

TEST REPORT

Intertek

REPORT NUMBER: 101925579PRT-001
REPORT DATE: April 6, 2015

EVALUATION CENTER
Intertek Testing Services NA Inc.
22887 NE Townsend Way
Fairview Oregon 97024

RENDERED TO

Hearth & Home Technologies dba Heatilator
1915 West Saunders Street
Mount Pleasant, IA 52641

PRODUCT EVALUATED:
Adventure II Wood Fired Room Heater

Report of Testing Model Adventure II Wood fired Room Heater 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 5G "Determination of Particulate Matter Emissions from Wood Heaters".

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

I. INTRODUCTION

Intertek Testing Services NA (Intertek) has conducted testing for Hearth & Home Technologies dba Heatilator, on model Adventure II Wood Fired Solid Fuel Room Heater, to evaluate all applicable performance requirements included in EPA Method 28 "Certification and auditing of wood heaters" and Method 5G "Determination of particulate matter emissions from wood heaters." Method 5G2 was used to evaluate emission rates from the Adventure II Wood stove. 5G2 utilizes a Method 5H sample train that extracts samples from a Dilution Tunnel. This method does not require results be corrected to obtain an EPA adjusted emission result.

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 started on January 12, 2015

I.B LABORATORY

The test on the Adventure II Wood fired Solid Fuel Room Heater was conducted at the client facility located at 347 W Second St Suite D-1, Colville Washington. Intertek Portland is accredited by the U.S. EPA, Certificate Number 8. An eight test series was conducted by Bruce S Davis.

I.C DESCRIPTION OF UNIT

Stove model Adventure II Solid Fuel Room Heater is a brick lined mild steel fire box with shielding mounted on the top, sides, and back. A knock out is fabricated in the back shield to accept an optional room air blower. Combustion air is control by an electronic circuit operating actuators that automatically open and close an air slide plate. The following was submitted by the manufacturer describing operation of the control.

The electronic automatically controlled air control system on this model consists of a control board, linear actuator, thermostat/receiver package, battery backup system, thermocouples in the secondary combustion system, and a cycle start button.

The system is activated by pressing a cycle start button. The air control moves to the full open position, once fuel reaches a level of combustion, realized by the temperature in the secondary combustion system, then the air control closes slightly. This is the "high" burn position. If the thermostat demands high burn then the system maintains the air control at this position for the duration of the burn. If the thermostat changes state and demands lower heat then the system incrementally shuts the air control to a lower setting while ensuring a clean burn by maintaining a temperature range in the secondary combustion that is

measured by the thermocouples. Once the air control is closed to a position that maintains the slowest burn allowable and yet maintaining a clean burn then control system maintains this air control position until a sharp drop in temperature is realized in the secondary combustion. This indicates that the V.O.C's are fully combusted and the air control can be shut to its minimum position or reopened at any time based on the set point of the thermostat.

The battery backup function serves to allow the system to maintain operation for several weeks in the event of a power outage. If system power is not realized either from battery or wall power then the default position of the air control is fully closed ensuring that operation cannot occur.

(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 at the Hearth & Home test facility, the sample was not independently selected for testing. The test unit was received by Intertek on January 12, 2015. The unit was inspected upon receipt and found to be in good condition. Following the manufacturer's instructions the appliance was set up 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 in excess of 10 hours during research and development tests conducted by Hearth & Home personnel.

Prior to testing the unit's chimney system and laboratory dilution tunnels was cleaned using standard wire brush chimney cleaning equipment.

II.B INFORMATION LOG

TEST STANDARD

From January 12, 2015 through March 17, 2015 the unit was tested for EPA

emissions using test method 5G2. A sample train described in EPA method 5H was used to extract a proportionate sample from the dilution tunnel. A heated front filter, four Impingers and a rear filter made up the sample train.

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 January 12, 2015: Test fuel was loaded by 60 seconds, the door was open for 165 seconds, and then closed. Thermostat set at 50 (No heat demand) degrees, auto cycle button was pushed at zero minutes. Burn time was 410 minutes with a category 2 burn rate of 0.87 kg/hr. The fan was set for auto high, will run on high at a predetermined firebox temperature.

RUN #2 January 13, 2015: Test fuel was loaded by 55 seconds, the door was cracked open for 3 minutes, and then closed. Thermostat set a 55 (No heat demand) degrees, auto cycle button pushed at zero minutes. Burn time was 310 minutes with a category 2 burn rate of 1.17 kg/hr. The fan was set for auto high, will run on high at a predetermined firebox temperature.

RUN #3 November 14, 2014: Test fuel was loaded by 55 seconds, the door was cracked open for 3 minutes and 30 seconds, and then closed. Prior to starting the test the programmable thermostat was set to open the combustion air fully after 4.0 hours from the start of the test. At zero minutes the auto cycle button was pushed. Burn time was 280 minutes with a category 3 burn rate of 1.29 kg/hr. The fan was set for auto high, will run on high at a predetermined firebox temperature.

RUN #4 January 14, 2015: Test fuel was loaded by 50 seconds, the door was cracked open for 1 minutes and 45 seconds, and then closed. Thermostat set a 90 (heat demand) degrees, auto cycle button pushed at zero minutes. Burn time was 140 minutes with a category 4 burn rate of 2.58 kg/hr. The fan was set for auto high, will run on high at a predetermined firebox temperature.

RUN #5 January 15, 2015: Test fuel was loaded by 50 seconds, the door was cracked open for 1 minutes and 45 seconds, and then closed. Prior to starting the test the programmable thermostat was set to open the combustion air fully after 4 hours from the start of the test. Auto cycle button pushed at zero minutes. Burn time was 210 minutes with a category 3 burn rate of 1.69 kg/hr. Fan was operated on high for the remainder of the test. Power was disconnected from the stove for the fan confirmation test.

RUN #6 January 16, 2015: Test fuel was loaded by 55 seconds, the door was cracked open for 2 minutes and 40 seconds, and then closed. Thermostat set a 49 (No heat demand) degrees, prior to starting the test the programmable thermostat was set to open the combustion air fully after 5 hours from the start of the test. Auto cycle button pushed at zero minutes. Burn time was 320 minutes with a category 2 burn rate of 1.12 kg/hr. Fan was not operated during the test for a fan confirmation test.

RUN #7 February 20, 2015: Test fuel was loaded by 50 seconds, the door was cracked open for 3 minutes, and then closed. Thermostat set a 50 (No heat demand) degrees, prior to starting the test the programmable thermostat was set to open the combustion air fully after 3.5 hours from the start of the test. Auto cycle button pushed at zero minutes. Burn time was 260 minutes with a category 3 burn rate of 1.53 kg/hr. The fan was set for auto high, will run on high at a predetermined firebox temperature.

RUN #8 March 17, 2015: Test fuel was loaded by 50 seconds, the door was cracked open for 2 minutes 40 seconds, and then closed. Thermostat set a 50 (No heat demand) degrees, prior to starting the test the programmable thermostat was set to open the combustion air fully after 1.5 hours from the start of the test. Auto cycle button pushed at zero minutes. Burn time was 180 minutes with a category 4 burn rate of 2.11 kg/hr. The fan was set for auto high, will run on high at a predetermined firebox temperature.

II.D SUMMARY OF OTHER DATA

EMISSIONS

Run Number	Test Date	Burn Rate (kg/hr)	Emission Rate (g/hr)	Heating Efficiency* (%HHV)	Heating Efficiency* (% LHV)
1	1/12/15	10.87	2.16	72.4	78.2
2	1/13/15	1.17	2.03	71.0	76.7
3	1/14/15	1.29	2.29	71.0	76.8
4	1/14/15	2.58	5.35	68.5	74.0
5	1/15/15	1.69	1.68	70.5	76.2
6	1/16/15	1.12	1.97	72.9	78.8
7	2/20/15	1.53	2.25	73.6	79.6
8	3/17/15	2.11	3.12	74.1	80.1

*Efficiency determined per CSA B415.1-2010.

1. A category 1 burn rate was not obtained, test 1 was conducted at the appliance minimum burn rate setting. There are no additional controls available to the end user to generate a slower burn rate.

WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate	(E) Average Emission Rate g/hr	Heat Output (Btu/hr) EPA	Heat Output (Btu/hr) B415 HHV	Probability	(K) Weighting Factor	(KxE)
1	0.87	2.16	10,491	12,018	0.2724	0.5140	1.1102
2	1.17	2.03	14,108	16,162	0.5140	0.3380	0.6861
3	1.29	2.29	15,555	17,819	0.6104	0.2534	0.5803
7	1.53	2.25	18,449	21,134	0.7674	0.3160	0.7110
8	2.11	3.12	25,443	29,146	0.9264	0.2030	0.6334
4	2.58	5.35	31,110	35,638	0.9704	0.0736	0.3938
						Totals:	1.698 4.1148
						Weighted average emission rate:	2.423

Run numbers 5 and 6 was not used in the weighted average due to being conducted without the blower operating (fan confirmation).

TEST FACILITY CONDITIONS

Run	Room Temp. °F before	Room Temp °F after	Baro. Pres. In. Hg before	Baro. Pres. In. Hg after	Air Vel. Ft/min before	Air Vel. Ft/min after
1	76	74	28.67	28.73	<50	<50
2	76	75	28.85	29.83	<50	<50
3	69	74	28.79	28.73	<50	<50
4	76	74	28.73	28.70	<50	<50
5	74	76	28.64	28.64	<50	<50
6	74	73	28.35	28.50	<50	<50
7	74	73	28.70	28.70	<50	<50
8	71	68	28.62	28.62	<50	<50

DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA (5G-2)

Run No.	Burn Time (min)	Velocity (ft/sec)	Volumetric Flow Rate (dscf/min)	Total Temp. (°R)	Volume of Sample	Particulate Catch (mg)
1	410	12.68	132.05	550.0	218.192	59.64
2	310	13.01	134.55	556.5	165.343	41.79
3	280	13.67	140.88	556.6	150.279	40.78
4	140	13.57	128.43	603.5	74.044	51.42
5	210	13.57	134.99	574.5	112.355	23.38
6	320	13.42	136.57	557.2	169.844	41.05
7	260	12.72	129.29	563.1	139.019	40.42
8	180	13.04	128.96	577.4	99.954	40.41

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (°F)	Initial Draft (in/H ₂ O)	Average Draft (in/H ₂ O)
1	0.87	83.4	-0.030	-0.023
2	1.17	67.8	-0.040	-0.032
3	1.29	12.4	-0.024	-0.036
4	2.58	20.8	-0.054	-0.062
5	1.69	9.0	-0.024	-0.050
6	1.12	23.0	N/A	N/A
7	1.53	12.4	-0.030	-0.038
8	2.11	43.0	-0.032	-0.052

Flue draft information not recorded for run 6, data not available.

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 is control by an electronic circuit operating actuators that automatically open and close an air slide plate based on temperature in the secondary combustion zone and the consumer set point on a programmable thermostat.

IV. SAMPLING SYSTEMS

IV.A SAMPLING LOCATIONS

Particulate samples are collected from the vertical sample section of the dilution tunnel. The tunnel has two elbows and two mixing baffles in the system ahead of the sampling section. The sampling section is a continuous section of 6 inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a standard Pitot tube located a minimum of 4 feet upstream of the sample location. The dry bulb thermocouple is located six inches downstream from the Pitot tube. Actual tunnel used was verified to meet EPA specifications and is similar to that shown in figure 1.

Actual gas sample collection train was similar to that shown in figure 2.

An emissions sample train similar to that shown in figure 3 was used; a glass probe was used in place of a heated probe and button hook nozzle.

IV.A.(1) DILUTION TUNNEL

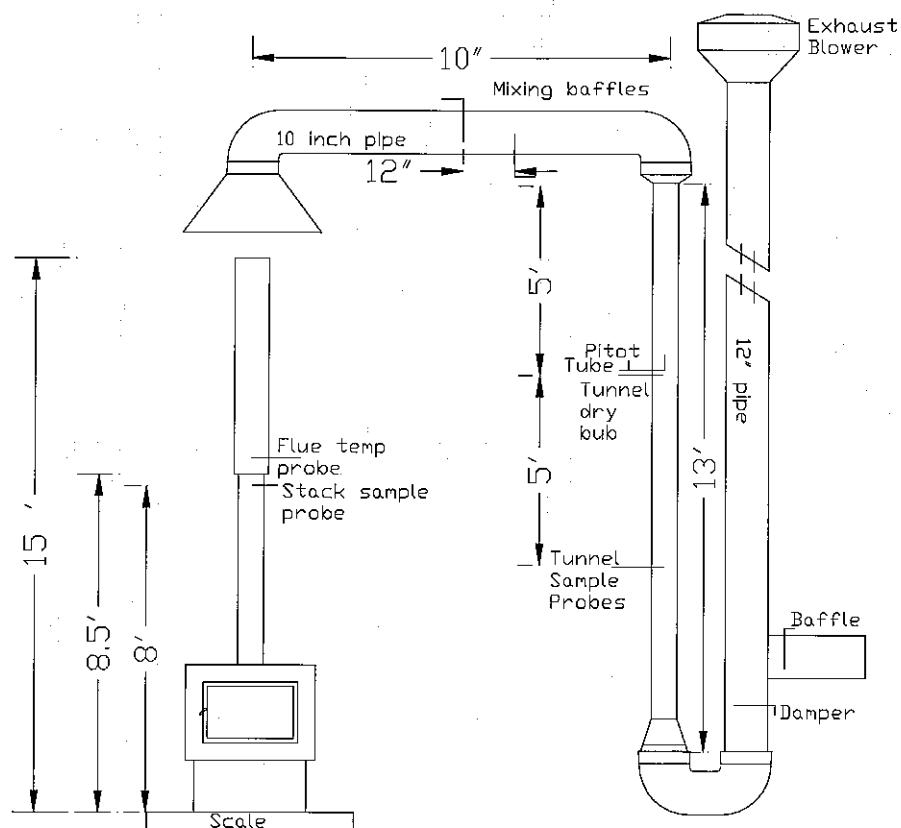
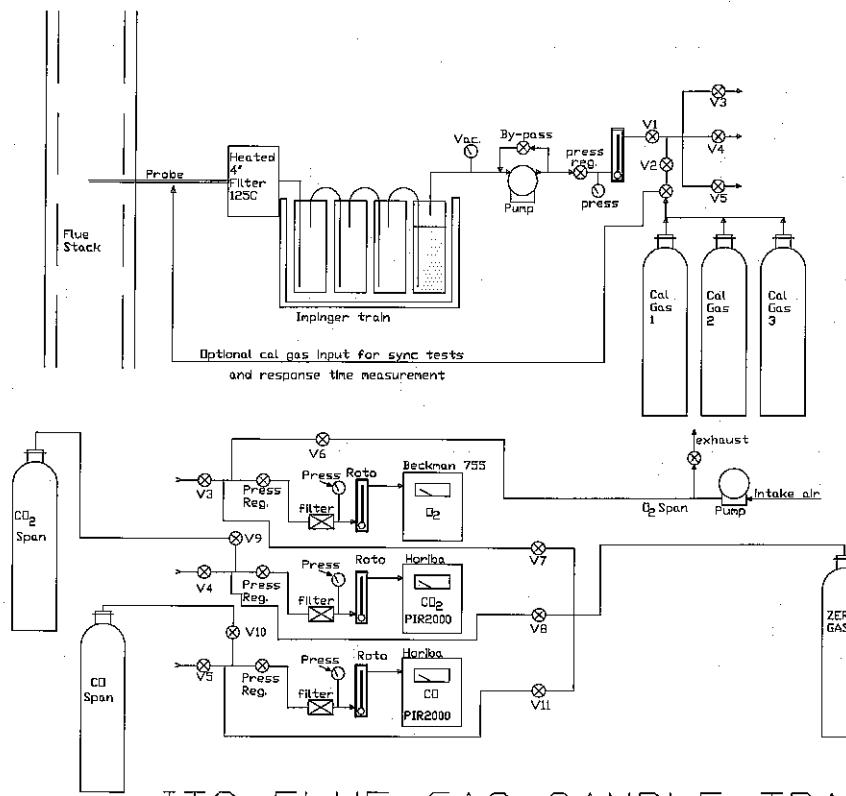


FIGURE 1

IV.B.OPERATIONAL DRAWINGS

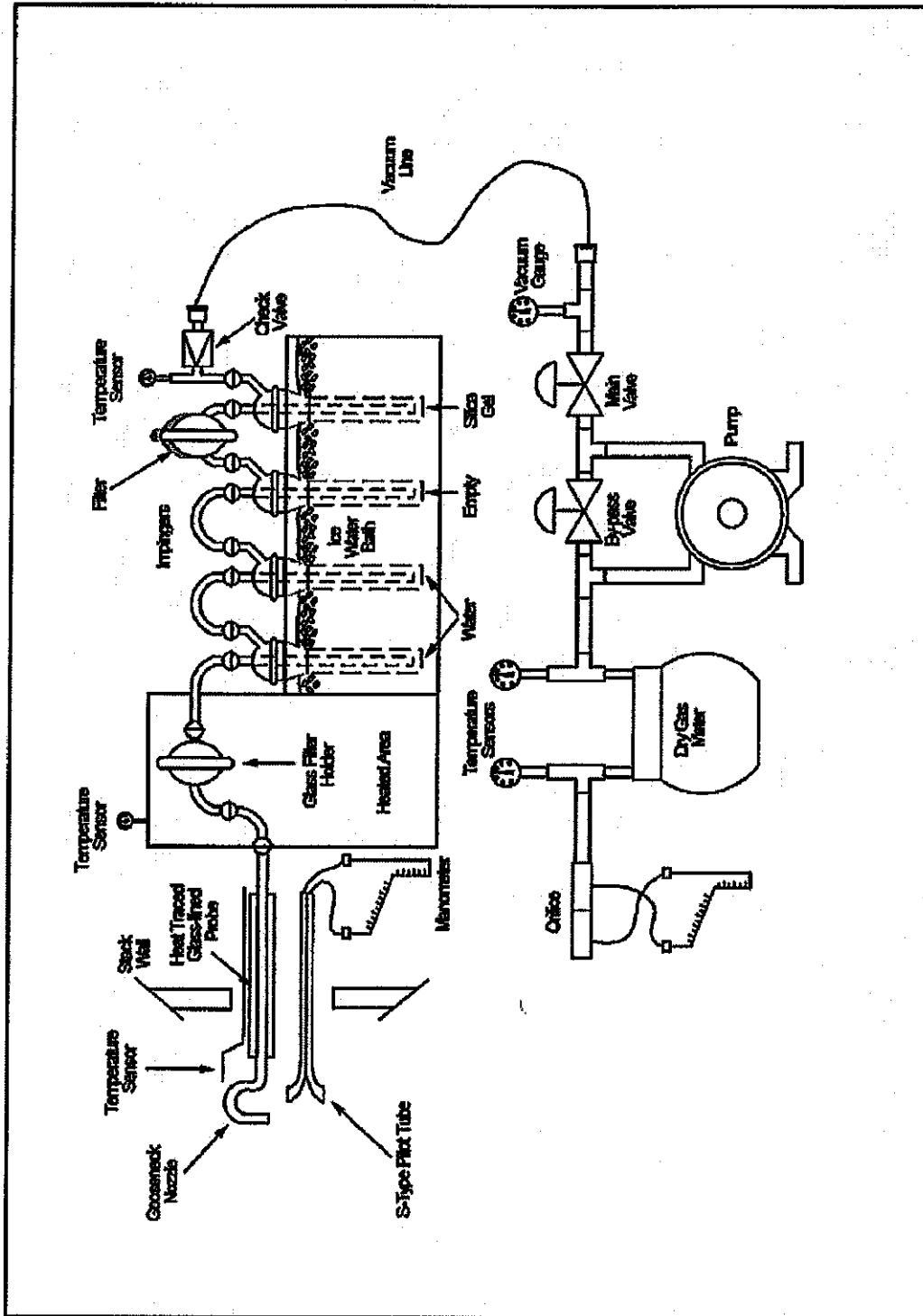
IV.B.(1) STACK GAS SAMPLE TRAIN



ITS FLUE GAS SAMPLE TRAIN

FIGURE 2

IV.B.(2). DILUTION TUNNEL SAMPLE SYSTEMS



V. SAMPLING METHODS

V.A. PARTICULATE SAMPLING

Particulates were sampled in strict accordance with EPA Method 5G-2 and 5H. A 5H sample train was used to extract particulate samples proportionally from a dilution tunnel. A glass probe was inserted into the tunnel and sample was drawn across a heated 110mm filter. After the heated front filter, gasses entered a set of four Impingers, a rear 55mm filter was placed between number three and four Impingers. Sample analysis consisted of a front and back half acetone rinse. Impinger water was subjected to a Dichloromethane extraction to separate organics prior to oven drying.

VI. QUALITY ASSURANCE

VI.A. INSTRUMENT CALIBRATION

VI.A. (1) DRY GAS METERS

At the conclusion of each test program the dry gas meters are checked against our 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 D.

An integral part of the posttest calibration procedure is a leak check of the pressure side 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 an accredited calibration agency. All calibration values are verified to be within EPA specifications.

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 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. During, these tests the vacuum was typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

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

The tunnel velocity is calculated from a center point Pitot tube signal multiplied by an adjustment factor. This factor is determined by a traverse of the tunnel as prescribed in EPA Method 1. 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 (5G)

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

VII. CONCLUSION

Results of this test show the Adventure II when operated following guidelines specified in EPA method 28 does meet emissions limits regulating an affected facility in the EPA New Source Performance Standards with a weighted average of 2.42 grams per hour.

VII.A RESULTS AND OBSERVATIONS

The Model Adventure II Wood fired Solid Fuel Room Heater 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 5G Determination of particulate matter emissions from wood heaters."

INTERTEK TESTING SERVICES NA

Reported by:



Bruce S Davis
Test Engineer

Reviewed by:



Jared Sorenson
Engineering Manager

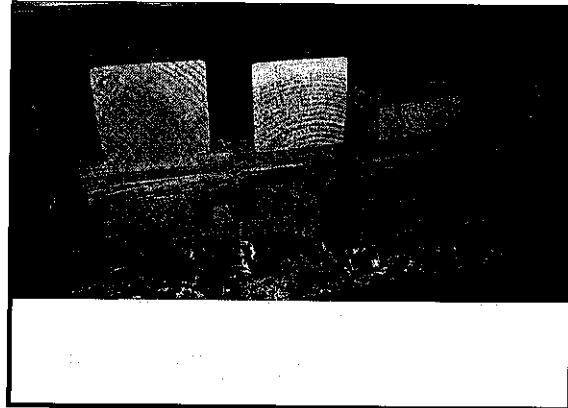
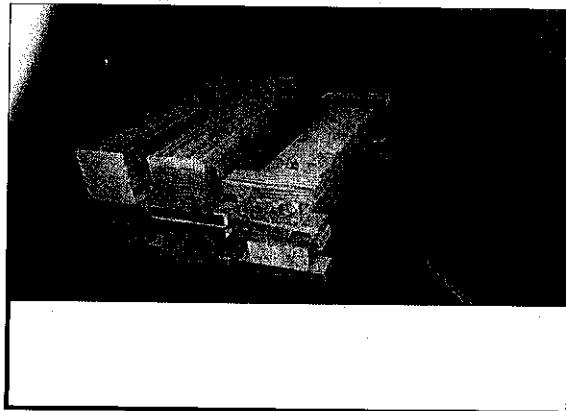
TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925579
 Manufacturer: Hearth & Home
 Model: Adventure II
 Sample ID Number: PRT1501130904-001
 Test Date: 12-Jan-15
 Test Run Number: 1

	Dry Burn-Rate, kg/hr:	0.87
	Emission-Rate, g/hr:	2.16
	Duration of Test, Minutes	410
Dry Gas Meter Standardization		Train A
Dry Gas Meter Beginning Reading, ft ³		695.7
Dry Gas Meter Ending Reading, ft ³		932.508
Barometric Pressure Correction Factor		0.959
Dry Gas Meter Calibration Factors (y factors)		0.977
Dry Gas Meter Temperature Factors		0.984
Dry Gas Meter Delta-H Correction Factors		1.002
Dry Gas Meter STD Volume Sampled, ft ³		218.841
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm		132.049
Total Tunnel Volume, scf		54139.914
Emission Calculations		Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)		247.393
Sample Particulate Mass, mg		59.6
Total Emissions, grams		14.754
Emission-Rate, g/hr		2.16
Adjusted Emission Rates, g/hr		3.45
Operating Parameters		Train A
Max Filter Temperature, °F		134
Post-Test Leak Check, cfm @ in. Hg vac.		0
Average Firebox Surface Temperature delta-T, °F		83.4
Maximum Ambient Temperature, °F		80
Minimum Ambient Temperature, °F		72
Fuel Properties		
Wet Fuel Load Weight, lb.		16.20
Dry-Basis Fuel Load Moisture Content, %		23.48
Wet-Basis Fuel Load Moisture Content, %		19.02

PROJECT / TEST INFORMATION	
Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	12-Jan-15
Test Run Number:	1
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft ³ :	2.49	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings

Primary Air:	Auto button was pushed after loading pre burn fuel. With the thermostat at a non-demand temperature this caused combustion air to automatically close down gradually to an electronic air stop. After secondary combustion temperatures cooled to a preset temperature combustion air closed down completely.
Secondary Air:	Fixed opening
Control Board:	Programable thermostat set at 50 degrees so will not call for heat.
Blower/Fan:	Auto high, will turn on and run at a predetermined temperature.

Pre- Burn Activities

Time	Activity
	At 83 minutes removed 0.4 pounds of coals.

Start-Up Procedure

Loading of fuel, sec. :	Fuel loaded by 60 seconds.
Fuel-loading door :	Door cracked open until 2:45 then closed.
Primary air:	Auto button pushed at zero minutes
Secondary air:	Fixed opening
Control board:	Programable thermostat set at 50 degrees so will not call for heat, then will open primary air fully
Blower / fan:	Auto high.

Other Notes

Test Engineer: BDR

Date: 4/6/15

Intertek**TEST FUEL DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	12-Jan-15
Test Run Number:	1

Firebox Volume, ft ³ :	2.49
-----------------------------------	------

Calibration Reference ID		
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	10@16	14.49	21.7	26.2	19.2
2			21.3	25.9	24.2
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight	14.5	Average, %db	23.1		

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	11:10	Temp., °F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
		2x4	4x4		
1	16.00	9.00		25.3	24.8
2	16.00			25.0	24.5
3	16.00			24.3	22.4
4	16.00			22.8	24.5
5	16.00	7.20		18.7	22.4
6	16.00			20.0	23.8
7					
8					
Totals		9.0	7.2		
% of Weight		56	44		
Total weight, wet, lb.		16.20		Average Moisture, dry	23.48
Total weight, dry, kg		5.95		Average Moisture, wet	19.02

Test Engineer: B.D.Date: 4/4/15



Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	12-Jan-15
Test Run Number:	1

EPA Method 28

Pre Burn Data

Coal Bed Range 3.3 to 4.0

Average Firebox Temp, °F 298.8

Final Coal Bed Wt, lb

Test Engineer:

Date: 4/6/15

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	12-Jan-15
Test Run No:	1

Temperature Data

Firebox Temp Start	294.6
Firebox Temp End	211.2
Firebox Delta-T	83.4

Max Filter Temps
Train A
134

Interval	10	Duration of Test, Min	410
Time			

Temperature Data

Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	76	86	137	121	256	279	408	409		131	76	74	
1	10	75	142	577	392	297	259	376	391		132	50	74	
2	20	77	136	557	195	246	244	386	404		132	49	74	
3	30	78	116	425	185	240	248	392	421		132	50	75	
4	40	78	118	460	194	225	249	394	437		132	51	76	
5	50	79	118	455	192	223	249	412	454		132	51	76	
6	60	79	120	471	201	235	248	429	474		133	52	77	
7	70	80	116	429	199	256	247	445	494		133	53	78	
8	80	80	110	366	179	272	247	457	457		133	54	78	
9	90	80	105	328	164	283	248	459	482		133	55	79	
10	100	80	102	291	151	290	250	453	474		132	55	79	
11	110	80	99	274	145	295	252	447	467		132	56	80	
12	120	80	96	257	141	299	253	439	461		133	57	80	
13	130	79	89	160	133	292	260	422	447		132	57	80	
14	140	79	87	141	126	276	267	401	425		132	58	80	
15	150	78	85	133	121	264	269	382	403		132	55	80	
16	160	78	84	127	117	254	269	366	384		132	51	80	
17	170	77	83	122	115	268	352	367	367		132	51	80	
18	180	77	82	118	112	239	266	340	352		132	52	79	
19	190	76	81	116	110	233	263	329	339		132	53	79	
20	200	76	81	114	108	227	260	320	327		132	53	79	
21	210	76	80	113	107	223	256	312	316		132	54	78	
22	220	76	80	110	104	218	253	304	307		132	54	78	
23	230	75	79	108	103	214	250	297	300		132	54	78	
24	240	75	79	107	102	211	247	290	293		132	54	77	
25	250	75	78	106	101	207	244	284	286		132	55	77	
26	260	74	77	105	101	203	242	277	280		132	55	77	
27	270	74	77	103	100	199	239	272	274		132	56	76	
28	280	74	77	102	99	196	236	266	269		132	56	76	
29	290	74	76	102	99	193	233	261	265		132	55	76	
30	300	74	76	102	98	191	232	259	263		132	55	76	
31	310	73	76	100	97	186	228	252	256		132	55	75	
32	320	73	76	100	96	183	225	248	252		132	54	75	
33	330	73	75	99	96	180	223	244	247		134	54	75	
34	340	72	75	98	95	177	220	241	243		132	54	75	
35	350	72	75	97	93	174	218	239	238		132	55	74	
36	360	72	75	97	94	171	216	237	233		132	54	74	
37	370	72	74	97	74	167	213	237	229		132	54	74	
38	380	72	76	95	93	165	210	238	225		132	54	74	
39	390	73	78	94	94	162	208	240	221		132	53	74	
40	400	74	89	228	98	187	193	249	223		132	53	74	
41	410	74	95	278	107	237	181	282	249		132	53	74	

Test Engineer: B.D.Date: 4/4/15

Gas Particulate Sampling Data

Project Number: G101925579
 Manufacturer: Hearth & Home
 Model: Adventure II
 Sample ID Number: PRT1501130904-001
 Test Date: 12-Jan-15
 Test Run Number: 1

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors		
Start	28.67		Meter Box (A)	0.977	
End	28.73				
Duration of Test, Min			410		

Leak Check, cfm @ in Hg	
Train A	.008@6

Maximum Vacuum	
Train A	0.00

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.036	1.00		-0.030	16.20	16.20	695.700		99.98		0.00
10	0.036	1.00		-0.075	14.84	1.36	701.580		107.06		0.00
20	0.036	1.00		-0.068	12.70	2.14	707.240		102.54		0.00
30	0.036	1.00		-0.057	11.20	1.50	713.000		102.39		0.00
40	0.036	1.00		-0.060	9.60	1.60	719.020		107.00		0.00
50	0.036	1.00		-0.058	8.09	1.51	724.700		100.96		0.00
60	0.036	1.00		-0.058	6.57	1.52	730.290		99.34		0.00
70	0.036	1.00		-0.054	5.30	1.27	736.180		104.12		0.00
80	0.036	1.00		-0.048	4.51	0.79	741.830		99.36		0.00
90	0.036	1.00		-0.043	3.90	0.61	747.660		101.88		0.00
100	0.036	1.00		-0.040	3.30	0.60	753.350		99.17		0.00
110	0.036	1.00		-0.037	2.90	0.40	759.180		101.15		0.00
120	0.036	1.00		-0.035	2.50	0.40	765.010		100.88		0.00
130	0.036	1.00		-0.020	2.40	0.10	770.850		100.41		0.00
140	0.036	1.00		-0.017	2.30	0.10	776.650		99.55		0.00
150	0.036	1.00		-0.015	2.20	0.10	782.330		97.31		0.00
160	0.036	1.00		-0.013	2.10	0.10	788.150		99.61		0.00
170	0.036	1.00		-0.013	2.10	0.00	793.960		99.35		0.00
180	0.036	1.00		-0.010	2.00	0.10	799.800		99.96		0.00
190	0.036	1.00		-0.010	1.90	0.10	805.760		101.92		0.00
200	0.036	1.00		-0.010	1.90	0.00	811.330		95.25		0.00
210	0.036	1.00		-0.010	1.80	0.10	817.090		98.59		0.00
220	0.036	1.00		-0.009	1.80	0.00	822.880		99.10		0.00
230	0.036	1.00		-0.008	1.70	0.10	828.730		100.04		0.00
240	0.036	1.00		-0.007	1.60	0.10	834.520		99.20		0.00
250	0.036	1.00		-0.007	1.60	0.00	840.320		99.27		0.00
260	0.036	1.00		-0.007	1.50	0.10	846.150		99.70		0.00
270	0.036	1.00		-0.007	1.50	0.00	851.880		98.17		0.00
280	0.036	1.00		-0.007	1.40	0.10	857.680		99.37		0.00
290	0.036	1.00		-0.007	1.40	0.00	863.500		99.62		0.00
300	0.036	1.00		-0.006	1.30	0.10	869.190		97.39		0.00
310	0.036	1.00		-0.006	1.30	0.00	875.350		105.63		0.00
320	0.036	1.00		-0.006	1.20	0.10	880.770		92.94		0.00
330	0.036	1.00		-0.006	1.20	0.00	886.670		101.08		0.00
340	0.036	1.00		-0.006	1.10	0.10	892.300		96.46		0.00
350	0.036	1.00		-0.006	1.10	0.00	898.150		100.41		0.00
360	0.036	1.00		-0.006	1.00	0.10	903.650		94.40		0.00
370	0.036	1.00		-0.006	0.90	0.10	909.530		100.83		0.00
380	0.036	1.00		-0.006	0.90	0.00	915.270		98.62		0.00
390	0.036	1.00		-0.005	0.70	0.20	921.160		101.38		0.00
400	0.036	1.00		-0.030	0.30	0.40	926.840		98.76		0.00
410	0.036	1.00		-0.036	0.00	0.30	932.508		99.09		0.00

Test Engineer: BDDate: 4/6/15

**Dilution Tunnel Velocity Traverse
EPA Method 5G-3**

Project Number: G101925579

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID Number: PRT1501130904-001

Test Date: 12-Jan-15

Test Run Number: 1

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0300	101	0.1732
A2	0.0340	101	0.1844
A3	0.0340	101	0.1844
A4	0.0320	101	0.1789
A Center	0.0350	101	0.1871
B1	0.0300	100	0.1732
B2	0.0350	100	0.1871
B3	0.0350	100	0.1871
B4	0.0340	100	0.1844
B Center	0.0360	100	0.1897
Averages	0.0335	100.5	0.1816

Tunnel Diameter **6.000** inchesTunnel Static **-0.510** in. H2OTunnel Area 0.19635 Ft²

Pitot Correction 0.9637 factor

Baro. Pressure 28.67

Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)

Initial Velocity 12.723 Ft/ Sec

Initial Flow **129.84** Ft³/minTest Engineer: BDDate: 3/4/15

Project Number: G101925579
 Manufacturer: Hearth & Home
 Model: Adventure II
 Sample ID Number: PRT1501130904-001
 Test Date: 12-Jan-15
 Test Run Number: 1

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	501	785	758.2		26.80
REAR FILTER CATCH	FILTER	507	130	130.5		-0.50
RINSE OF PROBE &	ACETONE	35	96045.1	96038.7	0.0027	6.31
RINSE OF IMPINGER SET	WATER	240	100388.5	100377.6	0.007	9.22
RINSE OF IMPINGER SET	METHANE	100	108998.5	108987	0.002	11.30
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	70	125680.4	125673.7	0.0027	6.51
					TOTAL:	59.64

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer: BD

Date: 1/6/15

Intertek**TEST RESULTS
EPA METHOD 5G-3**

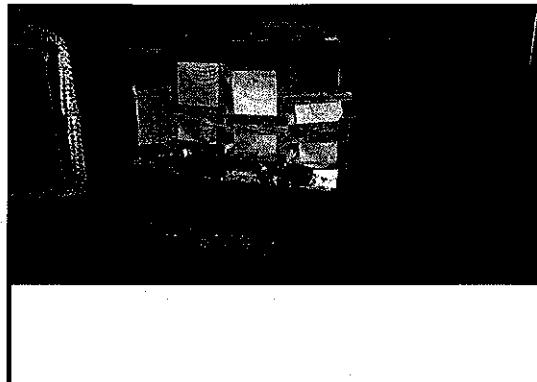
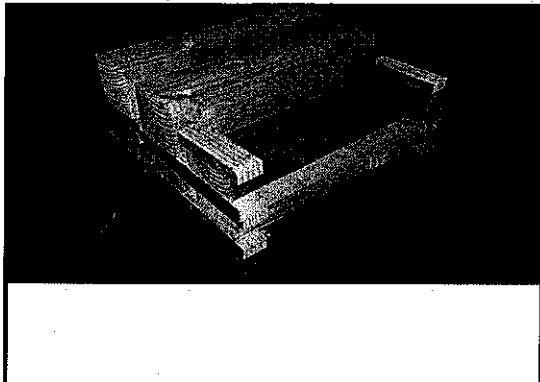
Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 13-Jan-15
Test Run Number: 2

Dry Burn-Rate, kg/hr:	1.17
Emission-Rate, g/hr:	2.03
Duration of Test, Minutes	310
Dry Gas Meter Standardization	Train A
Dry Gas Meter Beginning Reading, ft ³	0
Dry Gas Meter Ending Reading, ft ³	179.183
Barometric Pressure Correction Factor	0.964
Dry Gas Meter Calibration Factors (y factors)	0.977
Dry Gas Meter Temperature Factors	0.980
Dry Gas Meter Delta-H Correction Factors	1.002
Dry Gas Meter STD Volume Sampled, ft ³	165.840
Dilution Tunnel Flow / Volume	
Standardized Tunnel Flow, dscfm	134.547
Total Tunnel Volume, scf	41709.554
Emission Calculations	Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	251.505
Sample Particulate Mass, mg	41.8
Total Emissions, grams	10.510
Emission-Rate, g/hr	2.03
Adjusted Emission Rates, g/hr	3.28
Operating Parameters	Train A
Max Filter Temperature, °F	133
Post-Test Leak Check, cfm @ in. Hg vac.	0
Average Firebox Surface Temperature delta-T, °F	67.8
Maximum Ambient Temperature, °F	81
Minimum Ambient Temperature, °F	66
Fuel Properties	
Wet Fuel Load Weight, lb.	16.15
Dry-Basis Fuel Load Moisture Content, %	21.46
Wet-Basis Fuel Load Moisture Content, %	17.67

Test Engineer: BJDate: 4/3/15

PROJECT / TEST INFORMATION	
Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	13-Jan-15
Test Run Number:	2
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	2.3	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings

Primary Air: Auto button was pushed after loading pre burn fuel. With the thermostat at a non-demand temperature this caused combustion air to automatically close down gradually to an electronic air stop. After secondary combustion temperatures cooled to a preset temperature combustion air closed down completely.

Secondary Air: Fixed opening

Control Board: Programable thermostat set at 50 degrees so will not call for heat.

Blower/Fan: Auto high, will turn on and run at a predetermined temperature.

Pre-Burn Activities

Time Activity
At 90 minutes raked coals

Start-Up Procedure

Loading of fuel, sec.: Fuel loaded by 55 seconds.

Fuel-loading door: Door cracked open until 3:00 then closed.

Primary air: Auto button pushed at zero minutes

Secondary air: Fixed opening

Programable thermostat set at 50 degrees so will not call for heat, then will open primary air fully
Control board: after 5 hours.

Blower / fan: Auto high.

Other Notes

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	13-Jan-15
Test Run Number:	2

Firebox Volume, ft ³ :	2.49
-----------------------------------	------

Calibration Reference ID	
Set meter to Species 1	
Set Temperature to 70F	12% 12.0
Set pin setting to 444	22% 22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	96.00		24.6	26.8	22.3
2	96.00	13.80	23.8	25.2	24.3
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight	13.8	Average, %db	24.5		

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	9:15	Temp., °F:	68
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
		2x4	4x4		
1				19.5	23.1
2			7.67	20.1	24.4
3				19.1	19.7
4				20.5	19.2
5				22.5	23.8
6		8.49		20.1	22.1
7					
8					
Totals	8.5	7.7			
% of Weight	53	47			
Total weight, wet, lb.	16.15		Average Moisture, dry	21.46	
Total weight, dry, kg	6.03		Average Moisture, wet	17.67	

Test Engineer: BDDate: 4/6/15



Project Number: **G101925579**
Manufacturer: **Hearth & Home**
Model: **Adventure II**
Sample ID Number: **PRT1501130904-001**
Test Date: **13-Jan-15**
Test Run Number: **2**

EPA Method 28 Pre Burn Data

Coal Bed Range 3.3 to 4.0

Average Firebox Temp, °F 312.4

Final Coal Bed Wt, lb 3.9

Test Engineer:

Date: 4/3/15

Intertek**TEST DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	13-Jan-15
Test Run No:	2

Temperature Data

Firebox Temp Start	312.4
Firebox Temp End	244.6
Firebox Delta-T	67.8

Max Filter Temps
Train A
133

Interval	10	Duration of Test, Min			310	Temperature Data									
Time		Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM		
Interval	Duration														
0	0	76	86	141	182	266	295	420	399		131	77	76		
1	10	76	152	599	357	254	275	383	378		132	45	76		
2	20	78	152	610	487	226	260	403	427		132	45	76		
3	30	78	128	494	450	226	265	426	488		132	46	77		
4	40	79	127	478	445	227	268	440	473		133	47	77		
5	50	80	124	464	422	243	268	456	486		133	48	78		
6	60	80	118	417	392	264	268	469	501		133	49	79		
7	70	80	112	359	325	289	268	479	499		133	50	79		
8	80	81	107	330	291	300	268	485	490		133	50	80		
9	90	80	105	311	268	307	269	481	481		132	51	80		
10	100	80	102	295	252	310	270	471	473		133	51	81		
11	110	66	99	277	230	309	270	461	466		133	51	81		
12	120	74	97	272	225	310	270	465	454		132	51	81		
13	130	77	91	198	211	313	271	461	442		133	52	80		
14	140	77	88	151	191	296	280	442	425		132	52	80		
15	150	78	87	140	177	276	421	406	406		132	52	80		
16	160	77	85	134	169	262	287	401	388		132	53	80		
17	170	77	84	130	162	250	286	383	372		133	53	80		
18	180	77	83	126	156	241	284	370	357		132	53	79		
19	190	76	83	123	153	235	281	355	345		132	54	79		
20	200	76	82	120	149	230	277	346	334		132	55	79		
21	210	76	81	119	146	228	273	337	324		132	55	79		
22	220	76	81	117	145	226	269	330	315		133	56	79		
23	230	76	80	115	142	223	266	323	307		132	57	78		
24	240	76	80	114	140	218	262	316	300		132	57	78		
25	250	75	79	113	138	214	258	310	293		132	58	78		
26	260	75	79	112	136	210	255	304	287		132	58	78		
27	270	75	78	110	135	207	253	298	281		132	58	78		
28	280	75	78	109	134	204	250	293	276		132	58	77		
29	290	75	78	108	132	201	247	289	271		132	58	77		
30	300	74	84	168	132	197	244	285	266		132	58	77		
31	310	75	97	306	158	248	222	309	286		132	59	77		

Test Engineer: B.D.Date: 4/6/15

Gas Particulate Sampling Data

Project Number: G101925579
 Manufacturer: Hearth & Home
 Model: Adventure II
 Sample ID Number: PRT1501130904-001
 Test Date: 13-Jan-15
 Test Run Number: 2

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	28.85		Meter Box (A)	0.977
End	28.83			
Duration of Test, Min		310		

Leak Check, cfm @ in Hg	
Train A	0.0@4

Maximum Vacuum	
Train A	0.00

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.037	1.00		-0.040	16.15	16.15	0.000		100.00		0.00
10	0.037	1.00		-0.075	14.60	1.55	5.920		107.92		0.00
20	0.037	1.00		-0.075	11.80	2.80	11.590		103.36		0.00
30	0.037	1.00		-0.067	10.00	1.80	17.310		102.02		0.00
40	0.037	1.00		-0.065	8.30	1.70	23.060		102.47		0.00
50	0.037	1.00		-0.063	6.80	1.50	28.820		102.19		0.00
60	0.037	1.00		-0.057	5.50	1.30	34.600		101.83		0.00
70	0.037	1.00		-0.050	4.80	0.70	40.370		101.12		0.00
80	0.037	1.00		-0.047	4.10	0.70	46.180		101.19		0.00
90	0.037	1.00		-0.044	3.60	0.50	52.070		102.40		0.00
100	0.037	1.00		-0.040	3.10	0.50	58.150		105.23		0.00
110	0.037	1.00		-0.040	2.70	0.40	63.470		91.83		0.00
120	0.037	1.00		-0.040	2.30	0.40	69.280		99.59		0.00
130	0.037	1.00		-0.038	2.10	0.20	75.050		99.58		0.00
140	0.037	1.00		-0.020	2.00	0.10	81.100		103.59		0.00
150	0.037	1.00		-0.017	1.90	0.10	86.510		92.55		0.00
160	0.037	1.00		-0.015	1.80	0.10	92.150		96.31		0.00
170	0.037	1.00		-0.015	1.80	0.00	97.950		98.95		0.00
180	0.037	1.00		-0.014	1.70	0.10	104.030		103.82		0.00
190	0.037	1.00		-0.013	1.60	0.10	109.640		95.80		0.00
200	0.037	1.00		-0.013	1.50	0.10	115.450		99.12		0.00
210	0.037	1.00		-0.013	1.40	0.10	121.220		98.35		0.00
220	0.037	1.00		-0.012	1.40	0.00	127.080		99.88		0.00
230	0.037	1.00		-0.011	1.30	0.10	132.930		99.80		0.00
240	0.037	1.00		-0.010	1.20	0.10	138.630		97.24		0.00
250	0.037	1.00		-0.010	1.10	0.10	144.430		98.86		0.00
260	0.037	1.00		-0.009	1.10	0.00	150.300		100.05		0.00
270	0.037	1.00		-0.009	1.00	0.10	156.050		97.91		0.00
280	0.037	1.00		-0.009	0.90	0.10	162.170		104.41		0.00
290	0.037	1.00		-0.008	0.90	0.00	167.640		93.32		0.00
300	0.037	1.00		-0.033	0.50	0.40	173.400		98.81		0.00
310	0.037	1.00		-0.044	0.00	0.50	179.183		100.39		0.00

Test Engineer: SDDate: 4/6/15



Dilution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 13-Jan-15
Test Run Number: 2

	Dilution Tunnel	
	Delta P In. H2O	Temp, °F
A1	0.0350	97
A2	0.0380	97
A3	0.0360	94
A4	0.0300	94
A Center	0.0370	93
B1	0.0340	92
B2	0.0370	91
B3	0.0370	91
B4	0.0330	91
B Center	0.0370	91
Averages	0.0354	93.1
		0.1870

Tunnel Diameter **6.000** inches
Tunnel Static **-0.520** in. H2O
Tunnel Area 0.19635 Ft²
Pitot Correction 0.9720 factor
Baro. Pressure 28.85
Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity 12.973 Ft/ Sec
Initial Flow **135.00** Ft³/min

Test Engineer: BD

Date: 4/3/15

Project Number: G101925579
 Manufacturer: Hearth & Home
 Model: Adventure II
 Sample ID Number: PRT1501130904-001
 Test Date: 13-Jan-15
 Test Run Number: 2

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	502	772.3	753.8		18.50
REAR FILTER CATCH	FILTER	508	135.5	135.9		-0.40
RINSE OF PROBE &	ACETONE	40	124414.7	124409	0.0027	5.59
RINSE OF IMPINGER SET	WATER	210	99046.5	99038.7	0.007	6.33
RINSE OF IMPINGER SET	METHANE	100	100516.9	100510.2	0.002	6.50
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	50	106759.8	106754.4	0.0027	5.27
			TOTAL:		41.79	

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer: SD

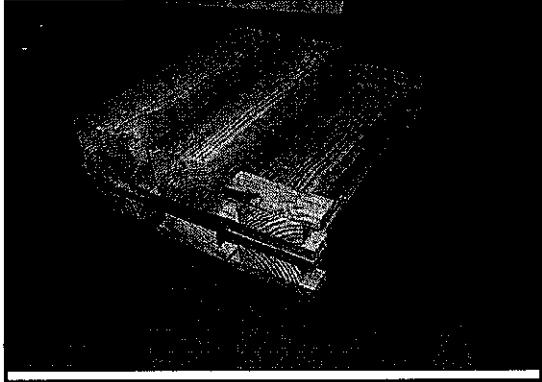
Date: 4/9/15

TEST RESULTS
EPA METHOD 5G-3

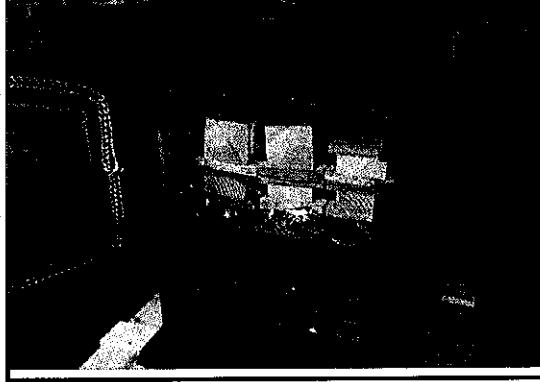
Project Number: G101925579
 Manufacturer: Hearth & Home
 Model: Adventure II
 Sample ID Number: PRT1501130904-001
 Test Date: 14-Jan-15
 Test Run Number: 3

	Dry Burn-Rate, kg/hr:	1.29
	Emission-Rate, g/hr:	2.29
	Duration of Test, Minutes	280
Dry Gas Meter Standardization	Train A	
Dry Gas Meter Beginning Reading, ft ³	179.5	
Dry Gas Meter Ending Reading, ft ³	341.621	
Barometric Pressure Correction Factor	0.961	
Dry Gas Meter Calibration Factors (y factors)	0.977	
Dry Gas Meter Temperature Factors	0.987	
Dry Gas Meter Delta-H Correction Factors	1.002	
Dry Gas Meter STD Volume Sampled, ft ³	150.716	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	140.879	
Total Tunnel Volume, scf	39446.199	
Emission Calculations	Train A	
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	261.725	
Sample Particulate Mass, mg	40.8	
Total Emissions, grams	10.674	
Emission-Rate, g/hr	2.29	
Adjusted Emission Rates, g/hr	3.62	
Operating Parameters	Train A	
Max Filter Temperature, °F	133	
Post-Test Leak Check, cfm @ in. Hg vac.	0	
Average Firebox Surface Temperature delta-T, °F	12.4	
Maximum Ambient Temperature, °F	74	
Minimum Ambient Temperature, °F	67	
Fuel Properties		
Wet Fuel Load Weight, lb.	16.00	
Dry-Basis Fuel Load Moisture Content, %	20.84	
Wet-Basis Fuel Load Moisture Content, %	17.25	

PROJECT / TEST INFORMATION	
Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run Number:	3
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification



Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	2.49	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings	
Primary Air:	Auto button was pushed after loading pre burn fuel. With the thermostat at a non-demand temperature this caused combustion air to automatically close down gradually to an electronic air stop. After secondary combustion temperatures cooled to a preset temperature combustion air closed down completely.
Secondary Air:	Fixed opening
Control Board:	Programable thermostat set at 50 degrees so will not call for heat.
Blower/Fan:	Auto high, will turn on and run at a predetermined temperature.
Pre- Burn Activities	
Time	Activity 75 minutes removed 1.4 pounds of coals
Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 55 seconds.
Fuel-loading door :	Cracked open until 3:30 then closed.
Primary air:	Auto button pushed at zero minutes
Secondary air:	Fixed opening
Control board:	Programable thermostat set at 50 degrees so will not call for heat, then will open primary air fully after 4.0 hours.
Blower / fan:	Auto High
Other Notes	

Intertek**TEST FUEL DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run Number:	3

Firebox Volume, ft ³ :	2.49
-----------------------------------	------

Calibration Reference ID		
Set meter to Species 1	12%	12.0
Set Temperature to 70F	22%	22.0
Set pin setting to 444		

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight	0.0	Average, %db	#DIV/0!		

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	9:30	Temp., °F:	65
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
			2x4	4x4	
1	16.00		7.64	22.0	20.2
2	16.00			19.8	19.2
3	16.00			20.9	22.4
4	16.00			20.2	21.9
5	16.00			22.0	22.0
6	16.00	8.37		20.9	21.5
7					
8					
Totals		8.4	7.6		
% of Weight		52	48		
Total weight, wet, lb.		16.00		Average Moisture, dry	20.84
Total weight, dry, kg		6.01		Average Moisture, wet	17.25

Test Engineer: SDDate: 4/16/15



Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run Number:	3

EPA Method 28 Pre Burn Data

Coal Bed Range 3.2 to 4.0

Average Firebox Temp, °F	320.4	Final Coal Bed Wt, lb	3.9
--------------------------	-------	-----------------------	-----

Test Engineer: B. D..

Date: 4/6/15

Intertek**TEST DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run No:	3

Temperature Data

Firebox Temp Start	320.4
Firebox Temp End	308
Firebox Delta-T	12.4

Max Filter Temps
Train A
133

Interval	10	Duration of Test, Min	280
Time			

Temperature Data													
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM
0	0	69	88	154	194	268	282	423	435		133	76	74
1	10	69	156	630	393	239	267	397	413		133	60	73
2	20	69	127	515	446	236	256	409	431		133	60	73
3	30	70	122	480	445	216	259	421	443		132	60	74
4	40	69	119	448	414	218	260	437	456		132	60	74
5	50	69	120	469	427	224	259	446	470		133	60	74
6	60	70	115	427	415	236	258	463	483		133	60	75
7	70	69	109	369	355	252	258	471	479		132	59	75
8	80	70	104	329	303	267	258	460	466		132	59	75
9	90	68	100	302	269	272	260	447	455		132	59	75
10	100	67	97	288	249	278	261	437	449		133	58	75
11	110	67	94	280	240	285	264	436	449		132	58	75
12	120	69	87	170	204	290	271	426	438		132	58	75
13	130	72	85	143	184	283	282	407	418		132	58	74
14	140	73	83	133	171	274	288	389	399		132	58	75
15	150	73	82	127	163	265	291	373	380		132	59	75
16	160	74	81	122	156	259	292	359	365		132	59	75
17	170	74	81	118	150	253	290	347	352		132	60	75
18	180	73	79	116	150	246	288	336	339		132	61	75
19	190	73	79	114	147	241	286	326	329		132	61	75
20	200	73	79	113	145	239	317	318	318		132	62	75
21	210	73	78	111	143	237	280	308	308		132	62	75
22	220	73	78	109	141	233	277	301	300		132	63	75
23	230	73	77	108	138	226	274	293	293		132	63	75
24	240	73	77	107	136	220	271	286	286		132	64	75
25	250	73	91	256	146	237	255	285	256		132	64	75
26	260	73	101	325	176	283	241	313	317		133	65	75
27	270	73	105	343	195	305	239	353	353		132	65	75
28	280	74	107	350	206	324	246	383	381		132	66	75

Test Engineer: Date:  4/14/15

Intertek**TEST DATA
EPA METHOD 5G-3****Gas Particulate Sampling Data**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run Number:	3

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start	28.79	Meter Box (A) 0.977
End	28.73	

Leak Check, cfm @ in Hg	
Train A	0.006@6

Maximum Vacuum	
Train A	
	0.00

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.040	1.00		-0.024	16.00	16.00	179.500		99.99		0.00
10	0.040	1.00		-0.080	13.90	2.10	185.320		106.07		0.00
20	0.040	1.00		-0.070	11.70	2.20	191.080		102.48		0.00
30	0.040	1.00		-0.067	10.00	1.70	196.810		101.32		0.00
40	0.040	1.00		-0.064	8.40	1.60	202.280		96.47		0.00
50	0.040	1.00		-0.064	6.90	1.50	208.040		101.67		0.00
60	0.040	1.00		-0.060	5.70	1.20	213.850		101.92		0.00
70	0.040	1.00		-0.054	4.80	0.90	219.680		101.74		0.00
80	0.040	1.00		-0.050	4.20	0.60	225.500		101.12		0.00
90	0.040	1.00		-0.046	3.60	0.60	231.270		99.89		0.00
100	0.040	1.00		-0.045	3.20	0.40	237.120		101.00		0.00
110	0.040	1.00		-0.042	2.70	0.50	242.930		100.04		0.00
120	0.040	1.00		-0.025	2.60	0.10	248.750		99.58		0.00
130	0.040	1.00		-0.020	2.40	0.20	254.880		104.89		0.00
140	0.040	1.00		-0.017	2.30	0.10	260.280		92.06		0.00
150	0.040	1.00		-0.016	2.20	0.10	266.310		102.70		0.00
160	0.040	1.00		-0.015	2.20	0.00	271.780		93.08		0.00
170	0.040	1.00		-0.014	2.10	0.10	277.520		97.67		0.00
180	0.040	1.00		-0.013	2.00	0.10	283.380		99.53		0.00
190	0.040	1.00		-0.012	1.90	0.10	289.350		101.40		0.00
200	0.040	1.00		-0.010	1.90	0.00	295.160		98.68		0.00
210	0.040	1.00		-0.010	1.80	0.10	301.420		106.22		0.00
220	0.040	1.00		-0.010	1.70	0.10	307.120		96.72		0.00
230	0.040	1.00		-0.010	1.60	0.10	312.490		91.04		0.00
240	0.040	1.00		-0.010	1.60	0.00	318.380		99.85		0.00
250	0.040	1.00		-0.043	1.00	0.60	324.150		99.09		0.00
260	0.040	1.00		-0.048	0.50	0.50	329.980		101.02		0.00
270	0.040	1.00		-0.050	0.10	0.40	335.950		103.81		0.00
280	0.040	1.00		-0.050	0.00	0.10	341.621		98.79		0.00

Test Engineer: BDDate: 1/16/15

Intertek**Dilution Tunnel Velocity Traverse
EPA Method 5G-3**

Project Number: G101925579

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID Number: PRT1501130904-001

Test Date: 14-Jan-15

Test Run Number: 3

	Dilution Tunnel		Square Root
	Delta P In. H ₂ O	Temp, °F	
A1	0.0350	89	0.1871
A2	0.0400	89	0.2000
A3	0.0400	88	0.2000
A4	0.0360	88	0.1897
A Center	0.0400	88	0.2000
B1	0.0360	88	0.1897
B2	0.0400	88	0.2000
B3	0.0380	88	0.1949
B4	0.0350	88	0.1871
B Center	0.0380	88	0.1949
Averages	0.0378	88.2	0.1936

Tunnel Diameter **6.000** inchesTunnel Static **-0.510** in. H₂OTunnel Area **0.19635** Ft²Pitot Correction **0.9803** factorBaro. Pressure **28.79**Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)Initial Velocity **13.387** Ft/ SecInitial Flow **140.26** Ft³/minTest Engineer: BDDate: 4/6/15



DILUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 14-Jan-15
Test Run Number: 3

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	503	780.5	763		17.50
REAR FILTER CATCH	FILTER	509	128.6	129		-0.40
RINSE OF PROBE &	ACETONE	35	102272	102266	0.0027	5.91
RINSE OF IMPINGER SET	WATER	200	101553	101544.8	0.007	6.80
RINSE OF IMPINGER SET	METHANE	100	131565.5	131558.7	0.002	6.60
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	45	122220.6	122216.1	0.0027	4.38
					TOTAL:	40.78

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer: BD

Date: 4/6/15

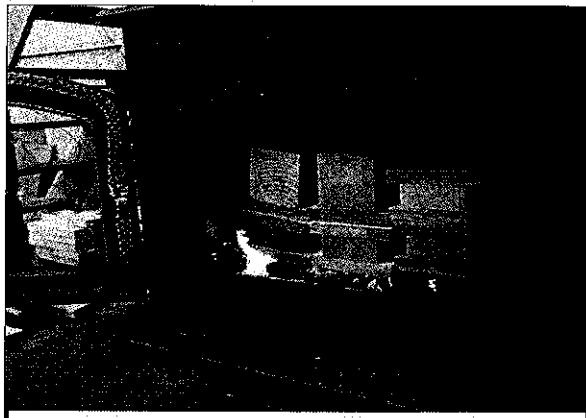
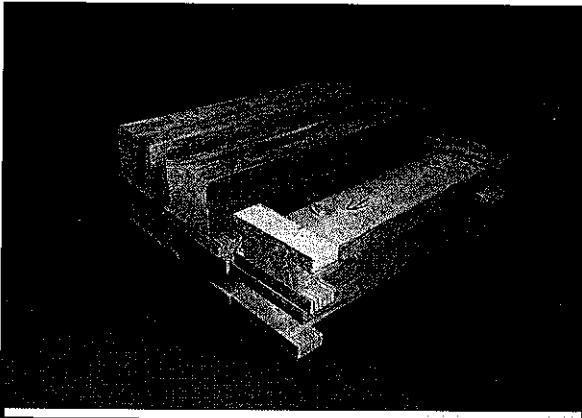
TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925579
 Manufacturer: Hearth & Home
 Model: Adventure II
 Sample ID Number: PRT1501130904-001
 Test Date: 14-Jan-15
 Test Run Number: 4

Dry Burn-Rate, kg/hr:	2.58
Emission-Rate, g/hr:	5.35
Duration of Test, Minutes	140
Dry Gas Meter Standardization	Train A
Dry Gas Meter Beginning Reading, ft ³	341.9
Dry Gas Meter Ending Reading, ft ³	422.76
Barometric Pressure Correction Factor	0.960
Dry Gas Meter Calibration Factors (y factors)	0.977
Dry Gas Meter Temperature Factors	0.978
Dry Gas Meter Delta-H Correction Factors	1.002
Dry Gas Meter STD Volume Sampled, ft ³	74.307
Dilution Tunnel Flow / Volume	
Standardized Tunnel Flow, dscfm	128.834
Total Tunnel Volume, scf	18036.690
Emission Calculations	Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	242.733
Sample Particulate Mass, mg	51.4
Total Emissions, grams	12.481
Emission-Rate, g/hr	5.35
Adjusted Emission Rates, g/hr	7.32
Operating Parameters	Train A
Max Filter Temperature, °F	133
Post-Test Leak Check, cfm @ in. Hg vac.	0
Average Firebox Surface Temperature delta-T, °F	20.8
Maximum Ambient Temperature, °F	82
Minimum Ambient Temperature, °F	70
Fuel Properties	
Wet Fuel Load Weight, lb.	16.30
Dry-Basis Fuel Load Moisture Content, %	22.75
Wet-Basis Fuel Load Moisture Content, %	18.53

PROJECT / TEST INFORMATION	
Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run Number:	4
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft ³ :	2.49	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

**Test Settings**

Primary Air: Thermostat set at 90 degrees (on demand) Primary air fully open.
 Secondary Air: Fixed opening
 Control Board: Cycle button pushed when pre test load was loaded.
 Blower/Fan: Auto on high

Pre- Burn Activities

Time Activity
 At 61 minutes removed 2.0 pounds of coals.

Start-Up Procedure

Loading of fuel, sec. : Fuel loaded by 50 seconds
 Fuel-loading door : cracked open until 1:45 then closed
 Primary air: Thermostat set at 90 degrees (on demand) Primary air fully open.
 Secondary air: Fixed
 Control board: air fully open.
 Blower / fan: Auto on high.

Other Notes

Test Engineer: B.D.

Date: 4/6/15

Intertek**TEST FUEL DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run Number:	4

Firebox Volume, ft ³	2.49
---------------------------------	------

Calibration Reference ID	
Set meter to Species 1	
Set Temperature to 70F	12% 12.0
Set pin setting to 444	22% 22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	96.00	16.71	21.0	25.9	25.0
2	96.00		24.4	23.8	25.6
3	96.00		24.3	25.2	24.3
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight		16.7	Average, %db	24.4	

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	16:45	Temp., °F:	70
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16.00		23.8	20.3	21.2
2	16.00		24.2	23.0	22.1
3	16.00		22.4	22.1	19.1
4	16.00		24.5	25.2	25.3
5	16.00		24.5	23.3	24.2
6	16.00	8.33	21.3	23.1	19.9
7					
8					
Totals		8.3	8.0		
% of Weight		51	49		
Total weight, wet, lb.		16.30	Average Moisture, dry	22.75	
Total weight, dry, kg		6.02	Average Moisture, wet	18.53	

Test Engineer: B.D.Date: 1/15



Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 14-Jan-15
Test Run Number: 4

EPA Method 28 Pre Burn Data

Coal Bed Range 3.3 to 4.0

Final Coal Bed Wt, lb	3.8
-----------------------	-----

Average Firebox Temp, °F 387.6

Test Engineer: BG

Date: 4/4/15

Intertek**TEST DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run No:	4

Temperature Data

Firebox Temp Start	387.6
Firebox Temp End	366.8
Firebox Delta-T	20.8

Max Filter Temps	
Train A	

Interval	10	Duration of Test, Min	140
Time			

Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	76	124	378	274	373	272	513	506		133	78	75	
1	10	77	193	714	515	288	271	495	497		133	46	75	
2	20	79	200	712	613	288	268	513	523		133	47	76	
3	30	80	187	663	577	295	270	537	559		133	49	78	
4	40	81	179	626	560	319	273	555	587		133	49	79	
5	50	82	156	521	455	361	276	564	606		133	50	80	
6	60	82	145	471	385	383	278	560	589		133	50	81	
7	70	82	137	439	339	383	280	556	570		133	51	82	
8	80	80	131	412	305	374	281	553	551		133	51	83	
9	90	77	126	392	285	368	282	552	532		133	51	83	
10	100	72	121	368	262	358	282	539	514		133	51	83	
11	110	72	117	352	247	351	282	532	497		133	51	83	
12	120	71	114	339	232	349	282	522	483		132	50	82	
13	130	70	112	334	226	352	282	518	471		132	50	81	
14	140	74	111	332	223	351	281	516	463		132	53	80	

Test Engineer: BDDate: 4/16/15

Intertek**TEST DATA
EPA METHOD 5G-3****Gas Particulate Sampling Data**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	14-Jan-15
Test Run Number:	4

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start 28.73		Meter Box (A) 0.977
End 28.70		

Leak Check, cfm @ in Hg	
Train A	.002@8

Maximum Vacuum	
Train A	
	0.00

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.038	1.00		-0.054	16.30	16.30	341.900		100.05		0.00
10	0.038	1.00		-0.085	13.40	2.90	347.670		104.94		0.00
20	0.038	1.00		-0.083	10.00	3.40	353.340		103.48		0.00
30	0.038	1.00		-0.079	7.30	2.70	359.020		102.25		0.00
40	0.038	1.00		-0.075	5.20	2.10	364.870		104.47		0.00
50	0.038	1.00		-0.067	4.00	1.20	370.610		100.45		0.00
60	0.038	1.00		-0.062	3.20	0.80	376.180		96.42		0.00
70	0.038	1.00		-0.060	2.50	0.70	382.000		99.90		0.00
80	0.038	1.00		-0.055	2.00	0.50	387.750		98.02		0.00
90	0.038	1.00		-0.055	1.50	0.50	393.550		98.45		0.00
100	0.038	1.00		-0.053	1.10	0.40	399.670		103.44		0.00
110	0.038	1.00		-0.050	0.80	0.30	405.670		101.06		0.00
120	0.038	1.00		-0.050	0.50	0.30	411.350		95.60		0.00
130	0.038	1.00		-0.050	0.20	0.30	416.950		94.26		0.00
140	0.038	1.00		-0.050	0.00	0.20	422.760		97.89		0.00

Test Engineer: DJDate: 4/3/15



Dilution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925579

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID Number: PRT1501130904-001

Test Date: 14-Jan-15

Test Run Number: 4

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0320	142	0.1789
A2	0.0360	142	0.1897
A3	0.0370	142	0.1924
A4	0.0320	142	0.1789
A Center	0.0370	142	0.1924
B1	0.0320	141	0.1789
B2	0.0370	141	0.1924
B3	0.0370	141	0.1924
B4	0.0330	140	0.1817
B Center	0.0380	140	0.1949
Averages	0.0351	141.3	0.1856

Tunnel Diameter **6.000** inches

Tunnel Static **-0.510** in. H2O

Tunnel Area 0.19635 Ft²

Pitot Correction 0.9587 factor

Baro. Pressure 28.73

Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)

Initial Velocity 13.459 Ft/ Sec

Initial Flow **128.29** Ft³/min

Test Engineer: BD

Date: 4/4/15



DILUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 14-Jan-15
Test Run Number: 4

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	504	786	759.2		26.80
REAR FILTER CATCH	FILTER	510	135.3	136.1		-0.80
RINSE OF PROBE &	ACETONE	40	108424	108416.3	0.0027	7.59
RINSE OF IMPINGER SET	WATER	220	99522.2	99513.8	0.007	6.86
RINSE OF IMPINGER SET	METHANE	100	106397.4	106390.8	0.002	6.40
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	50	98121.6	98116.9	0.0027	4.57
					TOTAL:	51.42

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer: B.D.

Date: 4/16/15

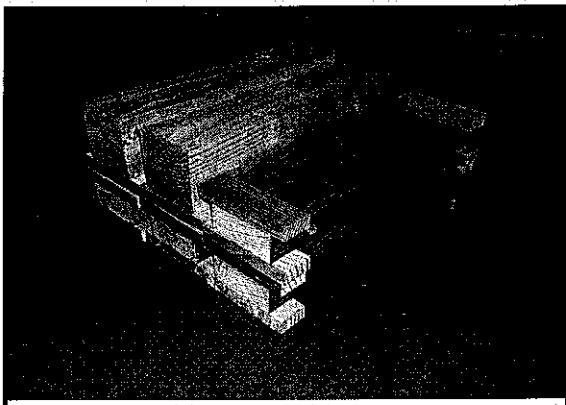
Intertek**TEST RESULTS
EPA METHOD 5G-3**

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 15-Jan-15
Test Run Number: 5

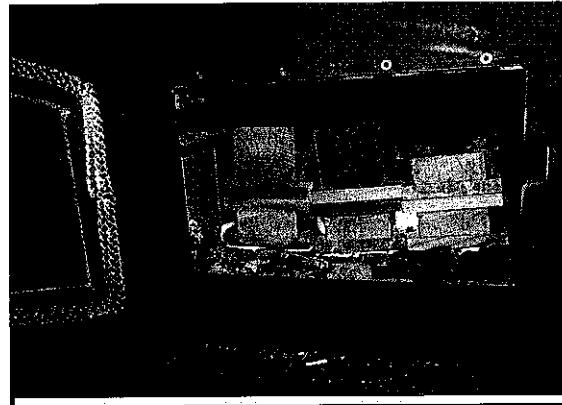
Dry Burn-Rate, kg/hr:	1.69
Emission-Rate, g/hr:	1.68
Duration of Test, Minutes	210
Dry Gas Meter Standardization	Train A
Dry Gas Meter Beginning Reading, ft ³	423
Dry Gas Meter Ending Reading, ft ³	545.02
Barometric Pressure Correction Factor	0.957
Dry Gas Meter Calibration Factors (y factors)	0.977
Dry Gas Meter Temperature Factors	0.985
Dry Gas Meter Delta-H Correction Factors	1.002
Dry Gas Meter STD Volume Sampled, ft ³	112.696
Dilution Tunnel Flow / Volume	
Standardized Tunnel Flow, dscfm	134.988
Total Tunnel Volume, scf	28347.422
Emission Calculations	Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	251.539
Sample Particulate Mass, mg	23.4
Total Emissions, grams	5.881
Emission-Rate, g/hr	1.68
Adjusted Emission Rates, g/hr	2.80
Operating Parameters	Train A
Max Filter Temperature, °F	133
Post-Test Leak Check, cfm @ in. Hg vac.	0
Average Firebox Surface Temperature delta-T, °F	9
Maximum Ambient Temperature, °F	78
Minimum Ambient Temperature, °F	66
Fuel Properties	
Wet Fuel Load Weight, lb.	15.82
Dry-Basis Fuel Load Moisture Content, %	21.09
Wet-Basis Fuel Load Moisture Content, %	17.42

Intertek**Run Notes
EPA Methods 28 and 5G-3**

PROJECT / TEST INFORMATION	
Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	15-Jan-15
Test Run Number:	5
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification



Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	2.49	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

**Test Settings**

Primary Air:	Auto button was pushed after loading pre burn fuel. With the thermostat at a non-demand temperature this caused combustion air to automatically close down gradually to an electronic air stop. After secondary combustion temperatures cooled to a preset temperature combustion air closed down completely.
Secondary Air:	Fixed
Control Board:	Cycle button pushed when pre test load was loaded.
Blower/Fan:	Power cord to the appliance was un-plugged for this test, fan confirmation.

Pre- Burn Activities

Time	Activity
	At 98 minutes raked coals

Start-Up Procedure

Loading of fuel, sec.	Fuel loaded by 50 seconds
Fuel-loading door	Fuel door cracked open until 1:45 then closed.
Primary air:	Auto cycle button pushed at zero minutes
Secondary air:	Fixed
Control board:	
Blower / fan:	Power cord to the appliance was un-plugged.

Other Notes

Test Engineer: BDDate: 4/4/15

Intertek**TEST FUEL DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	15-Jan-15
Test Run Number:	5

Firebox Volume, ft ³ :	2.49
-----------------------------------	------

Calibration Reference ID	
Set meter to Species 1	
Set Temperature to 70F	12% 12.0
Set pin setting to 444	22% 22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	96.00	14.32	22.3	21.9	19.0
2	96.00		18.0	24.2	18.9
3	96.00				
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight	14.3	Average, %db	20.7		

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	9:15	Temp., °F:	68
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16.00	7.30	18.9	22.0	20.9
2	16.00		18.7	19.7	19.9
3	16.00		22.2	22.5	22.0
4	16.00		24.7	21.9	24.3
5	16.00		19.3	19.3	20.2
6	16.00	8.52	19.2	20.2	23.8
7					
8					
Totals	7.3	8.5			
% of Weight	46	54			
Total weight, wet, lb.	15.82		Average Moisture, dry	21.09	
Total weight, dry, kg	5.93		Average Moisture, wet	17.42	

Test Engineer: B.D.Date: 1/15/15



Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	15-Jan-15
Test Run Number:	5

EPA Method 28 Pre Burn Data

Coal Bed Range 3.2 to 3.9

Average Firebox Temp, °F	378	Final Coal Bed Wt, lb	3.6
--------------------------	-----	-----------------------	-----

Test Engineer: B.D.

Date: 4/6/15

Intertek**TEST DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	15-Jan-15
Test Run No:	5

Temperature Data

Firebox Temp Start	378
Firebox Temp End	387
Firebox Delta-T	9.0

Max Filter Temps	
Train A	
133	

Interval	10	Duration of Test, Min		210		Temperature Data									
Time															
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM		
0	0	74	88	165	303	419	341	409	418		133	73	74		
1	10	75	154	615	581	366	310	397	407		132	48	74		
2	20	75	156	645	788	390	290	427	434		133	48	74		
3	30	76	139	560	803	427	285	473	466		133	48	75		
4	40	77	142	582	834	455	284	495	484		133	48	75		
5	50	76	142	584	853	478	283	516	502		133	49	76		
6	60	75	132	753	757	504	283	543	525		133	49	77		
7	70	66	123	443	632	532	283	555	531		133	50	77		
8	80	73	118	412	563	541	284	555	526		133	50	76		
9	90	73	115	392	521	545	287	556	521		133	50	76		
10	100	74	113	379	499	541	290	557	516		133	50	76		
11	110	74	110	349	457	538	294	545	510		132	50	76		
12	120	74	108	341	437	545	297	533	506		132	51	76		
13	130	72	106	331	420	549	301	527	503		132	51	77		
14	140	72	106	328	409	554	303	523	498		132	52	76		
15	150	74	104	320	399	557	306	521	494		132	52	76		
16	160	73	104	316	390	552	308	516	488		132	53	76		
17	170	75	94	198	367	540	325	506	478		133	54	76		
18	180	76	92	179	345	510	340	487	458		132	56	76		
19	190	77	93	172	326	490	347	468	437		132	56	77		
20	200	78	92	165	313	474	348	451	419		132	57	77		
21	210	76	89	160	300	455	346	433	401		132	58	78		

Test Engineer: B.D.Date: 1/15/15

Intertek**TEST DATA
EPA METHOD 5G-3****Gas Particulate Sampling Data**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	15-Jan-15
Test Run Number:	5

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start	28.64	Meter Box (A)
End	28.64	0.977

Leak Check, cfm @ in Hg	
Train A	.004@5

Maximum Vacuum	
Train A	
	0.00

Time	Particulate Sampling Data									
	Tunnel Delta-P	Train A Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train A Proportional Rate		Train A Vacuum, In. Hg	
0	0.040	1.00	-0.024	15.82	15.82	423.000	100.07		0.00	
10	0.040	1.00	-0.076	14.10	1.72	428.780	103.21		0.00	
20	0.040	1.00	-0.078	11.50	2.60	434.660	105.17		0.00	
30	0.040	1.00	-0.072	9.50	2.00	440.350	100.17		0.00	
40	0.040	1.00	-0.074	7.60	1.90	445.780	95.83		0.00	
50	0.040	1.00	-0.074	5.70	1.90	451.710	104.46		0.00	
60	0.040	1.00	-0.065	4.40	1.30	457.500	100.95		0.00	
70	0.040	1.00	-0.063	3.80	0.60	463.230	99.15		0.00	
80	0.040	1.00	-0.060	3.20	0.60	469.280	104.43		0.00	
90	0.040	1.00	-0.055	2.70	0.50	474.980	98.13		0.00	
100	0.040	1.00	-0.050	2.10	0.60	480.860	101.05		0.00	
110	0.040	1.00	-0.050	1.90	0.20	486.730	100.62		0.00	
120	0.040	1.00	-0.045	1.60	0.30	492.600	100.44		0.00	
130	0.040	1.00	-0.043	1.40	0.20	498.660	103.32		0.00	
140	0.040	1.00	-0.045	1.10	0.30	504.280	95.99		0.00	
150	0.040	1.00	-0.046	0.90	0.20	510.560	107.08		0.00	
160	0.040	1.00	-0.045	0.70	0.20	516.070	93.95		0.00	
170	0.040	1.00	-0.040	0.50	0.20	521.800	96.83		0.00	
180	0.040	1.00	-0.025	0.30	0.20	527.670	99.02		0.00	
190	0.040	1.00	-0.024	0.20	0.10	533.450	97.40		0.00	
200	0.040	1.00	-0.025	0.10	0.10	539.280	98.16		0.00	
210	0.040	1.00	-0.020	0.00	0.10	545.020	96.20		0.00	

Test Engineer: B.D.Date: 4/6/15



Dilution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925579

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID Number: PRT1501130904-001

Test Date: 15-Jan-15

Test Run Number: 5

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0320	93	0.1789
A2	0.0370	93	0.1924
A3	0.0370	93	0.1924
A4	0.0330	92	0.1817
A Center	0.0370	93	0.1924
B1	0.0340	92	0.1844
B2	0.0370	92	0.1924
B3	0.0400	92	0.2000
B4	0.0320	92	0.1789
B Center	0.0400	92	0.2000
Averages	0.0359	92.4	0.1876

Tunnel Diameter **6.000** inches

Tunnel Static **-0.500** in. H2O

Tunnel Area **0.19635** Ft²

Pitot Correction **0.9563** factor

Baro. Pressure **28.64**

Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)

Initial Velocity **13.060** Ft/ Sec

Initial Flow **135.08** Ft³/min

Test Engineer: BD

Date: 1/15



DILUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 15-Jan-15
Test Run Number: 5

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	505	759.4	749.6		9.80
REAR FILTER CATCH	FILTER	511	127.4	127.9		-0.50
RINSE OF PROBE &	ACETONE	30	98801.7	98798	0.0027	3.62
RINSE OF IMPINGER SET	WATER	215	97942.3	97937.6	0.007	3.19
RINSE OF IMPINGER SET	METHANE	100	102996.6	102993.1	0.002	3.30
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	50	101924.4	101920.3	0.0027	3.96
					TOTAL:	23.38

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer:

Date:



TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 16-Jan-15
Test Run Number: 6

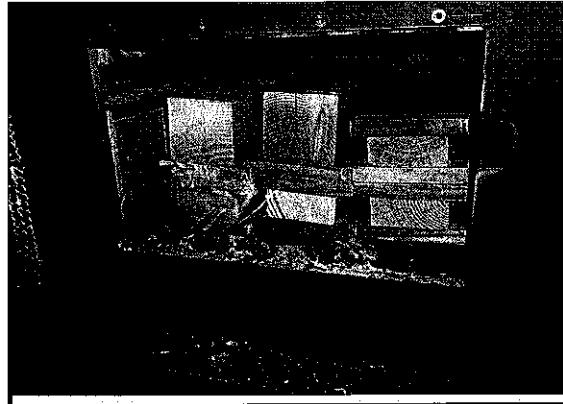
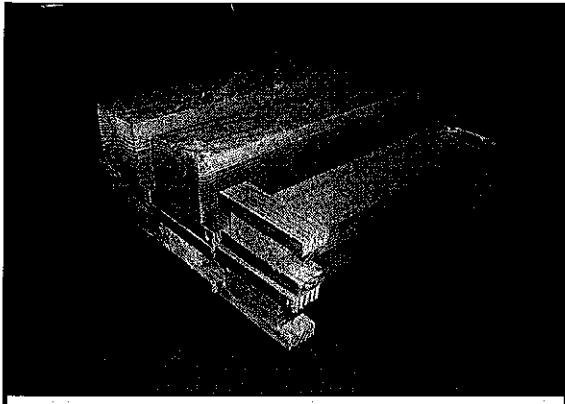
Dry Burn-Rate, kg/hr:	1.12
Emission-Rate, g/hr:	1.97
Duration of Test, Minutes	320
Dry Gas Meter Standardization	Train A
Dry Gas Meter Beginning Reading, ft ³	545.4
Dry Gas Meter Ending Reading, ft ³	730.582
Barometric Pressure Correction Factor	0.950
Dry Gas Meter Calibration Factors (y factors)	0.977
Dry Gas Meter Temperature Factors	0.989
Dry Gas Meter Delta-H Correction Factors	1.002
Dry Gas Meter STD Volume Sampled, ft ³	170.359
Dilution Tunnel Flow / Volume	
Standardized Tunnel Flow, dscfm	136.572
Total Tunnel Volume, scf	43702.943
Emission Calculations	Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	256.534
Sample Particulate Mass, mg	41.1
Total Emissions, grams	10.531
Emission-Rate, g/hr	1.97
Adjusted Emission Rates, g/hr	3.20
Operating Parameters	Train A
Max Filter Temperature, °F	133
Post-Test Leak Check, cfm @ in. Hg vac.	0
Average Firebox Surface Temperature delta-T, °F	23
Maximum Ambient Temperature, °F	78
Minimum Ambient Temperature, °F	71
Fuel Properties	
Wet Fuel Load Weight, lb.	16.13
Dry-Basis Fuel Load Moisture Content, %	22.11
Wet-Basis Fuel Load Moisture Content, %	18.11

Test Engineer: SD

Date: 1/15

PROJECT / TEST INFORMATION	
Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	16-Jan-15
Test Run Number:	6
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft ³ :	2.49	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard

**Test Settings**

Primary Air:	Auto button was pushed after loading pre burn fuel. With the thermostat at a non-demand temperature this caused combustion air to automatically close down gradually to an electronic air stop. After secondary combustion temperatures cooled to a preset temperature combustion air closed down completely.
Secondary Air:	Fixed
Control Board:	Cycle button pushed when pre test load was loaded.
Blower/Fan:	Fan was unplugged for the fan confirmation test.

Pre- Burn Activities

Time	Activity
	At 74 minutes removed 1.4 pounds of coals

Start-Up Procedure

Loading of fuel, sec. :	Fuel loaded by 55 seconds
Fuel-loading door :	Cracked open until 2:40 then closed
Primary air:	Auto cycle button pushed at zero minutes
Secondary air:	Fixed.
Control board:	Programable thermostat set to open primary air at 5 hours.
Blower / fan:	Fan was unplugged for the entire test, fan confirmation.

Other Notes

Test Engineer: B6JDate: 4/4/15

Intertek**TEST FUEL DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	16-Jan-15
Test Run Number:	6

Firebox Volume, ft ³ :	2.49
-----------------------------------	------

Calibration Reference ID	
Set meter to Species 1	
Set Temperature to 70F	12%
Set pin setting to 444	22%
	12.0
	22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16.00	14.25	25.5	24.3	20.4
2			19.4	21.9	22.6
3			20.6	24.4	18.6
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight	14.3	Average, %db	22.0		

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	9:30	Temp., °F:	69
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	15.38	6.95	19.8	22.0	26.3
2			22.1	20.2	18.7
3		9.18	23.0	25.4	22.8
4			24.5	20.5	24.9
5			20.1	20.5	22.7
6			20.3	21.5	22.7
7					
8					
Totals	9.2	6.9			
% of Weight	57	43			
Total weight, wet, lb.	16.13		Average Moisture, dry	22.11	
Total weight, dry, kg	5.99		Average Moisture, wet	18.11	

Test Engineer: BDDate: 1/15



Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 16-Jan-15
Test Run Number: 6

EPA Method 28

Pre Burn Data

Coal Bed Range 3.3 to 4.0

Average Firebox Temp, °F 379.4 Final Coal Bed Wt, lb 3.7

Test Engineer: B.D.

Date: 4/4/15

Intertek**TEST DATA
EPA METHOD 5G-3**

Project Number:	G101925579
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	16-Jan-15
Test Run No:	6

Temperature Data

Firebox Temp Start	379.4
Firebox Temp End	356.4
Firebox Delta-T	23.0

Max Filter Temps	
Train A	
133	

Interval	10	Duration of Test, Min		320	Temperature Data									
Time		Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	74	86	164	310	489	309	392	397		133	72	71	
1	10	74	142	548	501	357	281	373	380		132	53	71	
2	20	75	126	526	723	362	262	394	408		133	53	72	
3	30	71	114	436	658	363	267	405	418		132	50	72	
4	40	75	119	483	727	371	268	420	484		132	50	73	
5	50	76	118	466	703	392	267	439	459		132	50	73	
6	60	76	119	481	754	417	266	457	481		133	50	73	
7	70	77	116	433	686	447	265	471	496		133	51	74	
8	80	78	111	366	630	474	265	479	499		132	51	75	
9	90	78	108	370	567	494	267	482	500		133	53	75	
10	100	78	107	347	529	507	268	485	498		133	51	76	
11	110	73	102	330	497	518	269	487	492		133	51	76	
12	120	72	94	213	428	515	278	477	478		132	51	76	
13	130	73	92	189	382	497	287	457	457		132	50	75	
14	140	73	90	177	351	480	292	438	437		132	50	75	
15	150	73	89	168	329	465	294	421	420		132	50	75	
16	160	73	87	162	314	450	295	406	404		132	51	75	
17	170	73	86	157	302	436	294	393	391		132	49	75	
18	180	72	85	153	292	423	292	382	380		132	49	75	
19	190	72	84	152	282	414	291	372	370		132	49	74	
20	200	73	85	149	274	408	288	364	362		132	49	74	
21	210	73	84	149	268	401	287	358	355		132	48	74	
22	220	74	83	147	263	397	285	350	349		132	49	74	
23	230	73	83	146	261	393	283	344	343		132	48	74	
24	240	73	83	144	257	390	281	340	339		132	49	74	
25	250	73	82	143	254	387	279	336	334		132	49	74	
26	260	73	82	143	251	381	277	332	329		132	49	74	
27	270	73	81	141	246	373	276	329	324		132	49	74	
28	280	73	81	141	246	371	275	326	319		132	49	74	
29	290	73	81	139	244	369	274	323	316		132	50	74	
30	300	73	90	211	246	362	271	321	312		132	50	74	
31	310	73	105	351	296	421	247	344	331		132	52	74	
32	320	73	111	366	334	463	237	381	367		132	52	74	

Test Engineer: Date:  4/6/15

Intertek**TEST DATA
EPA METHOD 5G-3****Gas Particulate Sampling Data**

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 16-Jan-15
Test Run Number: 6

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start 28.35		Meter Box (A) 0.977
End 28.50		

Leak Check, cfm @ in Hg	
Train A	.006@6

Maximum Vacuum	
Train A	
	0.00

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.040	1.00			16.13	16.13	545.400		100.01		0.00
10	0.040	1.00			14.50	1.63	551.250		105.69		0.00
20	0.040	1.00			12.20	2.30	556.930		101.05		0.00
30	0.040	1.00			10.90	1.30	562.630		100.36		0.00
40	0.040	1.00			9.10	1.80	568.540		104.32		0.00
50	0.040	1.00			7.70	1.40	574.190		99.64		0.00
60	0.040	1.00			6.10	1.60	579.940		101.49		0.00
70	0.040	1.00			5.10	1.00	585.770		102.45		0.00
80	0.040	1.00			4.30	0.80	591.500		100.06		0.00
90	0.040	1.00			3.70	0.60	597.370		102.24		0.00
100	0.040	1.00			3.10	0.60	603.010		97.96		0.00
110	0.040	1.00			2.70	0.40	608.850		100.99		0.00
120	0.040	1.00			2.60	0.10	614.640		99.41		0.00
130	0.040	1.00			2.50	0.10	620.510		100.79		0.00
140	0.040	1.00			2.40	0.10	626.320		99.58		0.00
150	0.040	1.00			2.30	0.10	632.170		100.17		0.00
160	0.040	1.00			2.20	0.10	638.000		99.65		0.00
170	0.040	1.00			2.20	0.00	643.800		99.05		0.00
180	0.040	1.00			2.10	0.10	649.680		100.32		0.00
190	0.040	1.00			2.00	0.10	655.470		98.88		0.00
200	0.040	1.00			2.00	0.00	661.280		99.31		0.00
210	0.040	1.00			1.80	0.20	667.100		99.39		0.00
220	0.040	1.00			1.70	0.10	672.870		98.45		0.00
230	0.040	1.00			1.70	0.00	678.710		99.64		0.00
240	0.040	1.00			1.60	0.10	684.380		96.74		0.00
250	0.040	1.00			1.50	0.10	690.570		105.51		0.00
260	0.040	1.00			1.40	0.10	696.020		92.90		0.00
270	0.040	1.00			1.30	0.10	701.690		96.56		0.00
280	0.040	1.00			1.20	0.10	707.480		98.60		0.00
290	0.040	1.00			1.10	0.10	713.230		97.92		0.00
300	0.040	1.00			0.90	0.20	719.080		100.45		0.00
310	0.040	1.00			0.30	0.60	725.000		103.03		0.00
320	0.040	1.00			0.00	0.30	730.582		97.66		0.00

Test Engineer: Date: 



Dilution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925579

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID Number: PRT1501130904-001

Test Date: 16-Jan-15

Test Run Number: 6

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0320	93	0.1789
A2	0.0370	93	0.1924
A3	0.0370	93	0.1924
A4	0.0330	92	0.1817
A Center	0.0370	93	0.1924
B1	0.0340	92	0.1844
B2	0.0370	92	0.1924
B3	0.0400	92	0.2000
B4	0.0320	92	0.1789
B Center	0.0400	92	0.2000
Averages	0.0359	92.4	0.1876

Tunnel Diameter **6.000** inches

Tunnel Static **-0.500** in. H2O

Tunnel Area 0.19635 Ft²

Pitot Correction 0.9563 factor

Baro. Pressure 28.35

Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)

Initial Velocity 13.126 Ft/ Sec

Initial Flow **134.40** Ft³/min

Test Engineer: B.D.

Date: 4/6/15



DILUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925579
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 16-Jan-15
Test Run Number: 6

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	506	776.8	758.1		18.70
REAR FILTER CATCH	FILTER	512	129	129.6		-0.60
RINSE OF PROBE &	ACETONE	40	99196.9	99193.5	0.0027	3.29
RINSE OF IMPINGER SET	WATER	215	123583.1	123574.2	0.007	7.40
RINSE OF IMPINGER SET	METHANE	100	112550.1	112541.9	0.002	8.00
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	50	102519.7	102515.3	0.0027	4.26
					TOTAL:	41.05

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer: B. D.

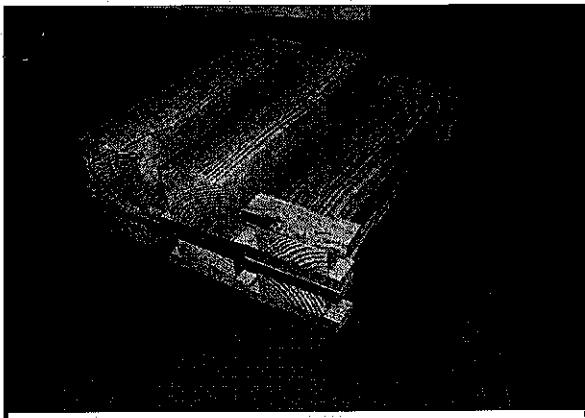
Date: 1/15/15

Intertek**TEST RESULTS
EPA METHOD 5G-3**

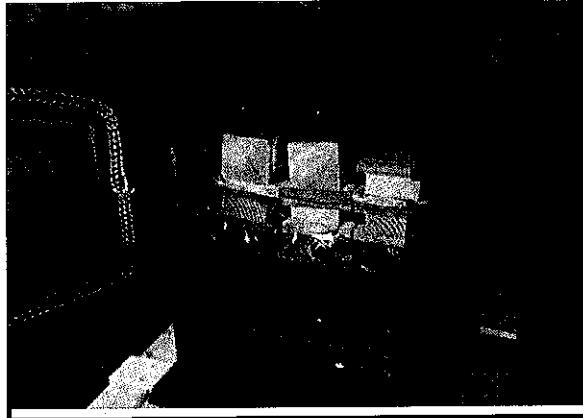
Project Number: G101860325
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 20-Feb-15
Test Run Number: 7

Dry Burn-Rate, kg/hr:	1.53
Emission-Rate, g/hr:	2.25
Duration of Test, Minutes	260
Dry Gas Meter Standardization	Train A
Dry Gas Meter Beginning Reading, ft ³	780.302
Dry Gas Meter Ending Reading, ft ³	930.085
Barometric Pressure Correction Factor	0.959
Dry Gas Meter Calibration Factors (y factors)	0.977
Dry Gas Meter Temperature Factors	0.991
Dry Gas Meter Delta-H Correction Factors	1.002
Dry Gas Meter STD Volume Sampled, ft ³	139.473
Dilution Tunnel Flow / Volume	
Standardized Tunnel Flow, dscfm	129.286
Total Tunnel Volume, scf	33614.290
Emission Calculations	Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	241.008
Sample Particulate Mass, mg	40.4
Total Emissions, grams	9.742
Emission-Rate, g/hr	2.25
Adjusted Emission Rates, g/hr	3.57
Operating Parameters	Train A
Max Filter Temperature, °F	133
Post-Test Leak Check, cfm @ in. Hg vac.	0
Average Firebox Surface Temperature delta-T, °F	12.4
Maximum Ambient Temperature, °F	76
Minimum Ambient Temperature, °F	67
Fuel Properties	
Wet Fuel Load Weight, lb.	17.60
Dry-Basis Fuel Load Moisture Content, %	20.77
Wet-Basis Fuel Load Moisture Content, %	17.20

PROJECT / TEST INFORMATION	
Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	20-Feb-15
Test Run Number:	7
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification



Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	2.49	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings	
Primary Air:	Auto button was pushed after loading pre burn fuel. With the thermostat at a non-demand
Secondary Air:	Fixed opening
Control Board:	Programable thermostat set at 50 degrees so will not call for heat.
Blower/Fan:	Auto high, will turn on and run at a predetermined temperature.
Pre- Burn Activities	
Time	Activity
	At 80 minutes raked coals
Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 50 seconds
Fuel-loading door :	closed by 3 minutes
Primary air:	Auto button pushed at zero minutes
Secondary air:	Fixed opening
Control board:	Programable thermostat set at 50 degrees so will not call for heat, then will open primary air fully
Blower / fan:	after 3.5 hours.
Other Notes	

Test Engineer: B.D.Date: 4/14/15

Intertek**TEST FUEL DATA
EPA METHOD 5G-3**

Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	20-Feb-15
Test Run Number:	7

Firebox Volume, ft ³ :	2.49
-----------------------------------	------

Calibration Reference ID		
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	96.00		18.9	19.0	195.0
2	96.00	13.50	20.4	19.2	23.8
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight		13.5	Average, %db	49.4	

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	9:30	Temp., °F:	65
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16.00		8.04	19.2	22.5
2	16.00			19.2	22.1
3	16.00			23.1	23.3
4	16.00			19.5	19.2
5	16.00			21.5	23.0
6	16.00	9.56		20.2	22.5
7					
8					
Totals		9.6	8.0		
% of Weight		54	46		
Total weight, wet, lb.		17.60	Average Moisture, dry	20.77	
Total weight, dry, kg		6.61	Average Moisture, wet	17.20	

Test Engineer: B.D.Date: 2/26/15



Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	20-Feb-15
Test Run Number:	7

EPA Method 28 Pre Burn Data

Coal Bed Range 3.6 to 4.3

Average Firebox Temp, °F	349.6	Final Coal Bed Wt, lb	4.3
--------------------------	-------	-----------------------	-----

Test Engineer: B. S.

Date: 4/6/15

Intertek**TEST DATA
EPA METHOD 5G-3**

Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	20-Feb-15
Test Run No:	7

Temperature Data

Firebox Temp Start	349.6
Firebox Temp End	337.2
Firebox Delta-T	12.4

Max Filter Temps
Train A
133

Interval	10	Duration of Test, Min	260
Time			

Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	74	91	198	267	303	280	452	446		131	68	67	
1	10	74	152	548	433	270	269	423	416		133	49	71	
2	20	75	142	529	553	252	259	437	430		132	53	72	
3	30	76	124	433	516	241	261	444	436		132	57	72	
4	40	76	119	418	493	234	264	440	429		132	59	73	
5	50	73	117	407	461	233	263	445	429		133	59	74	
6	60	75	117	417	479	236	259	457	434		132	60	74	
7	70	76	118	424	507	255	256	470	444		133	62	74	
8	80	71	112	386	453	275	253	477	455		132	63	75	
9	90	73	106	338	384	299	251	472	464		133	56	74	
10	100	73	103	332	332	312	249	459	467		132	55	74	
11	110	71	99	283	302	317	250	448	464		132	55	74	
12	120	71	96	259	277	321	250	440	462		132	55	74	
13	130	71	89	174	237	318	254	426	443		132	55	74	
14	140	70	86	149	210	300	260	405	417		132	56	74	
15	150	68	83	136	215	323	264	382	393		132	55	73	
16	160	67	81	137	245	363	266	369	379		132	54	73	
17	170	68	78	134	200	282	264	354	369		132	54	73	
18	180	68	78	131	208	299	263	347	361		132	54	72	
19	190	68	76	126	193	284	260	336	350		132	54	72	
20	200	68	78	122	176	259	258	327	340		132	53	72	
21	210	67	82	133	167	247	255	317	331		132	53	72	
22	220	70	102	322	206	297	234	333	345		132	53	72	
23	230	71	110	349	247	345	223	377	384		132	52	72	
24	240	72	114	359	265	363	222	410	414		132	52	72	
25	250	73	116	365	275	377	226	430	429		132	52	72	
26	260	73	116	360	278	284	232	448	444		132	52	72	

Test Engineer: BDDate: 2/14/15

Intertek**TEST DATA
EPA METHOD 5G-3****Gas Particulate Sampling Data**

Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	20-Feb-15
Test Run Number:	7

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start	28.70	Meter Box (A)
End	28.70	0.977

Leak Check, cfm @ in Hg	
Train A	

Maximum Vacuum	
Train A	0.00

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.036	1.00		-0.030	17.60	17.60	780.302		100.00		0.00
10	0.036	1.00		-0.072	16.00	1.60	786.060		104.56		0.00
20	0.036	1.00		-0.068	13.50	2.50	791.760		102.46		0.00
30	0.036	1.00		-0.060	11.80	1.70	797.370		99.32		0.00
40	0.036	1.00		-0.057	10.40	1.40	803.260		103.64		0.00
50	0.036	1.00		-0.057	9.10	1.30	808.650		94.50		0.00
60	0.036	1.00		-0.056	7.60	1.50	814.400		100.81		0.00
70	0.036	1.00		-0.055	6.20	1.40	820.167		101.20		0.00
80	0.036	1.00		-0.050	5.20	1.00	825.939		100.57		0.00
90	0.036	1.00		-0.045	4.60	0.60	831.760		101.08		0.00
100	0.036	1.00		-0.040	4.00	0.60	837.630		101.66		0.00
110	0.036	1.00		-0.040	3.50	0.50	843.480		100.95		0.00
120	0.036	1.00		-0.035	3.10	0.40	849.170		97.93		0.00
130	0.036	1.00		-0.021	3.00	0.10	855.130		101.93		0.00
140	0.036	1.00		-0.017	2.80	0.20	860.850		97.55		0.00
150	0.036	1.00		-0.015	2.80	0.00	866.570		97.47		0.00
160	0.036	1.00		-0.014	2.70	0.10	872.340		98.14		0.00
170	0.036	1.00		-0.014	2.60	0.10	878.070		97.19		0.00
180	0.036	1.00		-0.014	2.50	0.10	884.180		103.83		0.00
190	0.036	1.00		-0.013	2.50	0.00	889.910		97.19		0.00
200	0.036	1.00		-0.013	2.40	0.10	895.560		96.01		0.00
210	0.036	1.00		-0.010	2.40	0.00	901.450		100.46		0.00
220	0.036	1.00		-0.045	1.80	0.60	907.200		99.87		0.00
230	0.036	1.00		-0.047	1.30	0.50	912.830		98.48		0.00
240	0.036	1.00		-0.050	0.80	0.50	918.760		104.09		0.00
250	0.036	1.00		-0.050	0.40	0.40	924.360		98.47		0.00
260	0.036	1.00		-0.050	0.00	0.40	930.085		100.66		0.00

Test Engineer: B.D.Date: 4/14/15

Intertek**Dilution Tunnel Velocity Traverse
EPA Method 5G-3**

Project Number: G101860325

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID Number: PRT1501130904-001

Test Date: 20-Feb-15

Test Run Number: 7

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A Center	0.0300	105	0.1732
	0.0330	105	0.1817
	0.0350	105	0.1871
	0.0300	105	0.1732
	0.0360	105	0.1897
	0.0300	100	0.1732
	0.0350	100	0.1871
	0.0360	100	0.1897
B Center	0.0340	100	0.1844
Averages	0.0335	102.5	0.1812

Tunnel Diameter **6.000** inchesTunnel Static **-0.388** in. H2OTunnel Area 0.19635 Ft²

Pitot Correction 0.9550 factor

Baro. Pressure 28.70

Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)

Initial Velocity 12.710 Ft/ Sec

Initial Flow **129.38** Ft³/minTest Engineer: BDDate: 4/6/15

IntertekDILUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101860325
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 20-Feb-15
Test Run Number: 7

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	485	776	757.7		18.30
REAR FILTER CATCH	FILTER	448	126.4	126.5		-0.10
RINSE OF PROBE &	ACETONE	50	103688.4	103684.1	0.0027	4.16
RINSE OF IMPINGER SET	WATER	200	95097.3	95088	0.007	7.90
RINSE OF IMPINGER SET	METHANE	100	103002.1	102994.6	0.002	7.30
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	16	106071.9	106069	0.0027	2.86
					TOTAL:	40.42

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer: B.D.Date: 4/1/15

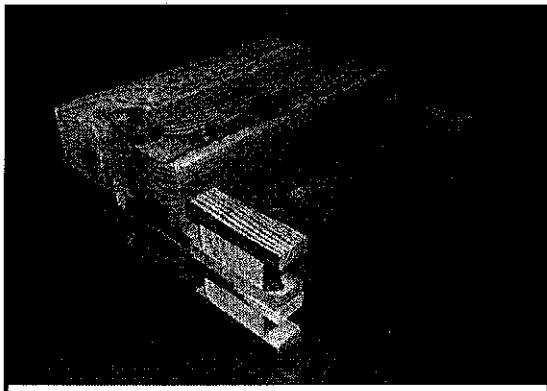
Intertek**TEST RESULTS
EPA METHOD 5G-3**

Project Number: G101860325
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 17-Mar-15
Test Run Number: 8

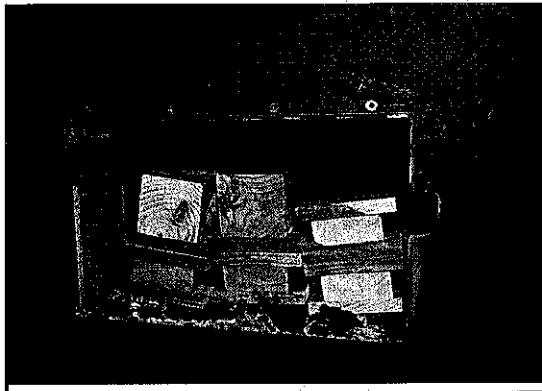
	Dry Burn-Rate, kg/hr:	2.11
	Emission-Rate, g/hr:	3.12
	Duration of Test, Minutes	180
Dry Gas Meter Standardization	Train A	
Dry Gas Meter Beginning Reading, ft ³	248.702	
Dry Gas Meter Ending Reading, ft ³	356.572	
Barometric Pressure Correction Factor	0.957	
Dry Gas Meter Calibration Factors (y factors)	0.977	
Dry Gas Meter Temperature Factors	0.992	
Dry Gas Meter Delta-H Correction Factors	1.002	
Dry Gas Meter STD Volume Sampled, ft ³	100.278	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	128.963	
Total Tunnel Volume, scf	23213.313	
Emission Calculations	Train A	
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	231.490	
Sample Particulate Mass, mg	40.4	
Total Emissions, grams	9.354	
Emission-Rate, g/hr	3.12	
Adjusted Emission Rates, g/hr	4.68	
Operating Parameters	Train A	
Max Filter Temperature, °F	133	
Post-Test Leak Check, cfm @ in. Hg vac.	0	
Average Firebox Surface Temperature delta-T, °F	43	
Maximum Ambient Temperature, °F	77	
Minimum Ambient Temperature, °F	67	
Fuel Properties		
Wet Fuel Load Weight, lb.	16.80	
Dry-Basis Fuel Load Moisture Content, %	20.57	
Wet-Basis Fuel Load Moisture Content, %	17.06	

Test Engineer: BDDate: 3/19/15

PROJECT / TEST INFORMATION	
Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	17-Mar-15
Test Run Number:	8
Date tunnel cleaned:	1/9/2015
Purpose of Test	Certification



Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	2.49	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings	
Primary Air:	Auto button was pushed after loading pre burn fuel. With the thermostat at a non-demand temperature this caused combustion air to automatically close down gradually to an electronic air stop. After secondary combustion temperatures cooled to a preset temperature combustion air closed down completely.
Secondary Air:	Fixed opening
Control Board:	Programable thermostat set at 50 degrees so will not call for heat.
Blower/Fan:	Auto high, will turn on and run at a predetermined temperature.
Pre- Burn Activities	
Time	Activity
	At 70 minutes removed 1 pound of coals
Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 50 seconds
Fuel-loading door :	closed by 2 minutes 40 seconds
Primary air:	Auto button pushed at zero minutes
Secondary air:	Fixed opening
Control board:	Programmable thermostat set at 50 degrees so will not call for heat, then will open primary air fully after 1.5 hours.
Blower / fan:	Fan on Auto High
Other Notes	

Test Engineer: B.D.Date: 7/6/15

Intertek**TEST FUEL DATA
EPA METHOD 5G-3**

Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	17-Mar-15
Test Run Number:	8

Firebox Volume, ft ³ :	2.49
-----------------------------------	------

Calibration Reference ID	
Set meter to Species 1	
Set Temperature to 70F	12%
Set pin setting to 444	22%
	12.0
	22.0

PRE-BURN FUEL PROPERTIES					
Eq. ID No.:		Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	96.00	13.90	18.6	20.2	22.8
2	96.00		19.3	19.3	21.6
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight	13.9	Average, %db	20.3		

Allowable Fuel Load Range: 15.7 to 19.1

TEST FUEL LOAD PROPERTIES					
Eq. ID No.:		Time:	9:30	Temp., °F:	65
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis		
1	16.00		20.1	21.0	21.9
2	16.00	7.90	18.8	22.3	21.9
3	16.00	8.90	19.2	20.5	20.0
4	16.00		20.0	21.9	22.1
5	16.00		21.2	19.9	19.8
6	16.00		20.1	20.5	19.0
7					
8					
Totals	8.9	7.9			
% of Weight	53	47			
Total weight, wet, lb.	16.80		Average Moisture, dry	20.57	
Total weight, dry, kg	6.32		Average Moisture, wet	17.06	

Test Engineer: BoDate: 4/15



Project Number: G101860325
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 17-Mar-15
Test Run Number: 8

EPA Method 28 Pre Burn Data

Coal Bed Range 3.4 to 4.2

Average Firebox Temp, °F	345.4	Final Coal Bed Wt, lb	4.1
--------------------------	-------	-----------------------	-----

Test Engineer: B. B.

Date: 4/6/15

Intertek**TEST DATA
EPA METHOD 5G-3**

Project Number:	G101860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID No:	PRT1501130904-001
Test Date:	17-Mar-15
Test Run No:	8

Temperature Data

Firebox Temp Start	336.8
Firebox Temp End	379.8
Firebox Delta-T	43.0

Max Filter Temps	
Train A	
133	

Interval	10	Duration of Test, Min	180
Time			

Temperature Data														
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Back	Firebox Bottom	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	71	87	171	247	307	269	431	430		132	49	68	
1	10	71	136	477	346	244	258	405	401		132	48	69	
2	20	72	129	468	435	219	250	418	407		132	49	69	
3	30	67	114	391	420	221	253	425	415		133	52	70	
4	40	71	114	411	457	226	256	426	419		132	55	70	
5	50	72	113	401	453	236	258	436	427		132	57	70	
6	60	73	115	413	480	246	258	448	435		132	57	71	
7	70	74	114	407	486	265	257	462	446		133	60	71	
8	80	74	109	359	417	285	257	471	452		133	61	71	
9	90	73	122	395	379	302	256	477	450		133	61	73	
10	100	74	131	445	397	366	245	499	465		133	62	73	
11	110	76	128	425	378	410	244	512	491		133	63	74	
12	120	76	124	391	343	432	247	519	505		133	63	74	
13	130	76	121	372	318	439	252	517	504		133	64	74	
14	140	77	118	356	299	434	258	512	499		133	65	75	
15	150	73	116	347	286	425	263	507	490		133	65	75	
16	160	75	114	338	276	413	268	502	482		133	65	75	
17	170	74	113	333	268	404	273	499	475		133	66	74	
18	180	68	111	327	262	397	278	494	468		133	66	74	

Test Engineer: BDDate: 4/15/15

Intertek**TEST DATA
EPA METHOD 5G-3****Gas Particulate Sampling Data**

Project Number:	GJ01860325
Manufacturer:	Hearth & Home
Model:	Adventure II
Sample ID Number:	PRT1501130904-001
Test Date:	17-Mar-15
Test Run Number:	8

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start	28.62	Meter Box (A)
End	28.62	0.977

Leak Check, cfm @ in Hg	
Train A	.008@4

Maximum Vacuum	
Train A	
0.00	

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.036	1.00		-0.032	16.80	16.80	248.702		100.14		0.00
10	0.036	1.00		-0.065	15.10	1.70	254.780		103.69		0.00
20	0.036	1.00		-0.063	13.10	2.00	260.975		105.06		0.00
30	0.036	1.00		-0.058	11.50	1.60	267.180		103.69		0.00
40	0.036	1.00		-0.058	9.50	2.00	273.370		103.44		0.00
50	0.036	1.00		-0.056	8.60	0.90	279.200		97.34		0.00
60	0.036	1.00		-0.056	7.30	1.30	285.070		97.99		0.00
70	0.036	1.00		-0.055	6.00	1.30	291.120		100.91		0.00
80	0.036	1.00		-0.050	5.10	0.90	296.910		96.15		0.00
90	0.036	1.00		-0.055	4.30	0.80	302.870		99.72		0.00
100	0.036	1.00		-0.058	3.30	1.00	308.950		102.51		0.00
110	0.036	1.00		-0.060	2.40	0.90	314.730		97.03		0.00
120	0.036	1.00		-0.053	1.90	0.50	320.650		99.04		0.00
130	0.036	1.00		-0.050	1.50	0.40	326.850		103.45		0.00
140	0.036	1.00		-0.048	1.10	0.40	332.650		96.35		0.00
150	0.036	1.00		-0.047	0.70	0.40	339.080		106.63		0.00
160	0.036	1.00		-0.046	0.40	0.30	344.580		91.05		0.00
170	0.036	1.00		-0.044	0.10	0.30	350.680		101.08		0.00
180	0.036	1.00		-0.044	0.00	0.10	356.572		97.47		0.00

Test Engineer: BDDate: 4/4/15



Dilution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101860325

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID Number: PRT1501130904-001

Test Date: 17-Mar-15

Test Run Number: 8

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0300	95	0.1732
A2	0.0360	95	0.1897
A3	0.0360	95	0.1897
A4	0.0300	95	0.1732
A Center	0.0360	95	0.1897
B1	0.0330	91	0.1817
B2	0.0360	91	0.1897
B3	0.0360	90	0.1897
B4	0.0320	90	0.1789
B Center	0.0360	90	0.1897
Averages	0.0341	92.7	0.1832

Tunnel Diameter **6.000** inches

Tunnel Static **-0.388** in. H2O

Tunnel Area 0.19635 Ft²

Pitot Correction 0.9657 factor

Baro. Pressure 28.62

Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)

Initial Velocity 12.759 Ft/ Sec

Initial Flow **131.81** Ft³/min

Test Engineer: BD

Date: 2/15



DILUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101860325
Manufacturer: Hearth & Home
Model: Adventure II
Sample ID Number: PRT1501130904-001
Test Date: 17-Mar-15
Test Run Number: 8

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	486	778.1	755.2		22.90
REAR FILTER CATCH	FILTER	517	129.4	130.2		-0.80
RINSE OF PROBE &	ACETONE	60	107986.7	107981.2	0.0027	5.34
RINSE OF IMPINGER SET	WATER	230	106101.9	106094.4	0.007	5.89
RINSE OF IMPINGER SET	METHANE	100	104468.6	104464.2	0.002	4.20
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	45	96381.3	96378.3	0.0027	2.88
					TOTAL:	40.41

EQUATIONS

FRONT FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
REAR FILTER CATCH	Final, mg - Tare, mg = Particulate, mg
RINSE OF PROBE & FILTER ASSEMBLY - FRONT	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF IMPINGER SET	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg
RINSE OF FILTER ASSEMBLY & GAS TRAIN - BACK	(Final, mg - Tare, mg) - (Blank, mg/ml x Volume, ml) = Particulate, mg

Test Engineer: BD

Date: 4/14/15

EPA NSPS WEIGHTED AVERAGE CALCULATION

V 1.1

8/27/2010

Project Number: G101860325

Manufacturer: Hearth & Home

Model: Adventure II

Sample ID No: PRT1501130904-001

Type of

Stove:

2

1=cat

2=noncat

3=pellet

Weighted Average

(E)
Ave.

Heat

(K)

Test	Burn	Emission	HHV	Output		Weighting		
No.	Rate	Rate g/hr	(OHE)	(BTU/HR)	Prob.	Factor	(KxE)	KxOHE
1	0.87	2.16	72.40	12017.60	0.2724	0.5140	1.1102	37.21
2	1.17	2.03	71.00	16161.61	0.5140	0.3380	0.6861	24.00
3	1.29	2.29	71.00	17819.21	0.6104	0.2534	0.5803	17.99
7	1.53	2.25	73.60	21134.41	0.7674	0.3160	0.7110	23.26
8	2.11	3.12	74.10	29146.14	0.9264	0.2030	0.6334	15.04
4	2.58	5.35	68.50	35638.41	0.9704	0.0736	0.3938	5.04
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
				0.00	1.0000	0.0000	0.0000	0.00
						0.0000	0.0000	0.00

Fan Confirmation

5	1.69	1.68	70.50
6	1.12	1.97	72.90

Totals: 1.698 4.1148 122.54

Weighted average emissions rate	2.4233
Weighted Average OHE	72.17