TEST REPORT

REPORT NUMBER: 101925554PRT-001
REPORT DATE: January 26, 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 III Wood Fired Room Heater

Report of Testing Model Adventure III 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".

I. INTRODUCTION

Intertek Testing Services NA (Intertek) has conducted testing for Hearth & Home Technologies dba Heatilator, on model Adventure III 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 III 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 conducted on November 17, 2014

I.B LABORATORY

The test on the Adventure III Wood fired Solid Fuel Room Heater was conducted at the Intertek facility located at 22887 NE Townsend Way, Fairview Oregon. Intertek Portland is accredited by the U.S. EPA, Certificate Number 8. The test was conducted by Bruce S Davis.

I.C DESCRIPTION OF UNIT

Stove model Adventure III 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 at the Intertek Portland facility on November 17, 2014. 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 November 17 through November 24, 2014 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 November 17, 2014: Test fuel was loaded by 50 seconds, the door was open for 70 seconds, and then closed. Thermostat set at 90 (Heat demand) degrees, auto cycle button was pushed at zero minutes. Burn time was 200 minutes with a category 4 burn rate of 3.59 kg/hr. The fan was off for the first 30 minutes then set to high for the remainder of the test.

RUN #2 November 18, 2014: Test fuel was loaded by 60 seconds, the door was cracked open for 4 minutes, and then closed. Thermostat set a 55 (No heat demand) degrees, auto cycle button pushed at zero minutes. Burn time was 630 minutes with a category 2 burn rate of 1.04 kg/hr. Fan was turned off for the first 30 minutes then turned to high for the remainder of the test.

RUN #3 November 19, 2014: Test fuel was loaded by 55 seconds, the door was cracked open for 2 minutes and 45 seconds, and then closed. Prior to starting the test the programmable thermostat was set to operate the stove with combustion air fully open for 30 minutes by programming a 90 degree set point causing a demand mode. Programmed thermostat (after 30 minutes) then operated at a no demand mode for the next 7 hours. After 7 hours the thermostat went into a demand mode causing the combustion air to open fully for the remainder of the test. Burn time was 470 minutes with a category 3 burn rate of 1.49 kg/hr. Fan was turned off for the first 30 minutes then turned to high for the remainder of the test.

RUN #4 November 20, 2014: Test fuel was loaded by 55 seconds, the door was cracked open for 3 minutes and 40 seconds, and then closed. Thermostat set a 45 (No heat demand) degrees, auto cycle button pushed at zero minutes. Burn time was 610 minutes with a category 2 burn rate of 1.09 kg/hr. Fan was turned off for the first 30 minutes then turned to high for the remainder of the test.

RUN #5 November 21, 2014: Test fuel was loaded by 60 seconds, the door was cracked open for 2 minutes and 45 seconds, and then closed. Thermostat set a 45 (No heat demand) degrees, auto cycle button pushed at zero minutes. Burn time was 750 minutes with a category 2 burn rate of 0.93 kg/hr. Fan was operated on high for the remainder of the test.

RUN #6 November 24, 2014: Test fuel was loaded by 65 seconds, the door was cracked open for 4 minutes and 45 seconds, and then closed. Thermostat set a 49 (No heat demand) degrees, auto cycle button pushed at zero minutes. Burn time was 540 minutes with a category 2 burn rate of 1.24 kg/hr. Fan was not operated during the test for a fan confirmation test.

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	**11/17/14**	**3.59**	**4.59**	**68.2**	**73.7**
2	**11/18/14**	**1.04**	**0.98**	**71.8**	**77.6**
3	**11/19/14**	**1.49**	**3.81**	**68.2**	**73.8**
4	**11/20/14**	**1.09**	**1.51**	**71.1**	**76.9**
5	**11/21/14**	**0.93**	**2.72**	**71.2**	**77.0**
6	**11/24/14**	**1.24**	**0.97**	**70.9**	**76.6**

**Efficiency determined per CSA B415.1-2010.*

1. A category I burn rate was not obtained, tests 2, 4 and 5 were 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)	Probability	(K) Weighting Factor	(KxE)
5	**0.93**	**2.72**	**11,214**	**0.3168**	**0.4016**	**1.0924**
2	**1.04**	**0.98**	**12,540**	**0.4016**	**0.4276**	**0.4190**
3	**1.49**	**3.81**	**17,967**	**0.7444**	**0.5894**	**2.2456**
1	**3.59**	**4.59**	**43,289**	**0.9910**	**0.2556**	**1.1732**
				Totals:	**1.6742**	**4.9302**
					Weighted average emission rate:	**2.945**

Test number 4 was omitted on a two for one basis having three tests with a category II burn rate.
Run number 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	72	72	29.89	29.91	<50	<50
2	74	75	29.85	29.80	<50	<50
3	73	75	29.87	29.83	<50	<50
4	73	76	30.03	29.97	<50	<50
5	73	76	29.79	29.86	<50	<50
6	73	75	30.01	29.96	<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	200	15.33	153.19	596.9	109.512	54.90
2	630	14.07	152.98	547.2	344.496	36.93
3	470	13.80	148.73	552.7	257.065	110.1
4	610	12.75	139.57	546.8	333.771	60.40
5	750	13.47	146.83	545.9	410.045	127.09
6	540	13.72	147.92	554.8	296.235	32.38

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (°F)	Initial Draft (in/H_2O)	Average Draft (in/H_2O)
1	3.59	4.2	-0.050	-0.060
2	1.04	88.2	-0.010	-0.020
3	1.49	92.6	-0.038	-0.034
4	1.09	97.8	-0.025	-0.026
5	0.93	99.4	-0.020	-0.023
6	1.24	120.4	-0.025	-0.034

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

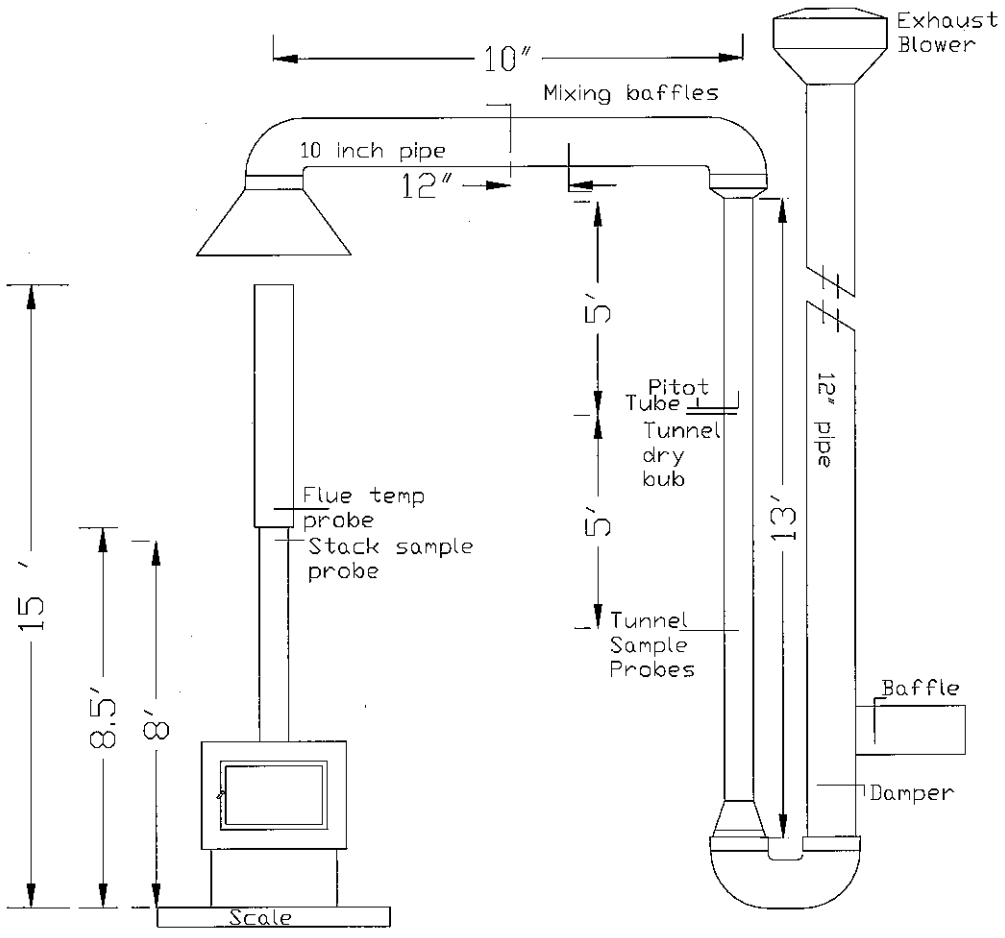
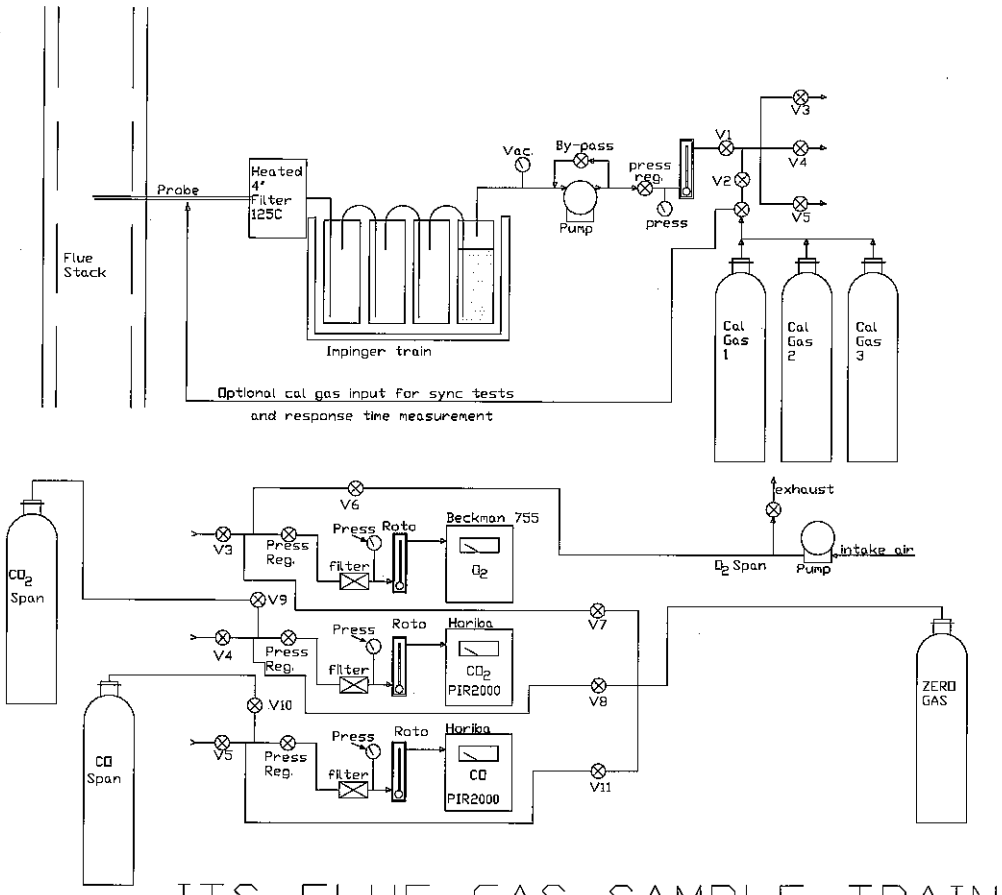


FIGURE 1

IV.B.OPERATIONAL DRAWINGS

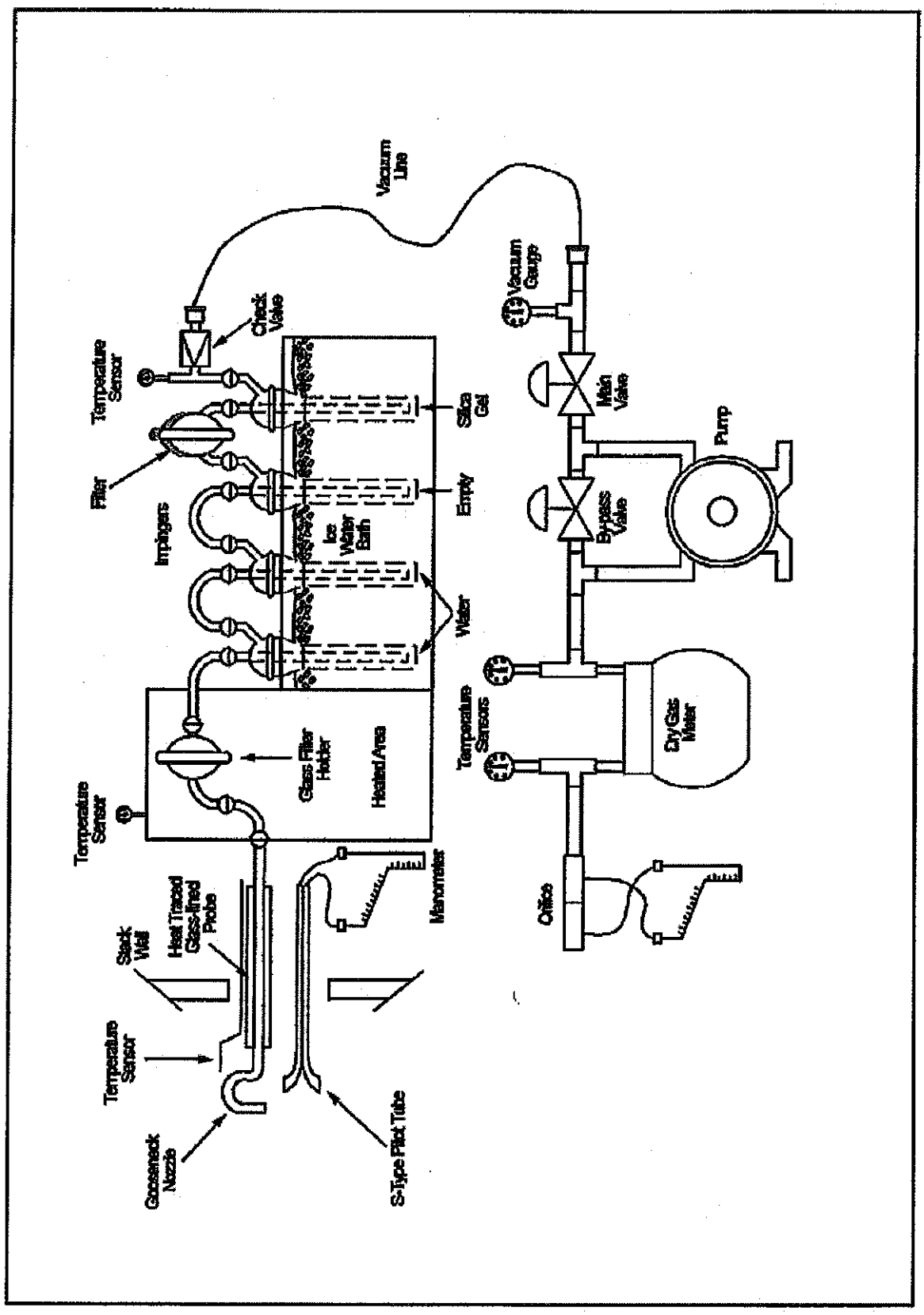
IV.B.(1) STACK GAS SAMPLE TRAIN



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 post test 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 III 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 2.94 grams per hour.

VII.A RESULTS AND OBSERVATIONS

The Model Adventure III 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 T. Sorenson
Engineering Manager

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 17-Nov-14
Test Run Number: 1

Dry Burn-Rate, kg/hr:		**3.59**
Emission-Rate, g/hr:		**4.59**
Duration of Test, Minutes	200	
Dry Gas Meter Standardization	Train A	
Dry Gas Meter Beginning Reading, ft^3	923.703	
Dry Gas Meter Ending Reading, ft^3	1036.709	
Barometric Pressure Correction Factor	0.999	
Dry Gas Meter Calibration Factors (γ factors)	0.977	
Dry Gas Meter Temperature Factors	0.993	
Dry Gas Meter Delta-H Correction Factors	1.002	
Dry Gas Meter STD Volume Sampled, ft^3	**109.851**	
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**153.191**	
Total Tunnel Volume, scf	**30638.212**	
Emission Caclulations	Train A	
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	278.906	
Sample Particulate Mass, mg	54.9	
Total Emissions, grams	15.313	
Emission-Rate, g/hr	4.59	
Adjusted Emission Rates, g/hr	**6.45**	
Operating Parameters	Train A	
Max Filter Temperature, °F	133	
Post-Test Leak Check, cfm @ in. Hg vac.	0.005@6	
Average Firebox Surface Temperture delta-T, °F	4.2	
Maximum Ambient Temperture, °F	78	
Mimimum Ambient Temperature, °F	72	
Fuel Properties		
Wet Fuel Load Weight, lb.	32.45	
Dry-Basis Fuel Load Moisture Content, %	22.85	
Wet-Basis Fuel Load Moisture Content, %	18.60	

Test Engineer: _____

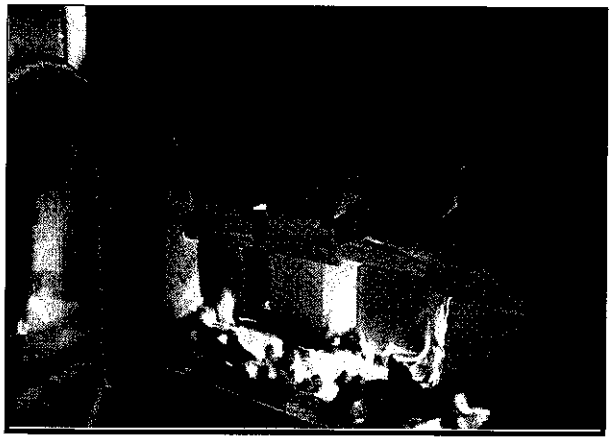
Date: 12/31/14

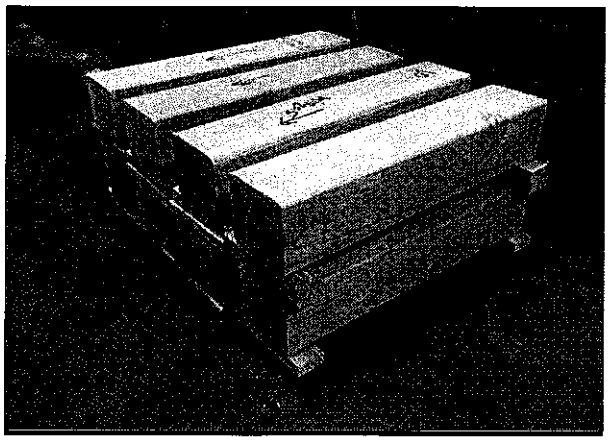
Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	17-Nov-14
Test Run Number:	1
Date tunnel cleaned:	11/14/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	4.5	N/A for pellet type
Convection Blower	2	1 - No Fan 2 - Fan Optional 3 - Fan Standard





Test Settings	
Primary Air:	Fully open, thermostat set at 97 degrees so on demand for heat leaving all controls open.
Secondary Air:	Fixed
Control Board:	Thermostat set at 97 degrees
Blower/Fan:	On high during Pre test

Pre- Burn Activities

Time	Activity

Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 50 seconds
Fuel-loading door :	Closed by 70 seconds
Primary air:	Thermostat set at 90 degrees so on demand for heat leaving all controls on high.
Secondary air:	Fixed opening
Control board:	Thermostat set at 90 degrees.
Blower / fan:	Off for the first 30 minutes then turned to high.

Other Notes

Test Engineer: _____ Date: 12/31/14

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	17-Nov-14
Test Run Number:	1

Firebox Volume, ft^3:	4.5

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**	**25.50**	**20.6**	**21.3**	**20.4**
2	**96.00**		**20.0**	**20.2**	**20.4**
3	**96.00**		**21.2**	**20.0**	**18.6**
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight		**25.5**	Average, %db		**20.3**

Allowable Fuel Load Range: **28.4** to **34.6**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:			Time:	9:30	Temp.,°F:	65
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	**16.00**			**20.3**	**20.1**	**21.7**
2	**16.00**			**21.6**	**23.3**	**24.4**
3	**16.00**			**22.7**	**24.8**	**22.1**
4	**16.00**			**23.9**	**23.9**	**23.9**
5	**16.00**			**21.7**	**23.1**	**24.6**
6	**16.00**			**20.4**	**23.3**	**21.4**
7	**16.00**			**23.9**	**22.6**	**23.7**
8	**16.00**		**32.45**	**23.6**	**23.6**	**23.8**
Totals		0.0	32.5			
% of Weight		0	100			
Total weight, wet, lb.		**32.45**		Average Moisture, dry		**22.85**
Total weight, dry, kg		11.98		Average Moisture, wet		18.60

Test Engineer: _____

Date: 12/31/14

Intertek

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	17-Nov-14
Test Run Number:	1

EPA Method 28
Pre Burn Data

Coal Bed Range	6.5	to	8.1

Average Firebox Temp, °F	376.8

Final Coal Bed Wt, lb	7.9

Duration, Minutes	Temperature Data										Flue Draft	Fuel Weight	Weight Loss
	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom		Catalyst Outlet			
0	70	151	434	475	192	482	420	433	400.4		-0.06	29.40	21.50
10	72	172	761	665	202	274	407	419	393.4		-0.09	26.10	3.30
20	72	165	771	733	208	238	398	416	398.6		-0.09	22.00	4.10
30	72	173	729	700	213	228	402	415	391.6		-0.085	18.20	3.80
40	72	163	696	585	216	236	415	419	374.2		-0.08	15.10	3.10
50	74	152	621	543	219	256	432	435	377		-0.072	12.40	2.70
60	74	141	607	508	223	273	449	449	380.4		-0.07	10.20	2.20
70	74	133	543	461	225	298	460	459	380.6		-0.065	8.90	1.30
80	73	123	463	382	231	345	465	464	377.4		-0.05	8.10	0.80
85	72	122	458	378	232	346	464	464	376.8		-0.05	7.90	0.20

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	17-Nov-14
Test Run No:	1

Temperature Data

Firebox Temp Start	377.2
Firebox Temp End	381.4
Firebox Delta-T	4.2

Max Filter Temps	
Train A	
133	

Interval	10	Duration of Test, Min	200

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	72	121	455	376	232	347	466	465		132	68	69	
1	10	74	179	767	790	234	385	453	450		132	50	69	
2	20	78	195	810	925	236	404	454	449		133	51	70	
3	30	76	189	775	809	234	337	473	458		132	53	70	
4	40	77	182	738	709	236	318	482	465		132	54	71	
5	50	76	169	689	621	235	315	489	469		132	55	71	
6	60	78	156	649	577	236	320	498	478		132	57	72	
7	70	77	149	634	561	234	322	499	481		132	57	72	
8	80	73	140	597	515	232	330	506	494		132	58	72	
9	90	74	136	569	468	233	335	509	505		132	58	72	
10	100	75	126	504	418	234	347	511	516		132	58	72	
11	110	76	119	463	368	237	365	506	520		132	59	72	
12	120	76	119	452	357	240	370	504	522		132	59	72	
13	130	75	115	436	339	240	368	499	522		132	60	72	
14	140	74	114	429	332	242	364	493	524		131	61	72	
15	150	75	115	425	327	245	361	487	529		132	62	72	
16	160	75	112	414	321	245	360	480	531		132	63	72	
17	170	74	111	406	316	246	361	476	531		132	64	73	
18	180	75	111	403	311	249	363	475	528		131	64	73	
19	190	76	110	411	309	248	362	476	521		132	65	73	
20	200	72	107	407	306	246	364	475	516		132	66	73	

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	17-Nov-14
Test Run Number:	1

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	29.89		Meter Box (A)	0.977
End	29.91			
Duration of Test, Min		200		

Leak Check, cfm @ in Hg	
Train A	
0.005@6	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	0.054	1.00		-0.050	32.50	32.50	923.703		100.00		0.00	
10	0.054	1.00		-0.070	28.50	4.00	929.440		105.57		0.00	
20	0.054	1.00		-0.070	25.70	2.80	935.040		104.13		0.00	
30	0.054	1.00		-0.080	20.60	5.10	941.050		111.24		0.00	
40	0.054	1.00		-0.080	17.80	2.80	946.130		93.35		0.00	
50	0.054	1.00		-0.070	14.60	3.20	951.600		99.49		0.00	
60	0.054	1.00		-0.070	11.60	3.00	957.120		99.17		0.00	
70	0.054	1.00		-0.070	9.30	2.30	962.870		102.71		0.00	
80	0.054	1.00		-0.070	7.30	2.00	968.580		101.24		0.00	
90	0.054	1.00		-0.065	5.80	1.50	974.270		100.55		0.00	
100	0.054	1.00		-0.062	4.80	1.00	980.000		100.40		0.00	
110	0.054	1.00		-0.062	4.20	0.60	985.750		100.15		0.00	
120	0.054	1.00		-0.060	3.70	0.50	991.310		96.84		0.00	
130	0.054	1.00		-0.058	3.20	0.50	997.150		101.37		0.00	
140	0.054	1.00		-0.050	2.80	0.40	1002.640		95.21		0.00	
150	0.054	1.00		-0.050	2.30	0.50	1008.380		99.63		0.00	
160	0.054	1.00		-0.048	1.80	0.50	1014.020		97.64		0.00	
170	0.054	1.00		-0.048	1.30	0.50	1019.750		98.92		0.00	
180	0.054	1.00		-0.046	0.90	0.40	1025.320		96.16		0.00	
190	0.054	1.00		-0.045	0.40	0.50	1031.270		102.63		0.00	
200	0.054	1.00		-0.046	0.00	0.40	1036.709		93.57		0.00	

Test Engineer: _____

Date: 12/3/14

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 17-Nov-14
Test Run Number: 1

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0480	128	0.2191
A2	0.0520	128	0.2280
A3	0.0480	128	0.2191
A4	0.0440	130	0.2098
A Center	0.0540	134	0.2324
B1	0.0400	136	0.2000
B2	0.0480	136	0.2191
B3	0.0540	135	0.2324
B4	0.0420	126	0.2049
B Center	0.0540	128	0.2324
Averages	0.0484	130.9	0.2165

Tunnel Diameter	**6.000**	inches
Tunnel Static	**-0.560**	in. H2O
Tunnel Area	0.19635	Ft2
Pitot Correction	0.9319	factor
Baro. Pressure	29.89	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	15.259	Ft/ Sec
Initial Flow	**153.99**	Ft3/min

Test Engineer: _____

Date: 12/31/14

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 17-Nov-14
Test Run Number: 1

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONET	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	479	783.2	755.1		28.10
REAR FILTER CATCH	FILTER	492	135.8	136		-0.20
RINSE OF PROBE &	ACETONE	48	109129	109122	0.00033	6.98
RINSE OF IMPINGER SET	WATER	225	97967.9	97960	0.002	7.45
RINSE OF IMPINGER SET	METHANE	150	106937.4	106928.9	0.0007	8.40
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	80	106760.5	106756.3	0.00033	4.17
					TOTAL:	54.90

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: 12/31/14

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 18-Nov-14
Test Run Number: 2

Dry Burn-Rate, kg/hr:		**1.04**
Emission-Rate, g/hr:		**0.98**
Duration of Test, Minutes	630	
Dry Gas Meter Standardization	Train A	
Dry Gas Meter Beginning Reading, ft^3	36.902	
Dry Gas Meter Ending Reading, ft^3	394.027	
Barometric Pressure Correction Factor	0.997	
Dry Gas Meter Calibration Factors (γ 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	**345.499**	
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**152.982**	
Total Tunnel Volume, scf	**96378.730**	
Emission Caclulations	Train A	
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	278.955	
Sample Particulate Mass, mg	36.9	
Total Emissions, grams	10.301	
Emission-Rate, g/hr	0.98	
Adjusted Emission Rates, g/hr	**1.79**	
Operating Parameters	Train A	
Max Filter Temperature, °F	132	
Post-Test Leak Check, cfm @ in. Hg vac.	0.008@4	
Average Firebox Surface Temperture delta-T, °F	88.2	
Maximum Ambient Temperture, °F	75	
Mimimum Ambient Temperature, °F	71	
Fuel Properties		
Wet Fuel Load Weight, lb.	28.95	
Dry-Basis Fuel Load Moisture Content, %	20.50	
Wet-Basis Fuel Load Moisture Content, %	17.01	

Test Engineer: _____

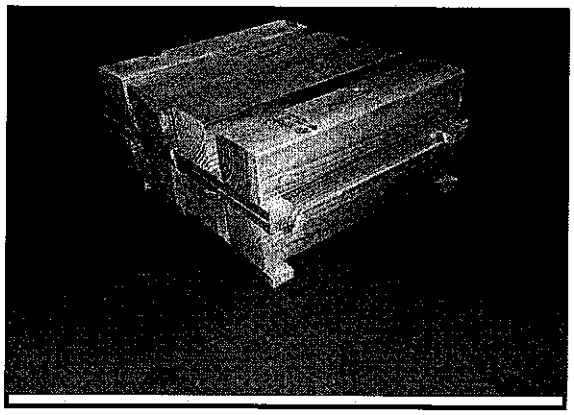
Date: 12/31/14

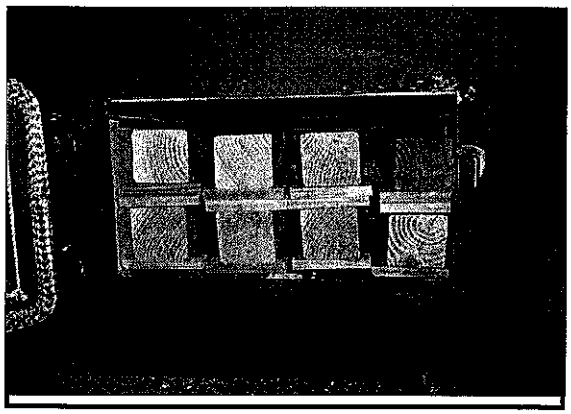
Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	18-Nov-14
Test Run Number:	2
Date tunnel cleaned:	11/14/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft³:	4.5	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 completly.
Secondary Air:	Fixed opening
Control Board:	Thermostat set a 49 degrees so it will not call for heat
Blower/Fan:	On high during pre test.

Pre- Burn Activities	
Time	Activity
	At 75 minutes raked coals
	At 125 raked coals

Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 60 seconds
Fuel-loading door :	Cracked open until 4 minutes then closed
Primary air:	Auto button pushed at zero minutes.
Secondary air:	Fixed opening.
Control board:	Thermostat set at 55 degrees, no demand.
Blower / fan:	Off for the first 30 minutes then turned to high.

Other Notes

Test Engineer: _____ Date: 12/31/14

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	18-Nov-14
Test Run Number:	2

Firebox Volume, ft^3:	4.5

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**		**19.9**	**23.2**	**18.8**
2	**96.00**	**20.50**	**21.2**	**23.2**	**21.1**
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight		**20.5**	Average, %db		**21.2**

Allowable Fuel Load Range: **28.4** to **34.6**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:			Time:	9:30	Temp.,°F:	65
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	**17.00**			**23.3**	**21.6**	**19.8**
2	**17.00**			**22.2**	**21.3**	**24.2**
3	**17.00**			**18.8**	**20.0**	**19.2**
4	**17.00**			**20.2**	**18.9**	**21.1**
5	**17.00**			**20.8**	**18.4**	**21.4**
6	**17.00**			**19.9**	**21.4**	**19.2**
7	**17.00**			**18.4**	**20.2**	**21.4**
8	**17.00**		**28.95**	**19.8**	**21.2**	**19.2**
Totals		0.0	29.0			
% of Weight		0	100			
Total weight, wet, lb.		**28.95**		Average Moisture, dry		**20.50**
Total weight, dry, kg		10.90		Average Moisture, wet		17.01

Test Engineer: _____ Date: 12/2/14

Intertek

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	18-Nov-14
Test Run Number:	2

EPA Method 28
Pre Burn Data

Coal Bed Range	5.8	to	7.2

Average Firebox Temp, °F	299

Final Coal Bed Wt, lb	6.1

Duration, Minutes	Temperature Data										Flue Draft	Fuel Weight	Weight Loss
	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom		Catalyst Outlet			
0	71	149	515	481	241	465	464	457	421.6		-0.07	23.10	17.00
10	72	178	710	655	262	315	451	455	427.6		-0.085	19.30	3.80
20	72	169	680	683	272	293	453	455	431.2		-0.08	14.80	4.50
30	72	152	628	669	277	293	459	458	431.2		-0.075	11.60	3.20
40	73	127	529	596	292	304	469	461	424.4		-0.065	9.60	2.00
50	72	117	470	519	297	308	469	470	412.6		-0.065	8.20	1.40
60	74	109	413	454	299	315	464	460	398.4		-0.05	7.20	1.00
70	73	114	362	352	300	344	458	457	382.2		-0.04	6.80	0.40
80	72	85	202	289	312	347	445	443	367.2		-0.022	6.40	0.40
90	73	81	178	262	318	329	428	427	352.8		-0.015	6.40	0.00
100	74	81	160	239	323	311	406	408	337.4		-0.01	6.30	0.10
110	74	82	153	227	325	296	385	389	324.4		-0.01	6.30	0.00
120	73	81	141	212	325	282	365	369	310.6		-0.01	6.20	0.10
130	74	78	160	194	324	271	350	356	299		-0.01	6.10	0.10

Test Engineer: _____

Date: 11/18/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	18-Nov-14
Test Run No:	2

Temperature Data

Firebox Temp Start	300.8
Firebox Temp End	212.6
Firebox Delta-T	88.2

Max Filter Temps	
Train A	
132	

Interval	10	Duration of Test, Min	630

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	74	79	156	204	324	271	349	356		132	69	71	
1	10	73	118	486	335	300	288	334	339		132	43	71	
2	20	72	146	623	648	277	301	339	336		132	41	71	
3	30	73	152	643	764	267	330	359	354		132	41	71	
4	40	74	132	536	560	267	242	382	383		132	42	71	
5	50	73	118	470	502	276	238	395	394		132	43	71	
6	60	74	117	464	491	278	244	399	397		132	43	72	
7	70	74	115	460	484	277	245	402	402		131	44	72	
8	80	73	114	458	481	276	253	404	407		132	44	72	
9	90	73	114	456	481	274	262	408	412		132	44	72	
10	100	74	111	467	491	273	276	415	424		132	45	72	
11	110	74	106	436	462	271	296	422	438		132	45	73	
12	120	73	103	419	445	270	308	426	443		132	46	73	
13	130	73	97	344	364	268	344	430	450		132	45	73	
14	140	73	95	323	330	269	347	430	448		132	45	73	
15	150	73	86	234	300	274	352	425	444		132	46	72	
16	160	73	83	184	266	286	340	413	434		132	46	72	
17	170	74	81	165	245	295	320	395	416		132	47	73	
18	180	74	77	153	232	296	305	380	398		131	48	73	
19	190	73	74	146	221	296	292	367	381		131	48	73	
20	200	72	76	142	213	295	283	353	368		131	48	73	
21	210	72	77	137	206	293	274	342	355		131	48	72	
22	220	73	78	135	202	292	268	334	346		131	48	72	
23	230	73	79	132	194	289	257	320	331		132	49	72	
24	240	73	78	131	192	288	260	317	325		132	49	72	
25	250	74	76	128	188	286	250	311	317		132	50	73	
26	260	72	74	126	184	283	246	304	307		131	51	73	
27	270	71	75	128	181	280	240	296	299		131	51	72	
28	280	72	76	128	180	278	239	294	295		132	50	72	
29	290	72	77	127	179	277	236	291	292		132	50	72	
30	300	72	78	127	178	276	234	288	287		131	50	72	
31	310	72	79	128	176	275	231	284	283		131	50	72	
32	320	74	78	128	176	274	229	282	278		131	51	72	
33	330	72	74	127	175	272	227	279	271		131	51	73	
34	340	72	74	126	174	271	226	276	268		132	50	72	
35	350	72	76	125	174	270	227	274	266		131	50	72	
36	360	72	77	124	173	269	226	273	266		131	50	72	
37	370	72	78	123	173	269	225	271	265		132	50	72	
38	380	73	78	122	173	268	224	269	262		131	49	72	
39	390	72	79	121	172	268	225	268	262		132	49	72	
40	400	73	81	120	173	268	229	266	262		132	49	72	
41	410	73	79	118	170	267	229	264	258		131	49	73	
42	420	73	80	117	169	266	230	261	257		131	49	73	
43	430	73	80	116	168	265	232	259	256		132	49	73	
44	440	73	80	115	167	264	235	258	254		132	49	73	
45	450	73	80	115	167	263	238	255	253		131	50	73	
46	460	74	80	117	169	262	241	253	251		132	50	73	
47	470	74	79	118	169	261	244	249	248		131	50	74	

Test Engineer: _____

Date: 12/3/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	18-Nov-14
Test Run No:	2

Temperature Data

Firebox Temp Start	300.8
Firebox Temp End	212.6
Firebox Delta-T	88.2

Max Filter Temps	
Train A	
132	

Interval	10	Duration of Test, Min	630

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
48	480	74	80	118	169	260	247	249	246		131	48	74	
49	490	74	80	119	169	259	249	246	245		132	47	74	
50	500	74	78	120	170	259	248	243	243		132	47	74	
51	510	74	80	119	170	258	244	242	243		132	47	74	
52	520	74	80	118	170	258	241	241	242		131	47	74	
53	530	74	80	118	170	257	240	239	241		132	47	74	
54	540	74	83	120	170	258	240	239	241		131	47	74	
55	550	74	81	119	168	256	240	236	240		132	48	74	
56	560	74	81	118	168	255	244	234	238		132	48	75	
57	570	74	81	117	167	254	240	231	236		132	48	75	
58	580	74	81	116	165	253	235	229	235		132	48	75	
59	590	74	81	113	163	252	232	228	233		132	48	75	
60	600	74	79	111	161	251	224	226	230		132	49	75	
61	610	74	81	111	158	249	218	223	229		132	49	75	
62	620	74	80	115	158	248	213	223	226		132	49	75	
63	630	75	79	115	158	247	211	223	224		131	49	75	

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	18-Nov-14
Test Run Number:	2

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	29.85		Meter Box (A)	0.977
End	29.80			
Duration of Test, Min		630		

Leak Check, cfm @ in Hg	
Train A	
0.008@4	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	0.046	1.00		-0.010	28.95	28.95	36.902		99.98		0.00	
10	0.046	1.00		-0.060	27.30	1.65	42.620		104.02		0.00	
20	0.046	1.00		-0.063	24.50	2.80	48.250		104.87		0.00	
30	0.046	1.00		-0.072	22.00	2.50	53.790		103.71		0.00	
40	0.046	1.00		-0.068	19.60	2.40	59.540		105.86		0.00	
50	0.046	1.00		-0.060	17.60	2.00	65.340		105.51		0.00	
60	0.046	1.00		-0.055	15.90	1.70	70.880		100.51		0.00	
70	0.046	1.00		-0.060	14.00	1.90	76.570		103.05		0.00	
80	0.046	1.00		-0.060	12.30	1.70	82.150		100.97		0.00	
90	0.046	1.00		-0.060	10.70	1.60	87.720		100.79		0.00	
100	0.046	1.00		-0.060	8.90	1.80	93.280		100.34		0.00	
110	0.046	1.00		-0.050	7.40	1.50	99.010		102.77		0.00	
120	0.046	1.00		-0.040	6.20	1.20	104.500		98.20		0.00	
130	0.046	1.00		-0.030	5.50	0.70	110.200		101.41		0.00	
140	0.046	1.00		-0.030	5.10	0.40	115.905		101.32		0.00	
150	0.046	1.00		-0.020	4.80	0.30	121.507		98.86		0.00	
160	0.046	1.00		-0.010	4.70	0.10	127.005		96.76		0.00	
170	0.046	1.00		-0.010	4.60	0.10	132.950		104.24		0.00	
180	0.046	1.00		-0.010	4.50	0.10	138.550		97.83		0.00	
190	0.046	1.00		-0.010	4.40	0.10	144.140		97.38		0.00	
200	0.046	1.00		-0.010	4.40	0.00	149.850		99.66		0.00	
210	0.046	1.00		-0.010	4.30	0.10	155.380		96.79		0.00	
220	0.046	1.00		-0.010	4.20	0.10	161.110		100.38		0.00	
230	0.046	1.00		-0.010	4.10	0.10	166.350		91.88		0.00	
240	0.046	1.00		-0.010	4.00	0.10	172.350		105.11		0.00	
250	0.046	1.00		-0.010	4.00	0.00	178.050		99.48		0.00	
260	0.046	1.00		-0.010	3.90	0.10	183.550		95.81		0.00	
270	0.046	1.00		-0.010	3.80	0.10	188.968		94.65		0.00	
280	0.046	1.00		-0.010	3.70	0.10	195.050		106.35		0.00	
290	0.046	1.00		-0.010	3.60	0.10	200.720		99.24		0.00	
300	0.046	1.00		-0.010	3.50	0.10	206.440		100.20		0.00	
310	0.046	1.00		-0.010	3.40	0.10	212.150		100.12		0.00	
320	0.046	1.00		-0.010	3.30	0.10	217.770		98.45		0.00	
330	0.046	1.00		-0.010	3.20	0.10	223.580		101.21		0.00	
340	0.046	1.00		-0.010	3.10	0.10	229.340		100.53		0.00	
350	0.046	1.00		-0.010	3.00	0.10	235.130		101.24		0.00	
360	0.046	1.00		-0.010	2.90	0.10	240.570		95.21		0.00	
370	0.046	1.00		-0.010	2.80	0.10	246.560		104.93		0.00	
380	0.046	1.00		-0.010	2.70	0.10	252.250		99.68		0.00	
390	0.046	1.00		-0.010	2.60	0.10	257.840		98.02		0.00	
400	0.046	1.00		-0.010	2.50	0.10	263.520		99.78		0.00	
410	0.046	1.00		-0.010	2.40	0.10	268.970		95.38		0.00	
420	0.046	1.00		-0.010	2.30	0.10	274.670		99.85		0.00	
430	0.046	1.00		-0.010	2.10	0.20	280.530		102.66		0.00	
440	0.046	1.00		-0.010	2.00	0.10	286.220		99.68		0.00	
450	0.046	1.00		-0.010	1.90	0.10	291.760		97.05		0.00	
460	0.046	1.00		-0.010	1.80	0.10	297.710		104.23		0.00	
470	0.046	1.00		-0.010	1.70	0.10	303.440		100.10		0.00	
480	0.046	1.00		-0.010	1.60	0.10	308.860		94.77		0.00	
490	0.046	1.00		-0.010	1.50	0.10	314.680		101.76		0.00	

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	18-Nov-14
Test Run Number:	2

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	29.85		Meter Box (A)	0.977
End	29.80			
Duration of Test, Min		630		

Leak Check, cfm @ in Hg	
Train A	
0.008@4	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	
500	0.046	1.00		-0.010	1.40	0.10	320.410		100.00		0.00	
510	0.046	1.00		-0.010	1.30	0.10	326.070		98.97		0.00	
520	0.046	1.00		-0.010	1.10	0.20	331.670		97.92		0.00	
530	0.046	1.00		-0.010	1.00	0.10	337.520		102.29		0.00	
540	0.046	1.00		-0.010	0.90	0.10	343.160		98.89		0.00	
550	0.046	1.00		-0.010	0.80	0.10	348.550		94.33		0.00	
560	0.046	1.00		-0.010	0.70	0.10	354.330		100.97		0.00	
570	0.046	1.00		-0.010	0.60	0.10	359.850		96.43		0.00	
580	0.046	1.00		-0.010	0.50	0.10	365.730		102.72		0.00	
590	0.046	1.00		-0.010	0.40	0.10	371.270		96.78		0.00	
600	0.046	1.00		-0.010	0.30	0.10	376.880		97.82		0.00	
610	0.046	1.00		-0.010	0.20	0.10	382.810		103.59		0.00	
620	0.046	1.00		-0.010	0.10	0.10	388.400		97.56		0.00	
630	0.046	1.00		-0.010	0.00	0.10	394.027		98.11		0.00	

Test Engineer: _____

Date: 12/3/14

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 18-Nov-14
Test Run Number: 2

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0400	87	0.2000
A2	0.0440	87	0.2098
A3	0.0460	87	0.2145
A4	0.0420	87	0.2049
A Center	0.0460	87	0.2145
B1	0.0400	86	0.2000
B2	0.0440	86	0.2098
B3	0.0460	86	0.2145
B4	0.0420	86	0.2049
B Center	0.0460	86	0.2145
Averages	0.0436	86.5	0.2073

Tunnel Diameter	**6.000**	inches
Tunnel Static	**-0.480**	in. H2O
Tunnel Area	0.19635	Ft2
Pitot Correction	0.9665	factor
Baro. Pressure	29.85	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	14.055	Ft/ Sec
Initial Flow	**153.16**	Ft3/min

Test Engineer: _____ Date: 12/31/14

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 18-Nov-14
Test Run Number: 2

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONET	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	480	774.7	755.8		18.90
REAR FILTER CATCH	FILTER	493	125.6	125.7		-0.10
RINSE OF PROBE &	ACETONE	30	108339.5	108336.3	0.00033	3.19
RINSE OF IMPINGER SET	WATER	220	102112.9	102105.8	0.002	6.66
RINSE OF IMPINGER SET	METHANE	150	107988.6	107982.4	0.0007	6.10
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	60	108640.1	108637.9	0.00033	2.18
					TOTAL:	36.93

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: 12/3/14

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 19-Nov-14
Test Run Number: 3

Dry Burn-Rate, kg/hr:		**1.49**
Emission-Rate, g/hr:		**3.81**
Duration of Test, Minutes	470	
Dry Gas Meter Standardization	Train A	
Dry Gas Meter Beginning Reading, ft^3	394.2	
Dry Gas Meter Ending Reading, ft^3	660.295	
Barometric Pressure Correction Factor	0.998	
Dry Gas Meter Calibration Factors (γ 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	**257.817**	
Dillution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**148.732**	
Total Tunnel Volume, scf	**69903.987**	
Emission Caclulations	Train A	
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	271.138	
Sample Particulate Mass, mg	110.1	
Total Emissions, grams	29.852	
Emission-Rate, g/hr	3.81	
Adjusted Emission Rates, g/hr	**5.52**	
Operating Parameters	Train A	
Max Filter Temperature, °F	132	
Post-Test Leak Check, cfm @ in. Hg vac.	0.006@4	
Average Firebox Surface Temperture delta-T, °F	92.6	
Maximum Ambient Temperture, °F	78	
Mimimum Ambient Temperature, °F	71	
Fuel Properties		
Wet Fuel Load Weight, lb.	31.20	
Dry-Basis Fuel Load Moisture Content, %	21.04	
Wet-Basis Fuel Load Moisture Content, %	17.38	

Test Engineer: _____

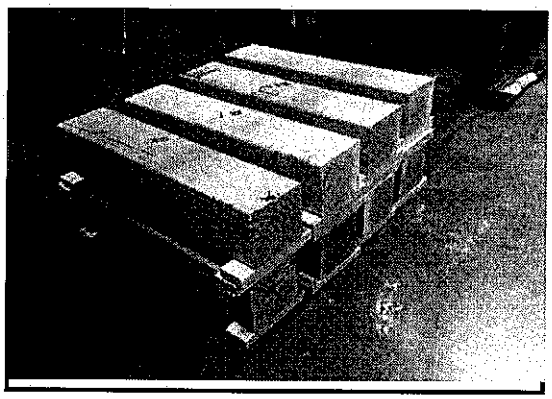
Date: 12/31/14

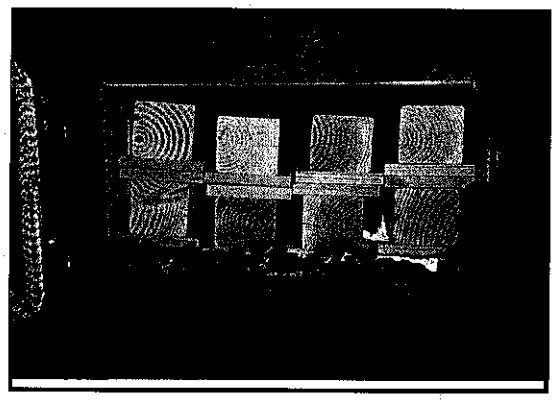
Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	19-Nov-14
Test Run Number:	3
Date tunnel cleaned:	11/17/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	4.5	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 completly.
Secondary Air:	Fixed opening
Control Board:	Timed activity not used during preburn
Blower/Fan:	Blower off for the first 30 minutes then turned to high.

Pre- Burn Activities	
Time	Activity
	At 75 minitues raked coals

Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 55 seconds
Fuel-loading door :	cracked open until 2:45 then closed.
Primary air:	Auto button pressed at zero minutes, programmable remote set to hold air fully open for 30 minutes then adjust to an electronic stop for 7 hours. The thermostat will then go into demand mode opening the air controls for the remainder of the test.
Secondary air:	Fixed opening
Control board:	operating in conjunction with a programable thermostat.
Blower / fan:	Blower off for the first 30 minutes then turned to high.

Other Notes

At 7.5 hours the programed thermostat called for heat and the stove automatically opened primary air openings.

Test Engineer: _____ Date: 12/31/14

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	19-Nov-14
Test Run Number:	3

Firebox Volume, ft^3:	4.5

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**		**21.3**	**18.1**	**18.9**
2	**96.00**	**19.85**	**21.2**	**20.4**	**19.4**
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight		**19.9**	Average, %db		**19.9**

Allowable Fuel Load Range: **28.4** to **34.6**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:			Time:	9:30	Temp.,°F:	65
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	**16.00**			**21.1**	**22.0**	**21.3**
2	**16.00**			**20.8**	**21.6**	**19.9**
3	**16.00**			**21.0**	**22.7**	**21.9**
4	**16.00**			**20.0**	**21.5**	**22.5**
5	**16.00**			**20.8**	**18.1**	**19.4**
6	**16.00**			**20.6**	**20.4**	**20.8**
7	**16.00**			**20.2**	**21.4**	**19.5**
8	**16.00**		**31.20**	**23.7**	**20.5**	**23.3**
Totals		0.0	31.2			
% of Weight		0	100			
Total weight, wet, lb.		**31.20**		Average Moisture, dry		**21.04**
Total weight, dry, kg		11.69		Average Moisture, wet		17.38

Test Engineer: _____

Date: 12/31/14

Intertek

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	19-Nov-14
Test Run Number:	3

EPA Method 28
Pre Burn Data

Coal Bed Range	6.3	to	7.8

Average Firebox Temp, °F	341.8

Final Coal Bed Wt, lb	7.7

Duration, Minutes	Temperature Data										Flue Draft	Fuel Weight	Weight Loss
	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom		Catalyst Outlet			
0	76	163	469	469	222	452	436	450	405.8		-0.07	23.30	15.60
10	77	171	681	619	237	273	428	439	399.2		-0.095	20.20	3.10
20	75	173	704	681	240	250	424	430	405		-0.1	16.50	3.70
30	74	154	618	611	243	250	428	434	393.2		-0.086	13.40	3.10
40	75	126	493	500	257	268	437	451	382.6		-0.075	11.20	2.20
50	75	118	435	469	368	275	438	458	401.6		-0.07	9.50	1.70
60	76	107	408	419	271	277	433	459	371.8		-0.065	8.40	1.10
70	75	96	330	339	273	284	427	455	355.6		-0.048	7.90	0.50
80	74	88	244	279	278	296	418	438	341.8		-0.038	7.70	0.20

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	19-Nov-14
Test Run No:	3

Temperature Data

Firebox Temp Start	341.4
Firebox Temp End	248.8
Firebox Delta-T	92.6

Max Filter Temps	
Train A	
132	

Interval	10	Duration of Test, Min	470

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	73	85	231	275	279	293	418	442		132	69	71	
1	10	74	148	596	505	267	340	397	417		132	52	71	
2	20	75	191	764	839	253	351	387	412		132	53	71	
3	30	76	208	792	954	247	387	400	426		132	54	71	
4	40	77	185	719	717	244	279	425	448		132	55	72	
5	50	77	156	628	614	242	276	441	458		132	55	73	
6	60	78	119	478	503	250	280	450	464		132	56	73	
7	70	74	112	438	453	256	278	452	462		132	55	73	
8	80	75	109	422	433	258	278	452	461		131	55	73	
9	90	74	107	403	406	259	280	453	460		131	55	73	
10	100	76	100	367	371	259	283	450	458		132	55	73	
11	110	74	94	328	322	259	289	444	457		131	50	73	
12	120	74	90	303	295	258	292	437	456		132	47	73	
13	130	74	81	200	258	263	299	429	450		131	47	73	
14	140	73	79	152	214	275	285	404	417		131	45	72	
15	150	72	79	149	211	275	283	401	415		132	45	72	
16	160	74	80	140	200	278	274	386	397		131	46	72	
17	170	74	76	137	196	278	266	371	374		131	46	72	
18	180	74	75	135	191	277	259	359	363		131	45	73	
19	190	72	75	132	186	273	250	340	346		131	45	73	
20	200	71	75	130	184	271	249	333	342		131	46	72	
21	210	72	75	127	182	269	247	307	335		131	46	72	
22	220	73	77	126	180	268	244	318	327		131	44	72	
23	230	74	78	127	180	267	241	311	322		131	45	72	
24	240	74	75	126	178	264	241	304	315		131	45	73	
25	250	73	73	125	176	262	236	298	308		131	45	73	
26	260	72	74	124	174	259	234	277	303		131	45	72	
27	270	72	75	123	174	258	236	287	301		131	45	72	
28	280	72	77	122	168	257	233	283	299		131	45	72	
29	290	73	76	121	174	256	228	280	297		131	45	72	
30	300	74	76	121	173	256	230	276	292		131	45	72	
31	310	73	74	119	172	255	223	272	292		131	45	72	
32	320	71	73	117	170	252	221	266	288		131	46	72	
33	330	72	74	115	168	251	221	264	288		131	45	72	
34	340	72	76	114	166	250	225	261	288		131	45	72	
35	350	72	76	113	165	249	220	259	286		131	46	72	
36	360	72	77	112	163	248	218	256	285		131	46	72	
37	370	73	78	112	163	247	215	253	284		131	46	72	
38	380	73	79	112	163	246	213	251	282		131	46	73	
39	390	73	78	113	163	246	215	250	281		131	46	73	
40	400	74	78	113	161	244	206	249	278		132	46	73	
41	410	74	78	114	161	243	207	249	275		132	46	73	
42	420	74	80	114	162	242	208	248	273		132	47	73	
43	430	74	80	115	163	241	208	247	271		132	47	73	
44	440	74	81	115	163	240	209	246	270		131	47	74	
45	450	75	83	139	164	239	214	244	269		132	47	74	
46	460	75	99	305	197	220	224	246	275		132	47	74	
47	470	75	106	341	224	211	247	263	299		131	47	74	

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	19-Nov-14
Test Run Number:	3

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	29.87		Meter Box (A)	0.977
End	29.83			
Duration of Test, Min		470		

Leak Check, cfm @ in Hg	
Train A	
0.006@4	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	0.046	1.00		-0.038	31.20	31.20	394.200		99.91		0.00	
10	0.046	1.00		-0.090	28.80	2.40	399.880		105.48		0.00	
20	0.046	1.00		-0.095	24.90	3.90	405.250		103.19		0.00	
30	0.046	1.00		-0.094	20.80	4.10	410.450		101.22		0.00	
40	0.046	1.00		-0.090	16.70	4.10	416.080		107.49		0.00	
50	0.046	1.00		-0.080	13.60	3.10	421.820		106.89		0.00	
60	0.046	1.00		-0.072	11.50	2.10	427.610		104.54		0.00	
70	0.046	1.00		-0.070	9.70	1.80	433.310		102.29		0.00	
80	0.046	1.00		-0.070	8.20	1.50	439.140		104.35		0.00	
90	0.046	1.00		-0.070	7.10	1.10	444.420		94.33		0.00	
100	0.046	1.00		-0.060	6.10	1.00	450.350		105.29		0.00	
110	0.046	1.00		-0.058	5.40	0.70	455.640		93.42		0.00	
120	0.046	1.00		-0.050	4.90	0.50	461.320		99.95		0.00	
130	0.046	1.00		-0.050	4.70	0.20	467.210		102.79		0.00	
140	0.046	1.00		-0.030	4.60	0.10	472.980		100.70		0.00	
150	0.046	1.00		-0.020	4.50	0.10	478.510		96.51		0.00	
160	0.046	1.00		-0.018	4.40	0.10	484.210		99.57		0.00	
170	0.046	1.00		-0.018	4.30	0.10	490.020		101.12		0.00	
180	0.046	1.00		-0.018	4.20	0.10	495.620		97.19		0.00	
190	0.046	1.00		-0.015	4.10	0.10	501.060		94.41		0.00	
200	0.046	1.00		-0.015	4.00	0.10	506.970		102.76		0.00	
210	0.046	1.00		-0.150	3.90	0.10	512.720		99.98		0.00	
220	0.046	1.00		-0.015	3.80	0.10	518.440		99.64		0.00	
230	0.046	1.00		-0.015	3.70	0.10	523.880		94.85		0.00	
240	0.046	1.00		-0.015	3.50	0.20	529.580		98.92		0.00	
250	0.046	1.00		-0.010	3.40	0.10	535.430		101.34		0.00	
260	0.046	1.00		-0.010	3.30	0.10	541.120		98.84		0.00	
270	0.046	1.00		-0.010	3.20	0.10	546.810		98.94		0.00	
280	0.046	1.00		-0.010	3.10	0.10	552.620		101.21		0.00	
290	0.046	1.00		-0.010	3.00	0.10	558.260		98.16		0.00	
300	0.046	1.00		-0.010	2.80	0.20	563.580		92.59		0.00	
310	0.046	1.00		-0.010	2.70	0.10	569.350		100.23		0.00	
320	0.046	1.00		-0.010	2.60	0.10	575.030		98.58		0.00	
330	0.046	1.00		-0.010	2.50	0.10	580.980		103.36		0.00	
340	0.046	1.00		-0.010	2.40	0.10	586.870		102.51		0.00	
350	0.046	1.00		-0.010	2.30	0.10	592.130		91.54		0.00	
360	0.046	1.00		-0.010	2.20	0.10	597.760		98.08		0.00	
370	0.046	1.00		-0.010	2.10	0.10	603.470		99.56		0.00	
380	0.046	1.00		-0.010	2.00	0.10	609.120		98.42		0.00	
390	0.046	1.00		-0.010	1.90	0.10	614.940		101.29		0.00	
400	0.046	1.00		-0.010	1.80	0.10	620.650		99.37		0.00	
410	0.046	1.00		-0.010	1.70	0.10	626.430		100.59		0.00	
420	0.046	1.00		-0.010	1.60	0.10	632.020		97.47		0.00	
430	0.046	1.00		-0.010	1.50	0.10	637.520		95.90		0.00	
440	0.046	1.00		-0.010	1.40	0.10	643.230		99.46		0.00	
450	0.046	1.00		-0.020	1.20	0.20	649.000		100.70		0.00	
460	0.046	1.00		-0.042	0.30	0.90	654.750		101.81		0.00	
470	0.046	1.00		-0.045	0.00	0.30	660.295		98.80		0.00	

Test Engineer: _____

Date: 12/24/14

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 19-Nov-14
Test Run Number: 3

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0400	91	0.2000
A2	0.0420	91	0.2049
A3	0.0420	91	0.2049
A4	0.0380	91	0.1949
A Center	0.0440	91	0.2098
B1	0.0300	91	0.1732
B2	0.0440	91	0.2098
B3	0.0440	91	0.2098
B4	0.0420	91	0.2049
B Center	0.0460	91	0.2145
Averages	0.0412	91	0.2003

Tunnel Diameter	**6.000**	inches
Tunnel Static	**-0.420**	in. H2O
Tunnel Area	0.19635	Ft2
Pitot Correction	0.9443	factor
Baro. Pressure	29.87	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	13.633	Ft/ Sec
Initial Flow	**147.44**	Ft3/min

Test Engineer: _____ Date: 12/31/14

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 19-Nov-14
Test Run Number: 3

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONET	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	481	819.5	759.3		60.20
REAR FILTER CATCH	FILTER	494	136.7	136.8		-0.10
RINSE OF PROBE &	ACETONE	45	101186.3	101177.5	0.00033	8.79
RINSE OF IMPINGER SET	WATER	230	110240.8	110222.9	0.002	17.44
RINSE OF IMPINGER SET	METHANE	150	103699.3	103685	0.0007	14.20
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	70	104475.6	104466	0.00033	9.58
					TOTAL:	110.10

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: 12/31/14

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 21-Nov-14
Test Run Number: 5

Dry Burn-Rate, kg/hr:		**0.93**
Emission-Rate, g/hr:		**2.72**
Duration of Test, Minutes	750	
Dry Gas Meter Standardization	Train A	
Dry Gas Meter Beginning Reading, ft^3	5.02	
Dry Gas Meter Ending Reading, ft^3	431.317	
Barometric Pressure Correction Factor	0.997	
Dry Gas Meter Calibration Factors (γ factors)	0.977	
Dry Gas Meter Temperature Factors	0.988	
Dry Gas Meter Delta-H Correction Factors	1.002	
Dry Gas Meter STD Volume Sampled, ft^3	**411.250**	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**146.826**	
Total Tunnel Volume, scf	**110119.870**	
Emission Caclulations	Train A	
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	267.768	
Sample Particulate Mass, mg	127.1	
Total Emissions, grams	34.030	
Emission-Rate, g/hr	2.72	
Adjusted Emission Rates, g/hr	**4.18**	
Operating Parameters	Train A	
Max Filter Temperature, °F	132	
Post-Test Leak Check, cfm @ in. Hg vac.	0.004@4	
Average Firebox Surface Temperture delta-T, °F	99.4	
Maximum Ambient Temperture, °F	77	
Mimimum Ambient Temperature, °F	72	
Fuel Properties		
Wet Fuel Load Weight, lb.	31.25	
Dry-Basis Fuel Load Moisture Content, %	22.24	
Wet-Basis Fuel Load Moisture Content, %	18.19	

Test Engineer: _____

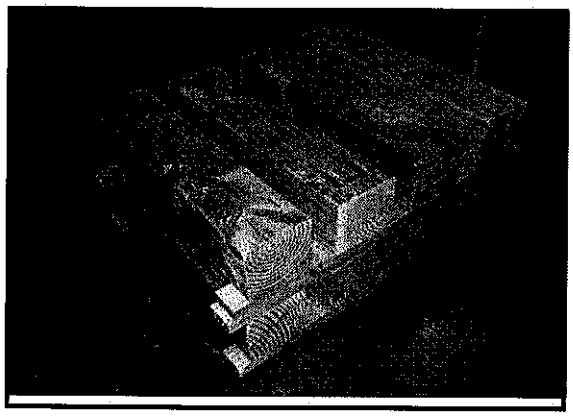
Date: 12/24/14

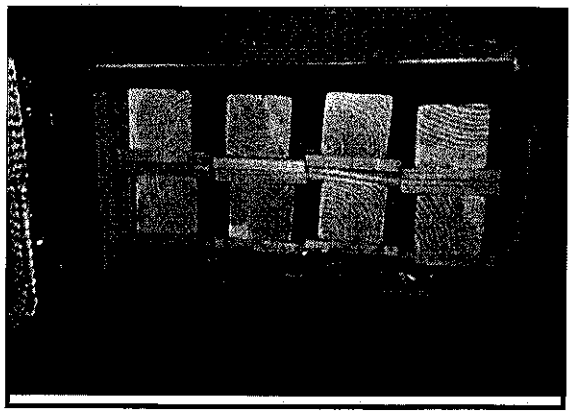
Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	21-Nov-14
Test Run Number:	5
Date tunnel cleaned:	11/14/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	4.5	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 completly.
Secondary Air:	Fixed opening
Control Board:	Programable thermostat was set to 49 degrees so will not call for heat.
Blower/Fan:	On high during pre test

Pre- Burn Activities	
Time	Activity
	At 85 minutes raked coals

Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 60 seconds
Fuel-loading door :	cracked open until 2:45 then closed
Primary air:	Auto button pushed at zero minutes
Secondary air:	Fixed opening
Control board:	Thermostat set at 45 degrees so it will not call for heat.
Blower / fan:	Fan on high entire test

Other Notes
Between 660 and 670 minutes there was no weight loss, fuel door was opened and coal bed was adjusted.

Test Engineer: _____ Date: 12/3/14

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	21-Nov-14
Test Run Number:	5

Firebox Volume, ft^3:	4.5

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	19.50	23.2	18.7	19.4
2	96.00		18.7	23.6	21.5
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight		19.5	Average, %db		20.9

Allowable Fuel Load Range: **28.4** to **34.6**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:			Time:	9:30	Temp.,°F:	65
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	15.00			19.1	23.7	22.5
2	15.00			23.5	20.5	21.4
3	15.00			23.3	20.0	19.1
4	15.00			23.4	23.5	25.8
5	15.00			22.8	24.9	21.6
6	15.00			21.1	25.3	24.5
7	15.00			21.1	20.2	21.2
8	15.00		31.25	21.9	22.1	21.2
Totals		0.0	31.3			
% of Weight		0	100			
Total weight, wet, lb.		31.25		Average Moisture, dry		22.24
Total weight, dry, kg		11.60		Average Moisture, wet		18.19

Test Engineer: _____

Date: 12/3/14

Intertek

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	21-Nov-14
Test Run Number:	5

EPA Method 28
Pre Burn Data

Coal Bed Range	6.3	to	7.8

Average Firebox Temp, °F	294

Final Coal Bed Wt, lb	6.8

	Temperature Data												
Duration, Minutes	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right		Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	73	148	401	333	204	345	372	406	332		-0.06	22.60	15.80
10	73	160	609	534	214	232	368	394	348.4		-0.085	19.70	2.90
20	75	165	645	616	222	221	371	388	363.6		-0.09	16.20	3.50
30	76	153	618	625	225	227	381	393	370.2		-0.09	13.50	2.70
40	73	118	471	488	239	241	398	405	354.2		-0.075	11.60	1.90
50	73	109	431	456	246	247	406	410	353		-0.07	9.90	1.70
60	73	103	396	402	249	249	508	411	363.8		-0.065	8.90	1.00
70	73	102	372	371	250	253	406	412	338.4		-0.058	8.10	0.80
80	74	96	317	339	252	262	403	416	334.4		-0.038	7.20	0.90
90	74	83	197	264	261	275	395	407	320.4		-0.025	7.00	0.20
100	73	100	222	223	269	270	377	387	305.2		-0.025	6.90	0.10
110	73	75	151	206	272	262	362	368	294		-0.02	6.80	0.10

Test Engineer: _____

Date: 12/3/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	21-Nov-14
Test Run No:	5

Temperature Data

Firebox Temp Start	293.6
Firebox Temp End	194.2
Firebox Delta-T	99.4

Max Filter Temps	
Train A	
132	

Interval	10	Duration of Test, Min	750

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	73	75	150	205	273	262	361	367		132	69	71	
1	10	73	102	354	230	255	215	343	345		131	50	71	
2	20	73	133	527	339	238	179	331	320		131	53	70	
3	30	74	143	567	441	228	181	343	326		132	54	71	
4	40	74	125	507	459	225	189	364	345		131	44	71	
5	50	72	115	446	432	231	197	378	348		132	46	72	
6	60	72	114	444	431	232	199	382	351		131	44	72	
7	70	75	113	442	433	233	206	384	357		132	45	72	
8	80	75	109	441	429	232	212	384	363		132	47	72	
9	90	75	108	442	433	231	218	385	366		132	48	72	
10	100	74	108	445	444	228	228	390	372		132	49	73	
11	110	74	109	442	444	227	242	394	386		132	49	73	
12	120	74	109	429	427	225	254	400	401		132	49	72	
13	130	75	106	412	421	225	265	404	416		131	50	72	
14	140	76	99	376	366	225	277	404	423		131	51	73	
15	150	75	94	344	325	224	287	405	426		132	52	73	
16	160	74	85	273	284	223	297	400	430		132	52	73	
17	170	73	81	189	246	230	302	395	422		132	53	73	
18	180	73	80	156	207	238	292	381	401		132	53	73	
19	190	75	78	143	198	243	279	366	380		132	54	72	
20	200	75	76	140	194	244	273	358	369		132	54	72	
21	210	73	75	135	188	243	260	344	348		131	55	73	
22	220	73	74	132	184	241	253	334	337		132	55	73	
23	230	72	75	130	181	239	247	322	328		131	55	72	
24	240	73	76	129	179	238	244	316	323		132	56	72	
25	250	74	78	128	177	236	242	308	315		132	53	72	
26	260	74	76	126	176	235	241	303	308		132	54	72	
27	270	73	75	124	175	234	240	299	304		132	55	73	
28	280	73	74	122	173	231	237	293	298		132	55	73	
29	290	72	75	119	170	229	235	288	295		131	55	72	
30	300	73	76	118	169	228	234	284	291		131	55	73	
31	310	73	78	119	169	228	229	280	287		132	55	73	
32	320	74	79	120	169	227	226	276	283		132	55	73	
33	330	74	79	118	168	226	223	271	279		132	55	73	
34	340	75	80	117	167	225	223	269	276		132	55	74	
35	350	75	80	117	166	224	223	266	274		132	55	74	
36	360	75	81	117	165	223	223	263	271		132	55	74	
37	370	75	81	116	165	222	223	260	269		132	48	74	
38	380	76	81	117	165	222	222	257	268		131	45	75	
39	390	76	81	117	165	221	222	255	266		132	45	75	
40	400	76	81	117	165	220	222	252	265		132	45	75	
41	410	76	79	117	164	219	221	249	263		132	46	75	
42	420	76	80	116	162	218	220	247	261		132	46	75	
43	430	76	80	115	161	217	217	243	258		132	46	75	
44	440	76	80	115	160	215	214	240	257		132	46	76	
45	450	76	81	115	159	215	213	238	256		132	46	76	
46	460	76	81	115	158	213	211	236	252		132	46	76	
47	470	77	81	116	158	213	209	234	253		132	46	76	

Test Engineer: _____

Date: 12/3/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	21-Nov-14
Test Run No:	5

Temperature Data

Firebox Temp Start	293.6
Firebox Temp End	194.2
Firebox Delta-T	99.4

Max Filter Temps	
Train A	
132	

Interval	10	Duration of Test, Min	750

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
48	480	77	81	115	157	212	207	232	252		132	46	76	
49	490	76	81	115	157	211	206	230	251		132	47	76	
50	500	76	81	116	157	210	203	228	250		132	47	76	
51	510	77	82	114	157	209	201	223	248		132	47	76	
52	520	77	81	114	157	209	201	226	247		132	47	76	
53	530	77	82	113	157	208	200	225	246		132	47	77	
54	540	77	82	114	156	207	197	223	244		132	47	77	
55	550	77	82	113	156	207	196	222	244		132	47	77	
56	560	77	82	113	155	206	194	221	242		131	47	77	
57	570	77	82	113	154	205	193	220	241		132	47	77	
58	580	77	82	112	153	205	191	218	239		132	47	77	
59	590	77	82	111	152	204	187	216	239		132	47	77	
60	600	77	80	110	151	204	186	213	234		131	47	77	
61	610	77	78	110	150	203	186	211	228		132	48	77	
62	620	76	78	110	149	202	187	209	228		132	47	77	
63	630	76	78	110	149	201	188	208	227		132	48	77	
64	640	76	79	109	149	201	187	207	227		131	48	76	
65	650	76	79	109	148	201	188	206	226		132	48	76	
66	660	76	80	109	148	201	186	204	226		132	48	76	
67	670	76	81	108	147	201	185	202	225		132	48	76	
68	680	77	81	115	147	201	186	200	223		132	48	76	
69	690	77	81	109	149	201	183	198	223		132	49	77	
70	700	77	81	109	151	200	180	198	224		132	49	76	
71	710	77	81	108	152	200	180	199	227		132	49	77	
72	720	77	78	109	154	199	182	199	228		132	49	77	
73	730	76	77	110	155	198	182	200	228		131	50	77	
74	740	76	78	110	155	197	184	201	230		132	50	76	
75	750	76	78	109	155	197	185	203	231		132	50	76	

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	21-Nov-14
Test Run Number:	5

Barometer, In. Hg		RH, %	Sample Box Correction (y) Factors	
Start	29.79		Meter Box (A)	0.977
End	29.86			
Duration of Test, Min		750		

Leak Check, cfm @ in Hg	
Train A	
0.004@4	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	0.046	1.00		-0.020	31.25	31.25	5.020		100.00		0.00	
10	0.046	1.00		-0.052	30.00	1.25	10.800		103.83		0.00	
20	0.046	1.00		-0.080	27.80	2.20	16.480		105.01		0.00	
30	0.046	1.00		-0.082	25.30	2.50	22.180		106.06		0.00	
40	0.046	1.00		-0.080	22.80	2.50	27.920		105.20		0.00	
50	0.046	1.00		-0.070	20.70	2.10	33.250		96.66		0.00	
60	0.046	1.00		-0.065	19.00	1.70	39.230		108.36		0.00	
70	0.046	1.00		-0.065	17.20	1.80	44.840		101.57		0.00	
80	0.046	1.00		-0.062	15.50	1.70	50.370		99.77		0.00	
90	0.046	1.00		-0.070	13.80	1.70	55.630		94.81		0.00	
100	0.046	1.00		-0.070	12.10	1.70	61.780		110.65		0.00	
110	0.046	1.00		-0.070	10.50	1.60	67.370		100.66		0.00	
120	0.046	1.00		-0.070	9.10	1.40	72.830		98.50		0.00	
130	0.046	1.00		-0.062	7.80	1.30	78.580		103.46		0.00	
140	0.046	1.00		-0.060	6.90	0.90	84.140		99.24		0.00	
150	0.046	1.00		-0.056	6.20	0.70	89.690		98.61		0.00	
160	0.046	1.00		-0.040	5.70	0.50	95.820		108.03		0.00	
170	0.046	1.00		-0.030	5.60	0.10	101.200		94.46		0.00	
180	0.046	1.00		-0.022	5.50	0.10	107.210		105.43		0.00	
190	0.046	1.00		-0.020	5.40	0.10	112.750		97.19		0.00	
200	0.046	1.00		-0.018	5.30	0.10	118.050		92.80		0.00	
210	0.046	1.00		-0.017	5.20	0.10	123.960		103.19		0.00	
220	0.046	1.00		-0.015	5.10	0.10	129.680		99.78		0.00	
230	0.046	1.00		-0.015	5.00	0.10	135.350		99.19		0.00	
240	0.046	1.00		-0.015	4.90	0.10	140.680		93.33		0.00	
250	0.046	1.00		-0.015	4.80	0.10	146.230		97.36		0.00	
260	0.046	1.00		-0.015	4.70	0.10	152.380		107.69		0.00	
270	0.046	1.00		-0.012	4.60	0.10	157.870		95.86		0.00	
280	0.046	1.00		-0.012	4.50	0.10	163.320		95.07		0.00	
290	0.046	1.00		-0.012	4.40	0.10	169.150		101.99		0.00	
300	0.046	1.00		-0.012	4.40	0.00	174.920		100.84		0.00	
310	0.046	1.00		-0.012	4.20	0.20	180.560		98.76		0.00	
320	0.046	1.00		-0.012	4.10	0.10	186.060		96.39		0.00	
330	0.046	1.00		-0.010	4.00	0.10	192.120		106.21		0.00	
340	0.046	1.00		-0.010	3.90	0.10	197.890		101.03		0.00	
350	0.046	1.00		-0.010	3.90	0.00	203.150		92.10		0.00	
360	0.046	1.00		-0.010	3.80	0.10	208.880		100.42		0.00	
370	0.046	1.00		-0.010	3.70	0.10	214.530		99.02		0.00	
380	0.046	1.00		-0.010	3.60	0.10	220.450		103.56		0.00	
390	0.046	1.00		-0.010	3.50	0.10	225.940		96.04		0.00	
400	0.046	1.00		-0.010	3.40	0.10	231.750		101.63		0.00	
410	0.046	1.00		-0.010	3.30	0.10	237.450		99.53		0.00	
420	0.046	1.00		-0.010	3.20	0.10	243.000		97.00		0.00	
430	0.046	1.00		-0.010	3.10	0.10	249.030		105.38		0.00	
440	0.046	1.00		-0.010	3.00	0.10	254.470		94.90		0.00	
450	0.046	1.00		-0.010	2.90	0.10	260.140		99.00		0.00	
460	0.046	1.00		-0.010	2.80	0.10	265.980		101.97		0.00	
470	0.046	1.00		-0.010	2.80	0.00	271.510		96.56		0.00	
480	0.046	1.00		-0.010	2.70	0.10	277.710		108.25		0.00	
490	0.046	1.00		-0.010	2.60	0.10	283.270		97.08		0.00	

Test Engineer: _____

Date: 12/21/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	21-Nov-14
Test Run Number:	5

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	29.79		Meter Box (A)	0.977
End	29.86			
Duration of Test, Min		750		

Leak Check, cfm @ in Hg	
Train A	
0.004@4	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	
500	0.046	1.00		-0.010	2.50	0.10	288.780		96.21		0.00	
510	0.046	1.00		-0.010	2.40	0.10	294.520		100.31		0.00	
520	0.046	1.00		-0.010	2.30	0.10	300.060		96.73		0.00	
530	0.046	1.00		-0.010	2.20	0.10	305.790		99.95		0.00	
540	0.046	1.00		-0.010	2.10	0.10	311.780		104.49		0.00	
550	0.046	1.00		-0.010	2.00	0.10	317.150		93.67		0.00	
560	0.046	1.00		-0.010	1.90	0.10	323.100		103.79		0.00	
570	0.046	1.00		-0.010	1.80	0.10	328.580		95.59		0.00	
580	0.046	1.00		-0.010	1.70	0.10	334.220		98.38		0.00	
590	0.046	1.00		-0.010	1.70	0.00	340.070		102.05		0.00	
600	0.046	1.00		-0.010	1.50	0.20	345.870		100.99		0.00	
610	0.046	1.00		-0.010	1.40	0.10	351.400		96.11		0.00	
620	0.046	1.00		-0.010	1.30	0.10	356.980		96.98		0.00	
630	0.046	1.00		-0.010	1.30	0.00	362.670		98.89		0.00	
640	0.046	1.00		-0.010	1.20	0.10	368.500		101.60		0.00	
650	0.046	1.00		-0.010	1.10	0.10	374.160		98.64		0.00	
660	0.046	1.00		-0.010	1.00	0.10	380.230		105.89		0.00	
670	0.046	1.00		-0.010	1.00	0.00	385.950		99.87		0.00	
680	0.046	1.00		-0.010	0.80	0.20	391.780		101.79		0.00	
690	0.046	1.00		-0.010	0.70	0.10	397.030		91.50		0.00	
700	0.046	1.00		-0.010	0.50	0.20	402.750		99.87		0.00	
710	0.046	1.00		-0.010	0.40	0.10	408.480		99.86		0.00	
720	0.046	1.00		-0.010	0.30	0.10	414.200		99.41		0.00	
730	0.046	1.00		-0.010	0.20	0.10	420.000		100.71		0.00	
740	0.046	1.00		-0.010	0.10	0.10	425.680		98.90		0.00	
750	0.046	1.00		-0.010	0.00	0.10	431.317		98.15		0.00	

Test Engineer: _____

Date: 12/3/14

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 21-Nov-14
Test Run Number: 5

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0360	81	0.1897
A2	0.0440	81	0.2098
A3	0.0440	81	0.2098
A4	0.0400	80	0.2000
A Center	0.0480	80	0.2191
B1	0.0300	80	0.1732
B2	0.0420	80	0.2049
B3	0.0460	79	0.2145
B4	0.0420	79	0.2049
B Center	0.0460	79	0.2145
Averages	0.0418	80	0.2009

Tunnel Diameter	**6.000**	inches
Tunnel Static	**-0.460**	in. H2O
Tunnel Area	0.19635	Ft2
Pitot Correction	0.9265	factor
Baro. Pressure	29.79	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	13.551	Ft/ Sec
Initial Flow	**149.15**	Ft3/min

Test Engineer: _____ Date: 12/31/14

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 21-Nov-14
Test Run Number: 5

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONET	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	483	813.5	763.5		50.00
REAR FILTER CATCH	FILTER	496	137.1	136.8		0.30
RINSE OF PROBE &	ACETONE	30	100631.3	100627.5	0.00033	3.79
RINSE OF IMPINGER SET	WATER	240	97267.5	97258.6	0.002	8.42
RINSE OF IMPINGER SET	METHANE	150	97408.5	97395.8	0.0007	12.59
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	55	97278.7	97226.7	0.00033	51.98
					TOTAL:	127.09

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: 12/31/14

Intertek

TEST RESULTS
EPA METHOD 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 24-Nov-14
Test Run Number: 6

Dry Burn-Rate, kg/hr:	**1.24**	
Emission-Rate, g/hr:	**0.97**	
Duration of Test, Minutes	540	
Dry Gas Meter Standardization	Train A	
Dry Gas Meter Beginning Reading, ft^3	431.5	
Dry Gas Meter Ending Reading, ft^3	735.934	
Barometric Pressure Correction Factor	1.002	
Dry Gas Meter Calibration Factors (γ 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	**296.099**	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	**147.923**	
Total Tunnel Volume, scf	**79878.571**	
Emission Caclulations	Train A	
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	269.770	
Sample Particulate Mass, mg	32.4	
Total Emissions, grams	8.734	
Emission-Rate, g/hr	0.97	
Adjusted Emission Rates, g/hr	**1.78**	
Operating Parameters	Train A	
Max Filter Temperature, °F	132	
Post-Test Leak Check, cfm @ in. Hg vac.	0.008@6	
Average Firebox Surface Temperture delta-T, °F	120.4	
Maximum Ambient Temperture, °F	77	
Mimimum Ambient Temperature, °F	72	
Fuel Properties		
Wet Fuel Load Weight, lb.	29.55	
Dry-Basis Fuel Load Moisture Content, %	20.06	
Wet-Basis Fuel Load Moisture Content, %	16.71	

Test Engineer: _____

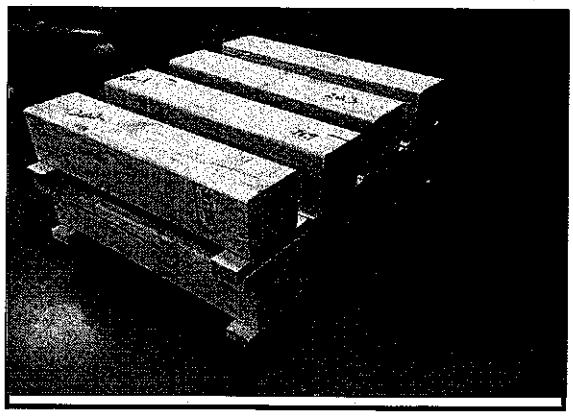
Date: 12/4/14

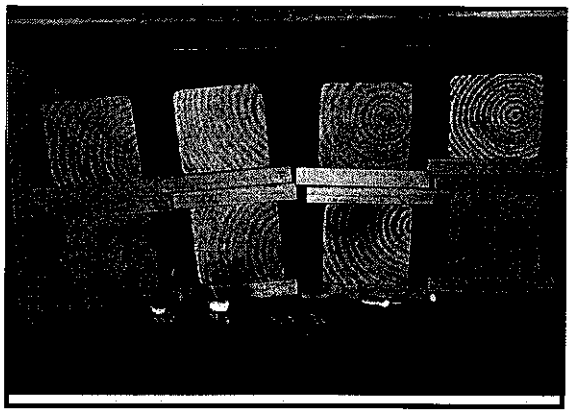
Intertek

Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	24-Nov-14
Test Run Number:	6
Date tunnel cleaned:	11/14/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	2	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft^3:	4.5	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 completly.
Secondary Air:	Fixed opening
Control Board:	Thermostat set at 49 degrees so it will not call for heat.
Blower/Fan:	Off, fan confirmation

Pre- Burn Activities	
Time	Activity
	At 77 minutes raked coals.
	At 117 minutes raked coals

Start-Up Procedure	
Loading of fuel, sec. :	Fuel loaded by 65 seconds.
Fuel-loading door :	Cracked open until 4:45 then closed
Primary air:	Auto button pushed at zero minutes, no other adjustments were made.
Secondary air:	Fixed opening
Control board:	Thermostat set at 49 degrees.
Blower / fan:	Off for the intire test.

Other Notes

Test Engineer: _____ Date: 12/31/14

Intertek

TEST FUEL DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	24-Nov-14
Test Run Number:	6

Firebox Volume, ft^3:	4.5

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**		**21.2**	**19.2**	**19.8**
2	**96.00**	**20.05**	**19.4**	**21.5**	**18.9**
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total Weight		**20.1**	Average, %db		**20.0**

Allowable Fuel Load Range: **28.4** to **34.6**

TEST FUEL LOAD PROPERTIES

Eq. ID No.:			Time:	9:30	Temp.,°F:	65
Piece No.	Length, In.	Weight, Lb. 2x4	Weight, Lb. 4x4	Moisture, %, Dry Basis		
1	**16.00**			**20.2**	**19.5**	**19.1**
2	**16.00**			**20.3**	**22.0**	**19.2**
3	**16.00**			**18.9**	**19.2**	**19.4**
4	**16.00**			**20.5**	**19.1**	**20.3**
5	**16.00**			**19.4**	**19.2**	**19.4**
6	**16.00**			**21.7**	**19.3**	**19.2**
7	**16.00**			**21.9**	**20.9**	**21.5**
8	**16.00**		**29.55**	**21.0**	**20.9**	**19.4**
Totals		0.0	29.6			
% of Weight		0	100			
Total weight, wet, lb.		**29.55**		Average Moisture, dry		**20.06**
Total weight, dry, kg		11.16		Average Moisture, wet		16.71

Test Engineer: _____ Date: 12/3/14

Intertek

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	24-Nov-14
Test Run Number:	6

EPA Method 28
Pre Burn Data

Coal Bed Range	6.0	to	7.3

Average Firebox Temp, °F	367.4

Final Coal Bed Wt, lb	6.3

	Temperature Data												
Duration, Minutes	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom		Catalyst Outlet	Flue Draft	Fuel Weight	Weight Loss
0	74	152	414	487	248	433	408	439	403		-0.07	23.10	16.80
10	75	155	597	623	253	384	404	426	418		-0.09	20.70	2.40
20	75	177	701	820	256	386	404	414	456		-0.095	17.20	3.50
30	75	173	715	884	256	401	414	418	474.6		-0.095	14.00	3.20
40	74	142	586	777	263	418	444	434	467.2		-0.085	11.40	2.60
50	73	138	568	770	273	482	464	446	487		-0.08	9.50	1.90
60	73	131	532	711	275	505	472	457	484		-0.08	8.00	1.50
70	74	123	471	641	277	527	474	468	477.4		-0.07	7.20	0.80
80	73	117	430	558	280	544	468	475	465		-0.057	6.60	0.60
90	73	97	275	479	293	535	463	472	448.4		-0.045	6.60	0.00
100	75	91	230	420	306	501	447	456	426		-0.038	6.40	0.20
110	75	88	206	381	313	469	429	439	406.2		-0.03	6.40	0.00
120	74	84	188	339	315	420	405	411	378		-0.03	6.30	0.10
130	74	82	179	325	314	413	388	397	367.4		-0.03	6.30	0.00

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	24-Nov-14
Test Run No:	6

Temperature Data

Firebox Temp Start	362.4
Firebox Temp End	242
Firebox Delta-T	120.4

Max Filter Temps	
Train A	
132	

Interval	10	Duration of Test, Min	540

Time		Temperature Data												
Interval	Duration	Room	Dilution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
0	0	73	82	176	319	314	406	382	391		131	64	71	
1	10	73	140	534	454	291	358	368	374		131	44	71	
2	20	74	165	672	703	266	347	308	354		131	43	71	
3	30	75	164	673	809	253	368	395	384		132	44	71	
4	40	75	149	611	800	252	389	412	395		132	44	71	
5	50	75	141	583	769	257	413	426	404		132	45	72	
6	60	77	135	573	766	257	438	434	411		132	45	72	
7	70	75	134	576	761	256	469	439	421		132	46	73	
8	80	77	132	573	764	254	492	446	429		132	47	73	
9	90	74	127	554	735	252	518	454	440		132	47	73	
10	100	76	122	526	693	251	546	464	453		132	48	73	
11	110	72	116	490	654	250	581	470	468		132	48	73	
12	120	75	114	443	586	251	602	472	477		132	48	73	
13	130	75	110	414	538	253	609	475	479		132	48	73	
14	140	74	109	390	500	256	603	479	478		132	48	73	
15	150	74	95	258	453	270	576	482	475		132	48	73	
16	160	75	89	229	420	281	535	472	464		132	49	73	
17	170	74	85	206	382	289	491	450	443		131	50	73	
18	180	73	82	198	366	290	473	440	431		131	50	73	
19	190	73	81	191	352	290	459	428	420		131	51	73	
20	200	73	82	181	331	288	440	412	405		131	51	73	
21	210	73	84	175	316	286	423	391	393		132	51	73	
22	220	72	83	174	312	285	418	387	389		132	52	73	
23	230	72	84	170	302	284	407	377	381		131	53	73	
24	240	73	84	166	295	282	397	369	372		131	53	73	
25	250	74	82	164	289	280	387	361	363		132	55	73	
26	260	74	81	161	285	279	376	352	354		131	51	73	
27	270	73	79	160	281	277	366	245	344		131	50	73	
28	280	72	77	157	278	275	359	339	337		131	49	73	
29	290	72	80	154	275	274	355	332	333		131	49	73	
30	300	73	82	152	272	272	349	327	327		131	49	73	
31	310	73	82	151	269	271	345	324	323		131	49	73	
32	320	73	82	149	266	271	340	321	320		131	49	73	
33	330	74	79	149	264	271	336	316	316		131	49	73	
34	340	74	79	146	260	269	325	311	309		131	49	73	
35	350	73	78	145	258	268	319	305	305		131	50	73	
36	360	72	77	142	254	266	315	300	301		131	50	73	
37	370	72	79	140	249	264	314	295	299		131	49	73	
38	380	72	80	140	246	264	312	393	298		132	49	72	
39	390	72	80	140	244	263	311	291	296		131	49	72	
40	400	72	81	140	243	262	309	288	293		131	49	72	
41	410	72	81	140	242	262	306	285	288		132	49	72	
42	420	73	81	140	241	261	303	283	286		131	49	73	
43	430	73	81	140	240	260	300	279	282		131	49	73	
44	440	74	82	139	238	260	299	277	280		132	49	73	
45	450	74	82	138	237	259	297	275	276		131	49	73	
46	460	74	81	138	235	258	298	272	274		131	49	73	
47	470	74	81	137	232	254	299	269	270		132	50	73	

Test Engineer: _____

Date: 12/3/14

Intertek

TEST DATA
EPA METHOD 5G-3

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID No:	PRT1411251459-001
Test Date:	24-Nov-14
Test Run No:	6

Temperature Data

Firebox Temp Start	362.4
Firebox Temp End	242
Firebox Delta-T	120.4

Max Filter Temps	
Train A	
132	

Interval	10	Duration of Test, Min	540

Time		Temperature Data												
Interval	Duration	Room	Dillution Tunnel	Flue Gas	Firebox Top	Firebox Right	Firebox Left	Firebox Back	Firebox Bottom	Catalyst Outlet	Train A Filter	Impinger Exit	Train A DGM	
48	480	74	81	135	230	255	301	264	267		131	50	74	
49	490	74	83	135	229	255	300	264	266		131	48	74	
50	500	74	83	134	227	254	298	261	264		132	48	74	
51	510	75	86	132	224	253	292	257	261		131	47	74	
52	520	74	83	131	222	252	289	255	259		131	48	74	
53	530	75	83	130	220	252	286	213	257		132	49	74	
54	540	75	82	129	217	251	283	204	255		131	49	74	

Test Engineer: _____

Date: 12/31/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	24-Nov-14
Test Run Number:	6

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.01		Meter Box (A)	0.977
End	29.96			
Duration of Test, Min		540		

Leak Check, cfm @ in Hg	
Train A	
0.008@6	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	0.048	1.00		-0.025	29.55	29.55	431.500		99.97		0.00	
10	0.048	1.00		-0.082	27.20	2.35	437.080		103.26		0.00	
20	0.048	1.00		-0.090	24.20	3.00	442.670		105.58		0.00	
30	0.048	1.00		-0.090	21.10	3.10	448.270		105.69		0.00	
40	0.048	1.00		-0.082	18.60	2.50	453.860		104.22		0.00	
50	0.048	1.00		-0.082	16.30	2.30	459.450		103.34		0.00	
60	0.048	1.00		-0.082	14.10	2.20	465.015		102.36		0.00	
70	0.048	1.00		-0.082	12.00	2.10	470.820		106.49		0.00	
80	0.048	1.00		-0.080	10.00	2.00	476.440		102.92		0.00	
90	0.048	1.00		-0.078	8.30	1.70	481.970		100.84		0.00	
100	0.048	1.00		-0.078	6.90	1.40	487.580		101.87		0.00	
110	0.048	1.00		-0.068	5.80	1.10	493.200		101.52		0.00	
120	0.048	1.00		-0.062	5.10	0.70	498.880		102.43		0.00	
130	0.048	1.00		-0.058	4.70	0.40	504.400		99.19		0.00	
140	0.048	1.00		-0.055	4.30	0.40	510.110		102.52		0.00	
150	0.048	1.00		-0.040	4.20	0.10	515.680		98.77		0.00	
160	0.048	1.00		-0.035	4.10	0.10	521.250		98.23		0.00	
170	0.048	1.00		-0.031	4.00	0.10	526.870		98.75		0.00	
180	0.048	1.00		-0.030	3.90	0.10	532.650		101.28		0.00	
190	0.048	1.00		-0.030	3.80	0.10	538.130		95.94		0.00	
200	0.048	1.00		-0.028	3.70	0.10	544.280		107.77		0.00	
210	0.048	1.00		-0.027	3.60	0.10	549.870		98.13		0.00	
220	0.048	1.00		-0.025	3.50	0.10	555.210		93.66		0.00	
230	0.048	1.00		-0.025	3.30	0.20	560.940		100.59		0.00	
240	0.048	1.00		-0.022	3.20	0.10	566.690		100.94		0.00	
250	0.048	1.00		-0.022	3.10	0.10	572.330		98.83		0.00	
260	0.048	1.00		-0.020	3.00	0.10	578.110		101.19		0.00	
270	0.048	1.00		-0.020	2.80	0.20	583.940		101.88		0.00	
280	0.048	1.00		-0.020	2.70	0.10	589.390		95.06		0.00	
290	0.048	1.00		-0.020	2.60	0.10	595.160		100.92		0.00	
300	0.048	1.00		-0.020	2.50	0.10	600.790		98.65		0.00	
310	0.048	1.00		-0.020	2.40	0.10	606.440		99.00		0.00	
320	0.048	1.00		-0.020	2.30	0.10	611.840		94.62		0.00	
330	0.048	1.00		-0.018	2.20	0.10	617.430		97.68		0.00	
340	0.048	1.00		-0.018	2.00	0.20	623.150		99.95		0.00	
350	0.048	1.00		-0.015	1.90	0.10	628.670		96.37		0.00	
360	0.048	1.00		-0.015	1.80	0.10	634.440		100.64		0.00	
370	0.048	1.00		-0.015	1.70	0.10	640.120		99.25		0.00	
380	0.048	1.00		-0.015	1.60	0.10	645.470		93.75		0.00	
390	0.048	1.00		-0.015	1.50	0.10	651.180		100.06		0.00	
400	0.048	1.00		-0.015	1.40	0.10	656.870		99.80		0.00	
410	0.048	1.00		-0.015	1.30	0.10	662.350		96.12		0.00	
420	0.048	1.00		-0.015	1.20	0.10	668.110		100.84		0.00	
430	0.048	1.00		-0.015	1.10	0.10	673.970		102.59		0.00	
440	0.048	1.00		-0.015	1.00	0.10	679.420		95.50		0.00	
450	0.048	1.00		-0.015	0.90	0.10	685.410		104.96		0.00	
460	0.048	1.00		-0.015	0.80	0.10	690.700		92.61		0.00	
470	0.048	1.00		-0.015	0.70	0.10	696.580		102.94		0.00	
480	0.048	1.00		-0.015	0.60	0.10	702.040		95.41		0.00	
490	0.048	1.00		-0.015	0.50	0.10	707.660		98.39		0.00	

Test Engineer: _____ Date: 12/3/14

Intertek

TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number:	G101925554
Manufacturer:	Hearth & Home
Model:	Adventure III
Sample ID Number:	PRT1411251459-001
Test Date:	24-Nov-14
Test Run Number:	6

Barometer, In. Hg		RH, %	Sample Box Correction (γ) Factors	
Start	30.01		Meter Box (A)	0.977
End	29.96			
Duration of Test, Min		540		

Leak Check, cfm @ in Hg	
Train A	
0.008@6	

Maximum Vacuum	
Train A	
0.00	

	Particulate Sampling Data											
Time	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	
500	0.048	1.00		-0.015	0.40	0.10	713.320		99.09		0.00	
510	0.048	1.00		-0.015	0.30	0.10	719.410		106.91		0.00	
520	0.048	1.00		-0.015	0.20	0.10	724.680		92.26		0.00	
530	0.048	1.00		-0.015	0.10	0.10	730.300		98.39		0.00	
540	0.048	1.00		-0.015	0.00	0.10	735.934		98.54		0.00	

Test Engineer: _____

Date: 12/31/14

Intertek

Dillution Tunnel Velocity Traverse
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 24-Nov-14
Test Run Number: 6

	Dilution Tunnel		
	Delta P In. H2O	Temp,°F	Square Root
A1	0.0380	87	0.1949
A2	0.0460	87	0.2145
A3	0.0460	87	0.2145
A4	0.0340	87	0.1844
A Center	0.0480	87	0.2191
B1	0.0340	87	0.1844
B2	0.0460	87	0.2145
B3	0.0480	87	0.2191
B4	0.0340	87	0.1844
B Center	0.0480	87	0.2191
Averages	0.0422	87	0.2013

Tunnel Diameter	**6.000**	inches
Tunnel Static	**-0.460**	in. H2O
Tunnel Area	0.19635	Ft2
Pitot Correction	0.9189	factor
Baro. Pressure	30.01	
Pitot Factor	**0.99**	(0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity	13.620	Ft/ Sec
Initial Flow	**149.08**	Ft3/min

Test Engineer: _____ Date: 12/31/14

Intertek

DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID Number: PRT1411251459-001
Test Date: 24-Nov-14
Test Run Number: 6

Intertek Equipment No.'s 19683, 19684

SAMPLE COMPONET	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	484	768.7	750.7		18.00
REAR FILTER CATCH	FILTER	497	125.6	125.4		0.20
RINSE OF PROBE &	ACETONE	40	122835	122829.2	0.00033	5.79
RINSE OF IMPINGER SET	WATER	245	121166.5	121163.5	0.002	2.51
RINSE OF IMPINGER SET	METHANE	150	123579	123575.4	0.0007	3.50
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	50	131562	131559.6	0.00033	2.38
					TOTAL:	32.38

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: 12/31/14

EPA NSPS WEIGHTED AVERAGE CALCULATION

V 1.1

8/27/2010

Project Number: G101925554
Manufacturer: Hearth & Home
Model: Adventure III
Sample ID No: PRT1411251459-001

Weighted Average

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

Test No.	Burn Rate	(E) Ave. Emission Rate g/hr	HHV (OHE)	Heat Output (BTU/HR)	Prob.	(K) Weighting Factor	(KxE)	KxOHE
5	0.93	2.72	71.20	11214.13	0.3168	0.4016	1.0924	28.59
2	1.04	0.98	71.80	12540.53	0.4016	0.4276	0.4190	30.70
3	1.49	3.81	68.20	17966.72	0.7444	0.5894	2.2456	40.20
1	3.59	4.59	68.20	43288.94	0.9910	0.2556	1.1732	17.43
				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
				0.00	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

6	1.24	0.97	70.90

Totals: 1.6742 4.9302 116.92

[redacted]