10.8	0.092	2.680	0.229	99.3	0.252
40	14.1	1.04	11.3	141.6	10.2	0.098	2.401	0.222	97.2	0.222
50	14.1	1.05	8.5	142.4	10.4	0.096	2.248	0.221	97.4	0.231
60	14.0	1.05	7.5	142.6	10.3	0.098	2.264	0.218	96.7	0.226
70	14.0	1.10	6.8	143.2	9.8	0.102	2.318	0.226	100.2	0.206
80	13.9	1.15	4.8	143.8	8.7	0.115	2.416	0.246	108.0	0.163
90	13.9	1.15	3.3	144.2	8.4	0.118	2.114	0.242	105.4	0.153
100	13.9	1.13	3.5	144.5	7.6	0.132	2.091	0.248	106.9	0.123
110	13.8	1.13	1.8	144.8	7.5	0.134	1.786	0.235	101.5	0.119
120	13.8	1.13	1.9	144.9	7.2	0.139	1.858	0.249	106.6	0.110
130	13.8	1.13	3.6	145.0	6.9	0.145	1.774	0.247	105.5	0.102
140	13.8	1.11	1.8	145.2	6.9	0.145	1.660	0.241	102.5	0.102
150	13.8	1.09	3.5	145.2	6.8	0.147	1.686	0.244	103.7	0.098
160	13.8	1.10	3.5	145.2	6.7	0.148	1.702	0.251	106.1	0.097
170	13.8	1.12	1.8	145.3	6.4	0.155	1.672	0.248	104.6	0.089
Averages/Totals	13.9	1.09	5.9	143.6	9.0	0.117	2.154		102.4	0.175

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	9.7
Average Moisture (% dry basis)	22.56
Average Moisture (% wet basis)	18.41
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	39.505
Pb (inches Hg)	28.73
Tm (avg oF)	72.44
dH (avg inches wc)	0.18
Vm (scf)	36.581
Qf by carbon balance (avg dscf/minute)	5.92
Analytical Data	
Probe/Front Wash (mg)	14.2
Front Filter (mg)	38.9
Impinger PM (mg)	37.0
Back Filter (mg)	2.3
Total Weight (mg)	92.4
Emission Results	
Cs (g/dscf)	0.0025
ER (g/hour)	0.90

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth & Home Technologies Equipment Numbers: _____ Run No.: 2
 Model: 2100 ACC Date: 01/11/07
 Project No.: 061-S-70-3
 Tracking No.: 959

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	N268	677.9	639.0		38.9
B. Rear filter catch	Filter	D484	154.9	152.6		2.3
C. Rinse of probe and filter assembly (FRONT)	Acetone	75	107996.1	107981.9	0.0000	14.2
D. Rinse of Impinger Set	Distilled Water	335	145435.3	145419.4	0.0000	15.9
E. Rinse of Impinger Set	Dichloromethane	155	109629.5	109624.5	0.0000	5.0
F. Rinse of filter assembly and gas train (BACK)	Acetone	100	116286.8	116270.7	0.0000	16.1
Total Particulate, mg :						92.4

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights		
	Final, g	Initial, g	Net, g
1	707.5	659.9	47.6
2	655.7	650.8	4.9
3	447.2	446.9	0.3
4	899.5	887.5	12.0
TOTAL, g:			64.8

Analyst: B. J. [Signature]Date: 1-26-07

STOVE TEMPERATURE TEST DATA - METHOD 5G

Page 1 of 1

Client/Model: Health & Home Technology ^{2100 Acc} Project #: 061-S-70-3 Tracking #: 959Date: 1-10-07 Test Crew: B. Davis Run #: 2

OMNI Equipment ID #:

Preburn Test		Fuel Weight		Delta Weight	Stack Draft	Coal Bed:						Actual:	
						Data: 0 = $\emptyset$ Range: 2.0 - 2.4						Coal Bed: 2.3	
						TEMPERATURES (oF)							
Time		Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst	
0		5.6		-0.68	68	766	476	498	718	670	482	NA	
10		4.3	1.3	-0.60	69	688	493	487	697	669	411		
20		3.6	0.7	-0.55	69	584	484	441	644	619	370		
30		2.9	0.7	-0.52	70	560	469	413	610	585	358		
40		2.6	0.3	-0.40	69	421	456	386	575	552	282		
50		2.4	0.2	-0.40	70	359	450	366	541	531	262		
60		2.3	0.1	-0.38	69	326	445	348	511	515	249		
70													
80													
90													
00													
10													
20													
30													
40													
50													
60													
70													
80													
90													
AVG													

Technician signature: B. DavisDate: 1-15-07

FUEL DATA

Client: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3 Tracking #: 959

Date: 1-11-07

Test Crew: B. Davis

Run #: 2

OMNI Equipment ID #:

FUEL LOAD PREPARED BY: B. Davis

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER,
DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings	Type
1	<u>24" x</u>	<u>25.7</u>	<u>2x4</u>
2	<u>ft</u>	<u>20.2</u>	<u>19.8</u>
3	<u>ft</u>		

Length of cut pieces: 308" inches

Pre-Burn Fuel Average Moisture: 21.90%

Time (clock): 0915 Room Temperature (F): 65 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 5 4 x 4 0 9.7 DL
CALCULATED LOAD WEIGHT: 10.01 ACTUAL LOAD WEIGHT: 25 (2 x 4)
0 (4 x 4)
FUEL PIECE LENGTH: 14" 9.6 Total
9.7 DL

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS	TYPE
1	<u>20.1</u> <u>22.0</u> <u>21.2</u>	<u>2x4</u>
2	<u>23.1</u> <u>18.1</u> <u>22.5</u>	<u>2x4</u>
3	<u>20.5</u> <u>23.0</u> <u>22.1</u>	<u>2x4</u>
4	<u>23.9</u> <u>24.5</u> <u>23.6</u>	<u>2x4</u>
5	<u>24.5</u> <u>24.8</u> <u>24.5</u>	<u>2x4</u>
6		
7		
8		
9		
10		

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 22.56

Time (clock): 0915 Room Temperature (F): 65 Initials: BD

Technician signature: B. Davis Date: 1-15-07

Run Notes

Client/Model: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3

Tracking Number: 959

Run #: 2 Date: 1-11-06

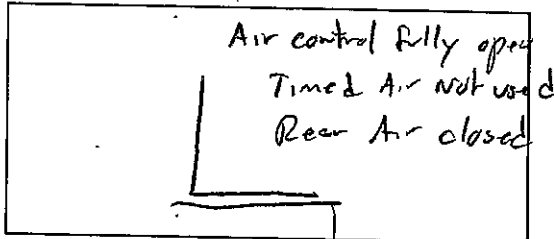
Test Crew: B. Davis

OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:



SECONDARY: fixed

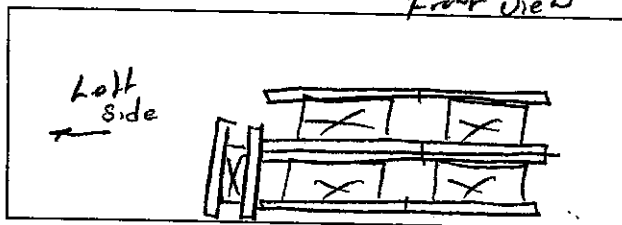
TERTIARY: NA

FAN: on High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0 61	Test setting				x	

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



TEST

START UP PROCEDURES

BYPASS: NA

FUEL LOADING By 55 sec.

DOOR: closed by 75 sec.

PRIMARY AIR: At fast setting R11 5:00

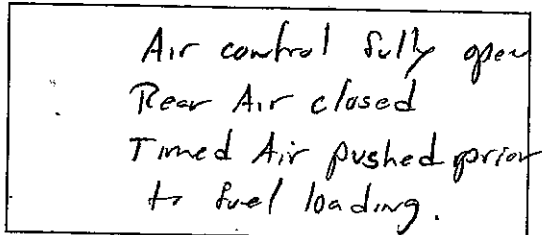
Timed Air pushed prior to loading

Rear Air closed

OTHER: NA

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:



SECONDARY: fixed

TERTIARY: NA

FAN: on High entire test duration

Technician signature: B. Davis

Date: 1-15-07

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 2100 ACC

Project No.: 061-S-70-3

Tracking No.: 959

Date: 1-11-07 Run No.: 2 Booth: 1

Test Crew: B Davis Start Time: 10:24 Stop Time: 13:14

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: good

Initial: good

Final: good

Final: good

Calibrations: Span Gas CO₂: 9.9 O₂: 10.48 CO: 1.25 CO₂(DT): 1.249

Time	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
	<u>Ø</u>		<u>EOT</u>					
O ₂	<u>0.0</u>	<u>10.4</u>	<u>0.0</u>	<u>10.3</u>				
CO ₂	<u>0.0</u>	<u>9.9</u>	<u>0.0</u>	<u>10.2</u>				
CO	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.22</u>				
CO ₂ (DT)	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.18</u>				

Stack Diameter (inches): 6"

Air Velocity (ft/min): Initial: 250 ft/min Final: 250 ft/min

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 3.0 Post: 0.0 @ 3.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 1-10-07 Initials: BM

	Initial	Middle	Ending
Pb (in. Hg)	<u>28.72</u>	<u>28.73</u>	<u>28.74</u>
Room Temp (°F)	<u>70</u>	<u>71</u>	<u>69</u>

Technician signature: B Davis Date: 1-15-07

*Model: 2100 ACC
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114*

Run 3

Wood Heater Test Data
EPA Method 5H

Run Number 3

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	2100 ACC	Test Meter 'Y':	0.972
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH@:	1.955
Project Number:	061-S-70-3	Pilot Tube Cp:	0.99
Test Date:	11-Jan-07	Average Barometric Pressure:	28.76
Test Start Time:	16:20	Average Fuel Moisture (dry basis %):	21.91
Recording interval (minutes):	10	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	190		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8		Initial
Initial dP	0.032	0.036	0.040	0.035	0.034	0.038	0.037	0.033	"H2O	136.6
Initial Temp	87	87	87	87	87	87	87	87	oF	scf/minute

Signature/Date: BO - 2-6-07
Post-Test Leak Check: .004@6 cfm@Hg

Initial/Assumed Values			
Dilution Tunnel	MW (lb/lb-mol)	28.56	Ambient CO2 (%)
	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)
			0.034
			0.32

Flue Gas	
Impinger Liquid, V _{ic} (g)	84.2
Volume of Water Vapor, V _w (std) (ft3)	3.97
Moisture Content, B _{ws}	0.062

Elapsed Time	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions							Stove Temperatures (oF)							Dilution Tunnel				Laboratory
	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)		
0	0.000		0.32		74	0	76	230	9.5		-0.030	13.7	6.0	1.05	200	14.5	289	408	338	488	450	386	87	0.036	-0.48	0.440	70		
10	3.122	0.312	0.57	100.0	73	1	53	230	8.5	-1.0	-0.058	7.4	13.3	0.41	404	8.1	432	402	282	423	416	391	107	0.036	-0.48	1.250	69		
20	7.148	0.403	0.54	98.6	73	1	53	230	6.8	-1.7	-0.061	4.5	15.5	0.67	466	6.9	640	388	298	442	446	443	119	0.039	-0.48	1.380	69		
30	11.117	0.397	0.47	99.6	72	1	56	230	5.1	-1.7	-0.061	3.9	16.0	0.89	483	6.7	692	373	331	513	492	480	119	0.039	-0.48	1.320	70		
40	14.777	0.366	0.32	99.5	72	1	60	230	3.8	-1.3	-0.059	5.0	15.0	0.48	429	7.2	690	362	351	566	545	503	112	0.039	-0.48	1.030	71		
50	18.139	0.336	0.39	107.8	72	1	64	230	2.9	-0.9	-0.050	8.4	11.6	0.11	366	9.3	600	355	359	591	571	495	105	0.039	-0.48	0.880	72		
60	21.485	0.335	0.42	97.5	73	1	65	230	2.3	-0.6	-0.048	9.4	10.2	0.11	349	10.5	554	350	362	591	571	486	103	0.039	-0.48	0.900	73		
70	24.928	0.344	0.38	97.5	73	1	66	230	1.7	-0.6	-0.043	11.5	8.8	0.41	301	11.5	455	347	360	553	549	453	99	0.039	-0.48	0.660	73		
80	28.323	0.340	0.36	100.9	73	1	60	229	1.5	-0.2	-0.035	13.4	6.0	1.36	257	13.9	384	346	348	520	523	424	95	0.039	-0.48	0.450	72		
90	31.659	0.334	0.37	101.0	73	1	59	230	1.3	-0.2	-0.030	13.7	5.7	1.23	227	14.7	316	346	319	477	476	387	92	0.039	-0.48	0.430	72		
100	35.050	0.339	0.34	102.0	72	1	60	230	1.2	-0.1	-0.029	14.0	5.5	1.49	214	14.5	282	347	301	446	441	363	90	0.039	-0.48	0.400	72		
110	38.255	0.321	0.38	100.5	72	1	60	230	1.0	-0.2	-0.027	14.5	4.8	1.44	202	16.0	259	346	290	425	419	348	89	0.039	-0.48	0.370	72		
120	41.580	0.333	0.39	99.1	72	1	60	230	0.9	-0.1	-0.024	14.6	4.6	1.51	190	16.3	238	342	281	404	397	332	87	0.039	-0.48	0.360	73		
130	44.908	0.333	0.43	97.9	72	1	61	230	0.8	-0.1	-0.022	14.9	4.5	1.41	184	16.7	226	337	274	389	383	322	87	0.039	-0.48	0.370	73		
140	48.477	0.357	0.45	99.7	72	1	61	230	0.7	-0.1	-0.021	15.0	4.4	1.32	180	17.2	215	333	271	377	373	314	86	0.039	-0.48	0.370	72		
150	52.143	0.387	0.37	100.0	72	1	62	230	0.5	-0.2	-0.020	15.0	4.7	1.34	178	16.4	212	329	268	371	362	308	86	0.039	-0.48	0.360	72		
160	55.447	0.330	0.34	99.3	72	1	64	230	0.4	-0.1	-0.020	14.8	4.8	1.37	177	16.1	208	325	268	368	355	304	85	0.039	-0.48	0.350	71		
170	58.705	0.326	0.32	102.9	72	1	65	230	0.3	-0.1	-0.020	15.2	4.8	1.31	175	16.3	206	322	267	368	350	303	84	0.039	-0.48	0.340	71		
180	61.821	0.312	0.34	101.4	71	1	65	230	0.2	-0.1	-0.020	15.2	4.8	1.24	174	16.5	206	319	274	369	346	303	84	0.039	-0.48	0.350	72		
190	64.990	0.317	0.41	100.1	71	1	66	230	0.0	-0.2	-0.020	14.8	4.9	1.34	173	16.0	205	315	289	370	344	305	84	0.039	-0.48	0.390	72		
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF)	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)		
190	64.990	0.342	0.40	100.28	72.3	1.00	61.80	229.95	9.50	-0.50	-0.03	11.94	7.80	1.02	267.95	13.27	364.45	349.60	306.45	451.45	440.45	82	95.00	0.04	-0.48	0.62	71.55		

Wood Heater Calculation Data
EPA Method 5H

Run	3
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	2100 ACC
Test Date:	11-Jan-07
Project Number:	061-S-70-3

Burn Rate (dry kg/hour) =	1.12
---------------------------	------

Emission Rate (grams/hour) =	0.75
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Note: When using the CO2 tracer-gas method, 1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.0	1.0		136.6	9.3	0.108				
10	13.4	1.00	8.9	135.0	12.4	0.081	2.887	0.311	100.0	0.569
20	14.0	1.03	13.0	139.0	12.1	0.083	3.732	0.302	98.6	0.545
30	14.0	1.03	12.5	139.0	11.2	0.089	3.679	0.304	99.6	0.467
40	14.0	1.04	10.4	139.8	9.3	0.107	3.398	0.304	99.5	0.323
50	13.9	1.07	9.3	140.7	10.3	0.097	3.120	0.335	107.8	0.395
60	13.8	1.12	6.9	141.0	10.6	0.094	3.106	0.302	97.5	0.420
70	13.8	1.04	7.6	141.5	10.1	0.099	3.190	0.300	97.5	0.380
80	13.7	1.11	3.1	142.0	9.9	0.101	3.145	0.311	100.9	0.365
90	13.7	1.13	3.3	142.4	9.9	0.101	3.091	0.312	101.0	0.368
100	13.7	1.09	1.6	142.6	9.5	0.105	3.141	0.316	102.0	0.340
110	13.7	1.14	3.5	142.7	10.1	0.099	2.975	0.311	100.5	0.378
120	13.6	1.15	1.8	143.0	10.2	0.098	3.086	0.307	99.1	0.389
130	13.6	1.13	1.9	143.0	10.8	0.093	3.087	0.302	97.9	0.432
140	13.6	1.15	1.9	143.1	11.0	0.091	3.315	0.308	99.7	0.452
150	13.6	1.09	3.6	143.1	10.0	0.100	3.403	0.309	100.0	0.373
160	13.6	1.10	1.8	143.3	9.5	0.105	3.067	0.307	99.3	0.336
170	13.6	1.04	1.8	143.4	9.2	0.109	3.024	0.318	102.9	0.316
180	13.6	1.05	1.8	143.4	9.5	0.105	2.892	0.314	101.4	0.338
190	13.6	1.12	3.5	143.4	10.5	0.095	2.947	0.310	100.1	0.411
Averages/Totals	13.7	1.09	5.2	141.4	10.3	0.098	3.173		100.3	0.400

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	9.5
Average Moisture (% dry basis)	21.91
Average Moisture (% wet basis)	17.97
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	64.990
Pb (inches Hg)	28.76
Tm (avg oF)	72.30
dH (avg inches wc)	0.40
Vm (scf)	60.292
Qf by carbon balance (avg dscf/minute)	5.18
Analytical Data	
Probe/Front Wash (mg)	17.5
Front Filter (mg)	48.9
Impinger PM (mg)	70.3
Back Filter (mg)	8.1
Total Weight (mg)	144.8
Emission Results	
Cs (g/dscf)	0.0024
ER (g/hour)	0.75

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth & Home Technologies Equipment Numbers: _____ Run No.: 3
 Model: 2100 ACC Date: 01/11/07
 Project No.: 061-S-70-3
 Tracking No.: 959

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	N269	688.5	639.6		48.9
B. Rear filter catch	Filter	D485	159.0	150.9		8.1
C. Rinse of probe and filter assembly (FRONT)	Acetone	80	105409.3	105391.8	0.0000	17.5
D. Rinse of Impinger Set	Distilled Water	300	128157.3	128125.6	0.0000	31.7
E. Rinse of Impinger Set	Dichloromethane	150	106237.3	106226.4	0.0000	10.9
F. Rinse of filter assembly and gas train (BACK)	Acetone	125	104745.5	104717.8	0.0000	27.7
Total Particulate, mg :						144.8

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights		
	Final, g	Initial, g	Net, g
1	716.2	655.4	60.8
2	659.8	651.5	8.3
3	447.8	445.4	2.4
4	910.1	897.4	12.7
TOTAL, g:			84.2

Analyst: BDDate: 1-26-07

STOVE TEMPERATURE TFST DATA - METHOD 5G

Page 1 of 1

Client/Model: Heath & Home Technologies 2100A Project #: 061-S-70-3 Tracking #: 959

Date: 1-11-07 Test Crew: B Davis Run #: 3

OMNI Equipment ID #: _____

Preburn ☒		Coal Bed:		Data:		0 = 0		Range: 1.9- 2.3		Actual:	
Test ☐										Coal Bed: 2.3	
								TEMPERATURES (oF)			
Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
0	5.1		-0.41	72	364	449	499	607	578	294	
10	4.1	1.0	-0.51	73	520	461	481	603	586	355	
20	3.5	0.6	-0.50	73	500	456	452	582	571	329	
30	2.9	0.6	-0.47	72	504	439	426	568	558	331	
40	2.7	0.2	-0.38	71	384	425	396	538	525	244	
50	2.5	0.2	-0.31	70	298	413	359	492	480	221	
60	2.4	0.1	-0.30	70	280	410	346	475	460	212	
62-70	2.3	0.1	-0.30	70	275	409	342	470	454	209	
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

Technician signature: B Davis Date: 1-15-07

FUEL DATA

Client: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3 Tracking #: 959

Date: 1-11-07 Test Crew: B. Davis Run #: 3

OMNI Equipment ID #: _____

FUEL LOAD PREPARED BY: B. Davis

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER,
DIMENSIONAL LUMBER.

PRE-BURN FUEL					
MOISTURE CONTENT (METER -- DRY BASIS)					
CALIBRATION:	Cal Value (1) = 12%	Actual Reading <u>12</u>			
	Cal Value (2) = 22%	Actual Reading <u>22</u>			
Piece	Length	Readings			Type
1	<u>24" x</u>	<u>19.4</u>	<u>19.4</u>	<u>21.6</u>	<u>2x4</u>
2	_____ ft	_____	_____	_____	_____
3	_____ ft	_____	_____	_____	_____
Length of cut pieces: <u>3 @ 24"</u> inches		Pre-Burn Fuel Average Moisture: <u>20.13%</u>			
Time (clock): <u>12:55</u>		Room Temperature (F): <u>70</u>	Initials: <u>BD</u>		

TEST FUEL				
FUEL TYPE AND AMOUNT:	2 x 4 <u>5</u>	4 x 4 <u>0</u>		
CALCULATED LOAD WEIGHT:	ACTUAL LOAD WEIGHT:		<u>9.5</u>	(2 x 4)
			<u>9.5</u>	(4 x 4)
FUEL PIECE LENGTH: <u>14</u>			<u>9.5</u>	Total
MOISTURE CONTENT (METER -- DRY BASIS)				
PIECE	READINGS			TYPE
1	<u>22.7</u>	<u>22.8</u>	<u>22.6</u>	<u>2x4</u>
2	<u>22.4</u>	<u>22.0</u>	<u>22.7</u>	<u>2x4</u>
3	<u>20.6</u>	<u>20.4</u>	<u>21.7</u>	<u>2x4</u>
4	<u>20.5</u>	<u>19.5</u>	<u>20.0</u>	<u>2x4</u>
5	<u>21.7</u>	<u>23.5</u>	<u>25.6</u>	<u>2x4</u>
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____
OVERALL TEST FUEL LOAD MOISTURE AVERAGE: <u>21.91</u>				
Time (clock): <u>13:35</u>		Room Temperature (F): <u>70</u>	Initials: <u>BD</u>	

Technician signature: B. Davis Date: 1-15-07

Run Notes

Client/Model: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3

Tracking Number: 959

Run #: 3 Date: 1-11-07

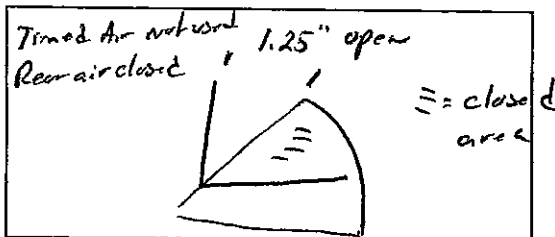
Test Crew: B Davis

OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:



SECONDARY: Fixed

TERTIARY: NA

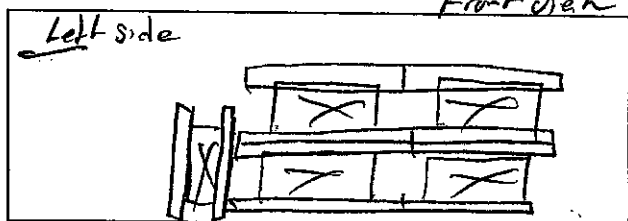
FAN: on High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
<u>Ø</u> <u>63</u>	<u>Test setting</u>				<u>X</u>	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NA

FUEL LOADING By 48 sec.

DOOR: closed by 65 sec

PRIMARY AIR: At Test setting Full 5:00

Timed Air pushed prior to Loading

Rear Air not used

OTHER:

NA

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

Primary Air same as Above
Timed Air pushed prior to Loading
Rear air not used

SECONDARY: Fixed

TERTIARY: NA

FAN: on high entire test duration

Technician signature: B Davis

Date: 1-15-07

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 2100 ACC

Project No.: 061-S-70-3

Tracking No.: 959

Date: 1-11-07

Run No.: 3

Booth: 1

Test Crew: B. Davis

Start Time: 16:20

Stop Time: 19:30

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: good

Initial: good

Final: good

Final: good

Calibrations: Span Gas CO₂: 9.9 O₂: 10.48 CO: 1.25 CO₂(DT): 1.249

Time	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
	0	10.4	0.0	10.4				
O ₂	0.0	10.4	0.0	10.4				
CO ₂	0.0	9.9	0.0	9.9				
CO	0.00	1.25	0.00	1.25				
CO ₂ (DT)	0.00	1.25	0.04	1.27				

Stack Diameter (inches): 6"

Air Velocity (ft/min): Initial: 450 ft/min Final: 450 ft/min

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 3.0 Post: 0.0 @ 3.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 1-10-07 Initials: h

	Initial	Middle	Ending
Pb (in. Hg)	<u>28.78</u>	<u>28.76</u>	<u>28.74</u>
Room Temp (°F)	<u>70</u>	<u>72</u>	<u>72</u>

Technician signature: B. Davis Date: 1-15-07

*Model: 2100 ACC
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114*

Run 4

Wood Heater Test Data
EPA Method 5H

Run Number 4

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	2100 ACC	Test Meter Y:	0.972
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH ₂ :	1.965
Project Number:	061-S-70-3	Pilot Tube Cp:	0.99
Test Date:	12-Jan-07	Average Barometric Pressure:	28.93
Test Start Time:	10:56	Average Fuel Moisture (dry basis %):	22.25
Recording Interval (minutes):	10	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	190		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8		Initial
Initial dP	0.036	0.038	0.038	0.032	0.033	0.037	0.040	0.039	H ₂ O	138.0
Initial Temp	85	85	85	85	84	84	84	84	oF	scf/minute

Signature/Date: *BIO 2-6-07*
Post-Test Leak Check: .004@5 cfm@7Hg

Initial/Assumed Values			
Dilution Tunnel	MW (lb/lb-mol)	28.58	Ambient CO ₂ (%)
	H ₂ O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)
			0.034
			0.32

Flue Gas	
Impinger liquid, V _{ic} (g)	85.5
Volume of Water Vapor, V _w (std) (ft ³)	4.03
Moisture Content, B _{ws}	0.061

Elapsed Time	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel				Laboratory
	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	0.000		0.33		62	0	81	230	9.6		-0.037	13.6	8.6	0.74	230	14.0	392	453	469	474	479	463	95	0.037	-0.41	0.460	71
10	3.177	0.318	0.67	100.0	63	1	85	230	8.6	-1.0	-0.060	8.0	12.0	0.38	393	8.9	480	431	385	424	442	434	110	0.037	-0.41	1.150	70
20	7.415	0.424	0.58	96.6	64	1	85	230	7.1	-1.5	-0.083	5.9	14.7	0.40	454	7.4	696	406	385	435	434	471	118	0.037	-0.41	1.320	72
30	11.510	0.410	0.45	99.8	64	1	86	230	6.6	-1.5	-0.066	4.9	15.5	0.51	452	7.0	769	388	426	496	491	514	119	0.037	-0.41	1.220	73
40	15.054	0.354	0.36	99.1	65	1	87	230	4.2	-1.4	-0.052	3.9	15.8	0.83	459	6.8	807	376	468	544	538	545	121	0.037	-0.41	1.120	73
50	18.381	0.333	0.42	102.8	65	1	83	230	3.1	-1.1	-0.060	7.0	12.7	0.10	411	8.6	778	367	491	597	587	564	117	0.037	-0.41	0.980	73
60	21.927	0.355	0.43	100.6	66	1	81	230	2.3	-0.8	-0.052	9.1	10.5	0.09	370	10.2	700	381	513	615	609	560	112	0.037	-0.41	0.820	73
70	25.487	0.356	0.46	99.9	67	1	82	230	1.8	-0.5	-0.050	11.4	8.3	0.23	333	12.3	621	357	525	600	602	541	107	0.037	-0.41	0.670	74
80	29.260	0.377	0.45	102.3	67	1	84	230	1.5	-0.3	-0.045	13.6	5.9	0.91	288	14.9	528	356	534	560	572	510	103	0.037	-0.41	0.480	74
90	32.840	0.358	0.35	98.1	68	1	85	230	1.4	-0.1	-0.041	13.8	5.5	1.20	254	15.1	462	356	502	514	530	473	100	0.037	-0.41	0.400	75
100	36.036	0.320	0.40	99.1	67	1	84	230	1.2	-0.2	-0.039	13.8	5.4	1.28	252	15.2	426	356	479	477	501	448	98	0.037	-0.41	0.420	74
110	39.383	0.335	0.37	96.9	68	1	81	230	1.1	-0.1	-0.033	14.3	4.9	1.35	238	16.0	398	356	462	450	483	430	97	0.037	-0.41	0.370	74
120	42.630	0.325	0.39	97.9	68	1	83	231	0.9	-0.2	-0.032	14.3	4.8	1.43	230	16.0	377	355	450	428	483	415	96	0.037	-0.41	0.370	74
130	45.992	0.336	0.31	99.2	68	1	84	230	0.8	-0.1	-0.032	14.7	4.6	1.40	222	16.5	360	352	445	410	446	403	95	0.037	-0.41	0.320	74
140	48.949	0.286	0.34	98.3	68	1	85	230	0.6	-0.2	-0.030	14.8	4.2	1.53	216	17.1	347	349	438	398	433	393	94	0.037	-0.41	0.310	73
150	51.900	0.295	0.42	93.1	68	1	86	230	0.5	-0.1	-0.030	14.8	4.2	1.49	213	17.2	334	344	437	388	421	385	93	0.037	-0.41	0.340	73
160	55.371	0.347	0.43	98.8	68	1	85	229	0.4	-0.1	-0.030	14.8	4.3	1.40	211	17.2	326	339	439	383	414	380	93	0.037	-0.41	0.350	73
170	58.808	0.344	0.44	97.2	69	1	86	230	0.2	-0.2	-0.030	14.5	4.5	1.50	211	16.5	323	335	447	382	314	360	93	0.037	-0.41	0.370	74
180	62.274	0.347	0.41	98.5	69	1	87	230	0.1	-0.1	-0.030	14.5	4.8	1.62	212	15.6	323	333	457	382	413	382	93	0.037	-0.41	0.380	74
190	65.804	0.353	0.37	101.7	70	1	87	230	0.0	-0.1	-0.029	14.5	4.9	1.50	215	15.7	328	330	470	485	415	405	93	0.037	-0.41	0.370	74
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF)	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (Inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
190	65.804	0.346	0.42	98.84	66.7	1.00	65.35	230.00	9.60	-0.51	-0.04	11.82	7.71	0.99	283.20	13.41	488.65	364.95	461.10	472.10	479.35	48	102.33	0.04	-0.41	0.61	73.25

Wood Heater Calculation Data
EPA Method 5H

Run	4
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	2100 ACC
Test Date:	12-Jan-07
Project Number:	061-S-70-3

Burn Rate (dry kg/hour) =	1.12
---------------------------	------

Emission Rate (grams/hour) =	1.07
------------------------------	------

Note: When using the CO2 tracer-gas method, 1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.3	1.04		138.0	9.0	0.112				
10	13.5	1.06	9.8	136.9	12.8	0.078	3.023	0.338	100.0	0.670
20	13.6	1.01	12.2	135.9	11.9	0.084	4.028	0.316	96.6	0.583
30	13.6	1.02	11.6	135.8	10.4	0.096	3.884	0.326	99.8	0.445
40	13.7	1.05	10.4	135.6	9.3	0.107	3.360	0.323	99.1	0.357
50	13.6	1.09	10.4	136.0	10.2	0.098	3.148	0.337	102.8	0.423
60	13.6	1.12	9.0	136.6	10.3	0.097	3.355	0.330	100.6	0.431
70	13.5	1.13	6.8	137.2	10.6	0.095	3.362	0.328	99.9	0.455
80	13.4	1.14	4.9	137.7	10.5	0.096	3.557	0.337	102.3	0.448
90	13.4	1.15	1.7	138.1	9.2	0.108	3.375	0.322	98.1	0.348
100	13.4	1.16	3.4	138.3	10.0	0.100	3.006	0.325	99.1	0.404
110	13.4	1.16	1.8	138.5	9.6	0.105	3.155	0.317	96.9	0.372
120	13.4	1.17	3.5	138.6	9.8	0.102	3.055	0.320	97.9	0.389
130	13.3	1.15	1.8	138.7	8.7	0.115	3.163	0.324	99.2	0.308
140	13.3	1.20	3.8	138.8	9.2	0.109	2.781	0.320	98.3	0.345
150	13.3	1.20	1.9	139.0	10.2	0.098	2.776	0.302	93.1	0.425
160	13.3	1.19	1.9	139.0	10.3	0.097	3.266	0.320	98.8	0.432
170	13.3	1.19	3.7	139.0	10.5	0.096	3.234	0.314	97.2	0.445
180	13.3	1.12	1.7	139.0	10.1	0.099	3.255	0.311	96.5	0.414
190	13.3	1.10	1.7	139.0	9.6	0.104	3.315	0.329	101.7	0.374
Averages/Totals	13.4	1.12	5.4	137.8	10.1	0.100	3.268		98.8	0.425

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	9.6
Average Moisture (% dry basis)	22.25
Average Moisture (% wet basis)	18.20
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	65.804
Pb (inches Hg)	28.93
Tm (avg oF)	66.70
dH (avg inches wc)	0.42
Vm (scf)	62.064
Qf by carbon balance (avg dscf/minute)	5.37
Analytical Data	
Probe/Front Wash (mg)	22.5
Front Filter (mg)	65.4
Impinger PM (mg)	99.3
Back Filter (mg)	18.0
Total Weight (mg)	205.2
Emission Results	
Cs (g/dscf)	0.0033
ER (g/hour)	1.07

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth & Home Technologies Equipment Numbers: _____ Run No.: 4
 Model: 2100 ACC Date: 01/12/07
 Project No.: 061-S-70-3
 Tracking No.: 959

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	N270	699.3	633.9		65.4
B. Rear filter catch	Filter	D486	169.7	151.7		18.0
C. Rinse of probe and filter assembly (FRONT)	Acetone	70	113271.9	113249.4	0.0000	22.5
D. Rinse of Impinger Set	Distilled Water	325	125107.4	125064.0	0.0000	43.4
E. Rinse of Impinger Set	Dichloromethane	150	116978.7	116966.2	0.0000	12.5
F. Rinse of filter assembly and gas train (BACK)	Acetone	100	101891.9	101848.5	0.0000	43.4
Total Particulate, mg :						205.2

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights		
	Final, g	Initial, g	Net, g
1	715.0	657.0	58.0
2	664.8	655.6	9.2
3	447.7	446.9	0.8
4	839.0	821.5	17.5
TOTAL, g:			85.5

Analyst: ABDDate: 2-9-07

STOVE TEMPERATURE TEST DATA - METHOD 5G

Page 1 of 1

Client/Model: Heath & Home Technologies 2100 Acc Project #: 061-S-70-3 Tracking #: 959Date: 1-12-07 Test Crew: B. Davis Run #: 4

OMNI Equipment ID #:

Preburn Test		Fuel Weight		Delta Weight	Stack Draft	Coal Bed:		TEMPERATURES (oF)						Actual:	
Time		Weight				Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst		
0	5.1				-0.5	67	460	513	568	682	683	342	N/A		
10	4.1			1.0	-0.58	67	675	521	605	648	649	377			
20	3.4			0.7	-0.56	69	676	510	595	615	616	362			
30	2.8			0.6	-0.51	69	660	496	496	581	594	336			
40	2.6			0.2	-0.45	69	527	486	554	563	575	282			
50	2.4			0.2	-0.41	70	468	477	529	538	548	264			
60	2.2			0.2	-0.40	69	436	465	500	508	521	254			
70	2.1			0.1	-0.37	72	396	454	473	477	492	231			
80															
90															
00															
10															
20															
30															
40															
50															
60															
70															
80															
90															
AVG															

Technician signature: B. DavisDate: 1-15-07

FUEL DATA

Client: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3 Tracking #: 959

Date: 1-12-07

Test Crew: B. Davis

Run #: 4

OMNI Equipment ID #:

FUEL LOAD PREPARED BY: B. Davis

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER,
DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION:

Cal Value (1) = 12%

Actual Reading 12

Cal Value (2) = 22%

Actual Reading 22

Piece	Length	Readings	Type
1	<u>24" ft</u>	<u>24.5</u>	<u>2x4</u>
2	<u>ft</u>	<u>17.7</u>	<u>196</u>
3	<u>ft</u>	<u>196</u>	<u>2x4</u>

Length of cut pieces: 305 inches

Pre-Burn Fuel Average Moisture: 20.60 %

Time (clock): 0820 Room Temperature (F): 65 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT:

2 x 4

5

4 x 4

0

CALCULATED LOAD WEIGHT: 10.01

ACTUAL LOAD WEIGHT:

9.6

(2 x 4)

FUEL PIECE LENGTH: 14

0

(4 x 4)

9.6

Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS	TYPE
1	<u>19.8</u>	<u>24.5</u>
2	<u>22.8</u>	<u>21.4</u>
3	<u>22.7</u>	<u>23.3</u>
4	<u>22.6</u>	<u>21.5</u>
5	<u>23.7</u>	<u>23.8</u>
6	<u>19.7</u>	<u>22.6</u>
7	<u>21.4</u>	<u>21.9</u>
8	<u>21.4</u>	<u>21.9</u>
9	<u>21.4</u>	<u>21.9</u>
10	<u>21.4</u>	<u>21.9</u>

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 22.25

Time (clock): 0840

Room Temperature (F): 65

Initials: BD

Technician signature: B. Davis

Date: 1-15-07

Run Notes

Client/Model: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3

Tracking Number: 959

Run #: 4 Date: 1-12-07

Test Crew: B. D. Davis

OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

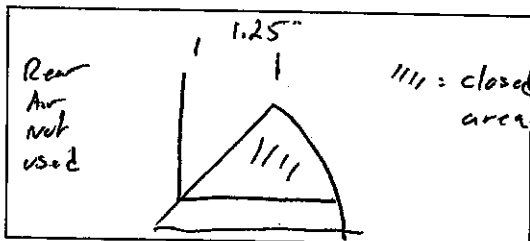
PRIMARY:

Timed Air not used

SECONDARY: Fixed

TERTIARY: NA

FAN: FAN off
FAN Confirmation

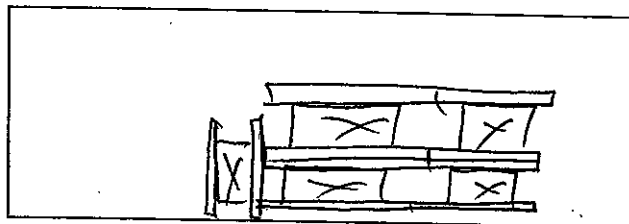


PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	<u>Test setting</u>					
61					<u>x</u>	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NA
FUEL LOADING: By 60 sec
DOOR: closed by 75 sec.
PRIMARY AIR: at test setting full 5 min
Timed Air pushed prior to loading
Rear Air not used
OTHER: NA

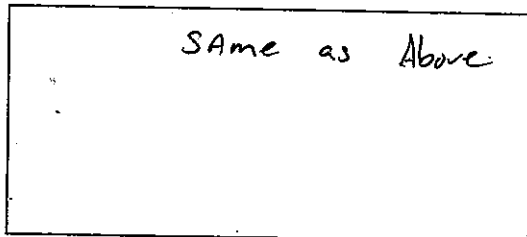
DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

SECONDARY: Fixed

TERTIARY: NA

FAN: FAN off



Technician signature: B. D. Davis Date: 1-15-07

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 2100 ACC

Project No.: 061-S-70-3

Tracking No.: 959

Date: 1-12-07 Run No.: 4 Booth: 1

Test Crew: B Davis Start Time: 10:56 Stop Time: 14:06

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: good

Initial: good

Final: good

Final: good

Calibrations: Span Gas CO₂: 9.9 O₂: 10.48 CO: 1.25 CO₂(DT): 1.249

Time	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
	<u>Ø</u>		<u>EOT</u>					
O ₂	<u>0.0</u>	<u>10.4</u>	<u>0.0</u>	<u>10.3</u>				
CO ₂	<u>0.0</u>	<u>9.9</u>	<u>0.0</u>	<u>9.8</u>				
CO	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.23</u>				
CO ₂ (DT)	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.19</u>				

Stack Diameter (inches): 6"

Air Velocity (ft/min): Initial: < 50 ft/min Final: < 50 ft/min

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 3.0 Post: 0.0 @ 3.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 1-10-07 Initials: BA

	Initial	Middle	Ending
Pb (in. Hg)	<u>28.96</u>	<u>28.94</u>	<u>28.90</u>
Room Temp (°F)	<u>71</u>	<u>74</u>	<u>74</u>

Technician signature: B Davis Date: 1-15-07

*Model: 2100 ACC
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114*

Run 5

Wood Heater Test Data
EPA Method 5H

Run Number 5

Manufacturer:	Hearth and Home Tech	Sample Rate Control Module Number:	322
Stove Model, Tracking Number:	2100 ACC	Test Meter Y:	0.972
Stove Type (cat, ncat, or pellet):	ncat	Orifice dH (in):	1.965
Project Number:	061-S-70-3	Pilot Tube Cp:	0.99
Test Date:	12-Jan-07	Average Barometric Pressure:	28.90
Test Start Time:	17:15	Average Fuel Moisture (dry basis %):	23.17
Recording Interval (minutes):	5	OMNI Equipment Numbers:	
Total Sampling Time (minutes):	90		

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel Flow
	PL1	PL2	PL3	PL4	PL5	PL6	PL7	PL8		Initial
Initial dP	0.028	0.034	0.037	0.036	0.034	0.035	0.035	0.028	"H2O	129.3
Initial Temp	114	114	114	114	114	114	114	114	oF	scf/minute

Signature/Date: BDO = 2-6-07
Post-Test Leak Check: .002@4 cfm@H_g

Initial/Assumed Values			
Dilution Tunnel	MW (lb/lb-mol)	28.58	Ambient CO2 (%)
	H2O (%)	4.00	Preferred Initial Sampling Rate (cf/minute)
			0.29

Flue Gas	
Impinger liquid, V _{ic} (g)	51.9
Volume of Water Vapor, V _w (std) (ft3)	2.45
Moisture Content, B _{ws}	0.090

Elapsed Time	Particulate Sampling System								Fuel Weight		Stove Flue-Gas Conditions						Stove Temperatures (oF)						Dilution Tunnel				Laboratory
	Dry Gas Meter Reading (cf)	Sample Rate (cfm)	Orifice dH (inches wc)	Proportional Rate (%)	Dry Gas Meter Temperature (F)	Sample Train Vacuum (inches Hg.)	Impinger Exit Temperature (F)	Hot Box Temperature (F)	Scale Reading (lbs)	Weight Change (lbs)	Draft Pressure (inches wc)	O2 (%)	CO2 (%)	CO (%)	Temperature (F)	Air to Fuel Ratio (lb/lb)	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Average Surface Temperature (F)	Temperature (F)	dP Velocity Pressure (inches wc)	Static Pressure (inches wc)	CO2 (%)	Ambient Temperature (F)
0	0.000		0.27		71	0	84	230	9.7		-0.048	8.5	9.7	0.10	276	10.9	344	473	441	576	562	479	114	0.033	-0.46	1.080	73
5	1.456	0.291	0.41	100.0	71	1	84	230	8.7	-1.0	-0.070	4.3	15.4	0.96	486	6.9	414	473	388	544	528	468	128	0.033	-0.46	2.120	73
10	3.104	0.330	0.34	95.7	71	1	82	230	7.5	-1.2	-0.072	2.2	17.0	2.53	622	5.8	605	471	385	542	521	505	145	0.033	-0.46	2.180	72
15	4.706	0.320	0.39	100.8	71	1	84	230	6.0	-1.5	-0.072	2.1	16.8	2.46	636	5.8	724	464	396	581	540	541	153	0.033	-0.46	2.310	72
20	6.391	0.337	0.37	99.6	71	1	85	230	4.7	-1.3	-0.072	2.3	16.7	2.12	632	6.0	760	466	409	620	567	582	153	0.033	-0.46	2.230	72
25	8.085	0.335	0.28	101.6	70	1	86	230	3.5	-1.2	-0.072	2.0	16.9	1.72	618	6.1	782	451	434	676	612	591	152	0.033	-0.46	1.980	73
30	9.489	0.285	0.33	98.9	71	1	87	230	2.6	-0.9	-0.072	1.6	17.3	1.08	605	6.1	801	449	454	706	655	613	149	0.033	-0.46	2.170	72
35	11.017	0.306	0.31	98.8	70	1	87	230	1.7	-0.9	-0.071	3.3	15.9	0.18	593	7.0	812	446	478	731	695	632	146	0.033	-0.46	1.950	73
40	12.578	0.312	0.23	102.8	70	1	83	231	1.3	-0.4	-0.070	11.9	8.7	0.04	468	12.1	696	443	513	747	723	624	131	0.033	-0.46	0.930	73
45	13.995	0.284	0.28	107.0	70	1	60	230	1.1	-0.2	-0.054	12.6	7.0	0.20	403	14.3	570	442	526	732	715	597	121	0.033	-0.46	0.820	73
50	15.423	0.286	0.26	98.0	70	1	58	230	1.0	-0.1	-0.054	13.4	7.1	0.37	377	13.8	497	443	516	708	691	571	118	0.033	-0.46	0.800	75
55	16.940	0.303	0.26	107.3	70	1	59	230	0.9	-0.1	-0.054	13.8	7.0	0.52	360	13.8	446	443	507	684	665	549	115	0.033	-0.46	0.780	75
60	18.298	0.272	0.26	97.2	69	1	59	231	0.7	-0.2	-0.051	13.4	7.0	0.55	350	13.7	416	444	496	658	642	531	113	0.033	-0.46	0.780	75
65	19.704	0.281	0.25	100.6	69	1	60	230	0.6	-0.1	-0.049	13.3	7.0	0.63	344	13.6	400	444	489	642	627	520	111	0.033	-0.46	0.770	75
70	21.083	0.276	0.26	99.9	69	1	60	230	0.5	-0.1	-0.050	13.7	6.5	0.75	336	14.2	384	443	480	626	614	509	109	0.033	-0.46	0.730	75
75	22.472	0.278	0.25	98.7	68	1	60	231	0.4	-0.1	-0.050	13.7	6.4	0.83	328	14.2	369	442	468	608	599	497	107	0.033	-0.46	0.700	76
80	23.860	0.278	0.25	101.4	68	1	61	231	0.2	-0.2	-0.049	14.0	6.3	0.94	322	14.2	358	440	456	593	588	487	106	0.033	-0.46	0.690	76
85	25.240	0.276	0.26	100.6	67	1	61	231	0.1	-0.1	-0.047	14.0	5.9	0.91	311	14.9	344	437	444	577	574	475	103	0.033	-0.46	0.650	73
90	26.567	0.265	0.27	96.5	67	1	61	230	0.0	-0.1	-0.045	14.1	5.8	0.97	307	15.0	336	434	437	566	564	467	102	0.033	-0.46	0.660	72
Total Sampling Time (minutes)	Total Sample Volume (cf)	Average Sampling Rate (cfm)	Average Orifice dH (inches wc)	Average Proportional Rate (%)	Average Meter Temp (oF)	Maximum Sample Train Vacuum (inches Hg)	Average Impinger Exit Temperature (F)	Average Hot Box Interior Temp (oF)	Total Fuel Burned (lbs)	Average Sample Interval Weight Change	Average Flue Draft (inches wc)	Average Oxygen (% O2)	Average Carbon Dioxide (% CO2)	Average Carbon Monoxide (%CO)	Average Flue Temp (oF)	Average Air to Fuel Ratio (lb/lb)	Average Firebox TopTemp (oF)	Average Firebox Bottom Temp (oF)	Average Firebox Back Temp (oF)	Average Firebox Left Side Temp (oF)	Average Firebox Right Side Temp (oF)	Difference in (Beg./End) Stove Surface Temps (oF)	Average Dilution Tunnel Temp (oF)	Average Dilution Tunnel dP (inches wc)	Average Dilution Tunnel Static Pressure (inches wc)	Average Dilution Tunnel CO2 (%)	Average Laboratory Ambient Temp (oF)
90	26.567	0.296	0.29	100.30	69.6	1.00	63.21	230.26	9.70	-0.54	-0.06	9.17	10.55	0.94	440.74	10.96	529.37	449.37	458.79	637.79	614.84	12	125.05	0.03	-0.46	1.28	73.58

Wood Heater Calculation Data
EPA Method 5H

Run	5
Manufacturer:	Hearth and Home Tech
Model/Tracking No.:	2100 ACC
Test Date:	12-Jan-07
Project Number:	061-S-70-3

Burn Rate (dry kg/hour) =	2.38
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Emission Rate (grams/hour) =	5.19
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Note: When using the CO2 tracer-gas method, 1/Qf (by tracer gas) = Si

Elapsed Time (minutes)	Dilution Tunnel Velocity (feet/second actual)	Fo (1.00 to 1.12)	Qf by carbon balance (scf/minute)	Qt-new (scf/minute)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dscf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	12.9	1.27		129.3	14.0	0.071				
5	13.0	1.04	15.0	127.2	17.3	0.058	1.360	0.097	100.0	0.406
10	13.2	1.02	15.3	125.4	15.9	0.063	1.540	0.089	95.7	0.342
15	13.3	1.04	19.4	124.6	16.9	0.059	1.497	0.094	100.8	0.389
20	13.3	1.04	17.1	124.6	16.4	0.061	1.575	0.093	99.6	0.367
25	13.2	1.06	16.0	124.7	14.4	0.070	1.564	0.095	101.6	0.282
30	13.2	1.08	12.1	125.0	15.5	0.065	1.333	0.093	98.9	0.325
35	13.2	1.10	13.7	125.3	15.1	0.066	1.428	0.092	98.8	0.312
40	13.0	1.03	10.6	126.9	13.1	0.076	1.459	0.096	102.8	0.235
45	12.9	1.17	6.2	128.0	14.4	0.069	1.328	0.101	107.0	0.284
50	12.9	1.03	3.0	128.3	13.9	0.072	1.337	0.093	98.0	0.264
55	12.8	0.98	3.0	128.6	13.8	0.073	1.420	0.102	107.3	0.259
60	12.8	1.03	6.0	128.8	13.8	0.072	1.271	0.092	97.2	0.260
65	12.8	1.04	3.0	129.1	13.6	0.073	1.318	0.096	100.6	0.254
70	12.8	1.04	3.1	129.3	13.9	0.072	1.293	0.095	99.9	0.265
75	12.8	1.05	3.1	129.5	13.6	0.074	1.302	0.094	98.7	0.251
80	12.7	1.02	6.2	129.6	13.6	0.074	1.304	0.096	101.4	0.252
85	12.7	1.08	3.3	130.0	13.6	0.073	1.296	0.096	100.6	0.255
90	12.7	1.08	3.3	130.1	14.1	0.071	1.249	0.092	96.5	0.274
Averages/Totals	13.0	1.06	8.9	127.6	14.6	0.069	1.382		100.3	0.293

Woodstove Type	
Yhc>1=cat,2=ncat, 3=pellet	2
EPA's Hydrocarbon Constant (%)	1.32
Fuel Data	
Test Charge (as fired lbs)	9.7
Average Moisture (% dry basis)	23.17
Average Moisture (% wet basis)	18.81
Run Parameters	
DGM initial reading (cf)	0.000
DGM final reading (cf)	26.567
Pb (inches Hg)	28.90
Tm (avg oF)	69.63
dH (avg inches wc)	0.29
Vm (scf)	24.884
Qf by carbon balance (avg dscf/minute)	8.85
Analytical Data	
Probe/Front Wash (mg)	37.6
Front Filter (mg)	88.7
Impinger PM (mg)	90.9
Back Filter (mg)	25.7
Total Weight (mg)	242.9
Emission Results	
Cs (g/dscf)	0.0098
ER (g/hour)	5.19

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth & Home Technologies Equipment Numbers: _____ Run No.: 5
 Model: 2100 ACC Date: 01/12/07
 Project No.: 061-S-70-3
 Tracking No.: 959

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	N271	731.3	642.6		88.7
B. Rear filter catch	Filter	D487	177.4	151.7		25.7
C. Rinse of probe and filter assembly (FRONT)	Acetone	120	109131.7	109094.1	0.0000	37.6
D. Rinse of Impinger Set	Distilled Water	290	146009.7	145990.5	0.0000	19.2
E. Rinse of Impinger Set	Dichloromethane	150	106759.2	106739.5	0.0000	19.7
F. Rinse of filter assembly and gas train (BACK)	Acetone	145	117084.3	117032.3	0.0000	52.0
Total Particulate, mg :						242.9

Component	Equations:
A. Front filter catch	Final (mg) - Tare (mg) = Particulate, mg
B. Rear filter catch	Final (mg) - Tare (mg) = Particulate, mg
C. Rinse of probe and filter assembly (FRONT)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
D. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
E. Rinse of Impinger Set	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
F. Rinse of filter assembly and gas train (BACK)	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

CONDENSED WATER

IMPINGERS	Weights		
	Final, g	Initial, g	Net, g
1	693.4	654.9	38.5
2	655.9	651.2	4.7
3	449.1	448.4	0.7
4	843.7	835.7	8.0
TOTAL, g:			51.9

Analyst: BDRDate: 2-9-07

Client/Model: Health & Home Technologies ^{2100 acc} Project #: 061-S-70-3 Tracking #: 959

Date: 1-12-07 Test Crew: BDA's Run #: 5

OMNI Equipment ID #:

[illegible]

Technician signature: B. J. [Signature] Date: 1-15-07

FUEL DATA

Client: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3 Tracking #: 959

Date: 1-12-07

Test Crew: B Daws

Run #: 5

OMNI Equipment ID #:

FUEL LOAD PREPARED BY: B Daws

FUEL: DOUGLAS-FIR SPECIES, UNTREATED, AIR-DRIED, STANDARD GRADE OR BETTER,
DIMENSIONAL LUMBER.

PRE-BURN FUEL

MOISTURE CONTENT (METER -- DRY BASIS)

CALIBRATION: Cal Value (1) = 12% Actual Reading 12
Cal Value (2) = 22% Actual Reading 22

Piece	Length	Readings	Type
1	<u>8</u> ft	<u>18.6</u> <u>23.3</u> <u>23.3</u>	<u>2x4</u>
2	ft		
3	ft		

Length of cut pieces: 4 e 12 inches

Pre-Burn Fuel Average Moisture: 21.73%

Time (clock): 15:45 Room Temperature (F): 70 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT: 2x4 5 4x4 0
CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 9.7 (2x4)
0 (4x4)
FUEL PIECE LENGTH: 14 9.7 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS	TYPE
1	<u>23.2</u> <u>22.7</u> <u>24.5</u>	<u>2x4</u>
2	<u>23.8</u> <u>24.5</u> <u>23.8</u>	<u>2x4</u>
3	<u>20.5</u> <u>21.9</u> <u>22.0</u>	<u>2x4</u>
4	<u>21.3</u> <u>24.5</u> <u>22.0</u>	<u>2x4</u>
5	<u>24.4</u> <u>23.8</u> <u>24.6</u>	<u>2x4</u>
6		
7		
8		
9		
10		

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 23.17

Time (clock): 16:10 Room Temperature (F): 70 Initials: BD

Technician signature: BD Date: 1-15-08

Run Notes

Client/Model: Hearth & Home Technologies

Model: 2100 ACC

Project #: 061-S-70-3

Tracking Number: 959

Run #: 5 Date: 1-12-07

Test Crew: B. Davis

OMNI Equipment ID Numbers: _____

PREBURN

DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

Timed Air open
Rear Air open
Primary Air fully open

SECONDARY: Fixed

TERTIARY: NA

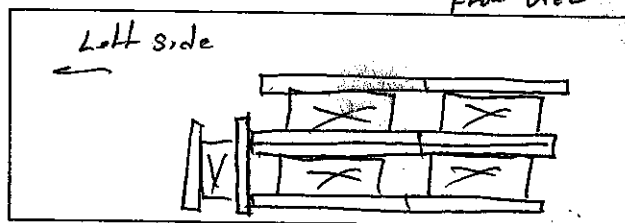
FAN: on high

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0	Test setting					
60				.5		
85					x	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NA

FUEL LOADING: 70 sec

DOOR: closed by 80 sec

PRIMARY AIR: fully open full 5:00

Timed Air open

Rear air open

OTHER: NA

DESCRIBE OR SKETCH TEST SETTINGS BELOW: (SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

Same as Above

SECONDARY: Fixed

TERTIARY: NA

FAN: on high entire test duration

Technician signature: B. Davis Date: 1-15-07

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 2100 ACC

Project No.: 061-S-70-3

Tracking No.: 959

Date: 1-12-07 Run No.: 5 Booth: 1

Test Crew: B Davis Start Time: 17:15 Stop Time: 18:45

OMNI Equipment #'s: _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: good

Initial: good

Final: good

Final: good

Calibrations: Span Gas CO₂: 9.9 O₂: 10.48 CO: 1.25 CO₂(DT): 1.249

Time	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
	<u>0</u>		<u>EOT</u>					
O ₂	<u>0.0</u>	<u>10.4</u>	<u>0.0</u>	<u>10.6</u>				
CO ₂	<u>0.0</u>	<u>9.9</u>	<u>0.0</u>	<u>10.3</u>				
CO	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.27</u>				
CO ₂ (DT)	<u>0.00</u>	<u>1.24</u>	<u>0.00</u>	<u>1.31</u>				

Stack Diameter (inches): _____

Air Velocity (ft/min): Initial: 450 ft/min Final: 450 ft/min

Scale Audit (lbs.): Pretest: 10.0 Post Test: 10.0

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 @ 30 Post: 0.0 @ 30

Flue Pipe Cleaned Prior to First Test in Series: Date: 1-10-07 Initials: ra

	Initial	Middle	Ending
Pb (in. Hg)	<u>28.90</u>	<u>28.90</u>	<u>28.90</u>
Room Temp (°F)	<u>73</u>	<u>75</u>	<u>72</u>

Technician signature: B Davis Date: 1-15-07