TEST REPORT

REPORT NUMBER: 100340618PRT-001
REPORT DATE: July 13, 2011

EVALUATION CENTER

Intertek Testing Services NA Inc.
222887 NE Townsend Way
Fairview Oregon 97024

RENDERED TO

Hearth & Home Technologies
1445 N. Highway
Colville Washington 99114

PRODUCT EVALUATED:

MODEL 5100I ACC SOLID FUEL ROOM HEATER FIREPLACE INSERT

Report of Testing Model 5100I ACC Wood Fuel Room Heater Fireplace Insert for compliance as an "Affected Facility" with the applicable requirements of the following criteria: EPA Method 28 "Certification and Auditing of Wood Heaters" and EPA Method 5H "Determination of Particulate Matter Emissions from Wood Heaters".

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I. INTRODUCTION

Intertek Testing Services NA (Intertek) has conducted testing for Hearth & Home Technologies, on model 5100I ACC Solid Fuel Room Heater Fireplace Insert, to evaluate all applicable performance requirements included in EPA Method 28 "Certification and auditing of wood heaters" and Method 5H "Determination of particulate matter emissions from wood heaters."

I.A PURPOSE OF TEST

The test was conducted to determine if the unit is in accordance with U.S EPA requirements under 40 CFR 60 SUBPART AAA, NSPS for Residential Wood Heaters. This evaluation was conducted on May 9 through May 13, 2011.

I.B LABORATORY

The test on the 5100I ACC Solid Fuel Room Heater Fireplace Insert was conducted at the Hearth & Home testing facility located in Colville Washington. The laboratory elevation is 1635 feet above sea level and is accredited by the U.S. EPA through approval of on-site testing conducted by test engineer Bruce Davis of Intertek.

I.C DESCRIPTION OF UNIT

The model 5100I ACC Solid Fuel Room Heater Fireplace Insert is constructed of carbon steel. The firebox inside dimensions is 22.0 inches deep, 11.3 inches high and 7.75 inches wide across the back. The unit has a door located on the front with a viewing glass for loading the fuel. Combustion air is controlled by a handle located on the front of the appliance. A second control located on the front of the appliance activates a timer providing additional air to the lower primary air orifice for a predetermined length of time. This same control can be pushed in and set to open an air passage to the rear of the firebox used on high burn rates. Secondary air is supplied by a third opening that has no user control. (See product drawings.)

I.D REPORT ORGANIZATION

This report includes summaries of all data necessary to determine compliance with the regulations. Raw data, calibration records, intermediate calculations, drawings, specifications and other supporting information are contained in appendices to this report.

II. SUMMARIZATION

II.A PRETEST INFORMATION

A sample was submitted to Intertek directly from the client. The sample was not independently selected for testing. The unit was inspected upon receipt and found to be in good condition. The unit was set up following the manufacturer's instructions without difficulty.

Following assembly, the unit was placed on the test stand and instrumented with thermocouples in the specified locations. Prior to beginning the emissions tests the unit had been operated for a minimum of 10 hours at high-to-medium burn rates to break in the stove. The unit was found to be operating satisfactory during this break-in.

Following the pre-burn break-in process the unit was allowed to cool. The unit's chimney system and laboratory dilution tunnels were cleaned using standard wire brush chimney cleaning equipment.

II.B INFORMATION LOG

TEST STANDARD

On May 9, 2011 the unit was tested for EPA emissions using method 5H.

Deviation from Standard Method

No deviations from the standards were performed, however, only the applicable sections from each standard were used during all testing.

II.C SUMMARY OF TEST RESULTS

RUN #1 May 9, 2011: Test fuel was loaded by 50 seconds, the door was open for 60 seconds, and then closed. Primary air control set fully open for entire test. Timed air was pushed at zero minutes and pulled out, rear air was not used. Burn time was 270 minutes with a category 3 burn rate of 1.53 kg/hr. The fan was set at high for the entire test duration.

RUN #2 May 10, 2011: Test fuel was loaded by 125 seconds, the door was open for 150 seconds, and then closed. Primary air control set at 0.40 inches open for entire test. Timed air was pushed at zero minutes and pulled out at 5 minutes. Burn time was 470 minutes with a category 2 burn rate of 0.88 kg/hr.

The fan was off for the first 30 minutes then set to high for the remainder of the test.

RUN #3 May 11, 2011: Test fuel was loaded by 35 seconds, the door was open for 40 seconds, and then closed. Primary air control set at 0.40 inches open for entire test. Timed air was pushed at zero minutes and pulled out at 5 minutes. Burn time was 480 minutes with a category 2 burn rate of 0.87 kg/hr. The fan was off for the first 30 minutes then set to high for the remainder of the test.

RUN #4 May 12, 2011: Test fuel was loaded by 61 seconds, the door was open for 70 seconds, and then closed. Primary air control set at 1.00 inches open for entire test. Timed air was pushed at zero minutes and pulled out at 5 minutes. Burn time was 320 minutes with a category 3 burn rate of 1.30 kg/hr. The fan was off for the first 30 minutes then set to high for the remainder of the test.

RUN #5 May 13, 2011: Test fuel was loaded by 45 seconds, the door was open for 60 seconds, and then closed. Primary air control set at full open for entire test. Timed air was pushed at zero minutes and not out. Burn time was 320 minutes with a category 4 burn rate of 2.31 kg/hr. The fan was on high for the entire test.

RUN #6 May 13, 2011: Test fuel was loaded by 48 seconds, the door was open for 60 seconds, and then closed. Primary air control set at 0.75 inches open for entire test. Timed air was pushed at zero minutes and pulled out at 5 minutes. Burn time was 370 minutes with a category 2 burn rate of 1.13 kg/hr. The fan was off for the first 30 minutes then set to high for the remainder of the test.

II.D SUMMARY OF OTHER DATA

EMISSIONS

Run Number	Test Date	Burn Rate (kg/hr)	Emission Rate (g/hr)	Heating Efficiency % LHV*	Heating Efficiency % HHV*
1	5/9/11	1.53	2.63	80.5	74.5
2	5/10/11	.88	13.05	71.9	66.6
3	5/11/11	.87	5.71	78.4	72.5
4	5/12/11	1.30	2.00	80.4	74.4
5	513/11	2.31	8.21	75.5	69.9
6	5/13/11	1.13	2.59	80.1	74.1

* *Heating efficiency was calculated by the stack loss method per CSA B415.1-2009 and is provided for information.*

WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate	(E) Average Emission Rate g/hr	Heat Output (Btu/hr)	Probability	(K) Weighting Factor	(KxE)
3	.87	5.71	10491	.2724	.4780	2.7294
2	.88	13.05	NA	NA	NA	NA
6	1.13	2.59	13626	.4780	.3476	.9003
4	1.3	2.00	15675	.6200	.2894	.5788
1	1.53	2.63	18449	.7674	.3262	.8579
5	2.31	8.21	27854	.9462	.2326	1.9096
				Totals:	1.6738	6.976
Note: Run 2 was omitted on a two for one basis and not included in the weighted average.						
					Weighted average emission rate:	**4.17**

TEST FACILITY CONDITIONS

Run	Room Temp. °F before	Room Temp °F after	Baro. Pres. In. Hg before	Baro. Pres. In. Hg After	Air Vel. Ft/min before	Air Vel. Ft/min after
1	76	79	28.38	28.44	<50	<50
2	75	75	28.42	28.33	<50	<50
3	74	76	28.22	28.23	<50	<50
4	71	78	28.56	28.61	<50	<50
5	75	76	28.69	28.55	<50	<50
6	77	74	28.52	28.45	<50	<50

DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA (5H)

Run No.	Burn Time (min)	Velocity (ft/sec)	Volumetric Flow Rate (dscf/min)	Total Temp. (°R)	Stack Flow Rate DSCFM	Particulate Catch (mg)
1	270	12.75	129.6	557.8	7.10	289.2
2	470	12.39	129.3	542	4.42	2645.8
3	480	12.25	126.7	543.9	4.32	2152.5
4	320	12.78	133.2	546.9	5.60	463.6
5	180	12.61	127.1	566.3	8.44	558.3
6	370	12.24	126.8	548.6	4.91	724.8

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (°F)	Run Time (min)	Average Draft (in/H_2O)
1	1.53	33.8	270	-.045
2	.88	84.2	470	-.040
3	.87	103	480	-.043
4	1.30	72	320	-.05
5	2.31	63.2	180	-.063
6	1.13	99.4	370	-.044

III. PROCESS DESCRIPTION

III.A TEST SET-UP DESCRIPTON

A standard 6" diameter single wall pipe and insulated chimney system was installed to 15' above floor level. The unit controls were adjusted to achieve the four individual burn rates. Rate of combustion was observed by monitoring fuel weight consumption displayed by a platform scale. All sampling equipment was built and maintained as described in EPA Methods 28 and 5H.

III.B AIR SUPPLY SYSTEM

Combustion air enters the firebox through an opening on the side of the firebox. This air is controlled by a sliding damper, which covers the inlet hole. A second air control at located on the lower right front of the appliance controls both a timer and a rear combustion air source. When this control is pushed in it opens a rear air source and activates the timer, when left pushed in the appliance will operate with the rear air open. Both levers are located on the right side of the appliance. All gases exit through the 6" flue

IV. SAMPLING SYSTEMS

IV.A. SAMPLING LOCATIONS

Particulate samples are collected from the appliance flue pipe at an elevation of eight feet above the platform scale. Combustion gasses and gas temperature in the flue are also sampled at eight feet above the scale.

Sample probes in the dilution tunnel include a temperature probe, combustion gas probe and a standard pitot tube.

Figure 1 shows an example of a dilution tunnel and sample locations.

IV.A.(1) DILUTION TUNNEL

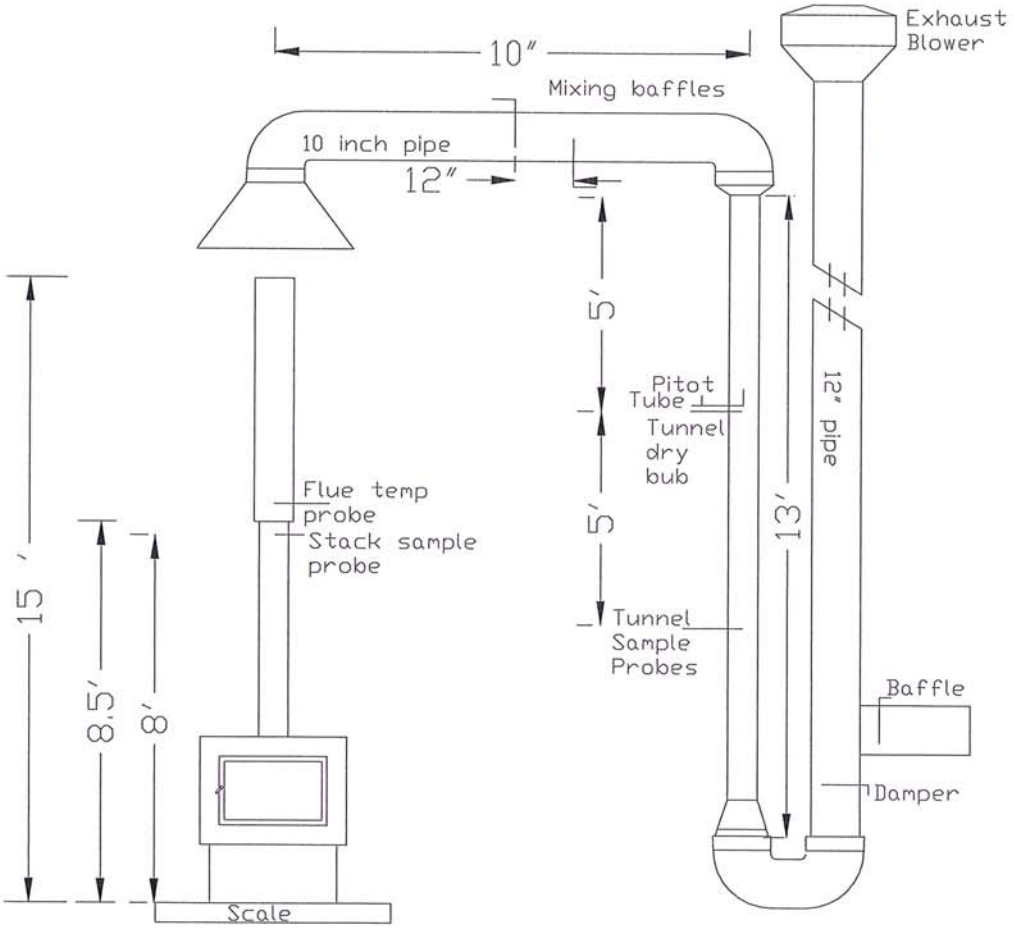


FIGURE 1

SAMPLING METHODS

V.A. PARTICULATE SAMPLING

Particulates were sampled in strict accordance with EPA Method 5H. This method uses a sampling system described in EPA method 5 with the addition of a rear filter. Components in the sampling system include a heated front filter, four impingers and a rear filter between number three and four impingers.

VI. QUALITY ASSURANCE

VI.A. INSTRUMENT CALIBRATION

VI.A. (1). DRY GAS METERS

At the conclusion of each test program the dry gas meter is checked against a standard dry gas meter. Three runs are made on each dry gas meter used during the test program. The average calibration factors obtained are then compared with the six-month calibration factor and, if within 5%, the six-month factor is used to calculate standard volumes. Results of this calibration are contained in Appendix E.

An integral part of the post test calibration procedure is a leak check of the pressure side of the dry gas meter. This is done by plugging the system exhaust and pressurizing the system to 10" W.C. The system is judged to be leak free if it retains the pressure for at least 10 minutes.

The standard dry gas meter is calibrated every 12 months using a accredited calibration agency. All calibration values are verified to be within WPA specifications.

VI.A.(2). GAS ANALYZERS

The continuous analyzers are zeroed and spanned before each test with appropriate gases. A mid-scale multi-component calibration gas is then analyzed (values are recorded). At the conclusion of a test, the instruments are checked again with zero, span and calibration gases (values are recorded only). The drift in each meter is then calculated and must not exceed 5% of the scale used for the test.

On a semi annual schedule a multi point calibration is conducted. This calibration check must meet accuracy requirements of the applicable

standards. Consistent deviations between analyzer readings and calibration gas concentrations are used to correct data before computer processing. Data is also corrected for interferences as prescribed by the instrument manufacturer's instructions.

VI.B. TEST METHOD PROCEDURES

VI.B.(1). LEAK CHECK PROCEDURES

Before and after each test, each sample train is tested for leaks. Leakage rates are measured and must not exceed 0.02 CFM or 4% of the sampling rate. Leak checks are performed checking the entire sampling train, not just the dry gas meters. Pre-test and post-test leak checks are conducted with a vacuum of 10 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post test vacuum value. If leakage limits are not met, the test run is rejected.

VI.B.(2). TUNNEL VELOCITY/FLOW MEASUREMENT

The tunnel velocity is calculated from an average point that is calculated from an eight point traverse. Final tunnel velocities and flow rates are calculated from EPA Method 2, Equation 6.9 and 6.10. (Tunnel cross sectional area is the average from both lines of traverse.)

Pitot tubes are cleaned before each test and leak checks are conducted after each test.

VI.B.(3). PM SAMPLING PROPORTIONALITY

Proportionality was calculated in accordance with EPA Method 5H. The data and results are included in Appendix G.

VII. CONCLUSION

Results of this test show the 5100I ACC when operated following guidelines specified in EPA method 28 does meet emissions limits regulating an affected facility in the EPA New Source Performance Standards.

VII.A RESULTS AND OBSERVATIONS

The Model 5100I ACC Solid Fuel Room Heater Fireplace Insert has been found to be in compliance with the applicable performance and construction requirements of the following criteria: EPA Method 28 "Certification and auditing of wood heaters" and Method 5H Determination of particulate matter emissions from wood heaters."

INTERTEK TESTING SERVICES NA

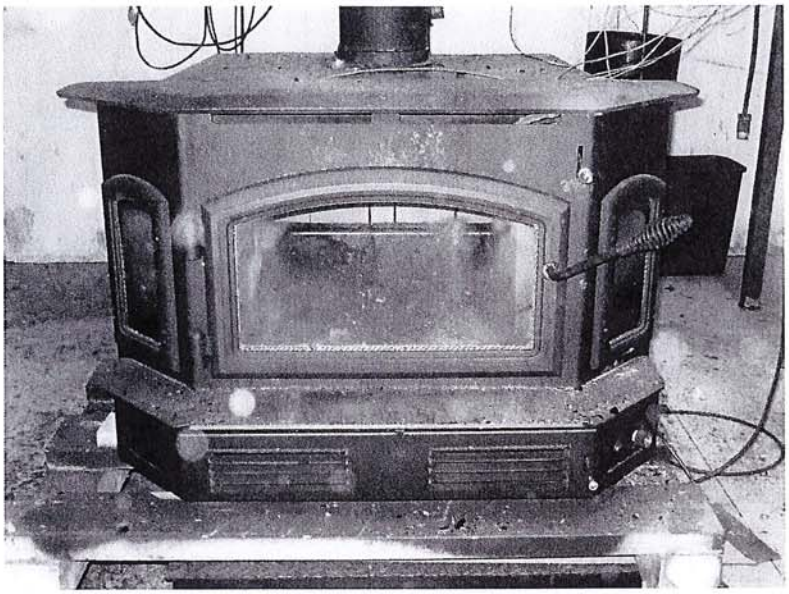
Reported by: _____
Bruce Davis
Test Engineer

Reviewed by: _____
Ken Morgan
Reviewer

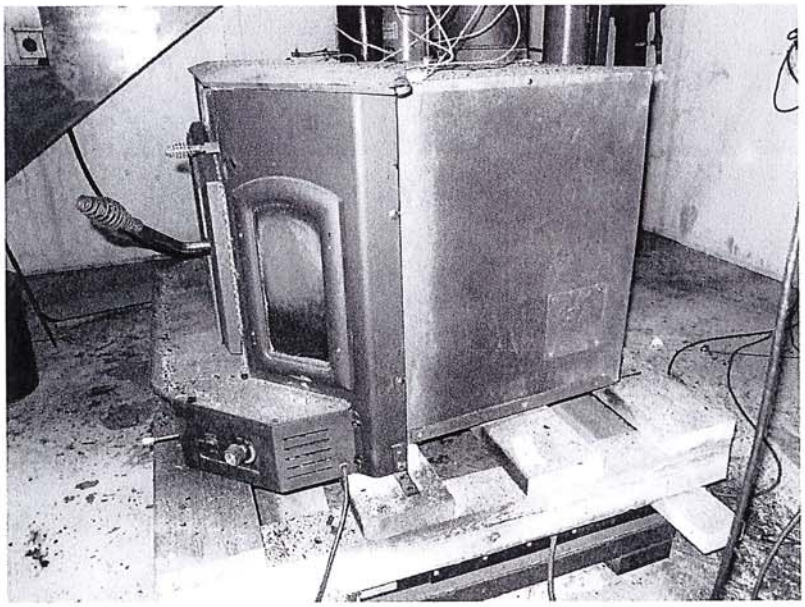
Appendix G

Test Data

Hearth & Home Technologies
Stove model 5100 I ACC
Project Number G100340618



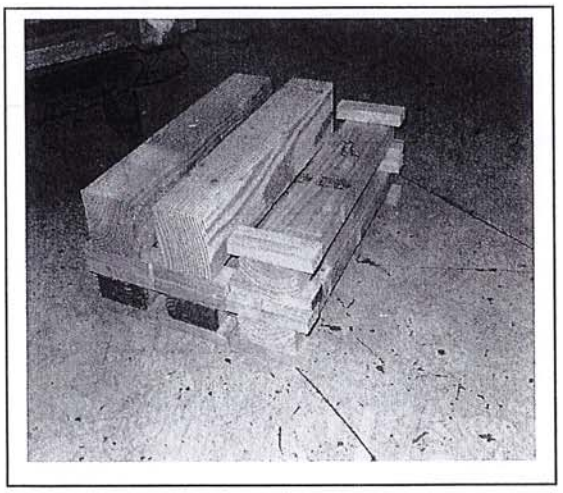
Front view



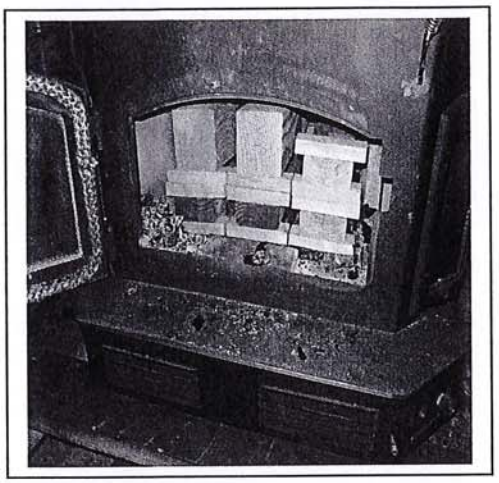
Side view

Hearth & Home Technologies
Stove Model 5100 I ACC
Project Number G100340618

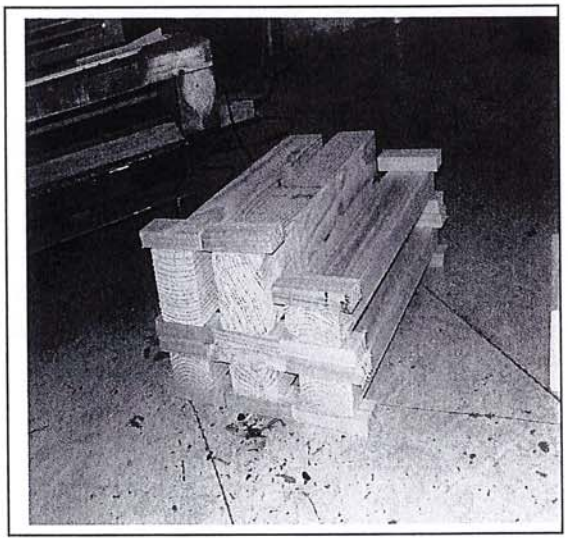
Fuel load Photos



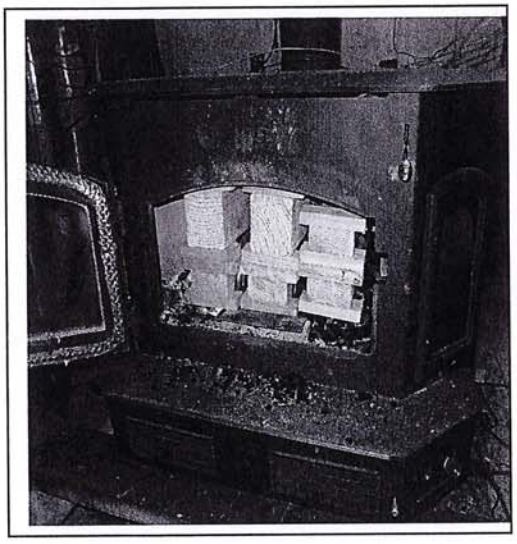
Run one fuel load



Run one fuel loaded



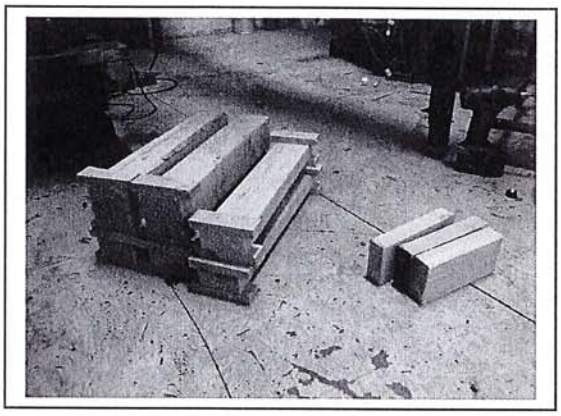
Run two fuel load



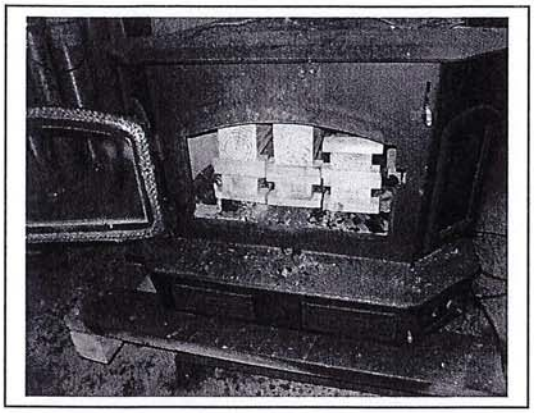
Run two fuel loaded

Hearth & Home Technologies
Stove Model 5100 I ACC
Project Number G100340618

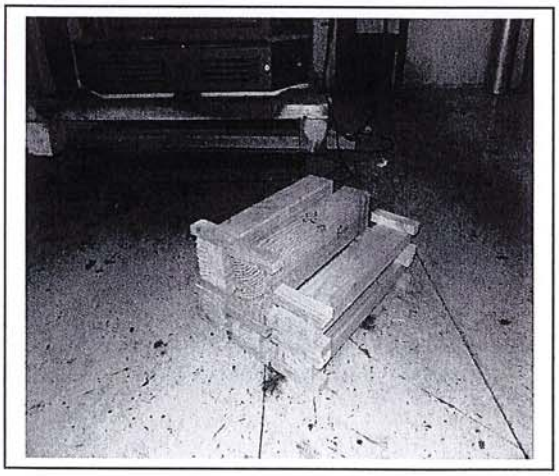
Fuel load Photos



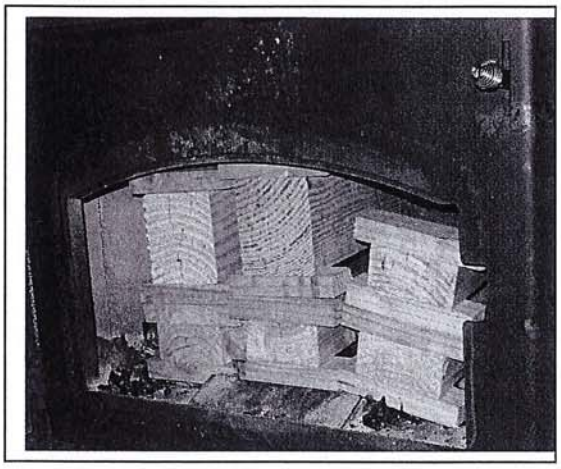
Run three fuel load



Run three loaded fuel



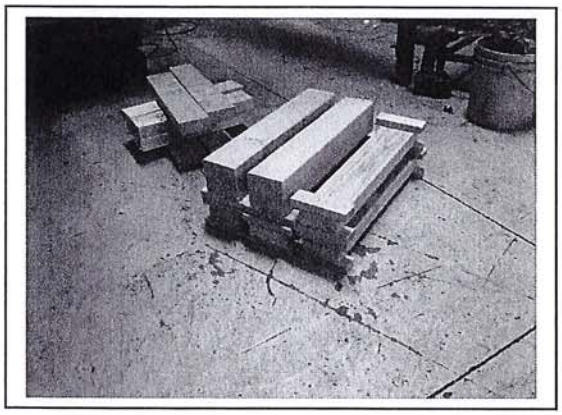
Run four fuel load



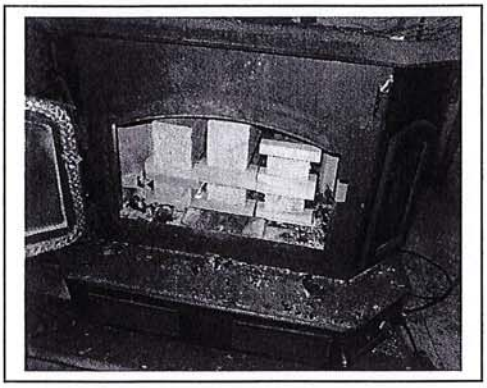
Run four loaded fuel

Hearth & Home Technologies
Stove Model 5100 I ACC
Project Number G100340618

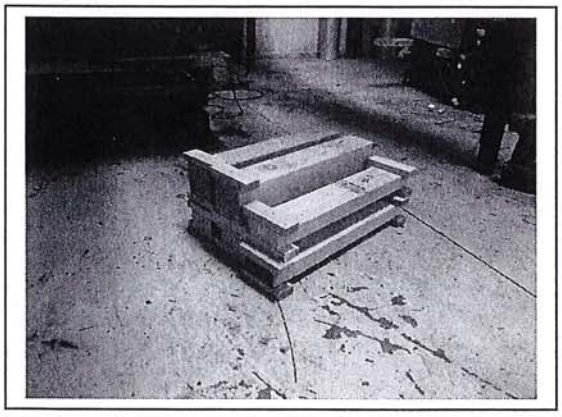
Fuel load Photos



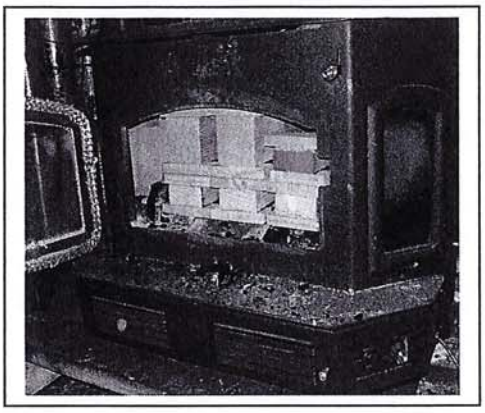
Run five fuel load



Run five loaded fuel



Run six fuel load



Run six loaded fuel

Hearth & Home
5100 I ACC
G100340618

Weighted Average

Type of Stove: 2
1=cat
2=noncat
3=pellet

Test No.	Burn Rate	(E) Ave. Emission Rate g/hr	(OHE)	Heat Output (BTU/HR)	Prob.	(K) Weighting Factor	(KxE)	KxOHE
3	0.87	5.710	78.40	10490.63	0.2724	0.4780	2.7294	37.48
6	1.13	2.590	80.10	13625.77	0.4780	0.3476	0.9003	27.84
4	1.3	2.000	80.40	15675.66	0.6200	0.2894	0.5788	23.27
1	1.53	2.630	80.50	18449.05	0.7674	0.3262	0.8579	26.26
5	2.31	8.210	75.50	27854.44	0.9462	0.2326	1.9096	17.56
						1.6738	6.9760	132.41

Weighted average emissions rate: 4.1678
Weighted Average OHE 79.11

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/9/2011
Run: 1
Control #: G100340618

Tech: B. Davis

Start	End	Delta T
403.4	369.6	33.8

Elapsed Time (min)	Fuel Weight (lbs)	Stack Gas Comp. (%) CO	CO_2	O_2	Tunnel CO_2	Flue Temp. (F)	Room Temp. (F)	Tunnel Temp. (F)	Tunnel Pitot (in. w.c.)	Appliance Firebox Temperatures (F) top	Bottom	Back	Left	Right
0	18.5	1.05	7.62	12.23	0.69	222	76	90	0.033	432	442	301	413	429
10	16.8	1.56	12.86	6.48	1.19	366	77	107	0.033	553	436	273	374	385
20	15.3	1.5	13	6.4	1.29	393	78	115	0.033	712	423	247	371	362
30	13.3	1.24	13.24	6.42	1.36	409	78	117	0.033	801	404	242	389	362
40	12	0.37	10.62	9.91	0.93	358	79	109	0.033	781	384	243	392	364
50	10.8	0.65	12.08	8.17	1.05	360	79	109	0.033	762	370	241	391	368
60	9.4	0.41	13.34	7.15	1.15	374	80	109	0.033	784	356	245	404	386
70	8.1	0.34	12.92	7.64	1.11	370	80	109	0.033	793	344	254	421	405
80	6.9	0.32	12.86	7.72	1.1	366	80	109	0.033	791	335	266	443	420
90	5.8	0.43	11.98	8.49	1.01	352	80	107	0.033	768	328	280	462	431
100	5	0.46	10.78	9.66	0.91	338	81	105	0.033	727	322	293	475	439
110	4.3	0.6	9.12	11.18	0.7	311	80	102	0.033	668	316	304	478	434
120	3.8	0.77	7.8	12.33	0.59	282	80	98	0.033	602	311	305	473	423
130	3.4	0.82	8.34	11.74	0.55	261	81	96	0.033	521	308	300	458	408
140	3.1	1.53	6.04	13.33	0.42	240	79	94	0.033	490	308	295	445	400
150	2.9	1.7	5.98	13.22	0.38	223	79	91	0.033	426	308	285	413	388
160	2.6	1.69	6.28	12.93	0.39	213	78	90	0.033	401	308	278	392	382
170	2.4	1.58	7.26	12.06	0.45	212	78	90	0.033	382	308	285	387	383
180	2.1	1.41	7.46	12.03	0.46	211	79	89	0.033	375	308	304	392	392
190	1.8	1.62	6.58	12.7	0.41	210	79	90	0.033	374	309	315	397	398
200	1.6	1.62	6.92	12.36	0.42	206	79	89	0.033	369	312	313	395	396
210	1.4	1.49	7.58	11.83	0.45	206	78	89	0.033	368	314	313	395	396
220	1.1	1.52	7.72	11.66	0.47	208	80	89	0.033	370	315	324	400	401
230	0.9	1.4	7.7	11.8	0.48	209	79	89	0.033	374	317	332	405	407
240	0.7	1.45	7.68	11.77	0.47	209	78	89	0.033	376	319	335	406	411
250	0.4	1.6	7.26	12.04	0.45	209	79	89	0.033	375	321	335	408	411
260	0.2	1.54	7.2	12.16	0.45	208	79	89	0.033	373	323	334	410	408
270	0	1.71	6.9	12.29	0.43	208	79	88	0.033	371	324	334	415	404

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/9/2011

Run: 1

Control #: G100340618

Tech: B. Davis

-0.044542

DGM Temps. (F)		DGM Vol.	Orifice Meter	Tunnel SP	Impinger	Front	VAC	Draft
In	Out	ft^3	ΔH (in H_2O)	(in H_2O)	Exit	Filter		
71	71	561.3	0.35	-0.38	78	233	0	-0.035
72	72	564.3	0.2500	-0.38	54	232	0	-0.06
72	70	566.58	0.2800	-0.38	54	233	0	-0.067
72	72	569.17	0.3000	-0.38	56	233	0	-0.067
72	72	571.91	0.2100	-0.38	58	233	0	-0.06
72	72	574.13	0.2100	-0.38	64	233	0	-0.06
72	72	576.28	0.2100	-0.38	53	233	0	-0.06
73	73	578.4	0.2100	-0.38	52	233	0	-0.06
73	73	580.43	0.2100	-0.38	53	233	0	-0.058
73	73	582.61	0.2000	-0.38	54	233	0	-0.057
73	73	584.66	0.2000	-0.38	55	233	0	-0.052
74	74	586.77	0.1600	-0.38	56	233	0	-0.05
74	74	588.46	0.1600	-0.38	59	233	0	-0.042
74	74	590.23	0.1200	-0.38	60	233	0	-0.04
74	74	591.88	0.1300	-0.38	60	233	0	-0.03
74	74	593.44	0.1000	-0.38	60	233	0	-0.03
74	74	594.79	0.1000	-0.38	60	233	0	-0.031
75	75	596.25	0.0800	-0.38	61	233	0	-0.03
75	75	597.81	0.1000	-0.38	61	233	0	-0.03
75	75	599.19	0.1000	-0.38	61	233	0	-0.03
75	75	600.58	0.1000	-0.38	63	233	0	-0.03
75	75	602	0.0900	-0.38	63	233	0	-0.03
75	75	603.39	0.0990	-0.38	63	233	0	-0.03
75	75	604.79	0.0900	-0.38	64	233	0	-0.03
76	76	606.19	0.1	-0.38	64	233	0	-0.03
76	76	607.59	0.1	-0.38	64	233	0	-0.03
76	76	608.98	0.1	-0.38	65	233	0	-0.035
76	76	610.457	0.1	-0.38	65	233	0	-0.036

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

	Cat	Non Cat	Pellet
(ENTER X)		X	
Initial Delta	0.34		
Delta H @	1.788		

Pitot Location

Center	
Point of Ave.	X

Baro: 28.41 in Hg (Tunnel Traverse)

DGM Cal 1.015 Y

Constants

K_1	17.64	R/in Hg
T_{std}	528	R
P_{std}	29.92	in Hg

V_m	49.157	ft^3
$V_{m(std)}$	46.879	dscf

Averages	1.161071	9.06	10.63214	0.705714	736.2143	539	557.75	0.033	533.85714	533.78571	589.020	0.159	-0.028

		Stack Gas Comp.			Tunnel	Flue	Room	Tunnel	Tunnel Pitot	DGM Temps. (R)		DGM Vol.	Orifice Meter	Tunnel SP
Time	Weight	CO	CO_2	O_2	CO_2	Temp. (R)	Temp. (R)	Temp. (R)	(in. w.c.)	In	Out	ft^3	ΔH (in H_2O)	(in Hg)
0	18.50	1.18	6.22	12.23	0.69	682	536	550	0.0330	531	531	561.300	0.3500	-0.02794
10	16.80	1.56	12.86	6.48	1.19	826	537	567	0.0330	532	532	564.300	0.2500	-0.02794
20	15.30	1.5	13	6.4	1.29	853	538	575	0.0330	532	530	566.580	0.2800	-0.02794
30	13.30	1.24	13.24	6.42	1.36	869	538	577	0.0330	532	532	569.170	0.3000	-0.02794
40	12.00	0.37	10.62	9.91	0.93	818	539	569	0.0330	532	532	571.910	0.2100	-0.02794
50	10.80	0.65	12.08	8.17	1.05	820	539	569	0.0330	532	532	574.130	0.2100	-0.02794
60	9.40	0.41	13.34	7.15	1.15	834	540	569	0.0330	532	532	576.280	0.2100	-0.02794
70	8.10	0.34	12.92	7.64	1.11	830	540	569	0.0330	533	533	578.400	0.2100	-0.02794
80	6.90	0.32	12.86	7.72	1.1	826	540	569	0.0330	533	533	580.430	0.2100	-0.02794
90	5.80	0.43	11.98	8.49	1.01	812	540	567	0.0330	533	533	582.610	0.2000	-0.02794
100	5.00	0.46	10.78	9.66	0.91	798	541	565	0.0330	533	533	584.660	0.2000	-0.02794
110	4.30	0.6	9.12	11.18	0.7	771	540	562	0.0330	534	534	586.770	0.1600	-0.02794
120	3.80	0.77	7.8	12.33	0.59	742	540	558	0.0330	534	534	588.460	0.1600	-0.02794
130	3.40	0.82	8.34	11.74	0.55	721	541	556	0.0330	534	534	590.230	0.1200	-0.02794
140	3.10	1.53	6.04	13.33	0.42	700	539	554	0.0330	534	534	591.880	0.1300	-0.02794
150	2.90	1.7	5.98	13.22	0.38	683	539	551	0.0330	534	534	593.440	0.1000	-0.02794
160	2.60	1.69	6.28	12.93	0.39	673	538	550	0.0330	534	534	594.790	0.1000	-0.02794
170	2.40	1.58	7.26	12.06	0.45	672	538	550	0.0330	535	535	596.250	0.0800	-0.02794
180	2.10	1.41	7.46	12.03	0.46	671	539	549	0.0330	535	535	597.810	0.1000	-0.02794
190	1.80	1.62	6.58	12.7	0.41	670	539	550	0.0330	535	535	599.190	0.1000	-0.02794
200	1.60	1.62	6.92	12.36	0.42	666	539	549	0.0330	535	535	600.580	0.1000	-0.02794
210	1.40	1.49	7.58	11.83	0.45	666	538	549	0.0330	535	535	602.000	0.0900	-0.02794
220	1.10	1.52	7.72	11.66	0.47	668	540	549	0.0330	535	535	603.390	0.0990	-0.02794
230	0.90	1.4	7.7	11.8	0.48	669	539	549	0.0330	535	535	604.790	0.0900	-0.02794
240	0.7	1.45	7.68	11.77	0.47	669	538	549	0.033	536	536	606.190	0.1000	-0.02794
250	0.4	1.6	7.26	12.04	0.45	669	539	549	0.033	536	536	607.590	0.1000	-0.02794
260	0.2	1.54	7.2	12.16	0.45	668	539	549	0.033	536	536	608.980	0.1000	-0.02794
270	0	1.71	6.9	12.29	0.43	668	539	548	0.033	536	536	610.457	0.1000	-0.02794

Manufacturer: Hearth & Home Technologies

Model: 5100I ACC

Date: 5/9/2011

Run: 1

Control #: G100340618 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)			
k_p	85.49		P_g	-0.38	(Tunnel Traverse)
C_p	0.99		N_c	0.0425	
M_s	28.56		HC	0.0132	
CO_{2amb}	0.034		B_{ws}	0.04	
K_2	384.8		Tunnel Area	0.19635	ft^2 (Tunnel Traverse)

					Sum Si x Vm			
12.753	**129.563**	**7.095**	**0.993**	**0.161**	**5.023**	100.4%	9.45	

Dilution Tunnel — **Proportional Rate Calculation**

V ft/min	Q_{tunnel} scfm	Q_{stack} scfm	Q_{snew}/Q_{sInit}	Target ΔH (in H2O)	Burn Rate lb/h dry	S_i	$V_{mi(sdt)}$	$S_i \times V_{mi(std)}$	Sum	$\Theta \times S_i \times V_{mi(std)}$	t x Sum S_i x $V_{mi(std)}$	PR	Qf by tracer	1/Qf by tracer
12.753	131.351		1.000	0.3519									13.929	0.072
12.753	127.412	14.5113	0.985	0.2448	8.379888	0.0689	2.8722	0.2062	0.2062	53.4400	50.226	100.0%	11.484	0.087
12.753	125.640	12.73934	0.978	0.2783	7.394019	0.0785	2.1787	0.1897	0.3959	46.1766	50.226	102.0%	12.171	0.082
12.753	125.204	17.00728	0.976	0.2980	9.858692	0.0588	2.4796	0.2037	0.5997	39.3655	50.226	109.5%	12.572	0.080
12.753	126.965	14.18885	0.983	0.2143	6.40815	0.0705	2.6183	0.2083	0.8079	49.8239	50.226	112.0%	10.746	0.093
12.753	126.965	11.47538	0.983	0.2128	5.915215	0.0871	2.1214	0.1974	1.0053	49.9138	50.226	106.1%	10.709	0.093
12.753	126.965	12.48179	0.983	0.2101	6.901084	0.0801	2.0545	0.1919	1.1972	44.4422	50.226	103.1%	10.649	0.094
12.753	126.965	11.97975	0.983	0.2082	6.40815	0.0835	2.0258	0.1902	1.3874	45.6586	50.226	102.3%	10.602	0.094
12.753	126.965	11.11924	0.983	0.2063	5.915215	0.0899	1.9362	0.1826	1.5701	47.0153	50.226	98.2%	10.552	0.095
12.753	127.412	10.76426	0.985	0.2000	5.422281	0.0929	2.0793	0.1970	1.7671	52.1544	50.226	105.9%	10.410	0.096
12.753	127.863	8.557805	0.987	0.1995	3.943477	0.1169	1.9553	0.1878	1.9549	61.6894	50.226	101.0%	10.423	0.096
12.753	128.546	8.519047	0.989	0.1624	3.450542	0.1174	2.0125	0.1931	2.1480	63.7838	50.226	103.8%	9.422	0.106
12.753	129.467	6.792596	0.993	0.1561	2.464673	0.1472	1.6089	0.1708	2.3188	63.9522	50.226	91.8%	9.269	0.108
12.753	129.933	5.12815	0.995	0.1177	1.971738	0.1950	1.6851	0.1818	2.5006	88.7191	50.226	97.7%	8.072	0.124
12.753	130.402	4.534	0.996	0.1269	1.478804	0.2206	1.5708	0.1946	2.6952	93.5421	50.226	104.6%	8.381	0.119
12.753	131.112	2.985723	0.999	0.1046	0.985869	0.3349	1.4851	0.1772	2.8724	134.3012	50.226	95.3%	7.629	0.131
12.753	131.351	4.33878	1.000	0.1007	1.478804	0.2305	1.2852	0.1685	3.0408	79.9781	50.226	90.6%	7.487	0.134
12.753	131.351	2.644834	1.000	0.1028	0.985869	0.3781	1.3899	0.1857	3.2265	141.8925	50.226	99.8%	7.562	0.132
12.753	131.590	3.95557	1.001	0.1020	1.478804	0.2528	1.4824	0.1960	3.4225	101.1830	50.226	105.4%	7.549	0.132
12.753	131.351	4.233956	1.000	0.1021	1.478804	0.2362	1.3113	0.1737	3.5962	83.6229	50.226	93.4%	7.545	0.133
12.753	131.590	2.725305	1.001	0.0974	0.985869	0.3669	1.3208	0.1751	3.7713	130.8555	50.226	94.1%	7.376	0.136
12.753	131.590	2.586286	1.001	0.0944	0.985869	0.3867	1.3493	0.1829	3.9542	140.8653	50.226	98.3%	7.254	0.138
12.753	131.590	3.816976	1.001	0.0996	1.478804	0.2620	1.3208	0.1821	4.1363	93.4303	50.226	97.9%	7.465	0.134
12.753	131.590	2.57884	1.001	0.1049	0.985869	0.3878	1.3303	0.1782	4.3145	139.2823	50.226	95.8%	7.656	0.131
12.753	131.590	2.571436	1.001	0.1010	0.985869	0.3889	1.3303	0.1738	4.4883	139.6833	50.226	93.4%	7.504	0.133
12.753	131.590	3.959456	1.001	0.1028	1.478804	0.2526	1.3278	0.1770	4.6652	90.5469	50.226	95.1%	7.576	0.132
12.753	131.590	2.671124	1.001	0.1045	0.985869	0.3744	1.3184	0.1740	4.8393	133.2607	50.226	93.6%	7.639	0.131
12.753	131.830	2.706093	1.002	0.1033	0.985869	0.3695	1.4009	0.1834	5.0226	139.7716	50.226	98.6%	7.603	0.132

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	18.50	W_{wd}
Load Weight (kg wet)	8.394	
Total Test Duration (min)	270	Θ
Total Test Duration (hours)	4.500	
Wood Moisture (Dry Bais)	21.72	%
Wood Moisture (Wet Bais)	17.84	%

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/9/2011
Run: 1
Control #: G100340618
Tech: B. Davis

Dry Burn Rate	1.532	Dry kg/hr
	3.378	Dry Lb/hr

Total Particulate Collected	289.2	mg

Cs	0.0062	g/dscf
Qstd	7771.5	dscf/hr
E	2.63	g/hr

Average Stack Flow (Qf)	7.10	dscf/min
Average Stack Flow (Qf)	425.72	dscf/hr

PARTICULATE CATCH

	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.6665	0.6354	31.1	F1
Rear Filter	0.1999	0.1630	36.9	F2
Probe/Front Half Rinse	99.5715	99.5147	56.8	R1
Impinger H2O +Back Rinse	142.4090	142.3438	65.2	R2
Meth Chlor. Extraction	100.6680	100.6265	41.5	R3
Back Half Acetone Rinse	97.4546	97.3945	60.1	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	75	Va1
Acetone Back Half Rinse	80	Va2
Water- Impingers + Back Half Rinse	300	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.0055	Ba
Water	0.001	Bw
Methylene Chloride	0.008	B_{DCM}

Total Particulate Collected 289.248 mg

ling Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6354
Rear Filter						0.1630
Probe/Front Half Rinse						99.5147
Impinger H2O +Back Rinse						142.3438
Meth Chlor. Extraction						100.6265
Back Half Acetone Rinse						97.3945

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6665
Rear Filter						0.1999
Probe/Front Half Rinse						99.5715
Impinger H2O +Back Rinse						142.4090
Meth Chlor. Extraction						100.6680
Back Half Acetone Rinse						97.4546

Test Engineer_

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.38**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.38**	in Hg
Tunnel Diameter	**6**	in
Tunnel Area	0.19635	ft^2

	PITOT TUNNEL VELOCITY P	TUNNEL TEMP	SQUARE ROOT VP
A CENTER			0.0000
B CENTER			0.0000
A1	0.034	90	0.1844
A2	0.038	90	0.1949
A3	0.034	90	0.1844
A4	0.026	90	0.1612
B1	0.030	90	0.1732
B2	0.034	90	0.1844
B3	0.036	90	0.1897
B4	0.030	90	0.1732
AVERAGE	0.033	90	0.1807

PITOT CONSTANT= **#DIV/0!** For Pitot Palced at Cer

1.00 For Pitot Palced at poir

Tunnel V	Tunnel Q
ft/sec	scfm
12.60	129.67

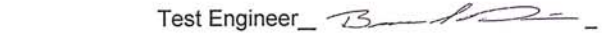
Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/9/2011

Run: 1

Control #: G100340618

Test Engineer_ 

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth N Home MODEL: 5100I ACC PROJECT #: G100340618 SAMPLE ID#: PRT1012031428

DATE: 5/9/11 ENGINEER: B Davis RUN #: 1

INTERTEK EQUIPMENT #'s: ETC7-2 ETC7-1

CALCULATED RANGE: 3.7 - 4.6 ACTUAL COAL BED: 4.2

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F) 7							8
				AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	7.3	—	-.067	82	932	412	356	490	469	NA	448
10	5.9	1.4	-.055	79	849	377	357	502	478		352
20	5.3	0.6	-.051	80	748	453	348	488	471		327
30	4.8	0.5	-.046	77	684	445	337	471	462		301
40	4.5	0.3	-.038	78	528	441	320	445	445		245
50	4.4	0.1	-.032	77	485	441	313	433	440		235
60	4.2	0.2	-.034	76	438	442	303	416	431		227
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 6/23/11 ENGINEER SIGNATURE: _____

FUEL DATA

CLIENT: Hearth & Home MODEL: 5100 I ACC PROJECT #: G100340618

DATE: 5/9/11 RUN #: 1 SAMPLE ID #: PRT1012031428

INTERTEK EQUIPMENT #'s: ETE-7

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	24" ~~FT~~	19.2	20.2	19.1	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 30 8 INCHES PRE-BURN FUEL AVG MOISTURE: 19.5

TIME (CLOCK): 0840 ROOM TEMP (F): 70

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: ACTUAL LOAD WT: 9.3 (2 X 4)
9.2 (4 X 4)
FUEL PIECE LENGTH: 19 18.5 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	22.0	21.7	22.4	4x4
2	23.2	20.4	25.0	4x4
3	22.0	22.7	22.6	2x4
4	20.1	20.4	17.9	2x4
5	23.6	23.8	23.3	2x4
6	20.8	19.3	19.7	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 21.72

TIME (CLOCK): 0910 ROOM TEMP (F): 70

ENGINEER: [signature] 5/23/11

Intertek

RUN NOTES

Client: Hearth N Home
Model: 5100I ACC
Run #: 1
Engineer: BOAMS
Intertek Equipment ID #(s): NA

Project #: G100340618 Sample ID #: PRT1012031428
Booth: ETC7 Date: 6/9/11

PREBURN

fully open

Rear Air Not used

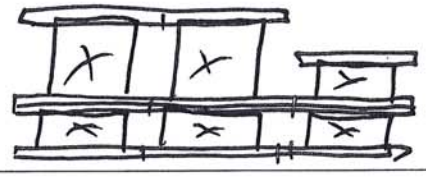
PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on high

Comments: Rated coals @ 55 minutes

TEST

START UP PROCEDURES
(Paste fuel and stove pictures in spaces below.)

No spacers on Rear of 4x4's



NA

BYPASS: NA FUEL LOADING: By 50 sec. DOOR: closed by 1:00
PRIMARY AIR: fully open full 5:00
OTHER: fixed Air pushed @ 0 minutes Rear Air Not used

fully open

PRIMARY:
Describe or sketch test settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on Entire test (High)

Date: 6/23/11
Engineer signature: BO

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth N Home

Model: 5100I Project #: G100340618 Sample ID #: PRT1012031428

Date: 5/9/11 Run #: 1

Start Time: 12:13 Stop Time: 16:43

Intertek Equipment #'s: ~~ETC5-4~~ ETC5-Y

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good 9.93

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good .97

Calibrations: Span Gas CO_2: ~~9.96~~ BL O_2: NA CO: ~~.98~~ BL CO_2(DT): 1.0

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time	~~0~~	EOT					
O_2	NA	NA					
CO_2	~~0~~ .02 | ~~10.3~~ .02	0.04 | 9.94					
CO	~~0~~ 0.00 | ~~1.05~~ 0.00	0.01 | 0.99					
CO_2 (DT)	0.00 | 1.00	0.01 | 1.01					

Stack Diameter (inches): 6

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

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 @ 3.1

Flue Pipe Cleaned Prior to First Test in Series: Date: 5/9/11 Initials: BL

	Initial	Middle	Ending
Pb (in/Hg)	28.38		28.44
Room Temp (°F)	76		79

Date: 6/23/11

Engineer signature: BD

Avg: 28.41

Method 5H Impinger Gravimetric Analysis

Client: Health Home

Model: 5100 I

Report Number: G100340618

Date: 5/9/11

Test Engineer: D Davis

Scale ID umber: NA

Audit Weight Number: NA

Run Number: 1

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	776.6	710.9	607.2	935.1
Initial Weight grams	709.8	692.3	604.5	923.0
Net Weight grams	66.8	18.6	2.7	12.1

Total Weight 100.2

Notes: Front Filter 291 Rear Filter 303

Test Engineer: D Davis

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/10/2011
Run: 2
Control #: G100340618

Tech: B. Davis

Start	End	Delta T
370.6	286.4	84.2

Elapsed Time (min)	Fuel Weight (lbs)	Stack Gas Comp. (%) CO	CO_2	O_2	Tunnel CO_2	Flue Temp. (F)	Room Temp. (F)	Tunnel Temp. (F)	Tunnel Pitot (in. w.c.)	Appliance Firebox Temperatures (F) top	Bottom	Back	Left	Right
0	18.3	1.31	11.66	7.93	0.58	170	75	81	0.032	414	398	274	382	385
10	17.3	1.19	11.32	8.39	0.87	267	74	90	0.032	472	394	305	361	347
20	16	1.34	12.04	7.52	0.94	352	75	100	0.032	722	395	300	344	320
30	14.3	1.43	12.44	7.03	0.99	366	76	103	0.032	833	394	303	352	323
40	13.1	0.54	12.42	7.94	0.84	332	77	100	0.032	837	377	259	360	331
50	12.2	0.58	10.88	9.44	0.67	297	77	97	0.032	756	354	233	352	332
60	11.4	1.15	9.24	10.51	0.53	264	77	94	0.032	664	334	218	336	330
70	10.8	2.3	6.16	12.44	0.31	224	79	90	0.032	556	318	206	320	323
80	10.3	2.36	6.24	12.3	0.3	197	77	88	0.032	441	304	194	304	311
90	9.8	2.42	6.58	11.9	0.3	183	76	85	0.032	389	295	187	294	303
100	9.4	2.36	6.68	11.86	0.28	174	76	84	0.032	354	287	180	285	295
110	8.9	2.34	6.76	11.8	0.27	167	76	82	0.032	332	279	176	278	289
120	8.5	2.33	6.67	11.9	0.26	162	76	82	0.032	319	274	174	274	286
130	8.1	2.72	5.96	12.22	0.22	155	75	81	0.032	302	169	172	269	283
140	7.8	2.84	6.08	11.98	0.22	149	74	80	0.032	289	264	171	265	281
150	7.4	2.88	6.16	11.86	0.21	146	75	80	0.032	280	260	174	263	279
160	7.1	2.98	6.34	11.58	0.22	145	75	80	0.032	273	257	169	260	279
170	6.7	3.18	6.36	11.36	0.22	144	75	80	0.032	270	254	170	260	280
180	6.3	3.34	6.52	11.04	0.22	142	74	79	0.032	267	252	171	259	282
190	5.9	3.59	6.52	10.79	0.22	141	75	79	0.032	267	250	173	260	284
200	5.5	3.46	6.46	10.98	0.21	140	75	79	0.032	268	250	176	261	287
210	5.2	3.37	6.52	11.01	0.21	139	76	79	0.032	267	249	178	262	289
220	4.9	3.3	6.44	11.16	0.21	137	75	79	0.032	265	249	180	262	290
230	4.6	3.17	6.32	11.41	0.19	136	76	79	0.032	265	249	181	262	291
240	4.3	3.12	6.12	11.66	0.18	135	78	79	0.032	262	249	182	261	290
250	4.1	3.05	5.96	11.89	0.18	129	75	79	0.032	258	247	183	261	287
260	4	3.1	5.94	11.86	0.17	128	75	78	0.032	250	247	185	262	285
270	3.8	3.77	6.48	10.65	0.19	129	74	78	0.032	249	249	186	263	285
280	3.5	3.19	6.96	10.75	0.22	129	75	79	0.032	252	246	189	266	289
290	3.3	3.78	6.54	10.58	0.22	131	75	79	0.032	253	247	194	269	293
300	3	3.98	6.5	10.42	0.2	132	75	78	0.032	254	247	199	271	300
310	2.8	4.18	6.36	10.36	0.2	133	76	78	0.032	255	247	204	271	306
320	2.6	4.19	6.32	10.39	0.19	132	75	78	0.032	257	248	209	270	314
330	2.4	4.11	6.32	10.47	0.19	131	75	78	0.032	259	248	215	270	323
340	2.2	4.17	6.38	10.35	0.2	130	74	78	0.032	261	248	220	268	328
350	2	4.17	6.54	10.19	0.21	132	76	79	0.032	262	249	226	266	334
360	1.8	4.16	6.74	10	0.21	133	75	79	0.032	263	250	230	266	338

370	1.6	4.25	6.72	9.93	0.22	134	75	79	0.032	266	251	238	268	342
380	1.4	4.08	6.7	10.12	0.22	134	76	79	0.032	267	252	244	271	344
390	1.2	4.17	6.72	10.01	0.22	135	75	79	0.032	269	253	249	274	344
400	1.1	4.04	6.64	10.22	0.22	135	75	79	0.032	270	255	254	278	344
410	0.9	4.14	6.62	10.14	0.21	135	75	79	0.032	270	256	257	281	343
420	0.7	4	6.52	10.38	0.21	135	76	79	0.032	270	258	259	286	341
430	0.5	3.94	6.58	10.38	0.21	135	75	78	0.032	270	259	262	290	340
440	0.4	3.87	6.58	10.45	0.21	135	75	78	0.032	270	259	265	292	339
450	0.2	3.97	6.54	10.39	0.21	135	76	78	0.032	271	259	268	295	338
460	0.1	3.64	6.4	10.86	0.21	134	75	78	0.032	270	259	271	297	337
470	0	3.61	6.4	10.89	0.21	134	75	78	0.032	268	260	271	297	336

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/10/2011

Run: 2

Control #: G100340618

Tech: B. Davis

-0.039542

DGM Temps. (F)		DGM Vol.	Orifice Meter	Tunnel SP	Impinger	Front	VAC	Draft
In	Out	ft^3	ΔH (in H_2O)	(in H_2O)	Exit	Filter		
73	73	610.8	0.41	-0.38	76	233	0	-0.037
73	73	614.21	0.2300	-0.38	52	233	0	-0.057
73	73	616.87	0.2900	-0.38	52	233	0	-0.068
73	73	619.45	0.3000	-0.38	52	233	0	-0.068
73	73	622.07	0.2100	-0.38	53	233	0	-0.062
73	73	624.23	0.1751	-0.38	56	233	0	-0.059
73	73	626.18	0.1500	-0.38	57	233	0	-0.052
73	73	628.14	0.1000	-0.38	60	233	0	-0.043
73	73	629.27	0.1000	-0.38	61	233	0	-0.04
73	73	630.38	0.0900	-0.38	62	233	0	-0.038
73	73	631.8	0.0700	-0.38	62	233	0	-0.036
73	73	633.13	0.0700	-0.38	63	233	0	-0.035
73	73	634.34	0.0600	-0.38	64	233	0	-0.034
73	73	635.48	0.0500	-0.38	65	233	0	-0.032
73	73	636.45	0.0500	-0.38	65	233	0	-0.03
73	73	637.56	0.0440	-0.38	66	233	0	-0.03
73	73	638.59	0.0460	-0.38	66	233	0	-0.03
73	73	639.55	0.0460	-0.38	67	233	0	-0.03
73	73	640.59	0.0440	-0.38	61	233	0	-0.03
73	73	641.61	0.0430	-0.38	60	233	0	-0.028
73	73	642.51	0.0400	-0.38	61	233	0	-0.028
73	73	643.37	0.0400	-0.38	63	233	0	-0.028
73	73	644.33	0.4000	-0.38	63	233	0	-0.027
74	74	645.35	0.0330	-0.38	64	233	0	-0.027
74	74	646.26	0.03	-0.38	64	233	0	-0.027
74	74	647.13	0.03	-0.38	63	233	0	-0.025
74	74	648.06	0.028	-0.38	64	233	0	-0.025
74	74	648.86	0.031	-0.38	64	233	0	-0.025
74	74	649.74	0.038	-0.38	63	233	0	-0.025
74	74	650.68	0.043	-0.38	62	233	0	-0.028
74	74	651.5	0.035	-0.38	62	233	0	-0.028
74	74	652.43	0.036	-0.38	63	233	0	-0.028
74	74	653.32	0.036	-0.38	63	233	0	-0.028
74	74	654.25	0.033	-0.38	64	233	0	-0.028
74	74	655.15	0.036	-0.38	64	233	0	-0.026
74	74	656.06	0.038	-0.38	65	233	0	-0.027
74	74	657.05	0.036	-0.38	65	233	0	-0.027
74	74	657.9	0.041	-0.38	61	233	0	-0.028
74	74	658.83	0.038	-0.38	60	233	0	-0.028
74	74	659.75	0.041	-0.38	60	233	0	-0.028
74	74	660.68	0.042	-0.38	60	233	0	-0.028
74	74	661.59	0.038	-0.38	61	233	0	-0.028
74	74	662.53	0.039	-0.38	61	233	0	-0.028
74	74	663.46	0.038	-0.38	62	233	0	-0.028
74	74	664.38	0.038	-0.38	62	233	0	-0.026
74	74	665.32	0.039	-0.38	63	233	0	-0.026
74	74	666.24	0.04	-0.38	63	233	0	-0.026
74	74	667.181	0.04	-0.38	64	233	0	-0.025

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

	Cat	Non Cat	Pellet
(ENTER X)		X	

Pitot Location

Center	
Point of Ave.	X

Constants

Initial Delta	0.37				
Delta H @	1.788				
Baro:	28.38	in Hg (Tunnel Traverse)	K_1	17.64 R/in Hg	V_m 56.381 ft^3
DGM Cal	1.015	Y	T_{std}	528 R	$V_{m(std)}$ 53.731 dscf
			P_{std}	29.92 in Hg	

Averages	3.104792	7.06	10.61854	0.3	624.875	535.45833	541.98	0.032	533.52083	533.52083	644.263	0.083	-0.028

		Stack Gas Comp.			Tunnel	Flue	Room	Tunnel	Tunnel Pitot	DGM Temps. (R)		DGM Vol.	Orifice Meter	Tunnel SP
Time	Weight	CO	CO_2	O_2	CO_2	Temp. (R)	Temp. (R)	Temp. (R)	(in. w.c.)	In	Out	ft^3	ΔH (in H_2O)	(in Hg)
0	18.30	1.18	6.22	7.93	0.58	630	535	541	0.0320	533	533	610.800	0.4100	-0.02794
10	17.30	1.19	11.32	8.39	0.87	727	534	550	0.0320	533	533	614.210	0.2300	-0.02794
20	16.00	1.34	12.04	7.52	0.94	812	535	560	0.0320	533	533	616.870	0.2900	-0.02794
30	14.30	1.43	12.44	7.03	0.99	826	536	563	0.0320	533	533	619.450	0.3000	-0.02794
40	13.10	0.54	12.42	7.94	0.84	792	537	560	0.0320	533	533	622.070	0.2100	-0.02794
50	12.20	0.58	10.88	9.44	0.67	757	537	557	0.0320	533	533	624.230	0.1751	-0.02794
60	11.40	1.15	9.24	10.51	0.53	724	537	554	0.0320	533	533	626.180	0.1500	-0.02794
70	10.80	2.3	6.16	12.44	0.31	684	539	550	0.0320	533	533	628.140	0.1000	-0.02794
80	10.30	2.36	6.24	12.3	0.3	657	537	548	0.0320	533	533	629.270	0.1000	-0.02794
90	9.80	2.42	6.58	11.9	0.3	643	536	545	0.0320	533	533	630.380	0.0900	-0.02794
100	9.40	2.36	6.68	11.86	0.28	634	536	544	0.0320	533	533	631.800	0.0700	-0.02794
110	8.90	2.34	6.76	11.8	0.27	627	536	542	0.0320	533	533	633.130	0.0700	-0.02794
120	8.50	2.33	6.67	11.9	0.26	622	536	542	0.0320	533	533	634.340	0.0600	-0.02794
130	8.10	2.72	5.96	12.22	0.22	615	535	541	0.0320	533	533	635.480	0.0500	-0.02794
140	7.80	2.84	6.08	11.98	0.22	609	534	540	0.0320	533	533	636.450	0.0500	-0.02794
150	7.40	2.88	6.16	11.86	0.21	606	535	540	0.0320	533	533	637.560	0.0440	-0.02794
160	7.10	2.98	6.34	11.58	0.22	605	535	540	0.0320	533	533	638.590	0.0460	-0.02794
170	6.70	3.18	6.36	11.36	0.22	604	535	540	0.0320	533	533	639.550	0.0460	-0.02794
180	6.30	3.34	6.52	11.04	0.22	602	534	539	0.0320	533	533	640.590	0.0440	-0.02794
190	5.90	3.59	6.52	10.79	0.22	601	535	539	0.0320	533	533	641.610	0.0430	-0.02794
200	5.50	3.46	6.46	10.98	0.21	600	535	539	0.0320	533	533	642.510	0.0400	-0.02794
210	5.20	3.37	6.52	11.01	0.21	599	536	539	0.0320	533	533	643.370	0.0400	-0.02794
220	4.90	3.3	6.44	11.16	0.21	597	535	539	0.0320	533	533	644.330	0.4000	-0.02794
230	4.60	3.17	6.32	11.41	0.19	596	536	539	0.0320	534	534	645.350	0.0330	-0.02794
240	4.3	3.12	6.12	11.66	0.18	595	538	539	0.032	534	534	646.260	0.0300	-0.02794
250	4.1	3.05	5.96	11.89	0.18	589	535	539	0.032	534	534	647.130	0.0300	-0.02794
260	4	3.1	5.94	11.86	0.17	588	535	538	0.032	534	534	648.060	0.0280	-0.02794
270	3.8	3.77	6.48	10.65	0.19	589	534	538	0.032	534	534	648.860	0.0310	-0.02794
280	3.5	3.19	6.96	10.75	0.22	589	535	539	0.032	534	534	649.740	0.0380	-0.02794
290	3.3	3.78	6.54	10.58	0.22	591	535	539	0.032	534	534	650.680	0.0430	-0.02794
300	3	3.98	6.5	10.42	0.2	592	535	538	0.032	534	534	651.500	0.0350	-0.02794
310	2.8	4.18	6.36	10.36	0.2	593	536	538	0.032	534	534	652.430	0.0360	-0.02794
320	2.6	4.19	6.32	10.39	0.19	592	535	538	0.032	534	534	653.320	0.0360	-0.02794
330	2.4	4.11	6.32	10.47	0.19	591	535	538	0.032	534	534	654.250	0.0330	-0.02794
340	2.2	4.17	6.38	10.35	0.2	590	534	538	0.032	534	534	655.150	0.0360	-0.02794
350	2	4.17	6.54	10.19	0.21	592	536	539	0.032	534	534	656.060	0.0380	-0.02794
360	1.8	4.16	6.74	10	0.21	593	535	539	0.032	534	534	657.05	0.0360	-0.02794
370	1.6	4.25	6.72	9.93	0.22	594	535	539	0.032	534	534	657.9	0.0410	-0.02794
380	1.4	4.08	6.7	10.12	0.22	594	536	539	0.032	534	534	658.83	0.0380	-0.02794

390	1.2	4.17	6.72	10.01	0.22	595	535	539	0.032	534	534	659.75	0.0410	-0.02794
400	1.1	4.04	6.64	10.22	0.22	595	535	539	0.032	534	534	660.68	0.0420	-0.02794
410	0.9	4.14	6.62	10.14	0.21	595	535	539	0.032	534	534	661.59	0.0380	-0.02794
420	0.7	4	6.52	10.38	0.21	595	536	539	0.032	534	534	662.53	0.0390	-0.02794
430	0.5	3.94	6.58	10.38	0.21	595	535	538	0.032	534	534	663.46	0.0380	-0.02794
440	0.4	3.87	6.58	10.45	0.21	595	535	538	0.032	534	534	664.38	0.0380	-0.02794
450	0.2	3.97	6.54	10.39	0.21	595	536	538	0.032	534	534	665.32	0.0390	-0.02794
460	0.1	3.64	6.4	10.86	0.21	594	535	538	0.032	534	534	666.24	0.0400	-0.02794
470	0	3.61	6.4	10.89	0.21	594	535	538	0.032	534	534	667.181	0.0400	-0.02794

Manufacturer: Hearth & Home Technologies
Model: 5100I ACC
Date: 5/10/2011
Run: 2
Control #: G100340618 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)			
k_p	85.49		P_g	-0.38	(Tunnel Traverse)
C_p	0.99		N_c	0.0425	
M_s	28.56		HC	0.0132	
CO_{2amb}	0.034		B_{ws}	0.04	
K_2	384.8		Tunnel Area	0.19635	ft^2 (Tunnel Traverse)

					Sum Si x Vm			
12.386	**129.340**	**4.419**	**0.999**	**0.076**	**11.842**	98.9%	5.55	

Dilution Tunnel **Proportional Rate Calculation**

V ft/min	Q_{tunnel} scfm	Q_{stack} scfm	Q_{snew}/Q_{slnit}	Target ΔH (in H2O)	Burn Rate lb/h dry	S_i	$V_{mi(sdt)}$	$S_i \times V_{mi(std)}$	Sum	$\Theta \times S_i \times V_{mi(std)}$	t x Sum S_i x $V_{mi(std)}$	PR	Qf by tracer	1/Qf by tracer
12.386	129.556		1.000	0.4147									11.435	0.087
12.386	127.436	9.77032	0.992	0.2846	4.957449	0.1024	3.2490	0.2841	0.2841	156.2929	118.421	100.0%	9.440	0.106
12.386	125.160	11.9497	0.983	0.2895	6.444683	0.0837	2.5344	0.2685	0.5526	99.6824	118.421	106.6%	9.445	0.106
12.386	124.493	15.12245	0.980	0.2997	8.427663	0.0661	2.4582	0.2603	0.8129	76.3996	118.421	103.3%	9.593	0.104
12.386	125.160	11.35492	0.983	0.2145	5.948938	0.0881	2.4963	0.2602	1.0731	103.3263	118.421	103.3%	8.145	0.123
12.386	125.834	9.515741	0.986	0.1751	4.461704	0.1051	2.0580	0.2527	1.3258	101.6494	118.421	100.3%	7.379	0.136
12.386	126.516	9.231325	0.988	0.1486	3.965959	0.1083	1.8579	0.2518	1.5776	94.5941	118.421	99.9%	6.816	0.147
12.386	127.436	8.289787	0.992	0.1043	2.974469	0.1206	1.8675	0.2740	1.8515	105.8781	118.421	108.7%	5.741	0.174
12.386	127.901	6.810661	0.994	0.0951	2.478724	0.1468	1.0766	0.1875	2.0391	74.2990	118.421	74.4%	5.482	0.182
12.386	128.605	6.546682	0.996	0.0861	2.478724	0.1527	1.0576	0.1929	2.2320	75.9268	118.421	76.6%	5.226	0.191
12.386	128.842	5.217124	0.997	0.0716	1.982979	0.1917	1.3530	0.2589	2.4909	121.8851	118.421	102.8%	4.769	0.210
12.386	129.317	6.483854	0.999	0.0646	2.478724	0.1542	1.2672	0.2657	2.7566	91.8570	118.421	105.5%	4.537	0.220
12.386	129.317	5.237346	0.999	0.0608	1.982979	0.1909	1.1529	0.2541	3.0107	103.4589	118.421	100.8%	4.404	0.227
12.386	129.556	5.404941	1.000	0.0518	1.982979	0.1850	1.0862	0.2466	3.2573	94.4512	118.421	97.9%	4.066	0.246
12.386	129.796	3.958697	1.001	0.0500	1.487235	0.2526	0.9242	0.2273	3.4846	109.7269	118.421	90.2%	3.993	0.250
12.386	129.796	5.217124	1.001	0.0435	1.982979	0.1917	1.0576	0.2649	3.7494	95.2764	118.421	105.1%	3.729	0.268
12.386	129.796	3.809874	1.001	0.0459	1.487235	0.2625	0.9814	0.2632	4.0126	121.0655	118.421	104.4%	3.828	0.261
12.386	129.796	4.976925	1.001	0.0456	1.982979	0.2009	0.9147	0.2389	4.2515	86.3781	118.421	94.8%	3.816	0.262
12.386	130.037	4.834473	1.002	0.0435	1.982979	0.2068	0.9909	0.2596	4.5112	96.3336	118.421	103.1%	3.729	0.268
12.386	130.037	4.728732	1.002	0.0434	1.982979	0.2115	0.9718	0.2606	4.7718	96.5938	118.421	103.4%	3.729	0.268
12.386	130.037	4.808666	1.002	0.0396	1.982979	0.2080	0.8575	0.2300	5.0017	83.8130	118.421	91.3%	3.562	0.281
12.386	130.037	3.616151	1.002	0.0388	1.487235	0.2765	0.8194	0.2301	5.2318	106.4990	118.421	91.3%	3.529	0.283
12.386	130.037	3.665195	1.002	0.0399	1.487235	0.2728	0.9147	0.2592	5.4910	117.2918	118.421	102.9%	3.573	0.280
12.386	130.037	3.749959	1.002	0.0325	1.487235	0.2667	0.9718	0.2720	5.7630	121.8056	118.421	108.0%	3.227	0.310
12.386	130.037	3.838736	1.002	0.0302	1.487235	0.2605	0.8654	0.2682	6.0312	105.9577	118.421	106.4%	3.120	0.321
12.386	130.037	2.616138	1.002	0.0321	0.99149	0.3822	0.8274	0.2652	6.2964	148.6409	118.421	105.3%	3.204	0.312
12.386	130.278	1.304281	1.003	0.0281	0.495745	0.7667	0.8844	0.2761	6.5725	318.7068	118.421	109.6%	3.000	0.333
12.386	130.278	2.335757	1.003	0.0311	0.99149	0.4281	0.7608	0.2536	6.8261	153.0883	118.421	100.7%	3.153	0.317
12.386	130.037	3.534181	1.002	0.0381	1.487235	0.2830	0.8369	0.2654	7.0915	111.2944	118.421	105.3%	3.492	0.286
12.386	130.037	2.32171	1.002	0.0432	0.99149	0.4307	0.8939	0.2560	7.3475	180.9670	118.421	101.6%	3.718	0.269
12.386	130.278	3.435344	1.003	0.0349	1.487235	0.2911	0.7798	0.2098	7.5573	106.6899	118.421	83.3%	3.345	0.299
12.386	130.278	2.278643	1.003	0.0364	0.99149	0.4389	0.8844	0.2644	7.8217	182.4258	118.421	105.0%	3.419	0.293
12.386	130.278	2.284421	1.003	0.0326	0.99149	0.4377	0.8464	0.2476	8.0693	174.1379	118.421	98.3%	3.233	0.309
12.386	130.278	2.299975	1.003	0.0326	0.99149	0.4348	0.8844	0.2736	8.3428	180.7338	118.421	108.6%	3.233	0.309
12.386	130.278	2.276723	1.003	0.0363	0.99149	0.4392	0.8559	0.2647	8.6076	176.6900	118.421	105.1%	3.408	0.293
12.386	130.037	2.246443	1.002	0.0386	0.99149	0.4451	0.8654	0.2539	8.8615	181.0613	118.421	100.8%	3.518	0.284
12.386	130.037	2.211514	1.002	0.0364	0.99149	0.4522	0.9415	0.2676	9.1292	200.0898	118.421	106.2%	3.413	0.293
12.386	130.037	2.198918	1.002	0.0409	0.99149	0.4548	0.8084	0.2369	9.3660	172.7784	118.421	94.0%	3.618	0.276
12.386	130.037	2.233447	1.002	0.0410	0.99149	0.4477	0.8844	0.2445	9.6105	186.1174	118.421	97.0%	3.628	0.276

12.386	130.037	2.213326	1.002	0.0409	0.99149	0.4518	0.8749	0.2411	9.8516	185.7899	118.421	95.7%	3.618	0.276
12.386	130.037	1.126029	1.002	0.0419	0.495745	0.8881	0.8844	0.2445	10.0961	369.1584	118.421	97.0%	3.661	0.273
12.386	130.037	2.237144	1.002	0.0377	0.99149	0.4470	0.8654	0.2364	10.3325	181.8138	118.421	93.8%	3.475	0.288
12.386	130.037	2.282492	1.002	0.0388	0.99149	0.4381	0.8939	0.2572	10.5897	184.0764	118.421	102.1%	3.529	0.283
12.386	130.278	2.282492	1.003	0.0383	0.99149	0.4381	0.8844	0.2506	10.8404	182.1182	118.421	99.5%	3.503	0.285
12.386	130.278	1.148033	1.003	0.0383	0.495745	0.8711	0.8749	0.2498	11.0902	358.1895	118.421	99.1%	3.503	0.285
12.386	130.278	2.284421	1.003	0.0387	0.99149	0.4377	0.8939	0.2552	11.3454	183.9210	118.421	101.3%	3.524	0.284
12.386	130.278	1.189468	1.003	0.0405	0.495745	0.8407	0.8749	0.2483	11.5936	345.7123	118.421	98.5%	3.602	0.278
12.386	130.278	1.192617	1.003	0.0405	0.495745	0.8385	0.8949	0.2485	11.8421	352.6697	118.421	98.6%	3.602	0.278

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	18.30	W_{wd}
Load Weight (kg wet)	8.303	
Total Test Duration (min)	470	Θ
Total Test Duration (hours)	7.833	
Wood Moisture (Dry Bais)	21.03	%
Wood Moisture (Wet Bais)	17.38	%

Manufacturer:	Hearth & Home Technologies
Model:	5100IACC
Date:	5/10/2011
Run:	2
Control #:	G100340618
Tech:	B. Davis

Dry Burn Rate	0.876	Dry kg/hr
	1.930	Dry Lb/hr

Total Particulate Collected	2645.8	mg

Cs	0.0492	g/dscf
Qstd	7759.3	dscf/hr
E	13.05	g/hr

Average Stack Flow (Qf)	4.42	dscf/min
Average Stack Flow (Qf)	265.11	dscf/hr

PARTICULATE CATCH	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.8082	0.6360	172.2	F1
Rear Filter	0.6552	0.1654	489.8	F2
Probe/Front Half Rinse	98.2854	97.9054	380	R1
Impinger H2O +Back Rinse	142.8996	142.4036	496	R2
Meth Chlor. Extraction	99.8805	99.1935	687	R3
Back Half Acetone Rinse	98.3846	97.9612	423.4	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	130	Va1
Acetone Back Half Rinse	65	Va2
Water- Impingers + Back Half Rinse	300	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.0055	Ba
Water	0.001	Bw
Methylene Chloride	0.008	B_{DCM}

Total Particulate Collected 2645.83 mg

Weighing Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6360
Rear Filter						0.1654
Probe/Front Half Rinse						97.9054
Impinger H2O +Back Rinse						142.4036
Meth Chlor. Extraction						99.1935
Back Half Acetone Rinse						97.9612

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.8082
Rear Filter						0.6552
Probe/Front Half Rinse						98.2854
Impinger H2O +Back Rinse						142.8996
Meth Chlor. Extraction						99.8805
Back Half Acetone Rinse						98.3846

Test Engineer

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.38**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.42**	in Hg
Tunnel Diameter	**6**	in
Tunnel Area	0.19635	ft^2

	PITOT TUNNEL VELOCITY P	TUNNEL TEMP	SQUARE ROOT VP
A CENTER			0.0000
B CENTER			0.0000
A1	0.028	84	0.1673
A2	0.034	84	0.1844
A3	0.036	84	0.1897
A4	0.028	84	0.1673
B1	0.030	84	0.1732
B2	0.038	84	0.1949
B3	0.030	84	0.1732
B4	0.028	84	0.1673
AVERAGE	0.032	84	0.1772

PITOT CONSTANT= **#DIV/0!** For Pitot Palced at Center.

1.00 For Pitot Palced at point of average VP

Tunnel V	Tunnel Q
ft/sec	scfm
12.28	127.94

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/10/2011

Run: 2

Control #: G100340618

Test Engineer_ _____

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth N Home MODEL: 5100I ACC PROJECT #: G100340618 SAMPLE ID#: PRT1012031428

DATE: 5/10/11 ENGINEER: B Davis RUN #: 2

INTERTEK EQUIPMENT #'s: ETC7-2 ETC7-1

CALCULATED RANGE: 3.7 - 4.5 ACTUAL COAL BED: 4.5

Back Left Right

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F)							
				AMBIENT	~~LEFT~~ Top	~~RIGHT~~ Bottom	~~BOTTOM~~	~~BACK~~	TOP	CATALYST	FLUE
0	4.5	—	-.050	78	812	530	539	596	552	NA	291
10	4.3	.2	-.041	75	645	518	447	564	542		229
20	6.7	—	-.042	75	552	506	404	526	512		221
30	6.2	0.5	-.037	76	488	484	356	474	468		205
40	5.6	0.6	-.042	75	499	461	325	439	442		226
50	5.0	0.6	-.045	76	544	437	307	418	418		232
60	4.6	0.4	-.038	74	526	418	291	411	408		192
70	4.5	0.1	-.032	76	426	401	277	387	389		170
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 6/23/11 ENGINEER SIGNATURE: B Davis

K. J. Morgan

FUEL DATA

Intertek

CLIENT: Hearth & Home MODEL: 5100 I ACC PROJECT #: G100340618

DATE: 5/10/11 RUN #: 2 SAMPLE ID #: PRT1012031428

INTERTEK EQUIPMENT #'s: ETC-7

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	24" ~~FT~~	19.1	19.0	19.2	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3 @ 8" INCHES PRE-BURN FUEL AVG MOISTURE:

TIME (CLOCK): 0900 ROOM TEMP (F): 68

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: ACTUAL LOAD WT: 9.1 (2 X 4)
9.2 (4 X 4)
FUEL PIECE LENGTH: 19" 18.3 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	22.7	25.2	22.8	4x4
2	18.7	20.1	23.5	4x4
3	19.8	19.9	20.9	2x4
4	25.2	20.6	21.5	2x4
5	19.4	19.2	19.2	2x4
6	18.2	20.9	20.8	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 21.03

TIME (CLOCK): 0900 ROOM TEMP (F): 68

ENGINEER: [signature] 6/23/11

Intertek

RUN NOTES

Client: Hearth N Home
Model: 5100I ACC
Run #: 2
Engineer: B Davis
Intertek Equipment ID #(s): NA

Project #: G100340618 Sample ID #: PRT1012031428
Booth: ____ Date: 5/10/11

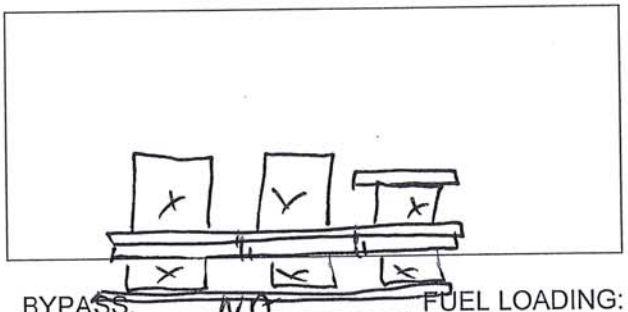
PREBURN

PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on high

Comments: At 15 minutes Added 2.6 lbs to 4.3 lb. coal bed
31 minutes Raked coals
61 minutes Raked coals

TEST

START UP PROCEDURES
(Paste fuel and stove pictures in spaces below.)



BYPASS: N/A FUEL LOADING: By 2:05 minutes DOOR: closed by 2:30
PRIMARY AIR: At test setting 8-11 5:00
OTHER: Timed Air pushed in @ 60 minutes Then pulled out @ 5:00

Same as Above

PRIMARY:
Describe or sketch test settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: off for first 30 minutes then turned to high

Date: 6/23/11
Engineer signature: BD

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth N Home

Model: 5100I Project #: G100340618 Sample ID #: PRT1012031428

Date: 5/10/11 Run #: 2

Start Time: 11:48 Stop Time: 19:38

Intertek Equipment #'s: ETC5-4

Gas Analyzer Train Leak Check:

Stack: Dilution Tunnel (Method 5G Only):

Initial: good Initial: good

Final: good Final: good

Calibrations: Span Gas CO_2: ~~9.97~~ 9.93 BL O_2: ____ CO: ~~.98~~ .97 BL CO_2(DT): 1.00

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time	Ø	EOT					
O_2							
CO_2	0.00 / 10.08	0.00 / 9.85					
CO	0.00 / 0.99	0.00 / 0.96					
CO_2 (DT)	0.01 / 1.00	0.00 / 0.98					

Stack Diameter (inches): 6

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

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 @ 3.0

Flue Pipe Cleaned Prior to First Test in Series: Date: 5/9/11 Initials: BL

	Initial	Middle	Ending
Pb (in/Hg)	28.42		28.33
Room Temp (°F)	75		75

Avg - 28.38

Date: 6/23/11

Engineer signature: BL

Method 5H Impinger Gravimetric Analysis

Client: Health & Home

Model: 5100 I

Report Number: G100340618

Date: 5/10/11

Test Engineer: D Davis

Scale ID umber: NA

Audit Weight Number: NA

Run Number: 2

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	802.6	696.4	605.6	988.8
Initial Weight grams	709.9	690.5	604.2	972.1
Net Weight grams	92.7	5.9	1.4	16.7

Total Weight 116.7

Notes: 292 304

Test Engineer:

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/11/2011
Run: 3
Control #: G100340618

Tech: B. Davis

Start	End	Delta T
358.4	255.4	103

Elapsed Time (min)	Fuel Weight (lbs)	Stack Gas Comp. (%) CO	CO_2	O_2	Tunnel CO_2	Flue Temp. (F)	Room Temp. (F)	Tunnel Temp. (F)	Tunnel Pitot (in. w.c.)	Appliance Firebox Temperatures (F) top	Bottom	Back	Left	Right
0	18.7	0.91	7.65	12.34	0.35	166	74	78	0.031	389	407	264	363	369
10	17.7	0.85	10.22	9.83	0.66	275	75	88	0.031	503	401	295	341	335
20	16.1	1.24	12.64	7.02	0.88	340	73	97	0.031	690	401	293	325	311
30	14.8	1.38	13.2	6.32	0.87	347	73	99	0.031	803	399	299	341	310
40	13.6	0.7	11.42	8.78	0.68	318	74	97	0.031	793	382	250	344	316
50	12.7	1.09	9.3	10.51	0.52	273	73	93	0.031	683	355	222	332	314
60	11.8	0.57	12.62	7.71	0.68	285	75	93	0.031	672	376	209	323	310
70	11	0.64	10.94	9.32	0.61	273	75	93	0.031	681	320	203	317	317
80	10.2	0.9	10.66	9.34	0.56	263	76	92	0.031	653	309	202	320	323
90	9.5	1.21	8.94	10.75	0.46	238	76	90	0.031	591	297	202	326	325
100	8.8	1.53	8.36	11.01	0.42	222	76	89	0.031	523	287	203	324	330
110	8.2	1.7	8	11.2	0.39	210	77	88	0.031	484	280	203	320	335
120	7.6	1.51	8.28	11.11	0.4	205	76	87	0.031	462	272	203	318	337
130	7	1.56	8.6	10.74	0.4	204	77	87	0.031	457	266	204	315	340
140	6.4	1.48	9.14	10.28	0.43	204	78	87	0.031	464	260	207	316	343
150	5.7	1.33	9.38	10.19	0.44	205	78	86	0.031	463	257	210	319	344
160	5.3	1.28	9.96	9.66	0.47	206	76	87	0.031	455	255	214	325	342
170	4.7	1.24	10.08	9.58	0.46	206	77	86	0.031	454	255	218	335	345
180	4.3	1.48	7.84	11.58	0.36	193	78	86	0.031	453	254	227	344	349
190	4.1	2.11	6.5	12.29	0.27	175	77	85	0.031	407	253	229	339	344
200	3.8	2.11	6.62	12.17	0.26	165	77	84	0.031	364	252	229	331	340
210	3.6	1.99	6.9	12.01	0.25	154	76	83	0.031	329	254	227	321	339
220	3.5	1.8	7.66	11.44	0.28	152	77	82	0.031	317	256	226	315	338
230	3.3	1.96	7.36	11.58	0.25	146	77	82	0.031	309	259	224	308	338
240	3.1	2.25	6.76	11.89	0.22	141	76	82	0.031	297	263	222	300	338
250	3	2.51	6.5	11.89	0.2	138	77	81	0.031	285	265	220	293	336
260	2.9	2.47	6.46	11.97	0.2	135	77	81	0.031	276	267	218	287	332
270	2.7	2.54	6.18	12.18	0.19	132	76	81	0.031	267	267	215	281	327
280	2.6	2.65	6.34	11.91	0.19	130	76	80	0.031	261	267	213	278	323
290	2.5	2.58	6.02	12.3	0.18	128	78	80	0.031	255	266	211	273	318
300	2.4	2.51	6.1	12.29	0.18	126	77	80	0.031	249	264	210	270	313
310	2.3	2.65	6	12.25	0.17	125	77	80	0.031	245	263	207	268	306
320	2.2	3.3	6.26	11.34	0.18	126	77	79	0.031	244	261	206	267	299
330	2	3	6.24	11.66	0.19	126	76	80	0.031	244	260	207	267	295
340	1.9	3.27	6.4	11.23	0.19	127	76	79	0.031	245	259	210	269	291
350	1.8	3.11	6.3	11.49	0.19	127	77	80	0.031	244	259	214	272	288
360	1.6	3.01	6.18	11.71	0.19	127	76	80	0.031	245	259	218	274	287

370	1.5	2.99	6.04	11.87	0.18	127	76	80	0.031	243	260	221	277	284
380	1.4	2.9	6	12	0.18	127	76	80	0.031	242	260	220	277	283
390	1.2	3.2	6.26	11.44	0.19	126	77	80	0.031	240	261	222	276	282
400	1.1	3.26	6.36	11.28	0.2	126	77	79	0.031	239	261	226	277	282
410	1	3.27	6.32	11.31	0.2	126	77	79	0.031	239	260	230	278	283
420	0.8	3.15	6.22	11.53	0.19	126	76	79	0.031	239	260	234	279	284
430	0.7	3.18	6.28	11.44	0.19	126	76	79	0.031	240	260	236	280	284
440	0.6	3.14	6.16	11.6	0.19	125	76	79	0.031	240	260	237	282	281
450	0.4	3.08	6.1	11.72	0.19	125	76	79	0.031	239	259	238	283	283
460	0.3	3.4	6.24	11.26	0.19	126	76	79	0.031	238	258	239	284	283
470	0.2	3.33	6.06	11.51	0.19	126	76	79	0.031	238	258	236	282	283
480	0	3.39	5.92	11.59	0.19	126	76	79	0.031	238	258	233	280	283

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/11/2011

Run: 3

Control #: G100340618

Tech: B. Davis

-0.043167

DGM Temps. (F)		DGM Vol.	Orifice Meter	Tunnel SP	Impinger	Front	VAC	Draft
In	Out	ft^3	ΔH (in H_2O)	(in H_2O)	Exit	Filter		
68	68	668.3	0.37	-0.38	73	232	0	-0.032
69	69	671.36	0.5200	-0.38	51	233	0	-0.052
69	69	675.02	0.6200	-0.38	49	233	0	-0.063
69	69	679.25	0.5500	-0.38	50	233	0	-0.068
70	70	683.25	0.4400	-0.38	53	233	0	-0.06
70	70	686.83	0.3800	-0.38	58	233	0	-0.05
70	70	690.17	0.3630	-0.38	59	233	0	-0.053
71	71	693.25	0.3800	-0.38	60	233	0	-0.052
71	71	696.57	0.3400	-0.38	62	233	0	-0.05
71	71	699.52	0.3200	-0.38	64	233	0	-0.042
71	71	702.38	0.3000	-0.38	64	233	0	-0.042
72	72	705.03	0.2760	-0.38	52	233	0	-0.042
72	72	707.76	0.2700	-0.38	53	233	0	-0.04
72	72	710.22	0.2500	-0.38	49	233	0	-0.042
72	72	712.78	0.2600	-0.38	51	233	0	-0.04
73	73	715.19	0.2600	-0.38	55	233	0	-0.04
73	73	717.55	0.2200	-0.38	54	233	0	-0.04
73	73	720.01	0.2500	-0.38	54	233	0	-0.039
73	73	722.43	0.2400	-0.38	55	233	0	-0.038
73	73	725.1	0.1900	-0.38	55	233	0	-0.032
73	73	727.49	0.1600	-0.38	58	233	0	-0.031
73	73	729.75	0.1400	-0.38	59	233	0	-0.03
73	73	731.58	0.1500	-0.38	59	233	0	-0.03
73	73	733.47	0.1200	-0.38	60	233	0	-0.028
73	73	735.11	0.11	-0.38	60	233	0	-0.028
73	73	736.95	0.09	-0.38	61	233	0	-0.023
73	73	738.55	0.094	-0.38	61	233	0	-0.025
73	73	740.05	0.09	-0.38	62	233	0	-0.023
73	73	741.45	0.09	-0.38	63	233	0	-0.022
73	73	742.96	0.08	-0.38	63	233	0	-0.022
73	73	744.43	0.08	-0.38	63	233	0	-0.022
73	73	745.93	0.07	-0.38	64	233	0	-0.022
73	73	747.38	0.08	-0.38	65	233	0	-0.022
73	73	748.88	0.09	-0.38	65	233	0	-0.022
73	73	750.38	0.08	-0.38	65	233	0	-0.021
73	73	751.93	0.09	-0.38	53	233	0	-0.021
73	73	753.35	0.09	-0.38	54	233	0	-0.021
73	73	754.87	0.08	-0.38	54	233	0	-0.021
73	73	756.35	0.08	-0.38	54	233	0	-0.02
73	73	757.85	0.09	-0.38	55	233	0	-0.02
73	73	759.34	0.1	-0.38	55	233	0	-0.02
73	73	760.8	0.1	-0.38	56	233	0	-0.02
73	73	762.37	0.09	-0.38	56	233	0	-0.021
73	73	763.81	0.09	-0.38	56	233	0	-0.021
73	73	765.27	0.09	-0.38	56	233	0	-0.02
73	73	766.79	0.09	-0.38	57	233	0	-0.02
73	73	768.27	0.09	-0.38	57	233	0	-0.02
73	73	769.78	0.09	-0.38	58	233	0	-0.021
73	73	771.285	0.1	-0.38	59	233	0	-0.021

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

	Cat	Non Cat	Pellet
(ENTER X)		X	

Pitot Location

Center	
Point of Ave.	X

Initial Delta	0.35
Delta H @	1.788
Baro:	28.22 in Hg (Tunnel Traverse)
DGM Cal	1.015 Y

Constants

K_1	17.64	R/in Hg
T_{std}	528	R
P_{std}	29.92	in Hg

V_m	102.985	ft^3
$V_{m(std)}$	97.858	dscf

Averages	2.183265	7.68	11.00857	0.328571	636.0204	536.16327	543.94	0.031	532.22449	532.22449	729.355	0.196	-0.028

		Stack Gas Comp.			Tunnel	Flue	Room	Tunnel	Tunnel Pitot	DGM Temps. (R)		DGM Vol.	Orifice Meter	Tunnel SP
Time	Weight	CO	CO_2	O_2	CO_2	Temp. (R)	Temp. (R)	Temp. (R)	(in. w.c.)	In	Out	ft˜	ΔH (in H_2O)	(in Hg)
0	18.70	1.18	6.22	12.34	0.35	626	534	538	0.0310	528	528	668.300	0.3700	-0.02794
10	17.70	0.85	10.22	9.83	0.66	735	535	548	0.0310	529	529	671.360	0.5200	-0.02794
20	16.10	1.24	12.64	7.02	0.88	800	533	557	0.0310	529	529	675.020	0.6200	-0.02794
30	14.80	1.38	13.2	6.32	0.87	807	533	559	0.0310	529	529	679.250	0.5500	-0.02794
40	13.60	0.7	11.42	8.78	0.68	778	534	557	0.0310	530	530	683.250	0.4400	-0.02794
50	12.70	1.09	9.3	10.51	0.52	733	533	553	0.0310	530	530	686.830	0.3800	-0.02794
60	11.80	0.57	12.62	7.71	0.68	745	535	553	0.0310	530	530	690.170	0.3630	-0.02794
70	11.00	0.64	10.94	9.32	0.61	733	535	553	0.0310	531	531	693.250	0.3800	-0.02794
80	10.20	0.9	10.66	9.34	0.56	723	536	552	0.0310	531	531	696.570	0.3400	-0.02794
90	9.50	1.21	8.94	10.75	0.46	698	536	550	0.0310	531	531	699.520	0.3200	-0.02794
100	8.80	1.53	8.36	11.01	0.42	682	536	549	0.0310	531	531	702.380	0.3000	-0.02794
110	8.20	1.7	8	11.2	0.39	670	537	548	0.0310	532	532	705.030	0.2760	-0.02794
120	7.60	1.51	8.28	11.11	0.4	665	536	547	0.0310	532	532	707.760	0.2700	-0.02794
130	7.00	1.56	8.6	10.74	0.4	664	537	547	0.0310	532	532	710.220	0.2500	-0.02794
140	6.40	1.48	9.14	10.28	0.43	664	538	547	0.0310	532	532	712.780	0.2600	-0.02794
150	5.70	1.33	9.38	10.19	0.44	665	538	546	0.0310	533	533	715.190	0.2600	-0.02794
160	5.30	1.28	9.96	9.66	0.47	666	536	547	0.0310	533	533	717.550	0.2200	-0.02794
170	4.70	1.24	10.08	9.58	0.46	666	537	546	0.0310	533	533	720.010	0.2500	-0.02794
180	4.30	1.48	7.84	11.58	0.36	653	538	546	0.0310	533	533	722.430	0.2400	-0.02794
190	4.10	2.11	6.5	12.29	0.27	635	537	545	0.0310	533	533	725.100	0.1900	-0.02794
200	3.80	2.11	6.62	12.17	0.26	625	537	544	0.0310	533	533	727.490	0.1600	-0.02794
210	3.60	1.99	6.9	12.01	0.25	614	536	543	0.0310	533	533	729.750	0.1400	-0.02794
220	3.50	1.8	7.66	11.44	0.28	612	537	542	0.0310	533	533	731.580	0.1500	-0.02794
230	3.30	1.96	7.36	11.58	0.25	606	537	542	0.0310	533	533	733.470	0.1200	-0.02794
240	3.1	2.25	6.76	11.89	0.22	601	536	542	0.031	533	533	735.110	0.1100	-0.02794
250	3	2.51	6.5	11.89	0.2	598	537	541	0.031	533	533	736.950	0.0900	-0.02794
260	2.9	2.47	6.46	11.97	0.2	595	537	541	0.031	533	533	738.550	0.0940	-0.02794
270	2.7	2.54	6.18	12.18	0.19	592	536	541	0.031	533	533	740.050	0.0900	-0.02794
280	2.6	2.65	6.34	11.91	0.19	590	536	540	0.031	533	533	741.450	0.0900	-0.02794
290	2.5	2.58	6.02	12.3	0.18	588	538	540	0.031	533	533	742.960	0.0800	-0.02794
300	2.4	2.51	6.1	12.29	0.18	586	537	540	0.031	533	533	744.430	0.0800	-0.02794
310	2.3	2.65	6	12.25	0.17	585	537	540	0.031	533	533	745.930	0.0700	-0.02794
320	2.2	3.3	6.26	11.34	0.18	586	537	539	0.031	533	533	747.380	0.0800	-0.02794
330	2	3	6.24	11.66	0.19	586	536	540	0.031	533	533	748.880	0.0900	-0.02794
340	1.9	3.27	6.4	11.23	0.19	587	536	539	0.031	533	533	750.380	0.0800	-0.02794
350	1.8	3.11	6.3	11.49	0.19	587	537	540	0.031	533	533	751.930	0.0900	-0.02794
360	1.6	3.01	6.18	11.71	0.19	587	536	540	0.031	533	533	753.35	0.0900	-0.02794
370	1.5	2.99	6.04	11.87	0.18	587	536	540	0.031	533	533	754.87	0.0800	-0.02794
380	1.4	2.9	6	12	0.18	587	536	540	0.031	533	533	756.35	0.0800	-0.02794

390	1.2	3.2	6.26	11.44	0.19	586	537	540	0.031	533	533	757.85	0.0900	-0.02794
400	1.1	3.26	6.36	11.28	0.2	586	537	539	0.031	533	533	759.34	0.1000	-0.02794
410	1	3.27	6.32	11.31	0.2	586	537	539	0.031	533	533	760.8	0.1000	-0.02794
420	0.8	3.15	6.22	11.53	0.19	586	536	539	0.031	533	533	762.37	0.0900	-0.02794
430	0.7	3.18	6.28	11.44	0.19	586	536	539	0.031	533	533	763.81	0.0900	-0.02794
440	0.6	3.14	6.16	11.6	0.19	585	536	539	0.031	533	533	765.27	0.0900	-0.02794
450	0.4	3.08	6.1	11.72	0.19	585	536	539	0.031	533	533	766.79	0.0900	-0.02794
460	0.3	3.4	6.24	11.26	0.19	586	536	539	0.031	533	533	768.27	0.0900	-0.02794
470	0.2	3.33	6.06	11.51	0.19	586	536	539	0.031	533	533	769.78	0.0900	-0.02794
480	0	3.39	5.92	11.59	0.19	586	536	539	0.031	533	533	771.285	0.1000	-0.02794

Manufacturer: Hearth & Home Technologies
Model: 5100I ACC
Date: 5/10/2011
Run: 3
Control #: G100340618 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)			
k_p	85.49		P_g	-0.38	(Tunnel Traverse)
C_p	0.99		N_c	0.0425	
M_s	28.56		HC	0.0132	
CO_{2amb}	0.034		B_{ws}	0.04	
K_2	384.8		Tunnel Area	0.19635	ft^2 (Tunnel Traverse)

					Sum Si x Vm			
12.248	**126.710**	**4.323**	**0.995**	**0.197**	**21.571**	100.0%	4.49	

Dilution Tunnel **Proportional Rate Calculation**

V ft/min	Q_{tunnel} scfm	Q_{stack} scfm	Q_{snew}/Q_{sInit}	Target ΔH (in H2O)	Burn Rate lb/h dry	S_i	$V_{mi(sdt)}$	$S_i \times V_{mi(std)}$	Sum	$\Theta \times S_i \times V_{mi(std)}$	t x Sum S_i x $V_{mi(std)}$	PR	Qf by tracer	1/Qf by tracer
12.248	128.095		1.000	0.3725									6.544	0.153
12.248	125.758	10.86545	0.991	0.5248	4.939085	0.0920	2.9265	0.4472	0.4472	129.2844	215.711	100.0%	7.729	0.129
12.248	123.726	14.17084	0.983	0.6180	7.902535	0.0706	3.4937	0.4520	0.8993	118.3413	215.711	100.6%	8.303	0.120
12.248	123.283	11.00691	0.981	0.5512	6.42081	0.0909	4.0378	0.4863	1.3856	176.0863	215.711	108.2%	7.828	0.128
12.248	123.726	12.01991	0.983	0.4409	5.926902	0.0832	3.8183	0.4878	1.8734	152.4788	215.711	108.5%	7.020	0.142
12.248	124.621	10.34677	0.986	0.3802	4.445176	0.0966	3.4109	0.4859	2.3593	158.2373	215.711	108.1%	6.536	0.153
12.248	124.621	8.350151	0.986	0.3627	4.445176	0.1198	3.1823	0.4869	2.8461	182.9291	215.711	108.3%	6.396	0.156
12.248	124.621	8.348712	0.986	0.3841	3.951268	0.1198	2.9345	0.4588	3.3049	168.7181	215.711	102.1%	6.582	0.152
12.248	124.846	8.361676	0.987	0.3374	3.951268	0.1196	3.1572	0.4797	3.7846	181.2411	215.711	106.7%	6.180	0.162
12.248	125.300	8.215875	0.989	0.3162	3.457359	0.1217	2.8054	0.4539	4.2385	163.9004	215.711	101.0%	5.993	0.167
12.248	125.529	8.406431	0.990	0.2975	3.457359	0.1190	2.7198	0.4538	4.6923	155.2981	215.711	101.0%	5.820	0.172
12.248	125.758	7.329745	0.991	0.2765	2.963451	0.1364	2.5201	0.4330	5.1254	165.0323	215.711	96.4%	5.620	0.178
12.248	125.988	7.270368	0.992	0.2737	2.963451	0.1375	2.5913	0.4611	5.5864	171.0807	215.711	102.6%	5.592	0.179
12.248	125.988	7.036044	0.992	0.2532	2.963451	0.1421	2.3350	0.4176	6.0040	159.2947	215.711	92.9%	5.383	0.186
12.248	125.988	6.764974	0.992	0.2618	2.963451	0.1478	2.4299	0.4514	6.4554	172.4124	215.711	100.4%	5.479	0.183
12.248	126.218	7.833424	0.993	0.2617	3.457359	0.1277	2.2875	0.4175	6.8729	140.1717	215.711	92.9%	5.483	0.182
12.248	125.988	4.287356	0.992	0.2681	1.975634	0.2332	2.2359	0.4078	7.2807	250.3235	215.711	90.7%	5.534	0.181
12.248	126.218	6.390331	0.993	0.2498	2.963451	0.1565	2.3306	0.4211	7.7018	175.0616	215.711	93.7%	5.352	0.187
12.248	126.218	5.061014	0.993	0.2419	1.975634	0.1976	2.2927	0.4284	8.1302	217.4488	215.711	95.3%	5.271	0.190
12.248	126.450	2.71144	0.994	0.1854	0.987817	0.3688	2.5296	0.4799	8.6101	447.8066	215.711	106.8%	4.615	0.217
12.248	126.682	4.018597	0.994	0.1642	1.481725	0.2488	2.2643	0.4906	9.1007	270.4598	215.711	109.2%	4.347	0.230
12.248	126.916	2.637081	0.995	0.1385	0.987817	0.3792	2.1411	0.4925	9.5932	389.7303	215.711	109.6%	3.993	0.250
12.248	127.150	1.248822	0.996	0.1456	0.493908	0.8008	1.7338	0.4342	10.0275	666.3921	215.711	96.6%	4.102	0.244
12.248	127.150	2.530507	0.996	0.1217	0.987817	0.3952	1.7906	0.4366	10.4640	339.6514	215.711	97.1%	3.749	0.267
12.248	127.150	2.606447	0.996	0.1072	0.987817	0.3837	1.5538	0.4145	10.8785	286.1371	215.711	92.2%	3.516	0.284
12.248	127.385	1.303223	0.997	0.0924	0.493908	0.7673	1.7432	0.4958	11.3743	642.0637	215.711	110.3%	3.270	0.306
12.248	127.385	1.313395	0.997	0.0936	0.493908	0.7614	1.5159	0.4635	11.8378	553.9924	215.711	103.1%	3.291	0.304
12.248	127.385	2.681733	0.997	0.0905	0.987817	0.3729	1.4211	0.4319	12.2696	254.3636	215.711	96.1%	3.233	0.309
12.248	127.621	1.305752	0.998	0.0861	0.493908	0.7658	1.3264	0.4102	12.6799	487.5809	215.711	91.3%	3.157	0.317
12.248	127.621	1.357087	0.998	0.0834	0.493908	0.7369	1.4306	0.4531	13.1330	505.9978	215.711	100.8%	3.113	0.321
12.248	127.621	1.35572	0.998	0.0814	0.493908	0.7376	1.3927	0.4474	13.5804	493.0904	215.711	99.6%	3.072	0.326
12.248	127.621	1.350281	0.998	0.0730	0.493908	0.7406	1.4211	0.4627	14.0431	505.1803	215.711	103.0%	2.909	0.344
12.248	127.858	1.237344	0.999	0.0774	0.493908	0.8082	1.3737	0.4722	14.5153	532.9137	215.711	105.1%	2.998	0.334
12.248	127.621	2.549678	0.998	0.0889	0.987817	0.3922	1.4211	0.4740	14.9893	267.5378	215.711	105.5%	3.208	0.312
12.248	127.858	1.224959	0.999	0.0847	0.493908	0.8164	1.4211	0.4430	15.4322	556.8637	215.711	98.6%	3.133	0.319
12.248	127.621	1.254641	0.998	0.0871	0.493908	0.7970	1.4685	0.4687	15.9009	561.8125	215.711	104.3%	3.177	0.315
12.248	127.621	2.561807	0.998	0.0907	0.987817	0.3903	1.3453	0.4234	16.3244	252.0699	215.711	94.2%	3.239	0.309
12.248	127.621	1.300705	0.998	0.0832	0.493908	0.7688	1.4401	0.4446	16.7689	531.4274	215.711	98.9%	3.102	0.322
12.248	127.621	1.31725	0.998	0.0843	0.493908	0.7592	1.4022	0.4520	17.2209	510.9432	215.711	100.6%	3.123	0.320

12.248	127.621	2.497643	0.998	0.0882	0.987817	0.4004	1.4211	0.4550	17.6759	273.1115	215.711	101.3%	3.198	0.313
12.248	127.858	1.230557	0.999	0.0969	0.493908	0.8126	1.4116	0.4415	18.1174	550.6347	215.711	98.2%	3.355	0.298
12.248	127.858	1.233941	0.999	0.0981	0.493908	0.8104	1.3832	0.4123	18.5296	538.0685	215.711	91.7%	3.376	0.296
12.248	127.858	2.518671	0.999	0.0897	0.987817	0.3970	1.4874	0.4405	18.9702	283.4702	215.711	98.0%	3.224	0.310
12.248	127.858	1.248822	0.999	0.0880	0.493908	0.8008	1.3643	0.4231	19.3933	524.3741	215.711	94.2%	3.193	0.313
12.248	127.858	1.267636	0.999	0.0914	0.493908	0.7889	1.3832	0.4332	19.8264	523.7661	215.711	96.4%	3.256	0.307
12.248	127.858	2.564247	0.999	0.0933	0.987817	0.3900	1.4401	0.4423	20.2687	269.5646	215.711	98.4%	3.288	0.304
12.248	127.858	1.228312	0.999	0.0891	0.493908	0.8141	1.4022	0.4264	20.6952	547.9391	215.711	94.9%	3.214	0.311
12.248	127.858	1.256984	0.999	0.0945	0.493908	0.7956	1.4306	0.4451	21.1403	546.2940	215.711	99.0%	3.310	0.302
12.248	127.858	2.532888	0.999	0.0990	0.987817	0.3948	1.4259	0.4308	21.5711	270.2090	215.711	95.9%	3.389	0.295

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	18.70	W_{wd}
Load Weight (kg wet)	8.485	
Total Test Duration (min)	480	Θ
Total Test Duration (hours)	8.000	
Wood Moisture (Dry Bais)	21.48	%
Wood Moisture (Wet Bais)	17.68	%

Manufacturer:	Hearth & Home Technologies
Model:	5100IACC
Date:	5/11/2011
Run:	3
Control #:	G100340618
Tech:	B. Davis

Dry Burn Rate	0.873	Dry kg/hr
	1.924	Dry Lb/hr

Total Particulate Collected	2152.5	mg

Cs	0.0220	g/dscf
Qstd	7601.8	dscf/hr
E	5.71	g/hr

Average Stack Flow (Qf)	4.32	dscf/min
Average Stack Flow (Qf)	259.39	dscf/hr

PARTICULATE CATCH	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.7728	0.6336	139.2	F1
Rear Filter	0.5939	0.1651	428.8	F2
Probe/Front Half Rinse	102.5514	102.2670	284.4	R1
Impinger H2O +Back Rinse	144.0925	143.6742	418.3	R2
Meth Chlor. Extraction	102.1459	101.5454	600.5	R3
Back Half Acetone Rinse	97.5099	97.2255	284.4	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	145	Va1
Acetone Back Half Rinse	130	Va2
Water- Impingers + Back Half Rinse	400	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.0055	Ba
Water	0.001	Bw
Methylene Chloride	0.008	B_{DCM}

Total Particulate Collected 2152.49 mg

Weighing Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6336
Rear Filter						0.1651
Probe/Front Half Rinse						102.2670
Impinger H2O +Back Rinse						143.6742
Meth Chlor. Extraction						101.5454
Back Half Acetone Rinse						97.2255

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.7728
Rear Filter						0.5939
Probe/Front Half Rinse						102.5514
Impinger H2O +Back Rinse						144.0925
Meth Chlor. Extraction						102.1459
Back Half Acetone Rinse						97.5099

Test Engineer

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.38**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.22**	in Hg
Tunnel Diameter	**6**	in
Tunnel Area	0.19635	ft^2

	PITOT TUNNEL VELOCITY P	TUNNEL TEMP	SQUARE ROOT VP
A CENTER			0.0000
B CENTER			0.0000
A1	0.028	80	0.1673
A2	0.030	80	0.1732
A3	0.032	80	0.1789
A4	0.026	80	0.1612
B1	0.032	80	0.1789
B2	0.038	80	0.1949
B3	0.034	80	0.1844
B4	0.026	80	0.1612
AVERAGE	0.031	80	0.1750

PITOT CONSTANT= **#DIV/0!** For Pitot Palced at Center.

1.00 For Pitot Palced at point of average VP

Tunnel V	Tunnel Q
ft/sec	scfm
12.13	126.40

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/11/2011

Run: 3

Control #: G100340618

Test Engineer_ _____

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth N Home MODEL: 5100I ACC PROJECT #: G100340618 SAMPLE ID#: PRT1012031428

DATE: 5/11/11 ENGINEER: B Davis RUN #: 3

INTERTEK EQUIPMENT #'s: 19745

CALCULATED RANGE: 3.8 - 4.6 ACTUAL COAL BED: 4.3

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F) AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	4.6	—	-.060	77	986	517	525	604	511	NA	373
10	4.4	0.2	-.045	77	772	499	455	586	529		251
20	6.4	—	-.047	75	616	523	404	536	509		240
30	6.0	0.4	-.042	75	561	511	370	497	483		222
40	5.4	0.6	-.040	76	529	485	334	454	451		214
50	4.9	0.5	-.040	74	493	459	308	423	424		212
60	4.6	0.3	-.032	75	479	440	293	406	409		193
70	4.4	0.2	-.032	74	413	421	279	384	389		183
~~78 80~~	4.3	0.1	-.032	73	394	409	266	365	372		169
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: _____ ENGINEER SIGNATURE: B Davis 6/23/11

FUEL DATA

CLIENT: Hearth & Home MODEL: 5100 I ACC PROJECT #: G100340618

DATE: 5/11/11 RUN #: 3 SAMPLE ID #: PRT1012031428

INTERTEK EQUIPMENT #'s: ETC-7

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	24" ~~FT~~	21.2	18.2	19.7	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3 @ 8" INCHES PRE-BURN FUEL AVG MOISTURE:

TIME (CLOCK): 0915 ROOM TEMP (F): 68

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: ACTUAL LOAD WT: 9.4 (2 X 4)
9.3 (4 X 4)
FUEL PIECE LENGTH: 19 18.7 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	18.0	23.4	19.4	4x4
2	23.5	19.3	23.1	4x4
3	19.2	21.2	20.4	2x4
4	24.5	24.5	24.5	2x4
5	21.0	21.0	21.1	2x4
6	20.6	20.9	21.1	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 21.4%

TIME (CLOCK): 0920 ROOM TEMP (F): 68

ENGINEER: [signature] 6/23/11

Intertek

RUN NOTES

Client: Hearth N Home
Model: 5100I ACC
Run #: 3
Engineer: B Davis
Intertek Equipment ID #(s): NA

Project #: G100340618 Sample ID #: PRT1012031428
Booth: _____ Date: 5/11/16

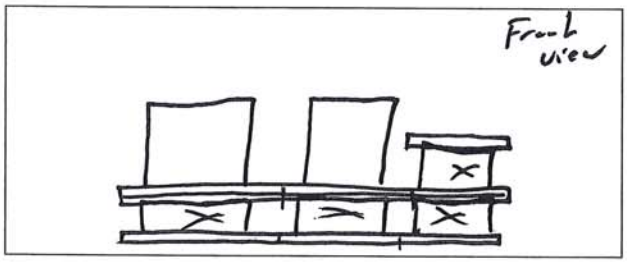
PREBURN

PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on high

Comments: At 15 minutes added 2.4 lbs fuel

TEST

START UP PROCEDURES
(Paste fuel and stove pictures in spaces below.)



BYPASS: NA FUEL LOADING: By 35 seconds DOOR: closed by 40 seconds
PRIMARY AIR: At test setting full SICC
OTHER: Timed for pushed in @ 0 minutes pulled out @ 5:00

Same as Above

PRIMARY:
Describe or sketch test settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: at for first 30 minutes then Turned to High

Date: 6/23/11

Engineer signature: BD

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth N Home

Model: 5100I Project #: G100340618 Sample ID #: PRT1012031428

Date: 5/11/11 Run #: 3

Start Time: 12:10 Stop Time: 20:10

Intertek Equipment #'s: ETCS-4

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good 9.93

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good .97

Calibrations: Span Gas CO_2: ~~9.96~~ BA O_2: ____ CO: .98 BA CO_2(DT): 1.00

	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time	Ø	EOT					
O_2	NA						
CO_2	0.06 / 9.98	0.06 / 9.90					
CO	0.00 / 0.98	0.01 / 0.99					
CO_2 (DT)	0.00 / 1.00	001 / 0.96					

Stack Diameter (inches): 6

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

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: 5/9/11 Initials: BA

	Initial	Middle	Ending
Pb (in/Hg)	28.22		28.23
Room Temp (°F)	74		76

Date: 6/23/11

Engineer signature: BA

Method 5H Impinger Gravimetric Analysis

Client: Heath N Home

Model: 5100 I Acc

Report Number: G100 340618

Date: 5/11/11

Test Engineer: B Davis

Scale ID umber: NA

Audit Weight Number: NA

Run Number: 3

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	864.9	707.5	606.0	1002.3
Initial Weight grams	711.8	690.0	603.1	987.0
Net Weight grams	153.1	17.5	2.9	15.3

Total Weight 188.8

Notes: 293 304

Test Engineer:

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/12/2011
Run: 4
Control #: G100340618

Tech: B. Davis

Start	End	Delta T
383.4	311.2	72.2

Elapsed	Fuel Weight	Stack Gas Comp. (%)			Tunnel	Flue	Room	Tunnel	Tunnel Pitot	Appliance Firebox Temperatures (F)				
Time (min)	(lbs)	CO	CO_2	O_2	CO_2	Temp. (F)	Temp. (F)	Temp. (F)	(in. w.c.)	top	Bottom	Back	Left	Right
0	18.5	0.98	7.44	12.48	0.43	221	71	80	0.034	479	303	298	422	415
10	17.2	1.56	12.78	6.56	0.94	373	72	94	0.034	576	359	340	397	381
20	15.2	1.51	13.86	5.53	0.96	412	70	101	0.034	817	397	340	378	357
30	13.4	1.11	15.36	4.43	0.95	422	70	101	0.034	921	430	346	400	358
40	11.7	0.4	14.9	5.6	0.97	392	72	101	0.034	912	412	288	416	377
50	10.3	0.62	14.24	6.04	0.92	370	74	98	0.034	883	357	267	413	391
60	9.2	0.5	14.18	6.22	0.87	352	73	95	0.034	831	312	260	411	399
70	8	0.8	14.04	6.06	0.85	340	74	93	0.034	788	299	257	409	405
80	7.1	0.43	13.58	6.89	0.81	334	76	92	0.034	770	391	257	406	408
90	6.2	0.82	11.16	8.92	0.65	312	74	90	0.034	700	269	259	412	414
100	5.5	0.62	10.88	9.4	0.64	302	75	88	0.034	662	252	261	410	410
110	4.9	1.01	9.72	10.17	0.54	277	74	86	0.034	595	256	259	408	400
120	4.3	0.95	10.08	9.87	0.56	270	74	87	0.034	561	259	258	405	391
130	3.8	1.09	9.86	9.95	0.54	264	75	87	0.034	541	254	259	408	384
140	3.4	1.55	7.9	11.45	0.4	232	74	85	0.034	481	250	261	414	375
150	3.1	1.42	7.3	12.18	0.35	215	75	85	0.034	433	233	264	417	365
160	2.9	1.59	7.04	12.27	0.35	207	76	84	0.034	402	229	257	400	357
170	2.7	1.8	6.76	12.34	0.32	197	75	83	0.034	375	225	252	382	352
180	2.5	2.1	6.7	12.1	0.31	189	75	82	0.034	354	222	249	370	347
190	2.3	2.15	6.56	12.19	0.3	185	74	82	0.034	337	219	246	363	344
200	2.1	2.17	6.36	12.37	0.29	182	76	81	0.034	323	217	245	356	341
210	2	2.36	6.26	12.28	0.28	179	74	81	0.034	318	216	245	351	338
220	1.8	2.56	6.28	12.06	0.28	177	74	81	0.034	312	215	245	346	337
230	1.6	2	7.06	11.84	0.3	176	75	81	0.034	309	214	247	343	339
240	1.4	1.8	7.52	11.58	0.33	177	75	82	0.034	309	216	259	344	349
250	1.2	1.93	7.42	11.55	0.32	178	76	83	0.034	313	217	275	346	360
260	1	1.96	7.02	11.92	0.31	179	76	83	0.034	315	218	283	348	366
270	0.8	1.93	7.04	11.93	0.3	180	77	84	0.034	317	219	287	351	369
280	0.6	1.85	7.02	12.03	0.3	180	78	84	0.034	317	220	288	355	370
290	0.4	1.88	6.92	12.1	0.29	180	78	84	0.034	315	220	288	360	369
300	0.2	1.95	6.82	12.13	0.29	179	77	84	0.034	313	219	291	367	366
310	0.1	1.95	6.5	12.45	0.27	179	78	83	0.034	311	219	292	374	362
320	0	1.86	6.34	12.7	0.27	179	78	83	0.034	310	220	290	379	357

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/12/2011

Run: 4

Control #: G100340618

Tech: B. Davis

-0.050083

DGM Temps. (F)		DGM Vol.	Orifice Meter	Tunnel SP	Impinger	Front	VAC	Draft
In	Out	ft^3	ΔH (in H_2O)	(in H_2O)	Exit	Filter		
66	66	771.7	0.42	-0.48	68	232	0	-0.041
66	66	774.96	0.5030	-0.48	46	231	0	-0.072
66	66	778.56	0.4430	-0.48	45	232	0	-0.075
67	67	782.005	0.3500	-0.48	46	233	5	-0.073
67	67	785.13	0.3900	-0.48	49	232	5	-0.07
67	67	788.25	0.3800	-0.48	49	233	5	-0.068
67	67	791.35	0.3500	-0.48	50	232	5	-0.062
68	68	794.37	0.3400	-0.48	52	232	6	-0.06
68	68	797.3	0.3300	-0.48	53	232	6	-0.06
68	68	800.28	0.3100	-0.48	54	232	6	-0.06
69	69	803.15	0.3100	-0.48	53	232	6	-0.057
69	69	806.02	0.2800	-0.48	54	232	7	-0.051
69	69	808.69	0.2800	-0.48	56	232	7	-0.05
70	70	811.32	0.2700	-0.48	54	232	7	-0.05
70	70	813.85	0.2200	-0.48	58	232	7	-0.042
71	71	816.35	0.1900	-0.48	54	232	7	-0.04
71	71	818.78	0.2100	-0.48	47	232	7	-0.04
72	72	821.24	0.1800	-0.48	47	232	7	-0.038
72	72	823.52	0.1700	-0.48	47	232	7	-0.035
73	73	825.78	0.1700	-0.48	49	232	7	-0.032
73	73	828.08	0.1700	-0.48	52	232	7	-0.032
73	73	830.2	0.1600	-0.48	53	232	7	-0.032
74	74	832.35	0.1600	-0.48	53	232	7	-0.032
74	74	834.45	0.1500	-0.48	54	232	7	-0.03
74	74	836.58	0.16	-0.48	55	232	7	-0.03
74	74	838.75	0.15	-0.48	57	232	7	-0.032
74	74	840.65	0.16	-0.48	57	232	7	-0.032
74	74	842.73	0.15	-0.48	58	232	7	-0.032
74	74	844.77	0.15	-0.48	58	232	7	-0.032
74	74	846.84	0.13	-0.48	59	232	7	-0.031
74	74	848.68	0.14	-0.48	59	232	7	-0.03
74	74	850.55	0.13	-0.48	60	232	7	-0.03
73	73	852.362	0.14	-0.48	60	232	7	-0.03

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

	Cat	Non Cat	Pellet
(ENTER X)		X	
Initial Delta	0.37		
Delta H @	1.788		
Baro:	28.59 in Hg (Tunnel Traverse)		
DGM Cal	1.015 Y		

Constants

K_1	17.64	R/in Hg	V_m	80.662	ft^3
T_{std}	528	R	$V_{m(std)}$	77.875	dscf
P_{std}	29.92	in Hg			

Pitot Location

Center	
Point of Ave.	X

Averages	1.497273	9.14	10.23	0.499697	708.2121	534.69697	546.91	0.034	530.75758	530.75758	816.351	0.244	-0.035

Time	Weight	Stack Gas Comp. CO	CO_2	O_2	Tunnel CO_2	Flue Temp. (R)	Room Temp. (R)	Tunnel Temp. (R)	Tunnel Pitot (in. w.c.)	DGM Temps. (R) In	Out	DGM Vol. ft^3	Orifice Meter ΔH (in H_2O)	Tunnel SP (in Hg)
0	18.50	1.18	6.22	12.48	0.43	681	531	540	0.0340	526	526	771.700	0.4200	-0.03529
10	17.20	1.56	12.78	6.56	0.94	833	532	554	0.0340	526	526	774.960	0.5030	-0.03529
20	15.20	1.51	13.86	5.53	0.96	872	530	561	0.0340	526	526	778.560	0.4430	-0.03529
30	13.40	1.11	15.36	4.43	0.95	882	530	561	0.0340	527	527	782.005	0.3500	-0.03529
40	11.70	0.4	14.9	5.6	0.97	852	532	561	0.0340	527	527	785.130	0.3900	-0.03529
50	10.30	0.62	14.24	6.04	0.92	830	534	558	0.0340	527	527	788.250	0.3800	-0.03529
60	9.20	0.5	14.18	6.22	0.87	812	533	555	0.0340	527	527	791.350	0.3500	-0.03529
70	8.00	0.8	14.04	6.06	0.85	800	534	553	0.0340	528	528	794.370	0.3400	-0.03529
80	7.10	0.43	13.58	6.89	0.81	794	536	552	0.0340	528	528	797.300	0.3300	-0.03529
90	6.20	0.82	11.16	8.92	0.65	772	534	550	0.0340	528	528	800.280	0.3100	-0.03529
100	5.50	0.62	10.88	9.4	0.64	762	535	548	0.0340	529	529	803.150	0.3100	-0.03529
110	4.90	1.01	9.72	10.17	0.54	737	534	546	0.0340	529	529	806.020	0.2800	-0.03529
120	4.30	0.95	10.08	9.87	0.56	730	534	547	0.0340	529	529	808.690	0.2800	-0.03529
130	3.80	1.09	9.86	9.95	0.54	724	535	547	0.0340	530	530	811.320	0.2700	-0.03529
140	3.40	1.55	7.9	11.45	0.4	692	534	545	0.0340	530	530	813.850	0.2200	-0.03529
150	3.10	1.42	7.3	12.18	0.35	675	535	545	0.0340	531	531	816.350	0.1900	-0.03529
160	2.90	1.59	7.04	12.27	0.35	667	536	544	0.0340	531	531	818.780	0.2100	-0.03529
170	2.70	1.8	6.76	12.34	0.32	657	535	543	0.0340	532	532	821.240	0.1800	-0.03529
180	2.50	2.1	6.7	12.1	0.31	649	535	542	0.0340	532	532	823.520	0.1700	-0.03529
190	2.30	2.15	6.56	12.19	0.3	645	534	542	0.0340	533	533	825.780	0.1700	-0.03529
200	2.10	2.17	6.36	12.37	0.29	642	536	541	0.0340	533	533	828.080	0.1700	-0.03529
210	2.00	2.36	6.26	12.28	0.28	639	534	541	0.0340	533	533	830.200	0.1600	-0.03529
220	1.80	2.56	6.28	12.06	0.28	637	534	541	0.0340	534	534	832.350	0.1600	-0.03529
230	1.60	2	7.06	11.84	0.3	636	535	541	0.0340	534	534	834.450	0.1500	-0.03529
240	1.4	1.8	7.52	11.58	0.33	637	535	542	0.034	534	534	836.580	0.1600	-0.03529
250	1.2	1.93	7.42	11.55	0.32	638	536	543	0.034	534	534	838.750	0.1500	-0.03529
260	1	1.96	7.02	11.92	0.31	639	536	543	0.034	534	534	840.650	0.1600	-0.03529
270	0.8	1.93	7.04	11.93	0.3	640	537	544	0.034	534	534	842.730	0.1500	-0.03529
280	0.6	1.85	7.02	12.03	0.3	640	538	544	0.034	534	534	844.770	0.1500	-0.03529
290	0.4	1.88	6.92	12.1	0.29	640	538	544	0.034	534	534	846.840	0.1300	-0.03529
300	0.2	1.95	6.82	12.13	0.29	639	537	544	0.034	534	534	848.680	0.1400	-0.03529
310	0.1	1.95	6.5	12.45	0.27	639	538	543	0.034	534	534	850.550	0.1300	-0.03529
320	0	1.86	6.34	12.7	0.27	639	538	543	0.034	533	533	852.362	0.1400	-0.03529

Manufacturer: Hearth & Home Technologies
Model: 5100I ACC
Date: 5/12/2011
Run: 4
Control #: G100340618 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)		
k_p	85.49	P_g	-0.48	(Tunnel Traverse)
C_p	0.99	N_c	0.0425	
M_s	28.56	HC	0.0132	
CO_{2amb}	0.034	B_{ws}	0.04	
K_2	384.8	Tunnel Area	0.19635	ft^2 (Tunnel Traverse)

					Sum Si x Vm			
12.780	**133.190**	**5.604**	**0.994**	**0.243**	**12.087**	100.1%	6.40	

Dilution Tunnel **Proportional Rate Calculation**

V ft/min	Q_{tunnel} scfm	Q_{stack} scfm	Q_{snew}/Q_{sInit}	Target ΔH (in H2O)	Burn Rate lb/h dry	S_i	$V_{mi(sdt)}$	$S_i \times V_{mi(std)}$	Sum	$\Theta \times S_i \times V_{mi(std)}$	t x Sum S_i x $V_{mi(std)}$	PR	Qf by tracer	1/Qf by tracer
12.780	134.877		1.000	0.4233									8.634	0.116
12.780	131.469	11.20419	0.987	0.5038	6.437237	0.0893	3.1699	0.3671	0.3671	90.5352	120.874	100.0%	9.345	0.107
12.780	129.828	16.17345	0.981	0.4434	9.903441	0.0618	3.5005	0.3746	0.7417	69.2596	120.874	99.2%	8.695	0.115
12.780	129.828	13.65606	0.981	0.3531	8.913097	0.0732	3.3498	0.3852	1.1270	78.4954	120.874	102.0%	7.760	0.129
12.780	129.828	13.80533	0.981	0.3904	8.417925	0.0724	3.0329	0.3909	1.5178	70.3005	120.874	103.5%	8.174	0.122
12.780	130.526	11.67827	0.984	0.3836	6.932409	0.0856	3.0280	0.3704	1.8883	82.9720	120.874	98.1%	8.141	0.123
12.780	131.232	9.279009	0.986	0.3470	5.446893	0.1078	3.0086	0.3696	2.2578	103.7566	120.874	97.8%	7.756	0.129
12.780	131.706	10.02233	0.988	0.3378	5.942065	0.0998	2.9310	0.3779	2.6358	93.5823	120.874	100.1%	7.673	0.130
12.780	131.945	7.923722	0.989	0.3260	4.456549	0.1262	2.8382	0.3699	3.0056	114.6227	120.874	97.9%	7.559	0.132
12.780	132.425	9.133132	0.991	0.3067	4.456549	0.1095	2.8867	0.3819	3.3875	101.1413	120.874	101.1%	7.332	0.136
12.780	132.908	7.369515	0.993	0.3129	3.466205	0.1357	2.7801	0.3792	3.7667	120.7189	120.874	100.4%	7.426	0.135
12.780	133.395	6.720369	0.994	0.2751	2.971032	0.1488	2.7749	0.3737	4.1404	132.1293	120.874	98.9%	6.969	0.144
12.780	133.151	6.557121	0.994	0.2758	2.971032	0.1525	2.5815	0.3704	4.5109	125.9820	120.874	98.1%	6.972	0.143
12.780	133.151	5.499894	0.994	0.2663	2.47586	0.1818	2.5428	0.3647	4.8756	147.9489	120.874	96.6%	6.857	0.146
12.780	133.640	5.012717	0.995	0.2186	1.980688	0.1995	2.4415	0.3561	5.2317	155.8610	120.874	94.3%	6.218	0.161
12.780	133.640	4.03289	0.995	0.1906	1.485516	0.2480	2.4126	0.3880	5.6197	191.4317	120.874	102.7%	5.812	0.172
12.780	133.885	2.712913	0.996	0.2050	0.990344	0.3686	2.3406	0.4027	6.0224	276.0845	120.874	106.6%	6.039	0.166
12.780	134.132	2.732134	0.997	0.1829	0.990344	0.3660	2.3695	0.3924	6.4147	277.5267	120.874	103.9%	5.703	0.175
12.780	134.379	2.66734	0.998	0.1737	0.990344	0.3749	2.1920	0.3843	6.7991	262.9728	120.874	101.7%	5.564	0.180
12.780	134.379	2.691274	0.998	0.1687	0.990344	0.3716	2.1728	0.3905	7.1896	258.3479	120.874	103.4%	5.477	0.183
12.780	134.628	2.740455	0.999	0.1660	0.990344	0.3649	2.2071	0.4029	7.5925	257.7176	120.874	106.7%	5.448	0.184
12.780	134.628	1.357821	0.999	0.1588	0.495172	0.7365	2.0343	0.3734	7.9659	479.4377	120.874	98.9%	5.319	0.188
12.780	134.628	2.656839	0.999	0.1578	0.990344	0.3764	2.0631	0.3879	8.3538	248.4918	120.874	102.7%	5.302	0.189
12.780	134.628	2.600528	0.999	0.1455	0.990344	0.3845	2.0114	0.3793	8.7331	247.5042	120.874	100.4%	5.097	0.196
12.780	134.379	2.536981	0.998	0.1585	0.990344	0.3942	2.0401	0.4003	9.1334	257.3281	120.874	106.0%	5.313	0.188
12.780	134.132	2.529848	0.997	0.1514	0.990344	0.3953	2.0784	0.3912	9.5246	262.8997	120.874	103.6%	5.194	0.193
12.780	134.132	2.620726	0.997	0.1576	0.990344	0.3816	1.8198	0.3504	9.8749	222.2065	120.874	92.8%	5.299	0.189
12.780	133.885	2.623273	0.996	0.1450	0.990344	0.3812	1.9922	0.3759	10.2509	243.0215	120.874	99.5%	5.083	0.197
12.780	133.885	2.649017	0.996	0.1456	0.990344	0.3775	1.9539	0.3844	10.6353	236.0317	120.874	101.8%	5.098	0.196
12.780	133.885	2.66734	0.996	0.1388	0.990344	0.3749	1.9826	0.3889	11.0242	237.8575	120.874	103.0%	4.977	0.201
12.780	133.885	2.675271	0.996	0.1432	0.990344	0.3738	1.7624	0.3541	11.3783	210.8021	120.874	93.7%	5.051	0.198
12.780	134.132	1.381447	0.997	0.1340	0.495172	0.7239	1.7911	0.3546	11.7329	414.8891	120.874	93.9%	4.896	0.204
12.780	134.132	1.417725	0.997	0.1409	0.495172	0.7054	1.7355	0.3545	12.0874	391.7338	120.874	93.9%	5.020	0.199

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	18.50	W_{wd}
Load Weight (kg wet)	8.394	
Total Test Duration (min)	320	Θ
Total Test Duration (hours)	5.333	
Wood Moisture (Dry Bais)	21.17	%
Wood Moisture (Wet Bais)	17.47	%

Manufacturer:	Hearth & Home Technologies
Model:	5100IACC
Date:	5/12/2011
Run:	4
Control #:	G100340618
Tech:	B. Davis

Dry Burn Rate	1.299	Dry kg/hr
	2.863	Dry Lb/hr

Total Particulate Collected	463.6	mg

Cs	0.0060	g/dscf
Qstd	7990.4	dscf/hr
E	2.00	g/hr

Average Stack Flow (Qf)	5.60	dscf/min
Average Stack Flow (Qf)	336.24	dscf/hr

PARTICULATE CATCH

	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.6783	0.6375	40.8	F1
Rear Filter	0.2410	0.1663	74.7	F2
Probe/Front Half Rinse	93.1890	93.1185	70.5	R1
Impinger H2O +Back Rinse	146.3514	146.2595	91.9	R2
Meth Chlor. Extraction	103.5406	103.4635	77.1	R3
Back Half Acetone Rinse	100.4885	100.3776	110.9	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	70	Va1
Acetone Back Half Rinse	80	Va2
Water- Impingers + Back Half Rinse	325	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.0055	Ba
Water	0.001	Bw
Methylene Chloride	0.008	B_{DCM}

Total Particulate Collected 463.55 mg

Weighing Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6375
Rear Filter						0.1663
Probe/Front Half Rinse						93.1185
Impinger H2O +Back Rinse						146.2595
Meth Chlor. Extraction						103.4635
Back Half Acetone Rinse						100.3776

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6783
Rear Filter						0.2410
Probe/Front Half Rinse						93.1890
Impinger H2O +Back Rinse						146.3514
Meth Chlor. Extraction						103.5406
Back Half Acetone Rinse						100.4885

Test Engineer

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.48**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.56**	in Hg
Tunnel Diameter	**6**	in
Tunnel Area	0.19635	ft^2

	PITOT TUNNEL VELOCITY P	TUNNEL TEMP	SQUARE ROOT VP
A CENTER			0.0000
B CENTER			0.0000
A1	0.036	90	0.1897
A2	0.042	90	0.2049
A3	0.034	90	0.1844
A4	0.030	90	0.1732
B1	0.028	90	0.1673
B2	0.038	90	0.1949
B3	0.038	90	0.1949
B4	0.028	90	0.1673
AVERAGE	0.034	90	0.1846

PITOT CONSTANT= **#DIV/0!** For Pitot Palced at Center.

1.00 For Pitot Palced at point of average VP

Tunnel V	Tunnel Q
ft/sec	scfm
12.84	132.88

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/12/2011

Run: 4

Control #: G100340618

Test Engineer_ _____

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth N Home MODEL: 5100I ACC PROJECT #: G100340618 SAMPLE ID#: PRT1012031428

DATE: 5/12/11 ENGINEER: B Davis RUN #: 4

INTERTEK EQUIPMENT #'s: ETC7-2

CALCULATED RANGE: 3.7 - 4.6 ACTUAL COAL BED: 4.1

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F) AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	4.6	—	-.061	73	466	495	524	550	533	NA	344
10	4.3	0.3	-.052	74	785	429	443	548	533		285
20	6.1	—	-.058	72	673	398	402	521	510		295
30	5.5	11.6	-.055	72	656	376	363	491	478		283
40	4.8	0.7	-.052	71	617	360	334	463	452		287
50	4.4	0.4	-.048	71	611	344	317	448	436		267
60	4.1	0.3	-.040	70	492	305	300	425	418		231
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: _____ ENGINEER SIGNATURE: B Davis 6/23/11

FUEL DATA

Intertek

CLIENT: Hearth & Home MODEL: 5100 I ACC PROJECT #: G100340618

DATE: 5/12/11 RUN #: 4 SAMPLE ID #: PRT1012031428

INTERTEK EQUIPMENT #'s: ETC-7

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	24" FT	19.9	19.1	19.3	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3 @ 24" & 8" INCHES PRE-BURN FUEL AVG MOISTURE:

TIME (CLOCK): 0825 ROOM TEMP (F): 68

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: ACTUAL LOAD WT: 9.7 (2 X 4)
9.8 (4 X 4)
FUEL PIECE LENGTH: 19 18.5 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	19.3	23.6	19.3	4x4
2	24.5	24.5	25.8	4x4
3	19.1	18.9	19.4	2x4
4	19.4	18.6	20.3	2x4
5	23.6	22.5	24.5	2x4
6	19.2	19.2	19.4	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 21.17

TIME (CLOCK): 0825 ROOM TEMP (F): 68

ENGINEER: [signature] 6/23/11

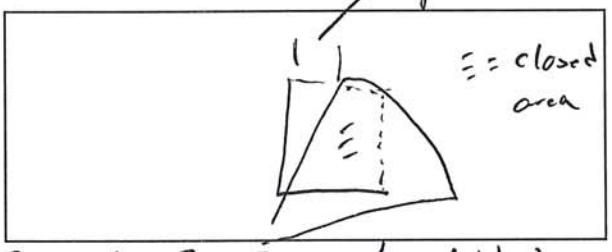
Intertek

RUN NOTES

Client: Hearth N Home
Model: 5100I ACC
Run #: 4
Engineer: B Davis
Intertek Equipment ID #(s): NA

Project #: G100340618 Sample ID #: PRT1012031428
Booth: _____ Date: 5/12/11

PREBURN

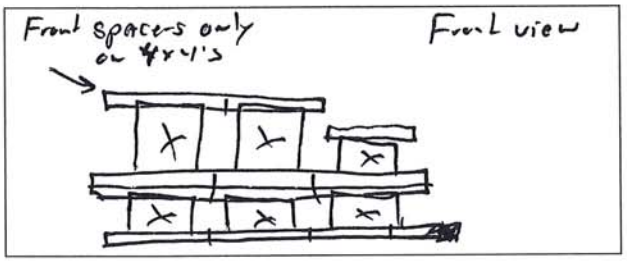


PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on High

Comments: @ 15 minutes Added 2.4 lbs
55 minutes Raked coals

TEST

START UP PROCEDURES
(Paste fuel and stove pictures in spaces below.)



BYPASS: NA FUEL LOADING: by 1.00 minute DOOR: closed by 70 seconds
PRIMARY AIR: At test setting full 5:00
OTHER: Timed Air pushed in @ ~~5:00~~ 0 minutes pulled out @ 5:00 minutes

Same as Above

PRIMARY:
Describe or sketch test settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: off for first 30 minutes then Turned to High.

Date: 6/23/11
Engineer signature: B Davis

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth N Home

Model: 5100I Project #: G100340618 Sample ID #: PRT1012031428

Date: 5/12/11 Run #: 4

Start Time: 11:28 Stop Time: 1648

Intertek Equipment #'s: ETCS-4

Gas Analyzer Train Leak Check:

Stack: Initial: good Final: good

Dilution Tunnel (Method 5G Only): Initial: good Final: good

Calibrations: Span Gas CO_2: ~~9.87~~ 9.93 BA O_2: _____ CO: ~~.98~~ .97 BA CO_2(DT): 1.00

	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time	Ø		EOT					
O_2								
CO_2	0.04	10.00	0.06	9.90				
CO	0.00	0.98	0.01	1.01				
CO_2 (DT)	0.00	0.98	0.00	0.96				

Stack Diameter (inches): 6

Air Velocity (ft/min): Initial: 650 Final: 650

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: 5/9/11 Initials: BL

	Initial	Middle	Ending
Pb (in/Hg)	28.56		28.61
Room Temp (°F)	71		78

Date: 6/23/11

Engineer signature: BA

K. J. Murray

Method 5H Impinger Gravimetric Analysis

Client: Hearth & Home

Model: 5100 I Acc

Report Number: 6100340618

Date: 5/12/11

Test Engineer: BDAVIS

Scale ID umber: NA

Audit Weight Number: NA

Run Number: 4

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	832.2	704.3	605.9	951.3
Initial Weight grams	710.5	688.1	605.2	934.4
Net Weight grams	121.7	16.2	0.7	16.9

Total Weight 155.5

Notes: 294 305

Test Engineer: BD 6/23/11

4e 18
4e 15

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/13/2011
Run: 5
Control #: G100340618

Tech: B. Davis

Start	End	Delta T
459	395.8	63.2

Elapsed	Fuel Weight	Stack Gas Comp. (%)			Tunnel	Flue	Room	Tunnel	Tunnel Pitot	Appliance Firebox Temperatures (F)				
Time (min)	(lbs)	CO	CO_2	O_2	CO_2	Temp. (F)	Temp. (F)	Temp. (F)	(in. w.c.)	top	Bottom	Back	Left	Right
0	18.6	1.26	9.95	9.69	0.61	316	75	97	0.032	615	350	350	505	475
10	16.9	1.63	13.82	5.45	1.47	443	74	115	0.032	633	363	324	458	433
20	14.3	2.79	16.4	1.71	1.73	506	73	128	0.032	788	340	290	443	411
30	11.5	4.26	16.86	-0.22	1.8	499	76	131	0.032	846	351	279	457	423
40	8.6	4.04	16.58	0.28	1.7	489	77	128	0.032	877	352	283	486	450
50	6.5	1.84	16.66	2.4	1.61	486	76	124	0.032	902	351	295	517	485
60	5	0.64	15.3	4.96	1.48	468	78	120	0.032	926	321	313	543	505
70	4	0.41	12.74	7.75	1.17	421	78	114	0.032	855	322	332	571	516
80	3.2	0.35	10.28	10.27	0.96	389	77	109	0.032	777	302	348	576	519
90	2.6	0.45	9.74	10.71	0.88	363	78	104	0.032	695	383	354	565	506
100	2.1	0.61	9.08	11.21	0.86	345	76	102	0.032	637	384	355	554	496
110	1.8	0.99	7.28	12.63	0.62	308	78	98	0.032	566	337	353	532	483
120	1.5	0.96	7.14	12.8	0.61	291	76	95	0.032	506	329	347	508	468
130	1.2	0.93	7.52	12.45	0.62	285	77	94	0.032	471	322	341	492	462
140	0.9	1	7.44	12.46	0.61	279	77	93	0.032	452	317	339	482	458
150	0.6	0.89	7.44	12.57	0.62	277	78	93	0.032	446	314	342	477	458
160	0.3	0.9	7.34	12.66	0.61	274	76	92	0.032	438	312	344	470	461
170	0.1	0.95	6.88	13.07	0.57	268	76	92	0.032	426	309	346	459	459
180	0	1.04	6.82	13.04	0.56	266	76	91	0.032	418	307	347	451	456

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/11/2011

Run: 5

Control #: G100340618

Tech: B. Davis

-0.062737

DGM Temps. (F)		DGM Vol.	Orifice Meter	Tunnel SP	Impinger	Front	VAC	Draft
In	Out	ft^3	ΔH (in H_2O)	(in H_2O)	Exit	Filter		
65	65	852.7	0.23	-0.38	69	233	0	-0.06
67	67	854.95	0.2800	-0.38	52	233	0	-0.075
67	67	857.25	0.2700	-0.38	52	233	0	-0.08
68	68	859.45	0.2700	-0.38	55	233	0	-0.08
68	68	861.68	0.2500	-0.38	56	233	0	-0.08
68	68	863.75	0.2300	-0.38	58	233	0	-0.078
69	69	865.72	0.1300	-0.38	60	233	0	-0.072
70	70	867.63	0.2000	-0.38	64	233	0	-0.07
70	70	869.75	0.2100	-0.38	53	233	0	-0.065
70	70	871.95	0.2000	-0.38	51	233	0	-0.062
70	70	873.97	0.2200	-0.38	56	233	0	-0.06
71	71	875.97	0.1700	-0.38	56	232	0	-0.058
71	71	877.63	0.1700	-0.38	57	232	0	-0.052
71	71	879.58	0.1600	-0.38	58	232	0	-0.05
72	72	881.27	0.1600	-0.38	59	233	0	-0.05
72	72	882.93	0.1700	-0.38	61	233	0	-0.05
72	72	884.61	0.1700	-0.38	61	233	0	-0.05
72	72	886.57	0.1600	-0.38	62	233	0	-0.05
73	73	888.283	0.1600	-0.38	62	233	0	-0.05

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

	Cat	Non Cat	Pellet
(ENTER X)		X	
Initial Delta	0.27		
Delta H @	1.788		

Baro: 28.62 in Hg (Tunnel Traverse)

DGM Cal 1.015 Y

Pitot Location

Center	
Point of Ave.	X

Constants

K_1	17.64	R/in Hg
T_{std}	528	R
P_{std}	29.92	in Hg

V_m	35.583	ft^3
$V_{m(std)}$	34.449	dscf

Averages	1.361053	10.61	8.731053	1.004737	827	536.42105	566.32	0.032	529.78947	529.78947	871.350	0.201	-0.028

		Stack Gas Comp.			Tunnel	Flue	Room	Tunnel	Tunnel Pitot	DGM Temps. (R)		DGM Vol.	Orifice Meter	Tunnel SP
Time	Weight	CO	CO_2	O_2	CO_2	Temp. (R)	Temp. (R)	Temp. (R)	(in. w.c.)	In	Out	ft^3	ΔH (in H_2O)	(in Hg)
0	18.60	1.18	6.22	9.69	0.61	776	535	557	0.0320	525	525	852.700	0.2300	-0.02794
10	16.90	1.63	13.82	5.45	1.47	903	534	575	0.0320	527	527	854.950	0.2800	-0.02794
20	14.30	2.79	16.4	1.71	1.73	966	533	588	0.0320	527	527	857.250	0.2700	-0.02794
30	11.50	4.26	16.86	-0.22	1.8	959	536	591	0.0320	528	528	859.450	0.2700	-0.02794
40	8.60	4.04	16.58	0.28	1.7	949	537	588	0.0320	528	528	861.680	0.2500	-0.02794
50	6.50	1.84	16.66	2.4	1.61	946	536	584	0.0320	528	528	863.750	0.2300	-0.02794
60	5.00	0.64	15.3	4.96	1.48	928	538	580	0.0320	529	529	865.720	0.1300	-0.02794
70	4.00	0.41	12.74	7.75	1.17	881	538	574	0.0320	530	530	867.630	0.2000	-0.02794
80	3.20	0.35	10.28	10.27	0.96	849	537	569	0.0320	530	530	869.750	0.2100	-0.02794
90	2.60	0.45	9.74	10.71	0.88	823	538	564	0.0320	530	530	871.950	0.2000	-0.02794
100	2.10	0.61	9.08	11.21	0.86	805	536	562	0.0320	530	530	873.970	0.2200	-0.02794
110	1.80	0.99	7.28	12.63	0.62	768	538	558	0.0320	531	531	875.970	0.1700	-0.02794
120	1.50	0.96	7.14	12.8	0.61	751	536	555	0.0320	531	531	877.630	0.1700	-0.02794
130	1.20	0.93	7.52	12.45	0.62	745	537	554	0.0320	531	531	879.580	0.1600	-0.02794
140	0.90	1	7.44	12.46	0.61	739	537	553	0.0320	532	532	881.270	0.1600	-0.02794
150	0.60	0.89	7.44	12.57	0.62	737	538	553	0.0320	532	532	882.930	0.1700	-0.02794
160	0.30	0.9	7.34	12.66	0.61	734	536	552	0.0320	532	532	884.610	0.1700	-0.02794
170	0.10	0.95	6.88	13.07	0.57	728	536	552	0.0320	532	532	886.570	0.1600	-0.02794
180	0.00	1.04	6.82	13.04	0.56	726	536	551	0.0320	533	533	888.283	0.1600	-0.02794

Manufacturer: Hearth & Home Technologies

Model: 5100I ACC

Date: 2/18/2011

Run: 5

Control #: G100340618 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)			
k_p	85.49		P_g	-0.38	(Tunnel Traverse)
C_p	0.99		N_c	0.0425	
M_s	28.56		HC	0.0132	
CO_{2amb}	0.034		B_{ws}	0.04	
K_2	384.8		Tunnel Area	0.19635	ft^2 (Tunnel Traverse)

					Sum Si x Vm			
12.608	**127.122**	**8.445**	**0.992**	**0.206**	**3.039**	99.5%	11.25	

Dilution Tunnel **Proportional Rate Calculation**

V ft/min	Q_{tunnel} scfm	Q_{stack} scfm	Q_{snew}/Q_{sInit}	Target ΔH (in H2O)	Burn Rate lb/h dry	S_i	$V_{mi(sdt)}$	$S_i \times V_{mi(std)}$	Sum	Θ x S_i x$V_{mi(std)}$	t x Sum S_i x $V_{mi(std)}$	PR	Qf by tracer	1/Qf by tracer
12.608	129.172		1.000	0.2261									12.028	0.083
12.608	125.128	13.62003	0.984	0.2793	8.379888	0.0734	2.1949	0.1825	0.1825	29.0069	30.386	100.0%	13.034	0.077
12.608	122.362	17.03216	0.973	0.2709	12.8163	0.0587	2.2351	0.1715	0.3540	23.6213	30.386	101.6%	12.680	0.079
12.608	121.741	16.76476	0.971	0.2749	13.80217	0.0596	2.1379	0.1686	0.5226	22.9547	30.386	99.9%	12.777	0.078
12.608	122.362	17.7592	0.973	0.2538	14.2951	0.0563	2.1630	0.1693	0.6919	21.9232	30.386	100.3%	12.320	0.081
12.608	123.200	14.23566	0.977	0.2269	10.35163	0.0702	2.0078	0.1630	0.8548	25.3872	30.386	96.5%	11.678	0.086
12.608	124.050	11.6765	0.980	0.2273	7.394019	0.0856	1.9108	0.1636	1.0184	29.4562	30.386	96.9%	11.750	0.085
12.608	125.346	9.285248	0.985	0.2046	4.929346	0.1077	1.8491	0.1574	1.1758	35.8460	30.386	93.2%	11.207	0.089
12.608	126.448	8.994647	0.989	0.2113	3.943477	0.1112	2.0485	0.1828	1.3586	40.9951	30.386	108.3%	11.428	0.088
12.608	127.569	7.003868	0.994	0.1979	2.957608	0.1428	2.1258	0.1860	1.5446	54.6343	30.386	110.2%	11.119	0.090
12.608	128.023	6.101614	0.996	0.2188	2.464673	0.1639	1.9519	0.1755	1.7202	57.5820	30.386	104.0%	11.690	0.086
12.608	128.940	4.203051	0.999	0.1722	1.478804	0.2379	1.9326	0.1653	1.8855	82.7648	30.386	97.9%	10.428	0.096
12.608	129.637	4.278903	1.002	0.1746	1.478804	0.2337	1.6010	0.1535	2.0390	67.3500	30.386	91.0%	10.508	0.095
12.608	129.871	4.125615	1.003	0.1628	1.478804	0.2424	1.8807	0.1790	2.2180	82.0555	30.386	106.0%	10.166	0.098
12.608	130.106	4.129842	1.004	0.1610	1.478804	0.2421	1.6300	0.1603	2.3783	71.0420	30.386	95.0%	10.119	0.099
12.608	130.106	4.176918	1.004	0.1664	1.478804	0.2394	1.5980	0.1579	2.5363	68.8647	30.386	93.6%	10.295	0.097
12.608	130.342	4.216241	1.005	0.1661	1.478804	0.2372	1.6173	0.1571	2.6934	69.0444	30.386	93.1%	10.276	0.097
12.608	130.342	2.936777	1.005	0.1638	0.985869	0.3405	1.8868	0.1836	2.8770	115.6458	30.386	108.8%	10.205	0.098
12.608	130.578	1.46359	1.005	0.1608	0.492935	0.6833	1.6490	0.1616	3.0386	202.8069	30.386	95.7%	10.121	0.099

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	18.60	W_{wd}
Load Weight (kg wet)	8.439	
Total Test Duration (min)	180	Θ
Total Test Duration (hours)	3.000	
Wood Moisture (Dry Bais)	21.72	%
Wood Moisture (Wet Bais)	17.84	%

Manufacturer:	Hearth & Home Technologies
Model:	5100IACC
Date:	5/13/2011
Run:	5
Control #:	G100340618
Tech:	B. Davis

Dry Burn Rate	**2.311**	Dry kg/hr
	5.094	Dry Lb/hr

Total Particulate Collected	**558.3**	**mg**

Cs	**0.0162**	g/dscf
Qstd	**7622.8**	dscf/hr
E	**8.21**	g/hr

Average Stack Flow (Qf)	**8.44**	dscf/min
Average Stack Flow (Qf)	**506.68**	dscf/hr

PARTICULATE CATCH	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.7267	0.6351	91.6	F1
Rear Filter	0.2732	0.1661	107.1	F2
Probe/Front Half Rinse	94.8347	94.7349	99.8	R1
Impinger H2O +Back Rinse	147.6735	147.6143	59.2	R2
Meth Chlor. Extraction	98.8520	98.7983	53.7	R3
Back Half Acetone Rinse	96.8614	96.7121	149.3	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	90	Va1
Acetone Back Half Rinse	80	Va2
Water- Impingers + Back Half Rinse	275	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.0055	Ba
Water	0.001	Bw
Methylene Chloride	0.008	B_{DCM}

Total Particulate Collected 558.29 mg

W ng Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6351
Rear Filter						0.1661
Probe/Front Half Rinse						94.7349
Impinger H2O +Back Rinse						147.6143
Meth Chlor. Extraction						98.7983
Back Half Acetone Rinse						96.7121

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.7267
Rear Filter						0.2732
Probe/Front Half Rinse						94.8347
Impinger H2O +Back Rinse						147.6735
Meth Chlor. Extraction						98.8520
Back Half Acetone Rinse						96.8614

Test Engineer

V1.2 R. Curkeet 2/18/2010

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EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.38**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.69**	in Hg
Tunnel Diameter	**6**	in
Tunnel Area	0.19635	ft^2

	PITOT TUNNEL VELOCITY P	TUNNEL TEMP	SQUARE ROOT VP
A CENTER			0.0000
B CENTER			0.0000
A1	0.034	98	0.1844
A2	0.038	98	0.1949
A3	0.032	98	0.1789
A4	0.028	98	0.1673
B1	0.032	98	0.1789
B2	0.032	98	0.1789
B3	0.032	98	0.1789
B4	0.030	98	0.1732
AVERAGE	0.032	98	0.1794

PITOT CONSTANT= **#DIV/0!** For Pitot Pa
1.00 For Pitot Pa

Tunnel V	Tunnel Q
ft/sec	scfm
12.54	128.53

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/13/2011
Run: 5
Control #: G100340618

Test Engineer_ _____

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth N Home MODEL: 5100I ACC PROJECT #: G100340618 SAMPLE ID#: PRT1012031428

DATE: 5/13/11 ENGINEER: B Davis RUN #: 5

INTERTEK EQUIPMENT #'s: ETC7-2 ETC7-1

CALCULATED RANGE: 3.8 - 4.6 ACTUAL COAL BED: 4.4

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F)							
				AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	17.5	—	-.062	67	658	376	526	535	501	NA	365
10	15.1	2.4	-.077	68	740	363	418	513	464		457
20	12.5	2.6	-.080	70	901	388	358	498	428		470
30	10.2	2.3	-.080	72	940	387	336	496	466		478
40	7.8	2.4	-.077	74	974	387	333	502	447		472
50	6.0	1.8	-.073	75	955	389	337	513	468		450
60	5.0	1.0	-.070	75	868	367	344	520	484		392
70	4.6	0.4	-.068	74	713	305	349	515	482		344
~~75~~80	4.4	0.2	-.060	73	625	351	350	506	476		318
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 6/23/11 ENGINEER SIGNATURE: B Davis

Page 1 of 1

FUEL DATA

Intertek

CLIENT: Hearth & Home MODEL: 5100 I ACC PROJECT #: G100340618

DATE: 5/13/11 RUN #: 5 SAMPLE ID #: PRT1012031428

INTERTEK EQUIPMENT #'s: ETC-7

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	24" ~~FT~~	24.8	24.5	17.1	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3 @ 8" INCHES PRE-BURN FUEL AVG MOISTURE: 22.13

TIME (CLOCK): 0845 ROOM TEMP (F): 70

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: ACTUAL LOAD WT: 10.0 (2 X 4)
8.6 (4 X 4)
FUEL PIECE LENGTH: 19 18.6 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	25.0	20.2	20.9	4x4
2	19.2	25.8	25.4	4x4
3	19.2	19.3	19.9	2x4
4	24.5	24.8	23.7	2x4
5	23.0	23.4	22.4	2x4
6	21.2	17.3	25.8	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 22.28

TIME (CLOCK): 0845 ROOM TEMP (F): 70

ENGINEER: [signature] 6/23/11 [signature]

Intertek

RUN NOTES

Client: Hearth N Home
Model: 5100I ACC
Run #: 5
Engineer: BDavis
Intertek Equipment ID #(s): NA

Project #: G100340618 Sample ID #: PRT1012031428
Booth: _____ Date: 5/13/11

PREBURN

Fully open

Timed Air Locked open

PRIMARY:

Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.

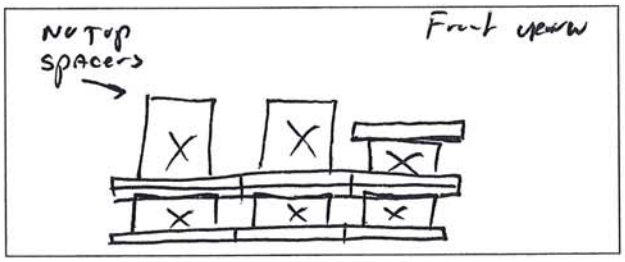
SECONDARY: fixed

FAN: on High

Comments: Rated coals @ 70 min

TEST

START UP PROCEDURES
(Paste fuel and stove pictures in spaces below.)



BYPASS: NA FUEL LOADING: By 45 sec. DOOR: closed by 1:00
PRIMARY AIR: fully open for full 5:00
OTHER: Timed Air Locked open (Pushed in and not pulled out)

Fully open

Timed Air pushed in and not pulled out.

PRIMARY:

Describe or sketch test settings in the box to the left. Settings must be accurate and reproducible.

SECONDARY: fixed

FAN: On entire test (High)

Date: 6/23/11

Engineer signature: BD

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth N Home

Model: 5100I Project #: G100340618 Sample ID #: PRT1012031428

Date: 5/13/11 Run #: 5

Start Time: 10:43 Stop Time: 1343

Intertek Equipment #'s: ETC5-4

Gas Analyzer Train Leak Check:

Stack: Initial: good Final: good

Dilution Tunnel (Method 5G Only): Initial: good Final: good

Calibrations: Span Gas CO_2: ~~9.97~~ 9.93 O_2: NM CO: ~~.98~~ .97 CO_2(DT): 1.00

	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time	Ø		EOT						
O_2									
CO_2	0.00	.98	0.08	0.99					
CO	0.00	9.96	0.00	9.90					
CO_2 (DT)	0.02	0.98	0.02	0.99					

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: 5/9/11 Initials: DA

	Initial	Middle	Ending
Pb (in/Hg)	28.69		28.55
Room Temp (°F)	75		76

Avg = 28.62

Date: 6/23/11

Engineer signature: DO

Method 5H Impinger Gravimetric Analysis

Client: Health n Home

Model: 5100 I

Report Number: G 1003406 18

Date: 5/13/11

Test Engineer: B Davis

Scale ID umber: NA

Audit Weight Number: NA

Run Number: 5

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	779.9	696.7	605.6	954.0
Initial Weight grams	710.0	691.0	604.7	951.9
Net Weight grams	69.9	5.7	0.9	2.1

Total Weight 78.6

Notes: 295 307

Test Engineer: 6/23/11

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 5100IACC
Date: 5/13/2011
Run: 6
Control #: G100340618

Tech: B. Davis

Start	End	Delta T
388.2	288.8	99.4

Elapsed Time (min)	Fuel Weight (lbs)	Stack Gas Comp. (%) CO	CO_2	O_2	Tunnel CO_2	Flue Temp. (F)	Room Temp. (F)	Tunnel Temp. (F)	Tunnel Pitot (in. w.c.)	Appliance Firebox Temperatures (F) top	Bottom	Back	Left	Right
0	18.7	0.85	7.7	12.35	0.43	208	77	87	0.031	436	405	290	404	406
10	17.5	1.33	12.1	7.47	0.97	358	74	100	0.031	568	407	329	379	367
20	15.7	2.1	13.5	5.3	1.04	405	75	107	0.031	775	374	328	368	342
30	14	2.03	15.32	3.55	1.11	426	77	110	0.031	840	404	333	384	349
40	12.4	0.46	13.36	7.08	0.88	366	78	105	0.031	838	343	275	394	362
50	11.5	0.69	11.8	8.41	0.76	336	78	102	0.031	763	294	253	382	363
60	10.5	0.59	13.82	6.49	0.83	331	77	100	0.031	716	252	235	370	363
70	9.4	0.6	14.88	5.42	0.9	338	77	100	0.031	730	255	233	374	370
80	8.5	0.43	13.7	6.77	0.84	325	77	99	0.031	716	274	235	379	378
90	7.5	0.63	14.58	5.69	0.87	328	77	99	0.031	704	273	238	384	384
100	6.6	0.55	14.16	6.19	0.84	324	77	99	0.031	712	271	244	289	393
110	5.8	0.58	13.48	6.84	0.8	312	78	98	0.031	703	266	250	393	397
120	5.2	1.05	10.2	9.65	0.59	272	79	94	0.031	625	264	253	397	398
130	4.7	1.13	8.54	11.23	0.47	240	79	92	0.031	536	255	255	395	394
140	4.3	1.28	8.06	11.56	0.44	227	79	91	0.031	482	248	253	388	387
150	4	1.67	7.38	11.85	0.38	212	79	89	0.031	442	241	249	378	375
160	3.7	1.96	6.94	12	0.34	197	79	87	0.031	393	234	243	358	364
170	3.4	2	6.96	11.94	0.34	188	79	86	0.031	362	230	238	340	364
180	3.3	1.9	7.14	11.86	0.34	182	79	86	0.031	347	228	236	332	363
190	3.1	1.88	7.16	11.86	0.33	179	78	85	0.031	333	228	235	325	363
200	2.9	1.9	7.34	11.66	0.34	177	76	84	0.031	323	227	237	322	364
210	2.7	1.9	7.7	11.3	0.35	177	77	84	0.031	318	228	239	321	369
220	2.5	1.88	7.4	11.62	0.33	173	77	84	0.031	316	229	243	322	377
230	2.3	1.87	7.22	11.81	0.33	171	77	83	0.031	314	229	243	321	379
240	2.2	1.92	7.1	11.88	0.32	169	75	82	0.031	312	229	243	318	378
250	2	1.94	7	11.96	0.32	168	75	82	0.031	308	229	243	316	376
260	1.8	2.05	6.64	12.21	0.3	167	75	82	0.031	305	229	242	314	372
270	1.7	2.03	6.4	12.47	0.29	165	75	81	0.031	301	229	238	311	365
280	1.5	1.84	6.9	12.16	0.31	166	74	81	0.031	302	228	234	310	354
290	1.4	1.92	6.9	12.08	0.31	167	73	80	0.031	305	228	235	315	346
300	1.2	1.84	7.06	12	0.33	168	73	80	0.031	305	228	239	322	339
310	1	1.84	6.72	12.34	0.31	166	73	79	0.031	304	227	245	331	332
320	0.8	1.94	6.74	12.22	0.31	166	73	79	0.031	301	227	248	335	327
330	0.7	1.95	6.9	12.05	0.31	165	73	79	0.031	299	226	250	339	323
340	0.5	2	6.9	12	0.32	163	74	78	0.031	299	226	254	342	323
350	0.3	1.95	6.92	12.03	0.31	160	73	77	0.031	297	227	259	340	326
360	0.2	2.02	6.65	12.23	0.31	160	73	77	0.031	296	227	261	339	327
370	0	2.12	6.62	12.16	0.31	160	74	77	0.031	294	227	265	337	329

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/13/2011

Run: 6

Control #: G100340618

Tech: B. Davis

-0.043833

DGM Temps. (F)		DGM Vol.	Orifice Meter	Tunnel SP	Impinger	Front	VAC	Draft
In	Out	ft^3	ΔH (in H_2O)	(in H_2O)	Exit	Filter		
71	71	888.46	0.35	-0.39	77	233	0	0.04
71	71	891.49	0.5000	-0.39	46	233	0	-0.061
71	71	895.18	0.4600	-0.39	47	233	0	-0.07
71	71	898.77	0.4100	-0.39	49	233	0	-0.07
71	71	902.27	0.3300	-0.39	51	233	0	-0.062
71	71	905.12	0.3200	-0.39	53	233	0	-0.058
71	71	908.08	0.2800	-0.39	54	233	0	-0.058
72	72	910.97	0.2800	-0.39	54	233	0	-0.058
72	72	913.57	0.2900	-0.39	56	233	0	-0.058
72	72	916.13	0.2800	-0.39	57	233	0	-0.057
72	72	918.95	0.2700	-0.39	58	233	0	-0.056
72	72	921.83	0.2700	-0.39	53	233	0	-0.052
72	72	924.6	0.2500	-0.39	53	233	0	-0.05
72	72	927.07	0.2200	-0.39	53	233	0	-0.043
72	72	929.54	0.2200	-0.39	54	233	0	-0.041
75	75	931.93	0.1900	-0.39	55	233	0	-0.038
75	75	933.96	0.1700	-0.39	56	233	0	-0.037
76	76	935.86	0.1700	-0.39	56	233	0	-0.032
76	76	937.74	0.1600	-0.39	55	233	0	-0.032
77	77	939.57	0.1500	-0.39	53	233	0	-0.032
76	76	941.51	0.1500	-0.39	53	233	0	-0.032
76	76	943.44	0.1500	-0.39	53	233	0	-0.032
75	75	945.44	0.1400	-0.39	54	233	0	-0.032
75	75	947.31	0.1500	-0.39	54	233	0	-0.031
74	74	949.25	0.14	-0.39	54	233	0	-0.03
74	74	951.21	0.15	-0.39	54	233	0	-0.03
73	73	953.12	0.14	-0.39	55	233	0	-0.03
73	73	955.06	0.14	-0.39	55	233	0	-0.03
73	73	957.04	0.14	-0.39	56	233	0	-0.03
72	72	958.93	0.14	-0.39	56	233	0	-0.03
72	72	960.83	0.15	-0.39	57	233	0	-0.031
72	72	962.76	0.15	-0.39	57	233	0	-0.031
72	72	964.69	0.15	-0.39	57	233	0	-0.031
71	71	966.63	0.14	-0.39	58	233	0	-0.03
71	71	968.54	0.15	-0.39	58	233	0	-0.03
71	71	970.53	0.15	-0.39	58	233	0	-0.03
71	71	972.38	0.15	-0.39	58	233	0	-0.03
72	72	974.314	0.15	-0.39	58	233	0	-0.03

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

	Cat	Non Cat	Pellet
(ENTER X)		X	
Initial Delta	0.34		
Delta H @	1.788		

Baro: 28.49 in Hg (Tunnel Traverse)

DGM Cal 1.015 Y

Constants

K_1 17.64 R/in Hg

T_{std} 528 R

P_{std} 29.92 in Hg

V_m 85.854 ft^3

$V_{m(std)}$ 82.281 dscf

Pitot Location

Center	
Point of Ave.	X

Averages	1.551316	9.06	10.255	0.505526	690.5789	536.13158	548.55	0.031	532.76316	532.76316	936.160	0.216	-0.029

		Stack Gas Comp.			Tunnel	Flue	Room	Tunnel	Tunnel Pitot	DGM Temps. (R)		DGM Vol.	Orifice Meter	Tunnel SP
Time	Weight	CO	CO_2	O_2	CO_2	Temp. (R)	Temp. (R)	Temp. (R)	(in. w.c.)	In	Out	ft^3	ΔH (in H_2O)	(in Hg)
0	18.70	1.18	6.22	12.35	0.43	668	537	547	0.0310	531	531	888.460	0.3500	-0.02868
10	17.50	1.33	12.1	7.47	0.97	818	534	560	0.0310	531	531	891.490	0.5000	-0.02868
20	15.70	2.1	13.5	5.3	1.04	865	535	567	0.0310	531	531	895.180	0.4600	-0.02868
30	14.00	2.03	15.32	3.55	1.11	886	537	570	0.0310	531	531	898.770	0.4100	-0.02868
40	12.40	0.46	13.36	7.08	0.88	826	538	565	0.0310	531	531	902.270	0.3300	-0.02868
50	11.50	0.69	11.8	8.41	0.76	796	538	562	0.0310	531	531	905.120	0.3200	-0.02868
60	10.50	0.59	13.82	6.49	0.83	791	537	560	0.0310	531	531	908.080	0.2800	-0.02868
70	9.40	0.6	14.88	5.42	0.9	798	537	560	0.0310	532	532	910.970	0.2800	-0.02868
80	8.50	0.43	13.7	6.77	0.84	785	537	559	0.0310	532	532	913.570	0.2900	-0.02868
90	7.50	0.63	14.58	5.69	0.87	788	537	559	0.0310	532	532	916.130	0.2800	-0.02868
100	6.60	0.55	14.16	6.19	0.84	784	537	559	0.0310	532	532	918.950	0.2700	-0.02868
110	5.80	0.58	13.48	6.84	0.8	772	538	558	0.0310	532	532	921.830	0.2700	-0.02868
120	5.20	1.05	10.2	9.65	0.59	732	539	554	0.0310	532	532	924.600	0.2500	-0.02868
130	4.70	1.13	8.54	11.23	0.47	700	539	552	0.0310	532	532	927.070	0.2200	-0.02868
140	4.30	1.28	8.06	11.56	0.44	687	539	551	0.0310	532	532	929.540	0.2200	-0.02868
150	4.00	1.67	7.38	11.85	0.38	672	539	549	0.0310	535	535	931.930	0.1900	-0.02868
160	3.70	1.96	6.94	12	0.34	657	539	547	0.0310	535	535	933.960	0.1700	-0.02868
170	3.40	2	6.96	11.94	0.34	648	539	546	0.0310	536	536	935.860	0.1700	-0.02868
180	3.30	1.9	7.14	11.86	0.34	642	539	546	0.0310	536	536	937.740	0.1600	-0.02868
190	3.10	1.88	7.16	11.86	0.33	639	538	545	0.0310	537	537	939.570	0.1500	-0.02868
200	2.90	1.9	7.34	11.66	0.34	637	536	544	0.0310	536	536	941.510	0.1500	-0.02868
210	2.70	1.9	7.7	11.3	0.35	637	537	544	0.0310	536	536	943.440	0.1500	-0.02868
220	2.50	1.88	7.4	11.62	0.33	633	537	544	0.0310	535	535	945.440	0.1400	-0.02868
230	2.30	1.87	7.22	11.81	0.33	631	537	543	0.0310	535	535	947.310	0.1500	-0.02868
240	2.2	1.92	7.1	11.88	0.32	629	535	542	0.031	534	534	949.250	0.1400	-0.02868
250	2	1.94	7	11.96	0.32	628	535	542	0.031	534	534	951.210	0.1500	-0.02868
260	1.8	2.05	6.64	12.21	0.3	627	535	542	0.031	533	533	953.120	0.1400	-0.02868
270	1.7	2.03	6.4	12.47	0.29	625	535	541	0.031	533	533	955.060	0.1400	-0.02868
280	1.5	1.84	6.9	12.16	0.31	626	534	541	0.031	533	533	957.040	0.1400	-0.02868
290	1.4	1.92	6.9	12.08	0.31	627	533	540	0.031	532	532	958.930	0.1400	-0.02868
300	1.2	1.84	7.06	12	0.33	628	533	540	0.031	532	532	960.830	0.1500	-0.02868
310	1	1.84	6.72	12.34	0.31	626	533	539	0.031	532	532	962.760	0.1500	-0.02868
320	0.8	1.94	6.74	12.22	0.31	626	533	539	0.031	532	532	964.690	0.1500	-0.02868
330	0.7	1.95	6.9	12.05	0.31	625	533	539	0.031	531	531	966.630	0.1400	-0.02868
340	0.5	2	6.9	12	0.32	623	534	538	0.031	531	531	968.540	0.1500	-0.02868
350	0.3	1.95	6.92	12.03	0.31	620	533	537	0.031	531	531	970.530	0.1500	-0.02868
360	0.2	2.02	6.65	12.23	0.31	620	533	537	0.031	531	531	972.38	0.1500	-0.02868
370	0	2.12	6.62	12.16	0.31	620	534	537	0.031	532	532	974.314	0.1500	-0.02868

Manufacturer: Hearth & Home Technologies
Model: 5100I ACC
Date: 5/13/2011
Run: 6
Control #: G100340618 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)	P_g	-0.39	(Tunnel Traverse)
k_p	85.49		N_c	0.0425	
C_p	0.99		HC	0.0132	
M_s	28.56		B_{ws}	0.04	
CO_{2amb}	0.034		Tunnel Area	0.19635	ft^2 (Tunnel Traverse)
K_2	384.8				

					Sum Si x Vm			
12.241	**126.801**	**4.910**	**0.999**	**0.215**	**13.087**	100.0%	6.23	

Dilution Tunnel — **Proportional Rate Calculation**

V ft/min	Q_{tunnel} scfm	Q_{stack} scfm	Q_{snew}/Q_{sInit}	Target ΔH (in H2O)	Burn Rate lb/h dry	S_i	$V_{mi(sdt)}$	$S_i \times V_{mi(std)}$	Sum	Θ x S_i x $V_{mi(std)}$	t x Sum S_i x $V_{mi(std)}$	PR	Qf by tracer	1/Qf by tracer
12.241	127.124		1.000	0.3529									8.138	0.123
12.241	124.173	10.89944	0.988	0.5048	5.898255	0.0917	2.9090	0.3575	0.3575	98.7504	130.872	100.0%	9.632	0.104
12.241	122.640	14.25237	0.982	0.4616	8.847383	0.0702	3.5426	0.3678	0.7252	91.9687	130.872	104.0%	9.162	0.109
12.241	121.994	12.19887	0.980	0.4061	8.355861	0.0820	3.4466	0.3762	1.1014	104.5383	130.872	106.4%	8.587	0.116
12.241	123.074	14.15824	0.984	0.3326	7.86434	0.0706	3.3602	0.3913	1.4927	87.8132	130.872	110.6%	7.813	0.128
12.241	123.731	8.730998	0.987	0.3159	4.423691	0.1145	2.7362	0.3502	1.8429	115.9529	130.872	99.0%	7.635	0.131
12.241	124.173	8.516994	0.988	0.2781	4.915213	0.1174	2.8418	0.3722	2.2151	123.4543	130.872	105.2%	7.170	0.139
12.241	124.173	8.771997	0.988	0.2839	5.406734	0.1140	2.7746	0.3870	2.6021	117.0308	130.872	109.4%	7.243	0.138
12.241	124.395	7.804212	0.989	0.2907	4.423691	0.1281	2.4915	0.3440	2.9461	118.1212	130.872	97.2%	7.337	0.136
12.241	124.395	8.104798	0.989	0.2761	4.915213	0.1234	2.4531	0.3344	3.2805	111.9905	130.872	94.5%	7.149	0.140
12.241	124.395	7.521839	0.989	0.2721	4.423691	0.1329	2.7023	0.3780	3.6585	132.9256	130.872	106.9%	7.098	0.141
12.241	124.618	6.968651	0.990	0.2712	3.93217	0.1435	2.7598	0.3888	4.0473	146.5303	130.872	109.9%	7.099	0.141
12.241	125.517	6.39486	0.994	0.2513	2.949128	0.1564	2.6544	0.3739	4.4212	153.5792	130.872	105.7%	6.865	0.146
12.241	125.972	6.095192	0.995	0.2215	2.457606	0.1641	2.3669	0.3448	4.7660	143.6790	130.872	97.5%	6.457	0.155
12.241	126.201	5.027104	0.996	0.2162	1.966085	0.1989	2.3669	0.3666	5.1325	174.2058	130.872	103.6%	6.384	0.157
12.241	126.661	3.875766	0.998	0.1881	1.474564	0.2580	2.2902	0.3587	5.4913	218.6371	130.872	101.4%	5.966	0.168
12.241	127.124	3.932651	1.000	0.1671	1.474564	0.2543	1.9344	0.3242	5.8155	181.9919	130.872	91.7%	5.633	0.178
12.241	127.356	3.909698	1.001	0.1664	1.474564	0.2558	1.8105	0.3214	6.1369	171.3373	130.872	90.9%	5.627	0.178
12.241	127.356	1.293169	1.001	0.1581	0.491521	0.7733	1.7881	0.3178	6.4547	511.6029	130.872	89.8%	5.484	0.182
12.241	127.590	2.586338	1.002	0.1476	0.983043	0.3866	1.7405	0.3174	6.7721	248.9982	130.872	89.7%	5.300	0.189
12.241	127.825	2.537354	1.003	0.1509	0.983043	0.3941	1.8417	0.3475	7.1196	268.5601	130.872	98.2%	5.354	0.187
12.241	127.825	2.453705	1.003	0.1459	0.983043	0.4075	1.8356	0.3429	7.4624	276.7995	130.872	96.9%	5.269	0.190
12.241	127.825	2.527779	1.003	0.1387	0.983043	0.3956	1.9022	0.3610	7.8235	278.4333	130.872	102.1%	5.137	0.195
12.241	128.060	2.573916	1.004	0.1460	0.983043	0.3885	1.7819	0.3469	8.1704	256.1467	130.872	98.1%	5.275	0.190
12.241	128.296	1.29567	1.005	0.1417	0.491521	0.7718	1.8486	0.3504	8.5208	527.8963	130.872	99.1%	5.193	0.193
12.241	128.296	2.611546	1.005	0.1458	0.983043	0.3829	1.8711	0.3603	8.8811	265.1016	130.872	101.9%	5.267	0.190
12.241	128.296	2.676769	1.005	0.1403	0.983043	0.3736	1.8234	0.3462	9.2273	252.0440	130.872	97.9%	5.166	0.194
12.241	128.534	1.374075	1.006	0.1402	0.491521	0.7278	1.8555	0.3592	9.5865	499.6424	130.872	101.5%	5.169	0.193
12.241	128.534	2.663465	1.006	0.1403	0.983043	0.3755	1.8938	0.3664	9.9529	263.0790	130.872	103.6%	5.167	0.194
12.241	128.772	1.321226	1.006	0.1408	0.491521	0.7569	1.8077	0.3499	10.3027	506.2356	130.872	98.9%	5.176	0.193
12.241	128.772	2.621767	1.006	0.1547	0.983043	0.3814	1.8207	0.3517	10.6545	256.9467	130.872	99.4%	5.425	0.184
12.241	129.010	2.71199	1.007	0.1488	0.983043	0.3687	1.8494	0.3409	10.9954	252.3206	130.872	96.4%	5.326	0.188
12.241	129.010	2.679446	1.007	0.1479	0.983043	0.3732	1.8494	0.3473	11.3427	255.3853	130.872	98.2%	5.310	0.188
12.241	129.010	1.317329	1.007	0.1411	0.491521	0.7591	1.8590	0.3501	11.6928	522.1451	130.872	99.0%	5.186	0.193
12.241	129.250	2.621767	1.008	0.1515	0.983043	0.3814	1.8337	0.3536	12.0464	258.7855	130.872	100.0%	5.384	0.186
12.241	129.491	2.629486	1.009	0.1408	0.983043	0.3803	1.9105	0.3549	12.4012	268.8332	130.872	100.3%	5.190	0.193
12.241	129.491	1.341064	1.009	0.1525	0.491521	0.7457	1.7761	0.3422	12.7434	490.0302	130.872	96.7%	5.402	0.185
12.241	129.491	2.663465	1.009	0.1536	0.983043	0.3755	1.8568	0.3437	13.0872	257.9349	130.872	97.2%	5.427	0.184

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	18.70	W_{wd}
Load Weight (kg wet)	8.485	
Total Test Duration (min)	370	Θ
Total Test Duration (hours)	6.167	
Wood Moisture (Dry Bais)	22.07	%
Wood Moisture (Wet Bais)	18.08	%

Manufacturer:	Hearth & Home Technologies
Model:	5100IACC
Date:	5/13/2011
Run:	6
Control #:	G100340618
Tech:	B. Davis

Dry Burn Rate	1.127	Dry kg/hr
	2.484	Dry Lb/hr

Total Particulate Collected	724.8	mg

Cs	0.0088	g/dscf
Qstd	7605.8	dscf/hr
E	2.59	g/hr

Average Stack Flow (Qf)	4.91	dscf/min
Average Stack Flow (Qf)	294.59	dscf/hr

PARTICULATE CATCH	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.6974	0.6351	62.3	F1
Rear Filter	0.2973	0.1656	131.7	F2
Probe/Front Half Rinse	96.4313	96.3106	120.7	R1
Impinger H2O +Back Rinse	144.4843	144.3370	147.3	R2
Meth Chlor. Extraction	103.7179	103.6174	100.5	R3
Back Half Acetone Rinse	96.0186	95.8537	164.9	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	90	Va1
Acetone Back Half Rinse	100	Va2
Water- Impingers + Back Half Rinse	370	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.0055	Ba
Water	0.001	Bw
Methylene Chloride	0.008	B_{DCM}

Total Particulate Collected 724.785 mg

W g Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6351
Rear Filter						0.1656
Probe/Front Half Rinse						96.3106
Impinger H2O +Back Rinse						144.3370
Meth Chlor. Extraction						103.6174
Back Half Acetone Rinse						95.8537

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6974
Rear Filter						0.2973
Probe/Front Half Rinse						96.4313
Impinger H2O +Back Rinse						144.4843
Meth Chlor. Extraction						103.7179
Back Half Acetone Rinse						96.0186

Test Engineer_

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.39**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.52**	in Hg
Tunnel Diameter	**6**	in
Tunnel Area	0.19635	ft^2

	PITOT TUNNEL VELOCITY P	TUNNEL TEMP	SQUARE ROOT VP
A CENTER			0.0000
B CENTER			0.0000
A1	0.028	87	0.1673
A2	0.032	87	0.1789
A3	0.034	87	0.1844
A4	0.026	87	0.1612
B1	0.030	87	0.1732
B2	0.038	87	0.1949
B3	0.032	87	0.1789
B4	0.026	87	0.1612
AVERAGE	0.031	87	0.1750

PITOT CONSTANT= **#DIV/0!** For Pitot Palced at Center.

1.00 For Pitot Palced at point of average VP

Tunnel V	Tunnel Q
ft/sec	scfm
12.14	126.25

Manufacturer: Hearth & Home Technologies

Model: 5100IACC

Date: 5/13/2011

Run: 6

Control #: G100340618

Test Engineer_ _____

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth N Home **MODEL:** 5100I ACC **PROJECT #:** G100340618 **SAMPLE ID#:** PRT1012031428

DATE: 5/13/11 **ENGINEER:** B Davis **RUN #:** 6

INTERTEK EQUIPMENT #'s: ETC7-2 ETC7-1

CALCULATED RANGE: 4.0 - 3.8 **ACTUAL COAL BED:** 4.2

Back Left Right

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F) AMBIENT	Top LEFT	bottom RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	4.6	Ø	.062	79	1009	488	474	530	529		396
10	4.2	0.4	-052	78	813	433	411	530	529		273
20	6.0	—	-052	77	671	391	374	497	498		283
30	5.4	0.6	-050	76	608	400	347	470	472		249
40	5.0	0.4	-046	77	561	335	325	444	448		253
50	4.4	0.6	-043	77	536	395	309	429	436		241
60	4.2	0.2	-040	77	477	393	299	418	417		213
65 70	4.2	0.0	-040	77	443	407	292	406	408		210
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: _____ **ENGINEER SIGNATURE:** B Davis 6/23/11

M. J. Mayo

FUEL DATA

CLIENT: Hearth & Home MODEL: 5100 I ACC PROJECT #: G100340618

DATE: 5/13/11 RUN #: 6 SAMPLE ID #: PRT1012031428

INTERTEK EQUIPMENT #'s: ETC-7

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	24" ~~FT~~	24.8	18.0	25.0	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3 @ 8" INCHES PRE-BURN FUEL AVG MOISTURE: 22.6

TIME (CLOCK): 13.48 ROOM TEMP (F): 72

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: ACTUAL LOAD WT: 8.9 (2 X 4)
9.8 (4 X 4)
FUEL PIECE LENGTH: 19 18.7 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	23.6	19.4	23.9	4x4
2	18.9	20.5	20.9	4x4
3	22.4	20.3	21.7	2x4
4	24.5	23.8	25.3	2x4
5	22.4	23.6	18.8	2x4
6	20.4	23.5	23.3	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 22.07

TIME (CLOCK): 13:48 ROOM TEMP (F): 72

ENGINEER: [signature] 6/23/11

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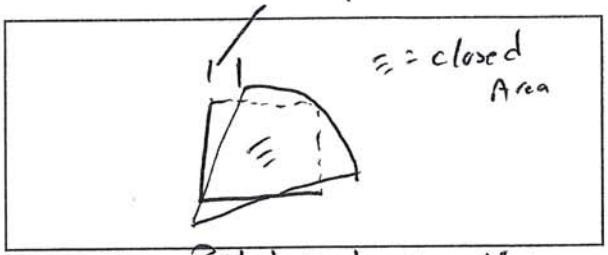
RUN NOTES

Client: Hearth N Home
Model: 5100I ACC
Run #: 6
Engineer: D Davis
Intertek Equipment ID #(s): MA

Project #: G100340618 Sample ID #: PRT1012031428
Booth: _____ Date: 5/13/11

PREBURN

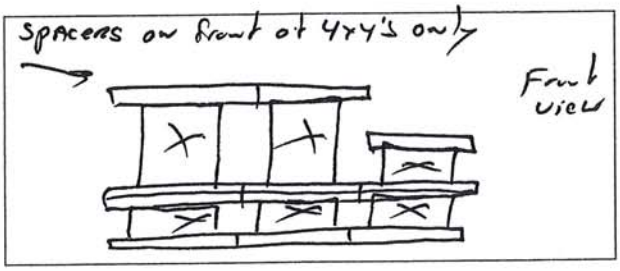


PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on High

Comments: Ashed cools @ 1hr.

TEST

START UP PROCEDURES
(Paste fuel and stove pictures in spaces below.)



BYPASS: NA FUEL LOADING: 18, 48 sec. DOOR: closed by 1:00
PRIMARY AIR: at test setting full 5:00
OTHER: Timed Air pushed in @ 0 min pulled out @ 5:00

Same as Above

PRIMARY:
Describe or sketch test settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: off for first 30 minutes then turned to High.

Date: 6/23/11
Engineer signature:

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth N Home

Model: 5100I Project #: G100340618 Sample ID #: PRT1012031428

Date: 5/13/11 Run #: 6

Start Time: 1536 Stop Time: 2146

Intertek Equipment #'s: ETC5-4

Gas Analyzer Train Leak Check:

Stack: Initial: good Final: good

Dilution Tunnel (Method 5G Only): Initial: good Final: good

Calibrations: Span Gas CO_2: ~~9.97~~ 9.93 BR O_2: ____ CO: ~~.98~~ .97 BR CO_2(DT): 1.00

	N_2 Span		N_2 Span		N_2 Span	N_2 Span	N_2 Span	N_2 Span	N_2 Span
Time	Ø		EOT						
O_2									
CO_2	0.0	9.98	0.0	9.96					
CO	0.00	.98	0.00	.99					
CO_2 (DT)	0.00	1.01	0.02	0.97					

Stack Diameter (inches): 6

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

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: 5/9/11 Initials: BR

	Initial	Middle	Ending
Pb (in/Hg)	28.52		28.45
Room Temp (°F)	77		74

Avg = 28.49

Date: 6/23/11

Engineer signature: BR

Method 5H Impinger Gravimetric Analysis

Client: Hearth & Home

Model: 5100 I ACC

Report Number: 6100 340618

Date: 5/13/11

Test Engineer: [signature]

Scale ID umber: NA

Audit Weight Number: NA

Run Number: 6

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	840.0	702.6	605.6	963.5
Initial Weight grams	711.4	691.6	605.4	954.0
Net Weight grams	128.6	11.0	0.2	9.5

Total Weight 149.3

Notes: 296 308

Test Engineer: [signature]

[signature]