



Certification Test Report

Hearth & Home Technologies

**Freestanding Wood Stove
Model: 5700**

Report Number: 061-S-73-3

Part 2 of 2

OMNI-Test Laboratories, Inc.
Product Testing & Certification



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Model: 5700
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114

Section 4

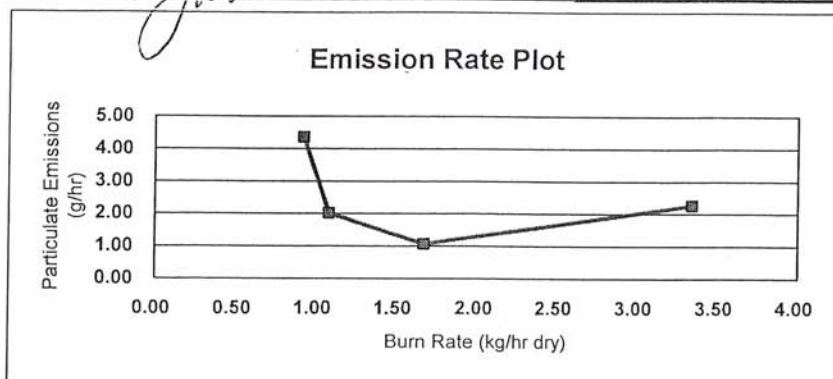
Test Data by Run

EPA Weighted Average Emissions

EPA Method 28

Client: Hearth N Home Status: Final
 Stove Model: 5700 Stove Type: Non-Catalytic Stove
 Test Dates: November 19 through November 22 2008
 Project Number: 061-S-73-3
 Tracking Number: 1305
 Signature/Date: *[Signature]* 2-9-09

Weighted Average (g/hr) 2.3



Run #	1	
Burn Rate (dry kg/hr)	0.92	
Catagory	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	4.36	
Cap (g/hr)	15	
Weighting Factor	0.439	26.16%
Heat Output (BTU/hr)	11117	

Run #	2	
Burn Rate (dry kg/hr)	1.08	
Catagory	2	
Overall Efficiency (%)	63%	
Emissions (g/hr)	2.01	
Cap (g/hr)	15	
Weighting Factor	0.520	30.98%
Heat Output (BTU/hr)	13050	

Run #	4	
Burn Rate (dry kg/hr)	1.67	
Catagory	3	
Overall Efficiency (%)	63%	
Emissions (g/hr)	1.07	
Cap (g/hr)	18	
Weighting Factor	0.550	32.78%
Heat Output (BTU/hr)	20179	

Run #	3	
Burn Rate (dry kg/hr)	3.34	
Catagory	4	
Overall Efficiency (%)	63%	
Emissions (g/hr)	2.26	
Cap (g/hr)	18	
Weighting Factor	0.169	10.07%
Heat Output (BTU/hr)	40359	

Model: 5700
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114

Run 1

Wood Heater Test Data EPA Method 5H

Run Number 1

Manufacturer: 322
 Stove Model, Tracking Number: 1305
 Stove Type (oil, coal, or pellet): coal
 Project Number: 091-S-75-3
 Test Date: 15-Nov-08
 Test Start Time: 11:59
 Recording Interval (minutes): 10
 Total Sampling Time (minutes): 470

Sample Rate Control Module Number: 0.945
 Test Meter Y: 1.754
 Orifice dH_g: 0.99
 Pilot Tube C_p: 28.87
 Average Barometric Pressure: 20.35
 Average Fuel Moisture (dry basis %):
 OMM Equipment Numbers:

Dilution Tunnel Velocity Traverse Data									
	P1.1	P1.2	P1.3	P1.4	P1.5	P1.6	P1.7	P1.8	Dilution Tunnel Velocity (ft/min)
Initial gP	0.032	0.036	0.034	0.034	0.038	0.034	0.034	0.028	Initial
Initial Temp	85	85	85	85	85	85	85	85	134.3
									scfm/min

Signature Date: 1-13-09
 P100015 (cmg/y)

Initial/Actual Values			
Dilution Tunnel	MW (lb-ft/min)	Ambient CO ₂ (%)	0.04
	4.00	Preferred Initial Sampling Rate (ft/min)	0.38

Fuel Gas	
Impinger Liquid, VS (g)	234.5
Volume of Water Vapor, V _{WV} (B3)	11.08
Moisture Content, B _W	0.060

Elapsed Time	Particulate Sampling System										Stove Flue-Gas Conditions										Stove Temperatures (°F)										Laboratory
	Dry Gas Meter Reading (scf)	Sample Rate (lb/hr)	Orifice dH (inches wet)	Proportional Rate (%)	Dry Gas Meter Temperature (°F)	Sample Temp (°F)	Impinger Exit Temperature (°F)	Hot Box Temperature (°F)	Scale Reading (lb/hr)	Weight Change (lb/hr)	Dust Pressure (inches wet)	CO (v/v)	CO2 (v/v)	Adm to Fuel Ratio (lb/hr)	Fishers Top	Fishers Bottom	Fishers Back	Fishers Left	Average Fuelbox Temperature (°F)	Average Fuelbox Temperature (°F)	Temperature (°F)	AP Velocity (ft³/minute wet)	CO2 (v/v)								
450	176.914	0.301	0.34	93.3	76	0	61	230	0.2	-0.011	128	14.3	21.3	331	275	272	273	275	331	261	78	0.04	-0.47	0.350	71						
460	180.656	0.354	0.30	100.7	76	0	62	230	0.1	-0.010	132	15.7	15.4	276	272	275	276	272	333	262	78	0.04	-0.47	0.350	71						
470	183.513	0.316	0.24	101.9	77	0	63	230	0.0	-0.009	122	15.5	15.3	278	273	271	273	271	332	261	79	0.04	-0.47	0.340	71						
Total Sampling Time (minutes)																															
470	183.013	0.381	0.48	100.00	76.7	0.00	60.29	229.00	19.10	-0.41	153.06	13.47	1.56	313.23	245.40	265.08	293.53	313.23	410.95	118	0.03	-0.45	0.44	70.40							

Wood Heater Calculation Data EPA Method 5H

Run	1
Manufacturer:	Hearth N Home Tech
Model/Tracking No.:	1305
Test Date:	19-Nov-08
Project Number:	061-S-73-3

Burn Rate (dry kg/hour) =

0.92

Emission Rate (grams/hour) =

4.36

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	12.7	0.36		134.3	7.7	0.131				
10	12.7	0.72	14.3	133.8	11.8	0.085	3.424	0.447	99.3	0.990
20	12.8	0.70	13.9	133.1	12.0	0.084	5.276	0.448	99.6	1.015
30	12.9	0.88	15.6	131.9	11.6	0.086	5.195	0.435	96.6	0.955
40	12.9	0.96	19.2	132.2	10.6	0.095	5.086	0.439	97.6	0.797
50	12.8	0.91	12.2	132.7	10.7	0.094	4.766	0.451	100.3	0.807
60	12.8	0.86	11.9	133.1	10.4	0.096	4.615	0.433	96.2	0.762
70	12.8	0.88	11.4	132.9	10.4	0.096	4.542	0.438	97.2	0.765
80	12.8	0.83	13.5	133.1	10.2	0.098	4.490	0.433	96.1	0.742
90	12.8	0.84	11.9	133.1	10.1	0.099	4.744	0.463	103.0	0.727
100	12.8	0.79	10.7	132.9	10.2	0.098	4.304	0.425	94.4	0.741
110	12.8	0.87	11.1	132.8	9.8	0.102	4.540	0.444	98.6	0.686
120	12.8	0.86	11.6	133.2	9.6	0.104	4.445	0.451	100.3	0.652
130	12.8	0.80	9.4	133.4	9.4	0.107	4.281	0.446	99.2	0.623
140	12.7	0.73	7.2	133.9	8.4	0.119	4.260	0.454	100.9	0.503
150	12.7	0.68	4.6	134.3	7.6	0.131	3.786	0.449	99.7	0.413
160	12.6	0.71	3.2	134.5	7.0	0.144	3.493	0.457	101.6	0.342
170	12.6	0.71	1.6	134.6	6.8	0.146	3.242	0.466	103.6	0.331
180	12.6	0.69	3.2	134.8	6.5	0.155	3.160	0.462	102.6	0.295
190	12.6	0.68	1.5	134.8	6.6	0.152	2.962	0.459	102.0	0.307
200	12.6	0.68	-2.0	134.8	6.7	0.150	3.040	0.463	102.8	0.318
210	12.6	0.69	6.6	134.9	6.5	0.153	2.837	0.424	94.3	0.303
220	12.6	0.65	1.5	135.0	6.7	0.150	3.002	0.460	102.1	0.315
230	12.6	0.71	1.5	135.0	6.7	0.149	2.907	0.437	97.1	0.319
240	12.6	0.71	3.0	135.1	6.6	0.152	3.012	0.449	99.8	0.310
250	12.6	0.72	1.5	135.1	6.6	0.151	2.931	0.444	98.7	0.312
260	12.6	0.64	1.5	135.3	6.8	0.147	2.913	0.440	97.7	0.327
270	12.6	0.64	3.2	135.1	6.8	0.148	3.163	0.467	103.6	0.326
280	12.6	0.64	1.6	135.1	6.8	0.147	3.097	0.457	101.5	0.329
290	12.6	0.63	3.1	135.0	7.3	0.136	3.233	0.476	105.6	0.383
300	12.6	0.63	1.5	135.1	7.6	0.132	3.358	0.457	101.6	0.407
310	12.6	0.61	1.6	135.1	8.0	0.125	3.576	0.473	105.0	0.459
320	12.6	0.61	1.6	135.1	8.0	0.126	3.307	0.412	91.6	0.452

Control No. P-SSI-0007 (5H Emission Calculations).xls, Effective Date: 10/25/2004

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Woodstove Type
Yhco-1=cat,2=ncat, 3=pellet
EPA's Hydrocarbon Constant (%)

2
1.32

Fuel Data
Test Charge (as fired lbs)
Average Moisture (% dry basis)
Average Moisture (% wet basis)

19.1
20.35
16.91

Run Parameters

DGM initial reading (cf)
DGM final reading (cf)
Pb (inches Hg)
Tm (avg of F)
dH (avg inches wc)
Vn (scf)
Qf by carbon balance (avg dscf/minute)

0.000
183.613
28.87
76.73
0.48
171.886
5.17

Analytical Data

Probe/Front Wash (mg)
Front Filter (mg)
Impinger PM (mg)
Back Filter (mg)
Total Weight (mg)

188.5
606.2
1,358.9
259.7
2,413.3

Emission Results

Cs (g/dscf)
ER (g/hour)

0.0140
4.36

OMNI-Test Laboratories

330	12.6	0.60	3.2	135.3	7.8	0.128	3.694	0.464	103.0	0.436
340	12.6	0.57	1.7	135.4	8.4	0.118	3.602	0.460	102.1	0.506
350	12.6	0.57	1.8	135.4	8.0	0.125	3.414	0.404	89.8	0.453
360	12.6	0.57	1.8	135.4	7.5	0.133	3.502	0.438	97.3	0.398
370	12.6	0.56	1.8	135.5	7.2	0.139	3.519	0.470	104.3	0.367
380	12.6	0.56	1.8	135.3	7.6	0.131	3.313	0.462	102.5	0.414
390	12.6	0.57	1.8	135.3	7.9	0.126	3.368	0.442	98.1	0.448
400	12.6	0.56	1.8	135.2	8.1	0.124	3.552	0.448	99.4	0.466
410	12.6	0.55	1.7	135.3	8.0	0.125	3.714	0.459	102.0	0.455
420	12.6	0.55	1.7	135.2	7.1	0.141	3.644	0.456	101.3	0.359
430	12.6	0.55	1.6	135.2	6.8	0.147	3.380	0.476	105.8	0.330
440	12.6	0.55	3.2	135.2	6.7	0.149	3.137	0.461	102.3	0.322
450	12.6	0.55	1.6	135.2	6.9	0.145	2.826	0.420	93.3	0.340
460	12.6	0.57	1.8	135.2	6.5	0.155	3.321	0.480	106.7	0.296
470	12.6	0.61	1.7	135.2	5.8	0.171	2.960	0.459	101.9	0.243
Averages/Totals	12.7	0.68	5.2	134.5	8.1	0.128	3.660	21.164	100.0	0.486

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth N Home Equipment Numbers: _____ Run No.: 1
 Model: 5700 Date: 11/19/08
 Project No.: 061-S-73-3
 Tracking No.: 1305

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	A1	1252.0	645.8		606.2
B. Rear filter catch	Filter	1a	409.3	149.6		259.7
C. Rinse of probe and filter assembly (FRONT)	Acetone	125	109349.3	109157.7	0.0245	188.5
D. Rinse of Impinger Set	Distilled Water	480	109280.4	108680.9	0.0000	599.5
E. Rinse of Impinger Set	Dichloromethane	150	109826.2	109527.5	0.0000	298.7
F. Rinse of filter assembly and gas train (BACK)	Acetone	160	104111.8	103647.2	0.0245	460.7
Total Particulate, mg :						2413.3

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	822.1	652.9	169.2
2	675.1	655.1	20.0
3	450.0	446.8	3.2
4	926.2	884.1	42.1
TOTAL, g:			234.5

Analyst: SMDate: 2-9-09

STOVE TEMPERATURE TEST DATA - METHOD 5G

Page 1 of 1

Client/Model: Handh & Home Tech Stove Project #: 061-S-733 Tracking #: 1305
 Date: 11-17-08 Test Crew: B Davis Run #: 1
 OMNI Equipment ID #: _____

Preburn Test		Fuel Weight		Delta Weight	Stack Draft	Coal Bed:					Actual:		
		[X]				Data: 0 = 0					Range: 39 - 4.7		
						TEMPERATURES (oF)							
Time		Fuel Weight	Stack Draft	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
0		7.0	-0.40			79	354	497	555	624	748	267	
10		6.4	-0.35	0.6		75	354	498	536	572	696	247	
20		5.8	-0.35	0.6		76	333	485	491	528	648	226	
30		5.3	-0.30	0.5		73	320	468	460	525	614	220	
40		5.0	-0.25	0.3		73	285	430	417	512	566	188	
50		4.9	-0.21	0.1		71	245	405	385	448	512	176	
60		4.7	-0.20	0.2		71	224	392	364	441	481	181	
70													
80													
90													
00													
10													
20													
30													
40													
50													
60													
70													
80													
90													
AVG													

Technician signature: B Davis Date: 1-7-09

FUEL DATA

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11-19-08Test Crew: B. DavisRun #: 1

OMNI Equipment ID #: _____

FUEL LOAD PREPARED BY: B. DavisFUEL: 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>21.0</u>	<u>2x4</u>
2	_____ ft	_____	_____
3	_____ ft	_____	_____

Length of cut pieces: 8 inchesPre-Burn Fuel Average Moisture: 19.60%Time (clock): 0805 Room Temperature (F): 69 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 3 4 x 4 3
 CALCULATED LOAD WEIGHT: _____ ACTUAL LOAD WEIGHT: 12.1 (2 x 4)
12.2 (4 x 4)
 FUEL PIECE LENGTH: 18 19.0 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS	TYPE
1	<u>19.7</u> <u>20.9</u> <u>18.3</u>	<u>2x4</u>
2	<u>19.3</u> <u>19.4</u> <u>19.0</u>	<u>2x4</u>
3	<u>19.1</u> <u>20.3</u> <u>20.8</u>	<u>2x4</u>
4	<u>19.7</u> <u>21.1</u> <u>18.8</u>	<u>4x4</u>
5	<u>22.3</u> <u>21.0</u> <u>23.8</u>	<u>4x4</u>
6	<u>20.3</u> <u>20.0</u> <u>22.5</u>	<u>4x4</u>
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.35Time (clock): 0850Room Temperature (F): 70Initials: BDTechnician signature: BDDate: 1-7-09

Run Notes

Client: Hearth N Home Tech

Model: 5700

Project #: 061-S-73-3

Tracking #: 1305

Run #: 1

Date: 11-19-08

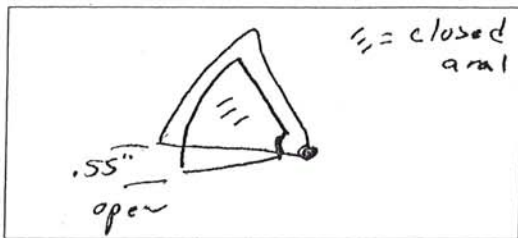
Test Crew: B. Davis

OMNI Equipment ID #(s): _____

PREBURN

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

PRIMARY:



SECONDARY: fixed

TERTIARY: NA

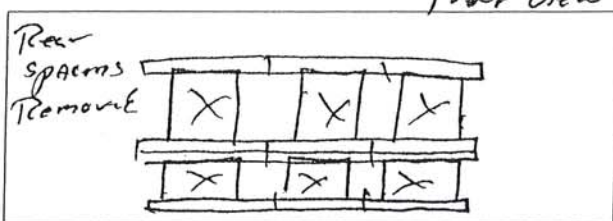
FAN: on High

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
0 58	Test setting				X	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



START UP PROCEDURES

BYPASS: NA

FUEL LOADING: By 55

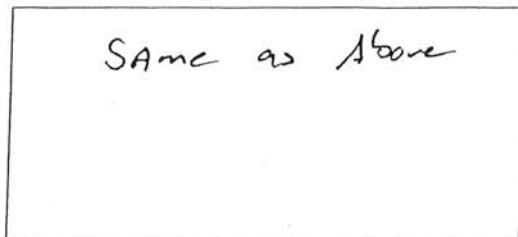
DOOR: closed by 65

PRIMARY AIR: At test setting full 5:00

OTHER: Timer Pushed @ 0 minutes

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

PRIMARY:



SECONDARY: fixed

TERTIARY: NA

FAN: off for 30 min then
Turned to High

Technician signature: B. Davis

Date: 1-7-09

OMNI-Test Laboratories, Inc.

Supplemental Data EPA 5G/5H

Client: Hearth N Home Tech

Model: 5700

Project #: 061-S-73-3

Tracking #: 1305

Date: 11-19-08 Run #: 1 Booth: _____

Test Crew: B Davis Start Time: 11:59 Stop Time: 19:49

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: _____ CO: 1.25 CO₂(DT): 1.25 1.249

	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
Time	<u>0</u>		<u>EOT</u>					
O ₂								
CO ₂	<u>0.0</u>	<u>9.9</u>	<u>0.02</u>	<u>9.8</u>				
CO	<u>0.00</u>	<u>1.25</u>	<u>0.0</u>	<u>1.24</u>				
CO ₂ (DT)	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.23</u>				

Stack Diameter (inches): 6"

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

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

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 Post: 0.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 11-18-08 Initials: me

	Initial	Middle	Ending
Pb (in/Hg)	<u>28.89</u>	<u>28.87</u>	<u>28.88</u>
Room Temp (°F)	<u>73</u>	<u>69</u>	<u>71</u>

Technician signature: B Davis Date: 1-7-09

Model: 5700
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114

Run 2

Wood Heater Test Data
EPA Method 5H

Mantidrone		Sample Rate Control Module Number:	
Shore Block, Tracking Number:	1305	Test Motor Y:	0.985
Shore Type (sea, reef, or pier):	seal	Circle #/Y:	1.764
Project Number:	0815-275-3	Pilot Tube Cp:	0.09
Test Date:	20-Nov-03	Average Barometric Pressure:	28.43
Test Start Time:	12:10	Average Fuel Mixture (dry basis %):	25.96
Recording Interval (minutely)	10	OMR Equipment Number:	
Test Sampling Time (minutes)	490		

Initial/Assumed Values	
Dilution	MW (air-sea-mo) 28.56 Ambient CO2 (%) 0.034
Tunnel	Preferred Initial Sampling Rate (Hz/min) 4.00

Dilution Tunnel Velocity Traverse Data										Dilution Tunnel	
	Pr. 1	Pr. 2	Pr. 3	Pr. 4	Pr. 5	Pr. 6	Pr. 7	Pr. 8		Initial	
Initial IP	0.034	0.038	0.035	0.034	0.038	0.040	0.036	0.038	%CO2	136.5	
Initial Temp	86	86	86	86	86	86	86	86	admixure	admixure	

Signature Date: BLD = 1-13-09

Pilot Test Leak Check: 015813.4 cmHg %N

[illegible]

Wood Heater Calculation Data EPA Method 5H

Run	2
Manufacturer:	Hearth N Home Tech
Model/Tracking No.:	1305
Test Date:	20-Nov-08
Project Number:	061-S-73-3

Burn Rate (dry kg/hour) = 1.08

Emission Rate (grams/hour) = 2.01

Note: When using the CO2 tracer-gas method, $1/Q_f$ (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 (discf)	SI * Volume Sampled	Proportional Sample Rate	dH new
0	13.2	1.09	136.5	136.5	8.6	0.116				
10	13.3	1.04	135.6	135.6	12.2	0.082	3.197	0.372	104.6	0.660
20	13.4	1.03	134.4	134.4	12.6	0.080	4.272	0.351	98.6	0.701
30	13.5	1.02	133.8	133.8	12.2	0.082	4.157	0.331	92.9	0.659
40	13.5	1.03	133.8	133.8	11.7	0.085	4.276	0.352	98.7	0.614
50	13.4	1.04	134.5	134.5	11.1	0.090	4.104	0.350	98.2	0.548
60	13.3	1.03	135.0	135.0	11.1	0.090	3.982	0.360	101.0	0.550
70	13.3	1.04	135.2	135.2	11.0	0.091	3.958	0.357	100.1	0.540
80	13.3	1.04	135.5	135.5	11.0	0.091	3.970	0.361	101.4	0.536
90	13.3	1.04	135.4	135.4	11.2	0.090	3.944	0.360	101.1	0.555
100	13.3	1.05	135.6	135.6	10.6	0.094	3.962	0.355	99.6	0.500
110	13.3	1.03	135.9	135.9	10.4	0.097	3.805	0.360	100.9	0.479
120	13.2	1.09	136.5	136.5	9.7	0.103	3.771	0.364	102.2	0.419
130	13.2	1.10	136.6	136.6	9.6	0.104	3.412	0.352	99.9	0.409
140	13.2	1.10	137.0	137.0	9.2	0.109	3.494	0.365	102.5	0.374
150	13.1	1.09	137.2	137.2	9.0	0.111	3.340	0.365	102.4	0.362
160	13.1	1.09	137.5	137.5	8.5	0.118	3.147	0.349	98.0	0.320
170	13.1	1.10	137.5	137.5	8.4	0.119	3.121	0.369	103.6	0.314
180	13.1	1.11	137.5	137.5	8.1	0.123	3.075	0.367	102.9	0.296
190	13.1	1.11	137.3	137.3	8.3	0.120	3.048	0.374	105.1	0.310
200	13.1	1.10	137.5	137.5	8.3	0.120	3.115	0.374	105.0	0.308
210	13.1	1.10	137.5	137.5	8.1	0.123	2.907	0.350	98.2	0.295
220	13.1	1.09	137.7	137.7	7.9	0.126	3.075	0.378	106.1	0.280
230	13.1	1.09	137.7	137.7	7.7	0.131	2.927	0.370	103.8	0.262
240	13.1	1.10	137.7	137.7	7.7	0.131	2.821	0.369	103.5	0.262
250	13.1	1.11	137.6	137.6	7.7	0.130	2.747	0.359	100.7	0.263
260	13.1	1.11	137.3	137.3	8.2	0.122	2.692	0.351	98.5	0.300
270	13.1	1.11	137.6	137.6	8.3	0.121	2.660	0.325	91.2	0.304
280	13.1	1.11	137.7	137.7	8.0	0.125	2.943	0.356	100.0	0.288
290	13.1	1.12	137.7	137.7	8.0	0.126	2.932	0.365	102.6	0.283
300	13.1	1.13	138.0	138.0	7.9	0.126	2.878	0.361	101.5	0.279
310	13.0	1.13	138.1	138.1	7.8	0.129	2.914	0.369	103.4	0.269
320	13.0	1.13	138.1	138.1	8.2	0.122	2.832	0.365	102.4	0.299

Control No. P-SSI-0007 (5H Emission Calculations) xls, Effective Date: 10/25/2004

Page 1 of 2

Woodstove Type
Yhc=1=cat,2=nat,3=pellet
EPA's Hydrocarbon Constant (%)

2
1.32

Fuel Data

Test Charge (as fired lbs)
Average Moisture (% dry basis)
Average Moisture (% wet basis)

19.1
20.86
17.26

Run Parameters

DGM initial reading (cf)
DGM final reading (cf)
Pb (inches Hg)
Tm (avg of)
dH (avg inches wc)
Vm (scf)
Qf by carbon balance (avg discf/minute)

0.000
143.691
28.43
75.85
0.40
132.653
5.75

Analytical Data

Probe/Front Wash (mg)
Front Filter (mg)
Impinger PM (mg)
Back Filter (mg)
Total Weight (mg)

76.0
143.0
491.6
61.2
771.8

Emission Results

Cs (g/discf)
ER (g/hour)

0.0058
2.01

OMNI-Test Laboratories

330	13.1	1.14	3.2	137.9	8.6	0.116	3.097	0.379	106.3	0.331
340	13.1	1.14	1.6	137.9	8.8	0.113	2.805	0.326	91.5	0.350
350	13.1	1.14	3.3	137.9	9.3	0.107	2.912	0.329	92.4	0.390
360	13.1	1.14	1.6	137.8	9.5	0.105	3.250	0.348	97.8	0.403
370	13.1	1.14	3.4	137.8	9.4	0.106	3.259	0.344	96.5	0.397
380	13.1	1.14	1.8	137.8	9.7	0.103	3.259	0.346	97.1	0.418
390	13.1	1.14	3.6	137.9	9.8	0.102	3.241	0.335	94.2	0.434
400	13.1	1.14	1.9	137.9	9.9	0.101	3.323	0.337	94.7	0.438
Averages/Totals	13.2	1.09	5.7	136.8	9.3	0.109	3.314	14.245	100.0	0.400

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth N Home Equipment Numbers: _____ Run No.: 2
 Model: 5700 Date: 11/20/08
 Project No.: 061-S-73-3
 Tracking No.: 1305

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	A2	782.0	639.0		143.0
B. Rear filter catch	Filter	2a	210.2	149.0		61.2
C. Rinse of probe and filter assembly (FRONT)	Acetone	75	102912.7	102834.9	0.0245	76.0
D. Rinse of Impinger Set	Distilled Water	500	303868.1	303668.9	0.0000	199.2
E. Rinse of Impinger Set	Dichloromethane	150	132512.5	132383.0	0.0000	129.5
F. Rinse of filter assembly and gas train (BACK)	Acetone	125	97455.5	97289.5	0.0245	162.9
Total Particulate, mg :						771.8

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	792.1	659.8	132.3
2	668.0	650.0	18.0
3	448.8	446.8	2.0
4	881.5	847.7	33.8
TOTAL, g:			186.1

Analyst: Date: 2-9-9

STOVE TEMPERATURE TEST DATA - METHOD 5G

Page 1 of 1

Client/Model: Heath N Home Tech Project #: 061-S-73-3 Tracking #: 1305

Date: 11-20-08 Test Crew: B Davis Run #: 2

OMNI Equipment ID #: _____

Preburn ☒		Coal Bed:					Actual:				
Test ☐		Data: 0 = ☐					Range: 3.8 - 4.7				
							Coal Bed: 4.7				
							TEMPERATURES (oF)				
Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
0	6.9	0.7	0.040	78	387	489	607	549	792	293	N/A
10	6.2	0.7	-0.35	77	376	482	590	625	764	247	
20	5.6	0.6	-0.31	76	356	508	536	569	708	233	
30	5.2	0.4	-0.31	75	347	480	490	523	690	235	
40	4.9	0.3	-0.25	75	305	449	450	513	617	797	
50	4.8	0.1	-0.20	74	268	425	418	471	558	787	
60	4.7	0.1	-0.18	73	239	406	389	445	510	191	
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

Technician signature: B Davis Date: 1-2-09

FUEL DATA

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11-24-08Test Crew: B DavisRun #: 2

OMNI Equipment ID #: _____

FUEL LOAD PREPARED BY: B DavisFUEL: 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>3</u> ft	<u>22.2</u> <u>18.7</u> <u>24.8</u>	<u>2x4</u>
2	ft		
3	ft		

Length of cut pieces: 8 inchesPre-Burn Fuel Average Moisture: 21.90 % CFTime (clock): 1000 Room Temperature (F): 69 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 3 4 x 4 3
 CALCULATED LOAD WEIGHT: _____ ACTUAL LOAD WEIGHT: 3.1 (2 x 4)
12.0 (4 x 4)
 FUEL PIECE LENGTH: 18 19.1 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	<u>22.5</u>	<u>18.6</u>	<u>22.4</u>	<u>2x4</u>
2	<u>20.5</u>	<u>21.3</u>	<u>20.2</u>	<u>2x4</u>
3	<u>20.6</u>	<u>19.7</u>	<u>18.7</u>	<u>2x4</u>
4	<u>20.1</u>	<u>22.8</u>	<u>22.6</u>	<u>4x4</u>
5	<u>21.9</u>	<u>18.8</u>	<u>21.2</u>	<u>4x4</u>
6	<u>21.6</u>	<u>20.8</u>	<u>21.2</u>	<u>4x4</u>
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.86Time (clock): 10:10Room Temperature (F): 69Initials: BATechnician signature: B DavisDate: 1-7-09

Run Notes

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Run #: 2Date: 11/20/08Test Crew: B Davis

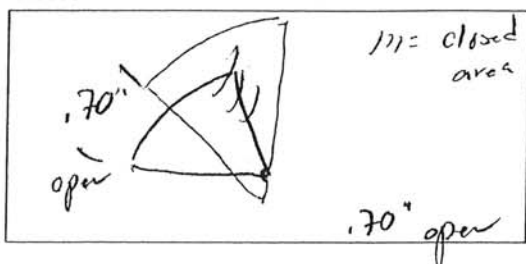
OMNI Equipment ID #(s): _____

PREBURN

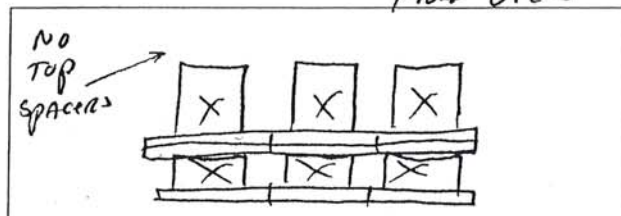
DESCRIBE OR SKETCH AIR OR THERMOMSTAT SETTINGS BELOW:

(SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

SECONDARY: fixedTERTIARY: NAFAN: on HighPREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø	Test settings					
58					X	→

TESTTEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)Front viewSTART UP PROCEDURESBYPASS: NAFUEL LOADING By 5.5 secDOOR: closed by 1:20 minPRIMARY AIR: at Test setting full flowOTHER: Timed Air pushed at 0 min.DESCRIBE OR SKETCH TEST SETTINGS BELOW:
(SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

Same as AboveSECONDARY: fixedTERTIARY: NAFAN: off for first 30 min.Technician signature: 1-7-09 B Davis Date: _____

Supplemental Data EPA 5G/5H

Client: Hearth N Home Tech

Model: 5700

Project #: 061-S-73-3

Tracking #: 1305

Date: 11-20-08 Run #: 2 Booth: _____

Test Crew: B. Davis Start Time: 12:10 Stop Time: 18:50

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: _____ CO: 1.25 CO₂(DT): 1.249

	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
Time	<u>Ø</u>	<u>Foot</u>					
O ₂							
CO ₂	<u>0.0</u>	<u>1.29</u>	<u>0.0</u>	<u>1.27</u>			
CO	<u>0.0</u>	<u>9.84</u>	<u>0.0</u>	<u>9.80</u>			
CO ₂ (DT)	<u>0.0</u>	<u>1.24</u>	<u>0.0</u>	<u>1.27</u>			

Stack Diameter (inches): 6"

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

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

Induced Draft: 0.0 %Smoke Capture: 100%

Pitot Tube Leak Test: Pre: 0.0 Post: 0.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 11-18-08 Initials: JD

	Initial	Middle	Ending
Pb (in/Hg)	<u>28.41</u>	<u>28.43</u>	<u>28.44</u>
Room Temp (°F)	<u>74</u>	<u>70</u>	<u>69</u>

Technician signature: B. Davis Date: 12-30-08

*Model: 5700
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114*

Run 3

Wood Heater Test Data
EPA Method 5H

[illegible]

Wood Heater Calculation Data EPA Method 5H

Run

3

Manufacturer: Hearth N Home

Model/Tracking No.: 5700/1305

Test Date: 21-Nov-08

Project Number: 061-S-73-3

Burn Rate (dry kg/hour) =

3.34

Emission Rate (grams/hour) =

2.26

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)	Qf-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	15.0	1.00		149.2	21.9	0.046				
5	15.4	1.01	24.4	146.5	25.4	0.039	1.397	0.064	102.0	0.351
10	15.8	1.04	25.7	142.7	24.9	0.040	1.495	0.059	94.3	0.339
15	16.0	1.04	27.5	140.7	25.1	0.040	1.476	0.059	94.9	0.343
20	16.0	1.03	26.9	140.4	24.1	0.041	1.508	0.060	96.4	0.318
25	16.0	1.02	28.2	140.7	23.9	0.042	1.475	0.061	97.9	0.311
30	15.9	1.02	24.4	141.3	23.0	0.043	1.488	0.062	99.9	0.290
35	15.8	1.01	23.3	142.3	22.1	0.045	1.441	0.063	100.2	0.266
40	15.7	1.01	23.7	143.9	21.1	0.047	1.442	0.065	104.5	0.242
45	15.5	1.00	18.6	145.5	19.6	0.051	1.393	0.066	105.8	0.210
50	15.4	1.00	15.0	146.5	19.6	0.051	1.248	0.064	102.0	0.209
55	15.3	1.00	13.1	147.3	18.8	0.053	1.206	0.062	98.6	0.193
60	15.2	1.00	13.3	147.8	18.8	0.053	1.182	0.063	100.7	0.193
65	15.2	1.00	11.0	148.3	18.7	0.053	1.206	0.064	102.6	0.191
70	15.2	1.00	13.6	148.6	18.5	0.054	1.229	0.066	105.1	0.187
75	15.1	1.01	9.0	149.1	18.7	0.054	1.112	0.060	96.3	0.190
80	15.1	1.01	6.2	149.6	18.2	0.055	1.174	0.063	100.6	0.182
85	15.0	1.01	6.3	150.0	18.1	0.055	1.193	0.065	104.8	0.179
90	15.0	1.02	6.4	150.3	18.5	0.054	1.190	0.066	105.2	0.187
95	15.0	1.02	6.4	150.4	18.5	0.054	1.136	0.061	98.2	0.187
100	15.0	1.03	6.5	150.5	18.9	0.053	1.073	0.058	92.8	0.196
105	14.9	1.03	6.6	150.7	18.4	0.054	1.235	0.065	104.4	0.184
110	14.9	1.03	6.8	150.7	18.8	0.053	1.140	0.062	99.4	0.192
115	14.9	1.03	6.8	150.7	18.5	0.054	1.175	0.063	100.2	0.186
120	15.0	1.03	3.4	150.5	18.4	0.054	1.098	0.059	95.2	0.185
125	14.9	1.04	7.1	150.8	18.7	0.054	1.131	0.061	98.2	0.190
Averages/Totals	15.3	1.02	14.4	147.1	20.4	0.050	1.274	1.561	100.0	0.228

Woodstove Type

Yhc>1=cat,2=nat,3=pellet
EPA's Hydrocarbon Constant (%)

2

1.32

Fuel Data

Test Charge (as fired lbs)
Average Moisture (% dry basis)
Average Moisture (% wet basis)

18.7

21.93

17.99

Run Parameters

DGM initial reading (cf)
DGM final reading (cf)
Pb (inches Hg)
Tm (avg of)
dH (avg inches wc)
Vm (scf)
Qf by carbon balance (avg dscf/minute)

0.000

33.648

28.79

69.19

0.23

31.838

14.40

Analytical Data

Probe/Front Wash (mg)
Front Filter (mg)
Impinger PM (mg)
Back Filter (mg)
Total Weight (mg)

11.1

19.1

45.7

7.2

83.1

Emission Results

Cs (g/dscf)
ER (g/hour)

0.0026

2.26

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth N Home Equipment Numbers: _____ Run No.: 3
 Model: 5700 Date: 11/21/08
 Project No.: 061-S-73-3
 Tracking No.: 1305

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	A3	661.1	642.0		19.1
B. Rear filter catch	Filter	3a	156.9	149.7		7.2
C. Rinse of probe and filter assembly (FRONT)	Acetone	60	108053.8	108041.2	0.0245	11.1
D. Rinse of Impinger Set	Distilled Water	320	103375.8	103358.6	0.0000	17.2
E. Rinse of Impinger Set	Dichloromethane	150	101519.1	101511.0	0.0000	8.1
F. Rinse of filter assembly and gas train (BACK)	Acetone	110	112690.7	112667.6	0.0245	20.4
Total Particulate, mg :						83.1

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	722.4	660.4	62.0
2	654.9	651.2	3.7
3	446.2	446.0	0.2
4	887.4	878.4	9.0
TOTAL, g:			74.9

Analyst: JMDate: 2-9-09

STOVE TEMPERATURE TEST -ATA - METHOD 5G

Page 1 of 1

Client/Model: Hamill N Home Project #: 061-S-73-B Tracking #: 1305
 Date: 11/24/08 Test Crew: B Davis Run #: 3
 OMNI Equipment ID #: _____

Preburn [X] Test []		Coal Bed:		Data:		0 = Ø		Range: 3.7- 4.6		Actual: Coal Bed: 4.4	
		TEMPERATURES (oF)									
Time	Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst
0	23.2		-0.60	71	328	423	574	485	690	370	
10	19.4	3.8	-0.82	70	735	494	517	433	597	747	
20	14.9	4.5	-0.80	70	793	482	608	512	609	772	
30	10.6	4.3	-0.80	69	823	474	528	549	649	774	
40	7.3	3.3	-0.80	71	837	474	567	548	736	691	
50	6.1	1.2	-0.62	71	617	474	586	518	811	503	
60	5.7	0.4	-0.55	71	467	467	602	491	782	432	
70	5.3	0.4	-0.50	71	397	469	601	473	760	404	
80	4.7	0.6	-0.50	70	367	477	591	469	747	390	
90	4.4	0.3	-0.50	71	343	467	578	548	736	362	
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

FUEL DATA

Client: Nearth N HomeModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11/21/08Test Crew: B DavisRun #: 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 12
 Cal Value (2) = 22% Actual Reading 22

Piece	Length		Readings		Type
1	<u>8</u> ft	<u>23.8</u>	<u>19.2</u>	<u>18.2</u>	<u>2x4</u>
2	<u>8</u> ft	<u>25.6</u>	<u>25.2</u>	<u>19.1</u>	<u>2x4</u>
3	<u>4</u> ft	<u>22.2</u>	<u>18.7</u>	<u>19.5</u>	<u>2x4</u>

4 = 20

Length of cut pieces: 8 = 16 inchesPre-Burn Fuel Average Moisture: 21.28% CTTime (clock): 0825 Room Temperature (F): 68 Initials: BR

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 3 4 x 4 3
 CALCULATED LOAD WEIGHT: _____ ACTUAL LOAD WEIGHT: 7.1 (2 x 4)
11.6 (4 x 4)
 FUEL PIECE LENGTH: 18 18.7 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	<u>21.5</u>	<u>21.0</u>	<u>21.1</u>	<u>2x4</u>
2	<u>21.9</u>	<u>20.6</u>	<u>20.2</u>	<u>2x4</u>
3	<u>21.2</u>	<u>19.3</u>	<u>19.7</u>	<u>2x4</u>
4	<u>22.6</u>	<u>23.1</u>	<u>20.1</u>	<u>4x4</u>
5	<u>24.2</u>	<u>24.5</u>	<u>23.8</u>	<u>4x4</u>
6	<u>23.8</u>	<u>22.8</u>	<u>23.3</u>	<u>4x4</u>
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 21.93Time (clock): 0830 Room Temperature (F): 68 Initials: BRTechnician signature: B Davis Date: 1-7-09

Run Notes

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Run #: 3 Date: 11-21-08Test Crew: B Davis

OMNI Equipment ID #(s): _____

PREBURN

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

PRIMARY:

full open

Timed Air full open

SECONDARY:

N. Road

TERTIARY:

NA

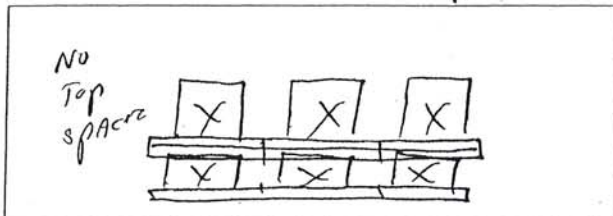
FAN:

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					
91					X	

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)front viewDESCRIBE OR SKETCH TEST SETTINGS BELOW:
(SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

Same as Above

START UP PROCEDURES

BYPASS:

NA

FUEL LOADING

by 42 seconds

DOOR:

closed by 55 seconds

PRIMARY AIR:

At test setting full 500

OTHER:

Timed Air fully open full duration at 1 test.

SECONDARY:

fired

TERTIARY:

NA

FAN:

on HighTechnician signature: B DavisDate: 1-7-09

Supplemental Data EPA 5G/5H

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11/21/08 Run #: 3 Booth: _____Test Crew: B Davis Start Time: 11:22 Stop Time: 13:27

OMNI Equipment #(s): _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: goodInitial: goodFinal: goodFinal: goodCalibrations: Span Gas CO₂: 9.9 O₂: _____ CO: 1.25 CO₂(DT): 1.245

	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
Time	<u>Ø</u>		<u>EOT</u>					
O ₂								
CO ₂	<u>0.0</u>	<u>9.84</u>	<u>0.0</u>	<u>9.84</u>				
CO	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.25</u>				
CO ₂ (DT)	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.23</u>				

Stack Diameter (inches): 6Air Velocity (ft/min): Initial: < 50 Final: < 50Scale Audit (lbs): Pretest: 10.0 Post Test: 10.0Induced Draft: 0.0 %Smoke Capture: 100 %Pitot Tube Leak Test: Pre: 0.0 Post: 0.0Flue Pipe Cleaned Prior to First Test in Series: Date: 11-11-08 Initials: BD

	Initial	Middle	Ending
Pb (in/Hg)	<u>28.80</u>	<u>28.79</u>	<u>28.77</u>
Room Temp (°F)	<u>71</u>	<u>72</u>	<u>68</u>

Technician signature: BD Date: 12-30-08

Model: 5700
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114

Run 4

Wood Heater Test Data EPA Method 5H

Run Number 4

Manufacturer: 322
 Sample Rate Control Module Number: 0.885
 Test Meter Y: 1.784
 Orifice dHG: 0.09
 Project Number: 0815-73-3
 Fuel Type C: 21-Nov-08
 Average Barometric Pressure: 28.85
 Average Fuel Moisture (dry basis %): 15.48
 Test Date: 10
 Recording Interval (minutes): 10
 Total Sampling Time (minutes): 260

Initial Assumed Values	
Dilution Tunnel	20.88
Ambient CO2 (%)	0.034
Ambient Relative Humidity (%)	0.34

Flow Gas	
Temperature, Fuel, Wet, Wet	121.3
Volume of Water Vapor, Wet, Wet	5.72
Moisture Content, Dry	0.865

Dilution Tunnel Velocity Traverse Data									
Port	Pt. 1	Pt. 2	Pt. 3	Pt. 4	Pt. 5	Pt. 6	Pt. 7	Pt. 8	Pt. 9
Initial	0.042	0.042	0.040	0.038	0.038	0.040	0.042	0.038	0.040
Final	0.042	0.042	0.040	0.038	0.038	0.040	0.042	0.038	0.040

Signature: *[Signature]*
 Date: 1-3-09
 Print Test Leak Check: 0.0012, 0.0012, 0.0012

Particulate Sampling System									
Elapsed Time (min)	Dry Gas Meter Reading (L)	Sample Rate (L/min)	Dilution Ratio	Dry Gas Meter Temp (°C)	Sample Temp (°C)	Sample Temp (°F)	Sample Temp (°C)	Sample Temp (°F)	Sample Temp (°C)
0	0.000	0.34	0.34	70	0	72	250	19.3	17.8
10	3.301	0.35	0.35	72	0	58	231	17.8	15.7
20	7.391	0.409	0.41	71	0	58	229	15.7	13.3
30	11.860	0.447	0.45	72	0	61	229	13.3	11.8
40	15.507	0.365	0.37	72	0	63	230	11.8	9.5
50	19.343	0.394	0.41	73	0	64	229	9.5	7.2
60	22.891	0.385	0.40	73	0	63	230	7.2	5.0
70	26.616	0.383	0.42	73	0	62	230	5.0	2.8
80	30.182	0.357	0.40	72	0	57	229	2.8	0.6
90	33.801	0.362	0.39	73	0	57	229	0.6	-1.7
100	37.394	0.359	0.38	73	0	57	229	-1.7	-3.9
110	40.771	0.338	0.35	73	0	57	230	-3.9	-6.1
120	44.332	0.356	0.32	73	0	58	229	-6.1	-8.3
130	47.527	0.320	0.32	72	0	57	230	-8.3	-10.5
140	50.689	0.314	0.30	72	0	57	230	-10.5	-12.7
150	53.865	0.320	0.29	72	0	57	230	-12.7	-14.9
160	56.960	0.310	0.28	72	0	58	230	-14.9	-17.1
170	60.028	0.307	0.28	72	0	60	230	-17.1	-19.3
180	63.087	0.304	0.27	73	0	63	229	-19.3	-21.5
190	66.107	0.302	0.27	73	0	64	230	-21.5	-23.7
200	69.131	0.302	0.27	73	0	65	230	-23.7	-25.9
210	72.118	0.299	0.27	73	0	66	230	-25.9	-28.1
220	75.241	0.312	0.27	74	0	65	230	-28.1	-30.3
230	78.196	0.296	0.26	73	0	63	230	-30.3	-32.5
240	81.165	0.300	0.27	74	0	61	230	-32.5	-34.7
250	84.227	0.303	0.27	74	0	62	230	-34.7	-36.9
260	87.251	0.302	0.27	74	0	61	230	-36.9	-39.1
Total Sampling Time (minutes): 260									

Stove Flow-Gas Conditions									
Elapsed Time (min)	CO (%)	CO2 (%)	CO/CO2 (%)	CO/CO2 (%)	CO/CO2 (%)	CO/CO2 (%)	CO/CO2 (%)	CO/CO2 (%)	CO/CO2 (%)
0	18.2	218	18.2	218	18.2	218	18.2	218	18.2
10	9.5	449	9.5	449	9.5	449	9.5	449	9.5
20	8.9	495	8.9	495	8.9	495	8.9	495	8.9
30	8.2	465	8.2	465	8.2	465	8.2	465	8.2
40	11.0	424	11.0	424	11.0	424	11.0	424	11.0
50	10.4	416	10.4	416	10.4	416	10.4	416	10.4
60	10.5	402	10.5	402	10.5	402	10.5	402	10.5
70	10.5	425	10.5	425	10.5	425	10.5	425	10.5
80	10.4	425	10.4	425	10.4	425	10.4	425	10.4
90	10.3	389	10.3	389	10.3	389	10.3	389	10.3
100	11.4	480	11.4	480	11.4	480	11.4	480	11.4
110	12.5	347	12.5	347	12.5	347	12.5	347	12.5
120	14.8	278	14.8	278	14.8	278	14.8	278	14.8
130	16.8	251	16.8	251	16.8	251	16.8	251	16.8
140	16.8	239	16.8	239	16.8	239	16.8	239	16.8
150	16.8	229	16.8	229	16.8	229	16.8	229	16.8
160	16.8	229	16.8	229	16.8	229	16.8	229	16.8
170	16.8	229	16.8	229	16.8	229	16.8	229	16.8
180	16.8	229	16.8	229	16.8	229	16.8	229	16.8
190	16.8	229	16.8	229	16.8	229	16.8	229	16.8
200	16.8	229	16.8	229	16.8	229	16.8	229	16.8
210	16.8	229	16.8	229	16.8	229	16.8	229	16.8
220	16.8	229	16.8	229	16.8	229	16.8	229	16.8
230	16.8	229	16.8	229	16.8	229	16.8	229	16.8
240	16.8	229	16.8	229	16.8	229	16.8	229	16.8
250	16.8	229	16.8	229	16.8	229	16.8	229	16.8
260	16.8	229	16.8	229	16.8	229	16.8	229	16.8

Wood Heater Calculation Data EPA Method 5H

Run

4

Burn Rate (dry kg/hour) =

1.67

Manufacturer: Hearth N Home

Model/Tracking No.: 1305

Test Date: 21-Nov-08

Project Number: 061-S-73-3

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)	Qf by tracer gas (scf/minute)	1/Qf by tracer gas (Si)	Volume Sampled (dsf)	Si * Volume Sampled	Proportional Sample Rate	dH new
0	13.8	1.09	140.5	12.4	0.080				
10	14.0	1.02	139.8	15.9	0.063	3.104	0.250	100.2	0.547
20	14.1	1.02	138.3	16.5	0.061	3.834	0.241	96.7	0.591
30	14.1	1.01	138.2	13.9	0.072	4.198	0.254	101.9	0.417
40	14.0	1.01	139.3	15.0	0.067	3.418	0.246	98.6	0.489
50	14.0	1.01	139.6	13.8	0.072	3.595	0.239	95.8	0.414
60	14.0	1.01	139.8	13.6	0.073	3.412	0.247	98.8	0.402
70	14.0	1.02	139.6	13.9	0.072	3.390	0.249	99.6	0.417
80	14.0	1.01	139.8	13.5	0.074	3.335	0.240	96.2	0.397
90	14.0	1.01	139.8	13.4	0.074	3.391	0.250	100.4	0.390
100	13.9	1.01	140.3	13.0	0.077	3.360	0.250	100.3	0.364
110	13.9	1.02	140.9	12.7	0.078	3.158	0.243	97.6	0.351
120	13.7	1.06	142.1	12.1	0.083	3.330	0.261	104.7	0.316
130	13.7	1.06	142.6	12.1	0.083	2.888	0.247	99.1	0.316
140	13.7	1.06	143.0	11.7	0.085	2.944	0.244	97.7	0.296
150	13.6	1.06	143.1	11.7	0.086	2.994	0.246	102.6	0.294
160	13.6	1.07	143.1	11.4	0.087	2.899	0.249	99.7	0.283
170	13.7	1.07	143.0	11.5	0.087	2.874	0.251	100.7	0.284
180	13.7	1.06	143.0	11.2	0.089	2.847	0.249	99.6	0.272
190	13.7	1.07	143.0	11.4	0.087	2.842	0.253	101.5	0.282
200	13.7	1.07	143.0	11.2	0.089	2.827	0.247	99.1	0.270
210	13.7	1.07	143.0	11.3	0.089	2.793	0.250	100.0	0.275
220	13.7	1.07	143.0	11.1	0.090	2.920	0.259	103.8	0.265
230	13.7	1.06	143.0	11.0	0.091	2.758	0.249	99.6	0.263
240	13.6	1.06	143.1	11.1	0.090	2.804	0.254	101.8	0.267
250	13.7	1.07	143.0	11.1	0.090	2.830	0.254	102.0	0.265
260	13.6	1.06	143.1	11.2	0.089	2.822	0.254	102.0	0.270
Averages/Totals	13.8	1.04	141.5	12.6	0.081	3.141	6.485	100.0	0.346

Woodstove Type
Yhco-1=cat, 2=mcot, 3=pellet
EPA's Hydrocarbon Constant (%)

2
1.32

Fuel Data

Test Charge (as fired bs)
Average Moisture (% dry basis)
Average Moisture (% wet basis)

19.3
20.83
17.24

Run Parameters

DGM initial reading (cf)
DGM final reading (cf)
Pb (inches Hg)
Tm (avg of F)
dH (avg inches wc)
Vm (scf)
Qf by carbon balance (avg dsf/minute)

0.000
87.251
28.65
72.63
0.35
81.651
9.14

Analytical Data

Probe/Front Wash (mg)
Front Filler (mg)
Impinger PM (mg)
Back Filler (mg)
Total Weight (mg)

15.6
38.7
93.2
12.4
159.9

Emission Results

Cs (g/dscf)
ER (g/hour)

0.0020
1.07

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth N Home Equipment Numbers: _____ Run No.: 4
 Model: 5700 Date: 11/21/08
 Project No.: 061-S-73-3
 Tracking No.: 1305

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	A4	674.8	636.1		38.7
B. Rear filter catch	Filter	4a	163.8	151.4		12.4
C. Rinse of probe and filter assembly (FRONT)	Acetone	80	111479.1	111461.5	0.0245	15.6
D. Rinse of Impinger Set	Distilled Water	355	105044.5	105003.6	0.0000	40.9
E. Rinse of Impinger Set	Dichloromethane	150	109130.7	109107.8	0.0000	22.9
F. Rinse of filter assembly and gas train (BACK)	Acetone	125	100741.1	100708.7	0.0245	29.3
Total Particulate, mg :						159.9

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	755.3	659.5	95.8
2	665.9	655.7	10.2
3	448.3	447.8	0.5
4	901.6	886.8	14.8
	TOTAL, g:		121.3

Analyst: B. D. [Signature]Date: 1-8-09

STOVE TEMPERATURE TEST DATA - METHOD 5G

Page 1 of 1

Client/Model: Harold n Home Tech Project #: 061-S-73-3 Tracking #: 1305
 Date: 11-21-08 Test Crew: BDA Run #: 4
 OMNI Equipment ID #: _____

Preburn Test		Coal Bed:		Data:		0 = Ø		Range: 3.9 - 4.8		Actual: 4.8		Coal Bed: 4.8	

FUEL DATA

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11-21-08Test Crew: B DAVISRun #: 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>8</u> ft	<u>24.8</u>	<u>2x4</u>
2	_____ ft	_____	_____
3	_____ ft	_____	_____

Length of cut pieces: 8 inchesPre-Burn Fuel Average Moisture: 22.47% CTTime (clock): 13:15 Room Temperature (F): 70 Initials: BD

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 3 4 x 4 3
 CALCULATED LOAD WEIGHT: _____ ACTUAL LOAD WEIGHT: 7.2 (2 x 4)
12.1 (4 x 4)
 FUEL PIECE LENGTH: 18 19.3 Total

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS	TYPE
1	<u>21.3</u> <u>21.3</u> <u>21.6</u>	<u>2x4</u>
2	<u>21.3</u> <u>18.6</u> <u>21.4</u>	<u>2x4</u>
3	<u>22.6</u> <u>21.6</u> <u>21.7</u>	<u>2x4</u>
4	<u>20.2</u> <u>21.4</u> <u>20.4</u>	<u>4x4</u>
5	<u>20.5</u> <u>19.8</u> <u>20.4</u>	<u>4x4</u>
6	<u>22.6</u> <u>18.8</u> <u>19.4</u>	<u>4x4</u>
7	_____	_____
8	_____	_____
9	_____	_____
10	_____	_____

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.83Time (clock): 15:10Room Temperature (F): 71Initials: BDTechnician signature: B DAVISDate: 1-7-09

Run Notes

Client: Hearth N Home Tech

Model: 5700

Project #: 061-S-73-3

Tracking #: 1305

Run #: 4 Date: 11/21/08

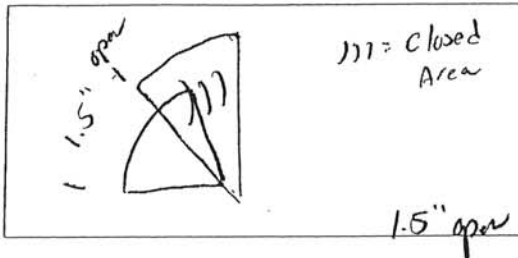
Test Crew: B Davis

OMNI Equipment ID #(s): _____

PREBURN

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

PRIMARY:



SECONDARY: Fixed

TERTIARY: NA

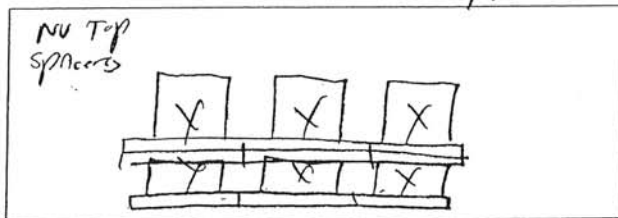
FAN: on high

PREBURN SETTINGS AND ACTIVITIES

TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
Ø 49	Test setting		<u>.6</u> BN	<u>.6</u>		

TEST

TEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)



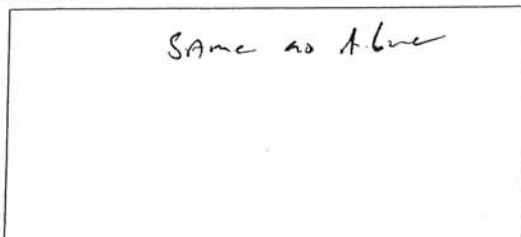
START UP PROCEDURES

BYPASS: NA
FUEL LOADING: by 48 sec.
DOOR: closed by 1:15 min
PRIMARY AIR: At test setting Full 5:00

OTHER: Timed Air push 1 @ Ø min

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

PRIMARY:



SECONDARY: Fixed

TERTIARY: NA

FAN: off Air test 30 min

Technician signature: B Davis Date: 1-7-09

Supplemental Data EPA 5G/5H

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11-21-08 Run #: 4 Booth: _____Test Crew: B D Ams Start Time: 15:46 Stop Time: 20:06

OMNI Equipment #(s): _____

Gas Analyzer Train Leak Check:

Stack:

Dilution Tunnel (Method 5G Only):

Initial: goodInitial: goodFinal: goodFinal: goodCalibrations: Span Gas CO₂: 9.9 O₂: _____ CO: 1.25 CO₂(DT): 1.249

	N ₂ Span		N ₂ Span		N ₂ Span	N ₂ Span	N ₂ Span	N ₂ Span
Time	<u>Ø</u>		<u>EOT</u>					
O ₂								
CO ₂	<u>0.0</u>	<u>9.88</u>	<u>0.0</u>	<u>9.86</u>				
CO	<u>0.00</u>	<u>1.26</u>	<u>0.00</u>	<u>1.26</u>				
CO ₂ (DT)	<u>0.00</u>	<u>1.24</u>	<u>0.00</u>	<u>1.22</u>				

Stack Diameter (inches): 6"Air Velocity (ft/min): Initial: 450 Final: 450Scale Audit (lbs): Pretest: 10.0 Post Test: 10.0Induced Draft: 0.0 %Smoke Capture: 100%Pitot Tube Leak Test: Pre: 0.0 @ 3-11 Post: 0.0Flue Pipe Cleaned Prior to First Test in Series: Date: 11/18/08 Initials: Ba

	Initial	Middle	Ending
Pb (in/Hg)	<u>28.71</u>	<u>28.66</u>	<u>28.57</u>
Room Temp (°F)	<u>71</u>	<u>71</u>	<u>70</u>

Technician signature: B D Ams Date: 1-7-09

Model: 5700
Hearth & Home Technologies
1445 North Highway
Colville, WA 99114

Run 5

Wood Heater Calculation Data EPA Method 5H

Run	5
Manufacturer:	Hearth N Home
Model/Tracking No.:	1305
Test Date:	22-Nov-08
Project Number:	061-S-73-3

Burn Rate (dry kg/hour) =

1.06

Emission Rate (grams/hour) =

4.84

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)	Qf-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	14.4	1.09		147.4	8.5	0.117				
10	14.2	1.05	11.6	147.5	11.0	0.091	3.128	0.367	104.8	0.555
20	14.3	1.05	16.5	147.0	12.0	0.083	3.933	0.357	101.9	0.660
30	14.4	1.03	14.3	145.8	11.1	0.090	4.088	0.340	97.1	0.564
40	14.5	1.02	17.8	145.3	11.1	0.090	4.016	0.361	103.2	0.566
50	14.5	1.01	12.5	145.4	10.2	0.098	3.797	0.341	97.5	0.479
60	14.5	1.02	12.5	145.4	10.5	0.095	3.656	0.357	101.9	0.506
70	14.4	1.03	12.1	145.9	10.1	0.099	3.797	0.360	103.0	0.469
80	14.3	1.15	13.6	147.1	8.8	0.114	3.630	0.358	102.3	0.351
90	17.1	1.04	10.0	123.1	8.6	0.116	3.213	0.366	104.5	0.337
100	14.3	1.04	10.0	147.2	9.3	0.107	3.131	0.364	104.1	0.394
110	14.3	1.02	9.3	147.2	9.1	0.109	3.024	0.325	92.8	0.381
120	14.2	1.04	10.2	147.5	8.6	0.117	3.009	0.329	94.0	0.337
130	14.2	1.06	7.0	148.0	8.5	0.118	2.927	0.341	97.4	0.267
140	14.2	1.10	7.5	148.3	7.8	0.129	2.937	0.346	98.7	0.276
150	14.1	1.11	6.0	148.6	7.6	0.131	2.770	0.356	101.7	0.267
160	14.1	1.11	1.6	148.7	8.4	0.118	2.774	0.363	103.6	0.326
170	14.1	1.11	4.8	148.6	8.5	0.118	2.945	0.349	99.6	0.328
180	14.1	1.11	1.7	148.6	8.4	0.119	2.746	0.324	92.6	0.324
190	14.1	1.11	3.2	148.7	8.3	0.120	2.731	0.325	92.7	0.317
200	14.1	1.10	3.2	148.7	8.1	0.123	3.007	0.361	103.2	0.301
210	14.1	1.10	1.6	149.0	8.0	0.124	2.665	0.328	93.7	0.297
220	14.1	1.11	3.2	149.0	8.0	0.125	2.923	0.363	103.8	0.294
230	14.1	1.12	3.2	148.7	8.2	0.122	2.822	0.352	100.6	0.308
240	14.1	1.13	3.2	148.6	8.2	0.122	2.812	0.343	97.9	0.310
250	14.1	1.13	1.7	148.6	8.3	0.121	2.922	0.355	101.5	0.315
260	14.2	1.14	3.4	148.5	8.1	0.123	2.817	0.340	97.0	0.304
270	14.2	1.14	1.7	148.5	8.0	0.125	2.769	0.340	97.1	0.290
280	14.2	1.14	3.4	148.5	8.0	0.125	2.899	0.364	103.9	0.291
290	14.2	1.11	1.6	148.5	7.8	0.129	2.712	0.340	97.1	0.277
300	14.1	1.11	3.3	148.6	7.8	0.128	2.799	0.360	102.8	0.277
310	14.1	1.10	3.1	148.9	7.6	0.131	2.869	0.368	105.2	0.267
320	14.1	1.10	1.5	149.0	7.6	0.131	2.773	0.363	103.7	0.267

Control No. P-SSI-0007 (5H Emission Calculations).xls, Effective Date: 10/25/2004

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OMNI-Test Laboratories

330	14.1	1.09	3.0	148.7	6.8	0.148	2.691	0.353	101.2	0.209
340	14.1	1.10	1.5	148.8	7.6	0.131	2.487	0.368	105.4	0.266
350	14.1	1.10	3.0	148.9	7.6	0.131	2.683	0.352	100.8	0.268
360	14.1	1.10	3.1	148.9	7.9	0.127	2.375	0.311	89.1	0.287
370	14.1	1.11	1.6	148.9	7.8	0.129	2.655	0.336	96.2	0.278
380	14.1	1.12	3.1	148.9	7.5	0.133	2.589	0.333	95.3	0.260
390	14.1	1.14	1.6	149.1	8.1	0.123	2.829	0.376	107.8	0.303
400	44.6	1.14	1.7	471.5	25.8	0.039	2.933	0.361	103.5	3.053
Averages/Totals	15.0	1.09	5.9	154.9	9.0	0.117	2.991	13.960	100.0	0.410

Final Laboratory Report - Method 5H Dilution Tunnel Particulate Calculations

Client Name: Hearth N Home Equipment Numbers: _____ Run No.: 5
 Model: 5700 Date: 11/22/08
 Project No.: 061-S-73-3
 Tracking No.: 1305

PARTICULATE COMPONENTS

Sample Component	Reagent	Filter # or Volume, ml	Weights			
			Final, mg	Tare, mg	Blank, mg/ml	Particulate, mg
A. Front filter catch	Filter	A5	1067.3	642.5		424.8
B. Rear filter catch	Filter	5a	349.0	148.9		200.1
C. Rinse of probe and filter assembly (FRONT)	Acetone	100	103084.6	102886.0	0.0245	196.2
D. Rinse of Impinger Set	Distilled Water	350	136608.7	136216.9	0.0000	391.8
E. Rinse of Impinger Set	Dichloromethane	150	138352.5	138146.2	0.0000	206.3
F. Rinse of filter assembly and gas train (BACK)	Acetone	150	106465.0	106227.2	0.0245	234.1
Total Particulate, mg :						1653.3

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	786.1	659.1	127.0
2	665.7	656.1	9.6
3	447.6	447.1	0.5
4	849.8	823.7	26.1
TOTAL, g:			163.2

Analyst: JMMDate: 2-9-09

STOVE TEMPERATURE TEST DATA - METHOD 5G

Page 1 of 1

Client/Model: Heath Home 5700 Project #: 061-S-73-3 Tracking #: 1305
 Date: 11-22-08 Test Crew: B. Davis Run #: 5
 OMNI Equipment ID #: _____

Preburn Test		Fuel Weight		Delta Weight	Stack Draft	Coal Bed:					Actual:					
		[X]		[]		Data: 0 = 0 Range: 3.8 - 4.7					Coal Bed: 4.2					
						TEMPERATURES (oF)										
Time		Fuel Weight	Delta Weight	Stack Draft	Ambient	Top	Bottom	Back	Left	Right	Flue	Catalyst				
0		7.0		-0.30	72	367	488	602	422	768	274					
10		6.3	0.7	-0.28	72	415	510	590	503	746	247					
20		5.8	0.5	-0.28	72	440	516	555	472	712	247					
30		5.2	0.6	-0.30	71	472	479	516	462	690	260					
40		4.9	0.3	-0.22	71	445	447	487	449	621	224					
50		4.8	0.1	-0.21	71	398	422	457	431	556	211					
60		4.7	0.1	-0.18	71	361	400	425	405	508	221					
70																
80																
90																
00																
10																
20																
30																
40																
50																
60																
70																
80																
90																
AVG																

Technician signature: B. Davis Date: 1-7-09

FUEL DATA

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11/22/08Test Crew: B DAVISRun #: 5

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>8</u> ft	<u>208</u>	<u>19.4</u>	<u>22.5</u>	
2	ft				
3	ft				

Length of cut pieces: 8 inches

Pre-Burn Fuel Average Moisture:

Time (clock): 0810 Room Temperature (F): 68 Initials: BA

TEST FUEL

FUEL TYPE AND AMOUNT: 2 x 4 3 4 x 4 3
 CALCULATED LOAD WEIGHT: ACTUAL LOAD WEIGHT: 7.0 (2 x 4)
12.0 (4 x 4)
19.0 Total

FUEL PIECE LENGTH: 18

MOISTURE CONTENT (METER -- DRY BASIS)

PIECE	READINGS			TYPE
1	<u>20.2</u>	<u>19.8</u>	<u>21.1</u>	<u>2x4</u>
2	<u>19.5</u>	<u>18.5</u>	<u>19.5</u>	<u>2x4</u>
3	<u>20.8</u>	<u>19.3</u>	<u>20.4</u>	<u>2x4</u>
4	<u>22.5</u>	<u>21.2</u>	<u>19.4</u>	<u>4x4</u>
5	<u>19.4</u>	<u>20.6</u>	<u>23.4</u>	<u>4x4</u>
6	<u>23.6</u>	<u>22.0</u>	<u>20.4</u>	<u>4x4</u>
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVERAGE: 20.66Time (clock): 0815 Room Temperature (F): 68 Initials: BATechnician signature: B DAVIS Date: 1-7-08

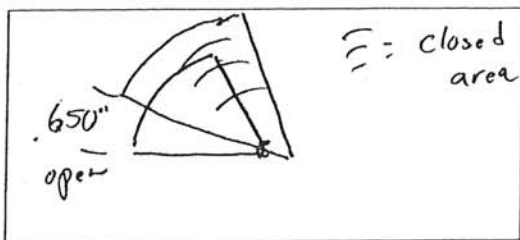
Run Notes

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Run #: 5 Date: 11-22-08Test Crew: B Davis

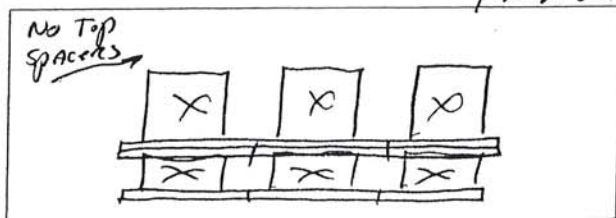
OMNI Equipment ID #(s): _____

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

PRIMARY:

SECONDARY: fixedTERTIARY: NAFAN: offPREBURN SETTINGS AND ACTIVITIES

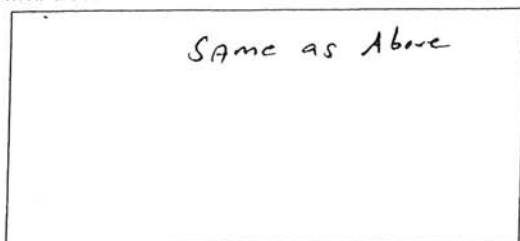
TIME	AIR (THERMO) CHANGES PRIMARY/SECONDARY/TERTIARY	FAN SETTING CHANGE	ADD FUEL + WT.	ADD FUEL - WT.	RAKE COAL	COMMENT
059	Test setting				x	

TESTTEST FUEL CONFIGURATION SKETCH
(INDICATE VIEW ANGLE)

START UP PROCEDURES

 BYPASS: NA
 FUEL LOADING: By 45 sec.
 DOOR: closed by 1:00 m.
 PRIMARY AIR: at Test setting full 5:00
OTHER: Timed Air pushed @ 0 m.DESCRIBE OR SKETCH TEST SETTINGS BELOW:
(SETTINGS MUST BE ACCURATE AND REPRODUCIBLE)

PRIMARY:

SECONDARY: fixedTERTIARY: NAFAN: offTechnician signature: B DavisDate: 1-7-08

Supplemental Data EPA 5G/5H

Client: Hearth N Home TechModel: 5700Project #: 061-S-73-3Tracking #: 1305Date: 11/22/08 Run #: 5 Booth: _____Test Crew: B Davis Start Time: 12:08 Stop Time: 18:48

OMNI Equipment #(s): _____

Gas Analyzer Train Leak Check:

Stack:

Initial: goodFinal: good

Dilution Tunnel (Method 5G Only):

Initial: goodFinal: goodCalibrations: Span Gas CO₂: 9.9 O₂: _____ CO: 1.25 CO₂(DT): 1.249

	N ₂ Span		N ₂ Span		N ₂ Span		N ₂ Span		N ₂ Span	
Time	<u>0</u>									
O ₂										
CO ₂	<u>0.0</u>	<u>9.94</u>	<u>0.0</u>	<u>9.81</u>						
CO	<u>0.00</u>	<u>1.27</u>	<u>0.01</u>	<u>1.27</u>						
CO ₂ (DT)	<u>0.00</u>	<u>1.25</u>	<u>0.00</u>	<u>1.24</u>						

Stack Diameter (inches): 6Air Velocity (ft/min): Initial: 250 Final: 250Scale Audit (lbs): Pretest: 10.0 Post Test: 10.0Induced Draft: 0.0 %Smoke Capture: 100Pitot Tube Leak Test: Pre: 0.0 Post: 0.0Flue Pipe Cleaned Prior to First Test in Series: Date: 11-18-08 Initials: BA

	Initial	Middle	Ending
Pb (in/Hg)	<u>28.57</u>	<u>28.58</u>	<u>28.60</u>
Room Temp (°F)	<u>71</u>	<u>67</u>	<u>65</u>

Technician signature: B Davis Date: 1-7-09