TEST REPORT

REPORT NUMBER: 100428939PRT-001
REPORT DATE: August 10, 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 4100I ACC SOLID FUEL ROOM HEATER FIREPLACE INSERT

Report of Testing Model 4100I 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 4100I 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 June 24 through July 14, 2011.

I.B LABORATORY

The test on the 4100I 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 4100I ACC Solid Fuel Room Heater Fireplace Insert is constructed of carbon steel. The firebox inside dimensions is 19.25 inches deep, 12 inches high and 18.75 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 June 24, 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 June 24, 2011: Test fuel was loaded by 52 seconds, the door was open for 60 seconds, and then closed. Primary air control set at 0.55 inches open for the entire test. Timed air was pushed at zero minutes and pulled out, rear air was not used. Burn time was 360 minutes with a category 2 burn rate of 0.97 kg/hr. The fan was off for the first 30 minutes then set to high for the remainder of the test.

RUN #2 June 27, 2011: Test fuel was loaded by 43 seconds, the door was open for 55 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, rear air was not used. Burn time was 380 minutes with a category 2 burn rate of 0.93 kg/hr. The fan was off for the first 30 minutes then set to high for the remainder of the test.

RUN #3 June 28, 2011: Test fuel was loaded by 42 seconds, the door was open for 50 seconds, and then closed. Primary air control set at full open for entire test. Timed air was pushed at zero minutes and remained in for the entire test to allow rear ports to supply air. Burn time was 165 minutes with a category 2 burn rate of 2.15 kg/hr. The fan was on high for the entire test.

RUN #4 June 28, 2011: Test fuel was loaded by 46 seconds, the door was open for 58 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 290 minutes with a category 2 burn rate of 1.21 kg/hr. The fan was set to high for the entire test.

RUN #5 June 28, 2011: Test fuel was loaded by 50 seconds, the door was open for 4 minutes, and then closed. Primary air control set fully open for entire test. Timed air was pushed at zero minutes; air control rod was left pushed in allowing air to the rear ports until 5 minutes. Timed air was activated again at 5 minutes. Burn time was 310 minutes with a category 2 burn rate of 1.14 kg/hr. The fan was off for the first 30 minutes then set to high for the remainder of the test.

RUN #6 July 14, 2011: Test fuel was loaded by 35 seconds, the door was open for 45 seconds, and then closed. Primary air control set at full open for entire test. Timed air was pushed at zero minutes and pulled out at 1 minute, setting the rear air opening to 0.25 inches. Burn time was 200 minutes with a category 3 burn rate of 1.76 kg/hr. The fan was set to high for the entire 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	6/24/11	0.97	3.49	78.8	73.0
2	6/27/11	0.93	4.84	78.7	72.8
3	6/28/11	2.15	7.09	76.8	71.0
4	6/28/11	1.21	4.04	80.2	74.2
5	6/29/11	1.14	2.64	79.3	73.3
6	7/14/11	1.76	5.61	77.0	71.3

* *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)
1	.97	3.49	11,696	.3488	.4840	1.6892
5	1.14	2.64	13,746	.4840	.2056	0.5428
4	1.21	4.04	14,590	.5544	.3766	1.5215
6	1.76	5.61	21,222	.8606	.3766	2.1183
3	2.15	7.08	25,925	.9320	.1394	.9883
				Totals:	1.5832	6.8601
Note: Run 2 was omitted on a two for one basis and not included in the weighted average.						
					Weighted average emission rate:	**4.33**

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	78	76	28.43	28.43	<50	<50
2	71	74	28.35	28.29	<50	<50
3	75	78	28.05	28.09	<50	<50
4	81	76	28.09	28.07	<50	<50
5	73	75	28.11	28.10	<50	<50
6	70	72	28.33	28.33	<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	360	12.39	129.3	542.9	4.88	1232.5
2	380	12.85	132.5	547.6	4.79	1714.1
3	165	13.79	134.4	574.5	8.47	479.6
4	290	13.56	136.6	555.6	5.84	1094.4
5	310	13.84	140.9	550.2	5.80	673.4
6	200	13.56	136.6	560.9	7.68	824.4

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (°F)	Run Time (min)	Average Draft (in/H_2O)
1	0.97	124.2	360	-.042
2	0.93	117.0	380	-.037
3	2.15	73.6	165	-.058
4	1.21	73.8	290	-.037
5	1.14	61.6	310	-.033
6	1.76	66.4	200	-.046

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

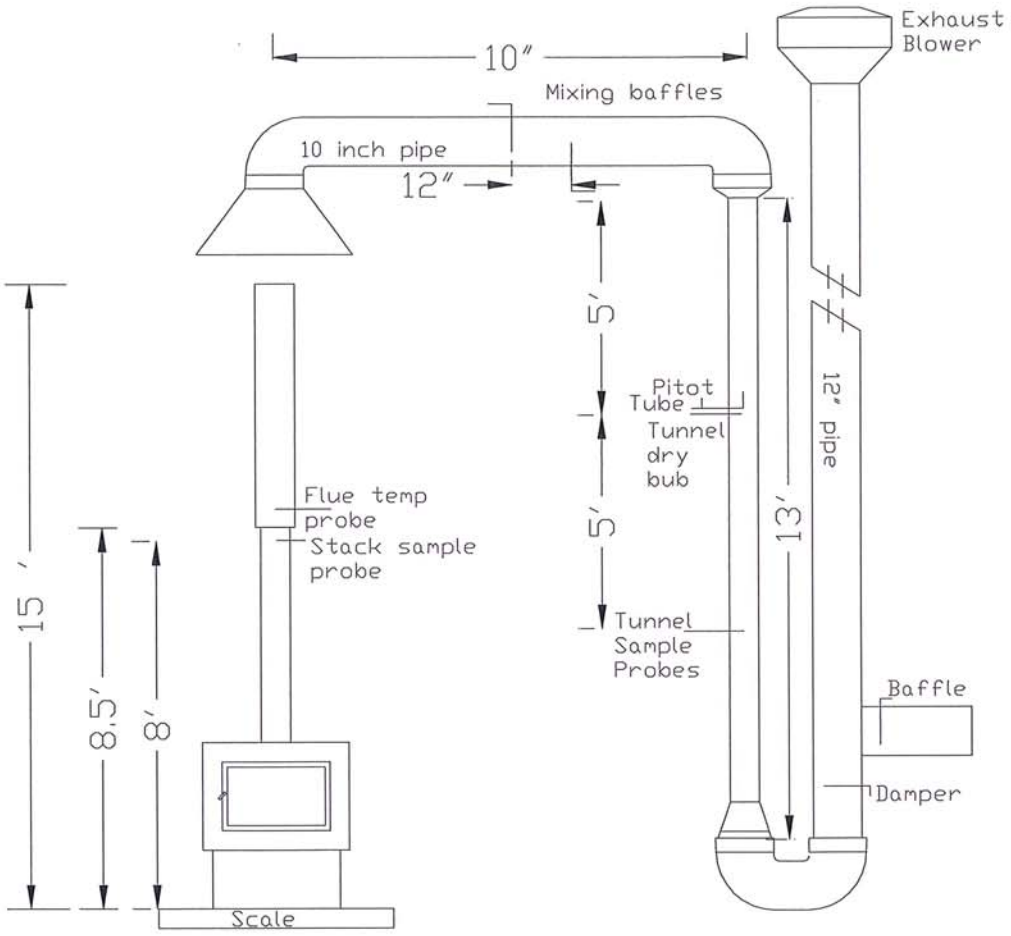


FIGURE 1

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 EPA 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 4100I 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 4100I 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."

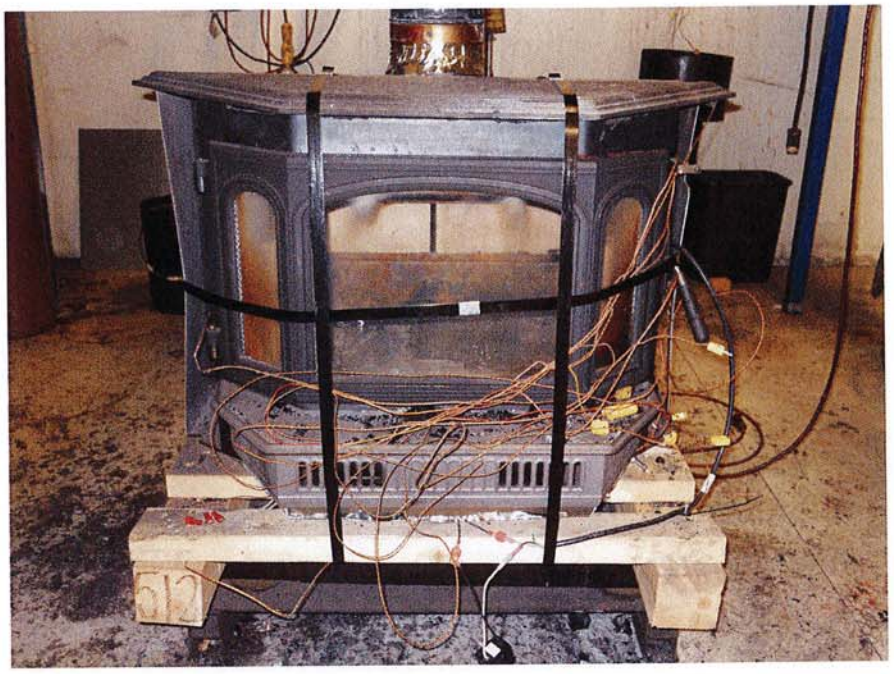
INTERTEK TESTING SERVICES NA

Reported by: _____
Bruce Davis
Test Engineer

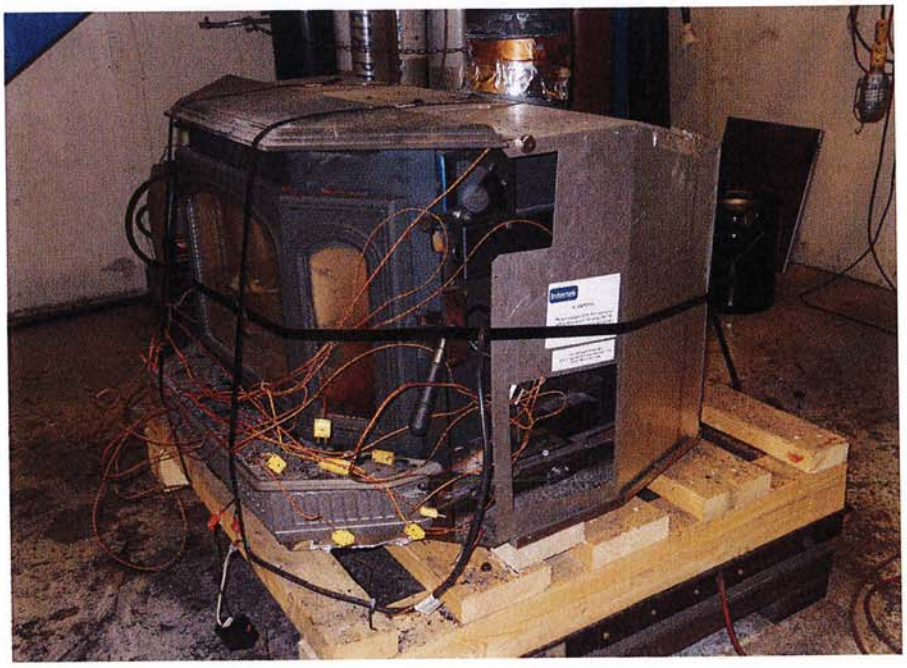
Reviewed by: _____
Ken Morgan
Reviewer

Appendix G
Test Data

Hearth & Home Technologies
Stove model 4100 I ACC
Project Number G100428939



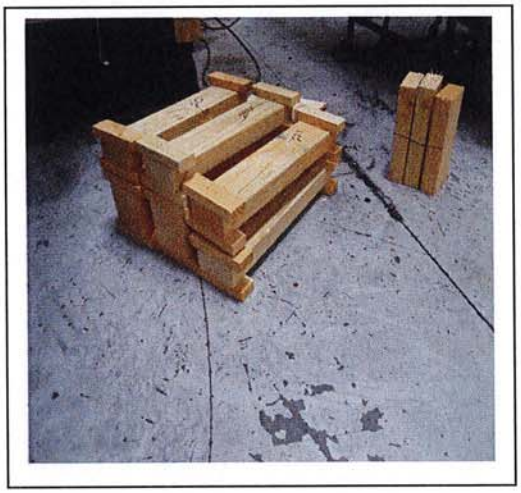
Front view



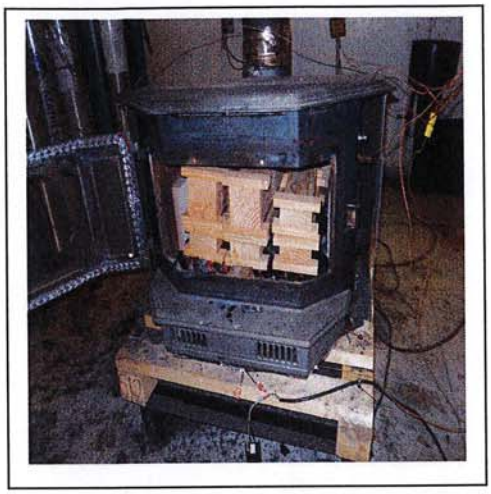
Side view

Hearth & Home Technologies
Stove Model 4100 I ACC
Project Number G100428939

Fuel load Photos

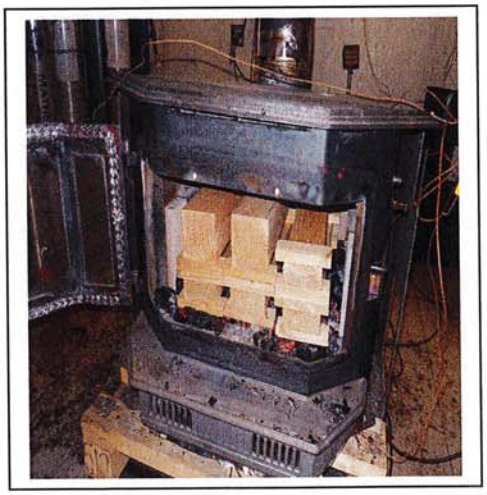


Run one fuel load



Run one fuel loaded

Run two fuel load

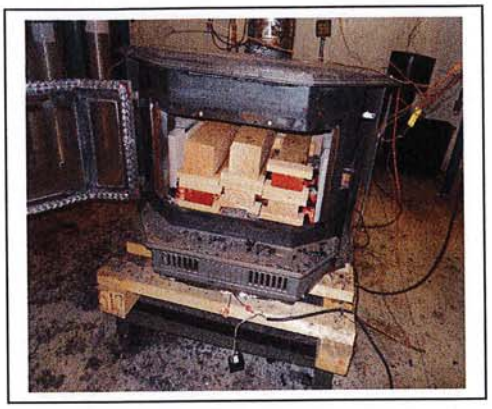


Run two fuel loaded

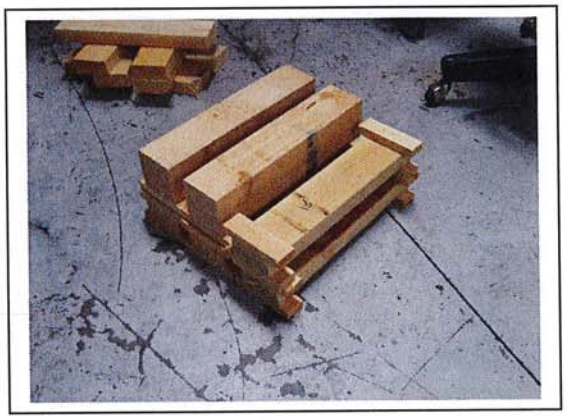
Hearth & Home Technologies
Stove Model 4100 I ACC
Project Number G100428939

Fuel load Photos

Run three fuel load



Run three loaded fuel



Run four fuel load

Run four loaded fuel

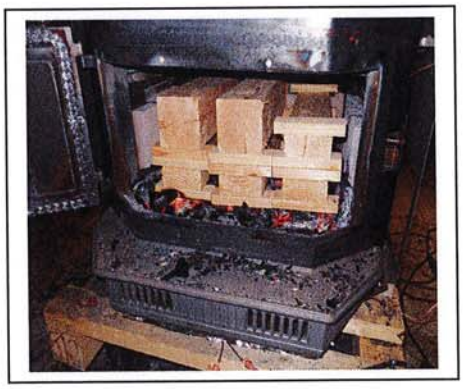
Hearth & Home Technologies
Stove Model 4100 I ACC
Project Number G100428939

Fuel load Photos

Run five fuel load

Run five loaded fuel

Run six fuel load



Run six loaded fuel

Run 1

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/24/2011
Run: 1
Control #: G100428939

Tech: B. Davis

Start	End	Delta T
322.4	198.2	124.2

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	back	right	left	bottom
0	15.7	0.75	7.9	12.25	0.49	201	78	84	0.032	365	395	359	306	187
10	15.1	0.84	7.1	12.96	0.54	244	68	86	0.032	300	352	323	366	311
20	13.7	1.34	11.7	7.86	0.92	362	68	95	0.032	296	347	302	383	33
30	12.2	1.21	15.64	4.05	1.27	417	68	102	0.032	302	369	310	386	332
40	10.4	0.72	12.76	7.42	0.94	376	68	100	0.032	241	406	333	299	179
50	9.5	0.41	10.62	9.87	0.76	339	69	96	0.032	221	411	326	266	159
60	8.6	0.65	9.58	10.67	0.65	316	69	93	0.032	209	405	312	247	150
70	7.7	1.12	11.5	8.28	0.75	310	69	92	0.032	205	399	310	226	137
80	6.6	1.01	12.18	7.71	0.83	323	70	92	0.032	218	410	321	214	131
90	5.7	0.83	11.46	8.61	0.75	315	70	91	0.032	230	424	330	207	129
100	4.8	0.78	11.84	8.28	0.78	311	70	91	0.032	242	348	335	201	128
110	4.2	0.89	10.8	9.21	0.7	294	70	90	0.032	246	443	337	199	129
120	3.6	1.14	8.58	11.18	0.5	244	71	87	0.032	251	448	338	197	128
130	3.3	1.29	7.66	11.95	0.45	222	69	84	0.032	251	435	335	197	128
140	3	1.15	7.66	12.09	0.42	203	70	82	0.032	246	409	325	200	129
150	2.8	1.39	7.18	12.33	0.39	189	71	81	0.032	245	398	321	205	131
160	2.7	1.55	7.08	12.27	0.36	180	75	80	0.032	246	387	317	211	133
170	2.5	1.74	6.92	12.24	0.35	175	73	79	0.032	244	377	311	214	133
180	2.4	1.97	6.72	12.21	0.33	169	73	78	0.032	240	368	305	217	133
190	2.2	2.22	6.44	12.24	0.32	165	72	78	0.032	235	359	298	219	134
200	2.1	2.36	6.36	12.18	0.3	160	73	77	0.032	231	350	291	220	133
210	1.9	2.36	6.28	12.26	0.3	156	73	77	0.032	228	344	288	221	132
220	1.8	2.43	6.14	12.33	0.29	153	72	76	0.032	225	338	285	221	132
230	1.6	2.59	5.96	12.35	0.28	152	72	76	0.032	222	329	283	220	130
240	1.5	2.52	5.82	12.56	0.27	150	71	76	0.032	221	324	279	219	130
250	1.4	2.52	5.8	12.58	0.27	149	72	76	0.032	220	316	276	217	130
260	1.2	2.48	5.64	12.78	0.27	146	71	75	0.032	219	309	273	215	130
270	1.1	2.62	5.78	12.5	0.27	144	72	75	0.032	220	303	271	214	130
280	0.9	2.48	5.58	12.84	0.26	144	72	75	0.032	223	299	270	212	130
290	0.8	2.3	5.3	13.3	0.25	139	72	74	0.032	221	291	265	209	129
300	0.6	2.28	5.42	13.2	0.24	139	73	77	0.032	219	287	261	208	130
310	0.5	2.27	5.52	13.11	0.24	138	75	78	0.032	219	283	254	207	130
320	0.4	2.3	5.4	13.2	0.24	136	75	78	0.032	219	280	247	205	130
330	0.3	2.29	4.74	13.87	0.22	134	74	79	0.032	216	278	242	205	130
340	0.2	1.96	4.12	14.82	0.2	132	75	79	0.032	207	272	235	205	129
350	0.1	1.51	4.44	14.95	0.2	129	76	79	0.032	195	265	228	203	128
360	0	1.41	4.72	14.77	0.2	126	76	79	0.032	185	258	220	202	126

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/24/2011

Run: 1

Control #: G100428939

Tech: B. Davis

-0.0415

DGM Temps. (F) In	DGM Temps. (F) Out	DGM Vol. ft^3	Orifice Meter ΔH (in H_2O)	Tunnel SP (in H_2O)	Impinger Exit	Front Filter	VAC	Draft
69	69	312.2	0.4	-0.43	72	229	0	-0.03
70	70	315.98	0.6200	-0.43	54	232	0	-0.041
70	70	320.4	0.6860	-0.43	55	232	0	-0.062
71	71	324.92	0.7360	-0.43	60	232	0	-0.07
71	71	329.64	0.5970	-0.43	65	232	0	-0.062
71	71	333.99	0.5670	-0.43	66	232	0	-0.057
71	71	338.26	0.4960	-0.43	67	232	0	-0.055
71	71	342.26	0.4650	-0.43	66	232	0	-0.057
72	72	346.14	0.5110	-0.43	64	232	0	-0.052
72	72	350.25	0.3200	-0.43	64	232	0	-0.053
72	72	353.85	0.4760	-0.43	65	232	0	-0.051
72	72	357.32	0.4570	-0.43	64	232	0	-0.05
72	72	360.95	0.3570	-0.43	64	232	0	-0.042
72	72	364.32	0.3600	-0.43	65	232	0	-0.036
72	72	367.48	0.3100	-0.43	66	232	0	-0.032
73	73	370.54	0.3000	-0.43	53	232	0	-0.032
73	73	373.59	0.2580	-0.43	49	232	0	-0.031
72	72	376.38	0.2550	-0.43	50	232	0	-0.03
72	72	379.33	0.2380	-0.43	51	232	0	-0.03
71	71	382.37	0.2430	-0.43	53	232	0	-0.025
71	71	384.87	0.2160	-0.43	53	232	0	-0.027
71	71	387.45	0.2200	-0.43	55	232	0	-0.027
71	71	389.69	0.2150	-0.43	55	232	0	-0.022
71	71	392.27	0.2100	-0.43	56	232	0	-0.022
71	71	394.64	0.204	-0.43	56	232	0	-0.021
71	71	397.11	0.205	-0.43	57	232	0	-0.021
71	71	399.58	0.217	-0.43	57	232	0	-0.021
71	71	402.05	0.21	-0.43	58	232	0	-0.021
71	71	404.51	0.2	-0.43	58	232	0	-0.021
71	71	406.78	0.206	-0.43	59	232	0	-0.021
71	71	409.2	0.178	-0.43	59	232	0	-0.02
71	71	411.18	0.171	-0.43	62	232	0	-0.02
72	72	413.37	0.178	-0.43	61	232	0	-0.02
73	73	415.69	0.19	-0.43	61	233	0	-0.02
74	74	418.05	0.199	-0.43	62	232	0	-0.02
74	74	420.37	0.172	-0.43	62	232	0	-0.02
74	74	422.702	0.151	-0.43	63	232	0	-0.02

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/24/2011
Run: 1
Control #: G100428939 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)	P_g	-0.43	(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	ft² (Tunnel Traverse)
K_2	384.8				

					Sum Si x Vm			
12.387	**129.344**	**4.877**	**1.001**	**0.328**	**15.389**		102.5%	7.28

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 x $V_{mi(std)}$	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
													7.481	0.134
12.387	129.055		1.000	0.4068										
12.387	128.583	8.649534	0.998	0.6197	2.938536	0.1156	3.5452	0.4739	0.4739	147.5527	153.889	100.0%	9.208	0.109
12.387	126.497	13.01446	0.990	0.6857	6.856583	0.0768	4.1376	0.4494	0.9232	114.4522	153.889	105.1%	9.607	0.104
12.387	124.922	11.02018	0.984	0.7364	7.346339	0.0907	4.2312	0.4404	1.3636	138.2221	153.889	103.0%	9.894	0.101
12.387	125.368	16.23541	0.986	0.5971	8.815607	0.0616	4.4101	0.4457	1.8094	97.7885	153.889	104.3%	8.925	0.112
12.387	126.270	9.7281	0.989	0.5571	4.407803	0.1028	4.0644	0.4554	2.2648	150.4078	153.889	106.5%	8.660	0.115
12.387	126.955	10.40191	0.992	0.4959	4.407803	0.0961	3.9896	0.4607	2.7255	138.0778	153.889	107.8%	8.192	0.122
12.387	127.185	8.61851	0.993	0.4652	4.407803	0.1160	3.7374	0.4562	3.1817	156.1122	153.889	106.7%	7.942	0.126
12.387	127.185	10.11994	0.993	0.5114	5.387315	0.0988	3.6253	0.4565	3.6381	128.9624	153.889	106.8%	8.335	0.120
12.387	127.416	8.827482	0.994	0.4684	4.407803	0.1133	3.8329	0.4598	4.0980	156.3137	153.889	107.6%	7.984	0.125
12.387	127.416	8.61851	0.994	0.4763	4.407803	0.1160	3.3573	0.4205	4.5185	140.2369	153.889	98.4%	8.051	0.124
12.387	127.647	6.156394	0.995	0.4573	2.938536	0.1624	3.2361	0.4019	4.9204	189.2322	153.889	94.0%	7.896	0.127
12.387	128.347	7.254953	0.997	0.3566	2.938536	0.1378	3.3853	0.4287	5.3491	167.9825	153.889	100.3%	6.999	0.143
12.387	129.055	3.899449	1.000	0.3602	1.469268	0.2564	3.1428	0.4491	5.7982	290.1474	153.889	105.1%	7.040	0.142
12.387	129.531	3.953341	1.002	0.3107	1.469268	0.2530	2.9470	0.4186	6.2168	268.3582	153.889	97.9%	6.556	0.153
12.387	129.771	2.699518	1.003	0.3010	0.979512	0.3704	2.8537	0.4353	6.6520	380.5636	153.889	101.8%	6.465	0.155
12.387	130.011	1.34162	1.004	0.2581	0.489756	0.7454	2.8391	0.4391	7.0912	761.8104	153.889	102.7%	6.015	0.166
12.387	130.252	2.675173	1.005	0.2554	0.979512	0.3738	2.5970	0.4317	7.5229	349.4851	153.889	101.0%	5.977	0.167
12.387	130.495	1.333578	1.006	0.2381	0.489756	0.7499	2.7511	0.4603	7.9832	742.6696	153.889	107.7%	5.777	0.173
12.387	130.495	2.675173	1.006	0.2426	0.979512	0.3738	2.8351	0.4907	8.4739	381.5168	153.889	114.8%	5.826	0.172
12.387	130.738	1.329593	1.006	0.2152	0.489756	0.7521	2.3359	0.4009	8.8749	632.4561	153.889	93.8%	5.497	0.182
12.387	130.738	2.680545	1.006	0.2207	0.979512	0.3731	2.4106	0.4385	9.3134	323.7470	153.889	102.6%	5.568	0.180
12.387	130.981	1.349759	1.007	0.2147	0.489756	0.7409	2.0929	0.3759	9.6893	558.2143	153.889	87.9%	5.492	0.182
12.387	130.981	2.704988	1.007	0.2105	0.979512	0.3697	2.4106	0.4390	10.1282	320.8215	153.889	102.7%	5.437	0.184
12.387	130.981	1.381896	1.007	0.2036	0.489756	0.7236	2.2144	0.4073	10.5355	576.8755	153.889	95.3%	5.342	0.187
12.387	130.981	1.384763	1.007	0.2047	0.489756	0.7221	2.3078	0.4320	10.9675	599.9715	153.889	101.1%	5.361	0.187
12.387	131.226	2.828202	1.008	0.2173	0.979512	0.3536	2.3078	0.4305	11.3980	293.7620	153.889	100.7%	5.524	0.181
12.387	131.226	1.373366	1.008	0.2065	0.489756	0.7281	2.3078	0.4178	11.8157	604.9505	153.889	97.7%	5.390	0.186
12.387	131.226	2.846293	1.008	0.2032	0.979512	0.3513	2.2985	0.4265	12.2422	290.7131	153.889	99.8%	5.347	0.187
12.387	131.472	1.496537	1.009	0.2063	0.489756	0.6682	2.1210	0.3966	12.6388	510.2081	153.889	92.8%	5.393	0.185
12.387	130.738	2.959892	1.006	0.1780	0.979512	0.3379	2.2611	0.4193	13.0581	275.0100	153.889	98.1%	5.000	0.200
12.387	130.495	1.465325	1.006	0.1706	0.489756	0.6824	1.8500	0.3700	13.4281	454.5066	153.889	86.5%	4.900	0.204
12.387	130.495	1.479946	1.006	0.1784	0.489756	0.6757	2.0462	0.4176	13.8456	497.7455	153.889	97.7%	5.010	0.200
12.387	130.252	1.598696	1.005	0.1891	0.489756	0.6255	2.1636	0.4319	14.2775	487.2075	153.889	101.0%	5.148	0.194
12.387	130.252	1.803934	1.005	0.1994	0.489756	0.5543	2.1968	0.4267	14.7043	438.3971	153.889	99.8%	5.292	0.189
12.387	130.252	1.836192	1.005	0.1712	0.489756	0.5446	2.1555	0.4073	15.1116	422.6027	153.889	95.3%	4.907	0.204

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	15.70	W_{wd}
Load Weight (kg wet)	7.123	
Total Test Duration (min)	360	Θ
Total Test Duration (hours)	6.000	
Wood Moisture (Dry Bais)	22.51	%
Wood Moisture (Wet Bais)	18.37	%

Manufacturer:	Hearth & Home Technologies
Model:	4100I
Date:	6/24/2011
Run:	1
Control #:	G100428939
Tech:	B. Davis

Dry Burn Rate	0.969	Dry kg/hr
	2.136	Dry Lb/hr

PARTICULATE CATCH	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.7357	0.6320	103.7	F1
Rear Filter	0.3625	0.1647	197.8	F2
Probe/Front Half Rinse	94.0139	93.8199	194	R1
Impinger H2O +Back Rinse	142.5652	142.3441	221.1	R2
Meth Chlor. Extraction	98.5409	98.3216	219.3	R3
Back Half Acetone Rinse	107.2258	106.9282	297.6	R4

Total Particulate Collected	1232.5	mg

Cs	0.0119	g/dscf
Qstd	7759.1	dscf/hr
E	3.49	g/hr

Average Stack Flow (Qf)	4.88	dscf/min
Average Stack Flow (Qf)	292.60	dscf/hr

Solvent Volumes	(ml)	
Acetone Front Half Rinse	125	Va1
Acetone Back Half Rinse	120	Va2
Water- Impingers + Back Half Rinse	330	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.00235	Ba
Water	0.0003	Bw
Methylene Chloride	0.002	B_{DCM}

Total Particulate Collected 1232.53 mg

Wei[illegible]g Record

PER-TEST INITIAL/TARE WEIGHTS						
DATE						Stable
TIME						Weights
Front Filter						0.6320
Rear Filter						0.1647
Probe/Front Half Rinse						93.8199
Impinger H2O +Back Rinse						142.3441
Meth Chlor. Extraction						98.3216
Back Half Acetone Rinse						106.9282

POST-TEST FINAL WEIGHTS						
DATE						Stable
TIME						Weights
Front Filter						0.7357
Rear Filter						0.3625
Probe/Front Half Rinse						94.0139
Impinger H2O +Back Rinse						142.5652
Meth Chlor. Extraction						98.5409
Back Half Acetone Rinse						107.2258

Test Engineer

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	-0.43	in H2O (enter as negative value e.g. -0.12)
Barometer:	28.43	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	0.030	84	0.1732
A2	0.038	84	0.1949
A3	0.034	84	0.1844
A4	0.034	84	0.1844
B1	0.030	84	0.1732
B2	0.036	84	0.1897
B3	0.032	84	0.1789
B4	0.024	84	0.1549
AVERAGE	0.032	84	0.1792

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

Tunnel V	Tunnel Q
ft/sec	scfm
12.42	129.42

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/24/2011
Run: 1
Control #: G100428939

Test Engineer 

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939 SAMPLE ID#: PRT110617545-001

DATE: 6/24/11 ENGINEER: B Davis RUN #: 1

INTERTEK EQUIPMENT #'s: ETC7-2

CALCULATED RANGE: 3.2 - 3.9 ACTUAL COAL BED: 3.7

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F) AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	3.8	/	-042	72	516	650	571	603	423	NA	322
10	3.6	0.2	-025	72	403	604	540	529	335		245
20	5.3	/	-040	69	225	535	486	467	282		271
30	4.8	0.5	-035	69	199	484	439	409	243		236
40	4.4	0.4	-032	69	184	450	411	370	220		223
50	4.0	0.4	-034	69	174	423	385	337	201		247
60	3.7	0.3	-030	70	272	403	368	312	190		212
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 8/9/11 ENGINEER SIGNATURE: _____

FUEL DATA

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939

DATE: 6/24/11 RUN #: 1 SAMPLE ID #: PRT110617154S-001

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~~	~~19.7~~	22.4	21.6	2x4
2	FT				
3	FT				

2.2 lbs

LENGTH OF CUT PIECES: 3@ 8" INCHES PRE-BURN FUEL AVG MOISTURE: 21.23

TIME (CLOCK): 0920 ROOM TEMP (F): 70

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: 17.15 ACTUAL LOAD WT: 8.2 (2 X 4)
7.5 (4 X 4)
FUEL PIECE LENGTH: 16 15.7 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	23.8	20.4	22.8	2x4
2	~~24.5~~	~~25.7~~		—
3	24.3	23.2	26.3	2x4
4	20.3	20.2	20.1	2x4
5	21.7	21.7	22.3	2x4
6	20.6	22.6	24.8	4x4
7	25.6	22.7	22.3	4x4
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 22.51

TIME (CLOCK): 0920 ROOM TEMP (F): 70

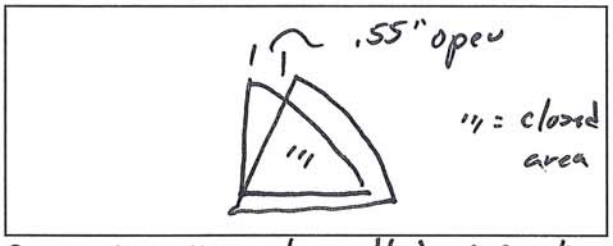
ENGINEER: [signature] 8/9/11

Intertek

RUN NOTES

Client: Hearth & Home Technologies
Model: 4100I Project #: G100428939 Sample ID #: PRT 110617545-001
Run #: 6/24/11 1 Booth: 7 Date: 6/24/11
Engineer: B. Davis
Intertek Equipment ID #(s): NA

PREBURN

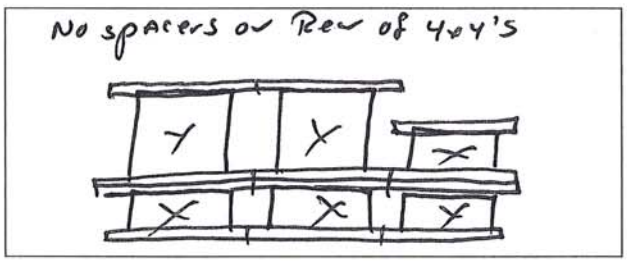


PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on High

Comments: 11 minutes added 2-2 lbs, 41 minutes Raked coals
55 minutes Raked coals

TEST

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



NA

BYPASS: NA FUEL LOADING: by 52 seconds DOOR: closed by 1:00
PRIMARY AIR: AT test setting till 5:00
OTHER: Timed to pushed @ 0 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: 8/9/11
Engineer signature: BD

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 4100I Project #: G100428939 Sample ID #: PRT110617154S-001

Date: 6/24/11 Run #: 1

Start Time: 1133 Stop Time: 5:33

Intertek Equipment #'s: EPC5-4 19745

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.98 O_2: NA CO: .97 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	0.00	9.98	0.02	9.94				
CO	0.00	0.97	0.00	0.98				
CO_2 (DT)	0.00	1.00	0.02	1.00				

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: 6/23/11 Initials: BA

	Initial	Middle	Ending
Pb (in/Hg)	28.43		28.43
Room Temp (°F)	78		76

Date: 8/9/11

Engineer signature: BO

Method 5H Impinger Gravimetric Analysis

Client: _Hearth & Home_____ Model: __4100I_____

Report Number: __G100428939_____ Date: 6/24/11

Test Engineer: __B. Davis_____ Scale ID umber: _____

Audit Weight Number: _____ NA _____ Run Number: __1_____

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	804.6	734.4	618.0	1010.1
Initial Weight grams	702.1	694.2	609.6	989.8
Net Weight grams	102.5	40.2	8.4	20.3

Total Weight 171.4

Notes: Front H 129 Rear H 141

Test Engineer: 8/3/11

Run 2

EPA Method 5H Spreadsneet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/27/2011
Run: 2
Control #: G100428939

Tech: B. Davis

Start	End	Delta T
319.8	202.8	117

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	back	right	left	bottom
0	15.7	0.93	7.2	12.77	0.49	196	71	87	0.034	278	424	371	327	199
10	14.9	0.84	8.38	11.68	0.68	286	71	92	0.034	304	373	331	392	326
20	13.3	1.06	12.4	7.44	1.08	382	71	104	0.034	304	381	313	410	346
30	11.4	1.05	13.64	6.21	1.19	422	72	110	0.034	319	428	327	414	349
40	10.1	0.6	11.72	8.58	0.89	373	73	106	0.034	251	476	336	318	191
50	8.9	0.87	12.5	7.53	0.92	365	74	105	0.034	231	465	335	285	169
60	7.5	1.07	13.6	6.23	1.01	376	75	106	0.034	230	466	347	263	158
70	6.5	0.54	10.48	9.88	0.78	335	74	103	0.034	235	464	358	248	152
80	5.8	0.93	9	10.97	0.63	293	73	98	0.034	238	454	363	236	147
90	5.1	1.19	8.34	11.37	0.57	265	73	95	0.034	245	455	361	226	145
100	4.5	0.87	8.72	11.31	0.59	259	73	93	0.034	249	456	354	217	142
110	4	1.29	7.94	11.67	0.52	241	74	92	0.034	252	454	347	212	140
120	3.5	1.39	7.18	12.33	0.47	225	74	90	0.034	255	456	342	209	139
130	3.2	1.74	6.04	13.12	0.37	205	73	88	0.034	256	425	332	209	138
140	3	1.36	5.92	13.62	0.33	189	75	86	0.034	248	394	320	209	137
150	2.9	1.17	5.86	13.87	0.33	178	74	85	0.034	241	371	309	210	136
160	2.7	1.39	5.88	13.63	0.31	174	74	84	0.034	238	358	302	211	135
170	2.6	1.43	5.9	13.57	0.32	169	73	84	0.034	237	348	294	210	133
180	2.4	1.48	5.8	13.62	0.3	165	74	84	0.034	237	341	287	209	132
190	2.3	1.64	5.6	13.66	0.29	162	75	83	0.034	236	334	283	207	132
200	2.1	1.86	5.7	13.34	0.29	150	75	83	0.034	236	328	280	206	131
210	2	1.86	5.78	13.26	0.29	157	74	82	0.034	236	324	276	205	132
220	1.9	1.91	5.72	13.27	0.29	156	75	82	0.034	237	321	274	204	131
230	1.7	2.05	5.52	13.33	0.28	155	74	82	0.034	238	318	273	204	131
240	1.6	1.92	5.72	13.26	0.28	152	74	82	0.034	237	316	271	203	131
250	1.4	1.94	5.68	13.28	0.28	151	74	82	0.034	237	314	272	202	132
260	1.3	2.01	5.58	13.31	0.28	150	74	82	0.034	237	312	271	201	132
270	1.2	1.93	5.5	13.47	0.28	149	73	81	0.034	237	310	271	200	133
280	1.1	1.88	5.12	13.9	0.26	147	72	81	0.034	236	308	268	199	133
290	0.9	1.76	4.92	14.22	0.25	148	76	82	0.034	230	301	265	198	133
300	0.8	1.81	5	14.09	0.25	145	74	81	0.034	225	296	262	197	132
310	0.7	1.77	4.92	14.21	0.24	144	73	81	0.034	218	291	259	195	132
320	0.6	1.76	4.8	14.34	0.23	142	72	81	0.034	210	285	253	193	131
330	0.5	1.7	4.68	14.52	0.23	141	74	80	0.034	205	283	251	192	130
340	0.4	2.01	4.92	13.97	0.24	140	73	80	0.034	200	280	248	190	129
350	0.3	1.76	4.6	14.54	0.23	139	73	80	0.034	198	279	245	189	128
360	0.2	1.74	4.64	14.52	0.22	138	73	80	0.034	196	279	241	188	126
370	0.1	1.67	4.54	14.69	0.21	137	74	80	0.034	193	278	238	187	125
380	0	1.63	4.4	14.87	0.21	136	74	80	0.034	190	278	235	187	124

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/27/2011

Run: 2

Control #: G100428939

Tech: B. Davis

-0.037417

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		
70	70	424	0.403	-0.49	76	232	0	-0.03
71	71	427.97	0.5910	-0.49	50	232	0	-0.057
71	71	432.1	0.6910	-0.49	42	232	0	-0.063
71	71	436.15	0.6880	-0.49	42	234	0	-0.069
72	72	440.24	0.5140	-0.49	44	233	0	-0.061
72	72	444.01	0.4840	-0.49	48	233	0	-0.058
72	72	448	0.4900	-0.49	51	233	0	-0.06
73	73	451.85	0.4900	-0.49	52	232	0	-0.055
73	73	455.73	0.4300	-0.49	53	233	0	-0.048
73	73	459.35	0.4070	-0.49	53	234	0	-0.04
73	73	462.85	0.4020	-0.49	56	234	0	-0.041
74	74	466.28	0.3700	-0.49	58	234	0	-0.04
74	74	469.59	0.3660	-0.49	58	234	3	-0.032
74	74	472.77	0.3100	-0.49	60	234	3	-0.032
74	74	475.88	0.2500	-0.49	60	234	3	-0.024
74	74	478.7	0.2560	-0.49	50	234	3	-0.023
74	74	481.31	0.2200	-0.49	50	234	3	-0.023
74	74	484	0.2370	-0.49	48	234	3	-0.022
74	74	486.59	0.2120	-0.49	50	234	3	-0.021
75	75	489.21	0.2110	-0.49	53	234	3	-0.02
75	75	491.75	0.2030	-0.49	52	234	3	-0.02
75	75	494.25	0.1980	-0.49	52	234	3	-0.019
75	75	496.65	0.2020	-0.49	54	234	3	-0.02
75	75	498.98	0.2010	-0.49	55	234	3	-0.02
75	75	501.33	0.187	-0.49	55	234	3	-0.02
75	75	503.59	0.19	-0.49	56	234	3	-0.02
75	75	505.83	0.197	-0.49	57	234	3	-0.02
75	75	508.14	0.2	-0.49	57	234	3	-0.02
75	75	510.47	0.198	-0.49	57	234	3	-0.02
75	75	512.97	0.195	-0.49	57	234	3	-0.018
75	75	515.53	0.189	-0.49	58	234	3	-0.018
75	75	518	0.178	-0.49	59	234	3	-0.018
75	75	520.4	0.17	-0.49	59	234	3	-0.017
75	75	522.58	0.178	-0.49	59	234	3	-0.017
75	75	524.88	0.179	-0.49	60	234	3	-0.017
75	75	527.18	0.185	-0.49	60	234	3	-0.017
75	75	529.5	0.164	-0.49	61	234	3	-0.016
75	75	531.68	0.153	-0.49	62	234	3	-0.017
75	75	533.652	0.163	-0.49	62	234	3	-0.018

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/27/2011
Run: 2
Control #: G100428939 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)	P_g	-0.46	(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	ft² (Tunnel Traverse)
K_2	384.8				

					Sum Si x Vm			
12.849	**132.484**	**4.790**	**1.000**	**0.296**	**14.327**	100.3%	7.87	

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
12.849	132.599		1.000	0.4045									8.438	0.119
12.849	131.398	10.29433	0.995	0.5909	3.98076	0.0971	3.7014	0.4387	0.4387	136.6306	143.272	100.0%	10.170	0.098
12.849	128.602	14.68231	0.985	0.6906	7.961519	0.0681	3.8433	0.3779	0.8166	99.4701	143.272	100.2%	10.878	0.092
12.849	127.248	16.09574	0.980	0.6881	9.454304	0.0621	3.7688	0.3465	1.1630	88.9777	143.272	91.9%	10.811	0.092
12.849	128.148	12.9264	0.983	0.5141	6.468734	0.0774	3.8061	0.3520	1.5151	111.8878	143.272	93.4%	9.387	0.107
12.849	128.374	11.07919	0.984	0.4840	5.971139	0.0903	3.5017	0.3730	1.8881	120.1028	143.272	98.9%	9.124	0.110
12.849	128.148	11.87485	0.983	0.4941	6.966329	0.0842	3.7060	0.4062	2.2943	118.5945	143.272	107.7%	9.220	0.108
12.849	128.830	10.99091	0.986	0.4904	4.97595	0.0910	3.5760	0.3879	2.6822	123.6366	143.272	102.9%	9.200	0.109
12.849	129.985	8.439063	0.990	0.4295	3.483165	0.1185	3.5971	0.3910	3.0731	161.9727	143.272	103.7%	8.641	0.116
12.849	130.687	8.750181	0.993	0.4069	3.483165	0.1143	3.3561	0.3884	3.4615	145.7457	143.272	103.0%	8.433	0.119
12.849	131.160	7.458907	0.995	0.4019	2.98557	0.1341	3.2448	0.3848	3.8463	165.3092	143.272	102.0%	8.396	0.119
12.849	131.398	6.427858	0.995	0.3706	2.487975	0.1556	3.1799	0.3788	4.2251	187.9889	143.272	100.5%	8.077	0.124
12.849	131.875	6.856815	0.997	0.3664	2.487975	0.1458	3.0629	0.3792	4.6043	169.7445	143.272	100.6%	8.046	0.124
12.849	132.357	4.471246	0.999	0.3097	1.492785	0.2237	2.9426	0.3657	4.9700	250.0857	143.272	97.0%	7.405	0.135
12.849	132.842	3.154135	1.001	0.2503	0.99519	0.3170	2.8778	0.3887	5.3586	346.7132	143.272	103.1%	6.680	0.150
12.849	133.085	1.624285	1.002	0.2564	0.497595	0.6157	2.6095	0.3906	5.7492	610.4880	143.272	103.6%	6.762	0.148
12.849	133.330	3.157807	1.003	0.2218	0.99519	0.3167	2.4152	0.3572	6.1064	290.6332	143.272	94.7%	6.295	0.159
12.849	133.330	1.567951	1.003	0.2370	0.497595	0.6378	2.4892	0.3954	6.5019	603.2675	143.272	104.9%	6.501	0.154
12.849	133.330	3.154135	1.003	0.2118	0.99519	0.3170	2.3967	0.3687	6.8706	288.7419	143.272	97.8%	6.151	0.163
12.849	133.576	1.584437	1.004	0.2105	0.497595	0.6311	2.4244	0.3942	7.2647	581.4556	143.272	104.5%	6.144	0.163
12.849	133.576	3.05468	1.004	0.2031	0.99519	0.3274	2.3460	0.3819	7.6466	291.8406	143.272	101.3%	6.035	0.166
12.849	133.822	1.513703	1.005	0.1983	0.497595	0.6606	2.3091	0.3826	8.0292	579.6649	143.272	101.5%	5.962	0.168
12.849	133.822	1.515394	1.005	0.2021	0.497595	0.6599	2.2167	0.3718	8.4010	555.8573	143.272	98.6%	6.025	0.166
12.849	133.822	3.051244	1.005	0.2008	0.99519	0.3277	2.1520	0.3572	8.7582	268.0135	143.272	94.7%	6.001	0.167
12.849	133.822	1.513703	1.005	0.1870	0.497595	0.6606	2.1705	0.3617	9.1199	544.8850	143.272	95.9%	5.790	0.173
12.849	133.822	3.034179	1.005	0.1896	0.99519	0.3296	2.0874	0.3605	9.4804	261.4237	143.272	95.6%	5.831	0.172
12.849	133.822	1.522198	1.005	0.1965	0.497595	0.6569	2.0689	0.3548	9.8352	516.4815	143.272	94.1%	5.936	0.168
12.849	134.069	1.550032	1.006	0.2031	0.497595	0.6451	2.1336	0.3594	10.1947	523.0570	143.272	95.3%	6.034	0.166
12.849	134.069	1.630142	1.006	0.1983	0.497595	0.6134	2.1520	0.3567	10.5513	501.6586	143.272	94.6%	5.957	0.168
12.849	133.822	3.390695	1.005	0.1945	0.99519	0.2949	2.3091	0.3876	10.9389	258.7790	143.272	102.8%	5.916	0.169
12.849	134.069	1.668239	1.006	0.1893	0.497595	0.5994	2.3645	0.3997	11.3386	538.5915	143.272	106.0%	5.831	0.171
12.849	134.069	1.693231	1.006	0.1782	0.497595	0.5906	2.2813	0.3912	11.7298	511.9865	143.272	103.8%	5.653	0.177
12.849	134.069	1.721165	1.006	0.1699	0.497595	0.5810	2.2167	0.3922	12.1220	489.4028	143.272	104.0%	5.514	0.181
12.849	134.318	1.7614	1.006	0.1784	0.497595	0.5677	2.0135	0.3652	12.4871	434.3864	143.272	96.9%	5.666	0.176
12.849	134.318	1.643973	1.006	0.1785	0.497595	0.6083	2.1243	0.3749	12.8620	491.0331	143.272	99.4%	5.663	0.177
12.849	134.318	1.765987	1.006	0.1851	0.497595	0.5663	2.1243	0.3751	13.2372	457.1072	143.272	99.5%	5.766	0.173

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	15.70	W_{wd}
Load Weight (kg wet)	7.123	
Total Test Duration (min)	380	Θ
Total Test Duration (hours)	6.333	
Wood Moisture (Dry Bais)	20.58	%
Wood Moisture (Wet Bais)	17.07	%

Manufacturer:	Hearth & Home Technologies
Model:	4100I
Date:	6/27/2011
Run:	2
Control #:	G100428939
Tech:	B. Davis

Dry Burn Rate	0.933	Dry kg/hr
	2.056	Dry Lb/hr

Total Particulate Collected	1714.1	mg

Cs	0.0169	g/dscf
Qstd	7947.6	dscf/hr
E	4.84	g/hr

Average Stack Flow (Qf)	4.79	dscf/min
Average Stack Flow (Qf)	287.41	dscf/hr

PARTICULATE CATCH

	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.8005	0.6333	167.2	F1
Rear Filter	0.4932	0.1625	330.7	F2
Probe/Front Half Rinse	102.7490	102.5158	233.2	R1
Impinger H2O +Back Rinse	147.9471	147.6149	332.2	R2
Meth Chlor. Extraction	95.6760	95.3920	284	R3
Back Half Acetone Rinse	102.4728	102.1051	367.7	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	95	Va1
Acetone Back Half Rinse	135	Va2
Water- Impingers + Back Half Rinse	350	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.00235	Ba
Water	0.0003	Bw
Methylene Chloride	0.002	B_{DCM}

ıl Particulate Collected 1714.05 mg

Weighing Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6333
Rear Filter						0.1625
Probe/Front Half Rinse						102.5158
Impinger H2O +Back Rinse						147.6149
Meth Chlor. Extraction						95.3920
Back Half Acetone Rinse						102.1051

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.8005
Rear Filter						0.4932
Probe/Front Half Rinse						102.7490
Impinger H2O +Back Rinse						147.9471
Meth Chlor. Extraction						95.6760
Back Half Acetone Rinse						102.4728

Test Engineer_

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.46**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.35**	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	0.030	87	0.1732
A2	0.038	87	0.1949
A3	0.038	87	0.1949
A4	0.032	87	0.1789
B1	0.028	87	0.1673
B2	0.038	87	0.1949
B3	0.038	87	0.1949
B4	0.026	87	0.1612
AVERAGE	0.034	87	0.1826

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

1.00 For Pitot Pa

Tunnel V	Tunnel Q
ft/sec	scfm
12.71	131.28

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/27/2011

Run: 2

Control #: G100428939

Test Engineer

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939 SAMPLE ID#: PRT110617545-001

DATE: 6/27/11 ENGINEER: B Davis RUN #: 2

INTERTEK EQUIPMENT #'s: ETC7-2

CALCULATED RANGE: 3.2 - 3.9 ACTUAL COAL BED: 3.5

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F) AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	6.3	—	-.042	76	749	686	585	549	397	NA	467
10	5.5	0.8	-.052	76	562	650	570	484	319		350
20	4.8	0.7	-.050	74	441	578	509	432	274		306
30	4.2	0.6	-.045	74	363	520	452	383	239		296
40	3.9	0.3	-.040	72	331	493	427	361	224		266
50	3.7	0.2	-.032	73	304	460	400	342	211		217
60	3.5	0.2	-.030	71	280	428	374	328	201		196
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 8/9/11 ENGINEER SIGNATURE: _____

FUEL DATA

Intertek

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939

DATE: 6/27/11 RUN #: 2 SAMPLE ID #: PRT110617545-001

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 22
CAL VALUE (2) = 22% ACTUAL READING 12

PIECE	LENGTH	READINGS			TYPE
1	24 FT	22.0	20.6	20.4	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: INCHES PRE-BURN FUEL AVG MOISTURE: 21.0

TIME (CLOCK): 0930 ROOM TEMP (F): 70

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: 17.15 ACTUAL LOAD WT: 8.9 (2 X 4)
7.8 (4 X 4)
FUEL PIECE LENGTH: 16 15.7 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	19.9	22.0	20.4	4x4
2	19.7	20.3	20.2	4x4
3	20.7	20.3	20.5	2x4
4	20.1	24.3	220	2x4
5	20.2	20.5	20.8	2x4
6	20.3	18.5	19.8	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 20.58

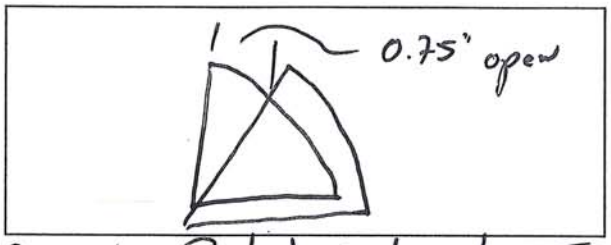
TIME (CLOCK): 0936 ROOM TEMP (F): 70

ENGINEER: [signature] 8/9/11

RUN NOTES

Client: Hearth & Home Technologies
Model: 4100I Project #: G100428939 Sample ID #: PRT1106171545-001
Run #: 2 Booth: 7 Date: 6/27/11
Engineer: B. Davis
Intertek Equipment ID #(s): NA

PREBURN

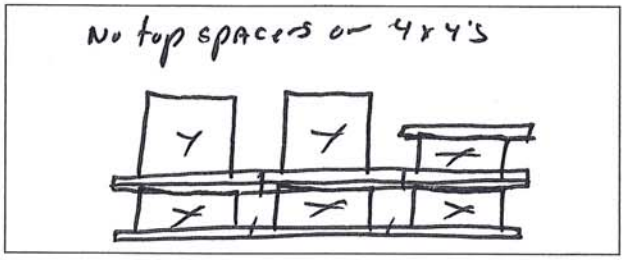


PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on High

Comments: Rated coals at 55 minutes

TEST

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



NA

BYPASS: NA FUEL LOADING: by 43 second DOOR: closed by 55 seconds
PRIMARY AIR: At test setting full 5:00 minutes
OTHER: Timed Air pushed @ 0 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 min. then Turned to high.

Date: 8/9/11

Engineer signature: BD

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 4100I Project #: G100428939 Sample ID #: PRT110617154S-001

Date: 6/27/11 Run #: 2

Start Time: 11:35 Stop Time: 17:55

Intertek Equipment #'s: ETC5-4 P745

Gas Analyzer Train Leak Check:

Stack: Initial: good Final: good

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

Calibrations: Span Gas CO_2: ~~9.89~~ 9.96 O_2: NA CO: 0.97 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	0		EOT						
O_2									
CO_2	0.00	9.96	0.01	9.96					
CO	0.00	.97	0.01	0.97					
CO_2 (DT)	0.00	1.00	0.02	1.00					

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: 6/23/11 Initials: AM

	Initial	Middle	Ending
Pb (in/Hg)	28.35		28.29
Room Temp (°F)	71		74

Date: 8/9/11

Engineer signature: BD

Method 5H Impinger Gravimetric Analysis

Client: _Hearth & Home_____ Model: __4100I_____

Report Number: __G100428939_____ Date: 6/27/11

Test Engineer: __B. Davis_____ Scale ID umber: _____

Audit Weight Number: ~~N/A~~ _____ Run Number: 2

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	844.5	707.5	606.7	991.2
Initial Weight grams	710.0	~~709.0~~ ~~703.4~~ 690.0	605.1	970.0
Net Weight grams	134.5	17.5	1.6	21.2

Total Weight 174.8

Notes: Final 330 Rem 340

Test Engineer: [signature] 8/9/11

Run 3

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/28/2011
Run: 3
Control #: G100428939

Tech: B. Davis

Start	End	Delta T
436.2	362.6	73.6

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	back	right	left	bottom
0	15.9	0.17	10.6	10.13	1.2	330	75	113	0.037	456	597	510	379	239
5	15.1	1.34	10.52	9.04	1.2	364	75	125	0.037	417	555	483	371	236
10	14.1	1.37	15.08	4.45	1.51	456	74	126	0.037	374	532	447	361	227
15	12.6	1.6	15.92	3.38	1.68	502	76	134	0.037	339	546	429	348	218
20	11.5	1.95	15.74	3.21	1.67	503	75	137	0.037	322	560	427	339	210
25	10.1	2.71	15.7	2.49	1.66	506	76	138	0.037	310	579	433	327	203
30	8.8	3.01	16.04	1.85	1.69	509	77	139	0.037	312	593	439	319	198
35	7.6	3.1	15.98	1.82	1.69	506	78	139	0.037	318	610	447	313	195
40	6.5	2.16	15.48	3.26	1.58	491	78	136	0.037	323	630	457	306	193
45	5.6	2.07	14.52	4.31	1.47	473	80	133	0.037	334	645	467	304	192
50	4.9	1.07	13.68	6.15	1.34	449	78	129	0.037	352	657	479	302	192
55	4.3	0.3	12.22	8.38	1.18	423	77	124	0.037	375	658	493	301	193
60	3.9	0.32	11.2	9.38	1.07	395	78	121	0.037	385	646	505	302	194
65	3.5	0.32	10.94	9.64	1.03	380	79	117	0.037	399	632	511	302	196
70	3.1	0.24	10.72	9.94	0.99	370	78	116	0.037	412	622	516	303	198
75	2.7	0.24	10.64	10.02	1.01	365	80	114	0.037	420	614	520	304	201
80	2.4	0.33	9.82	10.75	0.9	353	80	112	0.037	420	611	520	305	202
85	2.2	0.34	9.64	10.92	0.86	344	79	111	0.037	417	602	519	306	203
90	2	0.47	8.64	11.79	0.81	332	79	109	0.037	411	593	515	308	205
95	1.8	0.61	8.14	12.15	0.71	317	71	107	0.037	399	576	506	310	207
100	1.7	0.83	7.72	12.35	0.68	307	79	106	0.037	386	558	495	311	207
105	1.6	0.9	7.68	12.32	0.67	300	78	104	0.037	378	543	486	311	207
110	1.4	0.88	7.7	12.32	0.64	292	78	103	0.037	370	531	471	310	206
115	1.3	0.9	7.62	12.38	0.66	289	78	103	0.037	367	526	461	308	205
120	1.1	0.93	7.48	12.49	0.63	284	78	102	0.037	366	524	452	307	204
125	1	0.98	7.42	12.5	0.62	281	77	101	0.037	364	522	447	306	203
130	0.8	1.02	7.38	12.5	0.63	279	77	101	0.037	361	518	443	304	203
135	0.7	1.11	7.1	12.69	0.6	275	78	100	0.037	357	514	439	302	201
140	0.6	1.25	7	12.65	0.58	273	77	100	0.037	353	510	437	300	200
145	0.4	1.16	6.86	12.88	0.58	271	78	100	0.037	348	504	432	298	200
150	0.3	1.19	6.67	13.04	0.56	268	78	99	0.037	343	499	429	296	198
155	0.2	1.17	6.46	13.27	0.54	263	76	98	0.037	337	493	424	294	197
160	0.1	1.25	6.28	13.37	0.51	261	76	98	0.037	332	487	419	292	193
165	0	1.22	6.06	13.62	0.49	257	78	98	0.037	328	482	415	290	195

Manufacturer: Hearth & Home Technologies

Model: 4100I ACC

Date: 6/28/2011

Run: 3

Control #: G100428939

Tech: B. Davis

-0.057667

DGM Temps. (F) In	DGM Temps. (F) Out	DGM Vol. ft^3	Orifice Meter ΔH (in H_2O)	Tunnel SP (in H_2O)	Impinger Exit	Front Filter	VAC	Draft
69	69	534.1	0.315	-0.49	70	232	0	-0.05
71	71	535.48	0.3040	-0.49	57	233	0	-0.057
71	71	536.78	0.2370	-0.49	56	233	0	-0.071
71	71	538.02	0.2670	-0.49	56	233	0	-0.072
71	71	539.31	0.2690	-0.49	57	233	0	-0.072
71	71	540.67	0.2670	-0.49	58	233	0	-0.072
71	71	541.98	0.2640	-0.49	58	233	0	-0.072
71	71	543.28	0.2650	-0.49	59	233	0	-0.07
72	72	544.61	0.2480	-0.49	59	233	0	-0.07
72	72	545.8	0.2430	-0.49	60	233	0	-0.068
73	73	547.09	0.2290	-0.49	60	233	0	-0.062
73	73	548.25	0.2240	-0.49	61	233	0	-0.061
73	73	549.42	0.2180	-0.49	61	233	0	-0.06
73	73	550.57	0.2130	-0.49	62	233	0	-0.058
73	73	551.73	0.2050	-0.49	60	233	0	-0.055
73	73	552.87	0.2170	-0.49	60	233	0	-0.052
74	74	554	0.2010	-0.49	59	233	0	-0.05
74	74	555.01	0.1900	-0.49	59	233	0	-0.05
74	74	556.12	0.2100	-0.49	61	233	0	-0.048
74	74	557.23	0.1830	-0.49	61	233	0	-0.048
74	74	558.28	0.1840	-0.49	61	233	0	-0.042
75	75	559.31	0.1810	-0.49	62	232	0	-0.042
75	75	560.37	0.1640	-0.49	62	232	0	-0.042
75	75	561.33	0.1780	-0.49	63	232	0	-0.04
75	75	562.33	0.168	-0.49	64	232	0	-0.04
75	75	563.28	0.166	-0.49	64	233	0	-0.04
75	75	564.27	0.173	-0.49	64	232	0	-0.04
75	75	565.37	0.169	-0.49	65	233	0	-0.04
75	75	566.48	0.162	-0.49	64	232	0	-0.04
75	75	567.42	0.168	-0.49	64	232	0	-0.04
75	75	568.28	0.166	-0.49	65	233	0	-0.04
75	75	569.32	0.164	-0.49	65	232	0	-0.04
76	76	570.38	0.154	-0.49	66	233	0	-0.038
76	76	571.446	0.151	-0.49	66	232	0	-0.038

Manufacturer: Hearth & Home Technologies
Model: 4100I ACC
Date: 6/28/2011
Run: 3
Control #: G100428939 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			
13.790	**134.384**	**8.467**	**0.999**	**0.210**	**2.830**	100.6%	12.55	

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
13.790	134.655		1.000	0.3151									14.860	0.067
13.790	131.893	16.24774	0.990	0.3133	7.856617	0.0615	1.2777	0.0860	0.0860	12.9750	14.148	100.0%	14.666	0.068
13.790	131.668	15.06367	0.989	0.2439	9.820771	0.0664	1.1991	0.0818	0.1677	13.1339	14.148	95.3%	12.917	0.077
13.790	129.895	21.31222	0.982	0.2674	14.73116	0.0469	1.1437	0.0885	0.2563	8.8547	14.148	103.3%	13.459	0.074
13.790	129.242	15.4892	0.980	0.2694	10.80285	0.0646	1.1898	0.0884	0.3447	12.6748	14.148	103.1%	13.462	0.074
13.790	129.026	18.99412	0.979	0.2665	13.74908	0.0526	1.2544	0.0932	0.4379	10.8969	14.148	108.7%	13.392	0.075
13.790	128.811	17.08326	0.978	0.2639	12.767	0.0585	1.2083	0.0902	0.5281	11.6703	14.148	105.2%	13.327	0.075
13.790	128.811	15.74597	0.978	0.2654	11.78493	0.0635	1.1991	0.0900	0.6181	12.5648	14.148	104.9%	13.377	0.075
13.790	129.459	15.53004	0.981	0.2477	10.80285	0.0644	1.2267	0.0917	0.7098	13.0335	14.148	106.9%	12.958	0.077
13.790	130.114	13.45133	0.983	0.2433	8.838694	0.0743	1.0955	0.0845	0.7943	13.4384	14.148	98.6%	12.898	0.078
13.790	130.998	11.66005	0.986	0.2292	6.87454	0.0858	1.1876	0.0921	0.8864	16.8056	14.148	107.4%	12.537	0.080
13.790	132.119	11.60469	0.991	0.2236	5.892463	0.0862	1.0659	0.0850	0.9714	15.1556	14.148	99.2%	12.425	0.080
13.790	132.801	8.338987	0.993	0.2184	3.928308	0.1199	1.0751	0.0865	1.0579	21.2726	14.148	100.9%	12.322	0.081
13.790	133.722	8.511335	0.997	0.2127	3.928308	0.1175	1.0567	0.0858	1.1437	20.4856	14.148	100.0%	12.212	0.082
13.790	133.954	8.719266	0.997	0.2048	3.928308	0.1147	1.0659	0.0873	1.2310	20.1710	14.148	101.8%	11.984	0.083
13.790	134.421	8.776442	0.999	0.2166	3.928308	0.1139	1.0475	0.0874	1.3184	19.6941	14.148	101.9%	12.370	0.081
13.790	134.891	7.001259	1.001	0.2010	2.946231	0.1428	1.0383	0.0839	1.4023	24.4710	14.148	97.9%	11.937	0.084
13.790	135.127	4.737725	1.002	0.1905	1.964154	0.2111	0.9263	0.0776	1.4799	32.2616	14.148	90.5%	11.619	0.086
13.790	135.602	5.132914	1.004	0.2102	1.964154	0.1948	1.0181	0.0876	1.5676	32.7261	14.148	102.2%	12.227	0.082
13.790	136.080	5.316415	1.005	0.1832	1.964154	0.1881	1.0181	0.0833	1.6508	31.5965	14.148	97.1%	11.348	0.088
13.790	136.321	2.712072	1.006	0.1836	0.982077	0.3687	0.9630	0.0849	1.7357	58.5899	14.148	99.0%	11.458	0.087
13.790	136.804	2.703853	1.008	0.1808	0.982077	0.3698	0.9447	0.0825	1.8181	57.6486	14.148	96.2%	11.379	0.088
13.790	137.047	5.407707	1.009	0.1636	1.964154	0.1849	0.9704	0.0853	1.9034	29.6084	14.148	99.4%	10.834	0.092
13.790	137.047	2.72034	1.009	0.1783	0.982077	0.3676	0.8788	0.0811	1.9845	53.3053	14.148	94.6%	11.309	0.088
13.790	137.291	5.502189	1.010	0.1680	1.964154	0.1817	0.9155	0.0809	2.0655	27.4528	14.148	94.4%	10.989	0.091
13.790	137.536	2.753925	1.011	0.1657	0.982077	0.3631	0.8697	0.0791	2.1446	52.1067	14.148	92.3%	10.912	0.092
13.790	137.536	5.507849	1.011	0.1733	1.964154	0.1816	0.9063	0.0831	2.2277	27.1504	14.148	96.9%	11.159	0.090
13.790	137.781	2.80883	1.012	0.1689	0.982077	0.3560	1.0070	0.0902	2.3179	59.1547	14.148	105.2%	11.037	0.091
13.790	137.781	2.79709	1.012	0.1620	0.982077	0.3575	1.0162	0.0921	2.4100	59.9431	14.148	107.4%	10.799	0.093
13.790	137.781	5.731937	1.012	0.1684	1.964154	0.1745	0.8605	0.0797	2.4897	24.7713	14.148	92.9%	11.021	0.091
13.790	138.028	2.91592	1.012	0.1657	0.982077	0.3429	0.7873	0.0714	2.5611	44.5497	14.148	83.3%	10.941	0.091
13.790	138.275	2.990855	1.013	0.1644	0.982077	0.3344	0.9521	0.0870	2.6481	52.5243	14.148	101.5%	10.888	0.092
13.790	138.275	3.024649	1.013	0.1540	0.982077	0.3306	0.9704	0.0891	2.7373	52.9362	14.148	103.9%	10.538	0.095
13.790	138.275	3.112575	1.013	0.1513	0.982077	0.3213	0.9741	0.0924	2.8297	51.6355	14.148	107.8%	10.464	0.096

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	15.90	W_{wd}
Load Weight (kg wet)	7.214	
Total Test Duration (min)	165	Θ
Total Test Duration (hours)	2.750	
Wood Moisture (Dry Bais)	22.19	%
Wood Moisture (Wet Bais)	18.16	%

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/28/2011
Run: 3
Control #: G100428939
Tech: B. Davis

Dry Burn Rate	2.147	Dry kg/hr
	4.732	Dry Lb/hr

Total Particulate Collected	479.6	mg

Cs	0.0140	g/dscf
Qstd	8058.4	dscf/hr
E	7.09	g/hr

Average Stack Flow (Qf)	8.47	dscf/min
Average Stack Flow (Qf)	508.01	dscf/hr

PARTICULATE CATCH	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.6958	0.6384	57.4	F1
Rear Filter	0.2387	0.1629	75.8	F2
Probe/Front Half Rinse	110.3163	110.2220	94.3	R1
Impinger H2O +Back Rinse	146.6958	146.6088	87	R2
Meth Chlor. Extraction	96.4219	96.3787	43.2	R3
Back Half Acetone Rinse	109.1099	108.9871	122.8	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	105	Va1
Acetone Back Half Rinse	120	Va2
Water- Impingers + Back Half Rinse	275	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.00235	Ba
Water	0.0003	Bw
Methylene Chloride	0.002	B_{DCM}

Total Particulate Collected 479.589 mg

W[illegible]g Record

	PER-TEST INITIAL/TARE WEIGHTS						
DATE						Stable	
TIME						Weights	
Front Filter						0.6384	
Rear Filter						0.1629	
Probe/Front Half Rinse						110.2220	0.0943
Impinger H2O +Back Rinse						146.6088	0.0870
Meth Chlor. Extraction						96.3787	0.0432
Back Half Acetone Rinse						108.9871	0.1228

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6958
Rear Filter						0.2387
Probe/Front Half Rinse						110.3163
Impinger H2O +Back Rinse						146.6958
Meth Chlor. Extraction						96.4219
Back Half Acetone Rinse						109.1099

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:	**28.05**	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	0.042	119	0.2049
A2	0.048	119	0.2191
A3	0.036	118	0.1897
A4	0.026	118	0.1612
B1	0.030	117	0.1732
B2	0.042	117	0.2049
B3	0.042	115	0.2049
B4	0.030	115	0.1732
AVERAGE	0.037	117.25	0.1914

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

1.00 For Pitot Pa

Tunnel V	Tunnel Q
ft/sec	scfm
13.76	133.28

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/28/2011

Run: 3

Control #: G100428939

Test Engineer 

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939 SAMPLE ID#: PRT 110617154 5-001

DATE: 6/28/11 ENGINEER: B Davis RUN #: 3

INTERTEK EQUIPMENT #'s: ETC 7-2

CALCULATED RANGE: 3.2 - 3.9 ACTUAL COAL BED: 3.2

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F)							
				AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	14.0	✓	-.052	73	641	590	499	468	322	NA	358
10	12.0	2.0	-.067	73	511	556	469	431	268		462
20	9.8	2.2	-.062	73	486	559	461	400	242		456
30	7.6	2.2	-.068	76	507	589	480	379	231		486
40	5.6	2.0	-.068	76	509	598	491	377	232		474
50	4.1	1.5	-.0062	76	504	616	512	377	236		463
60	3.3	0.8	-.050	78	466	607	516	382	241		344
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 8/9/11 ENGINEER SIGNATURE: BD

FUEL DATA

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939

DATE: 6/28/11 RUN #: 3 SAMPLE ID #: PRT1106171545-001

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	~~8 24" FT~~ FT	19.9	24.2	22.3	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: ~~3 8~~ 4 & 14 INCHES PRE-BURN FUEL AVG MOISTURE: 22.13

TIME (CLOCK): 0905 ROOM TEMP (F): 70

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: 17.15 ACTUAL LOAD WT: 7.6 (2 X 4)
8.3 (4 X 4)
FUEL PIECE LENGTH: 16 15.9 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	24.5	22.5	23.8	2x4
2	19.0	21.0	22.0	2x4
3	24.2	22.6	23.3	2x4
4	21.9	24.5	21.9	2x4
5	20.5	23.8	19.7	4x4
6	19.2	24.3	18.7	4x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 22.19

TIME (CLOCK): 0905 ROOM TEMP (F): 70

ENGINEER: BD 8/9/11

RUN NOTES

Client: Hearth & Home Technologies
Model: 4100I Project #: G100428939 Sample ID #: PRT110617545-001
Run #: 3 Booth: 1 Date: 6/28/11
Engineer: B. Davis
Intertek Equipment ID #(s): NA

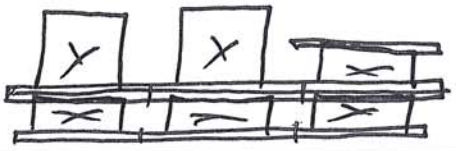
PREBURN

full 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: Raked coals at 54 minutes

TEST

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

	NA

BYPASS: NA FUEL LOADING: By 42 second DOOR: closed by 50 second
PRIMARY AIR: At test setting full side
OTHER: Timed Air Locked open

full open Timed Air Locked open

PRIMARY:
Describe or sketch test settings in the box to the Left. Settings must be accurate and Reproducible.
SECONDARY: fixed
FAN: on for Entire Test

Date: 8/9/11
Engineer signature: BD

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 4100I Project #: G100428939 Sample ID #: PRT/10617545-001

Date: 6/28/11 Run #: 3

Start Time: 1049 Stop Time: 13:24

Intertek Equipment #'s: ETC5-4 19745

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.98 O_2: NA CO: 4.98 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							
O_2							
CO_2	-0.02 | 9.96	0.00 | 9.96					
CO	0.00 | 0.96	0.00 | 0.98					
CO_2 (DT)	0.00 | 1.01	0.00 | 0.97					

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: 6/23/11 Initials: DM

	Initial	Middle	Ending
Pb (in/Hg)	DM ~~28.03~~ 28.05		28.09
Room Temp (°F)	75		78

Date: 8/9/11

Engineer signature: BD

Method 5H Impinger Gravimetric Analysis

Client: _Hearth & Home_____ Model: __4100I_____

Report Number: __G100428939_____ Date: 6/28/11

Test Engineer: __B. Davis_____ Scale ID umber: _____

Audit Weight Number: ___NA_____ Run Number: ___3_____

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	770.0	702.2	605.6	974.6
Initial Weight grams	706.3	693.2	602.5	969.2
Net Weight grams	63.7	9.0	3.1	5.4

Total Weight 81.2

Notes: Fnl ~~340~~ 331 Rem 34

Test Engineer: [signature] 8/9/11

Run 4

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/28/2011
Run: 4
Control #: G100428939

Tech: B. Davis

Start	End	Delta T
325	251.2	73.8

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	back	right	left	bottom
0	15.6	1.21	6.4	13.29	0.4	217	81	95	0.037	295	431	381	323	195
10	14.8	0.74	9.12	11.04	0.69	306	78	102	0.037	248	345	339	315	184
20	13.4	0.86	11.16	8.88	0.88	357	78	109	0.037	212	386	307	297	173
30	11.5	1.15	14.08	5.67	1.17	413	79	115	0.037	208	423	310	278	163
40	10.1	0.69	11.9	8.31	0.88	382	80	112	0.037	211	453	322	264	157
50	8.8	0.92	13.52	6.46	0.97	375	79	111	0.037	217	469	331	251	152
60	7.7	0.55	11.34	9.01	0.79	350	79	108	0.037	224	475	346	242	149
70	6.7	1.06	10.94	8.9	0.74	331	80	106	0.037	230	472	354	234	146
80	5.6	0.73	12.3	7.87	0.87	348	80	107	0.037	241	482	360	228	144
90	4.8	0.45	10.96	9.49	0.75	332	79	105	0.037	246	486	367	224	144
100	4.2	0.92	10.04	9.94	0.66	298	78	102	0.037	251	478	371	222	144
110	3.5	1.17	9.16	10.57	0.61	283	79	100	0.037	261	476	376	221	145
120	3.1	1.09	7.34	12.47	0.47	252	78	97	0.037	276	469	381	222	145
130	2.8	1.26	6.68	12.96	0.4	229	78	94	0.037	280	445	368	225	147
140	2.6	1.36	6.72	12.82	0.38	215	77	92	0.037	274	424	352	226	148
150	2.4	1.37	6.9	12.63	0.39	209	78	91	0.037	271	411	340	227	149
160	2.2	1.31	6.98	12.61	0.39	206	78	90	0.037	273	406	331	228	148
170	2	1.2	6.84	12.86	0.37	197	78	89	0.037	287	407	323	230	148
180	1.8	1.19	6.92	12.79	0.37	196	77	89	0.037	296	407	320	231	148
190	1.7	1.26	6.98	12.66	0.37	194	77	88	0.037	302	406	316	231	147
200	1.5	1.43	6.92	12.55	0.38	193	77	88	0.037	302	403	312	234	146
210	1.3	1.47	7.08	12.35	0.38	193	77	88	0.037	300	399	313	235	147
220	1.1	1.53	6.78	12.59	0.36	190	77	87	0.037	298	391	316	236	148
230	0.9	1.59	6.8	12.51	0.36	188	77	87	0.037	294	382	319	236	148
240	0.8	1.45	6.72	12.73	0.35	186	77	87	0.037	293	375	322	237	149
250	0.6	1.39	6.14	13.37	0.32	182	77	86	0.037	280	369	324	237	150
260	0.4	1.67	5.64	13.59	0.3	180	76	86	0.037	266	361	320	238	149
270	0.3	1.67	5.52	13.71	0.29	176	76	86	0.037	252	348	315	237	148
280	0.2	1.65	5.82	13.43	0.3	173	76	85	0.037	244	337	310	234	136
290	0	1.89	5.74	13.27	0.29	170	76	85	0.037	241	331	307	232	145

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/28/2011

Run: 4

Control #: G100428939

Tech: B. Davis

-0.036833

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		
78	78	571.804	0.397	-0.55	78	232	0	-0.027
79	79	575.24	0.6220	-0.55	55	233	0	-0.047
79	79	579.6	0.6800	-0.55	48	234	0	-0.057
79	79	584.33	0.7600	-0.55	48	233	0	-0.06
79	79	589.27	0.5940	-0.55	49	233	0	-0.057
80	80	593.67	0.5640	-0.55	55	233	0	-0.057
80	80	597.98	0.5270	-0.55	57	234	0	-0.05
80	80	602.13	0.4940	-0.55	59	233	0	-0.05
80	80	606.15	0.5470	-0.55	61	234	0	-0.05
80	80	610.33	0.5090	-0.55	60	233	0	-0.048
80	80	614.42	0.4670	-0.55	60	233	0	-0.042
80	80	618.26	0.4760	-0.55	60	234	0	-0.04
80	80	622.18	0.4290	-0.55	63	233	0	-0.037
80	80	625.93	0.3670	-0.55	56	234	0	-0.03
80	80	629.74	0.3260	-0.55	55	234	0	-0.028
79	79	632.95	0.3270	-0.55	55	233	0	-0.027
79	79	636.25	0.3200	-0.55	55	233	0	-0.023
79	79	639.65	0.2980	-0.55	57	233	0	-0.023
79	79	642.58	0.2910	-0.55	57	233	0	-0.025
79	79	645.67	0.2870	-0.55	58	233	0	-0.022
78	78	648.82	0.3090	-0.55	59	233	0	-0.021
78	78	651.87	0.2955	-0.55	59	233	0	-0.021
78	78	654.97	0.2870	-0.55	60	233	0	-0.022
78	78	658.06	0.2850	-0.55	60	233	0	-0.02
78	78	661.13	0.274	-0.55	60	233	0	-0.02
78	78	664.26	0.2702	-0.55	60	233	0	-0.02
78	78	667.18	0.277	-0.55	62	233	0	-0.02
78	78	670.13	0.268	-0.55	63	234	0	-0.02
77	77	673.07	0.261	-0.55	64	233	0	-0.02
77	77	676.019	0.249	-0.55	64	233	0	-0.02

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/28/2011
Run: 4
Control #: G100428939 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)			
k_p	85.49		P_g	-0.55	(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			
13.560	**136.628**	**5.842**	**1.000**	**0.402**	**12.115**	100.3%	8.09	

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	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
13.560	136.728		1.000	0.3951									7.861	0.127
13.560	135.025	9.661762	0.994	0.6217	3.963012	0.1035	3.1286	0.3980	0.3980	93.9056	121.152	100.0%	9.749	0.103
13.560	133.364	14.17034	0.988	0.6811	6.935271	0.0706	3.9626	0.4065	0.8045	81.0950	121.152	97.3%	10.141	0.099
13.560	131.972	15.50114	0.982	0.7611	9.412153	0.0645	4.2988	0.4239	1.2284	80.4239	121.152	101.5%	10.674	0.094
13.560	132.664	13.58967	0.985	0.5935	6.935271	0.0736	4.4897	0.4206	1.6490	95.8089	121.152	100.7%	9.458	0.106
13.560	132.897	11.13769	0.986	0.5644	6.439894	0.0898	3.9989	0.4228	2.0718	104.1227	121.152	101.2%	9.224	0.108
13.560	133.599	11.24341	0.988	0.5267	5.449141	0.0889	3.9099	0.4239	2.4957	100.8468	121.152	101.5%	8.933	0.112
13.560	134.071	10.13687	0.990	0.4944	4.953765	0.0986	3.7647	0.4214	2.9171	107.7028	121.152	100.9%	8.679	0.115
13.560	133.834	10.3502	0.989	0.5471	5.449141	0.0966	3.6468	0.4202	3.3373	102.1786	121.152	100.6%	9.122	0.110
13.560	134.308	8.485349	0.991	0.5085	3.963012	0.1179	3.7919	0.4157	3.7530	129.5954	121.152	99.5%	8.801	0.114
13.560	135.025	6.597221	0.994	0.4668	2.972259	0.1516	3.7103	0.4216	4.1746	163.0967	121.152	100.9%	8.447	0.118
13.560	135.507	8.112977	0.996	0.4759	3.467635	0.1233	3.4835	0.4124	4.5869	124.5185	121.152	98.7%	8.553	0.117
13.560	136.237	5.53941	0.998	0.4286	1.981506	0.1805	3.5561	0.4158	5.0027	186.1682	121.152	99.5%	8.130	0.123
13.560	136.975	4.374399	1.001	0.3669	1.486129	0.2286	3.4019	0.4184	5.4211	225.5256	121.152	100.2%	7.543	0.133
13.560	137.471	2.872832	1.003	0.3258	0.990753	0.3481	3.4563	0.4582	5.8793	348.8973	121.152	109.7%	7.114	0.141
13.560	137.721	2.815915	1.004	0.3270	0.990753	0.3551	2.9120	0.4093	6.2887	299.8945	121.152	98.0%	7.141	0.140
13.560	137.971	2.810054	1.005	0.3201	0.990753	0.3559	2.9992	0.4200	6.7087	309.5189	121.152	100.5%	7.071	0.141
13.560	138.222	2.885109	1.005	0.2976	0.990753	0.3466	3.0901	0.4370	7.1457	310.6022	121.152	104.6%	6.824	0.147
13.560	138.222	2.863693	1.005	0.2912	0.990753	0.3492	2.6629	0.3902	7.5359	269.6678	121.152	93.4%	6.745	0.148
13.560	138.475	1.412376	1.006	0.2868	0.495376	0.7080	2.8083	0.4164	7.9523	576.6286	121.152	99.7%	6.698	0.149
13.560	138.475	2.792619	1.006	0.3094	0.990753	0.3581	2.8629	0.4274	8.3797	297.2945	121.152	102.3%	6.958	0.144
13.560	138.475	2.736031	1.006	0.2955	0.990753	0.3655	2.7771	0.3991	8.7788	294.3563	121.152	95.5%	6.800	0.147
13.560	138.728	2.804218	1.007	0.2867	0.990753	0.3566	2.8227	0.4151	9.1939	291.9068	121.152	99.4%	6.704	0.149
13.560	138.728	2.781115	1.007	0.2850	0.990753	0.3596	2.8136	0.4197	9.6136	293.3824	121.152	100.5%	6.684	0.150
13.560	138.728	1.422794	1.007	0.2742	0.495376	0.7028	2.7953	0.4182	10.0318	569.7586	121.152	100.1%	6.557	0.153
13.560	138.982	3.05137	1.008	0.2698	0.990753	0.3277	2.8500	0.4347	10.4665	270.8594	121.152	104.0%	6.510	0.154
13.560	138.982	3.129157	1.008	0.2774	0.990753	0.3196	2.6588	0.4084	10.8749	246.4052	121.152	97.8%	6.595	0.152
13.560	138.982	1.586641	1.008	0.2683	0.495376	0.6303	2.6861	0.4073	11.2822	490.9507	121.152	97.5%	6.485	0.154
13.560	139.237	1.536099	1.009	0.2609	0.495376	0.6510	2.6770	0.4128	11.6950	505.3852	121.152	98.8%	6.401	0.156
13.560	139.237	3.017276	1.009	0.2485	0.990753	0.3314	2.6902	0.4203	12.1152	258.5605	121.152	100.6%	6.247	0.160

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	15.60	W_{wd}
Load Weight (kg wet)	7.078	
Total Test Duration (min)	290	Θ
Total Test Duration (hours)	4.833	
Wood Moisture (Dry Bais)	21.12	%
Wood Moisture (Wet Bais)	17.44	%

Manufacturer:	Hearth & Home Technologies
Model:	4100I
Date:	6/28/2011
Run:	4
Control #:	G100428939
Tech:	B. Davis

Dry Burn Rate	1.209	Dry kg/hr
	2.665	Dry Lb/hr

Total Particulate Collected	1094.4	mg

Cs	0.0115	g/dscf
Qstd	8195.3	dscf/hr
E	4.04	g/hr

Average Stack Flow (Qf)	5.84	dscf/min
Average Stack Flow (Qf)	350.52	dscf/hr

PARTICULATE CATCH

	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.7099	0.6348	75.1	F1
Rear Filter	0.3655	0.1624	203.1	F2
Probe/Front Half Rinse	97.4021	97.2585	143.6	R1
Impinger H2O +Back Rinse	142.5850	142.4036	181.4	R2
Meth Chlor. Extraction	96.2942	96.0386	255.6	R3
Back Half Acetone Rinse	100.7472	100.5107	236.5	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	75	Va1
Acetone Back Half Rinse	125	Va2
Water- Impingers + Back Half Rinse	375	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.00235	Ba
Water	0.0003	Bw
Methylene Chloride	0.002	B_{DCM}

Total Particulate Collected 1094.4 mg

We g Record

	PER-TEST INITIAL/TARE WEIGHTS						
DATE						Stable	
TIME						Weights	
Front Filter						0.6348	
Rear Filter						0.1624	
Probe/Front Half Rinse						97.2585	0.1436
Impinger H2O +Back Rinse						142.4036	0.1814
Meth Chlor. Extraction						96.0386	0.35
Back Half Acetone Rinse						100.5107	

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.7099
Rear Filter						0.3655
Probe/Front Half Rinse						97.4021
Impinger H2O +Back Rinse						142.5850
Meth Chlor. Extraction						96.2942
Back Half Acetone Rinse						100.7472

Test Engineer

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	**-0.55**	in H2O (enter as negative value e.g. -0.12)
Barometer:	**28.09**	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	0.030	95	0.1732
A2	0.042	95	0.2049
A3	0.044	95	0.2098
A4	0.028	95	0.1673
B1	0.038	95	0.1949
B2	0.048	95	0.2191
B3	0.036	95	0.1897
B4	0.026	95	0.1612
AVERAGE	0.037	95	0.1900

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

1.00 For Pitot Pa

Tunnel V	Tunnel Q
ft/sec	scfm
13.39	135.03

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/28/2011

Run: 4

Control #: G100428939

Test Engineer 

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939 SAMPLE ID#: PRT110617545-001

DATE: 6/28/11 ENGINEER: B Davis RUN #: 4

INTERTEK EQUIPMENT #'s: ETC7-2

CALCULATED RANGE: 3.2 – 3.9 ACTUAL COAL BED: 3.9

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F)							
				AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	6.7	—	-.060	83	725	628	531	474	352		463
10	5.7	1.0	-.050	82	529	620	532	426	426		348
20	5.1	0.6	-.042	82	434	572	493	391	~~390~~ 251		309
30	4.6	0.5	-.042	81	376	529	456	361	229		314
40	4.2	0.4	-.032	80	340	498	425	340	285		258
50	4.1	0.1	-.030	81	318	464	404	328	205		228
60	3.9	0.2	-.027	81	297	434	383	323	196		223
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

97

DATE: 8/9/11 ENGINEER SIGNATURE: BD

FUEL DATA

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939

DATE: 6/28/11 RUN #: 4 SAMPLE ID #: PRT1106171545-004

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~~	21.4	23.0	23.8	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3@8" INCHES PRE-BURN FUEL AVG MOISTURE: 22.73

TIME (CLOCK): 1430 ROOM TEMP (F): ~~75~~

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: 17.15 ACTUAL LOAD WT: 8.3 (2 X 4)
7.3 (4 X 4)
15.6 TOTAL

FUEL PIECE LENGTH: 16

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	21.3	20.1	21.0	2x4
2	21.2	21.1	20.6	2x4
3	20.5	24.1	20.3	2x4
4	21.1	20.6	21.3	2x4
5	21.5	21.4	19.4	4x4
6	19.7	21.9	23.1	4x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 21.12

TIME (CLOCK): 1430 ROOM TEMP (F): 75

ENGINEER: [signature] 8/9/11

Intertek

RUN NOTES

Client: Hearth & Home Technologies
Model: 4100I Project #: G100428939 Sample ID #: PRT 110671545-001
Run #: 4 Booth: 7 Date: 6/27/11
Engineer: B. Davis
Intertek Equipment ID #(s): NA

PREBURN

fully open

Timed Air Not Used

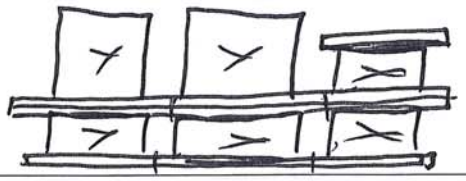
PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on high

Comments: 58 minutes rated coals

TEST

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

No Top Spacers on 4x4's



NA

BYPASS: NA FUEL LOADING: by 46 seconds DOOR: closed by 58 seconds
PRIMARY AIR: fully open for entire test
OTHER: Timed Air pushed @ 8 minute

fully

PRIMARY:
Describe or sketch test settings in the box to the Left. Settings must be accurate and Reproducible.
SECONDARY: fixed
FAN: On high entire test

Date: 8/9/11

Engineer signature: BD

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 4100I Project #: G100428939 Sample ID #: PRT 110617154 5-001

Date: 6/28/11 Run #: 4

Start Time: 15:30 Stop Time: 20:20

Intertek Equipment #'s: ETC5-4 19745

Gas Analyzer Train Leak Check:

Stack: Initial: good Final: good

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

Calibrations: Span Gas CO_2: 9.98 O_2: N/A CO: .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	9.98	0.00	9.96					
CO	0.00	0.98	0.00	0.98					
CO_2 (DT)	0.00	0.97	0.00	0.99					

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: 6/23/11 Initials: DA

	Initial	Middle	Ending
Pb (in/Hg)	28.09		28.07
Room Temp (°F)	81		76

Date: 8/9/11

Engineer signature: [signature]

Method 5H Impinger Gravimetric Analysis

Client: _Hearth & Home_____ Model: __4100l_____

Report Number: __G100428939_____ Date: 6/28/11

Test Engineer: __B. Davis_____ Scale ID umber: _____

Audit Weight Number: ____NA____ Run Number: 4

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	859.8	711.6	607.7	992.6
Initial Weight grams	710.2	691.2	604.0	974.1
Net Weight grams	149.6	20.4	3.7	18.5

Total Weight 192.2

Notes: F = 332 R = 342

Test Engineer: BD 8/3/11

Run 5

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/30/2011
Run: 5
Control #: G100428939

Tech: B. Davis

Start	End	Delta T
308.2	246.6	61.6

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	back	right	left	bottom
0	16	0.89	6.82	13.19	0.45	213	73	90	0.039	278	424	361	296	182
10	14.6	0.58	9.4	10.92	0.67	335	73	102	0.039	321	400	340	362	296
20	12.9	1.008	15.4	4.492	1.25	426	73	113	0.039	325	424	334	389	323
30	11.1	0.4	11.06	9.44	1	423	73	112	0.039	346	470	361	399	333
40	9.8	0.36	10.1	10.44	0.75	362	75	106	0.039	268	465	361	310	190
50	8.9	0.54	10.58	9.78	0.72	334	75	104	0.039	251	454	347	280	171
60	7.6	1.16	12.02	7.72	0.9	345	75	104	0.039	237	479	356	254	157
70	6.6	1.15	11.06	8.69	0.77	324	75	100	0.039	249	496	362	240	150
80	5.6	0.93	11.34	8.63	0.76	316	76	99	0.039	262	509	373	229	146
90	4.7	0.64	10.46	9.8	0.69	304	76	97	0.039	272	518	379	221	144
100	4	0.51	10.06	10.33	0.68	292	76	95	0.039	288	518	381	216	142
110	3.5	0.99	8.1	11.81	0.52	258	75	92	0.039	304	505	376	212	141
120	3.1	0.85	8.22	11.83	0.5	250	75	90	0.039	302	493	368	211	140
130	2.8	1.06	7.36	12.48	0.44	236	75	89	0.039	298	484	356	209	140
140	2.6	1.57	5.82	13.51	0.34	215	74	88	0.039	288	459	341	208	139
150	2.4	1.61	5.82	13.47	0.33	202	74	86	0.039	272	427	328	209	138
160	2.2	1.9	4.84	14.16	0.27	191	75	85	0.039	258	397	316	209	138
170	2.1	2.18	4.54	14.18	0.25	183	75	84	0.039	245	374	307	208	137
180	2	2.11	4.62	14.17	0.25	177	75	84	0.039	234	355	299	205	136
190	1.8	1.95	5.36	13.59	0.27	174	75	83	0.039	227	341	292	201	135
200	1.7	1.85	5.46	13.59	0.28	174	75	82	0.039	226	335	291	198	134
210	1.5	1.95	5.96	12.99	0.31	174	75	82	0.039	230	332	292	196	133
220	1.3	2.04	5.8	13.06	0.3	174	75	82	0.038	239	332	295	196	134
230	1.2	1.63	5.92	13.35	0.3	174	75	82	0.038	243	335	294	197	134
240	1	1.63	6.04	13.23	0.31	174	76	82	0.039	246	341	291	197	135
250	0.8	1.6	5.92	13.38	0.31	174	75	82	0.039	252	348	289	198	135
260	0.7	1.74	5.66	13.5	0.29	172	75	82	0.039	254	361	286	200	136
270	0.5	1.91	5.5	13.49	0.28	169	75	82	0.039	253	359	282	202	137
280	0.4	2.02	5.32	13.56	0.27	169	75	82	0.039	251	345	278	203	136
290	0.2	2.09	5	13.81	0.25	166	75	82	0.039	249	339	274	203	137
300	0.1	1.99	4.74	14.17	0.25	164	75	82	0.039	245	331	270	203	136
310	0	1.85	4.86	14.19	0.24	162	75	81	0.039	240	324	264	202	137

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/30/2011

Run: 5

Control #: G100428939

Tech: B. Davis

-0.0325

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		
70	70	676.3	0.402	-0.54	77	233	0	-0.023
70	70	679.65	0.4830	-0.54	53	232	0	-0.05
71	71	683.05	0.6430	-0.54	53	232	0	-0.057
71	71	687.09	0.7890	-0.54	52	233	0	-0.056
71	71	692.06	0.5200	-0.54	54	232	0	-0.05
72	72	695.53	0.4400	-0.54	57	232	0	-0.045
72	72	698.94	0.5400	-0.54	58	232	0	-0.042
72	72	703.02	0.4660	-0.54	58	232	0	-0.041
73	73	706.64	0.4320	-0.54	59	232	0	-0.04
73	73	710.56	0.4160	-0.54	60	232	0	-0.04
73	73	714.25	0.4380	-0.54	60	233	0	-0.038
74	74	718.18	0.3860	-0.54	62	233	0	-0.038
74	74	721.8	0.3450	-0.54	62	233	0	-0.03
74	74	725.02	0.3280	-0.54	64	232	0	-0.028
74	74	728.23	0.3000	-0.54	65	233	0	-0.028
74	74	731.4	0.2800	-0.54	54	232	0	-0.022
74	74	734.5	0.2590	-0.54	52	232	0	-0.022
74	74	737.08	0.2480	-0.54	53	232	0	-0.02
74	74	739.63	0.2390	-0.54	54	233	0	-0.018
75	75	742.34	0.2120	-0.54	55	232	0	-0.02
75	75	744.76	0.2220	-0.54	55	233	0	-0.018
75	75	747.25	0.2350	-0.54	56	233	0	-0.018
75	75	749.78	0.2240	-0.54	56	233	0	-0.018
75	75	752.38	0.2150	-0.54	56	232	0	-0.018
75	75	754.88	0.228	-0.54	57	232	0	-0.018
75	75	757.38	0.2378	-0.54	58	233	0	-0.018
75	75	759.95	0.224	-0.54	58	233	0	-0.015
75	75	762.53	0.219	-0.54	59	233	0	-0.015
75	75	765	0.216	-0.54	60	233	0	-0.015
75	75	767.52	0.2046	-0.54	61	233	0	-0.015
76	76	770.05	0.228	-0.54	61	233	0	-0.015
76	76	772.549	0.1974	-0.54	61	232	0	-0.015

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 6/30/2011
Run: 5
Control #: G100428939 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)	P_g	-0.64	(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 = **11.280**

13.838	**140.926**	**5.802**	**0.999**	**0.338**								100.7%	8.22	
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
13.849	141.047		1.000	0.4014									8.647	0.116
13.849	138.035	16.4608	0.989	0.4827	6.824275	0.0608	3.0992	0.3584	0.3584	58.3656	112.804	100.0%	9.373	0.107
13.849	135.385	12.74062	0.980	0.6430	8.28662	0.0785	3.1454	0.3356	0.6940	76.5335	112.804	92.2%	10.714	0.093
13.849	135.622	18.71298	0.981	0.7895	8.774068	0.0534	3.7305	0.3482	1.0422	61.7992	112.804	95.7%	11.882	0.084
13.849	137.059	14.6622	0.986	0.5240	6.336827	0.0682	4.5892	0.3862	1.4284	97.0290	112.804	106.1%	9.749	0.103
13.849	137.545	9.612212	0.988	0.4397	4.387034	0.1040	3.2041	0.3287	1.7571	103.3357	112.804	90.3%	8.947	0.112
13.849	137.545	11.91178	0.988	0.5425	6.336827	0.0840	3.1428	0.3513	2.1084	81.7909	112.804	96.5%	9.938	0.101
13.849	138.528	9.819818	0.991	0.4664	4.874482	0.1018	3.7603	0.3784	2.4867	118.7091	112.804	104.0%	9.247	0.108
13.849	138.776	9.776463	0.992	0.4316	4.874482	0.1023	3.3364	0.3608	2.8476	105.7923	112.804	99.2%	8.911	0.112
13.849	139.274	9.627691	0.994	0.4158	4.387034	0.1039	3.6061	0.4047	3.2522	116.1116	112.804	111.2%	8.763	0.114
13.849	139.776	7.821993	0.995	0.4376	3.412137	0.1278	3.3945	0.3874	3.6396	134.5304	112.804	106.5%	9.006	0.111
13.849	140.536	6.381467	0.998	0.3855	2.437241	0.1567	3.6153	0.4014	4.0410	175.6239	112.804	110.3%	8.468	0.118
13.849	141.047	5.115	1.000	0.3454	1.949793	0.1955	3.3239	0.3925	4.4335	201.4468	112.804	107.9%	8.029	0.125
13.849	141.304	4.092263	1.001	0.3279	1.462345	0.2444	2.9566	0.3682	4.8018	223.9700	112.804	101.2%	7.831	0.128
13.849	141.561	3.050795	1.002	0.2997	0.974896	0.3278	2.9474	0.3764	5.1782	299.4950	112.804	103.4%	7.487	0.134
13.849	142.080	3.036849	1.004	0.2815	0.974896	0.3293	2.9107	0.3888	5.5669	297.1212	112.804	106.8%	7.269	0.138
13.849	142.341	3.296827	1.005	0.2593	0.974896	0.3033	2.8464	0.3916	5.9585	267.6474	112.804	107.6%	6.990	0.143
13.849	142.602	1.652514	1.005	0.2476	0.487448	0.6051	2.3689	0.3389	6.2975	444.3980	112.804	93.1%	6.836	0.146
13.849	142.602	1.650461	1.005	0.2390	0.487448	0.6059	2.3414	0.3425	6.6400	439.7769	112.804	94.1%	6.717	0.149
13.849	142.865	3.079076	1.006	0.2119	0.974896	0.3248	2.4883	0.3705	7.0105	250.5223	112.804	101.8%	6.330	0.158
13.849	143.129	1.539538	1.007	0.2223	0.487448	0.6495	2.2179	0.3504	7.3608	446.5910	112.804	96.3%	6.489	0.154
13.849	143.129	2.878919	1.007	0.2346	0.974896	0.3474	2.2820	0.3517	7.7125	245.7281	112.804	96.6%	6.666	0.150
13.671	141.282	2.90092	0.994	0.2243	0.974896	0.3447	2.3187	0.3478	8.0603	247.7820	112.804	95.6%	6.518	0.153
13.671	141.282	1.497882	0.994	0.2152	0.487448	0.6676	2.3828	0.3656	8.4259	493.1520	112.804	100.5%	6.385	0.157
13.849	143.129	2.955776	1.007	0.2280	0.974896	0.3383	2.2912	0.3589	8.7848	240.2999	112.804	98.6%	6.577	0.152
13.849	143.129	3.005931	1.007	0.2378	0.974896	0.3327	2.2912	0.3483	9.1331	236.2904	112.804	95.7%	6.711	0.149
13.849	143.129	1.523648	1.007	0.2239	0.487448	0.6563	2.3554	0.3509	9.4841	479.2183	112.804	96.4%	6.513	0.154
13.849	143.129	3.043806	1.007	0.2190	0.974896	0.3285	2.3645	0.3631	9.8471	240.8173	112.804	99.8%	6.442	0.155
13.849	143.129	1.534205	1.007	0.2156	0.487448	0.6518	2.2637	0.3514	10.1985	457.4026	112.804	96.6%	6.390	0.156
13.849	143.129	3.159623	1.007	0.2046	0.974896	0.3165	2.3095	0.3614	10.5600	226.5950	112.804	99.3%	6.225	0.161
13.849	143.129	1.650461	1.007	0.2278	0.487448	0.6059	2.3187	0.3725	10.9324	435.5121	112.804	102.4%	6.569	0.152
13.849	143.393	1.654572	1.008	0.1974	0.487448	0.6044	2.2860	0.3480	11.2804	428.3064	112.804	95.6%	6.121	0.163

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	16.00	W_{wd}
Load Weight (kg wet)	7.260	
Total Test Duration (min)	310	Θ
Total Test Duration (hours)	5.167	
Wood Moisture (Dry Bais)	23.09	%
Wood Moisture (Wet Bais)	18.76	%

Manufacturer:	Hearth & Home Technologies
Model:	4100I
Date:	6/30/2011
Run:	5
Control #:	G100428939
Tech:	B. Davis

Dry Burn Rate	1.141	Dry kg/hr
	2.516	Dry Lb/hr

PARTICULATE CATCH	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.6817	0.6349	46.8	F1
Rear Filter	0.2555	0.1636	91.9	F2
Probe/Front Half Rinse	108.7414	108.6375	103.9	R1
Impinger H2O +Back Rinse	150.4853	150.2809	204.4	R2
Meth Chlor. Extraction	96.8276	96.7319	95.7	R3
Back Half Acetone Rinse	103.1255	102.9939	131.6	R4

Total Particulate Collected	673.4	mg

Cs	0.0076	g/dscf
Qstd	8450.9	dscf/hr
E	2.64	g/hr

Average Stack Flow (Qf)	5.80	dscf/min
Average Stack Flow (Qf)	348.09	dscf/hr

Solvent Volumes	(ml)	
Acetone Front Half Rinse	100	Va1
Acetone Back Half Rinse	125	Va2
Water- Impingers + Back Half Rinse	330	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.00235	Ba
Water	0.0003	Bw
Methylene Chloride	0.002	B_{DCM}

Total Particulate Collected 673.372 mg

W[illegible]g Record

PER-TEST INITIAL/TARE WEIGHTS							
DATE						Stable	
TIME						Weights	
Front Filter						0.6349	
Rear Filter						0.1636	
Probe/Front Half Rinse						108.6375	0.1039
Impinger H2O +Back Rinse						150.2809	0.2044
Meth Chlor. Extraction						96.7319	0.0957
Back Half Acetone Rinse						102.9939	0.1316

POST-TEST FINAL WEIGHTS						
DATE						Stable
TIME						Weights
Front Filter						0.6817
Rear Filter						0.2555
Probe/Front Half Rinse						108.7414
Impinger H2O +Back Rinse						150.4853
Meth Chlor. Extraction						96.8276
Back Half Acetone Rinse						103.1255

Test Engineer

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	-0.64	in H2O (enter as negative value e.g. -0.12)
Barometer:	28.11	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	0.040	88	0.2000
A2	0.046	88	0.2145
A3	0.042	88	0.2049
A4	0.030	88	0.1732
B1	0.028	87	0.1673
B2	0.038	87	0.1949
B3	0.048	87	0.2191
B4	0.040	87	0.2000
AVERAGE	0.039	87.5	0.1967

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

1.00 For Pitot Pa

Tunnel V	Tunnel Q
ft/sec	scfm
13.76	140.79

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 6/30/2011

Run: 5

Control #: G100428939

Test Engineer

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939 SAMPLE ID#: PRT 1106/7/540 mod

DATE: 6/29/11 ENGINEER: B Davis RUN #: 5

INTERTEK EQUIPMENT #'s: ETC 2

CALCULATED RANGE: 3.2 - 4.0 ACTUAL COAL BED: 3.9

TIME	FUEL WT.	DELTA WT.	STACK DRAFT	TEMPERATURES (F)							
				AMBIENT	LEFT	RIGHT	BOTTOM	BACK	TOP	CATALYST	FLUE
0	6.6	/	-.050	77	748	679	534	494	369	NA	428
10	5.7	1.1	-.042	76	531	636	529	424	279		323
20	5.1	0.6	-.038	73	431	580	485	389	248		289
30	4.7	0.4	-.037	73	367	533	443	357	223		270
40	4.3	0.4	-.032	73	333	502	417	334	207		274
50	4.1	0.2	-.024	72	304	462	391	312	194		225
60	3.9	0.2	-.021	72	283	431	366	299	184		205
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 8/9/11 ENGINEER SIGNATURE: [signature] 8/9/11

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 7/14/2011

Run: 6

Control #: G100428939

Tech: B. Davis

-0.046

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		
69	69	772.9	0.405	-0.58	75	233	0	-0.061
69	69	776.38	0.6440	-0.58	53	232	0	-0.06
69	69	780.75	0.7800	-0.58	50	232	0	-0.06
69	69	785.68	0.7200	-0.58	58	233	0	-0.06
69	69	790.44	0.6110	-0.58	63	233	0	-0.062
70	70	795.11	0.5240	-0.58	65	233	0	-0.062
70	70	799.17	0.5100	-0.58	63	232	2	-0.062
71	71	803.15	0.4900	-0.58	63	233	2	-0.062
71	71	807.15	0.4300	-0.58	62	232	2	-0.063
71	71	811.07	0.4300	-0.58	60	232	2	-0.062
71	71	814.55	0.3780	-0.58	59	232	2	-0.032
71	71	817.95	0.3530	-0.58	59	232	2	-0.032
71	71	821.37	0.3230	-0.58	59	232	2	-0.032
71	71	824.52	0.3240	-0.58	59	232	2	-0.032
71	71	827.66	0.3130	-0.58	60	232	2	-0.032
72	72	830.54	0.3190	-0.58	61	232	2	-0.033
72	72	833.65	0.3050	-0.58	61	232	2	-0.032
72	72	836.95	0.2830	-0.58	61	232	2	-0.032
72	72	839.75	0.2790	-0.58	62	232	2	-0.031
72	72	842.58	0.2820	-0.58	62	232	2	-0.032
72	72	845.42	0.2600	-0.58	63	232	2	-0.032

Manufacturer: Hearth & Home Technologies
Model: 4100I
Date: 7/14/2011
Run: 6
Control #: G100428939 Tech: B. Davis

C_F	1.0000	Pitot Center Correction (Tunnel Traverse)	P_g	-0.58	(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			
13.564	**136.638**	**7.684**	**0.991**	**0.427**	**6.738**	100.1%	9.89	

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
13.564	139.238		1.000	0.4054									9.859	0.101
13.564	134.117	13.05835	0.981	0.6442	6.932409	0.0766	3.2510	0.3297	0.3297	49.7926	67.384	100.0%	12.192	0.082
13.564	129.798	17.89623	0.966	0.7812	11.88413	0.0559	4.0825	0.3348	0.6646	45.6241	67.384	99.4%	13.220	0.076
13.564	129.141	19.62369	0.963	0.7219	13.36965	0.0510	4.6057	0.3484	1.0130	46.9397	67.384	103.4%	12.701	0.079
13.564	131.131	16.60116	0.970	0.6114	9.903441	0.0602	4.4468	0.3501	1.3631	53.5726	67.384	103.9%	11.789	0.085
13.564	132.264	14.04996	0.975	0.5239	7.922753	0.0712	4.3628	0.3701	1.7332	62.1035	67.384	109.8%	10.960	0.091
13.564	133.649	11.39402	0.980	0.5100	5.446893	0.0878	3.7857	0.3454	2.0786	66.4512	67.384	102.5%	10.880	0.092
13.564	134.825	10.17342	0.984	0.4922	4.456549	0.0983	3.7111	0.3411	2.4197	72.9575	67.384	101.2%	10.726	0.093
13.564	135.541	6.05235	0.987	0.4331	2.47586	0.1652	3.7228	0.3471	2.7668	123.0187	67.384	103.0%	10.078	0.099
13.564	136.507	7.816645	0.990	0.4310	2.971032	0.1279	3.6483	0.3620	3.1288	93.3471	67.384	107.4%	10.100	0.099
13.564	137.488	4.298325	0.994	0.3779	1.485516	0.2326	3.2388	0.3207	3.4494	150.7007	67.384	95.2%	9.490	0.105
13.564	140.773	4.289218	1.005	0.3532	1.485516	0.2331	3.1643	0.3334	3.7829	147.5489	67.384	99.0%	9.284	0.108
13.564	138.733	4.257647	0.998	0.3225	1.485516	0.2349	3.1830	0.3428	4.1257	149.5174	67.384	101.8%	8.807	0.114
13.564	138.985	4.289218	0.999	0.3239	1.485516	0.2331	2.9317	0.3329	4.4586	136.6997	67.384	98.8%	8.826	0.113
13.564	139.238	2.915063	1.000	0.3128	0.990344	0.3430	2.9224	0.3311	4.7897	200.5012	67.384	98.3%	8.689	0.115
13.564	139.238	2.940466	1.000	0.3188	0.990344	0.3401	2.6804	0.3085	5.0982	182.3105	67.384	91.6%	8.772	0.114
13.564	139.491	2.992625	1.001	0.3049	0.990344	0.3342	2.8890	0.3294	5.4276	193.0751	67.384	97.8%	8.586	0.116
13.564	139.746	3.102699	1.002	0.2826	0.990344	0.3223	3.0655	0.3570	5.7846	197.6025	67.384	106.0%	8.274	0.121
13.564	139.746	3.120634	1.002	0.2791	0.990344	0.3204	2.6010	0.3144	6.0990	166.6992	67.384	93.3%	8.214	0.122
13.564	139.746	3.21734	1.002	0.2822	0.990344	0.3108	2.6289	0.3200	6.4190	163.4209	67.384	95.0%	8.260	0.121
13.564	140.001	1.597247	1.003	0.2612	0.495172	0.6261	2.6382	0.3194	6.7384	330.3424	67.384	94.8%	7.954	0.126

Intertek

EPA Method 5H Spreadsheet

V1.2 R. Curkeet 2/18/2010

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 7/14/2011

Run: 6

Control #: G100428939

Tech: B. Davis

Start	End	Delta T
349.8	283.4	66.4

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	back	right	left	bottom
0	15.7	0.69	7.18	13.03	0.54	231	70	90	0.037	319	478	410	343	199
10	14.3	1.17	11.98	7.75	1.12	398	69	111	0.037	272	435	362	331	189
20	11.9	1.96	14.82	4.12	1.54	494	70	130	0.037	269	473	339	309	175
30	9.2	2.31	14.94	3.65	1.5	496	72	133	0.037	290	533	357	288	166
40	7.2	1.38	13.56	5.96	1.25	446	73	124	0.037	302	582	385	274	162
50	5.6	0.91	13.14	6.85	1.12	416	73	119	0.037	320	604	407	263	160
60	4.5	0.67	11.04	9.19	0.93	372	74	113	0.037	351	610	426	257	160
70	3.6	0.58	10.04	10.28	0.83	343	73	108	0.037	371	600	438	254	161
80	3.1	0.57	9.26	11.07	0.72	322	72	105	0.037	376	579	440	252	163
90	2.5	0.68	8.36	11.86	0.65	306	73	101	0.037	370	557	439	251	165
100	2.2	0.88	7.22	12.8	0.53	269	73	97	0.037	358	531	427	251	166
110	1.9	1.02	7.1	12.78	0.5	253	73	84	0.037	348	510	416	250	167
120	1.6	1.13	7.06	12.71	0.48	245	73	92	0.037	338	492	407	250	167
130	1.3	1.22	6.9	12.78	0.47	237	72	91	0.037	331	478	402	249	167
140	1.1	1.24	6.7	12.96	0.45	231	73	90	0.037	324	466	398	249	166
150	0.9	1.54	6.32	13.04	0.43	227	73	90	0.037	316	453	396	248	166
160	0.7	1.72	5.98	13.2	0.4	223	73	89	0.037	308	441	393	246	165
170	0.5	1.84	5.54	13.52	0.36	216	73	88	0.037	296	425	384	243	161
180	0.3	1.75	5.58	13.57	0.36	214	72	88	0.037	287	417	379	241	160
190	0.1	1.69	5.38	13.83	0.35	210	72	88	0.037	277	409	370	237	158
200	0	1.71	5.42	13.77	0.34	208	72	87	0.037	269	400	361	233	154

Run 6

Intertek

RUN NOTES

Client: Hearth & Home Technologies
Model: 4100I Project #: G100428939 Sample ID #: PRT 110617154 5-001
Run #: 5 Booth: 1 Date: 6/29/11
Engineer: B. Davis
Intertek Equipment ID #(s): NA

PREBURN

Primary Air full open

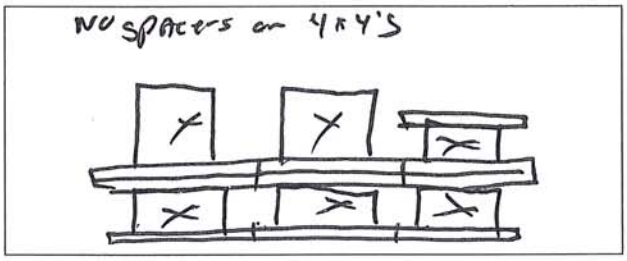
Timed Air Not used

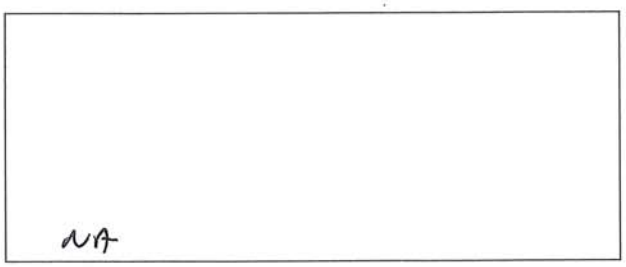
PRIMARY:
Describe or sketch air or thermostat settings in the box to the left. Settings must be accurate and reproducible.
SECONDARY: fixed
FAN: on high

Comments: Rated coals @ 58 minutes

TEST

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





BYPASS: NA FUEL LOADING: by 50 seconds DOOR: cracked open until 4:00
PRIMARY AIR: At test setting full 5:00
OTHER: Rear Air open during 5:00 closed @ 5:00 minutes
Timed air used @ 5:00

Primary Air fully open

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: 8/9/11

Engineer signature: B Davis

FUEL DATA

CLIENT: Hearth & Home Technologies MODEL: 4100I PROJECT #: G100428939

DATE: 6/29/11 RUN #: 5 SAMPLE ID #: PRT 1106171545-001

INTERTEK EQUIPMENT #'s: FTC-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	22.8	23.8	24.5	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3 @ 8" INCHES PRE-BURN FUEL AVG MOISTURE: 23.7

TIME (CLOCK): 0830 ROOM TEMP (F): 68

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: 17.15 ACTUAL LOAD WT: 7.7 (2 X 4)
8.3 (4 X 4)
FUEL PIECE LENGTH: 16 16.0 TOTAL

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	23.3	24.6	23.2	2x4
2	21.4	24.6	24.7	2x4
3	22.7	23.3	23.8	2x4
4	23.8	24.7	25.5	2x4
5	20.2	21.5	22.0	4x4
6	21.9	19.5	24.9	4x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 23.09

TIME (CLOCK): 0830 ROOM TEMP (F): 68

ENGINEER: [signature] 8/9/11

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 4100I Project #: G100428939 Sample ID #: PRT 1061715 45-001

Date: 6/29/11 Run #: 5

Start Time: 10:05 Stop Time: 15:15

Intertek Equipment #'s: ERG-4 19745

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.9% O_2: NA CO: 0.97 CO_2(DT): 4.10

	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							
CO_2	0.00 | 9.96	0.00 | 9.98					
CO	0.00 | 0.96	0.00 | 0.98					
CO_2 (DT)	0.00 | 4.1	0.00 | 4.11					

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: 6/23/11 Initials: BK

	Initial	Middle	Ending
Pb (in/Hg)	28.11		28.10
Room Temp (°F)	73		73

Date: 8/10/11

Engineer signature: BK

Method 5H Impinger Gravimetric Analysis

Client: _Hearth & Home_____ Model: __4100I_____

Report Number: __G100428939_____ Date: 6/29/11

Test Engineer: __B. Davis_____ Scale ID umber: _____

Audit Weight Number: NA Run Number: 5

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	833.1	702.7	607.9	997.1
Initial Weight grams	707.7	692.3	604.0	992.2
Net Weight grams	125.4	10.4	3.9	4.9

Total Weight 144.6

Notes: Rev 343

Test Engineer: DD 8/9/11

Intertek

EPA Method 5H Spreadsheet

INPUT DATA

Load Weight (lbs wet)	15.70	W_{wd}
Load Weight (kg wet)	7.123	
Total Test Duration (min)	200	Θ
Total Test Duration (hours)	3.333	
Wood Moisture (Dry Bais)	21.17	%
Wood Moisture (Wet Bais)	17.47	%

Manufacturer:	Hearth & Home Technologies
Model:	4100I
Date:	7/14/2011
Run:	6
Control #:	G100428939
Tech:	B. Davis

Dry Burn Rate	1.764	Dry kg/hr
	3.887	Dry Lb/hr

Total Particulate Collected	824.4	mg

Cs	0.0122	g/dscf
Qstd	8192.5	dscf/hr
E	5.61	g/hr

Average Stack Flow (Qf)	7.68	dscf/min
Average Stack Flow (Qf)	461.06	dscf/hr

PARTICULATE CATCH

	Final Wt.	Tare or Initial Wt.	Net Catch (mg)	
Front Filter	0.7004	0.6357	64.7	F1
Rear Filter	0.2694	0.1651	104.3	F2
Probe/Front Half Rinse	95.1980	95.0885	109.5	R1
Impinger H2O +Back Rinse	143.8778	143.6762	201.6	R2
Meth Chlor. Extraction	111.5357	111.4140	121.7	R3
Back Half Acetone Rinse	98.0917	97.8682	223.5	R4

Solvent Volumes	(ml)	
Acetone Front Half Rinse	75	Va1
Acetone Back Half Rinse	150	Va2
Water- Impingers + Back Half Rinse	325	Vw
Methylene Chloride Extration	150	V_{DCM}

Blanks	(mg/ml)	
Acetone	0.00235	Ba
Water	0.0003	Bw
Methylene Chloride	0.002	B_{DCM}

Total Particulate Collected 824.374 mg

W.. ..g Record

	PER-TEST INITIAL/TARE WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.6357
Rear Filter						0.1651
Probe/Front Half Rinse						95.0885
Impinger H2O +Back Rinse						143.6762
Meth Chlor. Extraction						111.4140
Back Half Acetone Rinse						97.8682

	POST-TEST FINAL WEIGHTS					
DATE						Stable
TIME						Weights
Front Filter						0.7004
Rear Filter						0.2694
Probe/Front Half Rinse						95.1980
Impinger H2O +Back Rinse						143.8778
Meth Chlor. Extraction						111.5357
Back Half Acetone Rinse						98.0917

Test Engineer_

V1.2 R. Curkeet 2/18/2010

Intertek

EmissionsTunnel Traverse Worksheet

Static Pressure:	-0.58	in H2O (enter as negative value e.g. -0.12)
Barometer:	28.33	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	91	0.1844
A2	0.044	91	0.2098
A3	0.040	91	0.2000
A4	0.028	91	0.1673
B1	0.034	91	0.1844
B2	0.046	91	0.2145
B3	0.044	91	0.2098
B4	0.028	91	0.1673
AVERAGE	0.037	91	0.1922

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

1.00 For Pitot Pa

Tunnel V	Tunnel Q
ft/sec	scfm
13.43	137.63

Manufacturer: Hearth & Home Technologies

Model: 4100I

Date: 7/14/2011

Run: 6

Control #: G100428939

Test Engineer 

STOVE TEMPERATURE DATA - METHOD 5G/E2515/_____

Intertek

CLIENT: Hearth & Home Technologies MODEL: 4100 I ACC PROJECT #: G100428939 SAMPLE ID#: PRT 1106171545-001

DATE: 7/14/11 ENGINEER: B. Davis RUN #: 6

INTERTEK EQUIPMENT #'s: ETC7-2

CALCULATED RANGE: 3.2 - 3.9 ACTUAL COAL BED: 3.8

				TEMPERATURES (F)							
					Top Left		Right Back Bottom				
TIME	FUEL WT.	DELTA WT.	STACK DRAFT	AMBIENT	~~LEFT~~	~~RIGHT~~	~~BOTTOM~~	~~BACK~~	TOP	CATALYST	FLUE
0	7.4	/	-.067	75	707	626	526	510	363	NA	521
10	6.1	1.3	-.062	72	545	635	529	453	292		387
20	5.3	0.8	-.061	72	439	593	498	403	252		340
30	4.7	0.6	-.061	72	390	560	472	377	232		327
40	4.2	0.5	-.061	70	357	529	448	356	215		275
50	3.9	0.3	-.061	69	331	497	427	346	204		246
60	3.8	0.1	-.060	70	321	482	411	344	199		232
70											
80											
90											
00											
10											
20											
30											
40											
50											
60											
70											
80											
90											
AVG											

DATE: 8/9/11 ENGINEER SIGNATURE: B Davis

FUEL DATA

CLIENT: Hearth & Home Technologies MODEL: 4100 I ACC PROJECT #: G100428939

DATE: 7/14/11 RUN #: 6 SAMPLE ID #: PRT 110617545-004

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~~	25.5	24.7	22.0	2x4
2	FT				
3	FT				

LENGTH OF CUT PIECES: 3 @ 8" INCHES PRE-BURN FUEL AVG MOISTURE: 24.07

TIME (CLOCK): 0925 ROOM TEMP (F): 70

TEST FUEL

TYPE & FUEL AMOUNT 2 X 4 4 4 X 4 2
CALCULATED LOAD WT.: 17.15 ACTUAL LOAD WT: 7.7 (2 X 4)
8.0 (4 X 4)
15.7 TOTAL

FUEL PIECE LENGTH: 16

MOISTURE CONTENT (METER - DRY BASIS)

PIECE	READINGS			TYPE
1	20.6	21.1	21.2	4x4
2	21.5	20.2	20.9	4x4
3	22.8	23.8	24.2	2x4
4	22.0	18.7	19.3	2x4
5	21.2	19.2	21.9	2x4
6	21.0	21.7	19.7	2x4
7				
8				
9				
10				

OVERALL TEST FUEL LOAD MOISTURE AVG: 21.17

TIME (CLOCK): 0925 ROOM TEMP (F): 70

ENGINEER: [signature] 8/9/11

Intertek

RUN NOTES

Client: Hearth & Home
Model: 4100 I ACC
Run #: 6
Engineer: B Davis
Intertek Equipment ID #(s): NA

Project #: G100428939 Sample ID #: PRT 110617/545-001
Booth: 7 Date: 7/14/11

PREBURN

Primary Air fully open

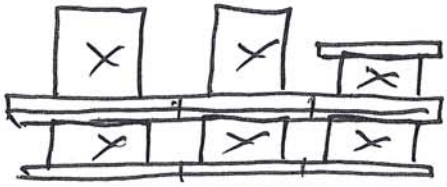
Rear Air 1/4" open

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: 55 minutes Rated Coals

TEST

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



NA

BYPASS: NA FUEL LOADING: By 35 seconds DOOR: closed by 45 seconds
PRIMARY AIR: fully open full 5:00
OTHER: Timed Air pushed @ 60 minutes Rear Air set to 1/4" at 1:00 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: on entire test duration

Date: 8/9/11

Engineer signature: B

Method 5H Impinger Gravimetric Analysis

Client: _Hearth & Home_____ Model: 4100I ACC_

Report Number: _G100428939_____ Date: 7/14/11

Test Engineer: D Davis Scale ID umber: _____

Audit Weight Number: NA Run Number: 6

Impinger Analysis

	Impinger 1	Impinger 2	Impinger 3	Impinger 5
Final Weight grams	768.2	735.2	620.0	965.3
Initial Weight grams	702.4	692.1	609.2	941.7
Net Weight grams	65.8	43.1	10.8	23.6

Total Weight 143.3

Notes: F= 334 R= 344

Test Engineer: DO 8/9/11

Intertek

Supplemental Data EPA 5G/5H

Client: Hearth & Home Technologies

Model: 4100I ACC Project #: G100428939 Sample ID #: PRT110617545-001

Date: 7/14/11 Run #: 6

Start Time: 11:11 Stop Time: 2:32

Intertek Equipment #'s: ETC5-4 19745

Gas Analyzer Train Leak Check:

Stack:

Initial: good

Final: good

Dilution Tunnel (Method 5G Only):

Initial: good

Final: good

Calibrations: Span Gas CO_2: 9.96 O_2: NA CO: .98 CO_2(DT): 4.10

	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	0.00 / 9.96	0.00 / 9.94					
CO	0.00 / 0.97	0.00 / 0.98					
CO_2 (DT)	0.00 / 4.13	0.00 / 4.11					

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: 6/23/11 Initials: DL

	Initial	Middle	Ending
Pb (in/Hg)	28.33		28.33
Room Temp (°F)	70		72

Date: 8/9/11

Engineer signature: