

TEST REPORT

The Intertek logo consists of the word "Intertek" in a white, sans-serif font, centered within a dark blue rounded rectangular background.

REPORT NUMBER: 101836596PRT-001
REPORT DATE: December 15, 2014

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

RENDERED TO

Hearth & Home Technologies
1445 North Hwy
Colville Washington 99114

PRODUCT EVALUATED:

Model Mt. Vernon E2 Freestanding and Insert pellet Fired Room Heater

Report of Testing Model Mt. Vernon E2 Pellet 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".

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I. INTRODUCTION

Intertek Testing Services NA (Intertek) has conducted testing for Hearth & Home Technologies, on model Mt. Vernon E2 Pellet 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 Mt. Vernon E2 Pellet 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 October 21 through October 22, 2014

I.B LABORATORY

The test on the Mt. Vernon E2 Pellet fired Solid Fuel Room Heater was conducted at the Intertek Portland facility. Intertek Portland is accredited by the U.S. EPA, Certificate Number 8. The test was conducted by Bruce Davis.

I.C DESCRIPTION OF UNIT

The model Mt. Vernon E2 Solid Fuel Room Heater is constructed of carbon steel. The outer dimensions are 26 7/8-inches deep, 32-inches high, and 28-inches wide. A remote controller is used to operate the appliance at desired heat outputs and fan speeds. This control can be operated in either manual or automatic mode, see operation manual for details. Unit operates by a combustion blower creating a negative pressure on the firebox and pulling combustion air through a fire pot. Pellet fuel is fed into the fire pot via an auger that is turned at a timed cycle depending on heat output settings. A viewing window is mounted in the front door; fuel is added through a door on the hopper. A Freestanding version was not tested but shares all feed and air moving components. The firebox is identical but is covered by a freestanding shell consisting of a cast iron front, and side shields constructed of cast iron.
(See product drawings.)

RUN #2 October 21, 2014: Controller was set to the second dot on the dial face, trim pot set to 0. Feed rate, combustion blower, and convection fan automatically set to a predetermined setting via a printed circuit board. A burn rate of 1.24 kg/hr was achieved producing 18,512 BTU's per hour using EPA calculation and default efficiency of 78%.

RUN #3 October 22, 2014: Controller was set to the third dot on the dial face, trim pot set to 0. Feed rate, combustion blower, and convection fan automatically set to a predetermined setting via a printed circuit board. A burn rate of 1.73 kg/hr was achieved producing 25,828 BTU's per hour using EPA calculation and default efficiency of 78%.

RUN #4 October 22, 2014: Controller was set to maximum on the dial face, trim pot set to +4. Feed rate, combustion blower, and convection fan automatically set to a predetermined setting via a printed circuit board. A burn rate of 2.83 kg/hr was achieved producing 42,250 BTU's per hour using EPA calculation and default efficiency of 78%.

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	8/5/14	0.93	0.39	74.7	80.8
2	8/5/14	1.24	0.44	72.5	78.3
3	8/6/14	1.73	0.58	79.8	86.2
4	8/6/14	2.83	0.98	77.3	83.6

*Efficiency determined per CSA B415.1-2010.

Note: The stove was operated at the minimum setting that controls feed timing and blower speed through a printed circuit board. There are no additional controls that would allow for a slower burn rate to be achieved.

WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate	(E) Average Emission Rate g/hr	Heat Output (Btu/hr)	Probability	(K) Weighting Factor	(KxE)
1	0.93	0.39	13,884.16	0.3168	0.5676	0.2214
2	1.24	0.44	18,512.21	0.5676	0.5334	0.2347
3	1.73	0.58	25,827.52	0.8502	0.4130	0.2395
4	2.83	0.98	42,249.64	0.9806	0.1498	0.1468
Totals:					1.6638	0.8424
Weighted average emission rate:						0.5063

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	73	74	29.94	29.91	<50	<50
2	74	74	29.91	29.88	<50	<50
3	72	73	29.74	29.71	<50	<50
4	73	74	29.68	29.65	<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	120	12.89	139.05	553	83.473	3.87
2	120	13.03	139.91	555	82.506	4.39
3	120	14.16	150.97	556	83.393	5.37
4	120	13.94	142.50	579	82.192	9.47

GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)	Change In Surface Temp (°F)	Initial Draft (in/H ₂ O)	Run Time (min)	Average Draft (in/H ₂ O)
1	0.93	5.0	-0.040	120	-0.031
2	1.24	6.0	-0.030	120	-0.032
3	1.73	13.4	-0.050	120	-0.050
4	2.83	15.0	-0.060	120	-0.060

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 as specified by EPA regulations. A 3" to 6" adaptor was installed directly to the top of the 3" flue collar which connected to the 6" single wall pipe. A 3" pellet vent transition to 6" single wall pipe stove pipe is shown as an option in manufactures installation instruction in addition to standard 3" and 4" pellet pipe.

III.B AIR SUPPLY SYSTEM

Combustion air enters through a tube located at the rear of the appliance. This tube is connected directly to the firebox and firepot. Air control is achieved by a programmed speed control of the combustion blower creating a vacuum to the air inlet tube.

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.

Stack gas samples are collected from the steel chimney section 8 feet \pm 6 inches above the scale platform. 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

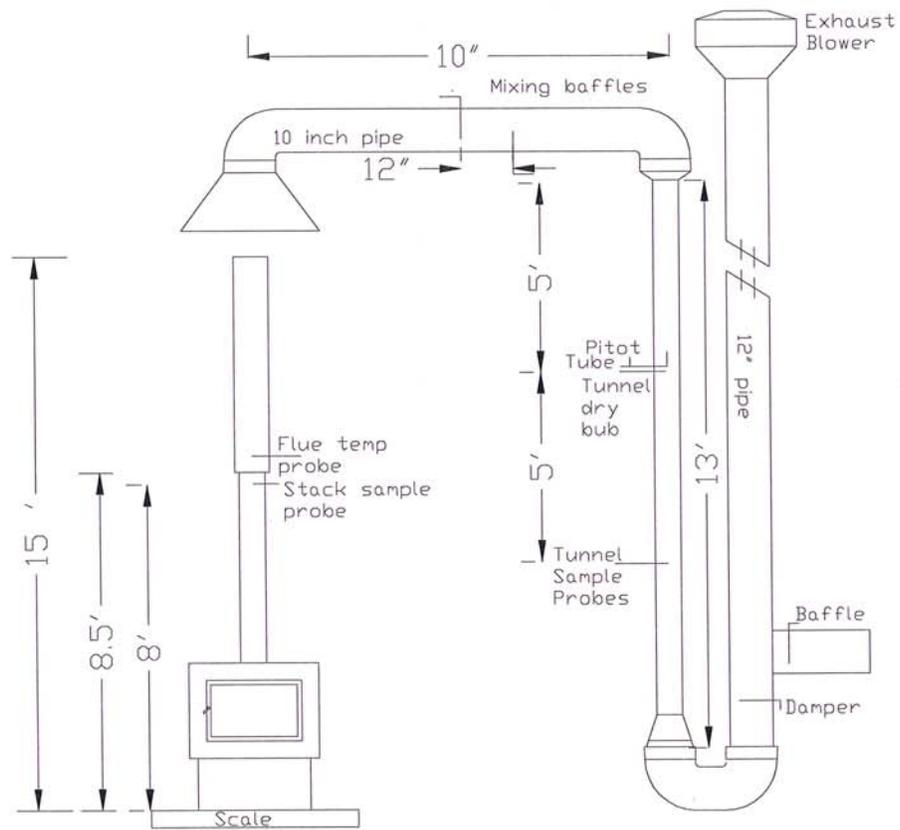
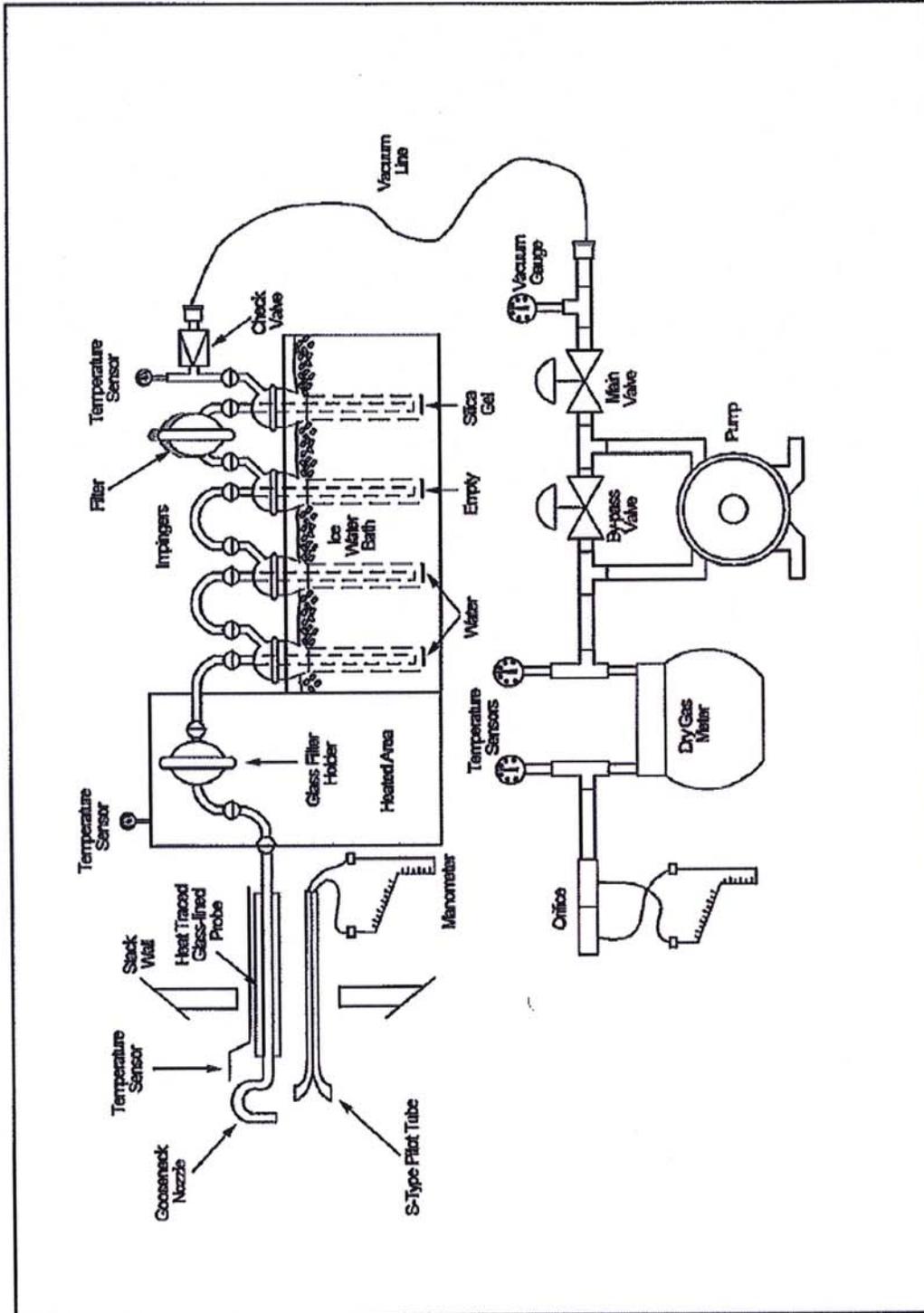


FIGURE 1

IV.B.(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.A.(3). GAS ANALYZERS

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

VI.B. TEST METHOD PROCEDURES

VI.B.(1). LEAK CHECK PROCEDURES

Before and after each test, each sample train is tested for leaks. Leakage rates are measured and must not exceed 0.02 CFM or 4% of the sampling rate. Leak checks are performed checking the entire sampling train, not just the dry gas meters. Pre-test and post-test leak checks are conducted with a vacuum of 10 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post test vacuum value. If leakage limits are not met, the test run is rejected. 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 Mt. Vernon E2 Freestanding and Insert when operated following guidelines specified in EPA method 28 does meet emissions limits regulating an affected facility in the EPA New Source Performance Standards.

VII.A RESULTS AND OBSERVATIONS

The Model Mt. Vernon E2 Freestanding and Insert Pellet 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

Appendix F
Test Data

EPA NSPS WEIGHTED AVERAGE CALCULATION

V 1.1

8/27/2010

Project Number: G101836596

Manufacturer: Hearth & Home

Model: MT. Vernon E2

Sample ID No: PRT1409261108-001

Weighted Average

Type of

Stove:

3

1=cat

2=noncat

3=pellet

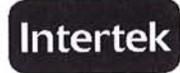
Test No.	Burn Rate	(E)	HHV (OHE)	Heat Output (BTU/HR)	Prob.	(K)		
		Ave. Emission Rate g/hr				Weighting Factor	(KxE)	KxOHE
1	0.93	0.39	74.70	13884.16	0.3168	0.5676	0.2214	42.40
2	1.24	0.44	72.50	18512.21	0.5676	0.5334	0.2347	38.67
3	1.73	0.58	79.80	25827.52	0.8502	0.4130	0.2395	32.96
4	2.83	0.98	77.30	42249.64	0.9806	0.1498	0.1468	11.58
				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
				0.00	1.0000	0.0000	0.0000	0.00

Totals: 1.6638 0.8424 125.61

B...

Weighted average emissions rate:	0.5063
Weighted Average OHE:	75.49

Pellet Fuel Moisture Content Worksheet



Intertek Portland

Client Hearth & Home
 Model Mt. Vernon E2
 Project No. G101836596
 Sample Description _____

Golden Fire Wood Pellets

Container	Container ID No.	Date Placed in Oven	Time Placed in Oven	Container Tare Weight, Grams	Initial Gross Weight, Grams	Date Removed from Oven	Time Removed From Oven	Final Gross Weight, Grams	Moisture Content, Wet Basis, %	Moisture Content, Dry Basis, %
1	2023	10/21/2014	13:48	106.7523	211.5480	10/22/2014	14:10	209.0524	2.3814	2.4395
2	2030	10/22/2014	14:48	104.9801	208.9645	10/23/2014	15:10	206.5898	2.2837	2.3371

Average Moisture Content, Wet Basis **2.33** %
 Average Moisture Content, Dry Basis **2.39** %

Method: ASTM D4442-92 Method A -- Oven Drying Method

Dry Basis, % = (Initial net - Final net) / Final net x 100

Wet Basis, % = (Initial net - Final net) / Initial net x 100

Engineer Signature 

Date 10/23/2014

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

Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 21-Oct-14
 Test Run Number: 1

B. D.

Dry Burn-Rate, kg/hr:		0.93
Emission-Rate, g/hr:		0.39
Duration of Test, Minutes		120
Dry Gas Meter Standardization		
Train A		
Dry Gas Meter Beginning Reading, ft ³	412.802	
Dry Gas Meter Ending Reading, ft ³	498.771	
Barometric Pressure Correction Factor	1.000	
Dry Gas Meter Calibration Factors (γ factors)	0.979	
Dry Gas Meter Temperature Factors	0.992	
Dry Gas Meter Delta-H Correction Factors	1.004	
Dry Gas Meter STD Volume Sampled, ft ³	83.825	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm		139.050
Total Tunnel Volume, scf		16685.969
Emission Calculations		
Train A		
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	199.056	
Sample Particulate Mass, mg	3.9	
Total Emissions, grams	0.770	
Emission-Rate, g/hr	0.39	
Adjusted Emission Rates, g/hr	0.82	
Operating Parameters		
Train A		
Max Filter Temperature, °F	132	
Post-Test Leak Check, cfm @ in. Hg vac.	0.0@3	
Average Firebox Surface Temperature delta-T, °F	5	
Maximum Ambient Temperature, °F	79	
Minimum Ambient Temperature, °F	73	
Fuel Properties		
Wet Fuel Load Weight, lb.	4.20	
Dry-Basis Fuel Load Moisture Content, %	2.40	
Wet-Basis Fuel Load Moisture Content, %	2.34	

PROJECT / TEST INFORMATION	
Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID Number:	PRT1409261108-001
Test Date:	21-Oct-14
Test Run Number:	1
Date tunnel cleaned:	5/9/2014
Purpose of Test	Certification

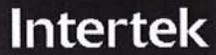
Appliance Information		
Appliance Type:	3	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft ³ :	0	N/A for pellet type
Convection Blower	3	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings	
Primary Air:	NA
Secondary Air:	NA
Control Board:	Controller set to minimum, trim pot set to -4
Blower/Fan:	Automatic by control board
Pre- Burn Activities	
Time	Activity
	NA
Start-Up Procedure	
Loading of fuel, sec. :	NA
Fuel-loading door :	NA
Primary air:	NA
Secondary air:	NA
Control board:	Controller set to minimum, trim pot set to -4
Blower / fan:	120 volt to room and combustion fans.
Other Notes	
NA	

Test Engineer: BD

Date: 12/2/14



TEST DATA
EPA METHOD 5G-3

Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID No:	PRT1409261108-001
Test Date:	21-Oct-14
Test Run No:	1

Temperature Data

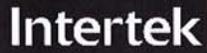
Firebox Temp Start	162.4
Firebox Temp End	157.4
Firebox Delta-T	5.0

Max Filter Temps	
Train A	
	132

Interval	10	Duration of Test, Min	120	Temperature Data											
Time				Room	Dilution 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	92	218	356	150	113	88	105		132	70	71		
1	10	75	96	219	349	144	115	90	108		131	54	71		
2	20	73	92	218	352	141	116	89	104		132	54	71		
3	30	73	93	222	364	140	115	89	107		131	55	71		
4	40	73	93	221	365	138	115	89	107		131	55	72		
5	50	74	95	221	358	140	115	90	107		131	55	72		
6	60	79	96	216	333	137	113	90	107		131	56	72		
7	70	74	92	217	347	134	113	90	106		131	57	73		
8	80	76	94	218	348	134	114	90	106		131	57	73		
9	90	73	92	215	344	135	113	89	106		131	59	73		
10	100	73	92	218	346	135	113	89	106		131	60	73		
11	110	73	92	217	334	133	117	89	103		131	61	73		
12	120	74	95	217	342	135	114	90	106		131	62	73		

Test Engineer: BA

Date: 12/2/14



TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 21-Oct-14
 Test Run Number: 1

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start	29.94	Meter Box (A) 0.979
End	29.91	

Leak Check, cfm @ in Hg
Train A
0.0@3

Maximum Vacuum
Train A
0.00

Duration of Test, Min		120		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	0.044	1.50	-0.040	32.60	4.20	412.802	100.01	0.00						
10	0.044	1.50	-0.030	32.30	0.30	420.160	103.19	0.00						
20	0.044	1.50	-0.030	31.90	0.40	427.100	96.98	0.00						
30	0.044	1.50	-0.030	31.50	0.40	434.910	109.23	0.00						
40	0.044	1.50	-0.030	31.10	0.40	442.330	103.58	0.00						
50	0.044	1.50	-0.030	30.80	0.30	448.850	91.18	0.00						
60	0.044	1.50	-0.030	30.50	0.30	455.760	96.72	0.00						
70	0.044	1.50	-0.030	30.20	0.30	462.930	99.82	0.00						
80	0.044	1.50	-0.030	29.80	0.40	470.230	101.81	0.00						
90	0.044	1.50	-0.030	29.50	0.30	477.210	97.17	0.00						
100	0.044	1.50	-0.030	29.10	0.40	484.390	99.95	0.00						
110	0.044	1.40	-0.030	28.80	0.30	491.580	100.09	0.00						
120	0.044	1.40	-0.030	28.40	0.40	498.771	100.38	0.00						

Test Engineer: BD

Date: 12/2/14



DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101836596
Manufacturer: Hearth & Home
Model: Mt Vernon E2
Sample ID Number: PRT1409261108-001
Test Date: 21-Oct-14
Test Run Number: 1

Intertek Equipment No.'s 19683, 19684, 19995

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	469	743.1	740.4		2.70
REAR FILTER CATCH	FILTER	482	125	125.1		-0.10
RINSE OF PROBE &	ACETONE	30	106929.9	106928.8	0.00033	1.09
RINSE OF IMPINGER SET	WATER	210	101177	101176.9	0	0.10
RINSE OF IMPINGER SET	METHANE	100	103684.5	103685	0.0007	0.00
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	60	107224.3	107224.2	0.00033	0.08
TOTAL:						3.87

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: 12/2/14

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

Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 21-Oct-14
 Test Run Number: 2

B. A. D.

Dry Burn-Rate, kg/hr:		1.24
Emission-Rate, g/hr:		0.44
Duration of Test, Minutes		120
Dry Gas Meter Standardization		Train A
Dry Gas Meter Beginning Reading, ft ³	499.103	
Dry Gas Meter Ending Reading, ft ³	584.361	
Barometric Pressure Correction Factor	0.999	
Dry Gas Meter Calibration Factors (γ factors)	0.979	
Dry Gas Meter Temperature Factors	0.990	
Dry Gas Meter Delta-H Correction Factors	1.004	
Dry Gas Meter STD Volume Sampled, ft ³	82.860	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm	139.914	
Total Tunnel Volume, scf	16789.667	
Emission Calculations		Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	202.626	
Sample Particulate Mass, mg	4.4	
Total Emissions, grams	0.890	
Emission-Rate, g/hr	0.44	
Adjusted Emission Rates, g/hr	0.93	
Operating Parameters		Train A
Max Filter Temperature, °F	133	
Post-Test Leak Check, cfm @ in. Hg vac.	0.0@4	
Average Firebox Surface Temperature delta-T, °F	6	
Maximum Ambient Temperature, °F	75	
Minimum Ambient Temperature, °F	73	
Fuel Properties		
Wet Fuel Load Weight, lb.	5.60	
Dry-Basis Fuel Load Moisture Content, %	2.40	
Wet-Basis Fuel Load Moisture Content, %	2.34	

PROJECT / TEST INFORMATION	
Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID Number:	PRT1409261108-001
Test Date:	21-Oct-14
Test Run Number:	2
Date tunnel cleaned:	5/9/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	3	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft ³ :	0	N/A for pellet type
Convection Blower	3	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings	
Primary Air:	NA
Secondary Air:	NA
Control Board:	Controller set at second dot, trim pot set at 0.
Blower/Fan:	Automatic from control board.
Pre- Burn Activities	
Time	Activity
	NA
Start-Up Procedure	
Loading of fuel, sec. :	NA
Fuel-loading door :	NA
Primary air:	NA
Secondary air:	NA
Control board:	Controller set at second dot, trim pot set at 0.
Blower / fan:	Automatic from control board.
Other Notes	
NA	

Test Engineer: *BP*

Date: 12/2/14

Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID Number:	PRT1409261108-001
Test Date:	21-Oct-14
Test Run Number:	2

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

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

PRE-BURN FUEL PROPERTIES				
Eq. ID No.:		Time:		Temp., °F:
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis	
1		10.80	6.0	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Total Weight		10.8	Average, %db	6.0

Allowable Fuel Load Range:	0.0	to	0.0
----------------------------	-----	----	-----

TEST FUEL LOAD PROPERTIES						
Eq. ID No.:		Time:	8:15	Temp., °F:	65	
Piece No.	Length, In.	Weight, Lb.		Moisture, %, Dry Basis		
		2x4	4x4			
1			5.60	2.4	2.4	2.4
2						
3						
4						
5						
6						
7						
8						
Totals		0.0	5.6			
% of Weight		0	100			
Total weight, wet, lb.		5.60		Average Moisture, dry		2.40
Total weight, dry, kg		2.48		Average Moisture, wet		2.34



TEST DATA
EPA METHOD 5G-3

Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID No:	PRT1409261108-001
Test Date:	21-Oct-14
Test Run No:	2

Temperature Data

Firebox Temp Start	189.6
Firebox Temp End	183.6
Firebox Delta-T	6.0

Max Filter Temps	
Train A	
133	

Interval	10	Duration of Test, Min	120	Temperature Data										
Time				Temperature Data										
Interval	Duration	Room	Dilution 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	74	92	235	467	157	126	92	106		132	72	72	
1	10	75	110	271	449	160	128	94	111		131	55	72	
2	20	75	94	235	447	159	124	92	111		131	54	72	
3	30	74	92	233	455	158	124	92	110		131	54	73	
4	40	74	92	235	462	159	126	92	110		130	55	73	
5	50	74	93	238	471	159	126	92	111		133	56	74	
6	60	73	106	270	455	160	125	92	112		132	55	74	
7	70	74	92	234	450	158	124	92	110		132	56	74	
8	80	74	93	236	466	158	125	92	110		132	56	74	
9	90	74	93	239	479	159	127	92	111		130	56	74	
10	100	75	95	241	476	162	128	94	113		131	56	74	
11	110	74	93	238	467	161	126	93	111		132	56	74	
12	120	74	93	234	435	159	122	92	110		131	56	74	

Test Engineer: BA

Date: 12/2/14

Gas Particulate Sampling Data

Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 21-Oct-14
 Test Run Number: 2

Barometer, In. Hg	RH, %	Sample Box Correction (γ) Factors
Start 29.91		Meter Box (A) 0.979
End 29.88		
Duration of Test, Min		120

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

Maximum Vacuum	
Train A	
0.00	

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H		Flue Draft	Fuel Weight	Weight Loss	Train A Volume		Train A Proportional Rate		Train A Vacuum, In. Hg
0	0.038	1.50		-0.030	24.50	5.60	499.103		100.03		0.00
10	0.038	1.50		-0.030	24.00	0.50	506.570		106.78		0.00
20	0.038	1.50		-0.030	23.60	0.40	513.650		99.82		0.00
30	0.038	1.50		-0.030	23.00	0.60	520.585		97.41		0.00
40	0.038	1.50		-0.030	22.60	0.40	527.430		96.15		0.00
50	0.038	1.50		-0.030	22.20	0.40	534.830		103.85		0.00
60	0.038	1.50		-0.050	21.70	0.50	541.910		100.52		0.00
70	0.038	1.50		-0.030	21.30	0.40	549.030		99.83		0.00
80	0.038	1.50		-0.030	20.70	0.60	556.145		99.85		0.00
90	0.038	1.50		-0.030	20.20	0.50	563.490		103.07		0.00
100	0.038	1.50		-0.030	19.80	0.40	570.250		95.04		0.00
110	0.038	1.50		-0.030	19.30	0.50	577.480		101.46		0.00
120	0.038	1.50		-0.030	18.90	0.40	584.361		96.56		0.00

Test Engineer: BOB

Date: 12/2/14



Dilution Tunnel Velocity Traverse EPA Method 5G-3

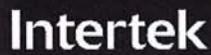
Project Number: G101836596
Manufacturer: Hearth & Home
Model: Mt Vernon E2
Sample ID Number: PRT1409261108-001
Test Date: 21-Oct-14
Test Run Number: 2

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0280	95	0.1673
A2	0.0340	95	0.1844
A3	0.0420	95	0.2049
A4	0.0400	95	0.2000
A Center	0.0380	94	0.1949
B1	0.0340	94	0.1844
B2	0.0380	94	0.1949
B3	0.0380	94	0.1949
B4	0.0380	94	0.1949
B Center	0.0380	94	0.1949
Averages	0.0368	94.4	0.1907

Tunnel Diameter **6.000** inches
Tunnel Static **-0.480** in. H2O
Tunnel Area 0.19635 Ft²
Pitot Correction 0.9784 factor
Baro. Pressure 29.91
Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity 13.012 Ft/ Sec
Initial Flow **140.06** Ft³/min

Test Engineer: BOR

Date: 12/2/14



DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101836596
Manufacturer: Hearth & Home
Model: Mt Vernon E2
Sample ID Number: PRT1409261108-001
Test Date: 21-Oct-14
Test Run Number: 2

Intertek Equipment No.'s 19683, 19684, 19725

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	470	752.3	749.5		2.80
REAR FILTER CATCH	FILTER	484	134	134.5		-0.50
RINSE OF PROBE &	ACETONE	25	107982.9	107982	0.00033	0.89
RINSE OF IMPINGER SET	WATER	210	97870	97868.8	0	1.20
RINSE OF IMPINGER SET	METHANE	100	100625.3	100625.9	0.0073	0.00
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	55	97904.7	97904.7	0.00033	0.00
TOTAL:						4.39

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: BOJ

Date: 12/2/14

TEST RESULTS
EPA METHOD 5G-3

Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 22-Oct-14
 Test Run Number: 3

B. J. [Signature]

Dry Burn-Rate, kg/hr:		1.73
Emission-Rate, g/hr:		0.58
Duration of Test, Minutes		120
Dry Gas Meter Standardization		
Train A		
Dry Gas Meter Beginning Reading, ft ³	584.7	
Dry Gas Meter Ending Reading, ft ³	671.017	
Barometric Pressure Correction Factor	0.993	
Dry Gas Meter Calibration Factors (γ factors)	0.979	
Dry Gas Meter Temperature Factors	0.994	
Dry Gas Meter Delta-H Correction Factors	1.004	
Dry Gas Meter STD Volume Sampled, ft ³	83.751	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dscfm		150.970
Total Tunnel Volume, scf		18116.369
Emission Calculations		
Train A		
Sample Ratios (Total Tunnel Volume / Total Sample Volume)		216.313
Sample Particulate Mass, mg		5.4
Total Emissions, grams		1.161
Emission-Rate, g/hr		0.58
Adjusted Emission Rates, g/hr		1.16
Operating Parameters		
Train A		
Max Filter Temperature, °F		131
Post-Test Leak Check, cfm @ in. Hg vac.		0.004@4
Average Firebox Surface Temperature delta-T, °F		13.4
Maximum Ambient Temperature, °F		74
Minimum Ambient Temperature, °F		72
Fuel Properties		
Wet Fuel Load Weight, lb.		7.80
Dry-Basis Fuel Load Moisture Content, %		2.40
Wet-Basis Fuel Load Moisture Content, %		2.34

PROJECT / TEST INFORMATION	
Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID Number:	PRT1409261108-001
Test Date:	22-Oct-14
Test Run Number:	3
Date tunnel cleaned:	5/9/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	3	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft ³ :	0	N/A for pellet type
Convection Blower	3	1 - No Fan 2 - Fan Optional 3 - Fan Standard



Test Settings	
Primary Air:	NA
Secondary Air:	NA
Control Board:	Controller set at 3rd dot, trim pot set to 0.
Blower/Fan:	Automatic from control board.
Pre- Burn Activities	
Time	Activity
	NA
Start-Up Procedure	
Loading of fuel, sec. :	NA
Fuel-loading door :	NA
Primary air:	NA
Secondary air:	NA
Control board:	Controller set at 3rd dot, trim pot set to 0.
Blower / fan:	Automatic from control board.
Other Notes	
NA	

Test Engineer: B. J. [Signature]

Date: 12/2/14



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

Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID Number:	PRT1409261108-001
Test Date:	22-Oct-14
Test Run Number:	3

Firebox Volume, ft ³ :	
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Calibration Reference ID		
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES				
Eq. ID No.:	Time:	Temp., °F:		
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis	
1		10.80	6.0	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Total Weight		10.8	Average, %db	6.0

Allowable Fuel Load Range:	0.0	to	0.0
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TEST FUEL LOAD PROPERTIES						
Eq. ID No.:	Time:	8:15		Temp., °F:	65	
Piece No.	Length, In.	Weight, Lb.		Moisture, %, Dry Basis		
		2x4	4x4			
1			7.80	2.4	2.4	2.4
2						
3						
4						
5						
6						
7						
8						
Totals		0.0	7.8			
% of Weight		0	100			
Total weight, wet, lb.		7.80		Average Moisture, dry	2.40	
Total weight, dry, kg		3.46		Average Moisture, wet	2.34	

Test Engineer: B.R.

Date: 12/2/14



TEST DATA
EPA METHOD 5G-3

Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID No:	PRT1409261108-001
Test Date:	22-Oct-14
Test Run No:	3

Temperature Data

Firebox Temp Start	224.8
Firebox Temp End	211.4
Firebox Delta-T	13.4

Max Filter Temps	
Train A	
	131

Interval	10	Duration of Test, Min	120											
Time		Temperature Data												
Interval	Duration	Room	Dilution 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	72	96	273	586	182	141	95	120		130	70	70	
1	10	72	95	273	585	185	142	97	121		131	50	70	
2	20	72	96	269	548	183	136	95	119		131	51	70	
3	30	74	98	273	566	184	139	97	120		131	50	71	
4	40	72	96	273	579	184	141	96	119		131	50	71	
5	50	72	96	275	583	184	141	96	120		131	51	71	
6	60	72	96	272	571	185	140	96	120		131	51	71	
7	70	72	96	267	521	183	133	95	118		131	51	72	
8	80	72	96	270	563	181	138	95	119		131	53	72	
9	90	72	96	268	545	181	135	95	118		131	53	72	
10	100	73	96	272	570	181	138	96	120		131	54	72	
11	110	73	96	274	580	182	142	96	121		131	56	72	
12	120	73	98	274	523	182	135	96	121		131	57	72	

Test Engineer: B.D.

Date: 12/2/14

Gas Particulate Sampling Data

Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 22-Oct-14
 Test Run Number: 3

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors	
Start	29.74	Meter Box (A)	0.979
End	29.71		
Duration of Test, Min		120	

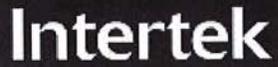
Leak Check, cfm @ in Hg	
Train A	
0.004@4	

Maximum Vacuum	
Train A	
0.00	

Time	Particulate Sampling Data										
	Tunnel Delta-P	Train A Delta-H	Flue Draft	Fuel Weight	Weight Loss	Train A Volume	Train A Proportional Rate	Train A Vacuum, In. Hg			
0	0.048	1.50	-0.050	25.30	7.80	584.700	100.00	0.00			
10	0.048	1.50	-0.050	24.60	0.70	592.160	103.86	0.00			
20	0.048	1.50	-0.050	24.00	0.60	599.260	98.93	0.00			
30	0.048	1.50	-0.050	23.30	0.70	606.420	99.76	0.00			
40	0.048	1.50	-0.050	22.60	0.70	613.430	97.50	0.00			
50	0.048	1.50	-0.050	22.00	0.60	620.100	92.77	0.00			
60	0.048	1.50	-0.050	21.30	0.70	627.390	101.39	0.00			
70	0.048	1.50	-0.050	20.70	0.60	634.670	101.06	0.00			
80	0.048	1.50	-0.050	20.10	0.60	642.050	102.45	0.00			
90	0.048	1.50	-0.050	19.40	0.70	649.720	106.47	0.00			
100	0.048	1.50	-0.050	18.70	0.70	656.570	95.09	0.00			
110	0.048	1.50	-0.050	18.10	0.60	663.760	99.81	0.00			
120	0.048	1.50	-0.050	17.50	0.60	671.017	100.92	0.00			

Test Engineer: BD

Date: 12/2/14



Dilution Tunnel Velocity Traverse EPA Method 5G-3

Project Number: G101836596
Manufacturer: Hearth & Home
Model: Mt Vernon E2
Sample ID Number: PRT1409261108-001
Test Date: 22-Oct-14
Test Run Number: 3

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0400	96	0.2000
A2	0.0420	96	0.2049
A3	0.0480	96	0.2191
A4	0.0380	96	0.1949
A Center	0.0480	96	0.2191
B1	0.0440	96	0.2098
B2	0.0440	96	0.2098
B3	0.0480	96	0.2191
B4	0.0380	96	0.1949
B Center	0.0480	96	0.2191
Averages	0.0438	96	0.2066

Tunnel Diameter **6.000** inches
Tunnel Static **-0.520** in. H2O
Tunnel Area 0.19635 Ft²
Pitot Correction 0.9428 factor
Baro. Pressure 29.74
Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)
Initial Velocity 14.154 Ft/ Sec
Initial Flow **151.04** Ft³/min

Test Engineer: BR

Date: 12/2/14



TEST RESULTS
EPA METHOD 5G-3

Project Number: G101836596
Manufacturer: Hearth & Home
Model: Mt Vernon E2
Sample ID Number: PRT1409261108-001
Test Date: 22-Oct-14
Test Run Number: 4

B...

Dry Burn-Rate, kg/hr:		2.83
Emission-Rate, g/hr:		0.98
Duration of Test, Minutes		120
Dry Gas Meter Standardization		Train A
Dry Gas Meter Beginning Reading, ft ³	671.3	
Dry Gas Meter Ending Reading, ft ³	756.745	
Barometric Pressure Correction Factor	0.991	
Dry Gas Meter Calibration Factors (γ factors)	0.979	
Dry Gas Meter Temperature Factors	0.992	
Dry Gas Meter Delta-H Correction Factors	1.004	
Dry Gas Meter STD Volume Sampled, ft ³	82.546	
Dilution Tunnel Flow / Volume		
Standardized Tunnel Flow, dsCFM	142.498	
Total Tunnel Volume, scf	17099.743	
Emission Calculations		Train A
Sample Ratios (Total Tunnel Volume / Total Sample Volume)	207.154	
Sample Particulate Mass, mg	9.5	
Total Emissions, grams	1.962	
Emission-Rate, g/hr	0.98	
Adjusted Emission Rates, g/hr	1.79	
Operating Parameters		Train A
Max Filter Temperature, °F	150	
Post-Test Leak Check, cfm @ in. Hg vac.	.004@6	
Average Firebox Surface Temperature delta-T, °F	15	
Maximum Ambient Temperature, °F	74	
Minimum Ambient Temperature, °F	73	
Fuel Properties		
Wet Fuel Load Weight, lb.	12.80	
Dry-Basis Fuel Load Moisture Content, %	2.40	
Wet-Basis Fuel Load Moisture Content, %	2.34	

Test Engineer: *BD*

Date: *12/2/14*



Run Notes
EPA Methods 28 and 5G-3

PROJECT / TEST INFORMATION	
Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID Number:	PRT1409261108-001
Test Date:	22-Oct-14
Test Run Number:	4
Date tunnel cleaned:	5/9/2014
Purpose of Test	Certification

Appliance Information		
Appliance Type:	3	1 - Catalytic 2 - Non - Catalytic 3 - Pellet 4 - Hydronic
Firebox Volume, ft ³ :	0	N/A for pellet type
Convection Blower	3	1 - No Fan 2 - Fan Optional 3 - Fan Standard

Load Fuel Photo

Photo File was lost



Test Settings	
Primary Air:	NA
Secondary Air:	NA
Control Board:	Control dial set at maximum, trim pot set at +4.
Blower/Fan:	Automatic from control board.
Pre- Burn Activities	
Time	Activity
	NA
Start-Up Procedure	
Loading of fuel, sec. :	NA
Fuel-loading door :	NA
Primary air:	NA
Secondary air:	NA
Control board:	Control dial set at maximum, trim pot set at +4.
Blower / fan:	Automatic from control board.
Other Notes	
NA	

Test Engineer: B. J. [Signature]

Date: 12/2/14



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

Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID Number:	PRT1409261108-001
Test Date:	22-Oct-14
Test Run Number:	4

Firebox Volume, ft ³ :	
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Calibration Reference ID		
Set meter to Species 1		
Set Temperature to 70F	12%	12.0
Set pin setting to 444	22%	22.0

PRE-BURN FUEL PROPERTIES				
Eq. ID No.:		Time:		Temp., °F:
Piece No.	Length, In.	Weight, Lb.	Moisture, %, Dry Basis	
1		10.80	6.0	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Total Weight		10.8	Average, %db	6.0

Allowable Fuel Load Range: 0.0 to 0.0

TEST FUEL LOAD PROPERTIES						
Eq. ID No.:		Time:	8:15	Temp., °F:	65	
Piece No.	Length, In.	Weight, Lb.		Moisture, %, Dry Basis		
		2x4	4x4			
1			12.80	2.4	2.4	2.4
2						
3						
4						
5						
6						
7						
8						
Totals		0.0	12.8			
% of Weight		0	100			
Total weight, wet, lb.		12.80		Average Moisture, dry	2.40	
Total weight, dry, kg		5.67		Average Moisture, wet	2.34	

Test Engineer: BD

Date: 12/2/14



TEST DATA
EPA METHOD 5G-3

Project Number:	G101836596
Manufacturer:	Hearth & Home
Model:	Mt Vernon E2
Sample ID No:	PRT1409261108-001
Test Date:	22-Oct-14
Test Run No:	4

Temperature Data

Firebox Temp Start	270.8
Firebox Temp End	285.8
Firebox Delta-T	15.0

Max Filter Temps	
Train A	
150	

Interval	10	Duration of Test, Min	120
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Time		Temperature Data												
Interval	Duration	Room	Dilution 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	118	357	733	170	185	111	155		150	71	71	
1	10	74	118	367	783	174	191	113	159		132	54	71	
2	20	73	119	370	791	178	195	115	162		132	57	72	
3	30	73	118	372	799	179	196	125	164		132	58	72	
4	40	74	119	362	726	186	191	112	158		131	59	72	
5	50	74	119	369	784	181	192	114	161		131	60	73	
6	60	74	119	368	769	182	190	114	161		130	60	73	
7	70	73	119	368	773	184	191	114	161		131	61	73	
8	80	73	119	369	778	180	192	114	161		130	61	73	
9	90	74	121	362	709	176	178	112	157		131	62	73	
10	100	74	119	365	770	175	188	113	158		132	62	73	
11	110	74	119	369	781	183	194	115	162		130	63	73	
12	120	74	119	370	782	177	193	115	162		131	63	73	

Test Engineer: BRD

Date: 12/2/14



TEST DATA
EPA METHOD 5G-3

Gas Particulate Sampling Data

Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 22-Oct-14
 Test Run Number: 4

Barometer, In. Hg	RH, %	Sample Box Correction (y) Factors
Start 29.68		Meter Box (A) 0.979
End 29.65		

Leak Check, cfm @ in Hg
Train A
.004@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	0.046	1.50	-0.060	20.30	12.80	671.300	100.01	0.00			
10	0.046	1.50	-0.060	19.10	1.20	678.830	105.98	0.00			
20	0.046	1.50	-0.060	18.00	1.10	685.950	100.11	0.00			
30	0.046	1.50	-0.060	17.00	1.00	692.900	97.63	0.00			
40	0.046	1.50	-0.060	16.00	1.00	700.030	100.25	0.00			
50	0.046	1.50	-0.060	14.90	1.10	707.330	102.45	0.00			
60	0.046	1.50	-0.060	13.90	1.00	714.180	96.13	0.00			
70	0.046	1.50	-0.060	12.80	1.10	721.510	102.87	0.00			
80	0.046	1.50	-0.060	11.70	1.10	728.500	98.10	0.00			
90	0.046	1.50	-0.060	10.80	0.90	735.530	98.83	0.00			
100	0.046	1.50	-0.060	9.60	1.20	742.770	101.61	0.00			
110	0.046	1.50	-0.060	8.60	1.00	749.750	97.96	0.00			
120	0.046	1.50	-0.060	7.50	1.10	756.745	98.17	0.00			

Test Engineer: BD

Date: 12/2/14



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

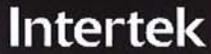
Project Number: G101836596
 Manufacturer: Hearth & Home
 Model: Mt Vernon E2
 Sample ID Number: PRT1409261108-001
 Test Date: 22-Oct-14
 Test Run Number: 4

	Dilution Tunnel		Square Root
	Delta P In. H2O	Temp, °F	
A1	0.0260	118	0.1612
A2	0.0320	118	0.1789
A3	0.0420	118	0.2049
A4	0.0420	118	0.2049
A Center	0.0460	118	0.2145
B1	0.0380	118	0.1949
B2	0.0440	117	0.2098
B3	0.0480	117	0.2191
B4	0.0480	118	0.2191
B Center	0.0460	117	0.2145
Averages	0.0412	117.7	0.1991

Tunnel Diameter **6.000** inches
 Tunnel Static **-0.520** in. H2O
 Tunnel Area 0.19635 Ft²
 Pitot Correction 0.9284 factor
 Baro. Pressure 29.68
 Pitot Factor **0.99** (0.99 for standard, 0.84 or Cal. For S-Type)
 Initial Velocity 13.921 Ft/ Sec
 Initial Flow **142.68** Ft³/min

Test Engineer: BD

Date: 12/2/17



DILLUTION TUNNEL PARTICULATE CALCULATIONS
EPA Method 5G-3

Project Number: G101836596
Manufacturer: Hearth & Home
Model: Mt Vernon E2
Sample ID Number: PRT1409261108-001
Test Date: 22-Oct-14
Test Run Number: 4

Intertek Equipment No.'s 19683, 19684, 19725

SAMPLE COMPONENT	REAGENT	FILTER # OR	WEIGHTS			
			FINAL, mg	TARE, mg	BLANK, mg/ml	PARTICULATE, mg
FRONT FILTER CATCH	FILTER	472	750.7	742.1		8.60
REAR FILTER CATCH	FILTER	485	129.9	130.6		-0.70
RINSE OF PROBE &	ACETONE	30	98816.3	98815.6	0.00033	0.69
RINSE OF IMPINGER SET	WATER	210	102105.7	102105.6	0	0.10
RINSE OF IMPINGER SET	METHANE	100	100159.8	100160.4	0.0073	0.00
RINSE OF FILTER ASSEMBLY & GAS TRAIN -	ACETONE	60	109122.2	109121.4	0.00033	0.78
TOTAL:						9.47

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: BA

Date: 12/2/14