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Valley Comfort Systems, Inc.  
AKA: Blaze King Industries, Inc.  
Project # 18-421  
Model: PE32  
Type: Residential Catalytic Wood Fired  
Heater  
October 30, 2018

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**EPA Test Method 28R for  
Certification and Auditing of Wood  
Heaters**

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[www.pfs.ca](http://www.pfs.ca)

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## Affidavit

PFS-TECO was contracted by Valley Comfort Systems, Inc. (Valley Comfort), also known as Blaze King Industries, Inc. (Blaze King) to provide testing services for the Princess PE32 Catalytic Wood-Fired Room Heater per EPA Method 28R, *Certification and Auditing of Wood Heaters*. All testing and associated procedures were conducted at Blaze King's Walla Walla, WA Laboratory beginning on 10/8/2018 and ending on 10/24/2018. Blaze King's Walla Walla Laboratory is located at 146 A Street, Walla Walla, Washington 99362. Testing procedures followed EPA Method 28R and ASTM E2780, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters*. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel*.

PFS-TECO is accredited by the U.S. Environmental Protection Agency for the certification and auditing of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards for Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces, Methods 28R, 28WHH, 28 WHH-PTS, and all methods listed in Sections 60.534 and 60.5476. PFS-TECO holds EPA Accreditation Certificate Numbers 4 and 4M (mobile). PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections, By A2LA to ISO 17025:2005 "Requirements for Testing Laboratories", and by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems".

The following people were associated with the testing, analysis and report writing associated with this project.



Sebastian Button, Laboratory Supervisor

## Introduction

Valley Comfort of Penticton, BC, contracted with PFS-TECO to perform EPA certification testing on the PE32 Catalytic Wood-Fired Room Heater. All testing was performed at Blaze King's Walla Walla Laboratory. Testing was performed by Mr. Sebastian Button.

## Notes

- Prior to start of testing, 50 hours of conditioning was performed per ASTM E2780.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- Front filters were changed on sample train A at one hour for all 8 test runs.
- 6 certification test runs were performed in accordance with EPA Method 28R, 1 at the maximum burn rate category, 1 at the medium high burn rate category, 1 at the medium low burn rate category, 1 at the low burn rate category, and 2 fan confirmation tests, the first of which missed the medium low burn rate requirement (it was a medium high instead), so a second test was performed, which did meet the medium low burn rate category requirement. All 6 test runs met validity requirements, and all but the 2 fan confirmation tests are included in the weighted average. See Run Narrative section for further detail on each run.
- In addition to the 6 tests described above, an additional 2 test runs were performed to demonstrate catalyst equivalency in accordance with EPA guidelines. These 2 tests were performed with a different catalyst, which was also aged for 50 hours prior to testing, in the same test model as the certification tests. The 2 tests, 1 at the high burn rate category, the other at the low burn rate category, had emissions results within 0.5 g/hr as their certification test counterparts and therefore the catalyst is deemed to be a suitable replacement. See Run Narrative and Appliance Description Sections for further details.

## Wood Heater Identification and Testing

- Appliance Tested: *Df]bWYgg'D9' &*
- Serial Number: *I b!gYf]U]nYX'DfclchmdY'É'D: G'HfUW]b[ 'Bi a VYf '\$\$%&'''*
- Manufacturer: *JU`Ym7 ca ZcfhGnghYa gž=bW*
- Catalyst: *MYg*
- Heat exchange blower: *Cdl]cbU*
- Type: *KccX'Gtcj Y*
- Style: *: fYY'GHUbX]b[*
- Date Received: *AcbXUnžCWtc VYf '\$, ž&\$%*
- Wood Heater Aging: *5i [ i gh&+ž&\$% '!GYdhYa VYf '& ž&\$%*
- Testing Period – Start: *AcbXUnžCWtc VYf '\$, ž&\$%* Finish: *K YXb YgXUnž CWtc VYf '& ž&\$%*
- Test Location: *6 `UnY?]b[ Dg'K U`UK U`U @UvcfUrcfnž% \* '5 `GlfYYIžK U`U KU`UžK 5 '--' \* &*
- Elevation: *≈%ž%, : YYhUVcj YgYU`Yj Y*
- Test Technician(s): *GYVUgh]Ub`6i Htc b*
- Observers: *7\ Uf`]Y6]g\ cd`UbX`5 Ufcb`GU Htc b`cZ6 `UnY?]b[ "*

## Test Procedures and Equipment

All Sampling and analytical procedures were performed by Sebastian Button. All procedures used are directly from ASTM E2780 and ASTM E2515. See the list below for equipment used. See Appendix C submitted with this report for calibration data.

### Equipment List:

Equipment ID#	Equipment Description
040	Delmhorst J-2000 Wood Moisture Meter
BK-1	Weigh-Tronix 3'x3' floor scale w/digital weight indicator
BK-06	Equimeter R-275 Sample Train A Dry Gas Meter
BK-07	Equimeter T-110 Sample Train B Dry Gas Meter
057	Infrared Industries IR-208 CO <sub>2</sub> /CO Analyzer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
051	10 lb audit weight
090	Dewalt Tape Measure
095	Anemometer
111	Microtector
CC76915	Gas Analyzer Calibration Span Gas

## Results

A total of 6 certification test runs were performed on the PE32. Runs #5 and 6, fan confirmation tests were not used in any weighted average results calculations. The weighted average emissions rate for the 4 run test series was measured to be **0.4 g/hr** with a Higher Heating Value efficiency of **79.9%**. The average CO emission rate for the 4 tests was **0.5 g/min**. The Blaze King PE32 Catalytic Wood-Fired Room Heater meets the 2020 crib wood PM emission standard of  $\leq 2.0$  g/hr per CFR 40 part 60, §60.532 (b).

Detailed individual run data can be found in Appendix A submitted with this report.

### Certification Test Summary Table

	<b>Cat. 1 &lt;0.8 kg/hr.</b>	<b>Cat. 2 0.80 - 1.25 kg/hr.</b>	<b>Cat. 3 1.25 - 1.90 kg/hr.</b>	<b>Cat. 4 Max Burn Rate</b>	<b>Fan Confirmation (Cat. 2)*</b>	<b>Fan Confirmation (Cat. 3)*</b>
Date	10/9/2018	10/8/2018	10/10/2018	10/10/2018	10/12/2018	10/11/2018
Run Number	2	1	3	4	6	5
Emission Rate (g/hr).	0.13	0.21	0.52	1.37	0.68	1.28
Burn Rate (kg/hr)	0.66	0.80	1.63	2.20	1.17	1.38
Heat Output (Btu/hr)	10,200	12,026	24,163	31,478	16,679	19,145
Overall Efficiency (% HHV)	82.2	80.6	79.3	76.7	76.0	73.7
CO Emissions (g/MJ Output)	0.51	1.36	0.74	2.68	3.33	5.11
CO Emissions (g/kg Dry Fuel)	8.35	21.64	11.57	40.72	50.15	74.58
CO Emissions (g/min)	0.09	0.29	0.31	1.48	0.98	1.72
ASTM E2515 Emissions – First Hour (g/hr)	0.27	0.57	1.11	3.03	0.85	0.36
<b>Weighted particulate emission average of 4 test runs: 0.4 grams per hour.</b>						
<b>Weighted average HHV efficiency of 4 test runs: 79.9%.</b>						

\*Fan Confirmation tests not included in weighted average calculations



In addition to the certification tests described above, 2 additional tests were performed with a different catalyst to demonstrate equivalency in accordance with EPA guidelines. Upon completion of the certification tests described above, the Applied Ceramics metal combustor (Manufacturer Part No. 115-0556) used for testing was removed and individually sealed in accordance with testing procedures. An appropriately aged Clariant metal combustor (Manufacturer Part No. 115-0336-A-M) was then installed in the same test stove. Results of the 2 equivalency tests are summarized below, detailed individual run data can be found in Appendix A submitted with this report.

### Equivalency Test Summary Table

	<b>Cat. 1 &lt;0.8 kg/hr.*</b>	<b>Cat. 2 Max Burn Rate</b>
Date	10/23/2018	10/24/2018
Run Number	7	8
Emission Rate (g/hr).	0.13	1.04
Burn Rate (kg/hr)	0.69	2.33
Heat Output (Btu/hr)	10,840	33,644
Overall Efficiency (% HHV)	84.0	76.6
CO Emissions (g/MJ Output)	0.63	2.05
CO Emissions (g/kg Dry Fuel)	10.41	31.12
CO Emissions (g/min)	0.12	1.21
ASTM E2515 Emissions – First Hour (g/hr)	0.09	2.11

\*Equivalency tests not included in weighed average calculations.

# Weighted Average Calculation Summary

PE32 Weighted Average.xism

## EPA Method 28R Weighted Average Emissions

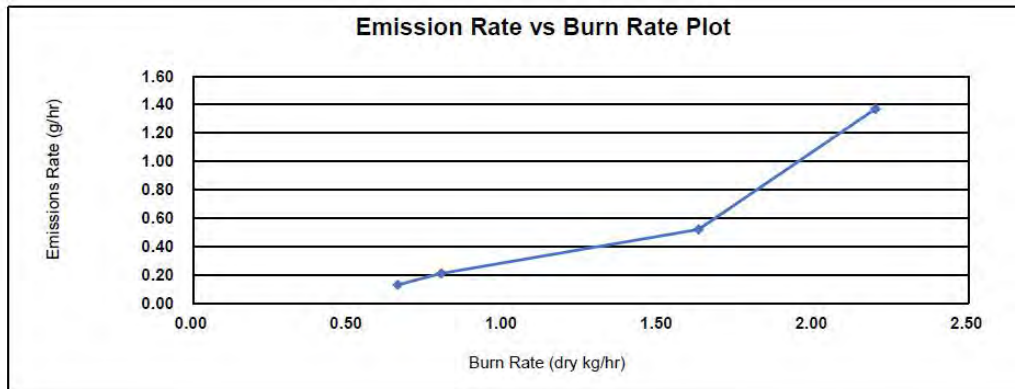
Client: Valley Comfort Systems Inc.  
 Stove Model: PE32  
 Test Dates: 10/8/18 - 10/10/18  
 Job Number: 18-421

Signature/Date:  10/23/2018

Weighted Average Particulate Emissions (g/hr):	0.4
Weighted Average HHV Efficiency (%):	79.9%
Weighted Average LHV Efficiency (%):	86.3%
Average CO Emissions (g/min):	0.5

### Individual Run Summaries

Run Number:	Burn Rate (dry kg/hr):	Emissions Rate (g/hr):	HHV Efficiency (%):	LHV Efficiency (%):	Weighting Percentage (%):
2	0.66	0.13	82.2%	88.9%	12.16%
1	0.80	0.21	80.6%	87.1%	38.04%
3	1.63	0.52	79.3%	85.7%	39.58%
4	2.20	1.37	76.7%	82.9%	10.23%



## Test Run Narrative

### *Run 1*

Run 1 was performed on 10/8/2018 as a category 2 test, per EPA Method 28R. The total test time was 522 minutes. The particulate emissions rate for the test was 0.21 g/hr, the burn rate was 0.80 kg/hr with an HHV efficiency of 80.6%. The Train A front filter was changed at 1 hr to determine 1<sup>st</sup> hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

### *Run 2*

Run 2 was performed on 10/9/2018 as a category 1 test, per EPA Method 28R. The total test time was 643 minutes. The particulate emissions rate for the test was 0.13 g/hr, the burn rate was 0.66 kg/hr with an HHV efficiency of 82.2%. The Train A front filter was changed at 1 hr to determine 1<sup>st</sup> hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

### *Run 3*

Run 3 was performed on 10/10/2018 as a category 3 test, per EPA Method 28R. The total test time was 257 minutes. The particulate emissions rate for the test was 0.52 g/hr, the burn rate was 1.63 kg/hr with an HHV efficiency of 79.3%. The Train A front filter was changed at 1 hr to determine 1<sup>st</sup> hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

### *Run 4*

Run 4 was performed on 10/10/2018 as a category 4 test, per EPA Method 28R. The total test time was 191 minutes. The particulate emissions rate for the test was 1.37 g/hr, the burn rate was 2.20 kg/hr with an HHV efficiency of 76.7%. The Train A front filter was changed at 1 hr to determine 1<sup>st</sup> hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

### *Run 5*

Run 5 was performed on 10/11/2018 as a targeted category 2 fan confirmation test, per EPA Method 28R. The total test time was 295 minutes. The particulate emissions rate for the test was 1.28 g/hr with a burn rate of 1.38 kg/hr. All test results were appropriate and valid, however, the test run ended up being a category 3 burn rate, so another fan confirmation test was performed (run 6) to meet the category 2 burn rate requirement. As an attempted fan confirmation test run, this test is not included in the weighted average calculations presented in the results summary.

### *Run 6*

Run 6 was performed on 10/12/2018 as a category 2 fan confirmation test, per EPA Method 28R. The total test time was 358 minutes. The particulate emissions rate for the test was 0.68 g/hr with a burn rate of 1.17 kg/hr. All test results were appropriate

and valid. There were no anomalies and all test criteria were met. Since the particulate emissions rate is within 1.0 g/hr of the other category 2 test (run 1, 0.21 g/hr) the blower is determined not to have a significant impact on emissions performance and may therefore be approved as an optional accessory. This test run is not included in the weighted average calculations presented in the results summary.

#### *Run 7*

Run 7 was performed on 10/23/2018 as a category 1 catalyst equivalency test, per EPA Method 28R and EPA catalyst equivalency determination guidelines. The total test time was 607 minutes. The particulate emissions rate for the test was 0.13 g/hr, the burn rate was 0.69 kg/hr with an HHV efficiency of 84.0%. The Train A front filter was changed at 1 hr to determine 1<sup>st</sup> hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met. A catalyst is deemed equivalent if both the low and high burn tests are within 0.5 g/hr of the certification test result. This test run, in comparison to run 2 (0.13 g/hr) meets the low burn rate test requirement. This test run is not included in the weighted average calculations presented in the results summary.

#### *Run 8*

Run 8 was performed on 10/24/2018 as a category 4 catalyst equivalency test, per EPA Method 28R and EPA catalyst equivalency determination guidelines. The total test time was 174 minutes. The particulate emissions rate for the test was 1.04 g/hr with a burn rate of 2.33 kg/hr with an HHV efficiency of 76.6%. All test results were appropriate and valid. There were no anomalies and all test criteria were met. A catalyst is deemed equivalent if both the low and high burn tests are within 0.5 g/hr of the certification test result. This test run, in comparison to run 4 (1.37 g/hr) meets the high burn rate test requirement. This test run is not included in the weighted average calculations presented in the results summary.

## Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E2780 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	66	67	37.0	37.6	28.71	19.76	18.76	23.2	522
2	67	69	42.0	39.0	28.62	18.24	19.00	21.9	643
3	68	70	37.2	35.6	28.76	18.24	18.70	22.1	257
4	72	68	34.2	34.2	28.75	18.42	18.90	23.3	191
5	68	68	28.8	27.9	28.87	18.04	18.34	22.4	295
6	68	73	26.0	20.6	28.77	17.50	18.92	23.2	358
7	66	67	36.2	36.9	28.69	19.26	18.69	22.3	607
8	69	68	33.0	33.2	28.79	18.72	18.42	23.3	174

## Appliance Operation and Test Settings

The appliance was operated according to procedures as described in the Operations Manual, found in Appendix B submitted with this report. Detailed run information can be found in Appendix A submitted with this report.

### Settings & Run Notes

	Pre-Burn Air Setting	Test Run Air and Fan Settings <sup>1</sup>
<b>Run 1</b>	Adjustable Primary Air Control (PAC) Knob Rotated up 70° from Fully Open	Adjustable PAC same as pre-burn setting, fan on turned on to medium low setting from beginning of test.
<b>Run 2</b>	Adjustable Primary Air Control (PAC) Knob Rotated up 76° from Fully Open	Adjustable PAC same as pre-burn setting, fan on turned on to low setting from beginning of test.
<b>Run 3</b>	Adjustable Primary Air Control (PAC) Knob Rotated up 75° from Fully Open	Adjustable PAC same as pre-burn setting, fan on turned on to medium high setting from beginning of test.
<b>Run 4</b>	Adjustable Primary Air Control (PAC) Knob Fully Open	Adjustable PAC same as pre-burn setting, fan on turned on to high setting from beginning of test.
<b>Run 5</b>	Adjustable Primary Air Control (PAC) Knob Rotated up 40° from Fully Open	Adjustable PAC same as pre-burn setting, fan confirmation test, fan off for duration of test.
<b>Run 6</b>	Adjustable Primary Air Control (PAC) Knob Rotated up 47° from Fully Open	Adjustable PAC same as pre-burn setting, fan confirmation test, fan off for duration of test.
<b>Run 7</b>	Adjustable Primary Air Control (PAC) Knob Rotated up 77° from Fully Open	Adjustable PAC same as pre-burn setting, fan on turned on to low setting from beginning of test.
<b>Run 8</b>	Adjustable Primary Air Control (PAC) Knob Fully Open	Adjustable PAC same as pre-burn setting, fan on turned on to high setting from beginning of test.

## Appliance Description

**Model(s):** Princess PE32

**Additional Models Discussion:** None

**Appliance Type:** Catalytic Wood-Fired Room Heater

**Firebox Volume:** 2.91 ft<sup>3</sup>

**Air Introduction System:** Primary Air enters the firebox from the rear bottom of the appliance and is channeled up the back and to the front of the appliance via tubes located in the firebox. Air then flows into the firebox down through the air wash. No secondary or pilot air ports are utilized in the design. Primary air is controlled via a control knob located on the side of the appliance, towards the back of the unit, which turns clockwise from fully closed to fully open. Dimensions on all these features can be found in Appendix D.

**Baffles:** A 10.5" wide, 0.135" thick Stainless-Steel smoke baffle hangs behind the combustor.

**Refractory Insulation:** The firebox is lined with 1" thick firebrick.

**Flue Outlet:** 6-inch exhaust outlet located on the top of the appliance.

**Catalytic Combustor:** Certification testing was performed with an Applied Ceramics metal combustor (Manufacturer Part No. 115-0556), as part of this test series, a Clariant metal combustor (Manufacturer Part No. 115-0336-A-M) was determined to be a suitable replacement. Both combustor models measure 10.650" by 2.150".

**Fan:** The appliance is optionally offered with a convection fan that attaches to the back of the appliance.

**Gasketing:** 7/8" fiberglass rope gasket seals the door against the firebox, 1/8" x 3/4" gasket is used to seal the 5mm ceramic glass against the door frame. 1/16" x 2" paper gasket is used between the combustor can the its housing in the top of the firebox.

### Appliance Dimensions

PE32 Unit Dimensions (with pedestal base)

Height	Width	Depth	Firebox Volume
27.375"	27"	29.375"	2.91ft <sup>3</sup>

Appliance design drawings can be found in Appendix D submitted with the CBI copy of this report.

Appliance Front



Appliance Left





Appliance Right



Appliance Rear



## Test Fuel Properties

Test fuel used was dimensional Doug fir lumber, air-dried to the specified moisture content range. Typical fuel loads are pictured below:

Typical Test Fuel Load Configuration



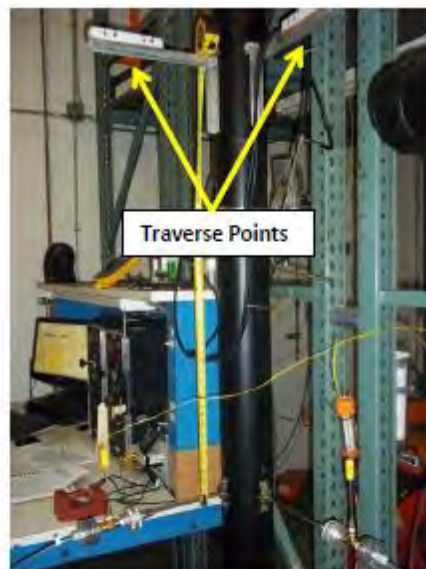
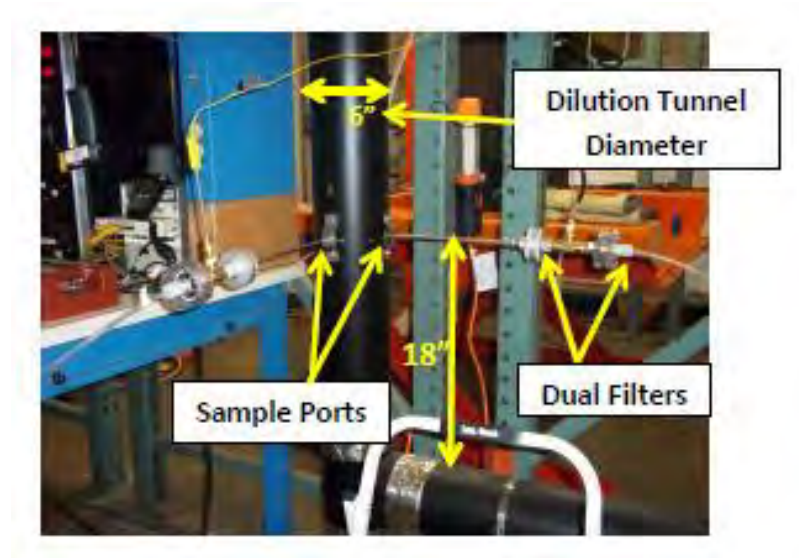
Typical Test Fuel Loaded in Test Stove



## Sampling Locations and Descriptions

Sample ports are located 16.5 feet downstream from any disturbances and 1 foot upstream from any disturbances. Flow rate traverse data was collected 12 feet downstream from any disturbances and 5.5 feet upstream from any disturbances. (See below).

### Sample Points



## Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 6 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used, and no sampling intervals fell outside of proportional rates of +/- 10%.

## Analytical Methods Description

All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings, dessicated for a minimum of 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 Section 10.

## Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E2780. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

## Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 146 A Street, Walla Walla, Washington 99362, for archival.

### Sealing Label

#### ATTENTION:

THIS SEAL IS NOT TO BE BROKEN WITHOUT PRIOR AUTHORIZATION FROM THE  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.

THIS APPLIANCE HAS BEEN SEALED INACCORDANCE WITH REQUIREMNTS OF 40CFR  
PART 60 SUBPART AAA §60.535 (a)(2)(vii)

REPORT # \_\_\_\_\_

DATE SEALED \_\_\_\_\_

MANUFACTURER \_\_\_\_\_

MODEL # \_\_\_\_\_

### Sealed Applied Ceramics Catalyst (Certification Catalyst)



### Sealed Unit



## List of Appendices

The following appendices have been submitted electronically in conjunction with this report:

Appendix A – Test Run Data, Technician Notes, Sample Analysis, and Photos

Appendix B – Labels and Manuals

Appendix C – Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

# Conditioning Data

Client: Valley Comfort Systems Inc.	Job #: 18-421
Model: PE32 - Clariant Combustor	Tracking #: 0012
Date(s): 10/9/2018 - 10/11/2018	Technician: SJB

Elapsed Time (hrs)	Scale Reading (lbs)	Average:	315.5	57.8	877
		Weight Change (lbs)	Flue (°F)	Ambient (°F)	Catalyst Exit (°F)
0		-	487	64	879
1			460	52	764
2			586	57	1107
3			539	54	1047
4			419	66	1111
5			370	66	936
6			449	60	1077
7			384	61	1036
8			352	58	825
9			350	59	803
10			287	59	1034
11			210	55	896
12			210	57	944
13			190	54	917
14			178	53	763
15			206	53	855
16			196	53	785
17			170	54	634
18			161	52	554
19			175	52	661
20			189	52	873
21			173	51	792
22			503	59	937
23			442	59	814
24			520	62	987
25			416	63	1070
26			373	61	1064
27			321	63	878
28			270	68	771
29			292	68	701
30			414	69	1091
31			495	67	995
32			451	70	876
33			454	65	822
34			249	61	912
35			214	54	895
36			196	58	959
37			204	54	1016
38			194	54	971
39			185	54	835
40			161	49	726
41			157	51	664
42			177	47	706
43			178	47	665
44			172	49	563
45			177	46	465
46			519	59	1043
47			429	58	1090
48			368	62	901
49			419	64	1008
50			407	67	999

# Conditioning Data

Client: Valley Comfort Systems Inc.	Job #: 18-421
Model: PE32 - Applied Metal Comb.	Tracking #: 0012
Date(s): 8/27/2018 - 9/24/2018	Technician: SJB

Elapsed Time (hrs)	Scale Reading (lbs)	Weight Change (lbs)	Average:	368.7	73.7	1027
			Flue (°F)	Ambient (°F)	Catalyst Exit (°F)	
0	12.2	-	65	63	75	
1	3.3	-8.8	387	69	1026	
2	18.3	14.9	254	71	965	
3	6.6	-11.7	422	72	1218	
4	12.6	6.0	426	72	1173	
5	4.5	-8.1	428	73	977	
6	1.2	-3.3	367	72	854	
7	9.4	8.2	189	64	961	
8	20.1	10.7	409	70	1301	
9	7.1	-13.0	438	72	1113	
10	17.0	9.9	401	72	1284	
11	5.9	-11.2	452	74	1162	
12	2.0	-3.9	391	75	896	
13	0.0	-2.0	325	75	816	
14	2.6	2.6	424	71	963	
15	11.0	8.4	404	75	1195	
16	4.6	-6.5	391	76	882	
17	11.3	6.7	413	78	1137	
18	4.1	-7.3	422	80	984	
19	1.7	-2.3	342	81	857	
20	0.1	-1.6	317	81	771	
21	4.5	4.4	389	72	1146	
22	18.3	13.8	381	74	1298	
23	7.5	-10.9	415	76	1134	
24	3.7	-3.7	360	76	884	
25	7.0	3.3	412	77	1181	
26	2.0	-5.1	393	77	936	
27	20.5	18.5	400	70	816	
28	8.1	-12.4	405	72	1166	
29	18.4	10.2	373	73	875	
30	6.7	-11.7	423	76	1161	
31	1.9	-4.8	382	75	888	
32	11.1	9.2	134	66	1026	
33	1.6	-9.5	414	72	958	
34	7.1	5.5	421	86	1208	
35	13.5	6.4	391	78	1038	
36	4.3	-9.2	423	78	1081	
37	1.4	-2.9	355	77	891	
38	9.9	8.5	205	72	1049	
39	1.8	-8.1	411	74	1010	
40	7.0	5.2	418	78	1180	
41	14.2	7.2	399	80	1196	
42	4.8	-9.4	431	81	1091	
43	1.4	-3.3	379	81	943	
44	9.5	8.1	170	64	1134	
45	1.2	-8.3	390	67	909	
46	7.3	6.1	401	67	1162	
47	14.2	7.0	399	68	1210	
48	4.1	-10.2	452	74	1183	
49	1.0	-3.1	361	72	903	
50	8.0	7.0	254	66	1110	





## Sample Calculations – ASTM E2780 & E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run: 1

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

$M_{Sdb}$  – Weight of test fuel spacers, dry basis, kg

$M_{Cdb}$  – Weight of test fuel crib, excluding nails and spacers, dry basis, kg

$D_{Cdb}$  - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft<sup>3</sup>

$M_{FTAdb}$  - Total weight of fuel crib excluding nails, dry basis, kg

BR – Dry burn rate, kg/hr

$V_s$  – Average gas velocity in the dilution tunnel, ft/sec

$Q_{sd}$  – Average gas flow rate in dilution tunnel, dscf/hr

$V_{m(std)}$  – Volume of gas sampled, corrected to dry standard conditions, dscf

$m_n$  – Total particulate matter collected, mg

$C_s$  - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf

$E_T$  – Total particulate emissions, g

PR - Proportional rate variation

$PM_R$  – Particulate emissions for test run, g/hr

$PM_F$  – Particulate emission factor for test run, g/dry kg of fuel burned

**M<sub>Sdb</sub> – Weight of test fuel spacers, dry basis, kg**

ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb}) (100 / (100 + FM_S))$$

Where,

FM<sub>S</sub> = average fuel moisture of test fuel spacers, % dry basis

M<sub>Swb</sub> = weight of test fuel spacers, wet basis, kg

Sample Calculation:

$$FM_S = 20.5 \%$$

$$M_{Swb} = 2.8 \text{ lbs}$$

0.4536 = Conversion factor from lbs to kg

$$M_{Sdb} = [(2.8 \times 0.4536) (100 / (100 + 20.5))]$$

$$M_{Sdb} = \mathbf{1.06 \text{ kg}}$$

**M<sub>Cdb</sub> – Weight of test fuel crib, excluding nails and spacers, dry basis, kg**  
ASTM E2780 equation (2)

$$M_{Cdb} = \sum[(M_{CPnwb})(100/(100 + FM_{CPn}))]$$

Where,

- M<sub>CPnwb</sub> = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
- FM<sub>CPn</sub> = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation (test fuel piece 1):

$$\begin{aligned} M_{CPnwb} &= 1.84 \\ FM_{CPn} &= 24.7 \\ &= 1.8 (100/(100+ 24.7 ) \\ &= 1.5 \text{ lbs} \end{aligned}$$

Total dry crib weight, excluding spacers = 12.96 lbs  
M<sub>Cdb</sub> = **5.88** kg

**D<sub>Cdb</sub> - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft<sup>3</sup>**  
ASTM E2780 equation (3)

$$D_{Cdb} = M_{Cdb} / V_C$$

Where,

$$V_C = \text{Volume of fuel crib, ft}^3$$

Sample calculation:

$$V_C = 773.5 \text{ in}^3$$

$$1728 = \text{conversion from in}^3 \text{ to ft}^3$$

$$D_{Cdb} = 12.96 / 773.5 * 1728$$

$$= \mathbf{28.95 \text{ lbs/ft}^3}$$

**M<sub>FTAdb</sub> - Total weight of fuel crib excluding nails, dry basis, kg**  
ASTM E2780 equation (4)

$$M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

Sample calculation:

$$\begin{aligned} M_{FTAdb} &= 1.06 + 5.88 \\ &= \mathbf{6.94 \text{ kg}} \end{aligned}$$

**BR – dry burn rate, kg/hr**

ASTM E2780 equation (5)

$$BR = \frac{60 M_{FTAdb}}{\theta}$$

Where,

$$\theta = \text{Total length of test run, min}$$

Sample Calculation:

$$M_{Bdb} = 6.94 \quad \text{kg}$$

$$\theta = 522 \quad \text{min}$$

$$BR = \frac{60 \times 6.94}{522}$$

$$BR = \mathbf{0.80} \quad \text{kg/hr}$$

**V<sub>s</sub> – Average gas velocity in the dilution tunnel, ft/sec**

ASTM E2515 equations (9)

$$V_s = F_p \times k_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where:

- F<sub>p</sub> = Adjustment factor for pitot tube center point reading =  $\frac{V_{strav}}{V_{scent}}$ , ASTM E2515 Equation (1)
- V<sub>scent</sub> = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec
- V<sub>strav</sub> = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec
- k<sub>p</sub> = Pitot tube constant, 85.49
- C<sub>p</sub> = Pitot tube coefficient: 0.99, unitless
- ΔP\* = Velocity pressure in the dilution tunnel, in H<sub>2</sub>O
- T<sub>s</sub> = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
- P<sub>s</sub> = Absolute average gas static pressure in dilution tunnel, = P<sub>bar</sub> + P<sub>g</sub>, in Hg
- P<sub>bar</sub> = Barometric pressure at test site, in. Hg
- P<sub>g</sub> = Static pressure of tunnel, in. H<sub>2</sub>O; (in Hg = in H<sub>2</sub>O/13.6)
- M<sub>s</sub> =

\*\*The dilution tunnel wet molecular weight; M<sub>s</sub> = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$F_p = \frac{13.70}{15.51} = 0.883$$

$$V_s = 0.883 \times 85.49 \times 0.99 \times 0.228 \times \left( \left( \frac{76.9}{28.71} + \frac{-0.20}{13.6} \right) \times \frac{460}{28.78} \right)^{1/2}$$

$$V_s = 13.74 \text{ ft/s}$$

\*The ASTM test standard mistakenly has the square root of the average delta p instead of the average of the square root of delta p. The current EPA Method 2 is also incorrect. This was verified by Mike Toney at EPA.

\*\*The ASTM test standard mistakenly identifies M<sub>s</sub> as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

**Q<sub>sd</sub> – Average gas flow rate in dilution tunnel, dscf/hr**

ASTM E2515 equation (3)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_{s(avg)}} \times \frac{P_s}{P_{std}}$$

Where:

- 3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
- B<sub>ws</sub> = Water vapor in gas stream, proportion by volume; assume 2%
- A = Cross sectional area of dilution tunnel, ft<sup>2</sup>
- T<sub>std</sub> = Standard absolute temperature, 528 °R
- P<sub>s</sub> = Absolute average gas static pressure in dilution tunnel, = P<sub>bar</sub> + P<sub>g</sub>, in Hg
- T<sub>s(avg)</sub> = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
- P<sub>std</sub> = Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 13.74 \times 0.1963 \times \frac{528}{76.9 + 460} \times \frac{28.71 + \frac{-0.20}{13.6}}{29.92}$$

Q<sub>sd</sub> = **8977.9** dscf/hr



**$V_{m(std)}$  – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf**  
 ASTM E2515 equation (6)

$$V_{m(std)} = K_1 V_m Y \frac{P_{bar} + \left( \frac{\Delta H}{13.6} \right)}{T_m}$$

Where:

- $K_1$  = 17.64 °R/in. Hg
- $V_m$  = Volume of gas sample measured at the dry gas meter, dcf
- $Y$  = Dry gas meter calibration factor, dimensionless
- $P_{bar}$  = Barometric pressure at the testing site, in. Hg
- $\Delta H$  = Average pressure differential across the orifice meter, in. H<sub>2</sub>O
- $T_m$  = Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 84.970 \times 1.002 \times \frac{\left( 28.71 + \frac{0.50}{13.6} \right)}{\left( 71.4 + 460 \right)}$$

$$V_{m(std)} = \mathbf{81.230} \text{ dscf}$$

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 56.425 \times 0.998 \times \frac{\left( 28.71 + \frac{0.50}{13.6} \right)}{\left( 71.7 + 460 \right)}$$

$$V_{m(std)} = \mathbf{53.699} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left( \underline{28.705} + \frac{0.00}{13.6} \right)}{\left( 67.7 + 460 \right)}$$

$$V_{m(std)} = \mathbf{0} \text{ dscf}$$

**$m_n$  – Total Particulate Matter Collected, mg**

ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

$m_p$  = mass of particulate matter from probe, mg

$m_f$  = mass of particulate matter from filters, mg

$m_g$  = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A (first hour):

$$m_n = 0.0 + 0.6 + 0.0$$

$$m_n = 0.6 \text{ mg}$$

Using equation for Train A (post-first hour):

$$m_n = 0.0 + 0.8 + 0.2$$

$$m_n = 1.0 \text{ mg}$$

Train A aggregate:

$$m_n = 0.6 + 1.0$$

$$m_n = 1.6 \text{ mg}$$

Using equation for Train B:

$$m_n = 0 + 0.7 + 0.8$$

$$m_n = 1.5 \text{ mg}$$

**C<sub>s</sub> - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf**  
ASTM E2515 equation (13)

$$C_s = K_2 \times \frac{m_n}{V_{m(\text{std})}}$$

Where:

- K<sub>2</sub> = Constant, 0.001 g/mg
- m<sub>n</sub> = Total mass of particulate matter collected in the sampling train, mg
- V<sub>m(std)</sub> = Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{1.6}{81.23}$$

$$C_s = \mathbf{0.00002} \text{ g/dscf}$$

For Train 2

$$C_s = 0.001 \times \frac{1.5}{53.70}$$

$$C_s = \mathbf{0.00003} \text{ g/dscf}$$

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{0}$$

$$C_r = \mathbf{0} \text{ g/dscf}$$

**E<sub>T</sub> – Total Particulate Emissions, g**

ASTM E2515 equation (15)

$$E_T = (C_s - C_r) \times Q_{std} \times \theta$$

Where:

- C<sub>s</sub> = Concentration of particulate matter in tunnel gas, g/dscf
- C<sub>r</sub> = Concentration particulate matter room air, g/dscf
- Q<sub>std</sub> = Average dilution tunnel gas flow rate, dscf/hr
- θ = Total time of test run, minutes

Sample calculation:

For Train 1

$$E_T = ( \underline{0.000020} - 0 ) \times \underline{8977.9} \times \underline{522} / 60$$

$$E_T = \underline{1.54} \text{ g}$$

For Train 2

$$E_T = ( \underline{0.000028} - 0 ) \times \underline{8977.9} \times \underline{522} / 60$$

$$E_T = \underline{2.18} \text{ g}$$

Average

$$E = \underline{1.86} \text{ g}$$

Total emission values shall not differ by more than 7.5% from the total average emissions

- 7.5% of the average = 0.14
- Train 1 difference = 0.32
- Train 2 difference = 0.32

**PR - Proportional Rate Variation**

ASTM E2515 equation (16)

$$PR = \left[ \frac{\theta \times V_m \times V_s \times T_m \times T_{si}}{\theta_i \times V_m \times V_{si} \times T_m \times T_s} \right] \times 100$$

Where:

- $\theta$  = Total sampling time, min
- $\theta_i$  = Length of recording interval, min
- $V_{mi}$  = Volume of gas sample measured by the dry gas meter during the "ith" time interval, dcf
- $V_m$  = Volume of gas sample as measured by dry gas meter, dcf
- $V_{si}$  = Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
- $V_s$  = Average gas velocity in the dilution tunnel, ft/sec
- $T_{mi}$  = Absolute average dry gas meter temperature during the "ith" time interval, °R
- $T_m$  = Absolute average dry gas meter temperature, °R
- $T_{si}$  = Absolute average gas temperature in the dilution tunnel during the "ith" time interval, °R
- $T_s$  = Absolute average gas temperature in the dilution tunnel, °R

Sample calculation (for the first 1 minute interval of Train 1):

$$PR = \left( \frac{522 \times 0.1628 \times 13.74 \times (75.9 + 460) \times (71.4 + 460)}{1 \times 84.97 \times 13.73 \times (76.9 + 460) \times (68.1 + 460)} \right) \times 100$$

$$PR = \underline{101} \%$$

**PM<sub>R</sub> – Particulate emissions for test run, g/hr**

ASTM E2780 equation (6)

$$PM_R = 60 (E_T/\theta)$$

Where,

$E_T$  = Total particulate emissions, grams

$\theta$  = Total length of full integrated test run, min

Sample Calculation:

$$E_T \text{ (Dual train average)} = 1.86 \text{ g}$$

$$\theta = 522 \text{ min}$$

$$PM_R = 60 \times ( 1.86 / 522 )$$

$$PM_R = \mathbf{0.21} \text{ g/hr}$$

**PM<sub>F</sub> – Particulate emission factor for test run, g/dry kg of fuel burned**  
ASTM E2780 equation (7)

$$PM_F = E_T / M_{FTAdb}$$

Sample Calculation:

$$\begin{aligned} E_T \text{ (Dual train average)} &= 1.86 \text{ g} \\ M_{Bdb} &= 6.94 \text{ kg} \\ \\ PM_F &= 1.86 / 6.94 \\ \\ PM_F &= \mathbf{0.27} \text{ g/kg} \end{aligned}$$

**WOOD STOVE TEST DATA PACKET**  
**ASTM E2780/E2515**



**Run 1 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/8/2018

A handwritten signature in black ink, appearing to be "JL", is written over a horizontal line.

Techician Signature

10/23/2018

Date



## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 1

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/8/2018

<b>Burn Rate (kg/hr):</b>	<b>0.80</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	84.970	56.425	9.767
Average Gas Velocity in Dilution Tunnel (ft/sec)	13.7			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	8977.9			
Average Gas Meter Temperature (°F)	67.7	71.4	71.7	69.5
Total Sample Volume (dscf)	0.000	81.230	53.699	9.371
Average Tunnel Temperature (°F)	76.9			
Total Time of Test (min)	522			
Total Particulate Catch (mg)	0.0	1.6	1.5	0.6
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000197	0.0000279	0.0000640
Total PM Emissions (g)	0.00	1.54	2.18	0.57
Particulate Emission Rate (g/hr)	0.00	0.18	0.25	0.57
Emissions Factor (g/kg)	-	0.22	0.31	-
Difference from Average Total Particulate Emissions (g)	-	0.32	0.32	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

Final Average Results	
Total Particulate Emissions (g)	1.86
Particulate Emission Rate (g/hr)	0.21
Emissions Factor (g/kg)	0.27
HHV Efficiency (%)	80.6%
LHV Efficiency (%)	87.1%
CO Emissions (g/min)	0.29

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	71.7	OK
Face Velocity	< 30 ft/min	8.7	OK
Leakage Rate	Less than 4% of average sample rate	0.003 cfm	OK
Ambient Temp	55-90 °F	Min: 65.41 / Max: 69.94	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	33.0	OK

## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/08/18  
**Run:** 1  
**Control #:** 18-421  
**Test Duration:** 522  
**Output Category:** 1

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	80.6%	87.1%
<b>Combustion Efficiency</b>	98.7%	98.7%
<b>Heat Transfer Efficiency</b>	81.7%	88.3%

<b>Output Rate (kJ/h)</b>	12,677	12,026	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.79	1.75	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	15,735	14,926	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.91	15.23	<b>dry lb</b>
<b>MC wet (%)</b>	18.82		
<b>MC dry (%)</b>	23.18		
<b>Particulate (g )</b>	1.86		
<b>CO (g)</b>	150		
<b>Test Duration (h)</b>	8.70		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.02	1.36
<b>g/kg Dry Fuel</b>	0.27	21.64
<b>g/h</b>	0.21	17.19
<b>g/min</b>	0.00	0.29
<b>lb/MM Btu Output</b>	0.04	3.15

<b>Air/Fuel Ratio (A/F)</b>	11.92
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	22.7		2x4	17.00	24.3
2x4	17.00	19.1		2x4	17.00	20.3
2x4	17.00	24.8				
2x4	17.00	24.2				
2x4	17.00	19.3				
2x4	17.00	21.6				
2x4	17.00	25.4				
2x4	17.00	22.0				
Total Fuel Weight (lbs):		19.76		Average Moisture (%DB):		22.4

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.58  
 Total 4x4 Crib Weight, with spacers (lbs): 9.18  
 Total Wet Fuel Weight, with spacers (lbs): 18.76

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.75  
 Max (lbs): 4.69

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	17.00	1.84	25.4	23.8	24.9	1.48
2x4	17.00	1.76	24.9	22.2	23.2	1.43
2x4	17.00	2.08	23.8	23.1	23.3	1.69
2x4	17.00	2.00	22.4	21.9	22.0	1.64
4x4	17.00	4.14	25.7	22.3	24.6	3.33
4x4	17.00	4.12	23.4	19.1	21.2	3.40
Total Dry Weight, no spacers (lbs):						12.96
Total Dry Weight, with spacers (lbs):						15.30

Spacer Moisture Readings (%DB)							
22.1	21.3	23.2	22.7	18.7	16.1		
16.2	16.4	21.1	22.8	24.9	22.3		
18.8	22.1	22.3	15.9	24.6	24.1		
22.3	21.3	21.1	16.1	15.1	21.3		

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	28.9	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.45	OK
2x4 Fuel Mix	35 - 65 % of total weight	51%	OK

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018Preburn Start Time: 9:50Recording Interval (min): 1Run Time (min): 107

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	4.7	-0.040	728	686	301	533	613	572.3	442	1000	66
1	4.7	-0.030	723	685	323	537	616	576.6	438	978	66
2	4.7	-0.030	715	679	327	533	619	574.4	437	963	66
3	4.6	-0.030	704	670	328	531	620	570.7	436	957	66
4	4.6	-0.030	692	660	328	528	621	565.5	436	952	65
5	4.6	-0.030	678	648	325	524	621	559.2	434	946	66
6	4.6	-0.030	665	636	322	520	620	552.7	432	936	65
7	4.6	-0.030	652	625	319	515	618	545.8	429	922	65
8	4.6	-0.020	639	613	316	510	616	539.1	425	908	65
9	4.6	-0.020	627	602	313	504	613	531.9	421	894	66
10	4.6	-0.020	615	591	311	497	610	524.9	417	879	66
11	4.6	-0.020	603	580	307	491	607	517.8	413	865	65
12	4.6	-0.020	592	570	303	486	603	511.1	408	851	65
13	4.6	-0.020	581	560	300	479	600	504.0	403	838	65
14	4.6	-0.020	571	551	296	472	596	497.1	398	825	65
15	4.6	-0.020	561	541	294	466	592	490.8	393	812	66
16	4.6	-0.020	551	533	291	460	588	484.3	388	800	66
17	4.6	-0.020	541	524	289	453	583	478.1	383	788	66
18	4.6	-0.020	532	515	286	448	579	472.0	378	777	66
19	4.7	-0.020	523	507	283	440	575	465.4	372	765	66
20	4.6	-0.020	514	499	281	434	570	459.6	367	754	66
21	4.6	-0.020	506	491	277	428	566	453.7	362	744	66
22	4.6	-0.020	498	484	274	421	562	447.6	358	733	66
23	4.7	-0.020	489	476	272	416	557	442.2	353	723	65
24	4.6	-0.020	482	469	271	411	553	437.1	348	714	65
25	4.7	-0.020	474	462	269	405	549	431.8	343	704	65
26	4.7	-0.020	467	455	266	400	544	426.3	339	696	65
27	4.7	-0.020	460	449	264	394	540	421.3	335	687	66
28	4.7	-0.020	453	442	260	389	535	416.1	331	679	65
29	4.7	-0.020	447	436	258	384	531	411.0	327	672	66
30	4.7	-0.020	440	430	255	379	526	405.9	323	664	65
31	4.7	-0.020	433	424	253	374	522	401.2	319	656	66
32	4.7	-0.020	428	418	250	369	517	396.4	315	648	65
33	4.7	-0.020	421	413	248	364	513	391.7	311	641	65
34	4.7	-0.020	415	407	245	359	509	387.1	307	633	65
35	4.7	-0.020	410	401	242	355	505	382.6	304	626	65
36	4.7	-0.020	404	396	240	350	500	378.1	300	619	65
37	4.8	-0.020	398	391	238	346	496	373.8	296	611	65
38	4.8	-0.020	393	386	235	342	492	369.5	293	604	66
39	4.7	-0.010	387	381	234	338	488	365.5	289	598	66
40	4.7	-0.020	382	376	231	334	484	361.3	286	592	65
41	4.7	-0.020	377	371	229	330	480	357.4	283	586	65
42	4.7	-0.010	372	367	227	326	476	353.5	280	580	65
43	4.8	-0.010	368	362	225	322	471	349.8	276	574	65
44	4.7	-0.010	363	358	224	318	467	346.1	273	568	65

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018Preburn Start Time: 9:50Recording Interval (min): 1Run Time (min): 107

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	4.8	-0.010	358	353	221	315	463	342.2	271	563	66
46	4.8	-0.010	354	349	220	311	459	338.7	268	560	65
47	4.9	-0.010	350	345	217	307	456	335.0	265	556	65
48	4.9	-0.010	345	341	216	304	451	331.5	262	555	66
49	4.7	-0.010	341	337	213	301	448	328.0	260	555	65
50	4.8	-0.010	337	333	211	298	444	324.9	257	558	65
51	4.8	-0.010	333	330	209	296	440	321.7	255	563	65
52	4.7	-0.020	329	326	208	294	436	318.8	253	569	65
53	4.8	-0.020	326	322	207	293	433	316.2	251	575	66
54	4.7	-0.020	322	319	206	291	430	313.4	249	585	65
55	4.7	-0.020	318	315	204	291	426	310.8	247	596	65
56	4.7	-0.020	314	312	203	290	424	308.6	246	603	65
57	4.7	-0.020	311	309	202	289	421	306.4	245	600	65
58	4.7	-0.020	308	307	201	287	419	304.2	244	587	65
59	4.7	-0.020	306	304	200	284	417	302.2	242	574	65
60	4.8	-0.020	303	302	200	283	415	300.7	241	566	65
61	4.7	-0.020	301	300	199	282	413	299.1	241	563	65
62	4.7	-0.020	299	298	198	280	412	297.6	240	563	65
63	4.7	-0.020	298	296	198	278	411	296.3	239	565	65
64	4.7	-0.020	296	295	197	277	410	295.2	238	566	65
65	4.7	-0.020	296	293	197	276	409	294.2	238	569	65
66	4.7	-0.020	295	292	197	275	409	293.5	238	571	65
67	4.7	-0.020	294	291	197	273	408	292.8	238	571	65
68	4.6	-0.020	294	290	197	272	407	292.2	238	572	65
69	4.6	-0.020	293	290	198	272	407	291.8	238	574	65
70	4.6	-0.020	293	289	198	271	407	291.5	238	575	65
71	4.6	-0.020	293	289	198	271	406	291.3	238	575	65
72	4.6	-0.020	292	288	198	270	406	290.9	238	576	65
73	4.6	-0.020	292	288	200	269	406	290.9	239	579	65
74	4.6	-0.020	291	288	200	269	406	291.0	239	582	65
75	4.6	-0.020	291	288	201	269	407	291.2	239	587	65
76	4.6	-0.020	291	288	202	269	407	291.3	240	591	65
77	4.8	-0.020	290	288	202	269	407	291.4	240	596	65
78	4.8	-0.020	290	288	203	269	407	291.5	240	603	65
79	4.8	-0.020	290	288	202	270	408	291.5	240	609	65
80	4.9	-0.020	290	287	203	270	408	291.6	240	614	65
81	4.5	-0.020	290	287	203	271	409	292.0	240	618	65
82	4.5	-0.020	290	287	203	272	409	292.2	241	623	65
83	4.5	-0.020	290	287	203	273	410	292.6	241	628	65
84	4.5	-0.020	289	287	203	273	410	292.6	241	633	65
85	4.5	-0.020	290	287	204	274	411	293.1	241	635	65
86	4.5	-0.020	289	287	204	276	411	293.6	241	638	65
87	4.5	-0.020	289	287	205	276	412	293.7	242	642	65
88	4.4	-0.020	289	287	205	276	412	293.7	242	646	65
89	4.4	-0.020	289	287	205	278	413	294.2	242	650	65

## WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Preburn Start Time: 9:50  
 Recording Interval (min): 1  
 Run Time (min): 107

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
90	4.4	-0.020	289	287	205	279	413	294.6	242	653	65
91	4.5	-0.020	289	287	206	280	414	294.8	243	658	65
92	4.4	-0.020	288	287	206	281	414	295.1	243	662	65
93	4.4	-0.020	288	287	206	282	414	295.6	243	665	65
94	4.4	-0.020	288	287	206	283	414	295.6	243	668	65
95	4.4	-0.020	288	287	206	284	414	295.8	244	672	65
96	4.4	-0.020	287	287	207	285	414	296.0	244	676	65
97	4.4	-0.020	287	287	207	285	414	296.1	244	679	66
98	4.4	-0.020	287	287	208	287	414	296.4	244	682	66
99	4.3	-0.020	287	287	208	288	414	296.5	244	685	66
100	4.3	-0.020	286	287	207	289	414	296.5	245	689	65
101	4.3	-0.020	286	287	208	290	413	296.9	245	692	66
102	4.3	-0.020	286	287	208	291	413	297.1	245	694	66
103	4.3	-0.020	286	287	209	292	413	297.1	245	693	65
104	4.3	-0.020	286	287	209	293	412	297.3	245	691	65
105	4.3	-0.020	285	287	209	293	411	297.2	245	689	66
106	4.3	-0.020	285	288	209	293	410	297.0	245	688	65
107	4.2	-0.020	285	288	209	293	410	296.8	245	688	66

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1  
 Test Start Time: 11:39

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Total Sampling Time (min): 522  
 Recording Interval (min): 1

Meter Box  $\gamma$  Factor: 1.002 (A)  
 Meter Box  $\gamma$  Factor: 0.998 (B)  
 Meter Box  $\gamma$  Factor: 0.000 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100%  
 Date Flue Pipe Last Cleaned: 10/7/2018

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	28.75	28.66
Relative Humidity (%)	37.0	37.6
Room Air Velocity (ft/min)	0	0
Scale Audit (lbs)	10.0	10.0
Ambient Sample Volume:		0.000 ft <sup>3</sup>

**Sample Train Post-Test Leak Checks**

(A)	<u>0.002</u>	cfm @	<u>-18</u> in. Hg
(B)	<u>0.003</u>	cfm @	<u>-17</u> in. Hg
(Ambient)	<u>0.000</u>	cfm @	<u>0</u> in. Hg

### DILUTION TUNNEL FLOW

#### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.034	74
2	0.048	74
3	0.044	74
4	0.030	74
5	0.028	74
6	0.044	74
7	0.051	74
8	0.038	74
Center	0.052	74

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 6 inches  
 Pitot Tube Cp: 0.99 [unitless]  
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole  
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole  
 Tunnel Area: 0.1963 ft<sup>2</sup>

$V_{strav}$ : 13.70 ft/sec  
 $V_{scent}$ : 15.51 ft/sec  
 $F_p$ : 0.883 [ratio]

Initial Tunnel Flow: 147.5 scf/min

Static Pressure: -0.200 in. H<sub>2</sub>O

### TEST FUEL PROPERTIES

#### Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

#### Actual Fuel Used Properties

Fuel Type:	<u>D. Fir</u>
HHV (kJ/kg)	<u>19,810</u>
%C	<u>48.73</u>
%H	<u>6.87</u>
%O	<u>43.9</u>
%Ash	<u>0.5</u>
MC (%DB)	<u>23.2</u>

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.052	0.50	68	-0.5		18.8		83	247	68	66
1	0.163	0.163	0.052	0.50	68	-0.5	101	18.7	-0.03	76	245	68	65
2	0.326	0.163	0.052	0.50	68	-0.5	100	18.7	-0.01	75	243	68	66
3	0.488	0.163	0.052	0.50	68	-0.5	100	18.7	-0.01	74	240	68	66
4	0.651	0.163	0.052	0.50	68	-0.5	100	18.7	-0.03	74	237	68	66
5	0.814	0.163	0.052	0.50	68	-0.5	100	18.7	-0.03	74	235	68	66
6	0.977	0.163	0.052	0.50	69	-0.5	100	18.6	-0.01	74	232	68	66
7	1.139	0.163	0.052	0.50	69	-0.5	100	18.6	-0.02	74	230	68	66
8	1.302	0.163	0.052	0.50	69	-0.5	100	18.6	-0.03	74	228	68	66
9	1.465	0.163	0.052	0.50	69	-0.5	100	18.6	-0.03	74	226	68	66
10	1.628	0.163	0.052	0.50	69	-0.5	100	18.5	-0.04	74	225	68	66
11	1.791	0.163	0.052	0.50	69	-0.5	100	18.5	-0.05	74	223	69	66
12	1.953	0.163	0.052	0.50	69	-0.5	100	18.4	-0.04	74	222	69	66
13	2.116	0.163	0.052	0.50	69	-0.5	100	18.4	-0.03	75	221	69	66
14	2.279	0.163	0.052	0.50	69	-0.5	100	18.3	-0.06	75	220	69	67
15	2.442	0.163	0.052	0.50	69	-0.5	100	18.3	-0.02	75	219	69	66
16	2.604	0.163	0.052	0.50	69	-0.5	100	18.2	-0.09	75	218	69	66
17	2.767	0.163	0.052	0.50	69	-0.5	100	18.2	-0.07	75	218	69	66
18	2.930	0.163	0.052	0.50	69	-0.5	100	18.1	-0.05	75	218	69	67
19	3.093	0.163	0.052	0.50	69	-0.5	100	18.1	-0.06	76	217	69	66
20	3.256	0.163	0.052	0.50	69	-0.5	100	18.0	-0.06	76	217	69	66
21	3.418	0.163	0.052	0.50	69	-0.5	100	17.9	-0.08	76	217	69	66
22	3.581	0.163	0.052	0.50	69	-0.5	100	17.9	-0.06	76	217	69	66
23	3.744	0.163	0.052	0.50	69	-0.5	100	17.8	-0.08	76	218	69	67
24	3.907	0.163	0.052	0.50	69	-0.5	100	17.7	-0.07	77	218	69	67
25	4.069	0.163	0.052	0.50	69	-0.5	100	17.6	-0.08	77	219	69	67
26	4.232	0.163	0.052	0.50	69	-0.5	100	17.6	-0.06	77	219	69	66
27	4.395	0.163	0.052	0.50	69	-0.5	100	17.5	-0.07	77	220	69	67
28	4.558	0.163	0.052	0.50	69	-0.5	100	17.4	-0.09	78	220	70	67
29	4.721	0.163	0.052	0.50	69	-0.5	100	17.3	-0.06	78	221	70	67
30	4.883	0.163	0.052	0.50	70	-0.5	100	17.3	-0.08	78	221	70	67
31	5.046	0.163	0.052	0.50	70	-0.5	100	17.2	-0.08	78	222	70	67



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	5.209	0.163	0.052	0.50	70	-0.5	100	17.1	-0.08	78	223	70	67
33	5.372	0.163	0.052	0.50	70	-0.5	100	17.0	-0.06	79	223	70	67
34	5.534	0.163	0.052	0.50	70	-0.5	101	17.0	-0.09	79	224	70	67
35	5.697	0.163	0.052	0.50	70	-0.5	101	16.9	-0.09	79	225	70	67
36	5.860	0.163	0.052	0.50	70	-0.5	101	16.8	-0.09	79	227	70	67
37	6.023	0.163	0.052	0.50	70	-0.5	101	16.7	-0.08	79	228	70	67
38	6.186	0.163	0.052	0.50	70	-0.5	101	16.6	-0.07	79	230	70	67
39	6.348	0.163	0.052	0.50	70	-0.5	101	16.5	-0.08	80	231	70	67
40	6.511	0.163	0.052	0.50	70	-0.5	101	16.5	-0.07	80	233	70	67
41	6.674	0.163	0.052	0.50	70	-0.5	100	16.4	-0.09	79	234	70	67
42	6.837	0.163	0.052	0.50	70	-0.5	100	16.3	-0.06	79	234	70	67
43	6.999	0.163	0.052	0.50	70	-0.5	100	16.3	-0.05	79	235	70	67
44	7.162	0.163	0.052	0.50	70	-0.5	100	16.2	-0.08	79	235	70	67
45	7.325	0.163	0.052	0.50	70	-0.5	100	16.1	-0.07	79	236	70	67
46	7.488	0.163	0.052	0.50	70	-0.5	100	16.1	-0.06	79	236	70	67
47	7.651	0.163	0.052	0.50	70	-0.5	100	16.0	-0.07	79	237	70	67
48	7.813	0.163	0.052	0.50	70	-0.5	100	15.9	-0.06	79	237	70	67
49	7.976	0.163	0.052	0.50	70	-0.5	100	15.9	-0.07	79	238	70	67
50	8.139	0.163	0.052	0.50	70	-0.5	100	15.8	-0.08	79	239	70	67
51	8.302	0.163	0.052	0.50	70	-0.5	100	15.7	-0.07	79	240	70	67
52	8.464	0.163	0.052	0.50	70	-0.5	100	15.6	-0.09	80	242	70	67
53	8.627	0.163	0.052	0.50	70	-0.5	101	15.5	-0.1	80	244	70	67
54	8.790	0.163	0.052	0.50	70	-0.5	101	15.4	-0.09	80	247	70	67
55	8.953	0.163	0.052	0.50	70	-0.5	101	15.3	-0.1	80	250	70	67
56	9.116	0.163	0.052	0.50	70	-0.5	101	15.3	-0.08	81	253	70	67
57	9.278	0.163	0.052	0.50	70	-0.5	101	15.1	-0.11	81	256	70	66
58	9.441	0.163	0.052	0.50	70	-0.5	101	15.1	-0.09	81	260	70	67
59	9.604	0.163	0.052	0.50	70	-0.5	101	15.0	-0.08	81	263	70	67
60	9.767	0.163	0.052	0.50	70	-0.5	101	14.9	-0.08	81	266	70	67
61	9.929	0.163	0.052	0.50	70	-0.5	101	14.8	-0.1	81	269	70	67
62	10.092	0.163	0.052	0.50	70	-0.5	101	14.7	-0.07	81	272	70	67
63	10.255	0.163	0.052	0.50	70	-0.5	101	14.6	-0.09	81	274	71	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.418	0.163	0.052	0.50	70	-0.5	101	14.6	-0.07	81	276	71	67
65	10.581	0.163	0.052	0.50	71	-0.5	101	14.5	-0.08	81	278	71	67
66	10.743	0.163	0.052	0.50	71	-0.5	101	14.4	-0.08	81	281	71	67
67	10.906	0.163	0.052	0.50	71	-0.5	101	14.3	-0.09	81	283	71	67
68	11.069	0.163	0.052	0.50	71	-0.5	101	14.3	-0.05	81	285	71	67
69	11.232	0.163	0.052	0.50	71	-0.5	101	14.2	-0.09	81	287	71	67
70	11.394	0.163	0.052	0.50	71	-0.5	101	14.1	-0.06	81	288	71	67
71	11.557	0.163	0.052	0.50	71	-0.5	101	14.1	-0.06	81	290	71	67
72	11.720	0.163	0.052	0.50	71	-0.5	100	14.0	-0.09	80	291	71	67
73	11.883	0.163	0.052	0.50	71	-0.5	100	13.9	-0.07	80	293	71	67
74	12.046	0.163	0.052	0.50	71	-0.5	100	13.8	-0.07	80	294	71	67
75	12.208	0.163	0.052	0.50	71	-0.5	100	13.8	-0.07	80	295	71	67
76	12.371	0.163	0.052	0.50	71	-0.5	100	13.7	-0.08	80	296	71	67
77	12.534	0.163	0.052	0.50	71	-0.5	100	13.6	-0.08	80	297	71	67
78	12.697	0.163	0.052	0.50	71	-0.5	100	13.5	-0.07	80	298	71	67
79	12.859	0.163	0.052	0.50	71	-0.5	100	13.4	-0.08	80	300	71	67
80	13.022	0.163	0.052	0.50	71	-0.5	100	13.4	-0.08	80	302	71	67
81	13.185	0.163	0.052	0.50	71	-0.5	100	13.3	-0.09	81	303	71	67
82	13.348	0.163	0.052	0.50	71	-0.5	100	13.2	-0.08	80	305	71	67
83	13.511	0.163	0.052	0.50	71	-0.5	100	13.1	-0.09	80	307	71	67
84	13.673	0.163	0.052	0.50	71	-0.5	100	13.0	-0.07	80	308	71	67
85	13.836	0.163	0.052	0.50	71	-0.5	100	12.9	-0.1	80	309	71	67
86	13.999	0.163	0.052	0.50	71	-0.5	100	12.9	-0.07	80	310	71	67
87	14.162	0.163	0.052	0.50	71	-0.5	100	12.8	-0.08	80	310	71	67
88	14.324	0.163	0.052	0.50	71	-0.5	100	12.7	-0.07	80	311	71	67
89	14.487	0.163	0.052	0.50	71	-0.5	100	12.7	-0.06	80	310	71	67
90	14.650	0.163	0.052	0.50	71	-0.5	100	12.6	-0.08	79	310	71	67
91	14.813	0.163	0.052	0.50	71	-0.5	100	12.5	-0.05	79	309	71	67
92	14.976	0.163	0.052	0.50	71	-0.5	100	12.5	-0.06	79	309	71	67
93	15.138	0.163	0.052	0.50	71	-0.5	100	12.4	-0.06	79	308	71	67
94	15.301	0.163	0.052	0.50	71	-0.5	100	12.4	-0.05	79	308	71	67
95	15.464	0.163	0.052	0.50	71	-0.5	100	12.3	-0.08	79	307	71	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.627	0.163	0.052	0.50	71	-0.5	100	12.2	-0.05	79	306	71	67
97	15.789	0.163	0.052	0.50	71	-0.5	100	12.2	-0.04	79	304	71	67
98	15.952	0.163	0.052	0.50	71	-0.5	100	12.1	-0.05	79	303	71	67
99	16.115	0.163	0.052	0.50	71	-0.5	100	12.1	-0.06	78	301	71	67
100	16.278	0.163	0.052	0.50	71	-0.5	100	12.0	-0.03	78	299	71	67
101	16.441	0.163	0.052	0.50	71	-0.5	100	12.0	-0.05	78	297	71	67
102	16.603	0.163	0.052	0.50	71	-0.5	100	12.0	-0.04	78	295	71	67
103	16.766	0.163	0.052	0.50	71	-0.5	100	11.9	-0.04	78	293	71	67
104	16.929	0.163	0.052	0.50	71	-0.5	100	11.9	-0.04	78	291	71	67
105	17.092	0.163	0.052	0.50	71	-0.5	100	11.8	-0.03	78	290	71	67
106	17.254	0.163	0.052	0.50	71	-0.5	100	11.8	-0.06	78	288	71	67
107	17.417	0.163	0.052	0.50	72	-0.5	100	11.7	-0.04	78	286	71	67
108	17.580	0.163	0.052	0.50	71	-0.5	100	11.7	-0.03	78	285	71	67
109	17.743	0.163	0.052	0.50	71	-0.5	100	11.7	-0.04	78	283	71	67
110	17.906	0.163	0.052	0.50	72	-0.5	100	11.6	-0.03	78	282	71	67
111	18.068	0.163	0.052	0.50	72	-0.5	100	11.6	-0.03	77	280	71	67
112	18.231	0.163	0.052	0.50	71	-0.5	100	11.6	-0.04	77	279	71	67
113	18.394	0.163	0.052	0.50	71	-0.5	100	11.5	-0.04	77	277	70	67
114	18.557	0.163	0.052	0.50	72	-0.5	100	11.5	-0.04	77	276	70	67
115	18.719	0.163	0.052	0.50	72	-0.5	100	11.5	-0.03	77	274	70	67
116	18.882	0.163	0.052	0.50	72	-0.5	100	11.4	-0.03	77	273	70	67
117	19.045	0.163	0.052	0.50	72	-0.5	100	11.4	-0.04	77	272	70	67
118	19.208	0.163	0.052	0.50	72	-0.5	100	11.4	-0.03	77	270	70	68
119	19.371	0.163	0.052	0.50	72	-0.5	100	11.3	-0.03	77	269	70	67
120	19.533	0.163	0.052	0.50	72	-0.5	100	11.3	-0.05	77	268	70	67
121	19.696	0.163	0.052	0.50	72	-0.5	100	11.2	-0.05	77	267	70	67
122	19.859	0.163	0.052	0.50	72	-0.5	100	11.2	-0.05	77	266	70	67
123	20.022	0.163	0.052	0.50	72	-0.5	100	11.1	-0.05	78	266	70	67
124	20.184	0.163	0.052	0.50	72	-0.5	100	11.1	-0.02	77	265	70	67
125	20.347	0.163	0.052	0.50	72	-0.5	100	11.1	-0.04	77	264	70	68
126	20.510	0.163	0.052	0.50	72	-0.5	100	11.0	-0.04	77	263	70	67
127	20.673	0.163	0.052	0.50	72	-0.5	100	11.0	-0.03	77	263	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.836	0.163	0.052	0.50	72	-0.5	100	11.0	-0.04	77	262	70	68
129	20.998	0.163	0.052	0.50	72	-0.5	100	10.9	-0.03	78	262	70	68
130	21.161	0.163	0.052	0.50	72	-0.5	100	10.9	-0.05	77	262	70	67
131	21.324	0.163	0.052	0.50	72	-0.5	100	10.8	-0.05	78	261	70	68
132	21.487	0.163	0.052	0.50	72	-0.5	100	10.8	-0.04	78	261	70	67
133	21.649	0.163	0.052	0.50	72	-0.5	100	10.8	-0.04	78	261	70	67
134	21.812	0.163	0.052	0.50	72	-0.5	100	10.7	-0.04	77	261	70	67
135	21.975	0.163	0.052	0.50	72	-0.5	100	10.7	-0.04	77	262	70	67
136	22.138	0.163	0.052	0.50	71	-0.5	100	10.6	-0.04	78	262	70	68
137	22.301	0.163	0.052	0.50	71	-0.5	100	10.6	-0.05	78	262	70	68
138	22.463	0.163	0.052	0.50	71	-0.5	100	10.6	-0.03	78	263	70	68
139	22.626	0.163	0.052	0.50	71	-0.5	100	10.5	-0.06	78	263	70	68
140	22.789	0.163	0.052	0.50	71	-0.5	100	10.4	-0.05	78	264	70	67
141	22.952	0.163	0.052	0.50	71	-0.5	100	10.4	-0.04	78	264	70	67
142	23.114	0.163	0.052	0.50	71	-0.5	100	10.4	-0.04	78	265	70	67
143	23.277	0.163	0.052	0.50	71	-0.5	100	10.3	-0.04	78	265	70	67
144	23.440	0.163	0.052	0.50	71	-0.5	100	10.3	-0.06	78	266	70	67
145	23.603	0.163	0.052	0.50	71	-0.5	100	10.2	-0.04	78	267	70	67
146	23.766	0.163	0.052	0.50	71	-0.5	100	10.2	-0.06	78	267	70	67
147	23.928	0.163	0.052	0.50	71	-0.5	100	10.1	-0.05	78	268	70	67
148	24.091	0.163	0.052	0.50	71	-0.5	100	10.1	-0.02	78	270	70	67
149	24.254	0.163	0.052	0.50	71	-0.5	100	10.0	-0.07	78	271	70	67
150	24.417	0.163	0.052	0.50	71	-0.5	100	10.0	-0.05	78	272	70	67
151	24.579	0.163	0.052	0.50	71	-0.5	100	9.9	-0.05	78	273	70	67
152	24.742	0.163	0.052	0.50	71	-0.5	100	9.9	-0.07	78	274	70	68
153	24.905	0.163	0.052	0.50	71	-0.5	100	9.8	-0.04	78	276	70	67
154	25.068	0.163	0.052	0.50	71	-0.5	100	9.8	-0.05	79	277	70	67
155	25.231	0.163	0.052	0.50	71	-0.5	100	9.7	-0.06	79	278	70	67
156	25.393	0.163	0.052	0.50	71	-0.5	100	9.7	-0.04	79	280	70	67
157	25.556	0.163	0.052	0.50	71	-0.5	100	9.6	-0.06	79	281	70	67
158	25.719	0.163	0.052	0.50	71	-0.5	100	9.5	-0.06	79	283	70	67
159	25.882	0.163	0.052	0.50	71	-0.5	100	9.5	-0.06	79	284	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	26.044	0.163	0.052	0.50	71	-0.5	100	9.4	-0.06	79	286	70	67
161	26.207	0.163	0.052	0.50	71	-0.5	100	9.4	-0.06	79	288	70	67
162	26.370	0.163	0.052	0.50	71	-0.5	100	9.3	-0.05	79	289	70	67
163	26.533	0.163	0.052	0.50	71	-0.5	100	9.3	-0.06	79	291	70	67
164	26.696	0.163	0.052	0.50	71	-0.5	100	9.2	-0.07	79	293	70	67
165	26.858	0.163	0.052	0.50	71	-0.5	100	9.1	-0.07	79	295	70	66
166	27.021	0.163	0.052	0.50	71	-0.5	100	9.0	-0.08	80	297	70	67
167	27.184	0.163	0.052	0.50	71	-0.5	100	8.9	-0.09	80	300	70	67
168	27.347	0.163	0.052	0.50	71	-0.5	100	8.9	-0.09	80	302	70	67
169	27.509	0.163	0.052	0.50	71	-0.5	100	8.8	-0.09	80	305	70	67
170	27.672	0.163	0.052	0.50	71	-0.5	100	8.7	-0.1	80	308	70	67
171	27.835	0.163	0.052	0.50	71	-0.5	100	8.6	-0.1	80	312	70	67
172	27.998	0.163	0.052	0.50	71	-0.5	100	8.5	-0.08	80	314	70	67
173	28.161	0.163	0.052	0.50	71	-0.5	100	8.4	-0.11	80	317	70	67
174	28.323	0.163	0.052	0.50	71	-0.5	100	8.3	-0.09	80	320	70	67
175	28.486	0.163	0.052	0.50	71	-0.5	100	8.2	-0.08	80	322	70	67
176	28.649	0.163	0.052	0.50	71	-0.5	100	8.1	-0.07	79	324	70	67
177	28.812	0.163	0.052	0.50	71	-0.5	100	8.1	-0.07	79	325	70	67
178	28.974	0.163	0.052	0.50	71	-0.5	100	8.0	-0.05	79	326	70	67
179	29.137	0.163	0.052	0.50	71	-0.5	100	8.0	-0.05	79	327	70	67
180	29.300	0.163	0.052	0.50	71	-0.5	100	7.9	-0.04	78	327	70	67
181	29.463	0.163	0.052	0.50	71	-0.5	100	7.9	-0.05	78	328	70	67
182	29.626	0.163	0.052	0.50	71	-0.5	100	7.8	-0.05	78	328	70	67
183	29.788	0.163	0.052	0.50	71	-0.5	100	7.7	-0.14	78	327	70	67
184	29.951	0.163	0.052	0.50	71	-0.5	100	7.7	0.05	77	327	70	67
185	30.114	0.163	0.052	0.50	71	-0.5	100	7.7	-0.03	77	326	70	66
186	30.277	0.163	0.052	0.50	71	-0.5	100	7.7	-0.04	77	325	70	66
187	30.439	0.163	0.052	0.50	71	-0.5	100	7.6	-0.05	77	324	70	66
188	30.602	0.163	0.052	0.50	71	-0.5	100	7.6	-0.03	77	323	69	66
189	30.765	0.163	0.052	0.50	71	-0.5	100	7.5	-0.05	77	322	69	66
190	30.928	0.163	0.052	0.50	71	-0.5	100	7.5	-0.03	77	321	69	66
191	31.091	0.163	0.052	0.50	71	-0.5	100	7.5	-0.05	77	319	69	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	31.253	0.163	0.052	0.50	71	-0.5	100	7.4	-0.04	76	318	69	66
193	31.416	0.163	0.052	0.50	71	-0.5	100	7.4	-0.04	76	317	69	67
194	31.579	0.163	0.052	0.50	71	-0.5	100	7.3	-0.03	77	315	69	67
195	31.742	0.163	0.052	0.50	71	-0.5	100	7.3	-0.03	77	314	70	67
196	31.904	0.163	0.052	0.50	71	-0.5	100	7.3	-0.05	77	313	70	67
197	32.067	0.163	0.052	0.50	71	-0.5	100	7.2	-0.03	76	311	70	67
198	32.230	0.163	0.052	0.50	71	-0.5	100	7.2	-0.03	76	310	70	67
199	32.393	0.163	0.052	0.50	71	-0.5	100	7.2	-0.03	76	308	70	67
200	32.556	0.163	0.052	0.50	71	-0.5	100	7.1	-0.03	76	307	70	67
201	32.718	0.163	0.052	0.50	71	-0.5	100	7.1	-0.02	76	305	70	68
202	32.881	0.163	0.052	0.50	71	-0.5	100	7.1	-0.03	76	304	70	68
203	33.044	0.163	0.052	0.50	71	-0.5	100	7.1	-0.02	76	302	70	68
204	33.207	0.163	0.052	0.50	71	-0.5	100	7.1	-0.02	76	300	70	68
205	33.369	0.163	0.052	0.50	71	-0.5	100	7.0	-0.05	76	299	70	68
206	33.532	0.163	0.052	0.50	71	-0.5	100	7.0	-0.01	76	297	70	68
207	33.695	0.163	0.052	0.50	71	-0.5	100	7.0	-0.04	76	295	69	68
208	33.858	0.163	0.052	0.50	71	-0.5	100	6.9	-0.03	75	293	69	68
209	34.021	0.163	0.052	0.50	71	-0.5	100	6.9	0	75	292	69	67
210	34.183	0.163	0.052	0.50	71	-0.5	100	6.9	-0.04	75	290	69	68
211	34.346	0.163	0.052	0.50	71	-0.5	100	6.9	-0.03	75	289	69	68
212	34.509	0.163	0.052	0.50	71	-0.5	100	6.8	-0.03	75	287	69	68
213	34.672	0.163	0.052	0.50	71	-0.5	100	6.8	-0.02	76	286	69	68
214	34.834	0.163	0.052	0.50	71	-0.5	100	6.8	-0.03	75	285	69	68
215	34.997	0.163	0.052	0.50	71	-0.5	100	6.7	-0.03	75	284	69	68
216	35.160	0.163	0.052	0.50	71	-0.5	100	6.7	-0.03	76	283	69	68
217	35.323	0.163	0.052	0.50	71	-0.5	100	6.7	-0.03	76	282	69	68
218	35.486	0.163	0.052	0.50	71	-0.5	100	6.6	-0.04	76	282	70	68
219	35.648	0.163	0.052	0.50	71	-0.5	100	6.6	-0.02	76	281	69	68
220	35.811	0.163	0.052	0.50	71	-0.5	100	6.6	-0.04	76	281	70	68
221	35.974	0.163	0.052	0.50	71	-0.5	100	6.6	-0.02	76	281	70	68
222	36.137	0.163	0.052	0.50	71	-0.5	100	6.5	-0.04	76	281	70	68
223	36.299	0.163	0.052	0.50	71	-0.5	100	6.5	-0.05	77	281	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.462	0.163	0.052	0.50	71	-0.5	100	6.4	-0.04	76	281	70	68
225	36.625	0.163	0.052	0.50	71	-0.5	100	6.4	-0.03	77	281	70	68
226	36.788	0.163	0.052	0.50	71	-0.5	100	6.4	-0.04	77	282	70	68
227	36.951	0.163	0.052	0.50	71	-0.5	100	6.3	-0.04	77	283	70	68
228	37.113	0.163	0.052	0.50	71	-0.5	100	6.3	-0.05	77	284	70	68
229	37.276	0.163	0.052	0.50	71	-0.5	100	6.2	-0.05	77	284	70	68
230	37.439	0.163	0.052	0.50	71	-0.5	100	6.2	-0.06	77	285	70	68
231	37.602	0.163	0.052	0.50	71	-0.5	100	6.1	-0.04	77	286	70	68
232	37.764	0.163	0.052	0.50	71	-0.5	100	6.1	-0.04	77	287	70	68
233	37.927	0.163	0.052	0.50	71	-0.5	100	6.0	-0.06	77	289	70	68
234	38.090	0.163	0.052	0.50	72	-0.5	100	6.0	-0.04	77	290	70	68
235	38.253	0.163	0.052	0.50	72	-0.5	100	5.9	-0.05	77	291	70	68
236	38.416	0.163	0.052	0.50	72	-0.5	100	5.9	-0.05	77	292	70	68
237	38.578	0.163	0.052	0.50	72	-0.5	100	5.8	-0.06	77	293	70	68
238	38.741	0.163	0.052	0.50	72	-0.5	100	5.8	-0.06	77	294	70	68
239	38.904	0.163	0.052	0.50	72	-0.5	100	5.7	-0.05	77	295	70	68
240	39.067	0.163	0.052	0.50	72	-0.5	100	5.7	-0.05	78	296	70	68
241	39.229	0.163	0.052	0.50	72	-0.5	100	5.6	-0.06	78	297	70	68
242	39.392	0.163	0.052	0.50	72	-0.5	100	5.6	-0.05	78	299	70	68
243	39.555	0.163	0.052	0.50	72	-0.5	100	5.5	-0.05	78	300	70	68
244	39.718	0.163	0.052	0.50	72	-0.5	100	5.4	-0.06	78	301	70	69
245	39.881	0.163	0.052	0.50	72	-0.5	100	5.4	-0.05	78	302	70	69
246	40.043	0.163	0.052	0.50	72	-0.5	100	5.3	-0.05	78	303	70	68
247	40.206	0.163	0.052	0.50	72	-0.5	100	5.3	-0.05	78	304	70	68
248	40.369	0.163	0.052	0.50	72	-0.5	100	5.3	-0.03	78	305	70	69
249	40.532	0.163	0.052	0.50	72	-0.5	100	5.2	-0.05	78	306	70	69
250	40.694	0.163	0.052	0.50	72	-0.5	100	5.1	-0.07	78	307	70	68
251	40.857	0.163	0.052	0.50	72	-0.5	100	5.1	-0.03	78	307	70	69
252	41.020	0.163	0.052	0.50	72	-0.5	100	5.1	-0.05	78	308	70	69
253	41.183	0.163	0.052	0.50	72	-0.5	100	5.0	-0.03	78	308	70	69
254	41.346	0.163	0.052	0.50	72	-0.5	100	5.0	-0.07	78	309	70	69
255	41.508	0.163	0.052	0.50	72	-0.5	100	4.9	-0.05	78	309	70	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.671	0.163	0.052	0.50	72	-0.5	100	4.9	-0.06	78	310	71	69
257	41.834	0.163	0.052	0.50	72	-0.5	100	4.8	-0.06	78	310	71	69
258	41.997	0.163	0.052	0.50	72	-0.5	100	4.8	-0.03	78	310	71	69
259	42.159	0.163	0.052	0.50	72	-0.5	100	4.7	-0.03	78	309	71	69
260	42.322	0.163	0.052	0.50	72	-0.5	100	4.7	-0.03	78	309	71	69
261	42.485	0.163	0.052	0.50	72	-0.5	100	4.7	-0.04	78	309	71	70
262	42.648	0.163	0.052	0.50	72	-0.5	100	4.6	-0.04	77	308	71	69
263	42.811	0.163	0.052	0.50	72	-0.5	100	4.6	-0.04	78	307	71	69
264	42.973	0.163	0.052	0.50	72	-0.5	100	4.6	-0.01	77	306	71	69
265	43.136	0.163	0.052	0.50	72	-0.5	100	4.5	-0.03	77	305	71	69
266	43.299	0.163	0.052	0.50	72	-0.5	100	4.5	-0.02	77	304	71	69
267	43.462	0.163	0.052	0.50	72	-0.5	100	4.5	-0.02	77	303	71	69
268	43.624	0.163	0.052	0.50	72	-0.5	100	4.5	-0.03	77	302	71	70
269	43.787	0.163	0.052	0.50	72	-0.5	100	4.5	-0.02	77	300	71	69
270	43.950	0.163	0.052	0.50	72	-0.5	100	4.4	-0.04	77	299	71	69
271	44.113	0.163	0.052	0.50	72	-0.5	100	4.4	-0.01	77	297	71	69
272	44.276	0.163	0.052	0.50	73	-0.5	100	4.4	-0.03	77	296	71	69
273	44.438	0.163	0.052	0.50	73	-0.5	100	4.4	-0.02	77	294	71	69
274	44.601	0.163	0.052	0.50	73	-0.5	100	4.3	-0.02	77	293	71	69
275	44.764	0.163	0.052	0.50	73	-0.5	100	4.3	-0.02	77	292	71	69
276	44.927	0.163	0.052	0.50	73	-0.5	100	4.3	-0.02	77	290	71	69
277	45.089	0.163	0.052	0.50	73	-0.5	100	4.3	-0.02	77	289	71	69
278	45.252	0.163	0.052	0.50	73	-0.5	100	4.2	-0.03	77	288	71	69
279	45.415	0.163	0.052	0.50	73	-0.5	100	4.2	-0.01	77	287	71	70
280	45.578	0.163	0.052	0.50	73	-0.5	100	4.2	-0.03	77	285	71	70
281	45.741	0.163	0.052	0.50	73	-0.5	100	4.2	-0.03	77	284	71	69
282	45.903	0.163	0.052	0.50	73	-0.5	100	4.1	-0.03	77	283	71	69
283	46.066	0.163	0.052	0.50	73	-0.5	100	4.1	-0.02	77	282	71	70
284	46.229	0.163	0.052	0.50	73	-0.5	100	4.1	-0.03	76	282	71	70
285	46.392	0.163	0.052	0.50	73	-0.5	100	4.1	-0.01	76	281	71	70
286	46.554	0.163	0.052	0.50	73	-0.5	100	4.1	-0.03	76	280	71	69
287	46.717	0.163	0.052	0.50	73	-0.5	100	4.0	-0.04	76	279	72	69



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	46.880	0.163	0.052	0.50	73	-0.5	100	4.0	-0.01	76	279	72	69
289	47.043	0.163	0.052	0.50	73	-0.5	100	4.0	-0.04	76	278	72	70
290	47.206	0.163	0.052	0.50	73	-0.5	100	3.9	-0.02	76	278	72	69
291	47.368	0.163	0.052	0.50	73	-0.5	100	3.9	-0.01	76	277	72	69
292	47.531	0.163	0.052	0.50	73	-0.5	100	3.9	-0.04	76	276	72	69
293	47.694	0.163	0.052	0.50	73	-0.5	100	3.9	-0.01	76	276	72	69
294	47.857	0.163	0.052	0.50	73	-0.5	100	3.9	-0.02	76	275	72	69
295	48.019	0.163	0.052	0.50	73	-0.5	100	3.8	-0.04	76	274	72	69
296	48.182	0.163	0.052	0.50	73	-0.5	100	3.8	-0.02	76	274	72	69
297	48.345	0.163	0.052	0.50	73	-0.5	100	3.8	-0.04	76	273	72	69
298	48.508	0.163	0.052	0.50	73	-0.5	100	3.8	-0.01	76	273	72	69
299	48.671	0.163	0.052	0.50	73	-0.5	100	3.7	-0.04	76	272	72	69
300	48.833	0.163	0.052	0.50	73	-0.5	100	3.7	-0.02	76	272	72	70
301	48.996	0.163	0.052	0.50	73	-0.5	100	3.7	-0.02	76	271	72	69
302	49.159	0.163	0.052	0.50	73	-0.5	100	3.6	-0.03	76	271	72	70
303	49.322	0.163	0.052	0.50	73	-0.5	100	3.6	-0.01	76	270	72	69
304	49.484	0.163	0.052	0.50	73	-0.5	100	3.6	-0.02	76	270	72	69
305	49.647	0.163	0.052	0.50	73	-0.5	100	3.6	-0.01	76	270	72	70
306	49.810	0.163	0.052	0.50	73	-0.5	100	3.6	-0.05	77	270	72	69
307	49.973	0.163	0.052	0.50	73	-0.5	100	3.5	-0.02	77	270	72	69
308	50.136	0.163	0.052	0.50	73	-0.5	100	3.5	-0.03	77	269	72	69
309	50.298	0.163	0.052	0.50	73	-0.5	100	3.5	-0.02	76	269	72	69
310	50.461	0.163	0.052	0.50	73	-0.5	100	3.4	-0.04	76	269	72	69
311	50.624	0.163	0.052	0.50	73	-0.5	100	3.4	-0.02	76	269	72	69
312	50.787	0.163	0.052	0.50	73	-0.5	100	3.4	-0.03	77	269	72	69
313	50.949	0.163	0.052	0.50	73	-0.5	100	3.4	-0.04	77	269	72	69
314	51.112	0.163	0.052	0.50	73	-0.5	100	3.3	-0.03	77	269	72	69
315	51.275	0.163	0.052	0.50	73	-0.5	100	3.3	-0.02	76	269	72	69
316	51.438	0.163	0.052	0.50	73	-0.5	100	3.3	-0.03	77	270	72	69
317	51.601	0.163	0.052	0.50	73	-0.5	100	3.2	-0.03	76	270	72	69
318	51.763	0.163	0.052	0.50	73	-0.5	100	3.2	-0.02	76	270	71	69
319	51.926	0.163	0.052	0.50	73	-0.5	100	3.2	-0.04	76	270	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	52.089	0.163	0.052	0.50	73	-0.5	100	3.2	-0.03	76	270	71	69
321	52.252	0.163	0.052	0.50	73	-0.5	100	3.1	-0.02	76	270	71	69
322	52.414	0.163	0.052	0.50	73	-0.5	100	3.1	-0.02	76	269	71	68
323	52.577	0.163	0.052	0.50	73	-0.5	100	3.1	-0.02	76	269	71	69
324	52.740	0.163	0.052	0.50	73	-0.5	100	3.1	-0.04	76	269	71	68
325	52.903	0.163	0.052	0.50	73	-0.5	100	3.0	-0.03	76	268	71	68
326	53.066	0.163	0.052	0.50	73	-0.5	100	3.0	-0.02	76	268	71	68
327	53.228	0.163	0.052	0.50	73	-0.5	100	3.0	-0.01	76	268	71	68
328	53.391	0.163	0.052	0.50	73	-0.5	100	3.0	-0.03	76	267	71	69
329	53.554	0.163	0.052	0.50	73	-0.5	100	2.9	-0.02	76	267	71	68
330	53.717	0.163	0.052	0.50	73	-0.5	100	2.9	-0.03	76	267	71	68
331	53.879	0.163	0.052	0.50	73	-0.5	100	2.9	-0.03	76	266	71	68
332	54.042	0.163	0.052	0.50	73	-0.5	100	2.9	-0.02	76	266	71	68
333	54.205	0.163	0.052	0.50	73	-0.5	100	2.9	-0.01	76	266	71	68
334	54.368	0.163	0.052	0.50	73	-0.5	100	2.8	-0.02	76	265	71	69
335	54.531	0.163	0.052	0.50	73	-0.5	100	2.8	-0.02	76	265	71	68
336	54.693	0.163	0.052	0.50	73	-0.5	100	2.8	-0.02	76	265	71	68
337	54.856	0.163	0.052	0.50	72	-0.5	100	2.8	-0.04	76	264	70	68
338	55.019	0.163	0.052	0.50	72	-0.5	100	2.7	-0.02	76	264	70	68
339	55.182	0.163	0.052	0.50	72	-0.5	100	2.7	-0.03	76	264	70	68
340	55.344	0.163	0.052	0.50	72	-0.5	100	2.7	-0.02	76	264	70	68
341	55.507	0.163	0.052	0.50	72	-0.5	100	2.7	-0.02	76	264	70	68
342	55.670	0.163	0.052	0.50	72	-0.5	100	2.6	-0.03	76	264	70	68
343	55.833	0.163	0.052	0.50	72	-0.5	100	2.6	-0.02	76	264	70	68
344	55.996	0.163	0.052	0.50	72	-0.5	100	2.6	-0.02	76	264	70	68
345	56.158	0.163	0.052	0.50	72	-0.5	100	2.6	-0.03	76	264	70	68
346	56.321	0.163	0.052	0.50	72	-0.5	100	2.6	-0.01	76	264	70	68
347	56.484	0.163	0.052	0.50	72	-0.5	100	2.5	-0.04	76	264	70	68
348	56.647	0.163	0.052	0.50	72	-0.5	100	2.5	-0.01	76	264	70	68
349	56.809	0.163	0.052	0.50	72	-0.5	100	2.5	-0.04	76	264	70	68
350	56.972	0.163	0.052	0.50	72	-0.5	100	2.5	-0.01	76	265	70	68
351	57.135	0.163	0.052	0.50	72	-0.5	100	2.4	-0.02	76	265	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	57.298	0.163	0.052	0.50	72	-0.5	100	2.4	-0.01	76	265	70	68
353	57.461	0.163	0.052	0.50	72	-0.5	100	2.4	-0.03	76	265	70	68
354	57.623	0.163	0.052	0.50	72	-0.5	100	2.4	-0.03	76	265	70	68
355	57.786	0.163	0.052	0.50	72	-0.5	100	2.4	-0.01	76	265	70	68
356	57.949	0.163	0.052	0.50	72	-0.5	100	2.3	-0.02	76	265	70	68
357	58.112	0.163	0.052	0.50	72	-0.5	100	2.3	-0.03	76	265	70	68
358	58.274	0.163	0.052	0.50	72	-0.5	100	2.3	-0.01	76	265	70	68
359	58.437	0.163	0.052	0.50	72	-0.5	100	2.3	-0.01	76	265	70	68
360	58.600	0.163	0.052	0.50	72	-0.5	100	2.3	-0.03	76	265	70	69
361	58.763	0.163	0.052	0.50	72	-0.5	100	2.2	-0.03	76	265	70	68
362	58.926	0.163	0.052	0.50	72	-0.5	100	2.2	0	76	265	70	68
363	59.088	0.163	0.052	0.50	72	-0.5	100	2.2	-0.01	76	265	70	68
364	59.251	0.163	0.052	0.50	72	-0.5	100	2.2	-0.04	76	264	70	69
365	59.414	0.163	0.052	0.50	72	-0.5	100	2.2	-0.01	76	264	70	69
366	59.577	0.163	0.052	0.50	72	-0.5	100	2.1	-0.02	76	264	70	69
367	59.739	0.163	0.052	0.50	72	-0.5	100	2.1	-0.01	76	264	70	69
368	59.902	0.163	0.052	0.50	72	-0.5	100	2.1	-0.03	76	263	70	69
369	60.065	0.163	0.052	0.50	72	-0.5	100	2.1	-0.01	76	263	70	69
370	60.228	0.163	0.052	0.50	72	-0.5	100	2.1	-0.02	76	263	70	69
371	60.391	0.163	0.052	0.50	72	-0.5	100	2.1	-0.02	76	263	71	69
372	60.553	0.163	0.052	0.50	72	-0.5	100	2.0	-0.01	76	262	71	69
373	60.716	0.163	0.052	0.50	72	-0.5	100	2.0	-0.02	76	262	71	69
374	60.879	0.163	0.052	0.50	72	-0.5	100	2.0	-0.02	76	262	71	69
375	61.042	0.163	0.052	0.50	72	-0.5	100	2.0	-0.03	76	262	71	69
376	61.204	0.163	0.052	0.50	72	-0.5	100	2.0	-0.01	76	261	71	68
377	61.367	0.163	0.052	0.50	72	-0.5	100	2.0	0	76	261	71	68
378	61.530	0.163	0.052	0.50	72	-0.5	100	1.9	-0.02	76	261	71	68
379	61.693	0.163	0.052	0.50	72	-0.5	100	1.9	-0.02	76	260	71	69
380	61.856	0.163	0.052	0.50	72	-0.5	100	1.9	-0.02	76	260	71	68
381	62.018	0.163	0.052	0.50	72	-0.5	100	1.9	-0.01	76	260	70	68
382	62.181	0.163	0.052	0.50	72	-0.5	100	1.9	-0.01	76	259	70	68
383	62.344	0.163	0.052	0.50	72	-0.5	100	1.9	-0.02	76	259	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	62.507	0.163	0.052	0.50	72	-0.5	100	1.9	-0.01	76	258	70	68
385	62.669	0.163	0.052	0.50	72	-0.5	100	1.8	-0.02	75	258	70	68
386	62.832	0.163	0.052	0.50	72	-0.5	100	1.8	0	75	258	70	68
387	62.995	0.163	0.052	0.50	72	-0.5	100	1.8	-0.03	76	258	70	68
388	63.158	0.163	0.052	0.50	72	-0.5	100	1.8	-0.01	76	257	70	68
389	63.321	0.163	0.052	0.50	72	-0.5	100	1.8	-0.02	75	257	70	68
390	63.483	0.163	0.052	0.50	72	-0.5	100	1.8	-0.02	75	257	70	68
391	63.646	0.163	0.052	0.50	72	-0.5	100	1.7	-0.02	75	256	70	68
392	63.809	0.163	0.052	0.50	72	-0.5	100	1.7	0	75	256	70	68
393	63.972	0.163	0.052	0.50	72	-0.5	100	1.7	-0.02	75	256	70	68
394	64.134	0.163	0.052	0.50	72	-0.5	100	1.7	-0.02	75	256	70	68
395	64.297	0.163	0.052	0.50	72	-0.5	100	1.7	-0.02	75	256	70	68
396	64.460	0.163	0.052	0.50	72	-0.5	100	1.7	0	75	255	70	68
397	64.623	0.163	0.052	0.50	72	-0.5	100	1.6	-0.03	75	255	70	68
398	64.786	0.163	0.052	0.50	72	-0.5	100	1.6	-0.01	75	255	70	68
399	64.948	0.163	0.052	0.50	72	-0.5	100	1.6	-0.01	75	255	70	68
400	65.111	0.163	0.052	0.50	72	-0.5	100	1.6	-0.03	75	255	70	68
401	65.274	0.163	0.052	0.50	72	-0.5	100	1.6	0	75	255	70	68
402	65.437	0.163	0.052	0.50	72	-0.5	100	1.6	-0.02	75	255	70	68
403	65.599	0.163	0.052	0.50	72	-0.5	100	1.6	-0.02	75	255	70	68
404	65.762	0.163	0.052	0.50	72	-0.5	100	1.6	0	75	255	70	68
405	65.925	0.163	0.052	0.50	72	-0.5	100	1.5	-0.02	75	255	70	68
406	66.088	0.163	0.052	0.50	72	-0.5	100	1.5	-0.02	75	255	70	68
407	66.251	0.163	0.052	0.50	72	-0.5	100	1.5	-0.02	75	255	70	68
408	66.413	0.163	0.052	0.50	72	-0.5	100	1.5	-0.01	75	255	70	67
409	66.576	0.163	0.052	0.50	72	-0.5	100	1.5	-0.01	75	255	70	68
410	66.739	0.163	0.052	0.50	72	-0.5	100	1.4	-0.03	75	256	70	68
411	66.902	0.163	0.052	0.50	72	-0.5	100	1.4	-0.01	75	256	70	68
412	67.064	0.163	0.052	0.50	72	-0.5	100	1.4	-0.02	75	256	70	67
413	67.227	0.163	0.052	0.50	71	-0.5	100	1.4	-0.02	75	256	70	68
414	67.390	0.163	0.052	0.50	71	-0.5	100	1.4	0.01	75	256	70	68
415	67.553	0.163	0.052	0.50	71	-0.5	100	1.4	-0.03	75	256	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	67.716	0.163	0.052	0.50	71	-0.5	100	1.3	-0.03	75	257	70	68
417	67.878	0.163	0.052	0.50	71	-0.5	100	1.3	0	75	257	70	68
418	68.041	0.163	0.052	0.50	71	-0.5	100	1.3	-0.03	75	257	70	68
419	68.204	0.163	0.052	0.50	71	-0.5	100	1.3	-0.01	75	257	70	68
420	68.367	0.163	0.052	0.50	71	-0.5	100	1.3	-0.01	75	256	70	68
421	68.529	0.163	0.052	0.50	71	-0.5	100	1.3	-0.01	75	256	70	67
422	68.692	0.163	0.052	0.50	71	-0.5	100	1.3	-0.02	75	255	70	68
423	68.855	0.163	0.052	0.50	71	-0.5	100	1.2	-0.02	75	255	70	68
424	69.018	0.163	0.052	0.50	71	-0.5	100	1.2	-0.01	75	254	70	68
425	69.181	0.163	0.052	0.50	71	-0.5	100	1.2	-0.01	75	253	70	68
426	69.343	0.163	0.052	0.50	71	-0.5	100	1.2	-0.01	75	253	70	68
427	69.506	0.163	0.052	0.50	71	-0.5	100	1.2	-0.02	75	252	70	68
428	69.669	0.163	0.052	0.50	71	-0.5	100	1.2	-0.01	75	251	70	68
429	69.832	0.163	0.052	0.50	71	-0.5	100	1.2	-0.01	75	251	70	68
430	69.994	0.163	0.052	0.50	71	-0.5	100	1.2	-0.01	75	250	70	68
431	70.157	0.163	0.052	0.50	71	-0.5	100	1.2	0	75	249	70	67
432	70.320	0.163	0.052	0.50	71	-0.5	100	1.1	-0.03	75	249	70	67
433	70.483	0.163	0.052	0.50	71	-0.5	100	1.1	-0.01	75	248	70	68
434	70.646	0.163	0.052	0.50	71	-0.5	100	1.1	-0.01	75	247	70	68
435	70.808	0.163	0.052	0.50	71	-0.5	100	1.1	0	75	247	70	67
436	70.971	0.163	0.052	0.50	71	-0.5	100	1.1	-0.03	75	246	70	68
437	71.134	0.163	0.052	0.50	71	-0.5	100	1.1	-0.01	75	246	70	68
438	71.297	0.163	0.052	0.50	71	-0.5	100	1.1	-0.01	75	245	70	68
439	71.459	0.163	0.052	0.50	71	-0.5	100	1.1	-0.01	75	244	70	68
440	71.622	0.163	0.052	0.50	71	-0.5	100	1.0	-0.02	75	244	70	68
441	71.785	0.163	0.052	0.50	71	-0.5	100	1.0	-0.01	75	243	70	68
442	71.948	0.163	0.052	0.50	71	-0.5	100	1.0	0	75	243	70	68
443	72.111	0.163	0.052	0.50	71	-0.5	100	1.0	-0.02	75	242	70	68
444	72.273	0.163	0.052	0.50	71	-0.5	100	1.0	-0.01	75	242	70	68
445	72.436	0.163	0.052	0.50	71	-0.5	100	1.0	0	75	241	70	68
446	72.599	0.163	0.052	0.50	71	-0.5	100	1.0	-0.01	75	241	70	68
447	72.762	0.163	0.052	0.50	71	-0.5	100	1.0	-0.02	75	241	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	72.924	0.163	0.052	0.50	71	-0.5	100	1.0	-0.01	75	240	70	68
449	73.087	0.163	0.052	0.50	72	-0.5	100	0.9	-0.02	75	240	70	68
450	73.250	0.163	0.052	0.50	72	-0.5	100	0.9	-0.01	75	239	70	68
451	73.413	0.163	0.052	0.50	72	-0.5	100	0.9	-0.03	75	239	70	68
452	73.576	0.163	0.052	0.50	72	-0.5	100	0.9	0.01	75	239	70	68
453	73.738	0.163	0.052	0.50	72	-0.5	100	0.9	-0.02	76	238	70	68
454	73.901	0.163	0.052	0.50	72	-0.5	100	0.9	0	76	238	70	68
455	74.064	0.163	0.052	0.50	72	-0.5	100	0.9	-0.01	76	237	70	68
456	74.227	0.163	0.052	0.50	72	-0.5	100	0.9	-0.01	76	237	70	68
457	74.389	0.163	0.052	0.50	72	-0.5	100	0.8	-0.02	76	236	70	68
458	74.552	0.163	0.052	0.50	72	-0.5	100	0.8	-0.01	76	236	70	68
459	74.715	0.163	0.052	0.50	72	-0.5	100	0.8	0	76	235	70	68
460	74.878	0.163	0.052	0.50	72	-0.5	100	0.8	-0.02	76	235	70	68
461	75.041	0.163	0.052	0.50	72	-0.5	100	0.8	0	76	235	70	68
462	75.203	0.163	0.052	0.50	72	-0.5	100	0.8	-0.03	76	234	70	68
463	75.366	0.163	0.052	0.50	72	-0.5	100	0.8	0	76	234	70	68
464	75.529	0.163	0.052	0.50	72	-0.5	100	0.8	-0.02	76	233	71	68
465	75.692	0.163	0.052	0.50	72	-0.5	100	0.8	0	76	233	71	68
466	75.854	0.163	0.052	0.50	72	-0.5	100	0.7	-0.02	76	232	71	68
467	76.017	0.163	0.052	0.50	72	-0.5	100	0.7	-0.01	75	232	71	68
468	76.180	0.163	0.052	0.50	72	-0.5	100	0.7	-0.03	75	231	71	68
469	76.343	0.163	0.052	0.50	72	-0.5	100	0.7	0	75	231	70	68
470	76.506	0.163	0.052	0.50	72	-0.5	100	0.7	-0.02	75	231	70	68
471	76.668	0.163	0.052	0.50	72	-0.5	100	0.7	-0.01	75	231	70	68
472	76.831	0.163	0.052	0.50	72	-0.5	100	0.7	-0.01	75	231	70	68
473	76.994	0.163	0.052	0.50	72	-0.5	100	0.7	-0.01	75	230	70	68
474	77.157	0.163	0.052	0.50	72	-0.5	100	0.6	-0.01	75	230	70	68
475	77.319	0.163	0.052	0.50	72	-0.5	100	0.6	-0.02	75	230	70	68
476	77.482	0.163	0.052	0.50	72	-0.5	100	0.6	-0.01	75	230	70	68
477	77.645	0.163	0.052	0.50	72	-0.5	100	0.6	-0.02	75	230	70	68
478	77.808	0.163	0.052	0.50	71	-0.5	100	0.6	-0.01	75	229	70	68
479	77.971	0.163	0.052	0.50	71	-0.5	100	0.6	-0.02	75	229	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	78.133	0.163	0.052	0.50	71	-0.5	100	0.6	0.01	75	229	70	67
481	78.296	0.163	0.052	0.50	71	-0.5	100	0.6	-0.02	75	229	70	68
482	78.459	0.163	0.052	0.50	71	-0.5	100	0.6	0	75	228	70	67
483	78.622	0.163	0.052	0.50	71	-0.5	100	0.5	-0.02	75	228	70	67
484	78.784	0.163	0.052	0.50	71	-0.5	100	0.5	-0.04	75	228	70	67
485	78.947	0.163	0.052	0.50	71	-0.5	100	0.5	0.01	75	228	70	67
486	79.110	0.163	0.052	0.50	71	-0.5	100	0.5	0	75	227	70	67
487	79.273	0.163	0.052	0.50	71	-0.5	100	0.5	-0.01	75	227	70	67
488	79.436	0.163	0.052	0.50	71	-0.5	100	0.5	-0.03	75	227	70	67
489	79.598	0.163	0.052	0.50	71	-0.5	100	0.5	0.01	75	227	70	67
490	79.761	0.163	0.052	0.50	71	-0.5	100	0.5	-0.02	75	226	70	67
491	79.924	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	226	70	67
492	80.087	0.163	0.052	0.50	71	-0.5	100	0.4	0	75	226	70	67
493	80.249	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	225	70	67
494	80.412	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	225	70	67
495	80.575	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	225	70	67
496	80.738	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	225	70	67
497	80.901	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	224	70	67
498	81.063	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	224	70	67
499	81.226	0.163	0.052	0.50	71	-0.5	100	0.4	-0.01	75	224	70	67
500	81.389	0.163	0.052	0.50	71	-0.5	100	0.4	-0.02	75	223	70	67
501	81.552	0.163	0.052	0.50	71	-0.5	100	0.3	-0.01	75	223	70	67
502	81.714	0.163	0.052	0.50	71	-0.5	100	0.3	0	75	223	70	67
503	81.877	0.163	0.052	0.50	71	-0.5	100	0.3	-0.01	75	222	70	67
504	82.040	0.163	0.052	0.50	71	-0.5	100	0.3	-0.01	76	222	70	67
505	82.203	0.163	0.052	0.50	71	-0.5	100	0.3	-0.01	75	221	70	67
506	82.366	0.163	0.052	0.50	71	-0.5	100	0.3	-0.01	75	221	70	67
507	82.528	0.163	0.052	0.50	71	-0.5	100	0.3	-0.02	75	221	70	67
508	82.691	0.163	0.052	0.50	71	-0.5	100	0.3	-0.01	75	220	70	67
509	82.854	0.163	0.052	0.50	71	-0.5	100	0.3	0	75	220	70	67
510	83.017	0.163	0.052	0.50	71	-0.5	100	0.2	-0.03	75	220	70	67
511	83.179	0.163	0.052	0.50	71	-0.5	100	0.2	0	75	220	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	83.342	0.163	0.052	0.50	71	-0.5	100	0.2	-0.02	75	219	70	67
513	83.505	0.163	0.052	0.50	71	-0.5	100	0.2	0	75	219	70	67
514	83.668	0.163	0.052	0.50	71	-0.5	100	0.2	-0.03	75	219	70	68
515	83.831	0.163	0.052	0.50	71	-0.5	100	0.2	-0.01	75	219	70	67
516	83.993	0.163	0.052	0.50	71	-0.5	100	0.2	-0.01	75	219	70	67
517	84.156	0.163	0.052	0.50	71	-0.5	100	0.2	0	75	219	70	67
518	84.319	0.163	0.052	0.50	71	-0.5	100	0.1	-0.03	75	219	70	67
519	84.482	0.163	0.052	0.50	71	-0.5	100	0.1	-0.01	75	220	70	67
520	84.644	0.163	0.052	0.50	71	-0.5	100	0.1	-0.02	75	220	70	67
521	84.807	0.163	0.052	0.50	71	-0.5	100	0.1	-0.01	75	220	70	67
522	84.970	0.163	0.052	0.50	71	-0.5	100	0.0	-0.1	75	220	69	67
Avg/Tot	84.970	0.163	0.052	0.50	71	-0.50	100			77	267	70	67.7



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	69	-1.5		68	-0.020	6.17	0.03
1	0.108	0.108	0.50	69	-1.5	100	68	-0.020	2.95	0.37
2	0.216	0.108	0.50	69	-1.5	100	68	-0.020	3.06	0.12
3	0.324	0.108	0.50	69	-1.5	100	68	-0.020	3.44	0.01
4	0.432	0.108	0.50	69	-1.5	100	68	-0.020	3.61	0.01
5	0.540	0.108	0.50	69	-1.5	100	68	-0.020	3.76	0.01
6	0.649	0.108	0.50	69	-1.5	100	68	-0.020	3.98	0.01
7	0.757	0.108	0.50	69	-1.5	100	68	-0.020	4.22	0.01
8	0.865	0.108	0.50	69	-1.5	100	68	-0.020	4.46	0.01
9	0.973	0.108	0.50	69	-1.5	100	68	-0.020	4.70	0.01
10	1.081	0.108	0.50	69	-1.5	100	68	-0.020	4.95	0.01
11	1.189	0.108	0.50	69	-1.5	100	68	-0.020	5.32	0.01
12	1.297	0.108	0.50	69	-1.5	100	68	-0.020	6.38	0.01
13	1.405	0.108	0.50	69	-1.5	100	68	-0.020	6.44	0.01
14	1.513	0.108	0.50	69	-1.5	100	69	-0.020	6.32	0.01
15	1.621	0.108	0.50	69	-1.5	100	69	-0.020	6.52	0.01
16	1.730	0.108	0.50	69	-1.5	100	69	-0.020	6.73	0.01
17	1.838	0.108	0.50	69	-1.5	100	69	-0.030	8.17	0.01
18	1.946	0.108	0.50	69	-1.5	100	69	-0.030	8.29	0.01
19	2.054	0.108	0.50	69	-1.5	100	69	-0.030	8.07	0.01
20	2.162	0.108	0.50	69	-1.5	100	69	-0.030	8.14	0.01
21	2.270	0.108	0.50	69	-1.5	100	69	-0.030	8.11	0.01
22	2.378	0.108	0.50	69	-1.5	100	69	-0.030	8.52	0.01
23	2.486	0.108	0.50	69	-1.5	100	69	-0.030	9.12	0.01
24	2.594	0.108	0.50	69	-1.5	100	69	-0.030	8.80	0.01
25	2.702	0.108	0.50	69	-1.5	100	69	-0.030	8.69	0.01
26	2.810	0.108	0.50	69	-1.5	100	69	-0.030	8.60	0.01
27	2.919	0.108	0.50	70	-1.5	100	69	-0.030	8.40	0.01
28	3.027	0.108	0.50	70	-1.5	100	69	-0.030	8.37	0.01
29	3.135	0.108	0.50	70	-1.5	100	69	-0.030	8.60	0.01
30	3.243	0.108	0.50	70	-1.5	100	69	-0.030	8.79	0.01
31	3.351	0.108	0.50	70	-1.5	100	69	-0.030	8.90	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	3.459	0.108	0.50	70	-1.5	100	69	-0.030	8.86	0.01
33	3.567	0.108	0.50	70	-1.5	101	69	-0.030	8.94	0.01
34	3.675	0.108	0.50	70	-1.5	101	69	-0.030	9.02	0.01
35	3.783	0.108	0.50	70	-1.5	101	70	-0.030	9.27	0.01
36	3.891	0.108	0.50	70	-1.5	101	70	-0.030	10.07	0.01
37	3.999	0.108	0.50	70	-1.5	101	70	-0.030	9.89	0.01
38	4.108	0.108	0.50	70	-1.5	101	70	-0.030	9.31	0.01
39	4.216	0.108	0.50	70	-1.5	101	70	-0.030	9.11	0.01
40	4.324	0.108	0.50	70	-1.5	101	70	-0.030	9.01	0.01
41	4.432	0.108	0.50	70	-1.5	101	70	-0.030	8.64	0.01
42	4.540	0.108	0.50	70	-1.5	101	70	-0.030	8.34	0.01
43	4.648	0.108	0.50	70	-1.5	101	70	-0.030	8.27	0.01
44	4.756	0.108	0.50	70	-1.5	101	70	-0.030	8.25	0.01
45	4.864	0.108	0.50	70	-1.5	100	70	-0.030	8.28	0.01
46	4.972	0.108	0.50	70	-1.5	100	70	-0.030	8.30	0.01
47	5.080	0.108	0.50	70	-1.5	100	70	-0.030	8.37	0.01
48	5.189	0.108	0.50	70	-1.5	100	70	-0.030	8.42	0.01
49	5.297	0.108	0.50	70	-1.5	100	70	-0.030	8.64	0.01
50	5.405	0.108	0.50	70	-1.5	100	70	-0.030	9.09	0.01
51	5.513	0.108	0.50	70	-1.5	100	70	-0.030	9.62	0.01
52	5.621	0.108	0.50	70	-1.5	101	70	-0.030	10.08	0.01
53	5.729	0.108	0.50	70	-1.5	101	70	-0.030	11.21	0.00
54	5.837	0.108	0.50	70	-1.5	101	70	-0.030	11.63	0.00
55	5.945	0.108	0.50	70	-1.5	101	70	-0.030	11.80	0.00
56	6.053	0.108	0.50	71	-1.5	101	70	-0.030	11.73	0.00
57	6.161	0.108	0.50	71	-1.5	101	70	-0.030	11.89	0.00
58	6.269	0.108	0.50	71	-1.5	101	70	-0.030	12.07	0.00
59	6.378	0.108	0.50	71	-1.5	101	70	-0.030	11.76	0.00
60	6.486	0.108	0.50	71	-1.5	101	70	-0.030	11.33	0.01
61	6.594	0.108	0.50	71	-1.5	101	70	-0.030	11.07	0.00
62	6.702	0.108	0.50	71	-1.5	101	70	-0.030	11.15	0.00
63	6.810	0.108	0.50	71	-1.5	101	70	-0.030	11.14	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	6.918	0.108	0.50	71	-1.5	101	70	-0.030	11.13	0.01
65	7.026	0.108	0.50	71	-1.5	101	70	-0.030	11.25	0.01
66	7.134	0.108	0.50	71	-1.5	101	70	-0.030	11.36	0.00
67	7.242	0.108	0.50	71	-1.5	101	70	-0.030	11.20	0.00
68	7.350	0.108	0.50	71	-1.5	101	70	-0.030	9.87	0.00
69	7.458	0.108	0.50	71	-1.5	101	70	-0.030	10.86	0.01
70	7.567	0.108	0.50	71	-1.5	101	70	-0.030	11.00	0.00
71	7.675	0.108	0.50	71	-1.5	101	70	-0.030	10.99	0.00
72	7.783	0.108	0.50	71	-1.5	100	70	-0.030	11.02	0.01
73	7.891	0.108	0.50	71	-1.5	100	70	-0.030	10.91	0.01
74	7.999	0.108	0.50	71	-1.5	100	70	-0.030	10.66	0.01
75	8.107	0.108	0.50	71	-1.5	100	70	-0.030	10.85	0.01
76	8.215	0.108	0.50	71	-1.5	100	70	-0.030	11.00	0.01
77	8.323	0.108	0.50	71	-1.5	100	70	-0.030	11.46	0.01
78	8.431	0.108	0.50	71	-1.5	100	70	-0.030	11.88	0.01
79	8.539	0.108	0.50	71	-1.5	100	70	-0.030	12.46	0.01
80	8.648	0.108	0.50	71	-1.5	100	70	-0.030	12.96	0.00
81	8.756	0.108	0.50	71	-1.5	100	70	-0.030	13.25	0.06
82	8.864	0.108	0.50	71	-1.5	100	70	-0.030	13.35	0.09
83	8.972	0.108	0.50	71	-1.5	100	70	-0.030	13.50	0.11
84	9.080	0.108	0.50	71	-1.5	100	70	-0.030	13.58	0.09
85	9.188	0.108	0.50	71	-1.5	100	70	-0.030	13.34	0.06
86	9.296	0.108	0.50	71	-1.5	100	70	-0.030	13.40	0.04
87	9.404	0.108	0.50	71	-1.5	100	70	-0.030	12.97	0.02
88	9.512	0.108	0.50	71	-1.5	100	70	-0.030	12.51	0.00
89	9.620	0.108	0.50	71	-1.5	100	70	-0.030	11.79	0.00
90	9.728	0.108	0.50	71	-1.5	100	70	-0.030	11.70	0.00
91	9.837	0.108	0.50	71	-1.5	100	70	-0.030	11.63	0.00
92	9.945	0.108	0.50	71	-1.5	100	70	-0.030	11.37	0.00
93	10.053	0.108	0.50	71	-1.5	100	70	-0.030	11.00	0.00
94	10.161	0.108	0.50	71	-1.5	100	70	-0.030	9.70	0.01
95	10.269	0.108	0.50	71	-1.5	100	70	-0.030	10.20	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	10.377	0.108	0.50	71	-1.5	100	70	-0.030	11.04	0.01
97	10.485	0.108	0.50	71	-1.5	100	70	-0.030	10.75	0.01
98	10.593	0.108	0.50	71	-1.5	100	70	-0.030	10.25	0.01
99	10.701	0.108	0.50	71	-1.5	100	70	-0.030	9.87	0.01
100	10.809	0.108	0.50	71	-1.5	100	70	-0.030	9.76	0.01
101	10.917	0.108	0.50	72	-1.5	100	70	-0.030	9.60	0.01
102	11.026	0.108	0.50	72	-1.5	100	70	-0.030	9.44	0.01
103	11.134	0.108	0.50	72	-1.5	100	70	-0.030	9.23	0.01
104	11.242	0.108	0.50	72	-1.5	100	70	-0.030	9.10	0.01
105	11.350	0.108	0.50	72	-1.5	100	70	-0.030	9.01	0.01
106	11.458	0.108	0.50	72	-1.5	100	70	-0.030	9.12	0.01
107	11.566	0.108	0.50	72	-1.5	100	70	-0.030	9.34	0.01
108	11.674	0.108	0.50	72	-1.5	100	70	-0.030	9.53	0.01
109	11.782	0.108	0.50	72	-1.5	100	70	-0.030	9.57	0.01
110	11.890	0.108	0.50	72	-1.5	100	70	-0.030	9.34	0.01
111	11.998	0.108	0.50	72	-1.5	100	70	-0.030	9.21	0.01
112	12.107	0.108	0.50	72	-1.5	100	70	-0.030	9.16	0.01
113	12.215	0.108	0.50	72	-1.5	100	70	-0.030	9.05	0.01
114	12.323	0.108	0.50	72	-1.5	100	70	-0.030	9.18	0.01
115	12.431	0.108	0.50	72	-1.5	100	70	-0.020	9.06	0.01
116	12.539	0.108	0.50	72	-1.5	100	70	-0.030	9.12	0.01
117	12.647	0.108	0.50	72	-1.5	100	70	-0.020	9.19	0.01
118	12.755	0.108	0.50	72	-1.5	100	70	-0.020	9.23	0.01
119	12.863	0.108	0.50	72	-1.5	100	70	-0.020	9.33	0.01
120	12.971	0.108	0.50	72	-1.5	100	70	-0.020	9.41	0.00
121	13.079	0.108	0.50	72	-1.5	100	70	-0.020	10.59	0.01
122	13.187	0.108	0.50	72	-1.5	100	70	-0.030	10.72	0.01
123	13.296	0.108	0.50	72	-1.5	100	70	-0.030	10.14	0.01
124	13.404	0.108	0.50	72	-1.5	100	70	-0.020	9.67	0.01
125	13.512	0.108	0.50	72	-1.5	100	70	-0.020	9.47	0.01
126	13.620	0.108	0.50	72	-1.5	100	70	-0.030	9.35	0.01
127	13.728	0.108	0.50	72	-1.5	100	70	-0.030	9.31	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	13.836	0.108	0.50	72	-1.5	100	70	-0.020	9.74	0.01
129	13.944	0.108	0.50	72	-1.5	100	70	-0.030	9.98	0.01
130	14.052	0.108	0.50	72	-1.5	100	70	-0.030	10.21	0.01
131	14.160	0.108	0.50	72	-1.5	100	70	-0.030	9.95	0.00
132	14.268	0.108	0.50	72	-1.5	100	70	-0.030	10.02	0.00
133	14.376	0.108	0.50	72	-1.5	100	70	-0.020	9.82	0.01
134	14.485	0.108	0.50	72	-1.5	100	70	-0.030	10.01	0.01
135	14.593	0.108	0.50	72	-1.5	100	70	-0.030	10.17	0.01
136	14.701	0.108	0.50	72	-1.5	100	70	-0.030	10.20	0.01
137	14.809	0.108	0.50	72	-1.5	100	70	-0.020	10.42	0.01
138	14.917	0.108	0.50	72	-1.5	100	70	-0.020	10.44	0.01
139	15.025	0.108	0.50	72	-1.5	100	69	-0.030	10.53	0.01
140	15.133	0.108	0.50	72	-1.5	100	70	-0.030	10.62	0.01
141	15.241	0.108	0.50	72	-1.5	100	69	-0.030	10.63	0.01
142	15.349	0.108	0.50	71	-1.5	100	69	-0.030	10.66	0.00
143	15.457	0.108	0.50	71	-1.5	100	69	-0.030	10.73	0.00
144	15.566	0.108	0.50	71	-1.5	100	69	-0.030	10.87	0.00
145	15.674	0.108	0.50	71	-1.5	100	69	-0.030	11.09	0.00
146	15.782	0.108	0.50	71	-1.5	100	69	-0.030	11.19	0.00
147	15.890	0.108	0.50	71	-1.5	100	69	-0.030	11.44	0.00
148	15.998	0.108	0.50	71	-1.5	100	69	-0.030	11.52	0.00
149	16.106	0.108	0.50	71	-1.5	100	69	-0.030	11.50	0.00
150	16.214	0.108	0.50	71	-1.5	100	69	-0.030	11.54	0.00
151	16.322	0.108	0.50	71	-1.5	100	69	-0.030	11.42	0.00
152	16.430	0.108	0.50	71	-1.5	100	69	-0.030	11.37	0.00
153	16.538	0.108	0.50	71	-1.5	100	69	-0.030	11.48	0.01
154	16.646	0.108	0.50	71	-1.5	100	69	-0.030	11.67	0.01
155	16.755	0.108	0.50	71	-1.5	100	69	-0.030	11.82	0.01
156	16.863	0.108	0.50	71	-1.5	100	69	-0.030	11.94	0.01
157	16.971	0.108	0.50	71	-1.5	100	69	-0.030	12.23	0.01
158	17.079	0.108	0.50	71	-1.5	100	69	-0.030	12.34	0.01
159	17.187	0.108	0.50	71	-1.5	100	69	-0.030	12.45	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	17.295	0.108	0.50	71	-1.5	100	69	-0.030	12.46	0.01
161	17.403	0.108	0.50	71	-1.5	100	69	-0.030	12.69	0.01
162	17.511	0.108	0.50	71	-1.5	100	69	-0.030	12.76	0.01
163	17.619	0.108	0.50	71	-1.5	100	69	-0.030	12.77	0.01
164	17.727	0.108	0.50	71	-1.5	100	69	-0.030	12.76	0.02
165	17.835	0.108	0.50	71	-1.5	100	69	-0.030	13.26	0.04
166	17.944	0.108	0.50	71	-1.5	100	69	-0.030	14.09	0.38
167	18.052	0.108	0.50	71	-1.5	100	69	-0.030	14.60	0.82
168	18.160	0.108	0.50	71	-1.5	100	69	-0.030	14.61	1.53
169	18.268	0.108	0.50	71	-1.5	101	69	-0.030	14.53	1.81
170	18.376	0.108	0.50	71	-1.5	101	69	-0.030	14.47	2.48
171	18.484	0.108	0.50	71	-1.5	101	69	-0.030	14.25	3.07
172	18.592	0.108	0.50	71	-1.5	100	69	-0.030	13.98	3.08
173	18.700	0.108	0.50	71	-1.5	100	69	-0.030	13.82	3.19
174	18.808	0.108	0.50	71	-1.5	100	69	-0.030	13.61	2.98
175	18.916	0.108	0.50	71	-1.5	100	69	-0.030	13.42	3.00
176	19.025	0.108	0.50	71	-1.5	100	69	-0.030	13.14	2.77
177	19.133	0.108	0.50	71	-1.5	100	69	-0.030	13.73	0.69
178	19.241	0.108	0.50	71	-1.5	100	69	-0.030	13.52	0.75
179	19.349	0.108	0.50	71	-1.5	100	69	-0.030	13.06	0.90
180	19.457	0.108	0.50	71	-1.5	100	69	-0.030	12.94	0.87
181	19.565	0.108	0.50	71	-1.5	100	69	-0.030	12.96	0.75
182	19.673	0.108	0.50	71	-1.5	100	69	-0.030	12.71	0.67
183	19.781	0.108	0.50	71	-1.5	100	69	-0.030	12.73	0.58
184	19.889	0.108	0.50	71	-1.5	100	69	-0.020	12.59	0.53
185	19.997	0.108	0.50	71	-1.5	100	69	-0.020	12.59	0.52
186	20.105	0.108	0.50	71	-1.5	100	69	-0.020	12.42	0.48
187	20.214	0.108	0.50	71	-1.5	100	69	-0.020	12.35	0.50
188	20.322	0.108	0.50	71	-1.5	100	69	-0.020	12.46	0.40
189	20.430	0.108	0.50	71	-1.5	100	69	-0.020	12.44	0.49
190	20.538	0.108	0.50	71	-1.5	100	69	-0.020	12.45	0.60
191	20.646	0.108	0.50	71	-1.5	100	69	-0.020	12.26	0.80

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
192	20.754	0.108	0.50	71	-1.5	100	69	-0.020	12.12	0.74
193	20.862	0.108	0.50	71	-1.5	100	69	-0.020	11.98	0.53
194	20.970	0.108	0.50	71	-1.5	100	69	-0.020	9.79	0.70
195	21.078	0.108	0.50	71	-1.5	100	69	-0.020	11.68	0.57
196	21.186	0.108	0.50	71	-1.5	100	69	-0.020	11.80	0.41
197	21.294	0.108	0.50	71	-1.5	100	69	-0.020	11.87	0.20
198	21.403	0.108	0.50	71	-1.5	100	69	-0.020	11.68	0.00
199	21.511	0.108	0.50	71	-1.5	100	69	-0.020	11.48	0.00
200	21.619	0.108	0.50	71	-1.5	100	69	-0.020	11.26	0.00
201	21.727	0.108	0.50	71	-1.5	100	69	-0.020	10.92	0.00
202	21.835	0.108	0.50	71	-1.5	100	69	-0.020	10.58	0.02
203	21.943	0.108	0.50	71	-1.5	100	69	-0.020	10.45	0.00
204	22.051	0.108	0.50	71	-1.5	100	69	-0.020	10.32	0.00
205	22.159	0.108	0.50	71	-1.5	100	69	-0.020	10.23	0.01
206	22.267	0.108	0.50	71	-1.5	100	69	-0.020	10.07	0.01
207	22.375	0.108	0.50	71	-1.5	100	69	-0.020	10.13	0.02
208	22.484	0.108	0.50	71	-1.5	100	69	-0.020	10.18	0.02
209	22.592	0.108	0.50	71	-1.5	100	69	-0.020	10.17	0.02
210	22.700	0.108	0.50	71	-1.5	100	69	-0.020	10.25	0.00
211	22.808	0.108	0.50	71	-1.5	100	69	-0.020	10.34	0.00
212	22.916	0.108	0.50	71	-1.5	100	69	-0.020	10.43	0.00
213	23.024	0.108	0.50	71	-1.5	100	69	-0.020	10.51	0.00
214	23.132	0.108	0.50	71	-1.5	100	69	-0.020	10.61	0.00
215	23.240	0.108	0.50	71	-1.5	100	69	-0.020	10.72	0.00
216	23.348	0.108	0.50	71	-1.5	100	69	-0.020	10.88	0.00
217	23.456	0.108	0.50	71	-1.5	100	69	-0.020	11.10	0.00
218	23.564	0.108	0.50	71	-1.5	100	69	-0.020	11.20	0.00
219	23.673	0.108	0.50	71	-1.5	100	69	-0.020	11.41	0.00
220	23.781	0.108	0.50	71	-1.5	100	69	-0.020	11.61	0.00
221	23.889	0.108	0.50	71	-1.5	100	69	-0.020	11.76	0.00
222	23.997	0.108	0.50	71	-1.5	100	69	-0.020	12.01	0.00
223	24.105	0.108	0.50	71	-1.5	100	70	-0.020	12.32	0.05

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
224	24.213	0.108	0.50	71	-1.5	100	70	-0.020	12.49	0.08
225	24.321	0.108	0.50	71	-1.5	100	70	-0.020	12.67	0.10
226	24.429	0.108	0.50	71	-1.5	100	70	-0.020	12.87	0.10
227	24.537	0.108	0.50	71	-1.5	100	70	-0.020	13.21	0.17
228	24.645	0.108	0.50	71	-1.5	100	70	-0.020	13.37	0.21
229	24.753	0.108	0.50	71	-1.5	100	70	-0.020	13.51	0.33
230	24.862	0.108	0.50	71	-1.5	100	70	-0.020	13.65	0.46
231	24.970	0.108	0.50	72	-1.5	100	70	-0.020	13.66	0.61
232	25.078	0.108	0.50	72	-1.5	100	70	-0.020	13.77	0.76
233	25.186	0.108	0.50	72	-1.5	100	70	-0.020	13.75	0.90
234	25.294	0.108	0.50	72	-1.5	100	70	-0.020	13.75	1.09
235	25.402	0.108	0.50	72	-1.5	100	70	-0.020	13.68	1.20
236	25.510	0.108	0.50	72	-1.5	100	70	-0.020	13.70	1.22
237	25.618	0.108	0.50	72	-1.5	100	70	-0.020	13.64	1.20
238	25.726	0.108	0.50	72	-1.5	100	70	-0.020	13.63	1.25
239	25.834	0.108	0.50	72	-1.5	100	70	-0.020	13.52	1.19
240	25.943	0.108	0.50	72	-1.5	100	70	-0.020	13.56	1.25
241	26.051	0.108	0.50	72	-1.5	100	70	-0.020	13.56	1.24
242	26.159	0.108	0.50	72	-1.5	100	70	-0.020	13.51	1.30
243	26.267	0.108	0.50	72	-1.5	100	70	-0.020	13.53	1.35
244	26.375	0.108	0.50	72	-1.5	100	70	-0.020	13.50	1.35
245	26.483	0.108	0.50	72	-1.5	100	70	-0.020	13.35	1.29
246	26.591	0.108	0.50	72	-1.5	100	70	-0.020	13.40	1.37
247	26.699	0.108	0.50	72	-1.5	100	70	-0.020	13.35	1.36
248	26.807	0.108	0.50	72	-1.5	100	70	-0.020	13.36	1.37
249	26.915	0.108	0.50	72	-1.5	100	70	-0.020	12.23	1.35
250	27.023	0.108	0.50	72	-1.5	100	70	-0.020	13.18	1.37
251	27.132	0.108	0.50	72	-1.5	100	70	-0.020	13.10	1.41
252	27.240	0.108	0.50	72	-1.5	100	70	-0.020	13.08	1.47
253	27.348	0.108	0.50	72	-1.5	100	70	-0.020	13.08	1.49
254	27.456	0.108	0.50	72	-1.5	100	70	-0.020	12.98	1.44
255	27.564	0.108	0.50	72	-1.5	100	70	-0.020	13.01	1.48



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
256	27.672	0.108	0.50	72	-1.5	100	70	-0.020	13.20	1.76
257	27.780	0.108	0.50	72	-1.5	100	70	-0.020	13.05	1.71
258	27.888	0.108	0.50	72	-1.5	100	70	-0.020	12.98	1.56
259	27.996	0.108	0.50	72	-1.5	100	70	-0.020	12.91	1.32
260	28.104	0.108	0.50	72	-1.5	100	70	-0.020	12.77	1.14
261	28.212	0.108	0.50	72	-1.5	100	71	-0.020	12.61	0.99
262	28.321	0.108	0.50	72	-1.5	100	70	-0.020	12.45	0.76
263	28.429	0.108	0.50	72	-1.5	100	71	-0.020	12.28	0.42
264	28.537	0.108	0.50	72	-1.5	100	71	-0.020	11.91	0.09
265	28.645	0.108	0.50	72	-1.5	100	71	-0.020	11.48	0.04
266	28.753	0.108	0.50	72	-1.5	100	71	-0.020	11.23	0.02
267	28.861	0.108	0.50	72	-1.5	100	71	-0.020	11.02	0.00
268	28.969	0.108	0.50	72	-1.5	100	71	-0.020	10.76	0.00
269	29.077	0.108	0.50	72	-1.5	100	71	-0.020	10.68	0.00
270	29.185	0.108	0.50	72	-1.5	100	71	-0.020	10.56	0.00
271	29.293	0.108	0.50	72	-1.5	100	71	-0.020	10.40	0.00
272	29.402	0.108	0.50	72	-1.5	100	71	-0.020	10.46	0.00
273	29.510	0.108	0.50	72	-1.5	100	71	-0.020	10.44	0.00
274	29.618	0.108	0.50	72	-1.5	100	71	-0.020	10.41	0.00
275	29.726	0.108	0.50	72	-1.5	100	71	-0.020	10.44	0.00
276	29.834	0.108	0.50	72	-1.5	100	71	-0.020	10.55	0.00
277	29.942	0.108	0.50	72	-1.5	100	71	-0.020	10.60	0.02
278	30.050	0.108	0.50	72	-1.5	100	71	-0.020	10.73	0.02
279	30.158	0.108	0.50	72	-1.5	100	71	-0.020	10.86	0.02
280	30.266	0.108	0.50	72	-1.5	100	71	-0.020	11.01	0.02
281	30.374	0.108	0.50	73	-1.5	100	71	-0.020	11.18	0.02
282	30.482	0.108	0.50	73	-1.5	100	71	-0.020	11.19	0.02
283	30.591	0.108	0.50	73	-1.5	100	71	-0.020	11.30	0.02
284	30.699	0.108	0.50	73	-1.5	100	71	-0.020	11.38	0.02
285	30.807	0.108	0.50	73	-1.5	100	71	-0.020	11.42	0.02
286	30.915	0.108	0.50	73	-1.5	100	71	-0.020	11.43	0.02
287	31.023	0.108	0.50	73	-1.5	100	71	-0.020	11.40	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
288	31.131	0.108	0.50	73	-1.5	100	71	-0.020	11.45	0.02
289	31.239	0.108	0.50	73	-1.5	100	71	-0.020	11.49	0.02
290	31.347	0.108	0.50	73	-1.5	100	71	-0.020	11.46	0.02
291	31.455	0.108	0.50	73	-1.5	100	71	-0.020	11.48	0.02
292	31.563	0.108	0.50	73	-1.5	100	71	-0.020	11.41	0.02
293	31.672	0.108	0.50	73	-1.5	100	71	-0.020	11.35	0.00
294	31.780	0.108	0.50	73	-1.5	100	71	-0.020	11.39	0.00
295	31.888	0.108	0.50	73	-1.5	100	71	-0.020	11.33	0.00
296	31.996	0.108	0.50	73	-1.5	100	71	-0.020	11.31	0.00
297	32.104	0.108	0.50	73	-1.5	100	71	-0.020	11.26	0.00
298	32.212	0.108	0.50	73	-1.5	100	71	-0.020	11.31	0.00
299	32.320	0.108	0.50	73	-1.5	100	71	-0.020	11.24	0.00
300	32.428	0.108	0.50	73	-1.5	100	71	-0.020	11.33	0.02
301	32.536	0.108	0.50	73	-1.5	100	71	-0.020	11.19	0.02
302	32.644	0.108	0.50	73	-1.5	100	71	-0.020	11.24	0.02
303	32.752	0.108	0.50	73	-1.5	100	71	-0.020	11.24	0.02
304	32.861	0.108	0.50	73	-1.5	100	71	-0.020	11.43	0.00
305	32.969	0.108	0.50	73	-1.5	100	71	-0.020	11.52	0.02
306	33.077	0.108	0.50	73	-1.5	100	71	-0.020	11.63	0.02
307	33.185	0.108	0.50	73	-1.5	100	71	-0.020	11.71	0.02
308	33.293	0.108	0.50	73	-1.5	100	71	-0.020	11.63	0.02
309	33.401	0.108	0.50	73	-1.5	100	71	-0.020	11.66	0.02
310	33.509	0.108	0.50	73	-1.5	100	71	-0.020	11.69	0.02
311	33.617	0.108	0.50	73	-1.5	100	71	-0.020	11.83	0.02
312	33.725	0.108	0.50	73	-1.5	100	71	-0.020	11.86	0.02
313	33.833	0.108	0.50	73	-1.5	100	71	-0.020	11.90	0.02
314	33.941	0.108	0.50	73	-1.5	100	71	-0.020	11.88	0.02
315	34.050	0.108	0.50	73	-1.5	100	71	-0.020	11.83	0.02
316	34.158	0.108	0.50	73	-1.5	100	71	-0.020	11.70	0.02
317	34.266	0.108	0.50	73	-1.5	100	71	-0.020	11.65	0.02
318	34.374	0.108	0.50	73	-1.5	100	71	-0.020	11.55	0.02
319	34.482	0.108	0.50	73	-1.5	100	71	-0.020	11.48	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
320	34.590	0.108	0.50	73	-1.5	100	71	-0.020	11.35	0.02
321	34.698	0.108	0.50	73	-1.5	100	71	-0.020	11.28	0.02
322	34.806	0.108	0.50	73	-1.5	100	71	-0.020	11.22	0.02
323	34.914	0.108	0.50	73	-1.5	100	71	-0.020	11.10	0.02
324	35.022	0.108	0.50	73	-1.5	100	71	-0.020	10.88	0.02
325	35.131	0.108	0.50	73	-1.5	100	71	-0.020	10.76	0.02
326	35.239	0.108	0.50	73	-1.5	100	71	-0.020	10.69	0.02
327	35.347	0.108	0.50	73	-1.5	100	71	-0.020	10.66	0.02
328	35.455	0.108	0.50	73	-1.5	100	70	-0.020	10.63	0.02
329	35.563	0.108	0.50	73	-1.5	100	70	-0.020	10.60	0.02
330	35.671	0.108	0.50	73	-1.5	100	70	-0.020	10.52	0.02
331	35.779	0.108	0.50	73	-1.5	100	70	-0.020	10.42	0.02
332	35.887	0.108	0.50	73	-1.5	100	70	-0.020	10.41	0.02
333	35.995	0.108	0.50	73	-1.5	100	70	-0.020	10.31	0.02
334	36.103	0.108	0.50	73	-1.5	100	70	-0.020	10.22	0.02
335	36.211	0.108	0.50	73	-1.5	100	70	-0.020	10.25	0.01
336	36.320	0.108	0.50	73	-1.5	100	70	-0.020	10.34	0.02
337	36.428	0.108	0.50	73	-1.5	100	70	-0.020	10.45	0.01
338	36.536	0.108	0.50	73	-1.5	100	70	-0.020	10.57	0.02
339	36.644	0.108	0.50	73	-1.5	100	70	-0.020	10.62	0.01
340	36.752	0.108	0.50	73	-1.5	100	70	-0.020	10.68	0.02
341	36.860	0.108	0.50	73	-1.5	100	70	-0.020	10.70	0.01
342	36.968	0.108	0.50	73	-1.5	100	70	-0.020	10.65	0.02
343	37.076	0.108	0.50	73	-1.5	100	70	-0.020	10.74	0.02
344	37.184	0.108	0.50	73	-1.5	100	70	-0.020	10.71	0.02
345	37.292	0.108	0.50	73	-1.5	100	70	-0.020	10.72	0.01
346	37.400	0.108	0.50	73	-1.5	100	70	-0.020	10.71	0.01
347	37.509	0.108	0.50	73	-1.5	100	70	-0.020	10.77	0.01
348	37.617	0.108	0.50	73	-1.5	100	70	-0.020	10.71	0.00
349	37.725	0.108	0.50	73	-1.5	100	70	-0.020	10.74	0.00
350	37.833	0.108	0.50	73	-1.5	100	70	-0.020	10.76	0.00
351	37.941	0.108	0.50	73	-1.5	100	70	-0.020	10.71	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
352	38.049	0.108	0.50	73	-1.5	100	70	-0.020	10.78	0.00
353	38.157	0.108	0.50	73	-1.5	100	70	-0.020	10.70	0.00
354	38.265	0.108	0.50	73	-1.5	100	70	-0.020	10.64	0.00
355	38.373	0.108	0.50	73	-1.5	100	70	-0.020	10.60	0.00
356	38.481	0.108	0.50	73	-1.5	100	70	-0.020	10.48	0.00
357	38.590	0.108	0.50	73	-1.5	100	70	-0.020	10.49	0.00
358	38.698	0.108	0.50	73	-1.5	100	70	-0.020	10.37	0.00
359	38.806	0.108	0.50	73	-1.5	100	70	-0.020	10.36	0.00
360	38.914	0.108	0.50	73	-1.5	100	70	-0.020	10.41	0.00
361	39.022	0.108	0.50	73	-1.5	100	70	-0.020	10.44	0.00
362	39.130	0.108	0.50	73	-1.5	100	70	-0.020	10.43	0.01
363	39.238	0.108	0.50	73	-1.5	100	70	-0.020	10.39	0.02
364	39.346	0.108	0.50	73	-1.5	100	70	-0.020	10.36	0.01
365	39.454	0.108	0.50	73	-1.5	100	70	-0.020	10.30	0.02
366	39.562	0.108	0.50	73	-1.5	100	70	-0.020	10.30	0.02
367	39.670	0.108	0.50	73	-1.5	100	70	-0.020	10.27	0.00
368	39.779	0.108	0.50	73	-1.5	100	70	-0.020	10.53	0.00
369	39.887	0.108	0.50	73	-1.5	100	70	-0.020	9.68	0.02
370	39.995	0.108	0.50	73	-1.5	100	70	-0.020	10.40	0.01
371	40.103	0.108	0.50	73	-1.5	100	70	-0.020	10.32	0.02
372	40.211	0.108	0.50	73	-1.5	100	70	-0.020	10.40	0.01
373	40.319	0.108	0.50	73	-1.5	100	70	-0.020	10.38	0.02
374	40.427	0.108	0.50	73	-1.5	100	70	-0.020	10.34	0.01
375	40.535	0.108	0.50	73	-1.5	100	71	-0.020	10.35	0.02
376	40.643	0.108	0.50	73	-1.5	100	71	-0.020	10.33	0.02
377	40.751	0.108	0.50	73	-1.5	100	70	-0.020	10.30	0.02
378	40.859	0.108	0.50	73	-1.5	100	70	-0.020	10.31	0.02
379	40.968	0.108	0.50	73	-1.5	100	70	-0.020	10.36	0.00
380	41.076	0.108	0.50	73	-1.5	100	70	-0.020	10.32	0.00
381	41.184	0.108	0.50	73	-1.5	100	70	-0.020	10.26	0.00
382	41.292	0.108	0.50	73	-1.5	100	70	-0.020	10.25	0.00
383	41.400	0.108	0.50	73	-1.5	100	70	-0.020	10.16	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
384	41.508	0.108	0.50	73	-1.5	100	70	-0.020	10.21	0.00
385	41.616	0.108	0.50	73	-1.5	100	70	-0.020	10.32	0.00
386	41.724	0.108	0.50	73	-1.5	100	70	-0.020	10.34	0.00
387	41.832	0.108	0.50	73	-1.5	100	70	-0.020	10.35	0.00
388	41.940	0.108	0.50	73	-1.5	100	70	-0.020	10.36	0.00
389	42.049	0.108	0.50	73	-1.5	100	70	-0.020	10.37	0.00
390	42.157	0.108	0.50	73	-1.5	100	70	-0.020	10.35	0.00
391	42.265	0.108	0.50	73	-1.5	100	70	-0.020	10.33	0.00
392	42.373	0.108	0.50	73	-1.5	100	70	-0.020	10.30	0.00
393	42.481	0.108	0.50	73	-1.5	100	70	-0.020	10.32	0.00
394	42.589	0.108	0.50	73	-1.5	100	70	-0.020	10.28	0.00
395	42.697	0.108	0.50	73	-1.5	100	70	-0.020	10.26	0.00
396	42.805	0.108	0.50	73	-1.5	100	70	-0.020	10.25	0.00
397	42.913	0.108	0.50	73	-1.5	100	70	-0.020	10.15	0.00
398	43.021	0.108	0.50	73	-1.5	100	70	-0.020	10.11	0.00
399	43.129	0.108	0.50	73	-1.5	100	70	-0.020	10.06	0.00
400	43.238	0.108	0.50	72	-1.5	100	70	-0.020	10.06	0.00
401	43.346	0.108	0.50	72	-1.5	100	70	-0.020	10.03	0.00
402	43.454	0.108	0.50	73	-1.5	100	70	-0.020	10.10	0.00
403	43.562	0.108	0.50	73	-1.5	100	70	-0.020	10.00	0.00
404	43.670	0.108	0.50	72	-1.5	100	70	-0.020	10.00	0.00
405	43.778	0.108	0.50	72	-1.5	100	70	-0.020	10.04	0.00
406	43.886	0.108	0.50	72	-1.5	100	70	-0.020	10.12	0.00
407	43.994	0.108	0.50	72	-1.5	100	70	-0.020	10.07	0.00
408	44.102	0.108	0.50	72	-1.5	100	70	-0.020	10.06	0.00
409	44.210	0.108	0.50	72	-1.5	100	70	-0.020	10.09	0.00
410	44.318	0.108	0.50	72	-1.5	100	70	-0.020	9.99	0.00
411	44.427	0.108	0.50	72	-1.5	100	70	-0.020	9.92	0.00
412	44.535	0.108	0.50	72	-1.5	100	70	-0.020	9.94	0.00
413	44.643	0.108	0.50	72	-1.5	100	70	-0.020	9.94	0.00
414	44.751	0.108	0.50	72	-1.5	100	70	-0.020	9.96	0.00
415	44.859	0.108	0.50	72	-1.5	100	70	-0.020	9.94	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
416	44.967	0.108	0.50	72	-1.5	100	70	-0.020	9.88	0.00
417	45.075	0.108	0.50	72	-1.5	100	70	-0.020	9.84	0.00
418	45.183	0.108	0.50	72	-1.5	100	70	-0.020	9.60	0.00
419	45.291	0.108	0.50	72	-1.5	100	70	-0.020	9.45	0.01
420	45.399	0.108	0.50	72	-1.5	100	70	-0.020	9.60	0.02
421	45.508	0.108	0.50	72	-1.5	100	70	-0.020	9.58	0.01
422	45.616	0.108	0.50	72	-1.5	100	70	-0.020	9.39	0.01
423	45.724	0.108	0.50	72	-1.5	100	70	-0.020	9.12	0.01
424	45.832	0.108	0.50	72	-1.5	100	70	-0.020	9.08	0.02
425	45.940	0.108	0.50	72	-1.5	100	70	-0.020	8.97	0.01
426	46.048	0.108	0.50	72	-1.5	100	70	-0.020	8.95	0.02
427	46.156	0.108	0.50	72	-1.5	100	70	-0.020	8.85	0.01
428	46.264	0.108	0.50	72	-1.5	100	70	-0.020	8.80	0.02
429	46.372	0.108	0.50	72	-1.5	100	70	-0.020	8.76	0.01
430	46.480	0.108	0.50	72	-1.5	100	70	-0.020	8.70	0.02
431	46.588	0.108	0.50	72	-1.5	100	70	-0.020	8.60	0.01
432	46.697	0.108	0.50	72	-1.5	100	70	-0.020	8.54	0.02
433	46.805	0.108	0.50	72	-1.5	100	70	-0.020	8.48	0.01
434	46.913	0.108	0.50	72	-1.5	100	69	-0.020	8.34	0.01
435	47.021	0.108	0.50	72	-1.5	100	69	-0.020	8.38	0.01
436	47.129	0.108	0.50	72	-1.5	100	69	-0.020	8.27	0.02
437	47.237	0.108	0.50	72	-1.5	100	69	-0.020	8.30	0.01
438	47.345	0.108	0.50	72	-1.5	100	69	-0.020	8.20	0.02
439	47.453	0.108	0.50	72	-1.5	100	69	-0.020	8.10	0.01
440	47.561	0.108	0.50	72	-1.5	100	69	-0.020	7.93	0.01
441	47.669	0.108	0.50	72	-1.5	100	69	-0.020	8.02	0.01
442	47.777	0.108	0.50	72	-1.5	100	69	-0.020	7.99	0.01
443	47.886	0.108	0.50	72	-1.5	100	69	-0.020	7.97	0.01
444	47.994	0.108	0.50	72	-1.5	100	69	-0.020	7.90	0.01
445	48.102	0.108	0.50	72	-1.5	100	69	-0.020	7.91	0.01
446	48.210	0.108	0.50	72	-1.5	100	70	-0.020	7.84	0.02
447	48.318	0.108	0.50	72	-1.5	100	70	-0.020	7.77	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
448	48.426	0.108	0.50	72	-1.5	100	70	-0.020	7.74	0.01
449	48.534	0.108	0.50	72	-1.5	100	70	-0.020	7.65	0.02
450	48.642	0.108	0.50	72	-1.5	100	70	-0.020	7.66	0.02
451	48.750	0.108	0.50	72	-1.5	100	70	-0.020	7.59	0.01
452	48.858	0.108	0.50	72	-1.5	100	70	-0.020	7.50	0.01
453	48.967	0.108	0.50	72	-1.5	100	70	-0.020	7.36	0.01
454	49.075	0.108	0.50	72	-1.5	100	70	-0.020	7.28	0.01
455	49.183	0.108	0.50	72	-1.5	100	70	-0.020	7.25	0.01
456	49.291	0.108	0.50	72	-1.5	100	70	-0.020	7.19	0.01
457	49.399	0.108	0.50	72	-1.5	100	70	-0.020	7.11	0.01
458	49.507	0.108	0.50	72	-1.5	100	70	-0.020	7.10	0.01
459	49.615	0.108	0.50	72	-1.5	100	70	-0.020	6.95	0.01
460	49.723	0.108	0.50	72	-1.5	100	70	-0.020	6.91	0.01
461	49.831	0.108	0.50	72	-1.5	100	70	-0.020	6.92	0.01
462	49.939	0.108	0.50	72	-1.5	100	70	-0.020	6.89	0.01
463	50.047	0.108	0.50	72	-1.5	100	70	-0.020	6.88	0.01
464	50.156	0.108	0.50	72	-1.5	100	70	-0.020	6.95	0.01
465	50.264	0.108	0.50	72	-1.5	100	70	-0.020	6.98	0.01
466	50.372	0.108	0.50	72	-1.5	100	70	-0.020	7.09	0.01
467	50.480	0.108	0.50	72	-1.5	100	70	-0.020	7.17	0.01
468	50.588	0.108	0.50	72	-1.5	100	70	-0.020	7.18	0.01
469	50.696	0.108	0.50	72	-1.5	100	70	-0.020	7.19	0.01
470	50.804	0.108	0.50	72	-1.5	100	70	-0.020	7.33	0.01
471	50.912	0.108	0.50	72	-1.5	100	70	-0.020	7.38	0.01
472	51.020	0.108	0.50	72	-1.5	100	70	-0.020	7.40	0.01
473	51.128	0.108	0.50	72	-1.5	100	70	-0.020	7.45	0.01
474	51.236	0.108	0.50	72	-1.5	100	70	-0.020	7.53	0.01
475	51.345	0.108	0.50	72	-1.5	100	70	-0.020	7.60	0.01
476	51.453	0.108	0.50	72	-1.5	100	70	-0.020	7.40	0.01
477	51.561	0.108	0.50	72	-1.5	100	70	-0.020	7.22	0.01
478	51.669	0.108	0.50	72	-1.5	100	70	-0.020	7.09	0.01
479	51.777	0.108	0.50	72	-1.5	100	70	-0.020	7.04	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
480	51.885	0.108	0.50	72	-1.5	100	70	-0.020	6.94	0.01
481	51.993	0.108	0.50	72	-1.5	100	70	-0.020	6.85	0.01
482	52.101	0.108	0.50	72	-1.5	100	70	-0.020	6.70	0.01
483	52.209	0.108	0.50	72	-1.5	100	70	-0.020	6.68	0.01
484	52.317	0.108	0.50	72	-1.5	100	69	-0.020	6.68	0.01
485	52.426	0.108	0.50	72	-1.5	100	69	-0.020	6.61	0.01
486	52.534	0.108	0.50	72	-1.5	100	69	-0.020	6.58	0.01
487	52.642	0.108	0.50	72	-1.5	100	69	-0.020	6.56	0.01
488	52.750	0.108	0.50	72	-1.5	100	69	-0.020	6.52	0.01
489	52.858	0.108	0.50	72	-1.5	100	69	-0.020	6.54	0.01
490	52.966	0.108	0.50	72	-1.5	100	69	-0.020	6.56	0.01
491	53.074	0.108	0.50	72	-1.5	100	69	-0.020	6.61	0.01
492	53.182	0.108	0.50	72	-1.5	100	69	-0.020	6.61	0.01
493	53.290	0.108	0.50	72	-1.5	100	69	-0.020	6.54	0.01
494	53.398	0.108	0.50	72	-1.5	100	69	-0.020	6.44	0.01
495	53.506	0.108	0.50	72	-1.5	100	69	-0.020	6.42	0.01
496	53.615	0.108	0.50	72	-1.5	100	69	-0.020	6.42	0.01
497	53.723	0.108	0.50	72	-1.5	100	69	-0.020	6.24	0.01
498	53.831	0.108	0.50	72	-1.5	100	69	-0.020	6.24	0.01
499	53.939	0.108	0.50	72	-1.5	100	69	-0.020	6.31	0.01
500	54.047	0.108	0.50	72	-1.5	100	69	-0.020	6.24	0.01
501	54.155	0.108	0.50	72	-1.5	100	69	-0.020	6.20	0.01
502	54.263	0.108	0.50	72	-1.5	100	69	-0.020	6.21	0.01
503	54.371	0.108	0.50	72	-1.5	100	69	-0.020	6.18	0.01
504	54.479	0.108	0.50	72	-1.5	100	69	-0.020	6.22	0.01
505	54.587	0.108	0.50	72	-1.5	100	69	-0.020	6.23	0.01
506	54.695	0.108	0.50	72	-1.5	100	69	-0.020	6.34	0.01
507	54.804	0.108	0.50	72	-1.5	100	69	-0.020	6.38	0.01
508	54.912	0.108	0.50	72	-1.5	100	69	-0.020	6.47	0.01
509	55.020	0.108	0.50	72	-1.5	100	69	-0.020	6.50	0.01
510	55.128	0.108	0.50	72	-1.5	100	69	-0.020	6.55	0.01
511	55.236	0.108	0.50	72	-1.5	100	69	-0.020	6.63	0.01



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
512	55.344	0.108	0.50	72	-1.5	100	69	-0.020	6.74	0.01
513	55.452	0.108	0.50	72	-1.5	100	69	-0.020	6.77	0.02
514	55.560	0.108	0.50	72	-1.5	100	69	-0.020	6.86	0.01
515	55.668	0.108	0.50	72	-1.5	100	69	-0.020	6.89	0.01
516	55.776	0.108	0.50	72	-1.5	100	69	-0.020	6.98	0.01
517	55.885	0.108	0.50	72	-1.5	100	69	-0.020	7.19	0.01
518	55.993	0.108	0.50	72	-1.5	100	69	-0.020	7.26	0.01
519	56.101	0.108	0.50	72	-1.5	100	69	-0.020	7.30	0.01
520	56.209	0.108	0.50	72	-1.5	100	69	-0.020	7.34	0.01
521	56.317	0.108	0.50	72	-1.5	100	69	-0.020	7.31	0.01
522	56.425	0.108	0.50	71	-1.5	100	69	-0.020	7.32	0.01
Avg/Tot	56.425	0.108	0.50	72	-1.50	100	70	-0.023	10.10	0.16

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	282	288	199	291	408	293.6	567
1	280	285	195	287	407	290.7	497
2	275	282	191	283	406	287.6	501
3	271	278	188	280	404	284.6	515
4	267	274	185	278	402	281.3	534
5	263	270	182	276	401	278.5	556
6	259	266	180	275	399	275.7	578
7	255	262	177	274	397	273.0	600
8	250	258	175	274	395	270.4	622
9	247	254	172	273	393	267.9	646
10	243	251	170	274	390	265.7	668
11	239	248	169	275	388	264.0	680
12	236	245	168	275	386	262.1	673
13	234	242	166	276	384	260.4	685
14	231	240	164	277	382	258.9	693
15	229	238	162	278	381	257.5	698
16	227	236	161	279	379	256.4	719
17	226	235	160	281	377	255.8	723
18	225	234	159	281	375	254.9	708
19	224	234	158	281	374	254.3	699
20	224	233	157	282	372	253.4	709
21	223	233	156	283	371	252.9	728
22	222	233	155	284	370	253.0	743
23	222	233	155	286	369	252.9	747
24	222	234	154	286	368	252.8	751
25	221	234	154	289	367	252.9	753
26	221	234	153	290	366	252.9	765
27	221	235	152	291	365	252.8	766
28	221	235	152	293	364	252.9	765
29	220	235	151	295	364	253.1	765
30	220	236	151	296	363	253.4	768
31	221	236	151	298	363	253.7	773
32	221	237	151	300	363	254.3	784
33	221	238	151	302	363	254.7	786
34	221	239	150	304	363	255.3	790
35	221	240	150	307	363	256.1	809
36	222	241	151	311	363	257.5	840
37	222	242	151	315	364	258.7	854
38	222	243	151	318	364	259.6	855
39	222	244	150	321	365	260.6	854
40	222	245	150	324	366	261.4	850
41	222	246	150	326	366	262.3	837
42	222	247	150	327	367	262.5	819
43	222	248	150	328	368	263.2	808
44	222	249	150	328	369	263.7	802
45	222	249	150	328	371	264.2	800
46	222	250	150	328	372	264.5	798
47	222	251	151	329	373	265.2	799

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
48	222	252	151	329	375	265.8	802	
49	223	252	151	330	376	266.5	810	
50	223	253	151	331	378	267.4	832	
51	224	255	152	335	380	269.1	862	
52	225	256	153	339	381	270.8	885	
53	226	258	153	345	383	273.1	922	
54	227	260	155	352	384	275.6	962	
55	229	261	156	360	386	278.3	985	
56	230	263	158	367	387	281.1	995	
57	232	265	159	375	389	283.8	1006	
58	233	267	161	382	390	286.7	1017	
59	235	269	162	389	391	289.2	1021	
60	237	271	164	395	392	291.8	1014	
61	238	273	166	399	393	293.7	1003	
62	240	276	167	403	394	295.7	1001	
63	242	278	168	407	395	297.7	1009	
64	243	280	169	410	395	299.5	1012	
65	245	282	171	413	396	301.3	1007	
66	246	284	172	416	397	303.0	1010	
67	248	287	172	419	398	304.6	1020	
68	249	289	173	422	399	306.3	1028	
69	250	291	173	426	399	307.8	1033	
70	252	293	173	429	400	309.3	1033	
71	253	294	173	432	401	310.6	1036	
72	254	296	173	435	401	311.9	1041	
73	256	297	172	438	402	313.1	1045	
74	256	299	173	440	402	314.2	1043	
75	258	300	174	442	403	315.3	1043	
76	259	301	173	444	403	316.2	1045	
77	260	303	174	447	404	317.5	1051	
78	262	305	174	449	404	318.6	1064	
79	263	307	174	452	404	320.3	1080	
80	265	310	174	456	405	321.7	1097	
81	266	313	175	460	405	323.8	1109	
82	268	316	175	463	405	325.3	1118	
83	269	320	175	467	405	327.4	1125	
84	270	324	175	471	405	329.2	1130	
85	271	328	176	475	405	331.0	1132	
86	273	331	176	478	405	332.7	1125	
87	274	335	176	482	405	334.2	1113	
88	275	338	176	483	405	335.4	1082	
89	276	341	176	482	405	336.3	1058	
90	277	344	176	482	405	337.0	1039	
91	278	346	176	480	404	337.0	1036	
92	279	346	176	483	404	337.6	1084	
93	279	345	175	488	403	338.2	1108	
94	279	346	175	491	403	338.8	1085	
95	280	348	174	489	402	338.7	1032	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	281	349	174	485	401	338.1	997
97	283	350	174	481	400	337.7	976
98	284	351	173	477	399	336.6	958
99	284	352	173	471	398	335.5	943
100	284	352	172	466	397	334.2	935
101	285	352	171	462	396	333.2	930
102	285	352	171	457	394	331.9	926
103	284	352	171	454	393	330.9	923
104	284	351	170	451	392	329.6	925
105	284	350	169	448	391	328.3	926
106	283	349	169	445	389	327.2	924
107	283	348	169	442	388	326.0	925
108	283	347	168	440	387	325.1	927
109	283	345	168	437	386	323.8	927
110	283	344	167	434	385	322.6	922
111	283	343	166	432	384	321.7	915
112	283	342	166	429	384	320.7	906
113	282	341	166	427	383	319.7	897
114	282	340	165	424	382	318.6	890
115	281	339	165	421	382	317.5	885
116	281	338	164	418	382	316.5	880
117	281	337	163	415	381	315.4	878
118	280	337	163	412	381	314.6	878
119	280	336	162	410	381	313.9	879
120	280	336	163	408	381	313.4	886
121	281	335	163	406	380	313.0	906
122	282	334	163	405	380	312.7	907
123	283	334	163	403	380	312.6	895
124	285	333	163	402	380	312.4	881
125	286	332	163	400	380	312.2	869
126	288	331	162	398	380	311.9	861
127	289	330	163	396	380	311.6	863
128	290	329	163	395	380	311.5	876
129	291	329	163	396	380	311.8	894
130	293	328	162	395	380	311.6	906
131	294	327	162	396	380	311.9	908
132	296	326	162	396	380	312.1	908
133	297	326	162	397	380	312.4	908
134	298	326	162	398	380	312.7	914
135	300	325	162	399	380	313.1	923
136	301	325	163	400	380	313.6	932
137	302	324	162	402	380	314.0	940
138	303	324	163	404	380	314.6	948
139	304	324	162	406	380	315.1	950
140	305	323	162	407	380	315.5	950
141	306	323	163	409	379	316.0	951
142	308	322	163	410	379	316.5	952
143	309	322	163	413	379	317.1	957

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	310	322	163	414	379	317.6	966
145	311	321	163	417	379	318.2	987
146	312	321	162	420	379	318.8	1000
147	313	321	162	424	378	319.8	1023
148	313	321	163	429	378	320.8	1037
149	314	321	163	433	378	321.8	1042
150	314	321	163	436	378	322.5	1042
151	315	321	163	439	378	323.2	1041
152	315	321	164	442	377	323.8	1042
153	315	322	164	447	377	325.1	1047
154	316	322	165	449	377	325.6	1051
155	316	323	165	451	377	326.4	1056
156	316	324	166	455	377	327.4	1062
157	317	325	166	457	377	328.3	1066
158	318	326	167	459	376	329.4	1069
159	320	327	168	462	376	330.6	1074
160	322	329	169	464	376	332.0	1075
161	324	330	169	467	376	333.3	1079
162	326	332	171	468	376	334.6	1080
163	328	334	171	471	376	336.1	1079
164	330	336	173	472	377	337.6	1077
165	332	339	174	475	377	339.3	1085
166	335	343	177	476	377	341.3	1085
167	337	347	179	476	377	343.2	1083
168	340	352	182	477	377	345.6	1072
169	343	358	185	476	377	347.7	1064
170	346	364	187	474	378	349.6	1034
171	349	370	191	472	378	351.7	1004
172	353	375	193	468	378	353.5	983
173	357	381	196	465	378	355.1	967
174	360	386	198	462	378	356.6	963
175	363	390	199	459	378	357.9	964
176	366	394	200	457	378	358.8	967
177	368	396	200	457	377	359.5	980
178	368	396	198	458	377	359.4	1014
179	368	395	198	463	377	360.2	1077
180	367	394	197	471	376	360.9	1099
181	365	393	197	477	376	361.4	1100
182	364	391	196	482	375	361.7	1093
183	363	389	196	487	375	361.8	1085
184	361	388	195	491	374	361.7	1077
185	359	386	195	493	373	361.3	1071
186	358	384	194	494	373	360.5	1065
187	356	382	194	496	372	360.0	1059
188	354	380	194	497	371	359.3	1055
189	353	379	194	497	371	358.5	1053
190	351	377	193	497	370	357.7	1049
191	350	375	193	497	369	356.8	1045

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
192	348	373	192	497	368	355.7	1042	
193	347	371	192	497	368	354.9	1039	
194	345	369	192	496	367	353.8	1038	
195	344	367	191	496	366	352.8	1035	
196	343	366	191	493	365	351.7	1030	
197	342	364	190	493	365	350.6	1025	
198	341	362	190	491	364	349.6	1020	
199	340	361	189	490	363	348.5	1013	
200	339	359	189	487	362	347.2	1003	
201	337	358	188	485	361	345.8	990	
202	336	357	188	480	360	344.2	977	
203	335	356	187	477	360	342.8	965	
204	333	354	186	473	359	341.1	955	
205	332	353	186	468	358	339.3	945	
206	331	352	185	463	357	337.7	936	
207	330	351	185	459	356	336.1	928	
208	329	349	184	455	356	334.5	922	
209	328	348	184	450	355	332.9	918	
210	327	347	184	446	354	331.5	915	
211	326	346	183	442	353	330.0	913	
212	325	345	183	439	353	328.7	912	
213	324	343	182	437	352	327.6	914	
214	323	342	182	433	351	326.3	916	
215	322	341	182	432	350	325.4	920	
216	321	340	182	430	350	324.6	926	
217	320	339	182	429	349	323.9	934	
218	320	339	181	428	349	323.3	942	
219	319	338	181	427	348	322.7	951	
220	319	337	181	428	348	322.4	961	
221	318	336	181	429	347	322.1	972	
222	317	335	180	430	347	322.1	985	
223	316	335	180	432	347	322.0	997	
224	316	334	180	434	347	322.3	1010	
225	316	334	181	436	346	322.6	1022	
226	316	334	181	440	346	323.3	1034	
227	316	334	181	444	346	324.0	1045	
228	316	334	181	448	346	325.0	1057	
229	317	334	181	453	346	326.1	1067	
230	317	334	181	459	346	327.3	1075	
231	317	335	182	461	346	328.1	1078	
232	318	335	183	466	346	329.4	1081	
233	318	336	183	470	346	330.5	1081	
234	319	336	184	474	346	331.6	1081	
235	319	337	184	477	345	332.6	1082	
236	320	338	185	480	346	333.5	1083	
237	320	338	186	484	346	334.8	1083	
238	321	339	187	486	346	335.8	1083	
239	322	340	188	487	346	336.6	1084	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	322	341	190	490	346	337.7	1084
241	323	341	191	492	346	338.7	1086
242	324	342	193	494	346	339.8	1085
243	324	343	195	496	346	340.7	1084
244	325	343	196	497	346	341.5	1083
245	326	344	197	498	346	342.3	1082
246	327	345	198	500	346	343.2	1080
247	328	346	200	501	346	344.1	1078
248	328	346	201	500	347	344.5	1075
249	329	347	202	501	347	345.2	1072
250	330	347	203	502	347	345.8	1070
251	331	348	204	501	347	346.1	1067
252	332	349	205	501	347	346.7	1063
253	332	350	206	500	348	347.2	1059
254	333	351	207	501	348	347.7	1060
255	334	352	207	500	348	348.0	1063
256	334	353	208	501	348	348.7	1061
257	335	353	208	502	348	349.2	1057
258	336	354	208	501	349	349.5	1052
259	336	355	208	500	349	349.5	1047
260	337	355	208	499	350	349.7	1042
261	337	356	208	498	350	349.9	1036
262	339	357	208	495	351	349.8	1025
263	339	358	207	493	352	349.8	1011
264	340	358	207	487	354	349.1	988
265	340	359	207	481	355	348.3	967
266	340	360	207	475	356	347.7	948
267	341	360	206	469	358	346.7	932
268	341	361	206	463	359	346.0	917
269	341	361	206	458	361	345.4	906
270	341	361	205	451	363	344.3	895
271	341	361	205	445	365	343.3	885
272	341	361	204	440	366	342.4	877
273	341	360	203	435	368	341.5	871
274	340	360	203	430	370	340.7	867
275	340	359	202	426	372	339.8	863
276	340	359	202	421	373	339.0	861
277	340	358	201	418	375	338.2	861
278	339	357	201	414	376	337.5	861
279	339	357	200	411	377	336.7	862
280	339	356	199	408	379	336.2	864
281	338	356	199	406	380	335.8	866
282	338	355	198	405	381	335.3	870
283	337	354	198	403	382	334.8	874
284	337	353	197	402	383	334.4	879
285	336	353	197	401	384	334.2	883
286	336	352	197	400	385	334.0	883
287	336	351	196	400	386	333.7	883

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	335	350	196	399	387	333.4	882
289	335	349	195	398	388	333.1	882
290	335	349	195	397	388	332.7	881
291	335	348	194	396	389	332.4	880
292	335	347	193	395	390	332.1	879
293	334	347	193	395	391	331.9	877
294	334	346	193	394	391	331.5	874
295	334	346	193	392	392	331.2	871
296	334	345	192	391	392	330.9	868
297	334	345	191	390	393	330.5	865
298	334	345	191	388	393	330.3	862
299	334	344	190	387	394	330.0	860
300	335	344	190	386	394	329.9	858
301	335	343	190	386	395	329.7	859
302	335	343	190	384	395	329.5	858
303	335	342	190	384	396	329.3	860
304	335	342	190	383	396	329.2	863
305	336	341	189	382	396	328.9	865
306	336	340	189	382	397	329.0	868
307	337	340	189	382	396	328.8	870
308	338	340	188	382	396	328.7	873
309	339	339	188	382	396	328.8	875
310	340	339	188	383	395	328.8	877
311	341	338	187	383	394	328.8	880
312	342	338	187	382	394	328.7	883
313	343	338	187	383	393	328.8	887
314	345	337	186	384	392	328.9	891
315	347	337	186	385	391	329.0	896
316	349	337	186	386	390	329.4	900
317	350	337	185	386	389	329.5	901
318	352	336	185	387	389	329.7	899
319	353	336	185	387	388	329.8	895
320	354	336	184	387	387	329.7	888
321	355	336	184	386	386	329.6	873
322	356	336	185	384	385	329.2	859
323	357	336	184	383	385	328.8	849
324	358	335	184	382	384	328.7	844
325	359	335	184	381	384	328.5	841
326	360	335	183	379	383	328.1	839
327	361	335	183	377	383	327.8	838
328	361	335	183	376	383	327.4	837
329	362	334	182	374	382	327.0	834
330	362	334	182	373	382	326.7	833
331	363	333	182	373	382	326.6	832
332	364	333	181	371	382	326.2	830
333	364	333	181	370	382	326.1	826
334	365	333	181	368	382	325.7	821
335	365	332	181	367	382	325.4	814



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	365	332	180	366	383	325.2	809
337	365	332	181	365	383	325.0	807
338	366	331	180	364	383	324.8	807
339	367	331	181	362	383	324.7	807
340	368	331	180	361	383	324.5	806
341	369	331	180	360	383	324.6	804
342	371	330	180	359	383	324.6	803
343	373	330	180	358	383	324.8	800
344	375	330	180	358	382	325.0	797
345	376	330	180	356	382	325.0	795
346	378	330	181	355	382	325.0	793
347	379	330	181	355	382	325.2	793
348	381	330	181	353	381	325.1	797
349	382	329	181	354	381	325.5	804
350	384	329	181	353	380	325.4	807
351	385	329	181	353	380	325.5	808
352	386	329	181	353	379	325.8	808
353	387	328	181	353	379	325.7	808
354	387	328	182	353	378	325.7	807
355	388	328	181	353	378	325.6	804
356	388	328	182	352	377	325.4	801
357	388	328	181	351	377	325.2	798
358	389	328	181	350	376	325.0	795
359	389	328	182	350	376	324.8	792
360	390	328	182	349	375	324.8	788
361	390	328	182	349	375	324.6	783
362	391	327	182	347	374	324.2	779
363	391	327	181	347	373	324.1	775
364	391	327	182	347	373	323.8	773
365	392	326	182	346	372	323.4	770
366	392	326	182	345	372	323.0	769
367	392	325	182	342	371	322.3	769
368	392	325	182	343	370	322.3	767
369	392	324	181	342	370	322.0	766
370	393	324	182	342	369	322.0	763
371	394	324	182	341	369	321.8	759
372	395	323	182	340	368	321.6	754
373	395	323	182	339	368	321.4	752
374	397	322	182	338	367	321.3	751
375	397	322	182	338	367	321.0	749
376	398	322	181	336	366	320.8	748
377	399	321	182	336	366	320.7	746
378	400	321	182	335	365	320.6	743
379	401	321	182	334	365	320.4	741
380	401	320	181	334	364	320.1	740
381	402	320	182	334	363	320.2	740
382	402	320	181	332	363	319.6	740
383	402	319	182	332	362	319.4	741

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	403	319	181	331	362	319.0	743
385	402	318	180	331	361	318.5	744
386	403	317	180	330	360	318.2	743
387	402	317	180	330	360	317.8	741
388	402	316	180	330	359	317.5	740
389	403	316	180	329	359	317.2	738
390	403	315	180	329	358	316.9	736
391	403	315	180	328	357	316.6	735
392	403	314	180	327	357	316.1	733
393	404	314	180	326	356	315.7	731
394	403	313	180	326	356	315.7	731
395	403	312	180	325	355	315.3	732
396	403	312	180	325	355	314.9	735
397	402	311	180	325	354	314.5	736
398	402	310	180	325	354	314.1	740
399	401	309	180	324	353	313.5	744
400	400	309	180	325	352	313.3	747
401	400	308	180	325	352	313.0	749
402	399	308	180	325	351	312.5	750
403	398	307	180	325	351	312.1	750
404	397	307	180	325	350	311.8	749
405	396	306	180	326	349	311.4	749
406	396	305	180	327	349	311.2	750
407	395	304	180	326	348	310.6	749
408	395	304	180	326	347	310.3	748
409	394	303	180	326	347	309.9	747
410	394	302	180	326	346	309.6	747
411	394	302	180	326	346	309.4	746
412	393	301	180	325	345	308.9	746
413	393	301	180	326	344	308.7	744
414	392	300	180	325	343	308.3	743
415	392	300	180	325	343	308.1	740
416	392	299	180	325	342	307.8	736
417	392	299	180	324	341	307.3	731
418	392	299	180	323	341	306.9	724
419	392	298	180	321	340	306.3	712
420	392	298	180	321	340	306.0	704
421	391	298	180	319	339	305.5	702
422	391	298	180	318	339	305.3	702
423	390	298	179	317	340	304.9	702
424	389	298	179	316	340	304.5	703
425	388	297	179	316	340	304.2	704
426	387	297	179	316	341	304.0	704
427	387	297	178	315	342	303.6	706
428	385	296	177	315	342	303.2	707
429	384	296	177	314	343	302.8	710
430	383	295	177	314	344	302.5	711
431	382	295	176	313	344	302.0	711

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	381	295	176	313	345	301.9	710
433	379	294	176	313	345	301.6	711
434	378	294	175	312	346	300.9	712
435	377	293	175	312	346	300.5	708
436	376	292	174	311	347	299.9	703
437	374	292	174	310	347	299.5	701
438	373	291	173	310	348	298.9	700
439	373	290	173	309	348	298.5	700
440	372	289	172	309	348	297.9	701
441	370	288	172	308	348	297.4	702
442	369	287	172	308	348	296.8	702
443	368	286	172	308	348	296.3	701
444	367	285	171	308	348	295.8	702
445	365	285	171	307	348	295.3	703
446	364	284	171	307	348	294.6	705
447	363	283	170	306	348	294.0	705
448	361	282	170	306	348	293.4	705
449	360	281	170	306	348	293.0	705
450	359	280	169	306	347	292.3	704
451	358	280	169	305	347	291.7	703
452	356	279	169	305	347	291.1	702
453	355	278	168	305	347	290.5	701
454	354	278	168	304	346	290.0	701
455	352	277	168	304	346	289.2	699
456	351	276	168	303	346	288.6	695
457	349	275	167	302	346	287.8	692
458	348	274	167	301	346	287.2	689
459	346	273	167	301	345	286.4	687
460	345	272	166	300	345	285.7	685
461	343	272	166	299	345	285.0	685
462	342	271	166	298	345	284.3	685
463	340	270	166	298	345	283.7	686
464	339	269	166	297	344	283.0	688
465	337	268	165	297	344	282.4	690
466	336	267	165	296	344	281.8	693
467	335	267	165	296	344	281.4	696
468	334	266	165	296	344	281.0	701
469	333	266	165	296	343	280.6	702
470	332	265	165	296	343	280.3	700
471	331	265	165	297	343	280.1	698
472	331	264	165	295	343	279.6	699
473	330	264	164	296	343	279.5	699
474	329	263	164	296	344	279.1	700
475	328	263	164	296	344	279.1	702
476	328	263	164	296	344	278.9	704
477	327	262	164	296	344	278.8	701
478	326	262	164	295	345	278.5	699
479	325	262	165	295	345	278.4	696

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 1

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/8/2018

**Stove ΔT:** 33

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	325	262	165	294	346	278.1	692
481	324	262	165	294	346	278.0	689
482	323	261	165	293	346	277.5	685
483	322	261	165	293	347	277.3	683
484	321	260	164	292	347	276.8	685
485	320	260	164	292	347	276.5	686
486	319	259	164	291	347	276.1	688
487	318	259	164	292	347	275.8	690
488	317	258	164	291	346	275.4	692
489	316	258	163	291	346	274.8	693
490	315	257	163	291	346	274.5	694
491	314	257	163	291	345	274.0	695
492	313	256	163	291	345	273.5	697
493	311	256	163	291	345	273.1	695
494	311	256	163	291	344	272.9	694
495	309	255	163	290	344	272.3	692
496	308	255	162	290	343	271.8	691
497	308	254	162	289	343	271.2	686
498	307	254	162	289	343	270.9	683
499	305	254	162	288	342	270.2	684
500	304	253	162	288	341	269.7	685
501	304	253	161	287	340	269.1	684
502	302	253	161	287	340	268.5	683
503	302	252	161	286	339	268.0	683
504	301	252	161	286	338	267.3	681
505	300	252	161	285	337	266.8	682
506	299	252	161	285	335	266.3	683
507	298	252	161	285	334	265.8	684
508	297	252	160	284	333	265.3	684
509	296	251	160	284	332	264.7	685
510	295	251	160	284	331	264.3	685
511	294	251	161	283	329	263.9	685
512	294	251	161	283	328	263.4	686
513	293	251	161	283	327	263.1	687
514	292	251	161	283	325	262.6	688
515	291	252	161	283	324	262.3	690
516	291	252	162	282	323	261.9	693
517	290	252	162	283	321	261.7	698
518	289	252	162	284	320	261.5	703
519	289	253	163	285	319	261.5	707
520	288	253	163	285	318	261.2	710
521	287	253	163	286	316	261.1	714
522	287	253	163	286	315	260.6	715
Average	324	313	177	381	368	312	861

## LAB SAMPLE DATA - ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 1Technician: SJBDate: 10/8/2018**TRAIN A (1st Hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3362	123.3	122.7	0.6
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	0.6
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**TRAIN A (Post 1st hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3363	121.4	120.6	0.8
B. Rear filter catch	Filter	3364	119.9	119.9	0.0
C. Probe catch*	Probe	6A	116565.1	116565.1	0.0
D. O-Ring catch*	O-Ring	6A	3615.8	3615.6	0.2

Sub-Total	Total Particulate, mg:	1.0
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Train A Aggregate	Total Particulate, mg:	<b>1.6</b>
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**TRAIN B**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3365	124.1	123.5	0.6
B. Rear filter catch	Filter	3366	120.7	120.6	0.1
C. Probe catch*	Probe	6B	116117.4	116117.4	0.0
D. O-Ring catch*	O-Ring	6B	3397.3	3396.5	0.8

Total Particulate, mg:	<b>1.5</b>
------------------------	------------

**AMBIENT**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:	<b>0.0</b>
------------------------	------------

\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 1 Test Date: 10/8/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): Medium Low Setting (70 degrees closed from fully open)

#### Preburn Notes

Time	Notes
7:00	Loaded 12 lbs of kindling
8:22	At 1.8 lbs, loaded pre-burn fuel, turned fan on high setting
9:50	At 4.7 lbs, set air to test setting, turned fan down to medium low setting (1/3 open)
11:39	Leveled coal bed, zeroed scale in preparation for fuel loading

#### Test Notes

Test Burn Start Time: 11:39 Test Fuel Loaded by: 30 seconds  
 Door Closed: 35 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min	Changed 1-hour filter.
522 min	End of Test

Test Burn End Time: 20:21

#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	9:00	-	9:05	20:40	-	20:43
CO <sub>2</sub>	0.00	-	10.04	0.03	-	9.94
CO	0.00	-	2.52	0.00	-	2.42

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature: 

Date: 10/9/2018

**WOOD STOVE TEST DATA PACKET  
ASTM E2780/E2515**



**Run 2 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/9/2018

A handwritten signature in black ink, appearing to be "JL", is written over a horizontal line.

Techician Signature

10/23/2018

Date

## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 2

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/9/2018

<b>Burn Rate (kg/hr):</b>	<b>0.66</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	103.707	117.622	9.677
Average Gas Velocity in Dilution Tunnel (ft/sec)	12.8			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	8372.9			
Average Gas Meter Temperature (°F)	68.6	72.1	74.1	70.1
Total Sample Volume (dscf)	0.000	98.695	111.087	9.245
Average Tunnel Temperature (°F)	76.2			
Total Time of Test (min)	643			
Total Particulate Catch (mg)	0.0	1.3	1.9	0.3
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000132	0.0000171	0.0000324
Total PM Emissions (g)	0.00	1.18	1.53	0.27
Particulate Emission Rate (g/hr)	0.00	0.11	0.14	0.27
Emissions Factor (g/kg)	-	0.17	0.22	-
Difference from Average Total Particulate Emissions (g)	-	0.18	0.18	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	1.36
Particulate Emission Rate (g/hr)	0.13
Emissions Factor (g/kg)	0.19
HHV Efficiency (%)	82.2%
LHV Efficiency (%)	88.9%
CO Emissions (g/min)	0.09

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	73.3	OK
Face Velocity	< 30 ft/min	9.9	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 66.02 / Max: 70	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	9.3	OK



## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/09/18  
**Run:** 2  
**Control #:** 18-421  
**Test Duration:** 643  
**Output Category:** 1

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	82.2%	88.9%
<b>Combustion Efficiency</b>	99.5%	99.5%
<b>Heat Transfer Efficiency</b>	82.7%	89.3%

<b>Output Rate (kJ/h)</b>	10,753	10,200	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.66	1.45	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	13,074	12,402	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	7.07	15.59	<b>dry lb</b>
<b>MC wet (%)</b>	17.96		
<b>MC dry (%)</b>	21.89		
<b>Particulate (g )</b>	1.36		
<b>CO (g)</b>	59		
<b>Test Duration (h)</b>	10.72		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.01	0.51
<b>g/kg Dry Fuel</b>	0.19	8.35
<b>g/h</b>	0.13	5.51
<b>g/min</b>	0.00	0.09
<b>lb/MM Btu Output</b>	0.03	1.19

<b>Air/Fuel Ratio (A/F)</b>	12.24
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	20.8		2x4	17.00	23.8
2x4	17.00	18.7		2x4	17.00	18.9
2x4	17.00	23.8				
2x4	17.00	24.4				
2x4	17.00	25.0				
2x4	17.00	19.3				
2x4	17.00	23.8				
2x4	17.00	24.5				
Total Fuel Weight (lbs):		18.24		Average Moisture (%DB):		22.3

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.20  
 Total 4x4 Crib Weight, with spacers (lbs): 9.80  
 Total Wet Fuel Weight, with spacers (lbs): 19.00

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.80  
 Max (lbs): 4.75

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	17.00	2.02	22.7	22.4	23.0	1.65
2x4	17.00	1.80	20.6	20.1	20.8	1.49
2x4	17.00	1.86	22.8	22.7	23.1	1.51
2x4	17.00	2.00	22.2	23.4	23.0	1.63
4x4	17.00	4.28	22.5	22.6	18.7	3.53
4x4	17.00	4.68	22.1	21.9	19.4	3.86
Total Dry Weight, no spacers (lbs):						13.67
Total Dry Weight, with spacers (lbs):						15.67

Spacer Moisture Readings (%DB)							
15.9	16.1	16.0	21.7	16.4	16.4		
17.9	18.8	16.5	20.3	22.0	18.7		
17.7	21.0	16.8	21.5	22.7	18.8		
15.5	17.0	15.3	16.5	21.2	22.0		

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	30.5	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.53	OK
2x4 Fuel Mix	35 - 65 % of total weight	48%	OK

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018Preburn Start Time: 8:50Recording Interval (min): 1Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	4.6	-0.040	665	696	292	557	542	550.4	436	1135	68
1	4.6	-0.030	666	696	299	554	545	551.9	434	1080	68
2	4.6	-0.030	663	691	318	558	548	555.6	432	1037	68
3	4.6	-0.030	656	682	323	555	551	553.5	432	1011	67
4	4.6	-0.030	648	671	325	551	553	549.9	432	993	67
5	4.6	-0.030	639	660	325	547	555	544.9	432	980	67
6	4.6	-0.030	628	647	325	542	555	539.6	430	967	68
7	4.6	-0.030	617	635	323	537	556	533.6	429	954	68
8	4.6	-0.020	606	623	322	533	555	527.8	426	939	67
9	4.5	-0.020	596	611	320	526	554	521.4	423	924	67
10	4.4	-0.020	585	600	317	521	553	515.1	420	908	67
11	4.5	-0.020	575	589	314	514	551	508.6	416	892	67
12	4.5	-0.020	565	578	310	507	549	501.7	413	876	67
13	4.5	-0.020	555	567	308	501	546	495.6	408	861	67
14	4.5	-0.020	546	557	304	494	544	489.0	404	847	67
15	4.5	-0.020	537	548	301	486	541	482.7	400	833	67
16	4.5	-0.020	528	538	299	481	538	476.6	395	818	67
17	4.5	-0.020	519	529	295	473	535	470.4	390	805	67
18	4.5	-0.020	511	520	292	466	532	464.1	386	792	67
19	4.5	-0.020	503	512	289	460	528	458.4	381	779	68
20	4.5	-0.020	495	504	286	453	525	452.5	376	767	68
21	4.5	-0.020	487	496	283	445	521	446.7	371	755	67
22	4.5	-0.020	480	488	281	440	518	441.3	367	744	67
23	4.5	-0.020	473	481	277	433	514	435.4	362	733	68
24	4.5	-0.020	465	473	274	426	511	430.0	357	723	68
25	4.5	-0.020	459	466	272	420	507	424.8	352	712	68
26	4.5	-0.020	452	459	269	413	504	419.5	348	703	68
27	4.5	-0.020	446	453	267	408	501	414.8	343	694	67
28	4.5	-0.020	440	446	264	402	497	410.0	339	685	67
29	4.5	-0.020	434	440	262	397	494	405.2	335	676	67
30	4.5	-0.020	428	434	259	392	490	400.5	330	668	68
31	4.5	-0.020	422	427	259	387	487	396.2	326	660	68
32	4.5	-0.020	416	421	256	382	483	391.7	323	653	68
33	4.9	-0.020	410	415	255	377	480	387.4	319	645	68
34	4.6	-0.020	405	410	252	372	476	382.9	315	637	67
35	4.6	-0.020	399	404	250	367	473	378.6	312	631	68
36	4.5	-0.020	394	399	247	363	469	374.5	308	624	68
37	4.6	-0.020	389	394	245	358	465	370.3	305	617	68
38	4.6	-0.020	384	389	243	353	462	366.1	302	611	68
39	4.6	-0.020	379	384	240	349	458	362.0	298	605	68
40	4.6	-0.020	375	379	238	345	455	358.2	295	599	67
41	4.6	-0.010	370	374	236	341	451	354.2	291	593	67
42	4.6	-0.010	366	369	234	337	447	350.6	288	587	67
43	4.6	-0.010	361	365	232	333	444	346.9	285	582	67
44	4.6	-0.010	357	360	230	329	440	343.1	282	577	68

## WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Preburn Start Time: 8:50  
 Recording Interval (min): 1  
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	4.6	-0.010	353	356	227	325	436	339.5	278	572	67
46	4.6	-0.010	350	352	225	321	433	336.0	275	567	67
47	4.6	-0.010	346	348	223	318	429	332.8	272	563	68
48	4.6	-0.010	341	343	222	315	426	329.3	269	558	68
49	4.6	-0.010	338	340	219	311	422	326.0	267	554	67
50	4.6	-0.010	334	336	217	308	419	322.6	264	550	68
51	4.6	-0.010	330	332	216	305	415	319.6	261	546	67
52	4.6	-0.010	327	328	213	301	412	316.1	258	543	67
53	4.6	-0.010	324	325	211	297	408	312.8	255	540	67
54	4.6	-0.010	320	321	209	295	405	309.9	253	537	68
55	4.6	-0.010	317	318	207	292	401	306.8	250	534	67
56	4.6	-0.010	313	314	205	289	398	304.0	247	531	67
57	4.6	-0.010	310	311	204	286	395	301.1	244	528	67
58	4.6	-0.010	307	308	202	283	392	298.4	242	526	67
59	4.7	-0.010	304	304	200	280	389	295.6	240	525	67
60	4.6	-0.010	302	301	198	278	385	293.0	237	525	67

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2  
 Test Start Time: 9:52

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Total Sampling Time (min): 643  
 Recording Interval (min): 1

Meter Box  $\gamma$  Factor: 1.002 (A)  
 Meter Box  $\gamma$  Factor: 0.998 (B)  
 Meter Box  $\gamma$  Factor: 0.000 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100%  
 Date Flue Pipe Last Cleaned: 10/7/2018

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	28.53	28.70
Relative Humidity (%)	42.0	39.0
Room Air Velocity (ft/min)	0	0
Scale Audit (lbs)	10.0	10.0
Ambient Sample Volume:	<u>0.000</u> ft <sup>3</sup>	

**Sample Train Post-Test Leak Checks**

(A)	<u>0.001</u>	cfm @	<u>-24</u>	in. Hg
(B)	<u>0.000</u>	cfm @	<u>-25</u>	in. Hg
(Ambient)	<u>0.000</u>	cfm @	<u>0</u>	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.030	72
2	0.046	72
3	0.040	72
4	0.020	72
5	0.024	72
6	0.040	72
7	0.046	72
8	0.032	72
Center	0.046	72

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 6 inches  
 Pitot Tube Cp: 0.99 [unitless]  
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole  
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole  
 Tunnel Area: 0.1963 ft<sup>2</sup>

V<sub>strav</sub>: 12.81 ft/sec  
 V<sub>scant</sub>: 14.61 ft/sec  
 F<sub>p</sub>: 0.876 [ratio]

Initial Tunnel Flow: 137.6 scf/min

Static Pressure: -0.195 in. H<sub>2</sub>O

## TEST FUEL PROPERTIES

### Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

### Actual Fuel Used Properties

Fuel Type:	<u>D. Fir</u>
HHV (kJ/kg)	<u>19,810</u>
%C	<u>48.73</u>
%H	<u>6.87</u>
%O	<u>43.9</u>
%Ash	<u>0.5</u>
MC (%DB)	<u>21.9</u>

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.046	0.50	70	-0.5		19.0		83	235	72	67
1	0.161	0.161	0.046	0.50	70	-0.5	100	19.0	0	76	232	72	67
2	0.322	0.161	0.046	0.50	70	-0.5	100	19.0	0	74	229	72	67
3	0.484	0.162	0.046	0.50	70	-0.5	101	19.0	0.04	73	227	72	67
4	0.645	0.161	0.046	0.50	70	-0.5	100	19.0	0	73	224	71	67
5	0.806	0.161	0.046	0.50	70	-0.5	100	19.0	-0.02	73	221	71	67
6	0.967	0.161	0.046	0.50	70	-0.5	100	19.0	0	73	218	71	67
7	1.129	0.162	0.046	0.50	70	-0.5	100	19.0	-0.01	72	216	71	67
8	1.290	0.161	0.046	0.50	70	-0.5	100	19.0	-0.01	72	213	71	67
9	1.451	0.161	0.046	0.50	70	-0.5	100	19.0	-0.02	73	211	71	67
10	1.613	0.162	0.046	0.50	70	-0.5	100	19.0	-0.01	73	209	70	67
11	1.774	0.161	0.046	0.50	70	-0.5	100	19.0	-0.01	72	207	70	67
12	1.935	0.161	0.046	0.50	70	-0.5	100	18.9	-0.04	73	205	70	68
13	2.096	0.161	0.046	0.50	70	-0.5	100	18.9	0	73	203	70	67
14	2.258	0.162	0.046	0.50	70	-0.5	101	18.9	-0.03	73	202	70	67
15	2.419	0.161	0.046	0.50	70	-0.5	100	18.9	-0.04	73	200	70	67
16	2.580	0.161	0.046	0.50	70	-0.5	100	18.8	-0.03	73	199	70	67
17	2.742	0.162	0.046	0.50	70	-0.5	101	18.8	-0.03	73	198	70	67
18	2.903	0.161	0.046	0.50	70	-0.5	100	18.8	-0.04	73	198	70	67
19	3.064	0.161	0.046	0.50	70	-0.5	100	18.7	-0.03	73	197	70	67
20	3.225	0.161	0.046	0.50	70	-0.5	100	18.7	-0.05	73	197	70	67
21	3.387	0.162	0.046	0.50	70	-0.5	101	18.6	-0.03	74	196	70	67
22	3.548	0.161	0.046	0.50	70	-0.5	100	18.6	-0.05	74	196	70	67
23	3.709	0.161	0.046	0.50	70	-0.5	100	18.6	-0.03	74	196	70	67
24	3.871	0.162	0.046	0.50	70	-0.5	101	18.5	-0.08	74	197	70	67
25	4.032	0.161	0.046	0.50	70	-0.5	100	18.4	-0.04	74	197	70	67
26	4.193	0.161	0.046	0.50	70	-0.5	100	18.4	-0.05	74	198	70	67
27	4.354	0.161	0.046	0.50	70	-0.5	100	18.3	-0.06	75	199	70	67
28	4.516	0.162	0.046	0.50	70	-0.5	101	18.3	-0.07	75	200	70	67
29	4.677	0.161	0.046	0.50	70	-0.5	100	18.2	-0.06	75	201	70	67
30	4.838	0.161	0.046	0.50	70	-0.5	100	18.2	-0.04	75	202	70	67
31	5.000	0.162	0.046	0.50	70	-0.5	101	18.1	-0.07	75	203	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	5.161	0.161	0.046	0.50	70	-0.5	100	18.0	-0.07	76	204	70	67
33	5.322	0.161	0.046	0.50	70	-0.5	100	17.9	-0.08	76	206	70	67
34	5.483	0.161	0.046	0.50	70	-0.5	100	17.9	-0.06	76	208	70	67
35	5.645	0.162	0.046	0.50	70	-0.5	101	17.8	-0.07	76	209	70	67
36	5.806	0.161	0.046	0.50	70	-0.5	100	17.7	-0.08	77	211	70	67
37	5.967	0.161	0.046	0.50	70	-0.5	100	17.7	-0.04	77	212	70	67
38	6.129	0.162	0.046	0.50	70	-0.5	101	17.6	-0.07	77	213	70	67
39	6.290	0.161	0.046	0.50	70	-0.5	100	17.5	-0.09	77	215	70	67
40	6.451	0.161	0.046	0.50	70	-0.5	100	17.5	-0.05	77	216	70	67
41	6.612	0.161	0.046	0.50	70	-0.5	100	17.4	-0.07	77	217	70	67
42	6.774	0.162	0.046	0.50	70	-0.5	101	17.4	-0.06	77	218	70	67
43	6.935	0.161	0.046	0.50	70	-0.5	100	17.3	-0.06	77	219	70	67
44	7.096	0.161	0.046	0.50	70	-0.5	100	17.2	-0.08	78	220	70	67
45	7.258	0.162	0.046	0.50	70	-0.5	101	17.1	-0.07	78	221	70	67
46	7.419	0.161	0.046	0.50	70	-0.5	100	17.1	-0.07	78	223	70	67
47	7.580	0.161	0.046	0.50	70	-0.5	100	17.0	-0.07	78	224	70	67
48	7.741	0.161	0.046	0.50	70	-0.5	100	16.9	-0.09	78	226	70	67
49	7.903	0.162	0.046	0.50	70	-0.5	101	16.8	-0.07	78	228	70	66
50	8.064	0.161	0.046	0.50	70	-0.5	100	16.8	-0.08	78	229	70	67
51	8.225	0.161	0.046	0.50	70	-0.5	100	16.7	-0.07	78	231	70	66
52	8.387	0.162	0.046	0.50	70	-0.5	101	16.6	-0.07	78	233	70	67
53	8.548	0.161	0.046	0.50	70	-0.5	100	16.5	-0.08	78	234	70	67
54	8.709	0.161	0.046	0.50	70	-0.5	100	16.5	-0.07	78	236	70	67
55	8.870	0.161	0.046	0.50	70	-0.5	100	16.4	-0.06	78	238	70	67
56	9.032	0.162	0.046	0.50	70	-0.5	101	16.3	-0.09	78	239	70	67
57	9.193	0.161	0.046	0.50	70	-0.5	100	16.3	-0.06	78	241	70	66
58	9.354	0.161	0.046	0.50	70	-0.5	100	16.2	-0.08	78	242	70	67
59	9.516	0.162	0.046	0.50	70	-0.5	101	16.1	-0.06	78	243	70	67
60	9.677	0.161	0.046	0.50	70	-0.5	100	16.1	-0.07	78	244	70	67
61	9.838	0.161	0.046	0.50	70	-0.5	100	16.0	-0.07	78	245	70	66
62	9.999	0.161	0.046	0.50	70	-0.5	100	15.9	-0.06	78	247	70	66
63	10.161	0.162	0.046	0.50	70	-0.5	101	15.9	-0.07	78	248	71	66

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.322	0.161	0.046	0.50	70	-0.5	100	15.8	-0.08	78	249	71	66
65	10.483	0.161	0.046	0.50	70	-0.5	100	15.7	-0.05	78	250	71	66
66	10.645	0.162	0.046	0.50	70	-0.5	101	15.6	-0.08	79	252	71	66
67	10.806	0.161	0.046	0.50	70	-0.5	100	15.6	-0.06	79	253	71	66
68	10.967	0.161	0.046	0.50	70	-0.5	100	15.5	-0.06	79	254	70	66
69	11.128	0.161	0.046	0.50	70	-0.5	100	15.5	-0.06	78	255	70	66
70	11.290	0.162	0.046	0.50	70	-0.5	101	15.4	-0.09	78	256	70	67
71	11.451	0.161	0.046	0.50	70	-0.5	100	15.3	-0.04	79	257	70	67
72	11.612	0.161	0.046	0.50	70	-0.5	100	15.3	-0.06	79	258	70	67
73	11.774	0.162	0.046	0.50	70	-0.5	101	15.2	-0.06	78	259	70	67
74	11.935	0.161	0.046	0.50	70	-0.5	100	15.2	-0.05	78	260	70	66
75	12.096	0.161	0.046	0.50	70	-0.5	100	15.1	-0.06	78	260	70	66
76	12.257	0.161	0.046	0.50	70	-0.5	100	15.0	-0.06	78	261	70	66
77	12.419	0.162	0.046	0.50	70	-0.5	101	15.0	-0.04	78	261	70	66
78	12.580	0.161	0.046	0.50	70	-0.5	100	14.9	-0.07	78	262	70	66
79	12.741	0.161	0.046	0.50	70	-0.5	100	14.9	-0.04	78	262	70	67
80	12.903	0.162	0.046	0.50	70	-0.5	101	14.8	-0.06	78	263	70	67
81	13.064	0.161	0.046	0.50	70	-0.5	100	14.8	-0.06	78	263	70	67
82	13.225	0.161	0.046	0.50	70	-0.5	100	14.7	-0.09	79	264	70	67
83	13.386	0.161	0.046	0.50	70	-0.5	100	14.6	-0.07	79	264	70	67
84	13.548	0.162	0.046	0.50	70	-0.5	101	14.6	-0.06	79	265	70	67
85	13.709	0.161	0.046	0.50	70	-0.5	100	14.5	-0.07	79	266	70	67
86	13.870	0.161	0.046	0.50	70	-0.5	100	14.4	-0.07	79	266	70	67
87	14.032	0.162	0.046	0.50	70	-0.5	101	14.3	-0.07	79	267	70	67
88	14.193	0.161	0.046	0.50	70	-0.5	100	14.3	-0.05	79	267	70	67
89	14.354	0.161	0.046	0.50	70	-0.5	100	14.2	-0.07	79	267	70	67
90	14.515	0.161	0.046	0.50	70	-0.5	100	14.2	-0.07	79	267	70	67
91	14.677	0.162	0.046	0.50	70	-0.5	101	14.1	-0.05	78	267	70	67
92	14.838	0.161	0.046	0.50	70	-0.5	100	14.1	-0.05	78	267	70	67
93	14.999	0.161	0.046	0.50	70	-0.5	100	14.0	-0.04	78	266	70	67
94	15.161	0.162	0.046	0.50	71	-0.5	101	14.0	-0.06	78	266	70	67
95	15.322	0.161	0.046	0.50	71	-0.5	100	13.9	-0.04	78	265	70	67



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.483	0.161	0.046	0.50	71	-0.5	100	13.8	-0.07	78	264	71	67
97	15.644	0.161	0.046	0.50	71	-0.5	100	13.8	-0.03	78	263	71	67
98	15.806	0.162	0.046	0.50	71	-0.5	101	13.8	-0.04	78	262	71	67
99	15.967	0.161	0.046	0.50	71	-0.5	100	13.7	-0.03	78	261	71	67
100	16.128	0.161	0.046	0.50	71	-0.5	100	13.7	-0.05	78	260	71	68
101	16.290	0.162	0.046	0.50	71	-0.5	101	13.7	-0.03	77	259	71	68
102	16.451	0.161	0.046	0.50	71	-0.5	100	13.6	-0.04	77	258	71	67
103	16.612	0.161	0.046	0.50	71	-0.5	100	13.6	-0.05	77	256	71	67
104	16.773	0.161	0.046	0.50	71	-0.5	100	13.6	-0.02	77	255	71	67
105	16.935	0.162	0.046	0.50	71	-0.5	101	13.5	-0.03	77	254	71	67
106	17.096	0.161	0.046	0.50	71	-0.5	100	13.5	-0.06	77	253	71	67
107	17.257	0.161	0.046	0.50	71	-0.5	100	13.4	-0.05	77	252	71	67
108	17.419	0.162	0.046	0.50	71	-0.5	101	13.4	-0.04	77	252	71	67
109	17.580	0.161	0.046	0.50	71	-0.5	100	13.3	-0.05	77	251	71	68
110	17.741	0.161	0.046	0.50	71	-0.5	100	13.3	-0.05	77	251	71	67
111	17.902	0.161	0.046	0.50	71	-0.5	100	13.2	-0.05	77	252	71	68
112	18.064	0.162	0.046	0.50	71	-0.5	101	13.2	-0.04	77	251	71	68
113	18.225	0.161	0.046	0.50	71	-0.5	100	13.1	-0.05	77	251	71	68
114	18.386	0.161	0.046	0.50	71	-0.5	100	13.1	-0.03	77	251	71	68
115	18.548	0.162	0.046	0.50	71	-0.5	101	13.1	-0.05	77	251	71	67
116	18.709	0.161	0.046	0.50	71	-0.5	100	13.0	-0.05	77	250	71	67
117	18.870	0.161	0.046	0.50	71	-0.5	100	13.0	-0.02	77	250	71	68
118	19.031	0.161	0.046	0.50	71	-0.5	100	13.0	-0.03	76	249	71	68
119	19.193	0.162	0.046	0.50	71	-0.5	101	12.9	-0.03	77	248	71	68
120	19.354	0.161	0.046	0.50	71	-0.5	100	12.9	-0.03	76	247	71	68
121	19.515	0.161	0.046	0.50	71	-0.5	100	12.9	-0.03	76	246	71	68
122	19.677	0.162	0.046	0.50	71	-0.5	101	12.8	-0.02	76	245	71	68
123	19.838	0.161	0.046	0.50	71	-0.5	100	12.8	-0.03	76	244	71	68
124	19.999	0.161	0.046	0.50	71	-0.5	100	12.8	-0.04	76	243	71	68
125	20.160	0.161	0.046	0.50	71	-0.5	100	12.8	-0.02	76	242	71	68
126	20.322	0.162	0.046	0.50	71	-0.5	101	12.7	-0.03	76	241	71	68
127	20.483	0.161	0.046	0.50	71	-0.5	100	12.7	-0.04	76	240	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.644	0.161	0.046	0.50	71	-0.5	100	12.7	-0.03	76	239	71	68
129	20.806	0.162	0.046	0.50	71	-0.5	101	12.6	-0.02	76	238	71	68
130	20.967	0.161	0.046	0.50	71	-0.5	100	12.6	-0.05	76	237	71	68
131	21.128	0.161	0.046	0.50	71	-0.5	100	12.6	-0.03	76	237	71	68
132	21.289	0.161	0.046	0.50	72	-0.5	100	12.5	-0.03	76	236	71	68
133	21.451	0.162	0.046	0.50	71	-0.5	101	12.5	-0.03	76	236	71	68
134	21.612	0.161	0.046	0.50	71	-0.5	100	12.5	-0.04	76	236	71	68
135	21.773	0.161	0.046	0.50	72	-0.5	100	12.4	-0.06	76	236	71	68
136	21.935	0.162	0.046	0.50	71	-0.5	101	12.4	-0.01	76	236	71	68
137	22.096	0.161	0.046	0.50	71	-0.5	100	12.3	-0.04	76	236	71	68
138	22.257	0.161	0.046	0.50	71	-0.5	100	12.3	-0.04	76	236	71	68
139	22.418	0.161	0.046	0.50	71	-0.5	100	12.3	-0.04	76	236	71	68
140	22.580	0.162	0.046	0.50	72	-0.5	101	12.2	-0.03	76	236	71	68
141	22.741	0.161	0.046	0.50	72	-0.5	100	12.2	-0.03	76	236	71	68
142	22.902	0.161	0.046	0.50	72	-0.5	100	12.2	-0.05	76	236	71	68
143	23.064	0.162	0.046	0.50	72	-0.5	101	12.1	-0.04	76	237	71	68
144	23.225	0.161	0.046	0.50	72	-0.5	100	12.1	-0.02	76	237	71	68
145	23.386	0.161	0.046	0.50	72	-0.5	100	12.1	-0.03	76	237	71	68
146	23.547	0.161	0.046	0.50	72	-0.5	100	12.0	-0.05	76	237	71	68
147	23.709	0.162	0.046	0.50	72	-0.5	101	12.0	-0.03	77	238	71	68
148	23.870	0.161	0.046	0.50	72	-0.5	100	11.9	-0.04	77	238	71	68
149	24.031	0.161	0.046	0.50	72	-0.5	100	11.9	-0.04	76	238	71	68
150	24.193	0.162	0.046	0.50	72	-0.5	101	11.9	-0.04	76	238	71	68
151	24.354	0.161	0.046	0.50	72	-0.5	100	11.8	-0.03	76	239	71	68
152	24.515	0.161	0.046	0.50	72	-0.5	100	11.8	-0.04	77	239	71	68
153	24.676	0.161	0.046	0.50	72	-0.5	100	11.7	-0.05	77	240	71	68
154	24.838	0.162	0.046	0.50	72	-0.5	101	11.7	-0.02	77	240	71	68
155	24.999	0.161	0.046	0.50	72	-0.5	100	11.7	-0.04	77	240	71	68
156	25.160	0.161	0.046	0.50	72	-0.5	100	11.7	-0.03	77	241	71	68
157	25.322	0.162	0.046	0.50	72	-0.5	101	11.6	-0.04	77	241	71	68
158	25.483	0.161	0.046	0.50	72	-0.5	100	11.6	-0.06	77	241	71	68
159	25.644	0.161	0.046	0.50	72	-0.5	100	11.5	-0.02	77	241	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.805	0.161	0.046	0.50	72	-0.5	100	11.5	-0.03	77	242	71	68
161	25.967	0.162	0.046	0.50	72	-0.5	101	11.5	-0.05	77	242	71	68
162	26.128	0.161	0.046	0.50	72	-0.5	100	11.4	-0.02	77	243	71	68
163	26.289	0.161	0.046	0.50	72	-0.5	100	11.4	-0.03	77	243	71	68
164	26.451	0.162	0.046	0.50	72	-0.5	101	11.4	-0.04	77	243	71	68
165	26.612	0.161	0.046	0.50	72	-0.5	100	11.3	-0.03	77	244	71	68
166	26.773	0.161	0.046	0.50	72	-0.5	100	11.3	-0.04	77	244	71	68
167	26.935	0.162	0.046	0.50	72	-0.5	101	11.3	-0.04	77	244	71	68
168	27.096	0.161	0.046	0.50	72	-0.5	100	11.2	-0.02	77	244	71	68
169	27.257	0.161	0.046	0.50	72	-0.5	100	11.2	-0.02	77	244	71	68
170	27.418	0.161	0.046	0.50	72	-0.5	100	11.2	-0.03	77	244	71	68
171	27.580	0.162	0.046	0.50	72	-0.5	101	11.1	-0.04	77	244	71	68
172	27.741	0.161	0.046	0.50	72	-0.5	100	11.1	-0.02	76	243	71	68
173	27.902	0.161	0.046	0.50	72	-0.5	100	11.1	-0.02	77	243	71	68
174	28.064	0.162	0.046	0.50	72	-0.5	100	11.1	-0.04	77	243	71	68
175	28.225	0.161	0.046	0.50	72	-0.5	100	11.0	-0.03	77	243	71	68
176	28.386	0.161	0.046	0.50	72	-0.5	100	11.0	-0.03	76	243	71	68
177	28.547	0.161	0.046	0.50	72	-0.5	100	11.0	-0.02	76	242	71	68
178	28.709	0.162	0.046	0.50	72	-0.5	100	11.0	-0.03	76	242	71	68
179	28.870	0.161	0.046	0.50	72	-0.5	100	10.9	-0.02	76	241	71	68
180	29.031	0.161	0.046	0.50	72	-0.5	100	10.9	-0.03	76	241	71	68
181	29.193	0.162	0.046	0.50	72	-0.5	100	10.9	-0.03	76	240	71	68
182	29.354	0.161	0.046	0.50	72	-0.5	100	10.9	-0.02	76	240	71	68
183	29.515	0.161	0.046	0.50	72	-0.5	100	10.8	-0.03	76	239	71	68
184	29.676	0.161	0.046	0.50	72	-0.5	100	10.8	-0.01	76	239	71	68
185	29.838	0.162	0.046	0.50	72	-0.5	100	10.8	-0.04	76	239	71	68
186	29.999	0.161	0.046	0.50	72	-0.5	100	10.8	-0.02	76	238	71	68
187	30.160	0.161	0.046	0.50	72	-0.5	100	10.7	-0.04	76	238	71	68
188	30.322	0.162	0.046	0.50	72	-0.5	100	10.7	-0.01	76	237	71	68
189	30.483	0.161	0.046	0.50	72	-0.5	100	10.7	-0.02	76	237	71	68
190	30.644	0.161	0.046	0.50	72	-0.5	100	10.7	-0.02	76	237	71	67
191	30.805	0.161	0.046	0.50	72	-0.5	100	10.6	-0.03	76	236	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	30.967	0.162	0.046	0.50	72	-0.5	100	10.6	-0.04	76	236	71	68
193	31.128	0.161	0.046	0.50	72	-0.5	100	10.6	0	76	236	71	68
194	31.289	0.161	0.046	0.50	72	-0.5	100	10.6	-0.01	76	236	71	68
195	31.451	0.162	0.046	0.50	72	-0.5	100	10.5	-0.05	76	235	71	68
196	31.612	0.161	0.046	0.50	72	-0.5	100	10.5	-0.01	76	235	71	68
197	31.773	0.161	0.046	0.50	72	-0.5	100	10.5	-0.03	76	235	71	68
198	31.934	0.161	0.046	0.50	72	-0.5	100	10.5	-0.04	76	235	71	68
199	32.096	0.162	0.046	0.50	72	-0.5	100	10.4	-0.02	76	235	71	68
200	32.257	0.161	0.046	0.50	72	-0.5	100	10.4	-0.03	77	235	71	68
201	32.418	0.161	0.046	0.50	72	-0.5	100	10.4	-0.03	77	235	71	68
202	32.580	0.162	0.046	0.50	72	-0.5	100	10.3	-0.03	76	235	71	68
203	32.741	0.161	0.046	0.50	72	-0.5	100	10.3	-0.02	77	235	71	68
204	32.902	0.161	0.046	0.50	72	-0.5	100	10.3	-0.04	76	236	71	68
205	33.063	0.161	0.046	0.50	72	-0.5	100	10.2	-0.04	76	237	71	68
206	33.225	0.162	0.046	0.50	72	-0.5	100	10.2	-0.04	76	238	71	68
207	33.386	0.161	0.046	0.50	72	-0.5	100	10.2	-0.05	77	239	71	68
208	33.547	0.161	0.046	0.50	72	-0.5	100	10.1	-0.04	77	240	71	68
209	33.709	0.162	0.046	0.50	72	-0.5	101	10.1	-0.05	77	242	71	68
210	33.870	0.161	0.046	0.50	72	-0.5	100	10.0	-0.05	77	244	71	69
211	34.031	0.161	0.046	0.50	72	-0.5	100	10.0	-0.05	77	246	71	68
212	34.192	0.161	0.046	0.50	72	-0.5	100	9.9	-0.04	77	248	71	68
213	34.354	0.162	0.046	0.50	72	-0.5	101	9.9	-0.03	77	250	71	68
214	34.515	0.161	0.046	0.50	72	-0.5	100	9.9	-0.04	77	251	71	68
215	34.676	0.161	0.046	0.50	72	-0.5	100	9.8	-0.05	77	253	71	68
216	34.838	0.162	0.046	0.50	72	-0.5	101	9.8	-0.05	77	254	71	68
217	34.999	0.161	0.046	0.50	72	-0.5	100	9.7	-0.03	77	255	71	68
218	35.160	0.161	0.046	0.50	72	-0.5	100	9.7	-0.03	77	256	71	68
219	35.321	0.161	0.046	0.50	72	-0.5	100	9.7	-0.04	77	257	71	68
220	35.483	0.162	0.046	0.50	72	-0.5	101	9.6	-0.03	77	258	71	68
221	35.644	0.161	0.046	0.50	72	-0.5	100	9.6	-0.03	77	259	71	68
222	35.805	0.161	0.046	0.50	72	-0.5	100	9.5	-0.05	77	260	71	68
223	35.967	0.162	0.046	0.50	72	-0.5	101	9.5	-0.03	77	261	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.128	0.161	0.046	0.50	72	-0.5	100	9.5	-0.05	77	261	71	68
225	36.289	0.161	0.046	0.50	72	-0.5	100	9.4	-0.02	77	262	70	68
226	36.450	0.161	0.046	0.50	72	-0.5	100	9.4	-0.03	77	262	70	68
227	36.612	0.162	0.046	0.50	72	-0.5	101	9.4	-0.04	77	263	70	68
228	36.773	0.161	0.046	0.50	72	-0.5	100	9.3	-0.05	77	263	70	68
229	36.934	0.161	0.046	0.50	72	-0.5	100	9.3	-0.01	77	264	70	68
230	37.096	0.162	0.046	0.50	72	-0.5	101	9.3	-0.05	77	264	70	68
231	37.257	0.161	0.046	0.50	72	-0.5	100	9.2	-0.05	77	265	70	68
232	37.418	0.161	0.046	0.50	72	-0.5	100	9.2	-0.01	77	265	70	68
233	37.579	0.161	0.046	0.50	72	-0.5	100	9.2	-0.05	76	266	70	68
234	37.741	0.162	0.046	0.50	72	-0.5	101	9.1	-0.02	77	267	70	68
235	37.902	0.161	0.046	0.50	72	-0.5	100	9.1	-0.04	76	267	70	68
236	38.063	0.161	0.046	0.50	72	-0.5	100	9.1	-0.02	77	268	70	68
237	38.225	0.162	0.046	0.50	72	-0.5	101	9.0	-0.04	77	268	70	68
238	38.386	0.161	0.046	0.50	72	-0.5	100	9.0	-0.04	77	269	70	68
239	38.547	0.161	0.046	0.50	72	-0.5	100	9.0	-0.03	77	269	70	68
240	38.708	0.161	0.046	0.50	72	-0.5	100	8.9	-0.03	77	270	70	68
241	38.870	0.162	0.046	0.50	72	-0.5	101	8.9	-0.03	77	271	71	68
242	39.031	0.161	0.046	0.50	72	-0.5	100	8.9	-0.04	77	271	71	68
243	39.192	0.161	0.046	0.50	72	-0.5	100	8.8	-0.03	77	272	71	68
244	39.354	0.162	0.046	0.50	72	-0.5	101	8.8	-0.02	77	272	71	68
245	39.515	0.161	0.046	0.50	72	-0.5	100	8.8	-0.04	77	272	71	68
246	39.676	0.161	0.046	0.50	72	-0.5	100	8.8	-0.02	77	273	71	69
247	39.837	0.161	0.046	0.50	72	-0.5	100	8.7	-0.06	77	273	71	68
248	39.999	0.162	0.046	0.50	72	-0.5	100	8.7	-0.01	76	273	71	68
249	40.160	0.161	0.046	0.50	72	-0.5	100	8.7	0	76	274	71	68
250	40.321	0.161	0.046	0.50	72	-0.5	100	8.6	-0.06	76	274	71	69
251	40.483	0.162	0.046	0.50	72	-0.5	100	8.6	-0.03	76	274	71	69
252	40.644	0.161	0.046	0.50	72	-0.5	100	8.6	-0.01	76	274	71	69
253	40.805	0.161	0.046	0.50	72	-0.5	100	8.5	-0.05	76	274	71	69
254	40.966	0.161	0.046	0.50	72	-0.5	100	8.5	-0.03	76	274	71	69
255	41.128	0.162	0.046	0.50	72	-0.5	100	8.5	-0.03	76	274	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.289	0.161	0.046	0.50	72	-0.5	100	8.4	-0.03	76	274	71	69
257	41.450	0.161	0.046	0.50	72	-0.5	100	8.4	-0.01	76	274	71	69
258	41.612	0.162	0.046	0.50	72	-0.5	100	8.4	-0.03	76	274	71	69
259	41.773	0.161	0.046	0.50	72	-0.5	100	8.4	-0.04	76	274	71	69
260	41.934	0.161	0.046	0.50	72	-0.5	100	8.3	-0.02	76	274	71	69
261	42.095	0.161	0.046	0.50	72	-0.5	100	8.3	-0.03	76	274	71	69
262	42.257	0.162	0.046	0.50	72	-0.5	100	8.3	-0.03	76	274	71	69
263	42.418	0.161	0.046	0.50	72	-0.5	100	8.3	-0.02	76	274	71	69
264	42.579	0.161	0.046	0.50	72	-0.5	100	8.2	-0.04	76	274	71	69
265	42.741	0.162	0.046	0.50	72	-0.5	100	8.2	-0.02	76	274	71	69
266	42.902	0.161	0.046	0.50	72	-0.5	100	8.2	-0.02	76	274	71	69
267	43.063	0.161	0.046	0.50	72	-0.5	100	8.2	-0.02	76	274	71	69
268	43.224	0.161	0.046	0.50	72	-0.5	100	8.1	-0.03	76	274	71	69
269	43.386	0.162	0.046	0.50	72	-0.5	100	8.1	-0.03	76	273	71	69
270	43.547	0.161	0.046	0.50	72	-0.5	100	8.1	-0.04	76	273	71	69
271	43.708	0.161	0.046	0.50	73	-0.5	100	8.1	-0.01	76	273	71	69
272	43.870	0.162	0.046	0.50	73	-0.5	100	8.0	-0.02	76	273	71	69
273	44.031	0.161	0.046	0.50	73	-0.5	100	8.0	-0.04	76	273	71	69
274	44.192	0.161	0.046	0.50	73	-0.5	100	8.0	0	76	272	71	69
275	44.353	0.161	0.046	0.50	73	-0.5	100	8.0	-0.04	76	272	71	69
276	44.515	0.162	0.046	0.50	73	-0.5	100	7.9	-0.02	76	272	71	70
277	44.676	0.161	0.046	0.50	73	-0.5	100	7.9	-0.02	76	272	71	70
278	44.837	0.161	0.046	0.50	73	-0.5	100	7.9	0	76	272	71	69
279	44.999	0.162	0.046	0.50	73	-0.5	100	7.9	-0.02	76	272	71	69
280	45.160	0.161	0.046	0.50	73	-0.5	100	7.9	-0.02	76	271	71	69
281	45.321	0.161	0.046	0.50	73	-0.5	100	7.9	-0.02	76	271	71	70
282	45.482	0.161	0.046	0.50	73	-0.5	100	7.8	-0.02	76	270	71	69
283	45.644	0.162	0.046	0.50	73	-0.5	100	7.8	-0.02	75	270	71	69
284	45.805	0.161	0.046	0.50	73	-0.5	100	7.8	-0.02	75	269	71	69
285	45.966	0.161	0.046	0.50	73	-0.5	100	7.8	-0.01	76	269	71	69
286	46.128	0.162	0.046	0.50	73	-0.5	100	7.8	-0.03	75	268	71	69
287	46.289	0.161	0.046	0.50	73	-0.5	100	7.7	-0.01	76	267	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	46.450	0.161	0.046	0.50	73	-0.5	100	7.7	-0.02	75	267	71	69
289	46.611	0.161	0.046	0.50	73	-0.5	100	7.7	-0.01	75	266	71	69
290	46.773	0.162	0.046	0.50	73	-0.5	100	7.7	-0.01	75	265	71	69
291	46.934	0.161	0.046	0.50	73	-0.5	100	7.7	-0.02	75	264	71	69
292	47.095	0.161	0.046	0.50	73	-0.5	100	7.7	-0.01	75	262	71	70
293	47.257	0.162	0.046	0.50	73	-0.5	100	7.7	-0.02	75	261	72	70
294	47.418	0.161	0.046	0.50	73	-0.5	100	7.6	-0.02	75	260	72	70
295	47.579	0.161	0.046	0.50	73	-0.5	100	7.6	0.01	75	259	72	70
296	47.740	0.161	0.046	0.50	73	-0.5	100	7.6	-0.03	75	258	72	70
297	47.902	0.162	0.046	0.50	73	-0.5	100	7.6	-0.01	75	257	72	69
298	48.063	0.161	0.046	0.50	73	-0.5	100	7.6	0	75	256	72	69
299	48.224	0.161	0.046	0.50	73	-0.5	100	7.6	-0.02	75	254	72	69
300	48.386	0.162	0.046	0.50	73	-0.5	100	7.6	-0.02	75	253	72	70
301	48.547	0.161	0.046	0.50	73	-0.5	100	7.6	0	75	252	72	70
302	48.708	0.161	0.046	0.50	73	-0.5	100	7.5	-0.03	75	251	72	70
303	48.869	0.161	0.046	0.50	73	-0.5	100	7.5	0	75	250	72	70
304	49.031	0.162	0.046	0.50	73	-0.5	100	7.5	-0.02	75	249	72	70
305	49.192	0.161	0.046	0.50	73	-0.5	100	7.5	-0.01	75	248	72	70
306	49.353	0.161	0.046	0.50	73	-0.5	100	7.5	-0.01	75	247	72	70
307	49.515	0.162	0.046	0.50	73	-0.5	100	7.5	-0.01	75	246	72	70
308	49.676	0.161	0.046	0.50	73	-0.5	100	7.5	-0.01	75	245	72	70
309	49.837	0.161	0.046	0.50	73	-0.5	100	7.5	-0.01	75	244	72	70
310	49.998	0.161	0.046	0.50	73	-0.5	99	7.5	-0.01	75	243	72	70
311	50.160	0.162	0.046	0.50	73	-0.5	100	7.4	-0.03	75	243	72	70
312	50.321	0.161	0.046	0.50	73	-0.5	100	7.4	0	75	242	72	70
313	50.482	0.161	0.046	0.50	73	-0.5	99	7.4	-0.01	75	241	72	70
314	50.644	0.162	0.046	0.50	73	-0.5	100	7.4	-0.01	75	240	72	70
315	50.805	0.161	0.046	0.50	73	-0.5	99	7.4	-0.02	75	240	72	70
316	50.966	0.161	0.046	0.50	73	-0.5	99	7.4	-0.02	75	239	72	70
317	51.127	0.161	0.046	0.50	73	-0.5	99	7.4	0	75	238	72	70
318	51.289	0.162	0.046	0.50	73	-0.5	100	7.3	-0.02	75	237	72	70
319	51.450	0.161	0.046	0.50	73	-0.5	99	7.3	0	75	237	72	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	51.611	0.161	0.046	0.50	73	-0.5	99	7.3	-0.02	75	236	72	70
321	51.773	0.162	0.046	0.50	73	-0.5	100	7.3	-0.02	75	235	72	70
322	51.934	0.161	0.046	0.50	73	-0.5	99	7.3	0	75	235	72	70
323	52.095	0.161	0.046	0.50	73	-0.5	99	7.3	-0.02	75	234	72	70
324	52.256	0.161	0.046	0.50	73	-0.5	100	7.3	-0.01	75	234	72	69
325	52.418	0.162	0.046	0.50	73	-0.5	100	7.3	-0.02	75	233	71	70
326	52.579	0.161	0.046	0.50	73	-0.5	100	7.2	-0.02	75	233	71	69
327	52.740	0.161	0.046	0.50	73	-0.5	100	7.2	-0.01	75	233	71	69
328	52.902	0.162	0.046	0.50	73	-0.5	100	7.2	-0.02	75	232	71	69
329	53.063	0.161	0.046	0.50	73	-0.5	100	7.2	-0.01	75	232	71	69
330	53.224	0.161	0.046	0.50	73	-0.5	100	7.2	-0.01	75	232	71	69
331	53.385	0.161	0.046	0.50	73	-0.5	100	7.2	-0.01	75	231	71	69
332	53.547	0.162	0.046	0.50	73	-0.5	100	7.2	-0.02	75	231	71	69
333	53.708	0.161	0.046	0.50	73	-0.5	100	7.1	-0.01	75	231	71	69
334	53.869	0.161	0.046	0.50	73	-0.5	100	7.1	-0.02	75	231	71	69
335	54.031	0.162	0.046	0.50	73	-0.5	100	7.1	0	75	231	71	69
336	54.192	0.161	0.046	0.50	73	-0.5	100	7.1	-0.03	75	230	71	69
337	54.353	0.161	0.046	0.50	73	-0.5	100	7.1	-0.02	75	230	71	69
338	54.514	0.161	0.046	0.50	73	-0.5	100	7.1	-0.02	75	230	71	69
339	54.676	0.162	0.046	0.50	73	-0.5	100	7.0	-0.02	75	230	71	69
340	54.837	0.161	0.046	0.50	73	-0.5	100	7.0	-0.02	75	230	71	69
341	54.998	0.161	0.046	0.50	73	-0.5	100	7.0	-0.02	75	230	71	69
342	55.160	0.162	0.046	0.50	73	-0.5	100	7.0	0	75	230	71	69
343	55.321	0.161	0.046	0.50	73	-0.5	100	7.0	-0.03	75	231	71	69
344	55.482	0.161	0.046	0.50	73	-0.5	100	6.9	-0.03	75	231	71	69
345	55.643	0.161	0.046	0.50	73	-0.5	100	6.9	0	75	231	71	69
346	55.805	0.162	0.046	0.50	73	-0.5	100	6.9	-0.02	75	231	71	69
347	55.966	0.161	0.046	0.50	73	-0.5	100	6.9	-0.03	75	231	71	69
348	56.127	0.161	0.046	0.50	73	-0.5	100	6.9	0	75	232	71	69
349	56.289	0.162	0.046	0.50	73	-0.5	100	6.8	-0.04	75	232	71	69
350	56.450	0.161	0.046	0.50	73	-0.5	100	6.8	-0.02	75	232	71	69
351	56.611	0.161	0.046	0.50	73	-0.5	100	6.8	-0.02	75	233	71	69



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	56.772	0.161	0.046	0.50	73	-0.5	100	6.8	0	75	233	71	69
353	56.934	0.162	0.046	0.50	73	-0.5	100	6.8	-0.04	75	234	71	69
354	57.095	0.161	0.046	0.50	73	-0.5	100	6.8	-0.01	75	234	71	69
355	57.256	0.161	0.046	0.50	73	-0.5	100	6.7	-0.02	75	235	71	69
356	57.418	0.162	0.046	0.50	73	-0.5	100	6.7	-0.01	75	235	71	69
357	57.579	0.161	0.046	0.50	73	-0.5	100	6.7	-0.04	76	236	71	69
358	57.740	0.161	0.046	0.50	73	-0.5	100	6.7	-0.01	75	236	71	69
359	57.901	0.161	0.046	0.50	73	-0.5	100	6.6	-0.03	75	237	71	69
360	58.063	0.162	0.046	0.50	73	-0.5	100	6.6	-0.02	75	237	71	69
361	58.224	0.161	0.046	0.50	73	-0.5	100	6.6	-0.02	76	238	71	69
362	58.385	0.161	0.046	0.50	73	-0.5	100	6.6	-0.01	76	238	71	69
363	58.547	0.162	0.046	0.50	72	-0.5	100	6.6	-0.01	76	238	71	69
364	58.708	0.161	0.046	0.50	72	-0.5	100	6.6	-0.03	76	239	71	69
365	58.869	0.161	0.046	0.50	72	-0.5	100	6.5	-0.02	76	239	71	69
366	59.030	0.161	0.046	0.50	72	-0.5	100	6.5	-0.02	76	239	71	69
367	59.192	0.162	0.046	0.50	73	-0.5	100	6.5	-0.03	76	240	71	69
368	59.353	0.161	0.046	0.50	73	-0.5	100	6.5	-0.01	76	240	71	69
369	59.514	0.161	0.046	0.50	73	-0.5	100	6.4	-0.03	76	240	71	70
370	59.676	0.162	0.046	0.50	73	-0.5	100	6.4	-0.02	76	241	71	69
371	59.837	0.161	0.046	0.50	72	-0.5	100	6.4	-0.04	76	241	71	69
372	59.998	0.161	0.046	0.50	72	-0.5	100	6.4	0	76	241	71	69
373	60.159	0.161	0.046	0.50	72	-0.5	100	6.4	-0.03	76	242	71	69
374	60.321	0.162	0.046	0.50	72	-0.5	100	6.3	-0.04	76	242	71	69
375	60.482	0.161	0.046	0.50	72	-0.5	100	6.3	-0.02	76	242	71	69
376	60.643	0.161	0.046	0.50	72	-0.5	100	6.3	-0.01	76	243	71	69
377	60.805	0.162	0.046	0.50	72	-0.5	100	6.3	-0.02	76	243	71	69
378	60.966	0.161	0.046	0.50	72	-0.5	100	6.2	-0.03	76	243	71	69
379	61.127	0.161	0.046	0.50	72	-0.5	100	6.2	-0.02	76	244	71	69
380	61.288	0.161	0.046	0.50	72	-0.5	100	6.2	-0.02	76	244	71	69
381	61.450	0.162	0.046	0.50	72	-0.5	100	6.2	-0.03	76	244	71	69
382	61.611	0.161	0.046	0.50	72	-0.5	100	6.1	-0.04	76	244	71	69
383	61.772	0.161	0.046	0.50	72	-0.5	100	6.1	0	76	244	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	61.934	0.162	0.046	0.50	72	-0.5	100	6.1	-0.01	76	244	71	69
385	62.095	0.161	0.046	0.50	72	-0.5	100	6.1	-0.04	76	244	71	69
386	62.256	0.161	0.046	0.50	72	-0.5	100	6.1	-0.01	76	244	71	69
387	62.417	0.161	0.046	0.50	72	-0.5	100	6.0	-0.02	76	244	71	70
388	62.579	0.162	0.046	0.50	72	-0.5	100	6.0	-0.02	76	244	71	69
389	62.740	0.161	0.046	0.50	72	-0.5	100	6.0	-0.01	76	244	71	69
390	62.901	0.161	0.046	0.50	72	-0.5	100	6.0	-0.03	76	244	71	69
391	63.063	0.162	0.046	0.50	72	-0.5	100	6.0	-0.02	76	244	71	69
392	63.224	0.161	0.046	0.50	72	-0.5	100	5.9	-0.03	76	244	71	69
393	63.385	0.161	0.046	0.50	72	-0.5	100	5.9	-0.01	76	245	71	70
394	63.546	0.161	0.046	0.50	72	-0.5	100	5.9	-0.03	76	245	71	69
395	63.708	0.162	0.046	0.50	72	-0.5	100	5.9	-0.02	76	244	71	69
396	63.869	0.161	0.046	0.50	72	-0.5	100	5.8	-0.03	76	244	71	69
397	64.030	0.161	0.046	0.50	72	-0.5	100	5.8	0	76	245	71	69
398	64.192	0.162	0.046	0.50	72	-0.5	100	5.8	-0.02	76	244	71	69
399	64.353	0.161	0.046	0.50	72	-0.5	100	5.8	-0.02	76	245	71	69
400	64.514	0.161	0.046	0.50	72	-0.5	100	5.8	-0.03	76	245	71	69
401	64.675	0.161	0.046	0.50	72	-0.5	100	5.8	-0.02	76	245	71	69
402	64.837	0.162	0.046	0.50	72	-0.5	100	5.8	0	76	245	71	69
403	64.998	0.161	0.046	0.50	72	-0.5	100	5.7	-0.04	76	245	71	69
404	65.159	0.161	0.046	0.50	72	-0.5	100	5.7	-0.04	76	245	71	69
405	65.321	0.162	0.046	0.50	72	-0.5	100	5.7	-0.01	76	245	71	69
406	65.482	0.161	0.046	0.50	72	-0.5	100	5.6	-0.02	77	246	71	69
407	65.643	0.161	0.046	0.50	72	-0.5	100	5.6	-0.02	77	246	71	69
408	65.804	0.161	0.046	0.50	72	-0.5	100	5.6	-0.03	77	246	71	69
409	65.966	0.162	0.046	0.50	72	-0.5	100	5.6	-0.04	77	247	71	69
410	66.127	0.161	0.046	0.50	72	-0.5	100	5.5	-0.01	77	247	71	69
411	66.288	0.161	0.046	0.50	72	-0.5	100	5.5	-0.03	77	247	71	69
412	66.450	0.162	0.046	0.50	72	-0.5	100	5.5	-0.01	76	247	71	69
413	66.611	0.161	0.046	0.50	72	-0.5	100	5.5	-0.04	76	248	71	70
414	66.772	0.161	0.046	0.50	72	-0.5	100	5.4	-0.02	76	248	71	69
415	66.933	0.161	0.046	0.50	72	-0.5	100	5.4	-0.01	76	248	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	67.095	0.162	0.046	0.50	72	-0.5	100	5.4	-0.03	76	248	71	69
417	67.256	0.161	0.046	0.50	72	-0.5	100	5.4	-0.04	76	249	71	69
418	67.417	0.161	0.046	0.50	72	-0.5	100	5.3	-0.03	76	249	71	69
419	67.579	0.162	0.046	0.50	72	-0.5	100	5.3	-0.01	77	249	71	69
420	67.740	0.161	0.046	0.50	72	-0.5	100	5.3	-0.04	76	250	71	69
421	67.901	0.161	0.046	0.50	72	-0.5	100	5.3	-0.02	76	250	71	69
422	68.062	0.161	0.046	0.50	72	-0.5	100	5.2	-0.02	76	250	71	69
423	68.224	0.162	0.046	0.50	72	-0.5	100	5.2	-0.04	76	250	71	69
424	68.385	0.161	0.046	0.50	72	-0.5	100	5.2	-0.01	76	250	71	69
425	68.546	0.161	0.046	0.50	72	-0.5	100	5.2	-0.04	76	250	71	69
426	68.708	0.162	0.046	0.50	72	-0.5	100	5.1	-0.01	76	250	71	69
427	68.869	0.161	0.046	0.50	72	-0.5	100	5.1	-0.03	76	250	71	69
428	69.030	0.161	0.046	0.50	72	-0.5	100	5.1	-0.01	77	250	71	69
429	69.191	0.161	0.046	0.50	72	-0.5	100	5.1	-0.03	76	250	71	69
430	69.353	0.162	0.046	0.50	72	-0.5	100	5.0	-0.03	76	250	71	69
431	69.514	0.161	0.046	0.50	72	-0.5	100	5.0	-0.01	76	250	71	69
432	69.675	0.161	0.046	0.50	72	-0.5	100	5.0	-0.04	76	250	71	69
433	69.837	0.162	0.046	0.50	72	-0.5	100	5.0	-0.03	76	250	71	69
434	69.998	0.161	0.046	0.50	72	-0.5	100	5.0	-0.01	76	250	71	69
435	70.159	0.161	0.046	0.50	72	-0.5	100	4.9	-0.03	76	250	71	69
436	70.320	0.161	0.046	0.50	72	-0.5	100	4.9	-0.04	76	250	71	69
437	70.482	0.162	0.046	0.50	72	-0.5	100	4.9	-0.02	76	250	71	69
438	70.643	0.161	0.046	0.50	72	-0.5	100	4.8	-0.03	76	250	71	69
439	70.804	0.161	0.046	0.50	72	-0.5	100	4.8	-0.03	76	250	71	69
440	70.966	0.162	0.046	0.50	72	-0.5	100	4.8	-0.02	76	250	71	69
441	71.127	0.161	0.046	0.50	72	-0.5	100	4.8	-0.03	76	250	71	69
442	71.288	0.161	0.046	0.50	72	-0.5	100	4.7	-0.03	76	250	71	69
443	71.449	0.161	0.046	0.50	72	-0.5	100	4.7	-0.03	76	251	71	69
444	71.611	0.162	0.046	0.50	72	-0.5	100	4.7	-0.02	76	251	71	70
445	71.772	0.161	0.046	0.50	72	-0.5	100	4.6	-0.04	76	251	71	69
446	71.933	0.161	0.046	0.50	72	-0.5	100	4.6	-0.03	76	252	71	69
447	72.095	0.162	0.046	0.50	72	-0.5	100	4.6	-0.04	76	252	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	72.256	0.161	0.046	0.50	72	-0.5	100	4.5	-0.02	76	253	71	69
449	72.417	0.161	0.046	0.50	72	-0.5	100	4.5	-0.04	76	253	71	69
450	72.578	0.161	0.046	0.50	72	-0.5	100	4.5	-0.04	76	254	71	69
451	72.740	0.162	0.046	0.50	72	-0.5	100	4.4	-0.03	76	254	71	69
452	72.901	0.161	0.046	0.50	72	-0.5	100	4.4	-0.03	76	255	71	69
453	73.062	0.161	0.046	0.50	72	-0.5	100	4.4	-0.03	76	255	71	69
454	73.224	0.162	0.046	0.50	72	-0.5	100	4.3	-0.04	76	256	71	69
455	73.385	0.161	0.046	0.50	72	-0.5	100	4.3	-0.02	76	257	71	69
456	73.546	0.161	0.046	0.50	72	-0.5	100	4.3	-0.04	76	257	71	70
457	73.707	0.161	0.046	0.50	72	-0.5	100	4.2	-0.03	77	258	71	69
458	73.869	0.162	0.046	0.50	72	-0.5	100	4.2	-0.05	76	259	71	69
459	74.030	0.161	0.046	0.50	72	-0.5	100	4.2	-0.04	77	259	71	69
460	74.191	0.161	0.046	0.50	72	-0.5	100	4.1	-0.02	77	260	71	69
461	74.353	0.162	0.046	0.50	72	-0.5	100	4.1	-0.04	77	260	71	70
462	74.514	0.161	0.046	0.50	72	-0.5	100	4.1	-0.02	76	261	71	69
463	74.675	0.161	0.046	0.50	72	-0.5	100	4.0	-0.04	77	262	71	69
464	74.836	0.161	0.046	0.50	72	-0.5	100	4.0	-0.04	76	262	71	69
465	74.998	0.162	0.046	0.50	72	-0.5	100	4.0	-0.04	76	263	71	69
466	75.159	0.161	0.046	0.50	72	-0.5	100	3.9	-0.04	76	263	71	69
467	75.320	0.161	0.046	0.50	72	-0.5	100	3.9	-0.02	76	263	71	69
468	75.482	0.162	0.046	0.50	72	-0.5	100	3.9	-0.04	76	264	70	68
469	75.643	0.161	0.046	0.50	72	-0.5	100	3.8	-0.03	76	264	70	69
470	75.804	0.161	0.046	0.50	72	-0.5	100	3.8	-0.07	76	265	70	68
471	75.965	0.161	0.046	0.50	72	-0.5	100	3.7	-0.03	76	266	70	69
472	76.127	0.162	0.046	0.50	72	-0.5	100	3.7	-0.05	76	266	70	69
473	76.288	0.161	0.046	0.50	72	-0.5	100	3.6	-0.06	77	267	70	69
474	76.449	0.161	0.046	0.50	72	-0.5	100	3.6	-0.06	77	268	70	69
475	76.611	0.162	0.046	0.50	72	-0.5	101	3.5	-0.06	77	268	70	69
476	76.772	0.161	0.046	0.50	72	-0.5	100	3.4	-0.05	77	269	71	69
477	76.933	0.161	0.046	0.50	72	-0.5	100	3.4	-0.05	77	269	71	69
478	77.094	0.161	0.046	0.50	72	-0.5	100	3.3	-0.06	77	270	71	69
479	77.256	0.162	0.046	0.50	72	-0.5	101	3.3	-0.05	77	271	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	77.417	0.161	0.046	0.50	72	-0.5	100	3.2	-0.04	77	271	71	69
481	77.578	0.161	0.046	0.50	72	-0.5	100	3.2	-0.06	77	272	71	69
482	77.740	0.162	0.046	0.50	72	-0.5	101	3.2	-0.03	77	273	71	69
483	77.901	0.161	0.046	0.50	72	-0.5	100	3.1	-0.07	77	273	71	69
484	78.062	0.161	0.046	0.50	72	-0.5	100	3.1	-0.03	77	273	71	69
485	78.224	0.162	0.046	0.50	72	-0.5	100	3.0	-0.04	77	274	71	69
486	78.385	0.161	0.046	0.50	72	-0.5	100	3.0	-0.05	77	274	71	69
487	78.546	0.161	0.046	0.50	73	-0.5	100	2.9	-0.03	77	275	71	69
488	78.707	0.161	0.046	0.50	73	-0.5	100	2.9	-0.04	77	275	71	69
489	78.869	0.162	0.046	0.50	73	-0.5	100	2.8	-0.05	77	276	71	69
490	79.030	0.161	0.046	0.50	73	-0.5	100	2.8	-0.05	77	276	71	69
491	79.191	0.161	0.046	0.50	73	-0.5	100	2.8	-0.03	77	276	71	69
492	79.353	0.162	0.046	0.50	73	-0.5	100	2.7	-0.05	77	276	71	69
493	79.514	0.161	0.046	0.50	73	-0.5	100	2.7	-0.04	77	276	71	69
494	79.675	0.161	0.046	0.50	73	-0.5	100	2.7	-0.02	77	276	71	69
495	79.836	0.161	0.046	0.50	73	-0.5	100	2.6	-0.04	77	277	71	69
496	79.998	0.162	0.046	0.50	73	-0.5	100	2.6	-0.04	76	277	71	69
497	80.159	0.161	0.046	0.50	73	-0.5	100	2.5	-0.04	76	277	71	68
498	80.320	0.161	0.046	0.50	73	-0.5	100	2.5	-0.04	76	277	71	69
499	80.482	0.162	0.046	0.50	73	-0.5	100	2.5	-0.04	76	277	71	69
500	80.643	0.161	0.046	0.50	73	-0.5	100	2.4	-0.04	76	277	71	68
501	80.804	0.161	0.046	0.50	73	-0.5	100	2.4	-0.02	76	277	71	69
502	80.965	0.161	0.046	0.50	73	-0.5	100	2.4	-0.03	76	277	71	69
503	81.127	0.162	0.046	0.50	73	-0.5	100	2.3	-0.03	76	277	71	69
504	81.288	0.161	0.046	0.50	73	-0.5	100	2.3	-0.03	76	277	71	69
505	81.449	0.161	0.046	0.50	73	-0.5	100	2.3	-0.02	76	276	71	69
506	81.611	0.162	0.046	0.50	73	-0.5	100	2.3	-0.02	76	276	71	69
507	81.772	0.161	0.046	0.50	73	-0.5	100	2.2	-0.03	76	275	71	69
508	81.933	0.161	0.046	0.50	72	-0.5	100	2.2	-0.02	76	275	71	69
509	82.094	0.161	0.046	0.50	72	-0.5	100	2.2	-0.02	76	274	71	69
510	82.256	0.162	0.046	0.50	72	-0.5	100	2.2	-0.01	76	273	71	69
511	82.417	0.161	0.046	0.50	73	-0.5	100	2.1	-0.04	76	273	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	82.578	0.161	0.046	0.50	73	-0.5	100	2.1	0	76	272	71	69
513	82.740	0.162	0.046	0.50	73	-0.5	100	2.1	-0.01	76	271	71	69
514	82.901	0.161	0.046	0.50	73	-0.5	100	2.1	-0.03	76	270	71	69
515	83.062	0.161	0.046	0.50	73	-0.5	100	2.1	-0.01	76	269	71	69
516	83.223	0.161	0.046	0.50	73	-0.5	100	2.1	-0.02	76	268	71	69
517	83.385	0.162	0.046	0.50	73	-0.5	100	2.0	-0.03	76	267	71	69
518	83.546	0.161	0.046	0.50	73	-0.5	100	2.0	-0.01	76	266	71	69
519	83.707	0.161	0.046	0.50	73	-0.5	100	2.0	-0.01	76	264	71	69
520	83.869	0.162	0.046	0.50	73	-0.5	100	2.0	-0.02	76	263	71	70
521	84.030	0.161	0.046	0.50	73	-0.5	100	2.0	-0.02	76	262	71	69
522	84.191	0.161	0.046	0.50	73	-0.5	100	2.0	-0.01	76	261	71	69
523	84.352	0.161	0.046	0.50	73	-0.5	100	2.0	-0.02	75	260	72	70
524	84.514	0.162	0.046	0.50	73	-0.5	100	1.9	-0.02	76	259	72	69
525	84.675	0.161	0.046	0.50	73	-0.5	100	1.9	-0.02	76	258	72	69
526	84.836	0.161	0.046	0.50	73	-0.5	100	1.9	-0.02	76	257	72	69
527	84.998	0.162	0.046	0.50	73	-0.5	100	1.9	-0.02	76	256	72	69
528	85.159	0.161	0.046	0.50	73	-0.5	100	1.9	-0.02	76	255	72	69
529	85.320	0.161	0.046	0.50	73	-0.5	100	1.8	-0.02	76	254	72	69
530	85.481	0.161	0.046	0.50	73	-0.5	100	1.8	-0.02	76	253	72	69
531	85.643	0.162	0.046	0.50	73	-0.5	100	1.8	-0.02	76	252	72	70
532	85.804	0.161	0.046	0.50	73	-0.5	100	1.8	-0.02	75	251	72	70
533	85.965	0.161	0.046	0.50	73	-0.5	100	1.7	-0.03	75	251	72	70
534	86.127	0.162	0.046	0.50	73	-0.5	100	1.7	-0.02	75	250	72	69
535	86.288	0.161	0.046	0.50	73	-0.5	100	1.7	0	75	249	72	70
536	86.449	0.161	0.046	0.50	73	-0.5	100	1.7	-0.01	75	248	72	70
537	86.610	0.161	0.046	0.50	73	-0.5	100	1.7	-0.01	75	247	72	70
538	86.772	0.162	0.046	0.50	73	-0.5	100	1.7	-0.04	75	246	72	70
539	86.933	0.161	0.046	0.50	73	-0.5	100	1.7	0	75	244	72	69
540	87.094	0.161	0.046	0.50	73	-0.5	100	1.6	-0.03	75	243	72	70
541	87.256	0.162	0.046	0.50	73	-0.5	100	1.6	-0.01	75	242	72	70
542	87.417	0.161	0.046	0.50	73	-0.5	100	1.6	-0.01	75	241	72	70
543	87.578	0.161	0.046	0.50	73	-0.5	100	1.6	-0.01	75	240	72	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
544	87.739	0.161	0.046	0.50	73	-0.5	100	1.6	-0.01	75	239	72	70
545	87.901	0.162	0.046	0.50	73	-0.5	100	1.6	-0.02	75	238	72	70
546	88.062	0.161	0.046	0.50	73	-0.5	100	1.6	-0.01	75	237	72	69
547	88.223	0.161	0.046	0.50	73	-0.5	100	1.5	-0.02	75	236	72	70
548	88.385	0.162	0.046	0.50	73	-0.5	100	1.5	-0.01	75	235	72	70
549	88.546	0.161	0.046	0.50	73	-0.5	100	1.5	-0.03	75	234	72	70
550	88.707	0.161	0.046	0.50	73	-0.5	100	1.5	0.01	75	233	72	70
551	88.868	0.161	0.046	0.50	73	-0.5	100	1.5	-0.03	75	232	72	70
552	89.030	0.162	0.046	0.50	73	-0.5	100	1.5	-0.01	75	232	72	70
553	89.191	0.161	0.046	0.50	73	-0.5	100	1.5	-0.01	76	231	72	70
554	89.352	0.161	0.046	0.50	73	-0.5	100	1.5	-0.01	75	230	72	70
555	89.514	0.162	0.046	0.50	73	-0.5	100	1.4	-0.01	76	229	72	70
556	89.675	0.161	0.046	0.50	73	-0.5	100	1.4	-0.02	75	228	72	69
557	89.836	0.161	0.046	0.50	73	-0.5	100	1.4	-0.01	76	228	72	70
558	89.997	0.161	0.046	0.50	73	-0.5	100	1.4	-0.02	76	227	72	70
559	90.159	0.162	0.046	0.50	73	-0.5	100	1.4	-0.01	76	227	72	70
560	90.320	0.161	0.046	0.50	73	-0.5	100	1.4	-0.02	76	226	72	70
561	90.481	0.161	0.046	0.50	73	-0.5	100	1.4	0	76	225	72	70
562	90.643	0.162	0.046	0.50	73	-0.5	100	1.4	0	76	225	72	70
563	90.804	0.161	0.046	0.50	73	-0.5	100	1.3	-0.03	76	225	72	70
564	90.965	0.161	0.046	0.50	73	-0.5	100	1.3	0	76	224	72	70
565	91.126	0.161	0.046	0.50	73	-0.5	100	1.3	-0.01	76	224	72	70
566	91.288	0.162	0.046	0.50	73	-0.5	100	1.3	-0.03	76	223	72	70
567	91.449	0.161	0.046	0.50	74	-0.5	100	1.3	-0.01	76	223	72	70
568	91.610	0.161	0.046	0.50	74	-0.5	100	1.3	-0.02	76	223	72	70
569	91.772	0.162	0.046	0.50	74	-0.5	100	1.2	-0.02	76	222	72	70
570	91.933	0.161	0.046	0.50	74	-0.5	100	1.2	-0.02	76	222	72	70
571	92.094	0.161	0.046	0.50	74	-0.5	100	1.2	-0.01	76	222	72	70
572	92.255	0.161	0.046	0.50	74	-0.5	100	1.2	-0.02	76	222	72	70
573	92.417	0.162	0.046	0.50	74	-0.5	100	1.2	-0.01	76	221	72	70
574	92.578	0.161	0.046	0.50	74	-0.5	100	1.2	-0.01	76	221	72	70
575	92.739	0.161	0.046	0.50	74	-0.5	100	1.2	-0.02	76	221	72	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
576	92.901	0.162	0.046	0.50	74	-0.5	100	1.2	0	76	221	72	70
577	93.062	0.161	0.046	0.50	74	-0.5	100	1.1	-0.03	76	221	72	70
578	93.223	0.161	0.046	0.50	74	-0.5	100	1.1	0	76	221	72	70
579	93.384	0.161	0.046	0.50	74	-0.5	100	1.1	-0.03	76	221	72	70
580	93.546	0.162	0.046	0.50	74	-0.5	100	1.1	-0.01	76	221	72	70
581	93.707	0.161	0.046	0.50	74	-0.5	100	1.1	-0.02	76	221	72	70
582	93.868	0.161	0.046	0.50	74	-0.5	100	1.1	-0.01	76	221	72	70
583	94.030	0.162	0.046	0.50	74	-0.5	100	1.0	-0.02	76	221	72	70
584	94.191	0.161	0.046	0.50	74	-0.5	100	1.0	-0.04	76	222	72	70
585	94.352	0.161	0.046	0.50	74	-0.5	100	1.0	0.01	76	222	72	70
586	94.513	0.161	0.046	0.50	74	-0.5	100	1.0	-0.02	76	222	72	70
587	94.675	0.162	0.046	0.50	74	-0.5	100	1.0	0	77	222	72	70
588	94.836	0.161	0.046	0.50	74	-0.5	100	1.0	-0.03	77	223	72	70
589	94.997	0.161	0.046	0.50	74	-0.5	100	0.9	-0.01	77	223	72	70
590	95.159	0.162	0.046	0.50	74	-0.5	100	0.9	-0.02	76	223	72	70
591	95.320	0.161	0.046	0.50	74	-0.5	100	0.9	-0.03	76	224	72	70
592	95.481	0.161	0.046	0.50	74	-0.5	100	0.9	-0.01	76	224	72	70
593	95.642	0.161	0.046	0.50	74	-0.5	100	0.9	-0.01	76	224	72	70
594	95.804	0.162	0.046	0.50	74	-0.5	100	0.9	-0.02	77	224	72	70
595	95.965	0.161	0.046	0.50	74	-0.5	100	0.8	-0.02	76	225	72	69
596	96.126	0.161	0.046	0.50	74	-0.5	100	0.8	-0.01	77	225	72	70
597	96.288	0.162	0.046	0.50	74	-0.5	100	0.8	-0.02	77	225	72	70
598	96.449	0.161	0.046	0.50	74	-0.5	100	0.8	-0.02	77	226	72	70
599	96.610	0.161	0.046	0.50	74	-0.5	100	0.8	-0.01	77	226	72	70
600	96.771	0.161	0.046	0.50	74	-0.5	100	0.8	0	76	226	72	70
601	96.933	0.162	0.046	0.50	74	-0.5	100	0.8	-0.02	76	227	72	70
602	97.094	0.161	0.046	0.50	74	-0.5	100	0.7	-0.04	76	227	72	70
603	97.255	0.161	0.046	0.50	74	-0.5	100	0.7	0.01	77	227	72	70
604	97.417	0.162	0.046	0.50	74	-0.5	100	0.7	-0.02	77	228	72	70
605	97.578	0.161	0.046	0.50	74	-0.5	100	0.7	-0.01	76	228	72	69
606	97.739	0.161	0.046	0.50	74	-0.5	100	0.7	-0.02	76	228	72	69
607	97.900	0.161	0.046	0.50	74	-0.5	100	0.7	-0.01	77	229	72	70



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
608	98.062	0.162	0.046	0.50	74	-0.5	100	0.7	-0.01	76	229	72	70
609	98.223	0.161	0.046	0.50	74	-0.5	100	0.6	-0.02	77	229	72	70
610	98.384	0.161	0.046	0.50	74	-0.5	100	0.6	-0.03	76	229	72	70
611	98.546	0.162	0.046	0.50	74	-0.5	100	0.6	-0.01	76	230	72	70
612	98.707	0.161	0.046	0.50	74	-0.5	100	0.6	-0.01	76	230	72	70
613	98.868	0.161	0.046	0.50	74	-0.5	100	0.6	-0.03	76	230	72	70
614	99.029	0.161	0.046	0.50	74	-0.5	100	0.6	0.01	76	230	72	69
615	99.191	0.162	0.046	0.50	74	-0.5	100	0.5	-0.03	76	231	72	69
616	99.352	0.161	0.046	0.50	74	-0.5	100	0.5	-0.02	76	231	72	69
617	99.513	0.161	0.046	0.50	74	-0.5	100	0.5	0	76	231	72	70
618	99.675	0.162	0.046	0.50	74	-0.5	100	0.5	-0.03	76	232	72	70
619	99.836	0.161	0.046	0.50	74	-0.5	100	0.5	-0.01	76	232	72	70
620	99.997	0.161	0.046	0.50	74	-0.5	100	0.5	-0.02	77	232	72	70
621	100.158	0.161	0.046	0.50	74	-0.5	100	0.4	-0.01	77	232	72	69
622	100.320	0.162	0.046	0.50	73	-0.5	100	0.4	-0.02	76	233	72	70
623	100.481	0.161	0.046	0.50	73	-0.5	100	0.4	0	76	233	72	69
624	100.642	0.161	0.046	0.50	73	-0.5	100	0.4	-0.02	77	233	72	69
625	100.804	0.162	0.046	0.50	73	-0.5	100	0.4	-0.02	77	234	72	70
626	100.965	0.161	0.046	0.50	73	-0.5	100	0.4	-0.02	77	234	72	69
627	101.126	0.161	0.046	0.50	73	-0.5	100	0.3	-0.02	76	234	72	70
628	101.287	0.161	0.046	0.50	73	-0.5	100	0.3	0	76	234	72	70
629	101.449	0.162	0.046	0.50	73	-0.5	100	0.3	-0.03	76	234	72	69
630	101.610	0.161	0.046	0.50	73	-0.5	100	0.3	-0.01	76	234	72	69
631	101.771	0.161	0.046	0.50	73	-0.5	100	0.3	0	76	234	72	69
632	101.933	0.162	0.046	0.50	73	-0.5	100	0.3	-0.02	76	234	72	69
633	102.094	0.161	0.046	0.50	73	-0.5	100	0.3	-0.03	76	234	72	69
634	102.255	0.161	0.046	0.50	73	-0.5	100	0.2	-0.02	76	235	72	69
635	102.416	0.161	0.046	0.50	73	-0.5	100	0.2	-0.01	76	235	72	69
636	102.578	0.162	0.046	0.50	73	-0.5	100	0.2	-0.01	76	235	72	69
637	102.739	0.161	0.046	0.50	73	-0.5	100	0.2	-0.02	76	235	72	69
638	102.900	0.161	0.046	0.50	73	-0.5	100	0.2	-0.01	76	234	72	69
639	103.062	0.162	0.046	0.50	73	-0.5	100	0.2	-0.03	76	234	71	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort Job #: 18-421  
 Model: Blaze King PE32 Tracking #: 0012  
 Run #: 2 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
640	103.223	0.161	0.046	0.50	73	-0.5	100	0.2	0	76	234	71	69
641	103.384	0.161	0.046	0.50	73	-0.5	100	0.1	-0.02	76	234	71	69
642	103.545	0.161	0.046	0.50	73	-0.5	100	0.1	-0.03	76	234	71	69
643	103.707	0.162	0.046	0.50	73	-0.5	100	0.0	-0.1	76	234	71	69
Avg/Tot	103.707	0.161	0.046	0.50	72	-0.50	100			76	245	71	68.6

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	70	-2		73	-0.020	4.09	0.05
1	0.182	0.182	0.50	70	-2	100	73	-0.020	0.95	0.15
2	0.365	0.183	0.50	70	-2	101	72	-0.020	1.87	0.54
3	0.548	0.183	0.50	71	-2	100	72	-0.020	3.30	0.38
4	0.731	0.183	0.50	71	-2	100	72	-0.020	4.19	0.03
5	0.914	0.183	0.50	71	-2	100	72	-0.020	4.53	0.01
6	1.097	0.183	0.50	71	-2	100	72	-0.020	4.66	0.01
7	1.280	0.183	0.50	71	-2	100	71	-0.020	4.75	0.01
8	1.462	0.182	0.50	71	-2	100	71	-0.020	4.90	0.01
9	1.645	0.183	0.50	71	-2	100	71	-0.020	5.04	0.01
10	1.828	0.183	0.50	71	-2	100	71	-0.020	5.26	0.01
11	2.011	0.183	0.50	71	-2	100	71	-0.020	5.40	0.01
12	2.194	0.183	0.50	71	-2	100	71	-0.020	5.70	0.01
13	2.377	0.183	0.50	71	-2	100	71	-0.020	6.29	0.01
14	2.560	0.183	0.50	71	-2	100	70	-0.020	6.64	0.01
15	2.743	0.183	0.50	71	-2	100	70	-0.020	7.09	0.01
16	2.926	0.183	0.50	71	-2	100	70	-0.020	7.58	0.01
17	3.109	0.183	0.50	71	-2	100	70	-0.020	9.09	0.00
18	3.292	0.183	0.50	72	-2	100	70	-0.020	8.88	0.01
19	3.475	0.183	0.50	72	-2	100	70	-0.020	8.49	0.00
20	3.658	0.183	0.50	72	-2	100	70	-0.020	8.12	0.00
21	3.841	0.183	0.50	72	-2	100	70	-0.020	8.11	0.01
22	4.023	0.182	0.50	72	-2	100	70	-0.020	8.24	0.01
23	4.206	0.183	0.50	72	-2	100	70	-0.020	8.45	0.01
24	4.389	0.183	0.50	72	-2	100	70	-0.020	8.98	0.01
25	4.572	0.183	0.50	72	-2	100	70	-0.020	9.74	0.01
26	4.755	0.183	0.50	72	-2	100	70	-0.020	8.93	0.01
27	4.938	0.183	0.50	72	-2	100	70	-0.020	9.04	0.00
28	5.121	0.183	0.50	72	-2	100	70	-0.030	9.11	0.01
29	5.304	0.183	0.50	72	-2	100	70	-0.020	9.16	0.01
30	5.487	0.183	0.50	72	-2	100	70	-0.020	9.51	0.01
31	5.670	0.183	0.50	72	-2	100	70	-0.030	9.71	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	5.853	0.183	0.50	72	-2	100	70	-0.030	9.94	0.01
33	6.036	0.183	0.50	72	-2	100	70	-0.030	10.41	0.01
34	6.219	0.183	0.50	72	-2	100	70	-0.030	10.23	0.01
35	6.402	0.183	0.50	72	-2	100	70	-0.030	10.05	0.00
36	6.584	0.182	0.50	72	-2	100	70	-0.030	9.96	0.00
37	6.767	0.183	0.50	72	-2	100	70	-0.030	9.90	0.00
38	6.950	0.183	0.50	72	-2	100	70	-0.030	9.93	0.00
39	7.133	0.183	0.50	72	-2	100	70	-0.030	9.90	0.00
40	7.316	0.183	0.50	72	-2	100	70	-0.030	9.88	0.01
41	7.499	0.183	0.50	72	-2	100	70	-0.030	9.73	0.00
42	7.682	0.183	0.50	72	-2	100	70	-0.030	9.78	0.00
43	7.865	0.183	0.50	72	-2	100	70	-0.030	9.89	0.00
44	8.048	0.183	0.50	72	-2	101	70	-0.030	9.66	0.01
45	8.231	0.183	0.50	72	-2	100	70	-0.030	10.06	0.01
46	8.414	0.183	0.50	72	-2	100	70	-0.030	10.51	0.01
47	8.597	0.183	0.50	73	-2	101	70	-0.030	10.79	0.00
48	8.780	0.183	0.50	73	-2	101	70	-0.030	10.74	0.00
49	8.962	0.182	0.50	73	-2	100	70	-0.030	10.89	0.01
50	9.145	0.183	0.50	73	-2	100	70	-0.030	11.36	0.00
51	9.328	0.183	0.50	73	-2	100	70	-0.030	10.76	0.00
52	9.511	0.183	0.50	73	-2	100	70	-0.030	10.79	0.01
53	9.694	0.183	0.50	72	-2	101	70	-0.030	10.94	0.00
54	9.877	0.183	0.50	72	-2	101	70	-0.030	10.88	0.01
55	10.060	0.183	0.50	72	-2	101	70	-0.030	10.82	0.01
56	10.243	0.183	0.50	72	-2	101	70	-0.030	10.82	0.00
57	10.426	0.183	0.50	72	-2	101	70	-0.030	10.85	0.00
58	10.609	0.183	0.50	72	-2	101	70	-0.030	10.84	0.00
59	10.792	0.183	0.50	72	-2	101	70	-0.030	10.78	0.00
60	10.975	0.183	0.50	72	-2	101	70	-0.030	10.80	0.00
61	11.158	0.183	0.50	72	-2	101	70	-0.030	10.26	0.00
62	11.341	0.183	0.50	72	-2	101	70	-0.030	10.44	0.00
63	11.523	0.182	0.50	72	-2	100	70	-0.030	10.39	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	11.706	0.183	0.50	72	-2	101	70	-0.030	10.86	0.00
65	11.889	0.183	0.50	72	-2	101	70	-0.030	11.00	0.01
66	12.072	0.183	0.50	72	-2	101	70	-0.030	11.13	0.00
67	12.255	0.183	0.50	71	-2	101	70	-0.030	11.42	0.00
68	12.438	0.183	0.50	71	-2	101	70	-0.030	11.16	0.00
69	12.621	0.183	0.50	71	-2	101	70	-0.030	10.79	0.01
70	12.804	0.183	0.50	71	-2	101	70	-0.030	10.79	0.00
71	12.987	0.183	0.50	71	-2	101	70	-0.030	10.86	0.01
72	13.170	0.183	0.50	71	-2	101	70	-0.030	10.47	0.00
73	13.353	0.183	0.50	71	-2	101	70	-0.030	9.90	0.00
74	13.536	0.183	0.50	71	-2	101	70	-0.030	9.73	0.00
75	13.719	0.183	0.50	71	-2	101	70	-0.030	9.81	0.01
76	13.902	0.183	0.50	71	-2	101	70	-0.030	9.85	0.00
77	14.084	0.182	0.50	71	-2	100	70	-0.030	10.00	0.00
78	14.267	0.183	0.50	71	-2	101	70	-0.030	10.06	0.00
79	14.450	0.183	0.50	71	-2	101	70	-0.030	10.13	0.00
80	14.633	0.183	0.50	71	-2	101	70	-0.030	10.22	0.00
81	14.816	0.183	0.50	71	-2	101	70	-0.030	10.76	0.00
82	14.999	0.183	0.50	71	-2	101	70	-0.030	12.16	0.00
83	15.182	0.183	0.50	72	-2	101	70	-0.030	12.28	0.00
84	15.365	0.183	0.50	72	-2	101	71	-0.030	11.96	0.00
85	15.548	0.183	0.50	72	-2	101	71	-0.030	11.31	0.00
86	15.731	0.183	0.50	72	-2	101	71	-0.030	11.25	0.00
87	15.914	0.183	0.50	72	-2	101	71	-0.030	11.32	0.00
88	16.097	0.183	0.50	72	-2	101	71	-0.030	11.35	0.00
89	16.280	0.183	0.50	72	-2	101	71	-0.030	10.82	0.00
90	16.462	0.182	0.50	72	-2	100	71	-0.030	10.17	0.00
91	16.645	0.183	0.50	72	-2	101	71	-0.030	9.91	0.00
92	16.828	0.183	0.50	72	-2	101	71	-0.030	9.45	0.00
93	17.011	0.183	0.50	72	-2	101	71	-0.030	9.39	0.00
94	17.194	0.183	0.50	72	-2	101	71	-0.030	9.58	0.00
95	17.377	0.183	0.50	72	-2	101	71	-0.030	9.34	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	17.560	0.183	0.50	72	-2	100	71	-0.030	8.70	0.00
97	17.743	0.183	0.50	72	-2	100	71	-0.030	8.13	0.00
98	17.926	0.183	0.50	73	-2	100	71	-0.030	7.65	0.00
99	18.109	0.183	0.50	73	-2	100	71	-0.030	7.52	0.00
100	18.292	0.183	0.50	73	-2	100	71	-0.030	7.35	0.00
101	18.475	0.183	0.50	73	-2	100	71	-0.030	7.32	0.00
102	18.658	0.183	0.50	73	-2	100	71	-0.020	7.33	0.00
103	18.841	0.183	0.50	73	-2	100	71	-0.020	7.39	0.00
104	19.023	0.182	0.50	73	-2	100	71	-0.020	7.54	0.00
105	19.206	0.183	0.50	73	-2	100	71	-0.020	7.66	0.00
106	19.389	0.183	0.50	73	-2	100	71	-0.020	8.05	0.00
107	19.572	0.183	0.50	73	-2	100	71	-0.020	9.55	0.00
108	19.755	0.183	0.50	73	-2	100	71	-0.020	9.27	0.00
109	19.938	0.183	0.50	73	-2	100	71	-0.020	9.00	0.00
110	20.121	0.183	0.50	73	-2	100	71	-0.020	9.92	0.00
111	20.304	0.183	0.50	73	-2	100	71	-0.020	9.10	0.00
112	20.487	0.183	0.50	73	-2	100	71	-0.020	8.69	0.00
113	20.670	0.183	0.50	73	-2	100	71	-0.020	8.64	0.00
114	20.853	0.183	0.50	73	-2	100	71	-0.020	8.56	0.00
115	21.036	0.183	0.50	73	-2	100	71	-0.020	8.55	0.00
116	21.219	0.183	0.50	73	-2	100	71	-0.020	8.05	0.00
117	21.402	0.183	0.50	73	-2	100	71	-0.020	7.38	0.00
118	21.584	0.182	0.50	73	-2	100	71	-0.020	7.34	0.00
119	21.767	0.183	0.50	73	-2	100	71	-0.020	5.15	0.00
120	21.950	0.183	0.50	73	-2	100	71	-0.020	6.79	0.00
121	22.133	0.183	0.50	73	-2	100	71	-0.020	7.04	0.00
122	22.316	0.183	0.50	73	-2	100	71	-0.020	7.06	0.00
123	22.499	0.183	0.50	73	-2	100	71	-0.020	7.26	0.00
124	22.682	0.183	0.50	73	-2	100	71	-0.020	7.43	0.00
125	22.865	0.183	0.50	73	-2	100	71	-0.020	7.58	0.00
126	23.048	0.183	0.50	73	-2	100	71	-0.020	7.69	0.00
127	23.231	0.183	0.50	73	-2	100	71	-0.020	7.84	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	23.414	0.183	0.50	73	-2	100	71	-0.020	8.02	0.00
129	23.597	0.183	0.50	73	-2	100	71	-0.020	8.18	0.00
130	23.780	0.183	0.50	73	-2	100	71	-0.020	8.23	0.00
131	23.962	0.182	0.50	74	-2	100	71	-0.020	8.35	0.00
132	24.145	0.183	0.50	74	-2	100	71	-0.020	8.38	0.00
133	24.328	0.183	0.50	74	-2	100	71	-0.020	8.70	0.00
134	24.511	0.183	0.50	74	-2	100	71	-0.020	8.96	0.01
135	24.694	0.183	0.50	74	-2	100	71	-0.020	8.95	0.00
136	24.877	0.183	0.50	74	-2	100	71	-0.020	8.99	0.01
137	25.060	0.183	0.50	74	-2	100	71	-0.020	8.97	0.01
138	25.243	0.183	0.50	74	-2	100	71	-0.020	8.96	0.01
139	25.426	0.183	0.50	74	-2	100	71	-0.020	9.00	0.00
140	25.609	0.183	0.50	74	-2	100	71	-0.020	9.04	0.01
141	25.792	0.183	0.50	74	-2	100	71	-0.020	8.97	0.01
142	25.975	0.183	0.50	74	-2	100	71	-0.020	9.03	0.01
143	26.158	0.183	0.50	74	-2	100	71	-0.020	8.91	0.01
144	26.341	0.183	0.50	74	-2	100	71	-0.020	8.99	0.01
145	26.523	0.182	0.50	74	-2	100	71	-0.020	8.93	0.01
146	26.706	0.183	0.50	74	-2	100	71	-0.020	8.95	0.01
147	26.889	0.183	0.50	74	-2	100	71	-0.020	9.08	0.01
148	27.072	0.183	0.50	74	-2	100	71	-0.020	9.04	0.00
149	27.255	0.183	0.50	74	-2	100	71	-0.020	9.05	0.01
150	27.438	0.183	0.50	74	-2	100	71	-0.020	9.21	0.01
151	27.621	0.183	0.50	74	-2	100	71	-0.020	9.23	0.01
152	27.804	0.183	0.50	74	-2	100	71	-0.020	9.23	0.01
153	27.987	0.183	0.50	74	-2	100	71	-0.020	9.19	0.01
154	28.170	0.183	0.50	74	-2	100	71	-0.020	9.23	0.01
155	28.353	0.183	0.50	74	-2	100	71	-0.020	9.04	0.01
156	28.536	0.183	0.50	74	-2	100	71	-0.020	9.04	0.01
157	28.719	0.183	0.50	74	-2	100	71	-0.020	9.13	0.01
158	28.902	0.183	0.50	74	-2	100	71	-0.020	8.93	0.01
159	29.084	0.182	0.50	74	-2	100	71	-0.020	8.95	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	29.267	0.183	0.50	74	-2	100	71	-0.020	8.83	0.01
161	29.450	0.183	0.50	74	-2	100	71	-0.020	8.88	0.01
162	29.633	0.183	0.50	74	-2	100	71	-0.020	8.82	0.01
163	29.816	0.183	0.50	74	-2	100	71	-0.020	8.66	0.01
164	29.999	0.183	0.50	74	-2	100	71	-0.020	8.58	0.01
165	30.182	0.183	0.50	74	-2	100	71	-0.020	8.57	0.01
166	30.365	0.183	0.50	74	-2	100	71	-0.020	8.49	0.01
167	30.548	0.183	0.50	74	-2	100	71	-0.020	8.51	0.01
168	30.731	0.183	0.50	74	-2	100	71	-0.020	7.89	0.01
169	30.914	0.183	0.50	74	-2	100	71	-0.020	8.37	0.01
170	31.097	0.183	0.50	74	-2	100	71	-0.020	8.30	0.01
171	31.280	0.183	0.50	74	-2	100	71	-0.020	8.33	0.01
172	31.463	0.183	0.50	74	-2	100	71	-0.020	8.40	0.01
173	31.645	0.182	0.50	74	-2	100	71	-0.020	8.38	0.01
174	31.828	0.183	0.50	74	-2	100	71	-0.020	8.37	0.01
175	32.011	0.183	0.50	74	-2	100	71	-0.020	8.51	0.01
176	32.194	0.183	0.50	74	-2	100	71	-0.020	8.54	0.01
177	32.377	0.183	0.50	74	-2	100	71	-0.020	8.73	0.01
178	32.560	0.183	0.50	74	-2	100	71	-0.020	8.68	0.00
179	32.743	0.183	0.50	74	-2	100	71	-0.020	8.75	0.01
180	32.926	0.183	0.50	74	-2	100	71	-0.020	8.70	0.01
181	33.109	0.183	0.50	74	-2	100	71	-0.020	8.69	0.01
182	33.292	0.183	0.50	74	-2	100	71	-0.020	8.66	0.01
183	33.475	0.183	0.50	74	-2	100	71	-0.020	8.62	0.01
184	33.658	0.183	0.50	74	-2	100	71	-0.020	8.57	0.01
185	33.841	0.183	0.50	74	-2	100	71	-0.020	8.44	0.01
186	34.023	0.182	0.50	74	-2	99	71	-0.020	8.49	0.01
187	34.206	0.183	0.50	74	-2	100	71	-0.020	8.45	0.01
188	34.389	0.183	0.50	74	-2	100	71	-0.020	8.38	0.01
189	34.572	0.183	0.50	74	-2	100	71	-0.020	8.23	0.01
190	34.755	0.183	0.50	74	-2	100	71	-0.020	8.13	0.01
191	34.938	0.183	0.50	74	-2	100	71	-0.020	8.28	0.01



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
192	35.121	0.183	0.50	74	-2	100	71	-0.020	8.31	0.01
193	35.304	0.183	0.50	74	-2	100	71	-0.020	8.41	0.01
194	35.487	0.183	0.50	74	-2	100	71	-0.020	8.51	0.01
195	35.670	0.183	0.50	74	-2	100	71	-0.020	8.67	0.01
196	35.853	0.183	0.50	74	-2	100	71	-0.020	8.58	0.01
197	36.036	0.183	0.50	74	-2	100	71	-0.020	8.66	0.01
198	36.219	0.183	0.50	74	-2	100	71	-0.020	8.73	0.01
199	36.402	0.183	0.50	74	-2	100	71	-0.020	8.89	0.01
200	36.584	0.182	0.50	74	-2	99	71	-0.020	9.08	0.01
201	36.767	0.183	0.50	74	-2	100	71	-0.020	9.31	0.00
202	36.950	0.183	0.50	74	-2	100	71	-0.020	9.73	0.00
203	37.133	0.183	0.50	74	-2	100	71	-0.020	10.13	0.01
204	37.316	0.183	0.50	74	-2	100	71	-0.020	10.41	0.01
205	37.499	0.183	0.50	74	-2	100	71	-0.020	10.66	0.00
206	37.682	0.183	0.50	74	-2	100	71	-0.020	11.23	0.00
207	37.865	0.183	0.50	74	-2	100	71	-0.020	11.61	0.01
208	38.048	0.183	0.50	74	-2	100	71	-0.020	11.94	0.01
209	38.231	0.183	0.50	74	-2	100	71	-0.020	12.04	0.00
210	38.414	0.183	0.50	74	-2	100	71	-0.020	12.06	0.00
211	38.597	0.183	0.50	74	-2	100	71	-0.020	11.86	0.00
212	38.780	0.183	0.50	74	-2	100	71	-0.020	11.71	0.00
213	38.963	0.183	0.50	74	-2	100	71	-0.020	11.77	0.00
214	39.145	0.182	0.50	74	-2	100	71	-0.020	11.59	0.00
215	39.328	0.183	0.50	74	-2	100	71	-0.020	11.43	0.00
216	39.511	0.183	0.50	74	-2	100	71	-0.020	11.25	0.00
217	39.694	0.183	0.50	74	-2	100	71	-0.020	11.12	0.00
218	39.877	0.183	0.50	74	-2	100	71	-0.020	10.88	0.00
219	40.060	0.183	0.50	74	-2	100	71	-0.020	10.83	0.01
220	40.243	0.183	0.50	74	-2	100	71	-0.030	10.82	0.01
221	40.426	0.183	0.50	74	-2	100	71	-0.020	10.83	0.01
222	40.609	0.183	0.50	74	-2	100	71	-0.020	10.93	0.00
223	40.792	0.183	0.50	74	-2	100	71	-0.020	10.82	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
224	40.975	0.183	0.50	73	-2	100	71	-0.020	10.76	0.00
225	41.158	0.183	0.50	73	-2	100	71	-0.020	10.77	0.00
226	41.341	0.183	0.50	73	-2	100	71	-0.020	10.74	0.00
227	41.523	0.182	0.50	73	-2	100	71	-0.020	10.77	0.00
228	41.706	0.183	0.50	73	-2	100	71	-0.020	10.78	0.00
229	41.889	0.183	0.50	73	-2	100	71	-0.020	10.87	0.00
230	42.072	0.183	0.50	73	-2	100	71	-0.020	10.81	0.00
231	42.255	0.183	0.50	73	-2	100	71	-0.020	10.80	0.00
232	42.438	0.183	0.50	73	-2	100	71	-0.020	10.94	0.00
233	42.621	0.183	0.50	73	-2	100	71	-0.020	10.92	0.00
234	42.804	0.183	0.50	73	-2	100	71	-0.020	10.92	0.01
235	42.987	0.183	0.50	73	-2	100	71	-0.020	10.91	0.01
236	43.170	0.183	0.50	73	-2	100	71	-0.020	11.01	0.00
237	43.353	0.183	0.50	73	-2	100	71	-0.020	11.07	0.01
238	43.536	0.183	0.50	73	-2	100	71	-0.020	11.05	0.01
239	43.719	0.183	0.50	74	-2	100	71	-0.020	11.03	0.01
240	43.902	0.183	0.50	74	-2	100	71	-0.020	11.11	0.01
241	44.084	0.182	0.50	74	-2	100	71	-0.020	10.96	0.01
242	44.267	0.183	0.50	74	-2	100	71	-0.020	10.86	0.01
243	44.450	0.183	0.50	74	-2	100	71	-0.020	10.97	0.01
244	44.633	0.183	0.50	74	-2	100	71	-0.020	10.73	0.01
245	44.816	0.183	0.50	74	-2	100	71	-0.020	10.63	0.01
246	44.999	0.183	0.50	74	-2	100	71	-0.020	10.75	0.01
247	45.182	0.183	0.50	74	-2	100	71	-0.020	10.91	0.00
248	45.365	0.183	0.50	74	-2	100	71	-0.020	10.76	0.00
249	45.548	0.183	0.50	74	-2	100	71	-0.020	10.89	0.00
250	45.731	0.183	0.50	74	-2	100	71	-0.020	10.84	0.00
251	45.914	0.183	0.50	74	-2	100	71	-0.020	10.84	0.00
252	46.097	0.183	0.50	74	-2	100	71	-0.020	11.04	0.00
253	46.280	0.183	0.50	74	-2	100	71	-0.020	11.11	0.00
254	46.463	0.183	0.50	74	-2	100	71	-0.020	11.27	0.00
255	46.645	0.182	0.50	74	-2	99	71	-0.020	11.29	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
256	46.828	0.183	0.50	74	-2	100	71	-0.020	11.36	0.00
257	47.011	0.183	0.50	74	-2	100	71	-0.020	11.45	0.00
258	47.194	0.183	0.50	74	-2	100	72	-0.020	11.44	0.01
259	47.377	0.183	0.50	74	-2	100	72	-0.020	11.53	0.01
260	47.560	0.183	0.50	74	-2	100	72	-0.020	11.57	0.01
261	47.743	0.183	0.50	74	-2	100	72	-0.020	11.63	0.00
262	47.926	0.183	0.50	74	-2	100	72	-0.020	11.67	0.00
263	48.109	0.183	0.50	74	-2	100	72	-0.020	11.85	0.00
264	48.292	0.183	0.50	74	-2	100	72	-0.020	11.92	0.00
265	48.475	0.183	0.50	74	-2	100	72	-0.020	12.04	0.00
266	48.658	0.183	0.50	74	-2	100	72	-0.020	11.96	0.00
267	48.841	0.183	0.50	74	-2	100	72	-0.020	12.07	0.00
268	49.023	0.182	0.50	74	-2	99	72	-0.020	12.09	0.00
269	49.206	0.183	0.50	74	-2	100	72	-0.020	12.17	0.00
270	49.389	0.183	0.50	75	-2	100	72	-0.020	12.34	0.00
271	49.572	0.183	0.50	75	-2	100	72	-0.020	12.25	0.00
272	49.755	0.183	0.50	75	-2	100	72	-0.020	12.14	0.01
273	49.938	0.183	0.50	75	-2	100	72	-0.020	12.10	0.00
274	50.121	0.183	0.50	75	-2	100	72	-0.020	12.11	0.00
275	50.304	0.183	0.50	75	-2	100	72	-0.020	11.93	0.00
276	50.487	0.183	0.50	75	-2	100	72	-0.020	11.87	0.01
277	50.670	0.183	0.50	75	-2	100	72	-0.020	11.90	0.00
278	50.853	0.183	0.50	75	-2	100	72	-0.020	10.07	0.01
279	51.036	0.183	0.50	75	-2	100	72	-0.020	11.67	0.00
280	51.219	0.183	0.50	75	-2	100	72	-0.020	11.62	0.00
281	51.402	0.183	0.50	75	-2	100	72	-0.020	11.53	0.00
282	51.584	0.182	0.50	75	-2	99	72	-0.020	11.54	0.00
283	51.767	0.183	0.50	75	-2	100	72	-0.020	11.58	0.01
284	51.950	0.183	0.50	75	-2	100	72	-0.020	11.13	0.00
285	52.133	0.183	0.50	75	-2	100	72	-0.020	10.81	0.00
286	52.316	0.183	0.50	75	-2	100	72	-0.020	10.74	0.00
287	52.499	0.183	0.50	75	-2	100	72	-0.020	10.69	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
288	52.682	0.183	0.50	75	-2	100	72	-0.020	10.73	0.02
289	52.865	0.183	0.50	75	-2	100	72	-0.020	10.48	0.02
290	53.048	0.183	0.50	75	-2	100	72	-0.020	10.61	0.00
291	53.231	0.183	0.50	75	-2	100	72	-0.010	10.48	0.00
292	53.414	0.183	0.50	75	-2	100	72	-0.010	10.34	0.00
293	53.597	0.183	0.50	75	-2	100	72	-0.010	10.17	0.00
294	53.780	0.183	0.50	75	-2	100	72	-0.010	10.30	0.02
295	53.963	0.183	0.50	75	-2	100	72	-0.010	10.22	0.02
296	54.145	0.182	0.50	75	-2	99	72	-0.010	10.02	0.01
297	54.328	0.183	0.50	75	-2	100	72	-0.010	10.03	0.00
298	54.511	0.183	0.50	75	-2	100	72	-0.010	10.07	0.00
299	54.694	0.183	0.50	75	-2	100	72	-0.010	10.04	0.00
300	54.877	0.183	0.50	75	-2	100	72	-0.010	10.02	0.00
301	55.060	0.183	0.50	75	-2	100	72	-0.010	9.92	0.00
302	55.243	0.183	0.50	75	-2	100	72	-0.010	9.85	0.00
303	55.426	0.183	0.50	75	-2	100	72	-0.010	9.85	0.02
304	55.609	0.183	0.50	75	-2	100	72	-0.010	9.80	0.02
305	55.792	0.183	0.50	75	-2	100	72	-0.010	9.79	0.02
306	55.975	0.183	0.50	75	-2	100	72	-0.010	9.79	0.02
307	56.158	0.183	0.50	75	-2	100	72	-0.010	9.84	0.02
308	56.341	0.183	0.50	75	-2	100	72	-0.010	9.75	0.00
309	56.523	0.182	0.50	75	-2	99	72	-0.010	9.90	0.00
310	56.706	0.183	0.50	75	-2	100	72	-0.010	9.82	0.00
311	56.889	0.183	0.50	75	-2	100	72	-0.010	9.92	0.02
312	57.072	0.183	0.50	75	-2	100	72	-0.010	10.05	0.01
313	57.255	0.183	0.50	75	-2	100	72	-0.010	10.07	0.01
314	57.438	0.183	0.50	75	-2	100	72	-0.010	10.13	0.02
315	57.621	0.183	0.50	75	-2	100	72	-0.010	10.08	0.01
316	57.804	0.183	0.50	75	-2	100	72	-0.010	9.59	0.02
317	57.987	0.183	0.50	75	-2	100	72	-0.010	9.27	0.01
318	58.170	0.183	0.50	75	-2	100	72	-0.010	9.33	0.01
319	58.353	0.183	0.50	75	-2	100	72	-0.010	9.37	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
320	58.536	0.183	0.50	75	-2	100	72	-0.010	9.32	0.01
321	58.719	0.183	0.50	75	-2	100	72	-0.010	9.36	0.02
322	58.902	0.183	0.50	75	-2	100	72	-0.010	9.31	0.01
323	59.084	0.182	0.50	75	-2	99	72	-0.010	9.78	0.02
324	59.267	0.183	0.50	75	-2	100	72	-0.010	9.82	0.00
325	59.450	0.183	0.50	75	-2	100	72	-0.010	9.86	0.00
326	59.633	0.183	0.50	75	-2	100	72	-0.010	9.66	0.00
327	59.816	0.183	0.50	75	-2	100	72	-0.010	9.51	0.01
328	59.999	0.183	0.50	75	-2	100	72	-0.010	9.31	0.01
329	60.182	0.183	0.50	75	-2	100	72	-0.010	9.27	0.01
330	60.365	0.183	0.50	75	-2	100	72	-0.010	9.28	0.01
331	60.548	0.183	0.50	75	-2	100	72	-0.010	9.45	0.01
332	60.731	0.183	0.50	75	-2	100	71	-0.010	9.45	0.00
333	60.914	0.183	0.50	75	-2	100	71	-0.010	9.41	0.00
334	61.097	0.183	0.50	75	-2	100	71	-0.010	9.20	0.00
335	61.280	0.183	0.50	75	-2	100	71	-0.020	9.26	0.00
336	61.463	0.183	0.50	75	-2	100	71	-0.020	9.38	0.00
337	61.645	0.182	0.50	75	-2	99	71	-0.020	9.36	0.01
338	61.828	0.183	0.50	75	-2	100	71	-0.020	9.58	0.01
339	62.011	0.183	0.50	75	-2	100	71	-0.020	9.61	0.00
340	62.194	0.183	0.50	75	-2	100	71	-0.020	9.47	0.00
341	62.377	0.183	0.50	75	-2	100	71	-0.020	9.47	0.01
342	62.560	0.183	0.50	75	-2	100	71	-0.020	9.55	0.01
343	62.743	0.183	0.50	75	-2	100	71	-0.020	9.50	0.00
344	62.926	0.183	0.50	75	-2	100	71	-0.020	9.67	0.00
345	63.109	0.183	0.50	75	-2	100	71	-0.020	9.71	0.00
346	63.292	0.183	0.50	75	-2	100	71	-0.020	9.67	0.01
347	63.475	0.183	0.50	75	-2	100	71	-0.020	9.87	0.01
348	63.658	0.183	0.50	75	-2	100	71	-0.020	9.98	0.01
349	63.841	0.183	0.50	75	-2	100	71	-0.020	10.10	0.01
350	64.023	0.182	0.50	75	-2	99	71	-0.020	10.13	0.00
351	64.206	0.183	0.50	75	-2	100	71	-0.020	10.31	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
352	64.389	0.183	0.50	75	-2	100	71	-0.020	10.01	0.01
353	64.572	0.183	0.50	75	-2	100	71	-0.020	10.01	0.00
354	64.755	0.183	0.50	75	-2	100	71	-0.020	9.98	0.00
355	64.938	0.183	0.50	75	-2	100	71	-0.020	9.88	0.00
356	65.121	0.183	0.50	75	-2	100	71	-0.020	9.71	0.01
357	65.304	0.183	0.50	75	-2	100	71	-0.020	9.66	0.01
358	65.487	0.183	0.50	75	-2	100	71	-0.020	9.57	0.01
359	65.670	0.183	0.50	75	-2	100	71	-0.020	9.60	0.01
360	65.853	0.183	0.50	75	-2	100	71	-0.020	9.58	0.01
361	66.036	0.183	0.50	75	-2	100	71	-0.020	9.66	0.01
362	66.219	0.183	0.50	75	-2	100	71	-0.020	9.70	0.01
363	66.402	0.183	0.50	75	-2	100	71	-0.020	9.72	0.01
364	66.584	0.182	0.50	75	-2	99	71	-0.020	9.65	0.01
365	66.767	0.183	0.50	75	-2	100	71	-0.020	9.75	0.01
366	66.950	0.183	0.50	75	-2	100	71	-0.020	9.00	0.01
367	67.133	0.183	0.50	75	-2	100	71	-0.020	9.60	0.01
368	67.316	0.183	0.50	75	-2	100	71	-0.020	10.01	0.01
369	67.499	0.183	0.50	75	-2	100	71	-0.020	10.00	0.01
370	67.682	0.183	0.50	75	-2	100	71	-0.020	10.05	0.01
371	67.865	0.183	0.50	75	-2	100	71	-0.020	10.08	0.01
372	68.048	0.183	0.50	75	-2	100	71	-0.020	9.87	0.01
373	68.231	0.183	0.50	75	-2	100	71	-0.020	9.84	0.01
374	68.414	0.183	0.50	75	-2	100	71	-0.020	9.96	0.01
375	68.597	0.183	0.50	75	-2	100	71	-0.020	9.96	0.01
376	68.780	0.183	0.50	75	-2	100	72	-0.020	9.78	0.01
377	68.963	0.183	0.50	74	-2	100	72	-0.020	9.65	0.01
378	69.145	0.182	0.50	74	-2	99	72	-0.020	9.55	0.01
379	69.328	0.183	0.50	74	-2	100	72	-0.020	9.43	0.01
380	69.511	0.183	0.50	74	-2	100	72	-0.020	9.39	0.01
381	69.694	0.183	0.50	74	-2	100	72	-0.020	9.37	0.01
382	69.877	0.183	0.50	74	-2	100	72	-0.020	9.40	0.01
383	70.060	0.183	0.50	74	-2	100	72	-0.020	9.32	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
384	70.243	0.183	0.50	74	-2	100	72	-0.020	9.35	0.01
385	70.426	0.183	0.50	74	-2	100	72	-0.020	9.26	0.01
386	70.609	0.183	0.50	74	-2	100	72	-0.020	9.19	0.01
387	70.792	0.183	0.50	74	-2	100	72	-0.020	9.16	0.01
388	70.975	0.183	0.50	74	-2	100	72	-0.020	9.16	0.01
389	71.158	0.183	0.50	74	-2	100	72	-0.020	9.34	0.01
390	71.341	0.183	0.50	74	-2	100	72	-0.020	9.43	0.01
391	71.523	0.182	0.50	74	-2	99	72	-0.020	9.39	0.01
392	71.706	0.183	0.50	74	-2	100	72	-0.020	9.22	0.01
393	71.889	0.183	0.50	74	-2	100	72	-0.020	9.21	0.01
394	72.072	0.183	0.50	74	-2	100	72	-0.020	9.24	0.01
395	72.255	0.183	0.50	74	-2	100	72	-0.020	9.15	0.01
396	72.438	0.183	0.50	74	-2	100	72	-0.020	9.20	0.01
397	72.621	0.183	0.50	74	-2	100	72	-0.020	9.17	0.01
398	72.804	0.183	0.50	74	-2	100	72	-0.020	9.18	0.01
399	72.987	0.183	0.50	74	-2	100	72	-0.020	9.30	0.01
400	73.170	0.183	0.50	74	-2	100	72	-0.020	9.41	0.01
401	73.353	0.183	0.50	74	-2	100	72	-0.020	9.47	0.01
402	73.536	0.183	0.50	74	-2	100	72	-0.020	9.46	0.01
403	73.719	0.183	0.50	74	-2	100	72	-0.020	9.58	0.01
404	73.902	0.183	0.50	74	-2	100	72	-0.020	9.60	0.01
405	74.084	0.182	0.50	74	-2	99	72	-0.020	9.70	0.00
406	74.267	0.183	0.50	74	-2	100	72	-0.020	9.71	0.01
407	74.450	0.183	0.50	74	-2	100	72	-0.020	9.74	0.01
408	74.633	0.183	0.50	74	-2	100	72	-0.020	9.71	0.01
409	74.816	0.183	0.50	74	-2	100	72	-0.020	9.75	0.01
410	74.999	0.183	0.50	74	-2	100	72	-0.020	9.87	0.01
411	75.182	0.183	0.50	74	-2	100	72	-0.020	9.76	0.01
412	75.365	0.183	0.50	74	-2	100	72	-0.020	9.74	0.01
413	75.548	0.183	0.50	74	-2	100	72	-0.020	9.70	0.00
414	75.731	0.183	0.50	74	-2	100	72	-0.020	9.71	0.01
415	75.914	0.183	0.50	74	-2	100	72	-0.020	9.69	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
416	76.097	0.183	0.50	74	-2	100	72	-0.020	9.78	0.01
417	76.280	0.183	0.50	74	-2	100	72	-0.020	7.61	0.01
418	76.463	0.183	0.50	74	-2	100	72	-0.020	9.70	0.01
419	76.645	0.182	0.50	74	-2	99	72	-0.020	9.74	0.00
420	76.828	0.183	0.50	74	-2	100	72	-0.020	9.64	0.00
421	77.011	0.183	0.50	74	-2	100	72	-0.020	9.59	0.00
422	77.194	0.183	0.50	74	-2	100	72	-0.020	9.52	0.00
423	77.377	0.183	0.50	74	-2	100	72	-0.020	9.48	0.00
424	77.560	0.183	0.50	74	-2	100	72	-0.020	9.02	0.01
425	77.743	0.183	0.50	74	-2	100	72	-0.020	8.96	0.01
426	77.926	0.183	0.50	74	-2	100	72	-0.020	9.01	0.01
427	78.109	0.183	0.50	74	-2	100	72	-0.020	8.95	0.01
428	78.292	0.183	0.50	74	-2	100	72	-0.020	9.01	0.01
429	78.475	0.183	0.50	74	-2	100	72	-0.020	9.01	0.01
430	78.658	0.183	0.50	74	-2	100	72	-0.020	9.05	0.01
431	78.841	0.183	0.50	74	-2	100	72	-0.020	9.21	0.01
432	79.023	0.182	0.50	74	-2	99	72	-0.020	9.24	0.01
433	79.206	0.183	0.50	74	-2	100	72	-0.020	9.22	0.01
434	79.389	0.183	0.50	74	-2	100	72	-0.020	9.58	0.01
435	79.572	0.183	0.50	74	-2	100	72	-0.020	9.65	0.01
436	79.755	0.183	0.50	74	-2	100	72	-0.020	9.65	0.01
437	79.938	0.183	0.50	74	-2	100	72	-0.020	9.91	0.01
438	80.121	0.183	0.50	74	-2	100	71	-0.020	10.01	0.01
439	80.304	0.183	0.50	74	-2	100	71	-0.020	10.23	0.00
440	80.487	0.183	0.50	74	-2	100	71	-0.020	10.28	0.00
441	80.670	0.183	0.50	74	-2	100	71	-0.020	10.49	0.00
442	80.853	0.183	0.50	74	-2	100	71	-0.020	10.67	0.00
443	81.036	0.183	0.50	74	-2	100	71	-0.020	10.81	0.00
444	81.219	0.183	0.50	74	-2	100	71	-0.020	10.94	0.00
445	81.402	0.183	0.50	74	-2	100	71	-0.020	10.95	0.00
446	81.584	0.182	0.50	74	-2	99	71	-0.020	11.15	0.00
447	81.767	0.183	0.50	74	-2	100	71	-0.020	11.24	0.00



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
448	81.950	0.183	0.50	74	-2	100	71	-0.020	11.20	0.00
449	82.133	0.183	0.50	74	-2	100	71	-0.020	11.09	0.00
450	82.316	0.183	0.50	74	-2	100	71	-0.020	11.11	0.00
451	82.499	0.183	0.50	74	-2	100	71	-0.020	11.25	0.00
452	82.682	0.183	0.50	74	-2	100	71	-0.020	11.30	0.00
453	82.865	0.183	0.50	74	-2	100	71	-0.020	11.40	0.00
454	83.048	0.183	0.50	74	-2	100	71	-0.020	11.58	0.01
455	83.231	0.183	0.50	74	-2	100	71	-0.020	11.59	0.01
456	83.414	0.183	0.50	74	-2	100	71	-0.020	11.59	0.01
457	83.597	0.183	0.50	74	-2	100	72	-0.020	11.70	0.01
458	83.780	0.183	0.50	74	-2	100	71	-0.020	11.69	0.01
459	83.963	0.183	0.50	74	-2	100	72	-0.020	11.66	0.01
460	84.145	0.182	0.50	74	-2	100	72	-0.020	11.68	0.01
461	84.328	0.183	0.50	74	-2	100	72	-0.020	11.68	0.01
462	84.511	0.183	0.50	74	-2	100	72	-0.020	11.62	0.01
463	84.694	0.183	0.50	74	-2	100	72	-0.020	11.70	0.01
464	84.877	0.183	0.50	74	-2	100	72	-0.020	11.79	0.01
465	85.060	0.183	0.50	74	-2	100	71	-0.020	11.69	0.01
466	85.243	0.183	0.50	74	-2	100	71	-0.020	11.76	0.01
467	85.426	0.183	0.50	74	-2	100	71	-0.020	11.86	0.01
468	85.609	0.183	0.50	74	-2	100	71	-0.020	11.79	0.01
469	85.792	0.183	0.50	74	-2	100	71	-0.020	11.99	0.01
470	85.975	0.183	0.50	74	-2	100	71	-0.020	12.04	0.01
471	86.158	0.183	0.50	74	-2	100	71	-0.020	13.55	0.92
472	86.341	0.183	0.50	73	-2	100	71	-0.020	13.42	1.91
473	86.523	0.182	0.50	73	-2	100	71	-0.020	13.32	2.37
474	86.706	0.183	0.50	74	-2	100	71	-0.020	13.22	2.69
475	86.889	0.183	0.50	74	-2	100	71	-0.020	13.37	2.34
476	87.072	0.183	0.50	74	-2	100	71	-0.020	13.18	1.96
477	87.255	0.183	0.50	74	-2	100	71	-0.020	13.15	1.70
478	87.438	0.183	0.50	74	-2	100	71	-0.020	13.07	1.41
479	87.621	0.183	0.50	74	-2	100	71	-0.020	12.74	1.33

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
480	87.804	0.183	0.50	74	-2	100	71	-0.020	12.59	1.05
481	87.987	0.183	0.50	74	-2	100	71	-0.020	12.90	0.94
482	88.170	0.183	0.50	74	-2	100	72	-0.020	12.93	0.80
483	88.353	0.183	0.50	74	-2	100	71	-0.020	12.85	0.81
484	88.536	0.183	0.50	74	-2	100	72	-0.020	12.79	1.24
485	88.719	0.183	0.50	74	-2	100	72	-0.020	12.54	0.71
486	88.902	0.183	0.50	74	-2	100	72	-0.020	12.62	1.27
487	89.084	0.182	0.50	74	-2	100	72	-0.020	12.54	1.08
488	89.267	0.183	0.50	74	-2	100	72	-0.020	12.62	0.95
489	89.450	0.183	0.50	74	-2	100	72	-0.020	12.54	0.59
490	89.633	0.183	0.50	74	-2	100	72	-0.020	12.84	0.35
491	89.816	0.183	0.50	74	-2	100	72	-0.020	12.63	0.32
492	89.999	0.183	0.50	74	-2	100	72	-0.020	12.85	0.68
493	90.182	0.183	0.50	75	-2	100	72	-0.020	12.49	0.56
494	90.365	0.183	0.50	74	-2	100	72	-0.020	12.65	0.73
495	90.548	0.183	0.50	74	-2	100	72	-0.020	12.70	0.69
496	90.731	0.183	0.50	74	-2	100	72	-0.020	12.49	0.36
497	90.914	0.183	0.50	74	-2	100	72	-0.020	12.89	0.86
498	91.097	0.183	0.50	74	-2	100	72	-0.020	12.79	0.90
499	91.280	0.183	0.50	74	-2	100	72	-0.020	13.00	0.98
500	91.463	0.183	0.50	74	-2	100	72	-0.020	12.83	1.01
501	91.645	0.182	0.50	74	-2	99	72	-0.020	12.87	0.93
502	91.828	0.183	0.50	74	-2	100	72	-0.020	12.71	1.43
503	92.011	0.183	0.50	74	-2	100	71	-0.020	12.54	1.61
504	92.194	0.183	0.50	74	-2	100	71	-0.020	11.98	1.01
505	92.377	0.183	0.50	74	-2	100	71	-0.020	12.65	0.58
506	92.560	0.183	0.50	74	-2	100	71	-0.020	12.50	0.34
507	92.743	0.183	0.50	74	-2	100	71	-0.020	12.46	0.22
508	92.926	0.183	0.50	74	-2	100	71	-0.020	12.22	0.07
509	93.109	0.183	0.50	74	-2	100	71	-0.020	11.97	0.03
510	93.292	0.183	0.50	74	-2	100	71	-0.020	11.65	0.02
511	93.475	0.183	0.50	74	-2	100	71	-0.020	11.56	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
512	93.658	0.183	0.50	74	-2	100	71	-0.020	11.53	0.01
513	93.841	0.183	0.50	74	-2	100	72	-0.020	11.44	0.01
514	94.024	0.183	0.50	74	-2	100	72	-0.020	11.32	0.01
515	94.206	0.182	0.50	74	-2	99	72	-0.020	11.43	0.01
516	94.389	0.183	0.50	75	-2	100	72	-0.020	11.43	0.01
517	94.572	0.183	0.50	75	-2	100	72	-0.020	11.32	0.02
518	94.755	0.183	0.50	75	-2	100	72	-0.020	11.51	0.01
519	94.938	0.183	0.50	75	-2	100	72	-0.020	11.54	0.02
520	95.121	0.183	0.50	75	-2	100	72	-0.020	11.71	0.02
521	95.304	0.183	0.50	75	-2	100	72	-0.020	11.68	0.02
522	95.487	0.183	0.50	75	-2	100	72	-0.020	11.49	0.00
523	95.670	0.183	0.50	75	-2	100	72	-0.020	11.44	0.00
524	95.853	0.183	0.50	75	-2	100	72	-0.020	11.46	0.00
525	96.036	0.183	0.50	75	-2	100	72	-0.020	11.58	0.00
526	96.219	0.183	0.50	75	-2	100	72	-0.020	11.95	0.00
527	96.402	0.183	0.50	75	-2	100	72	-0.020	12.11	0.00
528	96.584	0.182	0.50	75	-2	99	72	-0.020	12.21	0.00
529	96.767	0.183	0.50	75	-2	100	72	-0.020	12.01	0.00
530	96.950	0.183	0.50	75	-2	100	72	-0.020	11.77	0.00
531	97.133	0.183	0.50	75	-2	100	72	-0.020	11.65	0.00
532	97.316	0.183	0.50	75	-2	100	72	-0.020	11.24	0.00
533	97.499	0.183	0.50	75	-2	100	72	-0.020	11.08	0.00
534	97.682	0.183	0.50	75	-2	100	72	-0.020	10.90	0.00
535	97.865	0.183	0.50	75	-2	100	72	-0.020	10.76	0.00
536	98.048	0.183	0.50	75	-2	100	72	-0.020	10.68	0.00
537	98.231	0.183	0.50	75	-2	100	72	-0.020	10.53	0.00
538	98.414	0.183	0.50	75	-2	100	72	-0.020	10.64	0.00
539	98.597	0.183	0.50	75	-2	100	72	-0.020	10.69	0.00
540	98.780	0.183	0.50	75	-2	100	72	-0.020	10.39	0.00
541	98.963	0.183	0.50	75	-2	100	72	-0.020	10.26	0.00
542	99.145	0.182	0.50	75	-2	99	72	-0.020	10.00	0.00
543	99.328	0.183	0.50	75	-2	100	72	-0.020	9.80	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
544	99.511	0.183	0.50	75	-2	100	72	-0.020	9.60	0.00
545	99.694	0.183	0.50	75	-2	100	72	-0.020	9.68	0.00
546	99.877	0.183	0.50	75	-2	100	72	-0.020	9.65	0.00
547	100.060	0.183	0.50	75	-2	100	72	-0.020	9.67	0.00
548	100.243	0.183	0.50	75	-2	100	72	-0.020	9.61	0.01
549	100.426	0.183	0.50	75	-2	100	72	-0.020	9.57	0.01
550	100.609	0.183	0.50	75	-2	100	72	-0.020	9.46	0.01
551	100.792	0.183	0.50	75	-2	100	72	-0.020	9.58	0.01
552	100.975	0.183	0.50	75	-2	100	72	-0.020	9.55	0.01
553	101.158	0.183	0.50	75	-2	100	72	-0.020	9.57	0.01
554	101.341	0.183	0.50	75	-2	100	72	-0.020	9.54	0.01
555	101.524	0.183	0.50	75	-2	100	72	-0.020	9.46	0.00
556	101.706	0.182	0.50	75	-2	99	72	-0.020	9.48	0.00
557	101.889	0.183	0.50	75	-2	100	72	-0.020	9.50	0.00
558	102.072	0.183	0.50	76	-2	100	72	-0.020	9.45	0.00
559	102.255	0.183	0.50	75	-2	100	72	-0.020	9.40	0.01
560	102.438	0.183	0.50	76	-2	100	72	-0.020	9.32	0.01
561	102.621	0.183	0.50	75	-2	100	72	-0.020	9.39	0.01
562	102.804	0.183	0.50	75	-2	100	72	-0.020	9.39	0.01
563	102.987	0.183	0.50	75	-2	100	72	-0.020	9.44	0.01
564	103.170	0.183	0.50	76	-2	100	72	-0.020	9.26	0.01
565	103.353	0.183	0.50	76	-2	100	72	-0.020	9.43	0.01
566	103.536	0.183	0.50	76	-2	100	72	-0.020	9.36	0.01
567	103.719	0.183	0.50	76	-2	100	72	-0.020	9.39	0.01
568	103.902	0.183	0.50	76	-2	100	72	-0.020	9.47	0.01
569	104.084	0.182	0.50	76	-2	99	72	-0.020	9.32	0.01
570	104.267	0.183	0.50	76	-2	100	72	-0.020	5.66	0.01
571	104.450	0.183	0.50	76	-2	100	72	-0.020	9.34	0.01
572	104.633	0.183	0.50	76	-2	100	72	-0.020	9.40	0.00
573	104.816	0.183	0.50	76	-2	100	72	-0.020	9.45	0.00
574	104.999	0.183	0.50	76	-2	100	72	-0.020	9.41	0.00
575	105.182	0.183	0.50	76	-2	100	72	-0.020	9.31	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
576	105.365	0.183	0.50	76	-2	100	72	-0.020	9.46	0.01
577	105.548	0.183	0.50	76	-2	100	72	-0.020	9.56	0.01
578	105.731	0.183	0.50	76	-2	100	72	-0.020	9.65	0.01
579	105.914	0.183	0.50	76	-2	100	72	-0.020	9.66	0.01
580	106.097	0.183	0.50	76	-2	100	72	-0.020	9.63	0.01
581	106.280	0.183	0.50	76	-2	100	72	-0.020	9.78	0.01
582	106.463	0.183	0.50	76	-2	100	72	-0.020	9.77	0.01
583	106.645	0.182	0.50	76	-2	99	72	-0.020	9.75	0.01
584	106.828	0.183	0.50	76	-2	100	72	-0.020	9.69	0.01
585	107.011	0.183	0.50	76	-2	100	72	-0.020	9.70	0.01
586	107.194	0.183	0.50	76	-2	100	72	-0.020	9.72	0.01
587	107.377	0.183	0.50	76	-2	100	72	-0.020	9.67	0.01
588	107.560	0.183	0.50	76	-2	100	72	-0.020	9.69	0.01
589	107.743	0.183	0.50	76	-2	100	72	-0.020	9.69	0.01
590	107.926	0.183	0.50	76	-2	100	72	-0.020	9.89	0.00
591	108.109	0.183	0.50	76	-2	100	72	-0.020	9.98	0.00
592	108.292	0.183	0.50	76	-2	100	72	-0.020	9.97	0.00
593	108.475	0.183	0.50	76	-2	100	72	-0.020	9.96	0.00
594	108.658	0.183	0.50	76	-2	100	72	-0.020	10.05	0.00
595	108.841	0.183	0.50	76	-2	100	72	-0.020	9.81	0.00
596	109.024	0.183	0.50	76	-2	100	72	-0.020	9.86	0.00
597	109.206	0.182	0.50	76	-2	99	72	-0.020	9.82	0.00
598	109.389	0.183	0.50	76	-2	100	72	-0.020	9.66	0.00
599	109.572	0.183	0.50	76	-2	100	72	-0.020	9.56	0.00
600	109.755	0.183	0.50	76	-2	100	72	-0.020	9.61	0.00
601	109.938	0.183	0.50	76	-2	100	72	-0.020	9.57	0.00
602	110.121	0.183	0.50	76	-2	100	72	-0.020	9.56	0.00
603	110.304	0.183	0.50	76	-2	100	72	-0.020	9.45	0.00
604	110.487	0.183	0.50	76	-2	100	72	-0.020	9.41	0.01
605	110.670	0.183	0.50	76	-2	100	72	-0.020	9.40	0.01
606	110.853	0.183	0.50	76	-2	100	72	-0.020	9.43	0.01
607	111.036	0.183	0.50	76	-2	100	72	-0.020	9.47	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
608	111.219	0.183	0.50	76	-2	100	72	-0.020	9.56	0.00
609	111.402	0.183	0.50	76	-2	100	72	-0.020	9.61	0.01
610	111.584	0.182	0.50	76	-2	99	72	-0.020	9.60	0.01
611	111.767	0.183	0.50	76	-2	100	72	-0.020	9.66	0.00
612	111.950	0.183	0.50	76	-2	100	72	-0.020	9.59	0.00
613	112.133	0.183	0.50	76	-2	100	72	-0.020	9.52	0.00
614	112.316	0.183	0.50	76	-2	100	72	-0.020	9.44	0.00
615	112.499	0.183	0.50	76	-2	100	72	-0.020	9.50	0.00
616	112.682	0.183	0.50	76	-2	100	72	-0.020	9.49	0.00
617	112.865	0.183	0.50	76	-2	100	72	-0.020	9.59	0.00
618	113.048	0.183	0.50	76	-2	100	72	-0.020	9.50	0.00
619	113.231	0.183	0.50	76	-2	100	72	-0.020	9.15	0.00
620	113.414	0.183	0.50	76	-2	100	72	-0.020	9.35	0.01
621	113.597	0.183	0.50	76	-2	100	72	-0.020	9.29	0.01
622	113.780	0.183	0.50	76	-2	100	72	-0.020	9.30	0.01
623	113.963	0.183	0.50	76	-2	100	72	-0.020	9.27	0.00
624	114.145	0.182	0.50	76	-2	99	72	-0.020	9.30	0.00
625	114.328	0.183	0.50	76	-2	100	72	-0.020	9.25	0.00
626	114.511	0.183	0.50	76	-2	100	72	-0.020	9.16	0.01
627	114.694	0.183	0.50	76	-2	100	72	-0.020	9.16	0.00
628	114.877	0.183	0.50	76	-2	100	72	-0.020	9.21	0.00
629	115.060	0.183	0.50	76	-2	100	72	-0.020	9.08	0.01
630	115.243	0.183	0.50	76	-2	100	72	-0.020	9.04	0.01
631	115.426	0.183	0.50	76	-2	100	72	-0.020	9.08	0.01
632	115.609	0.183	0.50	76	-2	100	72	-0.020	9.07	0.00
633	115.792	0.183	0.50	75	-2	100	72	-0.020	9.15	0.01
634	115.975	0.183	0.50	75	-2	100	72	-0.020	9.24	0.01
635	116.158	0.183	0.50	75	-2	100	72	-0.020	9.41	0.01
636	116.341	0.183	0.50	75	-2	100	72	-0.020	9.58	0.00
637	116.524	0.183	0.50	75	-2	100	72	-0.020	9.44	0.00
638	116.706	0.182	0.50	75	-2	99	72	-0.020	9.28	0.00
639	116.889	0.183	0.50	75	-2	100	72	-0.020	9.24	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
640	117.072	0.183	0.50	75	-2	100	72	-0.020	9.22	0.00
641	117.255	0.183	0.50	75	-2	100	72	-0.020	9.30	0.00
642	117.438	0.183	0.50	75	-2	100	72	-0.020	9.32	0.00
643	117.622	0.184	0.50	75	-2	100	72	-0.020	9.21	0.01
Avg/Tot	117.622	0.183	0.50	74	-2.00	100	71	-0.020	9.93	0.07

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
0	295	294	191	273	380	286.5	479	
1	291	290	187	270	377	282.9	424	
2	287	285	184	266	374	279.3	425	
3	282	281	181	263	371	275.6	443	
4	277	276	178	261	369	272.3	457	
5	273	272	175	258	366	268.9	474	
6	268	267	173	257	364	265.9	492	
7	264	263	170	256	362	262.8	509	
8	260	259	168	254	359	259.9	523	
9	256	255	166	254	357	257.3	533	
10	252	251	163	253	355	254.6	543	
11	248	247	161	252	353	252.4	550	
12	244	244	159	252	351	250.0	558	
13	241	240	157	251	349	247.9	562	
14	238	237	156	250	347	245.8	568	
15	235	234	154	251	346	244.1	577	
16	233	232	153	251	344	242.5	593	
17	231	230	152	252	342	241.3	619	
18	230	228	151	253	341	240.4	640	
19	228	226	150	254	339	239.4	649	
20	227	224	148	255	338	238.4	651	
21	226	223	147	257	336	237.8	658	
22	225	221	146	259	335	237.2	673	
23	224	220	145	261	334	236.8	695	
24	224	219	145	264	334	237.0	728	
25	224	217	144	269	333	237.4	770	
26	224	216	144	273	332	237.7	781	
27	223	215	143	277	332	238.1	791	
28	224	215	142	282	331	238.7	802	
29	224	214	142	286	331	239.4	809	
30	225	213	141	291	331	240.2	821	
31	226	213	140	296	331	241.3	839	
32	228	213	140	301	331	242.4	859	
33	230	213	140	306	331	243.9	882	
34	232	213	140	312	331	245.5	893	
35	234	213	139	318	332	247.0	891	
36	236	213	139	321	332	248.3	886	
37	239	214	139	325	332	249.7	885	
38	242	214	139	329	333	251.2	886	
39	244	215	139	332	334	252.5	886	
40	247	215	139	334	334	253.8	884	
41	250	216	138	338	335	255.3	881	
42	253	216	138	340	336	256.5	880	
43	255	217	138	341	336	257.7	879	
44	258	218	138	344	337	259.0	882	
45	261	218	138	347	338	260.5	895	
46	265	219	139	350	339	262.3	912	
47	268	220	139	354	340	264.3	928	



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
48	273	221	140	357	341	266.2	934
49	277	222	140	361	342	268.3	942
50	281	223	140	366	342	270.3	950
51	285	224	140	369	343	272.1	955
52	289	225	140	372	344	274.1	955
53	293	226	140	376	344	276.1	958
54	297	228	141	379	345	278.0	964
55	301	229	141	382	345	279.7	964
56	304	230	142	385	346	281.3	964
57	308	232	141	388	346	283.0	962
58	311	233	142	389	346	284.4	960
59	315	235	142	391	347	285.8	958
60	318	236	142	393	347	287.2	957
61	321	237	143	396	347	288.8	957
62	324	238	143	396	348	289.8	961
63	326	240	143	399	348	291.1	969
64	329	241	144	402	348	292.7	979
65	331	242	144	404	348	293.9	984
66	334	243	145	407	348	295.4	988
67	336	244	145	409	348	296.6	992
68	339	246	146	411	348	297.9	994
69	341	246	146	414	348	299.1	1000
70	343	248	146	415	348	299.9	1001
71	344	249	147	418	348	301.2	996
72	345	250	147	420	348	302.0	1006
73	346	250	147	422	348	302.7	1004
74	346	251	148	423	348	303.2	993
75	347	251	148	423	348	303.6	986
76	348	252	148	424	348	303.9	982
77	350	252	148	424	348	304.3	982
78	351	253	149	424	348	304.8	985
79	352	253	149	424	348	305.1	988
80	352	253	149	425	347	305.4	989
81	353	255	150	426	347	306.1	984
82	353	256	150	427	347	306.8	987
83	353	259	151	428	347	307.5	994
84	352	261	151	430	347	308.3	997
85	352	263	152	431	348	309.0	997
86	352	265	152	431	348	309.4	993
87	351	267	153	433	348	310.3	985
88	351	269	153	433	347	310.6	983
89	351	270	153	434	347	311.0	982
90	350	272	153	434	347	311.3	971
91	350	273	154	433	346	311.3	956
92	350	274	154	432	346	311.0	944
93	350	275	154	430	345	310.7	934
94	350	276	154	428	345	310.4	914
95	350	277	154	425	344	309.9	894

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	349	278	154	422	343	309.3	878
97	349	279	154	419	342	308.5	862
98	348	279	154	415	342	307.4	843
99	347	280	154	410	341	306.2	824
100	346	280	154	405	340	304.8	808
101	345	280	153	401	339	303.5	795
102	344	280	153	396	338	302.1	786
103	343	279	154	392	336	300.9	777
104	342	279	154	388	335	299.5	769
105	341	278	154	384	334	298.2	760
106	341	278	155	380	333	297.1	754
107	340	278	156	377	332	296.4	759
108	340	278	157	373	330	295.6	762
109	339	278	158	371	329	295.1	763
110	338	279	158	369	328	294.4	786
111	337	280	159	368	326	294.0	806
112	335	281	159	368	325	293.6	801
113	334	281	159	366	324	292.8	790
114	332	282	159	365	323	292.3	783
115	331	283	159	364	322	291.6	782
116	329	284	158	363	321	291.0	787
117	327	284	158	361	319	290.1	780
118	326	284	158	360	318	289.3	767
119	325	284	157	358	317	288.3	753
120	324	283	157	356	316	287.0	741
121	323	281	156	354	315	285.9	737
122	322	280	156	352	314	284.5	738
123	321	278	155	350	313	283.3	738
124	320	277	155	348	311	282.2	736
125	319	275	154	346	310	281.0	734
126	319	274	153	345	309	280.0	735
127	318	272	153	344	308	279.0	737
128	318	271	153	343	307	278.4	741
129	317	270	153	342	306	277.6	745
130	317	269	153	341	305	277.0	748
131	316	267	153	341	304	276.5	752
132	316	267	153	341	303	275.9	758
133	315	266	153	340	303	275.6	765
134	315	266	154	341	302	275.4	772
135	315	266	154	341	301	275.2	780
136	314	265	154	342	300	275.0	788
137	314	265	154	342	300	275.0	794
138	314	265	154	343	299	275.0	799
139	313	265	154	344	299	275.1	806
140	313	265	154	345	298	275.0	812
141	313	265	153	346	298	275.1	818
142	313	265	154	348	298	275.4	823
143	313	265	154	349	297	275.5	827

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
144	313	265	153	350	297	275.5	831	
145	312	264	153	352	296	275.7	835	
146	312	264	153	353	296	275.8	840	
147	312	264	153	354	296	275.7	845	
148	312	264	153	356	295	276.0	850	
149	312	264	153	358	295	276.4	854	
150	312	263	153	359	295	276.4	860	
151	312	263	153	362	295	276.8	864	
152	311	263	153	363	294	277.0	868	
153	311	263	153	364	294	277.0	872	
154	311	263	152	366	294	277.1	874	
155	311	263	152	367	294	277.4	879	
156	311	263	152	369	293	277.7	882	
157	311	263	152	371	293	277.9	884	
158	311	262	152	372	293	278.1	887	
159	311	262	152	374	293	278.2	891	
160	310	261	152	375	293	278.1	894	
161	311	261	152	376	293	278.4	897	
162	311	260	153	377	292	278.6	897	
163	311	259	152	377	292	278.3	896	
164	311	258	153	378	292	278.4	892	
165	311	258	153	378	292	278.2	888	
166	311	257	153	378	292	278.1	883	
167	311	256	153	378	292	278.0	877	
168	312	256	153	376	292	277.8	872	
169	312	256	153	376	292	277.8	867	
170	313	255	153	376	293	277.9	860	
171	313	255	153	374	293	277.7	853	
172	314	255	153	373	293	277.6	848	
173	314	255	153	371	293	277.1	846	
174	315	254	153	370	294	277.3	846	
175	315	254	153	369	294	277.1	846	
176	316	254	153	368	294	277.1	843	
177	318	254	152	367	295	277.3	834	
178	319	254	152	366	295	277.3	824	
179	321	254	153	364	296	277.4	814	
180	322	254	152	362	296	277.4	807	
181	324	254	152	360	297	277.7	801	
182	326	254	152	358	298	277.7	797	
183	328	255	152	358	298	278.1	795	
184	329	255	152	355	299	278.0	794	
185	330	255	152	355	300	278.3	798	
186	331	255	152	354	300	278.3	803	
187	332	255	152	353	301	278.3	803	
188	333	255	151	352	301	278.4	801	
189	333	254	151	351	302	278.4	796	
190	334	254	151	349	302	278.2	790	
191	335	254	151	349	303	278.4	787	

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 Technician: SJB  
 Date: 10/9/2018

Stove ΔT: 9

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	335	254	151	348	303	278.4	785
193	336	254	151	347	304	278.2	785
194	336	254	151	346	304	278.2	786
195	336	253	152	346	305	278.3	787
196	336	253	151	345	305	278.1	787
197	336	253	151	344	306	278.1	787
198	336	253	151	344	306	278.2	789
199	336	253	151	344	306	278.2	792
200	337	253	151	343	307	278.4	795
201	338	253	151	344	307	278.8	801
202	340	253	151	344	307	279.1	809
203	342	254	152	343	307	279.6	819
204	345	254	152	345	308	280.6	830
205	347	254	152	347	308	281.7	844
206	350	255	153	349	308	282.9	861
207	354	256	153	351	308	284.2	880
208	357	256	154	353	308	285.7	901
209	361	257	155	357	307	287.5	920
210	365	258	156	361	307	289.3	931
211	369	259	156	364	307	291.0	933
212	373	260	157	367	307	292.5	928
213	377	261	157	369	306	294.0	920
214	380	262	158	372	306	295.5	919
215	383	264	158	374	305	296.8	914
216	387	265	159	374	305	297.9	903
217	390	266	160	375	304	298.9	896
218	392	267	160	376	304	299.9	892
219	395	268	161	377	303	300.7	892
220	397	269	161	378	302	301.4	891
221	399	269	162	379	302	302.0	889
222	400	270	162	379	301	302.5	890
223	402	271	163	379	300	303.0	886
224	404	271	163	379	299	303.4	870
225	406	272	164	378	298	303.7	859
226	408	273	164	378	298	304.0	856
227	409	273	164	378	297	304.3	862
228	411	273	165	379	296	304.7	864
229	412	273	166	378	295	304.9	862
230	413	274	166	379	294	305.1	859
231	414	274	166	378	293	305.1	860
232	415	274	167	379	292	305.3	864
233	415	274	167	379	291	305.3	869
234	415	274	168	379	291	305.5	874
235	415	274	168	381	290	305.5	878
236	415	274	169	382	289	305.5	883
237	414	274	169	382	288	305.3	887
238	413	274	170	383	287	305.5	889
239	413	273	171	384	286	305.5	890

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 Run #: 2

Job #: 18-421  
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 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	412	273	171	385	285	305.4	891
241	412	273	172	385	285	305.4	889
242	412	273	172	385	284	305.2	886
243	411	273	173	386	283	305.2	883
244	410	273	173	386	282	304.8	880
245	410	273	174	385	282	304.5	878
246	409	273	174	384	281	304.1	874
247	407	273	175	385	280	304.0	871
248	406	273	176	385	279	303.6	868
249	404	273	176	384	279	303.1	866
250	403	273	177	384	278	302.8	865
251	402	272	177	382	277	302.2	864
252	400	272	178	382	277	301.7	863
253	398	272	178	382	276	301.3	864
254	396	272	179	382	276	301.0	865
255	395	272	179	382	275	300.6	866
256	393	272	179	382	274	300.1	866
257	392	272	180	381	274	299.7	866
258	390	273	180	380	273	299.1	865
259	389	272	181	380	273	298.9	864
260	387	273	181	379	272	298.6	862
261	386	273	182	379	272	298.3	860
262	385	273	182	379	271	297.9	857
263	384	273	182	378	271	297.4	854
264	382	273	183	377	270	296.9	852
265	381	273	183	377	270	296.5	849
266	380	273	183	376	269	296.0	847
267	379	273	183	375	268	295.5	843
268	378	272	184	373	268	294.9	839
269	377	272	184	373	267	294.5	835
270	376	272	184	371	267	294.0	832
271	375	272	184	370	266	293.6	830
272	374	272	185	369	266	293.2	826
273	373	272	185	368	265	292.6	823
274	372	272	185	367	264	292.1	818
275	371	271	185	366	264	291.6	814
276	370	271	185	365	263	291.0	810
277	369	271	185	364	263	290.4	805
278	368	271	186	362	262	289.7	800
279	367	270	186	361	261	289.0	795
280	366	270	186	359	261	288.2	791
281	365	269	185	357	260	287.4	787
282	364	269	185	356	260	286.9	783
283	363	269	185	354	259	286.1	779
284	362	268	186	353	258	285.4	773
285	361	267	185	352	258	284.5	771
286	359	267	185	351	257	283.7	774
287	357	266	185	349	256	282.7	776

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 Date: 10/9/2018

**Stove ΔT:** 9

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	355	265	185	349	256	281.9	777
289	353	264	184	349	255	280.9	775
290	351	264	184	348	254	280.1	772
291	349	263	184	347	253	279.1	767
292	347	262	183	345	253	278.0	762
293	345	262	183	344	252	277.1	757
294	343	261	182	343	251	276.2	752
295	341	260	182	342	251	275.2	746
296	339	260	181	341	250	274.2	741
297	337	259	181	339	249	273.2	737
298	336	258	181	338	249	272.2	732
299	334	257	180	336	248	271.1	729
300	333	257	180	335	247	270.2	725
301	331	256	179	333	247	269.2	721
302	329	255	179	332	246	268.3	718
303	328	254	179	331	246	267.4	715
304	326	254	178	329	245	266.3	712
305	324	253	177	328	244	265.3	710
306	323	252	177	326	244	264.4	707
307	322	251	176	325	243	263.4	705
308	320	251	176	324	242	262.6	704
309	319	250	176	322	242	261.8	703
310	318	249	175	321	241	260.7	703
311	317	248	175	320	241	260.0	704
312	316	248	174	319	240	259.3	705
313	314	247	173	318	240	258.5	707
314	313	246	173	317	239	257.8	708
315	312	246	173	316	238	257.1	709
316	311	245	172	316	238	256.5	709
317	310	245	172	314	237	255.7	708
318	309	244	171	314	237	255.1	708
319	309	244	171	313	236	254.5	708
320	308	243	171	312	236	254.0	709
321	307	243	170	311	235	253.4	710
322	307	242	170	311	235	253.0	711
323	307	242	169	310	234	252.6	714
324	307	241	169	310	234	252.2	719
325	307	241	169	310	233	251.8	724
326	306	241	169	309	233	251.6	723
327	307	240	168	309	233	251.3	710
328	306	240	169	308	232	250.9	695
329	307	240	168	306	232	250.5	685
330	307	239	168	304	232	250.1	679
331	307	239	168	302	231	249.7	677
332	307	239	169	301	231	249.4	677
333	307	239	169	300	231	249.1	679
334	307	238	169	299	231	248.8	680
335	307	238	169	298	231	248.6	682

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 Date: 10/9/2018

**Stove ΔT:** 9

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
336	307	238	169	297	231	248.4	687	
337	307	238	169	297	231	248.4	694	
338	307	238	169	297	231	248.2	700	
339	307	238	169	297	231	248.1	705	
340	307	238	169	297	231	248.3	709	
341	307	237	169	297	231	248.2	713	
342	307	237	169	297	231	248.3	716	
343	307	237	169	298	232	248.4	720	
344	307	237	169	298	232	248.5	723	
345	307	237	169	299	232	248.8	726	
346	307	237	169	299	232	248.9	730	
347	307	237	169	301	232	249.3	735	
348	308	238	169	301	232	249.6	740	
349	308	238	169	302	232	250.0	746	
350	308	238	170	303	233	250.4	755	
351	309	239	170	304	233	250.8	762	
352	309	239	170	306	233	251.4	767	
353	310	239	170	307	233	251.9	771	
354	310	239	171	309	233	252.3	773	
355	310	240	171	310	233	252.7	775	
356	310	240	171	311	233	253.1	775	
357	311	240	171	311	233	253.3	776	
358	311	240	172	313	233	253.6	776	
359	311	240	172	314	233	254.0	775	
360	312	240	173	315	233	254.4	771	
361	311	241	173	315	233	254.5	767	
362	312	241	173	315	233	254.9	766	
363	312	241	174	316	233	255.2	765	
364	312	242	174	316	233	255.6	766	
365	313	243	174	317	233	255.8	768	
366	313	243	174	317	233	256.2	773	
367	313	244	175	318	233	256.4	780	
368	313	244	175	319	233	257.0	785	
369	313	245	176	320	233	257.4	792	
370	313	246	176	321	233	257.9	798	
371	313	246	176	323	233	258.3	803	
372	314	247	177	324	233	258.8	806	
373	314	247	177	325	233	259.2	811	
374	314	247	177	327	233	259.6	823	
375	314	248	177	330	233	260.2	834	
376	313	247	177	331	233	260.5	840	
377	313	247	177	333	234	260.9	842	
378	313	247	177	335	234	261.2	842	
379	312	247	177	337	234	261.5	841	
380	312	247	177	338	234	261.6	838	
381	311	248	177	339	234	261.9	836	
382	311	248	177	341	235	262.2	834	
383	311	248	177	341	235	262.4	833	

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**Stove ΔT:** 9

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	310	248	177	342	235	262.6	831
385	310	248	178	343	236	262.9	829
386	309	248	178	343	237	263.0	827
387	309	248	178	344	237	263.2	826
388	309	248	178	344	238	263.4	825
389	308	248	178	345	239	263.4	826
390	308	248	178	345	240	263.7	826
391	307	248	178	345	240	263.7	826
392	306	248	179	346	241	263.9	825
393	306	248	179	346	242	264.0	824
394	305	248	179	346	243	264.2	824
395	305	248	179	346	244	264.4	823
396	305	248	180	346	245	264.6	823
397	304	248	180	347	246	264.7	823
398	304	248	180	346	246	264.6	824
399	303	248	180	347	247	265.1	826
400	302	248	181	346	248	265.1	829
401	302	248	182	347	249	265.5	833
402	301	248	182	349	250	265.9	836
403	301	248	183	348	250	266.0	839
404	301	248	183	349	251	266.3	843
405	300	248	183	350	252	266.7	846
406	300	248	184	351	253	267.2	850
407	300	248	184	352	253	267.5	853
408	300	248	185	353	254	268.0	856
409	299	249	185	354	255	268.3	857
410	299	249	186	355	255	268.7	858
411	299	249	186	356	256	269.1	860
412	298	249	186	357	256	269.4	860
413	298	249	187	358	257	269.8	860
414	298	249	187	358	258	270.0	861
415	297	250	188	359	258	270.4	863
416	297	250	188	360	259	270.8	864
417	297	250	189	362	259	271.2	866
418	296	250	189	363	259	271.7	867
419	296	251	190	363	260	272.0	868
420	296	251	190	364	260	272.4	868
421	296	251	191	365	261	272.8	867
422	295	251	191	365	261	272.8	866
423	295	252	192	366	262	273.2	864
424	294	252	192	366	262	273.3	860
425	294	252	191	368	262	273.6	855
426	294	252	191	366	263	273.2	852
427	293	253	191	366	263	273.3	850
428	293	253	191	366	264	273.3	849
429	292	253	191	366	264	273.3	850
430	292	253	191	366	264	273.3	851
431	291	254	191	366	265	273.4	853



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**Stove ΔT:** 9

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
432	290	254	191	366	265	273.4	856	
433	290	254	192	367	266	273.6	859	
434	290	254	192	367	266	273.8	863	
435	289	255	191	368	267	274.0	868	
436	289	255	191	369	267	274.2	872	
437	288	256	192	370	268	274.7	875	
438	288	256	192	370	269	275.0	870	
439	288	257	193	370	269	275.5	864	
440	288	258	193	370	270	275.9	864	
441	288	259	194	371	271	276.5	867	
442	289	260	194	370	272	276.9	870	
443	289	261	195	371	273	277.6	876	
444	289	262	195	372	274	278.5	882	
445	290	263	196	373	275	279.3	886	
446	290	264	196	374	277	280.2	892	
447	290	265	198	374	278	281.1	899	
448	291	266	198	376	279	282.1	905	
449	291	268	199	377	281	283.0	910	
450	291	269	199	379	282	284.1	915	
451	291	270	200	380	283	284.9	920	
452	292	271	200	382	284	285.9	924	
453	292	273	201	384	285	287.0	928	
454	292	274	203	386	286	288.3	934	
455	293	276	203	388	287	289.2	941	
456	293	277	204	389	288	290.4	945	
457	293	279	205	392	289	291.6	946	
458	294	281	205	393	290	292.5	944	
459	294	283	206	395	291	293.6	942	
460	294	284	207	395	291	294.3	940	
461	295	286	207	397	292	295.2	939	
462	295	288	207	397	293	295.9	938	
463	295	289	208	398	293	296.8	939	
464	296	291	208	399	294	297.7	940	
465	296	293	208	400	294	298.4	939	
466	297	295	208	401	295	299.1	938	
467	297	297	208	402	296	299.7	939	
468	297	298	208	403	296	300.5	939	
469	297	300	209	403	297	301.1	938	
470	298	302	209	404	297	301.9	937	
471	298	304	209	404	298	302.6	945	
472	299	307	209	405	298	303.6	941	
473	299	309	209	406	299	304.6	936	
474	300	313	209	408	299	305.8	943	
475	300	316	209	410	300	306.8	949	
476	300	319	209	411	300	307.8	952	
477	301	321	208	412	301	308.7	961	
478	301	324	208	413	301	309.6	968	
479	301	326	208	418	302	311.0	969	

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 Run #: 2

Job #: 18-421  
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 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	302	328	208	419	302	311.8	969
481	302	330	208	422	303	312.9	977
482	303	332	207	425	303	314.1	980
483	303	333	207	427	304	315.0	973
484	304	334	206	428	305	315.5	975
485	304	335	206	430	305	316.3	977
486	304	336	206	432	306	316.9	988
487	304	337	206	433	307	317.3	988
488	305	337	206	435	308	318.1	985
489	305	338	206	436	308	318.6	981
490	305	339	206	437	309	319.4	973
491	306	340	205	437	310	319.8	963
492	306	340	205	437	311	320.0	963
493	307	341	205	436	312	320.2	967
494	307	342	204	436	313	320.7	964
495	308	343	204	435	314	320.9	961
496	308	343	204	436	315	321.3	958
497	308	344	204	435	316	321.3	960
498	309	344	204	435	317	321.7	961
499	309	345	204	434	318	321.8	962
500	309	345	204	433	319	322.1	961
501	309	345	203	433	320	322.1	959
502	309	345	204	432	321	322.1	968
503	309	345	203	432	322	322.3	975
504	309	345	203	433	323	322.4	973
505	308	345	203	433	324	322.6	967
506	308	345	202	433	325	322.4	960
507	307	344	202	432	326	322.4	953
508	307	344	201	432	327	322.2	943
509	306	343	201	431	328	321.9	930
510	305	343	200	429	329	321.3	916
511	305	342	200	427	330	320.8	901
512	304	342	200	424	331	320.1	889
513	303	341	199	422	331	319.4	879
514	303	341	199	419	332	318.7	871
515	302	340	198	416	333	317.9	865
516	301	340	197	413	334	316.9	860
517	300	339	197	410	335	316.0	856
518	299	338	196	407	336	315.4	854
519	299	337	196	405	337	314.6	853
520	298	337	195	402	337	313.9	852
521	297	336	194	400	338	313.0	850
522	296	335	194	398	339	312.4	847
523	295	335	193	395	339	311.5	844
524	295	334	192	393	340	310.9	840
525	294	334	192	391	340	310.0	829
526	293	334	191	388	341	309.3	820
527	292	333	190	385	341	308.4	817

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	291	333	189	383	341	307.6	817
529	291	333	188	380	341	306.6	817
530	290	333	188	378	341	305.9	815
531	289	332	187	376	341	305.3	812
532	289	332	187	374	342	304.5	806
533	288	332	186	371	342	303.7	799
534	287	332	185	369	342	302.8	790
535	287	332	184	366	342	302.1	780
536	286	333	183	363	342	301.4	771
537	286	334	183	360	342	300.8	762
538	285	335	182	358	342	300.2	754
539	285	335	181	355	342	299.4	748
540	284	336	180	352	342	298.8	741
541	284	336	179	349	341	298.1	733
542	284	337	179	346	341	297.4	725
543	283	337	178	343	341	296.6	719
544	282	337	177	341	341	295.7	716
545	282	337	176	339	341	294.9	716
546	281	337	176	337	341	294.2	716
547	281	336	175	335	341	293.5	715
548	280	336	174	333	340	292.7	713
549	280	336	173	331	340	292.1	711
550	279	336	173	330	340	291.5	709
551	279	336	172	328	340	290.8	708
552	278	335	171	326	340	290.3	707
553	278	335	171	325	340	289.8	706
554	277	335	170	324	340	289.2	706
555	277	335	169	322	340	288.6	705
556	276	334	169	322	340	288.2	704
557	276	334	168	321	340	287.8	704
558	275	334	168	320	340	287.5	705
559	275	334	167	319	340	287.1	706
560	275	334	167	319	340	286.8	708
561	274	334	166	318	340	286.5	707
562	274	334	166	317	340	286.3	704
563	274	334	166	317	340	286.0	701
564	273	334	165	316	339	285.6	700
565	273	335	165	315	339	285.4	700
566	273	335	165	315	339	285.3	700
567	273	335	164	315	339	285.1	700
568	272	335	164	314	339	284.9	701
569	272	336	164	314	339	284.9	702
570	272	336	163	313	338	284.7	702
571	272	337	163	313	338	284.5	702
572	272	337	163	313	338	284.5	701
573	271	338	163	312	338	284.4	701
574	271	339	163	312	338	284.4	702
575	271	339	163	311	338	284.4	703

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 2

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/9/2018

**Stove ΔT:** 9

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
576	271	340	163	312	338	284.6	705	
577	271	340	163	312	338	284.7	707	
578	271	341	163	311	338	284.8	708	
579	271	341	163	311	338	284.9	708	
580	271	342	163	311	338	285.2	708	
581	271	343	163	311	339	285.4	709	
582	272	343	164	311	339	285.8	710	
583	272	344	164	311	339	286.2	710	
584	272	346	165	312	340	286.8	710	
585	272	347	165	312	340	287.1	709	
586	273	347	165	311	341	287.3	709	
587	273	348	166	311	341	287.8	707	
588	273	349	166	311	341	288.2	708	
589	273	350	166	311	342	288.6	709	
590	273	351	167	312	342	289.0	709	
591	274	352	167	311	342	289.3	710	
592	274	353	168	312	343	289.7	711	
593	274	353	168	312	343	290.0	714	
594	274	354	168	311	343	290.3	714	
595	274	355	168	311	344	290.6	712	
596	275	356	169	311	344	291.0	712	
597	275	357	169	312	344	291.3	712	
598	275	358	169	312	345	291.8	711	
599	276	359	170	312	345	292.1	710	
600	276	360	170	312	345	292.3	710	
601	276	360	170	312	345	292.6	711	
602	276	361	171	312	345	292.9	712	
603	276	362	171	312	345	293.2	713	
604	276	363	171	312	345	293.5	714	
605	276	363	171	313	345	293.8	711	
606	276	364	172	312	345	293.9	708	
607	276	365	172	312	345	294.2	706	
608	276	365	172	312	345	294.2	707	
609	277	366	173	313	345	294.7	709	
610	278	367	173	312	345	294.9	712	
611	278	367	173	313	345	295.2	715	
612	278	368	174	313	345	295.5	717	
613	278	368	173	313	346	295.7	719	
614	279	369	174	314	346	296.1	722	
615	279	369	174	314	346	296.4	725	
616	279	370	174	315	346	296.6	725	
617	279	370	174	315	346	296.9	725	
618	279	371	175	316	346	297.2	724	
619	279	371	175	316	346	297.3	723	
620	279	371	176	316	346	297.4	721	
621	278	370	176	316	346	297.4	721	
622	278	370	177	316	346	297.5	721	
623	278	370	177	317	346	297.6	722	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort

Job #: 18-421

Model: Blaze King PE32

Tracking #: 0012

Run #: 2

Technician: SJB

Date: 10/9/2018

Stove ΔT: 9

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
624	278	370	177	316	346	297.6	724
625	278	370	177	317	346	297.6	726
626	278	369	177	317	346	297.5	725
627	278	369	178	317	346	297.5	724
628	278	368	178	316	346	297.4	721
629	278	368	178	316	346	297.3	719
630	278	368	179	316	346	297.4	718
631	278	367	179	315	346	297.0	718
632	278	367	179	315	346	297.0	719
633	277	367	179	316	346	296.9	721
634	277	367	179	315	345	296.7	722
635	277	366	180	316	345	296.8	718
636	277	366	179	314	345	296.4	707
637	277	367	180	314	345	296.4	697
638	277	367	179	313	345	296.2	690
639	276	368	180	311	345	295.9	685
640	276	368	180	311	345	295.9	682
641	276	369	180	310	345	295.9	680
642	276	370	180	308	345	295.7	676
643	276	370	181	307	345	295.8	673
Average	312	280	171	353	301	283	814

## LAB SAMPLE DATA - ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 2Technician: SJBDate: 10/9/2018**TRAIN A (1st Hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3367	121.3	121.0	0.3
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	0.3
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**TRAIN A (Post 1st hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3368	122.7	122.4	0.3
B. Rear filter catch	Filter	3369	118.9	119.3	-0.4
C. Probe catch*	Probe	7A	116740.1	116740.1	0.0
D. O-Ring catch*	O-Ring	7A	3574.5	3573.4	1.1

Sub-Total	Total Particulate, mg:	1.0
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Train A Aggregate	Total Particulate, mg:	<b>1.3</b>
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**TRAIN B**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3370	122.3	121.4	0.9
B. Rear filter catch	Filter	3371	122.6	123.0	-0.4
C. Probe catch*	Probe	7B	117305.2	117305.0	0.2
D. O-Ring catch*	O-Ring	7B	3523.0	3521.8	1.2

Total Particulate, mg:	<b>1.9</b>
------------------------	------------

**AMBIENT**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:	<b>0.0</b>
------------------------	------------

\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 2 Test Date: 10/9/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): Low Setting (76 degrees closed from fully open)

#### Preburn Notes

Time	Notes
6:05	Loaded 12 lbs of kindling
7:31	At 1.6 lbs, loaded pre-burn fuel, turned fan on high setting
8:50	At 4.5 lbs, set air to test setting, turned fan down to lowest setting
9:51	Leveled coal bed, zeroed scale in preparation for fuel loading

#### Test Notes

Test Burn Start Time: 9:52 Test Fuel Loaded by: 45 seconds  
 Door Closed: 50 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min	Changed 1-hour filter.
643 min	End of Test

Test Burn End Time: 20:35

#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:30	-	8:36	20:50	-	20:53
CO <sub>2</sub>	0.00	-	10.04	0.03	-	10.17
CO	0.00	-	2.52	0.02	-	2.58

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature: 

Date: 10/9/2018

**WOOD STOVE TEST DATA PACKET  
ASTM E2780/E2515**



**Run 3 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/10/2018

A handwritten signature in black ink, appearing to be "JL", is written over a horizontal line.

Techician Signature

10/23/2018

Date



## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 3

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/10/2018

<b>Burn Rate (kg/hr):</b>	<b>1.63</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	41.425	41.765	9.671
Average Gas Velocity in Dilution Tunnel (ft/sec)	12.4			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	7935.5			
Average Gas Meter Temperature (°F)	68.8	73.6	75.3	71.9
Total Sample Volume (dscf)	0.000	39.506	39.549	9.253
Average Tunnel Temperature (°F)	89.3			
Total Time of Test (min)	257			
Total Particulate Catch (mg)	0.0	2.8	2.4	1.3
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000709	0.0000607	0.0001405
Total PM Emissions (g)	0.00	2.41	2.06	1.11
Particulate Emission Rate (g/hr)	0.00	0.56	0.48	1.11
Emissions Factor (g/kg)	-	0.35	0.30	-
Difference from Average Total Particulate Emissions (g)	-	0.17	0.17	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	2.24
Particulate Emission Rate (g/hr)	0.52
Emissions Factor (g/kg)	0.32
HHV Efficiency (%)	79.3%
LHV Efficiency (%)	85.7%
CO Emissions (g/min)	0.31

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	76.1	OK
Face Velocity	< 30 ft/min	8.7	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 67.26 / Max: 70.34	OK
Negative Probe Weight Evaluation	<5% of Total Catch	-4.2%	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	18.7	OK

## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/10/18  
**Run:** 3  
**Control #:** 18-421  
**Test Duration:** 257  
**Output Category:** 3

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	79.3%	85.7%
<b>Combustion Efficiency</b>	99.3%	99.3%
<b>Heat Transfer Efficiency</b>	79.8%	86.3%

<b>Output Rate (kJ/h)</b>	25,472	24,163	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.62	3.58	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	32,135	30,483	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.95	15.31	<b>dry lb</b>
<b>MC wet (%)</b>	18.11		
<b>MC dry (%)</b>	22.11		
<b>Particulate (g )</b>	2.24		
<b>CO (g)</b>	80		
<b>Test Duration (h)</b>	4.28		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.02	0.74
<b>g/kg Dry Fuel</b>	0.32	11.57
<b>g/h</b>	0.52	18.77
<b>g/min</b>	0.01	0.31
<b>lb/MM Btu Output</b>	0.05	1.71

<b>Air/Fuel Ratio (A/F)</b>	10.19
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	23.8		2x4	17.00	22.3
2x4	17.00	24.5		2x4	17.00	19.8
2x4	17.00	25.1				
2x4	17.00	24.2				
2x4	17.00	24.9				
2x4	17.00	24.5				
2x4	17.00	24.8				
2x4	17.00	24.8				
Total Fuel Weight (lbs):		18.24	Average Moisture (%DB):		23.9	

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.10  
 Total 4x4 Crib Weight, with spacers (lbs): 9.60  
 Total Wet Fuel Weight, with spacers (lbs): 18.70

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.74  
 Max (lbs): 4.68

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	17.00	2.02	22.8	23.8	22.0	1.64
2x4	17.00	1.80	23.8	23.8	24.6	1.45
2x4	17.00	1.74	21.6	20.4	21.7	1.44
2x4	17.00	1.72	20.3	21.1	22.2	1.42
4x4	17.00	4.00	22.1	21.7	20.6	3.29
4x4	17.00	4.02	21.4	22.1	22.0	3.30
Total Dry Weight, no spacers (lbs):						12.54
Total Dry Weight, with spacers (lbs):						15.37

Spacer Moisture Readings (%DB)						
18.7	19.8	22.4	19.4	23.8	23.8	
19.3	21.4	22.5	20.9	19.3	21.4	
20.1	19.9	17.8	20.0	23.1	19.7	
15.3	14.6	23.3	18.7	17.3	18.6	

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	28.0	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.43	OK
2x4 Fuel Mix	35 - 65 % of total weight	49%	OK

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018Preburn Start Time: 8:29Recording Interval (min): 1Run Time (min): 86

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	8.5	-0.040	610	599	228	569	518	504.6	404	1179	67
1	8.3	-0.040	613	602	236	572	523	509.0	403	1175	67
2	8.2	-0.040	614	604	240	573	527	511.8	404	1174	67
3	8.0	-0.040	614	606	244	573	531	513.6	405	1184	66
4	7.9	-0.040	613	607	246	574	534	514.8	406	1187	68
5	7.8	-0.040	610	606	248	577	537	515.5	407	1185	68
6	7.7	-0.040	609	605	249	580	538	516.3	408	1186	67
7	7.6	-0.040	606	602	250	581	540	515.8	408	1158	67
8	7.5	-0.040	604	600	251	579	540	514.8	408	1138	66
9	7.5	-0.040	602	597	251	577	541	513.5	407	1128	67
10	7.4	-0.040	599	594	250	574	541	511.9	406	1119	68
11	7.3	-0.040	596	591	251	571	542	510.4	405	1113	67
12	7.1	-0.040	593	589	251	567	542	508.5	404	1106	67
13	7.1	-0.040	591	586	251	564	541	506.7	403	1101	67
14	7.0	-0.040	588	583	252	562	541	505.1	402	1102	67
15	6.9	-0.040	585	581	252	559	540	503.5	401	1105	67
16	6.8	-0.040	583	579	253	559	540	502.5	400	1109	67
17	6.7	-0.040	580	577	252	557	539	501.0	400	1116	67
18	6.6	-0.040	578	576	252	556	537	499.8	399	1117	67
19	6.5	-0.040	575	574	253	555	536	498.7	398	1116	67
20	6.4	-0.030	574	573	253	554	535	497.5	397	1108	67
21	6.3	-0.040	572	571	253	553	534	496.3	397	1102	67
22	6.3	-0.040	570	570	252	551	533	494.9	396	1097	67
23	6.2	-0.030	567	567	252	550	532	493.7	395	1112	67
24	6.1	-0.040	565	565	252	550	531	492.6	395	1131	67
25	6.0	-0.040	563	563	252	551	530	491.7	394	1140	67
26	6.0	-0.040	561	561	252	551	529	490.8	394	1142	67
27	5.9	-0.040	558	561	253	548	528	489.6	393	1132	68
28	5.8	-0.040	556	561	253	545	529	488.8	392	1122	67
29	5.7	-0.040	554	562	253	543	530	488.3	392	1116	67
30	5.7	-0.040	553	563	254	540	530	488.2	391	1110	67
31	5.6	-0.040	552	564	255	537	531	488.0	391	1104	67
32	5.5	-0.030	552	566	256	536	532	488.4	390	1095	67
33	5.5	-0.030	552	566	256	533	533	488.4	390	1093	67
34	5.4	-0.030	553	567	257	532	535	488.7	389	1082	67
35	5.3	-0.030	554	566	258	530	537	488.9	389	1070	67
36	5.3	-0.030	555	566	259	526	539	488.9	388	1064	67
37	5.2	-0.030	556	565	260	522	542	489.0	388	1055	67
38	5.2	-0.030	557	565	261	518	545	489.3	388	1038	67
39	5.1	-0.030	557	565	262	514	549	489.5	387	1020	67
40	5.1	-0.030	558	566	263	509	552	489.8	387	1001	68
41	5.0	-0.030	559	566	264	504	557	490.0	387	980	67
42	5.0	-0.030	559	566	265	500	561	490.4	386	966	68
43	5.0	-0.030	559	566	266	496	566	490.5	385	952	67
44	4.9	-0.030	559	566	266	492	570	490.6	384	939	68

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018Preburn Start Time: 8:29Recording Interval (min): 1Run Time (min): 86

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	4.9	-0.030	558	567	266	486	575	490.4	383	925	67
46	4.9	-0.030	557	566	267	481	579	489.9	381	914	67
47	4.8	-0.030	555	566	267	476	584	489.6	380	906	67
48	4.8	-0.030	554	566	267	471	589	489.3	379	900	68
49	4.8	-0.030	553	565	267	467	593	489.1	377	895	67
50	4.8	-0.030	551	564	267	463	598	488.6	375	892	68
51	4.7	-0.030	550	564	268	459	601	488.3	374	889	68
52	4.7	-0.030	548	563	267	455	605	487.6	372	888	68
53	4.7	-0.030	546	562	268	453	608	487.4	371	887	67
54	4.6	-0.030	545	561	268	449	611	486.8	370	886	68
55	4.6	-0.030	543	560	268	447	613	486.2	368	884	68
56	4.6	-0.030	541	560	268	443	616	485.5	367	881	68
57	4.5	-0.030	540	559	268	441	618	485.0	366	880	68
58	4.5	-0.030	539	558	268	438	620	484.6	365	877	68
59	4.5	-0.030	538	557	267	436	621	484.1	364	876	68
60	4.5	-0.030	536	556	267	435	623	483.4	362	876	68
61	4.4	-0.030	535	556	267	433	625	483.0	361	877	68
62	4.4	-0.030	534	554	267	431	626	482.4	360	878	68
63	4.4	-0.030	533	553	267	429	627	481.7	359	879	68
64	4.4	-0.030	532	552	267	428	628	481.3	358	880	68
65	4.3	-0.030	531	550	266	427	628	480.5	357	879	68
66	4.3	-0.030	529	548	265	425	628	479.1	356	875	68
67	4.3	-0.030	528	545	264	424	628	477.6	355	875	68
68	4.3	-0.030	526	542	265	423	627	476.3	354	875	68
69	4.2	-0.030	524	539	264	422	625	474.8	353	874	68
70	4.2	-0.030	522	536	264	420	624	473.2	352	872	68
71	4.2	-0.030	520	533	262	419	622	471.3	351	867	68
72	4.2	-0.030	518	530	261	418	620	469.2	349	863	68
73	4.1	-0.030	515	526	260	416	618	467.4	348	862	68
74	4.1	-0.030	513	523	259	415	617	465.4	346	860	68
75	4.1	-0.030	511	520	258	414	615	463.6	345	858	68
76	4.1	-0.030	509	517	256	413	614	461.7	343	857	68
77	4.1	-0.030	507	514	255	411	613	460.0	341	859	68
78	4.0	-0.030	505	512	254	410	612	458.5	340	859	68
79	4.0	-0.030	503	510	252	408	611	456.9	338	861	68
80	4.0	-0.030	501	507	252	407	610	455.7	337	859	68
81	3.9	-0.030	500	505	251	406	610	454.5	336	854	68
82	3.9	-0.030	499	504	251	405	609	453.7	334	850	68
83	3.9	-0.030	498	503	250	404	609	452.8	333	847	68
84	3.9	-0.030	497	502	251	403	609	452.2	332	843	68
85	3.9	-0.030	496	500	249	401	609	451.0	332	841	68
86	3.8	-0.030	495	499	248	399	610	450.5	331	841	68

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: <b>Valley Comfort</b>	Job #: <b>18-421</b>
Model: <b>Blaze King PE32</b>	Tracking #: <b>0012</b>
Run #: <b>3</b>	Technician: <b>SJB</b>
Test Start Time: <b>9:56</b>	Date: <b>10/10/2018</b>

Total Sampling Time (min): **257**  
 Recording Interval (min): **1**

Meter Box  $\gamma$  Factor: **1.002** (A)  
 Meter Box  $\gamma$  Factor: **0.998** (B)  
 Meter Box  $\gamma$  Factor: **0.000** (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): **0**  
 Smoke Capture Check (%): **100%**  
 Date Flue Pipe Last Cleaned: **10/7/2018**

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	28.76	28.75
Relative Humidity (%)	37.2	35.6
Room Air Velocity (ft/min)	0	0
Scale Audit (lbs)	10.0	10.0
Ambient Sample Volume:	<b>0.000</b> ft <sup>3</sup>	

**Sample Train Post-Test Leak Checks**

(A)	<b>0.000</b>	cfm @	<b>-24</b>	in. Hg
(B)	<b>0.002</b>	cfm @	<b>-20</b>	in. Hg
(Ambient)	<b>0.000</b>	cfm @	<b>0</b>	in. Hg

## DILUTION TUNNEL FLOW

**Traverse Data**

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.034	85
2	0.038	85
3	0.034	85
4	0.024	85
5	0.022	85
6	0.036	85
7	0.038	85
8	0.028	85
Center	0.040	85

Dilution Tunnel H<sub>2</sub>O: **2.00** percent  
 Tunnel Diameter: **6** inches  
 Pitot Tube Cp: **0.99** [unitless]  
 Dilution Tunnel MW(dry): **29.00** lb/lb-mole  
 Dilution Tunnel MW(wet): **28.78** lb/lb-mole  
 Tunnel Area: **0.1963** ft<sup>2</sup>

V<sub>strav</sub>: **12.36** ft/sec  
 V<sub>scant</sub>: **13.74** ft/sec  
 F<sub>p</sub>: **0.899** [ratio]

Initial Tunnel Flow: **130.9** scf/min

Static Pressure: **-0.190** in. H<sub>2</sub>O

## TEST FUEL PROPERTIES

**Default Fuel Values**

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

**Actual Fuel Used Properties**

Fuel Type:	D. Fir
HHV (kJ/kg)	19,810
%C	48.73
%H	6.87
%O	43.9
%Ash	0.5
MC (%DB)	22.1

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.040	0.50	71	-0.5		18.7		104	332	72	68
1	0.161	0.161	0.040	0.50	71	-0.5	101	18.7	-0.02	92	330	73	68
2	0.322	0.161	0.040	0.50	71	-0.5	101	18.6	-0.11	90	329	73	68
3	0.484	0.161	0.040	0.50	71	-0.5	100	18.5	-0.11	90	327	73	68
4	0.645	0.161	0.040	0.50	71	-0.5	100	18.4	-0.09	89	325	73	68
5	0.806	0.161	0.040	0.50	71	-0.5	100	18.3	-0.12	89	323	73	68
6	0.967	0.161	0.040	0.50	71	-0.5	100	18.1	-0.11	89	321	73	68
7	1.128	0.161	0.040	0.50	71	-0.5	100	18.1	-0.09	90	319	73	68
8	1.289	0.161	0.040	0.50	71	-0.5	100	17.9	-0.11	90	317	73	68
9	1.451	0.161	0.040	0.50	71	-0.5	101	17.8	-0.11	90	315	73	68
10	1.612	0.161	0.040	0.50	71	-0.5	101	17.7	-0.11	90	313	74	68
11	1.773	0.161	0.040	0.50	71	-0.5	101	17.6	-0.08	91	312	74	68
12	1.934	0.161	0.040	0.50	71	-0.5	101	17.5	-0.16	91	310	74	68
13	2.095	0.161	0.040	0.50	71	-0.5	101	17.4	-0.11	92	309	74	68
14	2.257	0.161	0.040	0.50	71	-0.5	101	17.2	-0.13	92	308	74	68
15	2.418	0.161	0.040	0.50	71	-0.5	101	17.1	-0.12	93	308	74	68
16	2.579	0.161	0.040	0.50	71	-0.5	101	17.0	-0.14	93	308	74	68
17	2.740	0.161	0.040	0.50	71	-0.5	101	16.8	-0.14	94	308	74	68
18	2.901	0.161	0.040	0.50	71	-0.5	101	16.7	-0.13	94	309	74	68
19	3.063	0.161	0.040	0.50	72	-0.5	101	16.6	-0.09	94	310	74	68
20	3.224	0.161	0.040	0.50	72	-0.5	101	16.5	-0.17	95	311	74	68
21	3.385	0.161	0.040	0.50	72	-0.5	101	16.3	-0.13	95	312	74	68
22	3.546	0.161	0.040	0.50	72	-0.5	101	16.2	-0.14	96	314	75	68
23	3.707	0.161	0.040	0.50	72	-0.5	101	16.1	-0.13	96	316	75	68
24	3.868	0.161	0.040	0.50	72	-0.5	101	15.9	-0.16	96	317	75	68
25	4.030	0.161	0.040	0.50	72	-0.5	101	15.8	-0.13	96	320	75	68
26	4.191	0.161	0.040	0.50	72	-0.5	101	15.6	-0.14	96	322	75	68
27	4.352	0.161	0.040	0.50	72	-0.5	101	15.5	-0.15	96	324	75	68
28	4.513	0.161	0.040	0.50	72	-0.5	101	15.3	-0.17	97	326	75	68
29	4.674	0.161	0.040	0.50	72	-0.5	101	15.2	-0.13	97	329	75	68
30	4.836	0.161	0.040	0.50	72	-0.5	101	15.0	-0.17	97	332	75	68
31	4.997	0.161	0.040	0.50	72	-0.5	101	14.9	-0.13	97	335	75	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	5.158	0.161	0.040	0.50	72	-0.5	101	14.7	-0.17	97	338	75	68
33	5.319	0.161	0.040	0.50	72	-0.5	101	14.6	-0.13	97	341	75	68
34	5.480	0.161	0.040	0.50	72	-0.5	101	14.5	-0.12	97	344	75	68
35	5.642	0.161	0.040	0.50	72	-0.5	101	14.3	-0.16	97	347	75	68
36	5.803	0.161	0.040	0.50	72	-0.5	101	14.2	-0.14	97	350	75	68
37	5.964	0.161	0.040	0.50	72	-0.5	101	14.0	-0.15	98	354	75	68
38	6.125	0.161	0.040	0.50	72	-0.5	101	13.9	-0.14	97	358	75	68
39	6.286	0.161	0.040	0.50	72	-0.5	101	13.7	-0.15	98	362	75	68
40	6.447	0.161	0.040	0.50	72	-0.5	101	13.6	-0.15	98	366	75	68
41	6.609	0.161	0.040	0.50	72	-0.5	101	13.4	-0.14	97	370	75	68
42	6.770	0.161	0.040	0.50	72	-0.5	101	13.3	-0.16	97	374	75	68
43	6.931	0.161	0.040	0.50	72	-0.5	101	13.1	-0.14	97	377	75	68
44	7.092	0.161	0.040	0.50	72	-0.5	101	13.0	-0.16	97	381	75	68
45	7.253	0.161	0.040	0.50	72	-0.5	101	12.8	-0.14	97	384	75	67
46	7.415	0.161	0.040	0.50	73	-0.5	101	12.7	-0.14	97	387	75	68
47	7.576	0.161	0.040	0.50	73	-0.5	101	12.5	-0.14	96	390	75	68
48	7.737	0.161	0.040	0.50	73	-0.5	101	12.4	-0.15	96	392	75	68
49	7.898	0.161	0.040	0.50	73	-0.5	101	12.3	-0.13	96	394	75	68
50	8.059	0.161	0.040	0.50	73	-0.5	101	12.2	-0.1	95	396	75	68
51	8.221	0.161	0.040	0.50	73	-0.5	101	12.0	-0.15	94	398	75	68
52	8.382	0.161	0.040	0.50	73	-0.5	101	11.9	-0.08	94	400	75	68
53	8.543	0.161	0.040	0.50	73	-0.5	101	11.8	-0.13	93	401	75	68
54	8.704	0.161	0.040	0.50	73	-0.5	100	11.7	-0.1	93	402	75	68
55	8.865	0.161	0.040	0.50	73	-0.5	100	11.6	-0.11	92	402	75	67
56	9.026	0.161	0.040	0.50	73	-0.5	100	11.5	-0.1	92	402	74	68
57	9.188	0.161	0.040	0.50	73	-0.5	100	11.4	-0.1	92	401	75	68
58	9.349	0.161	0.040	0.50	73	-0.5	100	11.3	-0.09	92	400	75	68
59	9.510	0.161	0.040	0.50	73	-0.5	100	11.2	-0.11	91	399	75	68
60	9.671	0.161	0.040	0.50	73	-0.5	100	11.1	-0.09	91	398	74	68
61	9.832	0.161	0.040	0.50	73	-0.5	100	11.0	-0.09	91	396	74	68
62	9.994	0.161	0.040	0.50	73	-0.5	100	10.9	-0.09	91	395	75	68
63	10.155	0.161	0.040	0.50	73	-0.5	100	10.8	-0.09	91	394	75	68



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.316	0.161	0.040	0.50	73	-0.5	100	10.7	-0.1	91	393	75	68
65	10.477	0.161	0.040	0.50	73	-0.5	100	10.7	-0.08	91	391	75	68
66	10.638	0.161	0.040	0.50	73	-0.5	100	10.6	-0.1	91	390	75	68
67	10.800	0.161	0.040	0.50	73	-0.5	100	10.5	-0.08	91	388	75	68
68	10.961	0.161	0.040	0.50	73	-0.5	100	10.4	-0.07	90	387	75	68
69	11.122	0.161	0.040	0.50	73	-0.5	100	10.3	-0.08	90	385	75	68
70	11.283	0.161	0.040	0.50	73	-0.5	100	10.2	-0.1	90	384	75	68
71	11.444	0.161	0.040	0.50	73	-0.5	100	10.1	-0.1	90	383	75	68
72	11.605	0.161	0.040	0.50	73	-0.5	100	10.0	-0.11	90	383	75	68
73	11.767	0.161	0.040	0.50	73	-0.5	100	9.9	-0.08	90	383	75	68
74	11.928	0.161	0.040	0.50	73	-0.5	100	9.8	-0.1	90	383	75	68
75	12.089	0.161	0.040	0.50	73	-0.5	100	9.7	-0.11	90	383	75	68
76	12.250	0.161	0.040	0.50	73	-0.5	100	9.6	-0.1	90	383	75	68
77	12.411	0.161	0.040	0.50	73	-0.5	100	9.5	-0.1	90	384	75	68
78	12.573	0.161	0.040	0.50	73	-0.5	100	9.4	-0.1	90	385	75	68
79	12.734	0.161	0.040	0.50	73	-0.5	100	9.3	-0.08	90	385	75	68
80	12.895	0.161	0.040	0.50	73	-0.5	100	9.3	-0.09	90	386	75	68
81	13.056	0.161	0.040	0.50	73	-0.5	100	9.2	-0.1	90	387	75	68
82	13.217	0.161	0.040	0.50	73	-0.5	100	9.1	-0.06	90	388	75	68
83	13.379	0.161	0.040	0.50	73	-0.5	100	9.0	-0.11	89	389	75	68
84	13.540	0.161	0.040	0.50	73	-0.5	100	8.9	-0.08	89	389	75	68
85	13.701	0.161	0.040	0.50	73	-0.5	100	8.8	-0.06	89	390	75	68
86	13.862	0.161	0.040	0.50	73	-0.5	100	8.8	-0.09	89	390	75	68
87	14.023	0.161	0.040	0.50	73	-0.5	100	8.7	-0.06	89	390	75	68
88	14.184	0.161	0.040	0.50	74	-0.5	100	8.6	-0.09	89	390	75	68
89	14.346	0.161	0.040	0.50	73	-0.5	100	8.5	-0.07	89	390	75	68
90	14.507	0.161	0.040	0.50	73	-0.5	100	8.4	-0.09	89	390	75	68
91	14.668	0.161	0.040	0.50	74	-0.5	100	8.4	-0.06	88	390	75	68
92	14.829	0.161	0.040	0.50	74	-0.5	100	8.3	-0.1	88	390	74	68
93	14.990	0.161	0.040	0.50	73	-0.5	100	8.2	-0.07	88	389	74	68
94	15.152	0.161	0.040	0.50	73	-0.5	100	8.1	-0.07	88	388	74	68
95	15.313	0.161	0.040	0.50	73	-0.5	100	8.1	-0.07	88	387	74	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.474	0.161	0.040	0.50	73	-0.5	100	8.0	-0.08	88	386	74	68
97	15.635	0.161	0.040	0.50	73	-0.5	100	7.9	-0.08	89	384	74	69
98	15.796	0.161	0.040	0.50	73	-0.5	100	7.9	-0.06	89	383	74	68
99	15.957	0.161	0.040	0.50	73	-0.5	100	7.8	-0.1	89	382	74	68
100	16.119	0.161	0.040	0.50	73	-0.5	100	7.7	-0.07	89	381	74	68
101	16.280	0.161	0.040	0.50	73	-0.5	100	7.6	-0.08	88	380	74	68
102	16.441	0.161	0.040	0.50	74	-0.5	100	7.5	-0.09	88	379	74	68
103	16.602	0.161	0.040	0.50	74	-0.5	100	7.5	-0.06	88	379	74	68
104	16.763	0.161	0.040	0.50	74	-0.5	100	7.4	-0.07	89	378	74	68
105	16.925	0.161	0.040	0.50	74	-0.5	100	7.3	-0.11	89	378	74	68
106	17.086	0.161	0.040	0.50	74	-0.5	100	7.2	-0.08	89	379	74	68
107	17.247	0.161	0.040	0.50	74	-0.5	100	7.1	-0.08	89	380	74	68
108	17.408	0.161	0.040	0.50	74	-0.5	100	7.0	-0.11	89	381	74	68
109	17.569	0.161	0.040	0.50	74	-0.5	100	6.9	-0.1	90	383	74	68
110	17.731	0.161	0.040	0.50	74	-0.5	100	6.8	-0.1	90	385	74	69
111	17.892	0.161	0.040	0.50	74	-0.5	100	6.7	-0.1	90	387	74	68
112	18.053	0.161	0.040	0.50	74	-0.5	100	6.6	-0.13	90	388	74	68
113	18.214	0.161	0.040	0.50	74	-0.5	100	6.5	-0.11	91	390	74	68
114	18.375	0.161	0.040	0.50	74	-0.5	100	6.3	-0.12	91	392	74	68
115	18.536	0.161	0.040	0.50	74	-0.5	100	6.2	-0.12	91	394	74	68
116	18.698	0.161	0.040	0.50	74	-0.5	100	6.1	-0.11	91	395	74	68
117	18.859	0.161	0.040	0.50	74	-0.5	100	6.0	-0.1	91	396	74	68
118	19.020	0.161	0.040	0.50	74	-0.5	100	5.9	-0.11	91	397	74	68
119	19.181	0.161	0.040	0.50	74	-0.5	100	5.8	-0.1	90	398	74	68
120	19.342	0.161	0.040	0.50	74	-0.5	100	5.7	-0.11	90	399	74	68
121	19.504	0.161	0.040	0.50	74	-0.5	100	5.6	-0.09	90	399	74	69
122	19.665	0.161	0.040	0.50	74	-0.5	100	5.5	-0.09	89	400	74	69
123	19.826	0.161	0.040	0.50	74	-0.5	100	5.4	-0.09	89	400	74	68
124	19.987	0.161	0.040	0.50	74	-0.5	100	5.3	-0.09	89	401	74	68
125	20.148	0.161	0.040	0.50	74	-0.5	100	5.3	-0.07	89	400	74	68
126	20.310	0.161	0.040	0.50	74	-0.5	100	5.2	-0.08	89	400	74	68
127	20.471	0.161	0.040	0.50	74	-0.5	100	5.1	-0.08	89	400	74	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.632	0.161	0.040	0.50	74	-0.5	100	5.0	-0.07	89	400	74	68
129	20.793	0.161	0.040	0.50	74	-0.5	100	4.9	-0.1	89	400	74	69
130	20.954	0.161	0.040	0.50	74	-0.5	100	4.9	-0.08	88	399	74	68
131	21.115	0.161	0.040	0.50	74	-0.5	100	4.8	-0.08	88	399	74	68
132	21.277	0.161	0.040	0.50	74	-0.5	100	4.7	-0.07	88	399	74	68
133	21.438	0.161	0.040	0.50	74	-0.5	100	4.6	-0.08	88	399	74	68
134	21.599	0.161	0.040	0.50	74	-0.5	100	4.6	-0.06	88	399	74	68
135	21.760	0.161	0.040	0.50	74	-0.5	100	4.5	-0.08	88	399	74	68
136	21.921	0.161	0.040	0.50	74	-0.5	100	4.4	-0.06	87	398	74	68
137	22.083	0.161	0.040	0.50	74	-0.5	100	4.4	-0.07	87	398	74	68
138	22.244	0.161	0.040	0.50	74	-0.5	100	4.3	-0.04	87	398	74	68
139	22.405	0.161	0.040	0.50	74	-0.5	100	4.3	-0.06	87	397	74	69
140	22.566	0.161	0.040	0.50	74	-0.5	100	4.2	-0.05	87	396	74	69
141	22.727	0.161	0.040	0.50	74	-0.5	100	4.1	-0.07	87	395	74	68
142	22.889	0.161	0.040	0.50	74	-0.5	100	4.1	-0.04	87	394	74	69
143	23.050	0.161	0.040	0.50	74	-0.5	100	4.0	-0.05	87	392	74	68
144	23.211	0.161	0.040	0.50	74	-0.5	100	4.0	-0.04	87	390	74	68
145	23.372	0.161	0.040	0.50	74	-0.5	100	3.9	-0.06	87	388	74	69
146	23.533	0.161	0.040	0.50	74	-0.5	100	3.9	-0.03	87	386	74	69
147	23.694	0.161	0.040	0.50	74	-0.5	100	3.8	-0.07	87	385	74	69
148	23.856	0.161	0.040	0.50	74	-0.5	100	3.8	-0.05	87	383	74	69
149	24.017	0.161	0.040	0.50	74	-0.5	100	3.7	-0.05	87	381	74	68
150	24.178	0.161	0.040	0.50	74	-0.5	100	3.7	-0.04	86	380	74	69
151	24.339	0.161	0.040	0.50	74	-0.5	100	3.6	-0.06	86	378	74	69
152	24.500	0.161	0.040	0.50	74	-0.5	100	3.6	-0.04	87	377	74	69
153	24.662	0.161	0.040	0.50	74	-0.5	100	3.6	-0.05	87	376	74	69
154	24.823	0.161	0.040	0.50	74	-0.5	100	3.5	-0.06	87	375	74	69
155	24.984	0.161	0.040	0.50	74	-0.5	100	3.5	-0.03	87	374	74	69
156	25.145	0.161	0.040	0.50	74	-0.5	100	3.4	-0.06	87	373	74	69
157	25.306	0.161	0.040	0.50	74	-0.5	100	3.3	-0.07	87	373	74	69
158	25.468	0.161	0.040	0.50	74	-0.5	100	3.3	-0.04	87	372	74	69
159	25.629	0.161	0.040	0.50	74	-0.5	100	3.2	-0.05	87	372	74	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.790	0.161	0.040	0.50	74	-0.5	100	3.2	-0.08	87	371	74	69
161	25.951	0.161	0.040	0.50	74	-0.5	100	3.1	-0.05	87	371	74	69
162	26.112	0.161	0.040	0.50	74	-0.5	100	3.0	-0.07	87	372	74	69
163	26.273	0.161	0.040	0.50	74	-0.5	100	3.0	-0.07	87	372	74	68
164	26.435	0.161	0.040	0.50	74	-0.5	100	2.9	-0.05	87	373	74	69
165	26.596	0.161	0.040	0.50	74	-0.5	100	2.9	-0.05	87	374	74	69
166	26.757	0.161	0.040	0.50	74	-0.5	100	2.8	-0.05	87	376	74	69
167	26.918	0.161	0.040	0.50	74	-0.5	100	2.8	-0.05	87	377	74	69
168	27.079	0.161	0.040	0.50	74	-0.5	100	2.7	-0.06	87	379	74	69
169	27.241	0.161	0.040	0.50	74	-0.5	100	2.7	-0.05	87	380	74	69
170	27.402	0.161	0.040	0.50	74	-0.5	100	2.6	-0.04	87	380	74	69
171	27.563	0.161	0.040	0.50	74	-0.5	100	2.6	-0.04	87	381	74	70
172	27.724	0.161	0.040	0.50	75	-0.5	100	2.6	-0.03	87	381	74	69
173	27.885	0.161	0.040	0.50	75	-0.5	100	2.5	-0.04	87	380	74	70
174	28.046	0.161	0.040	0.50	75	-0.5	100	2.5	-0.03	87	379	74	70
175	28.208	0.161	0.040	0.50	75	-0.5	100	2.4	-0.04	87	378	74	70
176	28.369	0.161	0.040	0.50	75	-0.5	100	2.4	-0.02	86	376	75	69
177	28.530	0.161	0.040	0.50	75	-0.5	100	2.4	-0.04	86	374	74	69
178	28.691	0.161	0.040	0.50	75	-0.5	100	2.4	-0.03	86	372	74	70
179	28.852	0.161	0.040	0.50	75	-0.5	100	2.3	-0.03	86	369	74	70
180	29.014	0.161	0.040	0.50	75	-0.5	100	2.3	-0.03	86	367	74	70
181	29.175	0.161	0.040	0.50	75	-0.5	100	2.3	-0.03	86	365	74	70
182	29.336	0.161	0.040	0.50	75	-0.5	99	2.2	-0.02	86	362	74	69
183	29.497	0.161	0.040	0.50	75	-0.5	99	2.2	-0.03	86	360	74	69
184	29.658	0.161	0.040	0.50	75	-0.5	99	2.2	-0.02	86	357	74	70
185	29.820	0.161	0.040	0.50	75	-0.5	99	2.2	-0.04	86	355	74	70
186	29.981	0.161	0.040	0.50	75	-0.5	99	2.1	-0.01	86	353	74	70
187	30.142	0.161	0.040	0.50	75	-0.5	99	2.1	-0.02	86	351	75	70
188	30.303	0.161	0.040	0.50	75	-0.5	99	2.1	-0.03	86	349	75	70
189	30.464	0.161	0.040	0.50	75	-0.5	100	2.1	-0.04	86	347	75	69
190	30.625	0.161	0.040	0.50	75	-0.5	100	2.0	-0.01	86	345	75	70
191	30.787	0.161	0.040	0.50	75	-0.5	100	2.0	-0.03	86	343	75	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	30.948	0.161	0.040	0.50	75	-0.5	99	2.0	-0.03	86	342	75	70
193	31.109	0.161	0.040	0.50	75	-0.5	100	2.0	-0.03	86	340	75	70
194	31.270	0.161	0.040	0.50	75	-0.5	100	1.9	-0.02	86	339	75	70
195	31.431	0.161	0.040	0.50	75	-0.5	100	1.9	-0.04	86	337	75	70
196	31.593	0.161	0.040	0.50	75	-0.5	100	1.9	-0.03	87	336	75	70
197	31.754	0.161	0.040	0.50	75	-0.5	100	1.8	-0.05	87	335	75	70
198	31.915	0.161	0.040	0.50	75	-0.5	100	1.8	-0.01	87	334	75	70
199	32.076	0.161	0.040	0.50	75	-0.5	100	1.8	-0.05	87	333	75	70
200	32.237	0.161	0.040	0.50	75	-0.5	100	1.7	-0.03	87	333	75	70
201	32.399	0.161	0.040	0.50	75	-0.5	100	1.7	-0.02	87	332	75	70
202	32.560	0.161	0.040	0.50	75	-0.5	100	1.7	-0.04	87	331	75	70
203	32.721	0.161	0.040	0.50	75	-0.5	100	1.6	-0.04	87	331	75	70
204	32.882	0.161	0.040	0.50	75	-0.5	100	1.6	-0.03	87	330	75	70
205	33.043	0.161	0.040	0.50	75	-0.5	100	1.6	-0.02	87	330	75	70
206	33.204	0.161	0.040	0.50	75	-0.5	100	1.5	-0.04	87	330	75	70
207	33.366	0.161	0.040	0.50	75	-0.5	100	1.5	-0.02	87	329	75	70
208	33.527	0.161	0.040	0.50	75	-0.5	100	1.5	-0.04	87	329	75	70
209	33.688	0.161	0.040	0.50	75	-0.5	100	1.4	-0.04	87	328	75	70
210	33.849	0.161	0.040	0.50	75	-0.5	100	1.4	-0.04	87	328	75	70
211	34.010	0.161	0.040	0.50	75	-0.5	99	1.4	-0.04	87	328	75	70
212	34.172	0.161	0.040	0.50	75	-0.5	100	1.3	-0.01	87	328	75	70
213	34.333	0.161	0.040	0.50	75	-0.5	100	1.3	-0.05	87	328	75	70
214	34.494	0.161	0.040	0.50	75	-0.5	100	1.3	-0.03	87	328	75	70
215	34.655	0.161	0.040	0.50	75	-0.5	100	1.2	-0.03	87	328	75	70
216	34.816	0.161	0.040	0.50	75	-0.5	100	1.2	-0.03	87	328	75	70
217	34.978	0.161	0.040	0.50	75	-0.5	100	1.2	-0.04	87	328	75	70
218	35.139	0.161	0.040	0.50	75	-0.5	100	1.2	-0.01	87	328	75	70
219	35.300	0.161	0.040	0.50	75	-0.5	100	1.1	-0.03	87	328	75	70
220	35.461	0.161	0.040	0.50	75	-0.5	100	1.1	-0.04	87	328	75	70
221	35.622	0.161	0.040	0.50	75	-0.5	100	1.1	-0.02	87	327	75	70
222	35.783	0.161	0.040	0.50	75	-0.5	100	1.0	-0.02	87	327	75	70
223	35.945	0.161	0.040	0.50	74	-0.5	100	1.0	-0.01	87	326	75	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.106	0.161	0.040	0.50	74	-0.5	100	1.0	-0.04	87	326	75	70
225	36.267	0.161	0.040	0.50	75	-0.5	100	1.0	-0.03	87	325	75	70
226	36.428	0.161	0.040	0.50	74	-0.5	100	0.9	-0.03	87	324	75	70
227	36.589	0.161	0.040	0.50	74	-0.5	100	0.9	-0.04	87	323	75	70
228	36.751	0.161	0.040	0.50	74	-0.5	100	0.9	-0.01	87	322	75	70
229	36.912	0.161	0.040	0.50	74	-0.5	100	0.9	-0.03	87	322	75	70
230	37.073	0.161	0.040	0.50	74	-0.5	100	0.8	-0.03	87	321	75	70
231	37.234	0.161	0.040	0.50	74	-0.5	100	0.8	-0.02	87	320	75	70
232	37.395	0.161	0.040	0.50	75	-0.5	100	0.8	-0.02	87	320	75	70
233	37.557	0.161	0.040	0.50	75	-0.5	100	0.8	-0.03	87	319	75	70
234	37.718	0.161	0.040	0.50	75	-0.5	100	0.7	-0.05	87	318	75	70
235	37.879	0.161	0.040	0.50	75	-0.5	100	0.7	-0.04	87	317	75	70
236	38.040	0.161	0.040	0.50	75	-0.5	100	0.7	0.01	87	317	75	70
237	38.201	0.161	0.040	0.50	75	-0.5	100	0.6	-0.05	87	317	75	70
238	38.362	0.161	0.040	0.50	75	-0.5	100	0.6	-0.02	87	316	75	70
239	38.524	0.161	0.040	0.50	75	-0.5	100	0.6	-0.01	87	316	75	70
240	38.685	0.161	0.040	0.50	75	-0.5	100	0.6	-0.04	87	315	75	70
241	38.846	0.161	0.040	0.50	75	-0.5	100	0.5	-0.03	87	315	75	70
242	39.007	0.161	0.040	0.50	75	-0.5	100	0.5	-0.05	86	315	75	70
243	39.168	0.161	0.040	0.50	75	-0.5	100	0.5	-0.01	87	314	75	70
244	39.330	0.161	0.040	0.50	75	-0.5	100	0.4	-0.04	87	314	75	70
245	39.491	0.161	0.040	0.50	74	-0.5	100	0.4	-0.02	86	314	75	70
246	39.652	0.161	0.040	0.50	74	-0.5	100	0.4	-0.02	86	314	75	70
247	39.813	0.161	0.040	0.50	74	-0.5	100	0.3	-0.05	86	314	75	70
248	39.974	0.161	0.040	0.50	74	-0.5	100	0.3	-0.02	87	314	75	70
249	40.136	0.161	0.040	0.50	74	-0.5	100	0.3	-0.02	86	314	74	70
250	40.297	0.161	0.040	0.50	74	-0.5	100	0.3	-0.02	87	314	74	70
251	40.458	0.161	0.040	0.50	74	-0.5	100	0.2	-0.05	87	314	74	70
252	40.619	0.161	0.040	0.50	74	-0.5	100	0.2	0	87	313	75	70
253	40.780	0.161	0.040	0.50	74	-0.5	100	0.2	-0.04	87	313	75	70
254	40.941	0.161	0.040	0.50	74	-0.5	100	0.2	-0.02	88	313	75	70
255	41.103	0.161	0.040	0.50	74	-0.5	100	0.1	-0.02	87	313	75	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.264	0.161	0.040	0.50	74	-0.5	100	0.1	-0.04	87	313	75	70
257	41.425	0.161	0.040	0.50	74	-0.5	100	0.0	-0.1	87	313	74	70
Avg/Tot	41.425	0.161	0.040	0.50	74	-0.50	100			89	360	74	68.8

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	70	-2		72	-0.030	8.75	0.00
1	0.163	0.163	0.50	70	-2	101	73	-0.030	3.94	0.01
2	0.325	0.163	0.50	70	-2	101	73	-0.040	8.84	0.01
3	0.488	0.163	0.50	70	-2	101	73	-0.040	9.28	0.01
4	0.650	0.163	0.50	70	-2	101	73	-0.040	9.85	0.01
5	0.813	0.163	0.50	71	-2	101	73	-0.040	9.78	0.00
6	0.975	0.163	0.50	71	-2	101	74	-0.040	9.78	0.00
7	1.138	0.163	0.50	71	-2	101	74	-0.040	10.47	0.00
8	1.300	0.163	0.50	71	-2	101	74	-0.040	9.90	0.00
9	1.463	0.163	0.50	71	-2	101	74	-0.040	9.85	0.00
10	1.625	0.163	0.50	71	-2	101	74	-0.040	9.81	0.00
11	1.788	0.163	0.50	71	-2	101	74	-0.040	9.71	0.00
12	1.950	0.163	0.50	71	-2	101	74	-0.040	9.97	0.00
13	2.113	0.163	0.50	71	-2	101	74	-0.040	10.59	0.00
14	2.275	0.163	0.50	71	-2	101	74	-0.040	10.74	0.00
15	2.438	0.163	0.50	72	-2	101	74	-0.040	11.02	0.00
16	2.600	0.163	0.50	72	-2	101	74	-0.040	10.97	0.00
17	2.763	0.163	0.50	72	-2	101	75	-0.040	10.94	0.00
18	2.925	0.163	0.50	72	-2	101	75	-0.040	11.12	0.00
19	3.088	0.163	0.50	72	-2	101	75	-0.040	11.32	0.00
20	3.250	0.163	0.50	72	-2	101	75	-0.040	11.73	0.00
21	3.413	0.163	0.50	72	-2	101	75	-0.040	12.03	0.00
22	3.575	0.163	0.50	72	-2	101	75	-0.040	12.12	0.00
23	3.738	0.163	0.50	72	-2	101	75	-0.040	12.25	0.00
24	3.900	0.163	0.50	73	-2	101	75	-0.040	12.53	0.00
25	4.063	0.163	0.50	73	-2	101	75	-0.040	12.68	0.00
26	4.225	0.163	0.50	73	-2	101	75	-0.040	12.84	0.00
27	4.388	0.163	0.50	73	-2	101	75	-0.040	13.09	0.00
28	4.550	0.163	0.50	73	-2	101	76	-0.040	13.55	0.00
29	4.713	0.163	0.50	73	-2	101	76	-0.040	14.10	0.03
30	4.875	0.163	0.50	73	-2	101	76	-0.040	14.69	0.18
31	5.038	0.163	0.50	73	-2	101	76	-0.040	14.71	0.11



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	5.200	0.163	0.50	73	-2	101	76	-0.040	14.25	0.00
33	5.363	0.163	0.50	73	-2	101	76	-0.040	13.82	0.00
34	5.525	0.163	0.50	73	-2	101	76	-0.040	14.06	0.00
35	5.688	0.163	0.50	73	-2	101	76	-0.040	14.20	0.00
36	5.850	0.163	0.50	74	-2	101	76	-0.040	14.57	0.01
37	6.013	0.163	0.50	74	-2	101	76	-0.040	14.70	0.13
38	6.175	0.163	0.50	74	-2	101	76	-0.040	14.89	0.18
39	6.338	0.163	0.50	74	-2	101	76	-0.040	15.06	0.24
40	6.500	0.163	0.50	74	-2	101	76	-0.040	15.27	0.33
41	6.663	0.163	0.50	74	-2	101	76	-0.040	15.51	0.37
42	6.825	0.163	0.50	74	-2	101	76	-0.040	15.58	0.54
43	6.988	0.163	0.50	74	-2	101	76	-0.040	15.62	0.62
44	7.150	0.163	0.50	74	-2	101	76	-0.040	15.68	0.74
45	7.313	0.163	0.50	74	-2	101	76	-0.040	15.67	0.83
46	7.475	0.163	0.50	74	-2	101	76	-0.040	15.68	0.88
47	7.638	0.163	0.50	74	-2	101	76	-0.040	15.56	0.90
48	7.800	0.163	0.50	74	-2	101	76	-0.040	15.30	0.86
49	7.963	0.163	0.50	74	-2	101	76	-0.040	15.29	0.61
50	8.125	0.163	0.50	75	-2	101	76	-0.040	15.08	0.51
51	8.288	0.163	0.50	75	-2	101	76	-0.040	14.91	0.45
52	8.451	0.163	0.50	75	-2	101	76	-0.040	11.03	0.18
53	8.613	0.163	0.50	75	-2	100	76	-0.040	13.14	0.34
54	8.776	0.163	0.50	75	-2	100	76	-0.040	14.30	0.17
55	8.938	0.163	0.50	75	-2	100	75	-0.040	14.12	0.10
56	9.101	0.163	0.50	74	-2	100	75	-0.040	13.86	0.05
57	9.263	0.163	0.50	75	-2	100	75	-0.040	13.72	0.05
58	9.426	0.163	0.50	74	-2	100	75	-0.040	13.65	0.04
59	9.588	0.163	0.50	75	-2	100	75	-0.040	13.71	0.03
60	9.751	0.163	0.50	75	-2	100	75	-0.040	13.77	0.04
61	9.913	0.163	0.50	75	-2	100	75	-0.040	13.53	0.00
62	10.076	0.163	0.50	75	-2	100	75	-0.040	13.18	0.00
63	10.238	0.163	0.50	75	-2	100	75	-0.040	13.27	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	10.401	0.163	0.50	75	-2	100	75	-0.040	13.24	0.00
65	10.563	0.163	0.50	75	-2	100	75	-0.040	13.33	0.00
66	10.726	0.163	0.50	75	-2	100	75	-0.040	12.41	0.00
67	10.888	0.163	0.50	75	-2	100	75	-0.040	11.81	0.00
68	11.051	0.163	0.50	75	-2	100	75	-0.040	11.44	0.00
69	11.213	0.163	0.50	75	-2	100	75	-0.040	11.69	0.00
70	11.376	0.163	0.50	75	-2	100	75	-0.040	11.94	0.00
71	11.538	0.163	0.50	75	-2	100	75	-0.040	12.92	0.00
72	11.701	0.163	0.50	75	-2	100	75	-0.030	15.08	0.30
73	11.863	0.163	0.50	75	-2	100	75	-0.040	14.43	0.00
74	12.026	0.163	0.50	75	-2	100	75	-0.040	13.76	0.00
75	12.188	0.163	0.50	75	-2	100	75	-0.040	13.91	0.00
76	12.351	0.163	0.50	75	-2	100	75	-0.030	14.73	0.08
77	12.513	0.163	0.50	75	-2	100	75	-0.040	14.95	0.06
78	12.676	0.163	0.50	75	-2	100	75	-0.040	14.55	0.00
79	12.838	0.163	0.50	75	-2	100	75	-0.040	13.94	0.00
80	13.001	0.163	0.50	75	-2	100	75	-0.040	13.85	0.00
81	13.163	0.163	0.50	75	-2	100	75	-0.040	13.82	0.00
82	13.326	0.163	0.50	75	-2	100	75	-0.040	13.56	0.00
83	13.488	0.163	0.50	75	-2	100	75	-0.040	13.28	0.00
84	13.651	0.163	0.50	75	-2	100	75	-0.040	13.28	0.00
85	13.813	0.163	0.50	75	-2	100	75	-0.040	13.07	0.00
86	13.976	0.163	0.50	75	-2	100	75	-0.040	12.92	0.00
87	14.138	0.163	0.50	75	-2	100	75	-0.040	12.89	0.00
88	14.301	0.163	0.50	75	-2	100	75	-0.040	12.85	0.01
89	14.463	0.163	0.50	75	-2	100	75	-0.040	13.05	0.01
90	14.626	0.163	0.50	75	-2	100	75	-0.040	13.09	0.01
91	14.788	0.163	0.50	75	-2	100	75	-0.040	12.96	0.01
92	14.951	0.163	0.50	75	-2	100	75	-0.040	12.98	0.01
93	15.113	0.163	0.50	75	-2	100	74	-0.030	13.04	0.01
94	15.276	0.163	0.50	75	-2	100	74	-0.040	13.06	0.01
95	15.438	0.163	0.50	75	-2	100	74	-0.040	13.10	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	15.601	0.163	0.50	75	-2	100	74	-0.040	13.14	0.01
97	15.763	0.163	0.50	75	-2	100	74	-0.030	13.16	0.01
98	15.926	0.163	0.50	75	-2	100	74	-0.030	13.25	0.01
99	16.088	0.163	0.50	75	-2	100	74	-0.030	13.15	0.01
100	16.251	0.163	0.50	75	-2	100	74	-0.040	13.02	0.01
101	16.413	0.163	0.50	75	-2	100	74	-0.030	12.97	0.01
102	16.576	0.163	0.50	75	-2	100	74	-0.040	12.88	0.01
103	16.739	0.163	0.50	75	-2	100	74	-0.030	13.19	0.00
104	16.901	0.163	0.50	75	-2	100	74	-0.040	13.39	0.00
105	17.064	0.163	0.50	75	-2	100	74	-0.040	13.56	0.03
106	17.226	0.163	0.50	75	-2	100	74	-0.030	13.82	0.15
107	17.389	0.163	0.50	75	-2	100	74	-0.040	14.22	0.27
108	17.551	0.163	0.50	75	-2	100	74	-0.040	14.57	0.48
109	17.714	0.163	0.50	75	-2	100	74	-0.040	14.76	0.80
110	17.876	0.163	0.50	75	-2	100	74	-0.040	14.94	0.95
111	18.039	0.163	0.50	76	-2	100	75	-0.040	15.05	1.15
112	18.201	0.163	0.50	76	-2	100	75	-0.040	15.24	1.29
113	18.364	0.163	0.50	76	-2	100	75	-0.040	15.25	1.44
114	18.526	0.163	0.50	76	-2	100	75	-0.040	15.29	1.44
115	18.689	0.163	0.50	76	-2	100	75	-0.040	15.29	1.48
116	18.851	0.163	0.50	76	-2	100	75	-0.040	15.56	1.49
117	19.014	0.163	0.50	76	-2	100	75	-0.040	15.62	1.29
118	19.176	0.163	0.50	76	-2	100	75	-0.040	15.51	1.05
119	19.339	0.163	0.50	76	-2	100	75	-0.040	15.43	1.12
120	19.501	0.163	0.50	76	-2	100	75	-0.040	14.98	1.13
121	19.664	0.163	0.50	76	-2	100	75	-0.040	14.68	0.99
122	19.826	0.163	0.50	76	-2	100	75	-0.040	14.52	0.79
123	19.989	0.163	0.50	76	-2	100	75	-0.040	14.26	0.60
124	20.151	0.163	0.50	76	-2	100	75	-0.040	14.17	0.45
125	20.314	0.163	0.50	76	-2	100	75	-0.030	14.36	0.26
126	20.476	0.163	0.50	76	-2	100	75	-0.040	14.02	0.25
127	20.639	0.163	0.50	76	-2	100	75	-0.030	14.06	0.18

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	20.801	0.163	0.50	76	-2	100	75	-0.030	14.16	0.31
129	20.964	0.163	0.50	76	-2	100	75	-0.040	14.27	0.37
130	21.126	0.163	0.50	76	-2	100	74	-0.030	14.52	0.19
131	21.289	0.163	0.50	76	-2	100	75	-0.040	14.52	0.16
132	21.451	0.163	0.50	76	-2	100	75	-0.040	14.38	0.04
133	21.614	0.163	0.50	76	-2	100	74	-0.040	14.32	0.00
134	21.776	0.163	0.50	76	-2	100	74	-0.040	14.00	0.02
135	21.939	0.163	0.50	76	-2	100	74	-0.040	13.61	0.02
136	22.101	0.163	0.50	76	-2	100	74	-0.030	13.32	0.01
137	22.264	0.163	0.50	76	-2	100	74	-0.030	13.14	0.00
138	22.426	0.163	0.50	76	-2	100	74	-0.030	12.88	0.00
139	22.589	0.163	0.50	76	-2	100	74	-0.030	12.53	0.01
140	22.751	0.163	0.50	76	-2	100	74	-0.030	12.20	0.00
141	22.914	0.163	0.50	76	-2	100	74	-0.030	11.96	0.01
142	23.076	0.163	0.50	76	-2	100	74	-0.030	11.88	0.01
143	23.239	0.163	0.50	76	-2	100	74	-0.030	11.79	0.01
144	23.401	0.163	0.50	76	-2	100	74	-0.030	11.57	0.00
145	23.564	0.163	0.50	76	-2	100	74	-0.030	11.35	0.00
146	23.726	0.163	0.50	76	-2	100	74	-0.030	11.26	0.00
147	23.889	0.163	0.50	76	-2	100	74	-0.030	11.30	0.00
148	24.051	0.163	0.50	76	-2	100	74	-0.030	11.28	0.01
149	24.214	0.163	0.50	76	-2	100	74	-0.030	11.25	0.00
150	24.376	0.163	0.50	76	-2	100	74	-0.030	11.28	0.00
151	24.539	0.163	0.50	76	-2	100	74	-0.030	11.19	0.00
152	24.701	0.163	0.50	76	-2	100	74	-0.030	11.22	0.00
153	24.864	0.163	0.50	76	-2	100	74	-0.030	11.25	0.00
154	25.026	0.163	0.50	76	-2	100	74	-0.030	11.27	0.00
155	25.189	0.163	0.50	76	-2	100	74	-0.030	11.23	0.00
156	25.352	0.163	0.50	76	-2	100	74	-0.030	11.31	0.00
157	25.514	0.163	0.50	76	-2	100	74	-0.030	11.37	0.01
158	25.677	0.163	0.50	76	-2	100	74	-0.030	11.60	0.01
159	25.839	0.163	0.50	76	-2	100	74	-0.040	11.78	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	26.002	0.163	0.50	76	-2	100	75	-0.030	11.98	0.01
161	26.164	0.163	0.50	76	-2	100	75	-0.030	12.23	0.01
162	26.327	0.163	0.50	76	-2	100	75	-0.030	12.54	0.01
163	26.489	0.163	0.50	76	-2	100	75	-0.030	12.58	0.01
164	26.652	0.163	0.50	76	-2	100	75	-0.030	12.49	0.02
165	26.814	0.163	0.50	76	-2	100	75	-0.030	12.61	0.02
166	26.977	0.163	0.50	76	-2	100	75	-0.030	12.69	0.05
167	27.139	0.163	0.50	76	-2	100	75	-0.030	12.59	0.05
168	27.302	0.163	0.50	76	-2	100	75	-0.030	12.17	0.00
169	27.464	0.163	0.50	76	-2	100	75	-0.030	11.83	0.00
170	27.627	0.163	0.50	76	-2	100	75	-0.030	11.59	0.00
171	27.789	0.163	0.50	76	-2	100	75	-0.030	11.31	0.00
172	27.952	0.163	0.50	76	-2	100	75	-0.030	11.04	0.00
173	28.114	0.163	0.50	76	-2	100	75	-0.030	10.62	0.00
174	28.277	0.163	0.50	76	-2	100	75	-0.030	10.15	0.00
175	28.439	0.163	0.50	76	-2	100	75	-0.030	9.88	0.01
176	28.602	0.163	0.50	76	-2	100	75	-0.030	9.77	0.01
177	28.764	0.163	0.50	76	-2	99	75	-0.030	9.76	0.01
178	28.927	0.163	0.50	76	-2	99	75	-0.030	9.71	0.01
179	29.089	0.163	0.50	76	-2	99	75	-0.030	9.65	0.01
180	29.252	0.163	0.50	76	-2	99	75	-0.030	9.63	0.01
181	29.414	0.163	0.50	77	-2	99	75	-0.030	9.55	0.01
182	29.577	0.163	0.50	77	-2	99	75	-0.030	9.52	0.01
183	29.739	0.163	0.50	77	-2	99	75	-0.030	9.57	0.01
184	29.902	0.163	0.50	77	-2	99	75	-0.030	9.51	0.01
185	30.064	0.163	0.50	77	-2	99	75	-0.030	9.39	0.01
186	30.227	0.163	0.50	77	-2	99	75	-0.030	9.37	0.01
187	30.389	0.163	0.50	77	-2	99	75	-0.030	9.37	0.01
188	30.552	0.163	0.50	77	-2	99	75	-0.030	9.37	0.01
189	30.714	0.163	0.50	77	-2	99	75	-0.030	9.35	0.01
190	30.877	0.163	0.50	77	-2	99	75	-0.030	9.43	0.01
191	31.039	0.163	0.50	77	-2	99	75	-0.030	9.53	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
192	31.202	0.163	0.50	77	-2	99	75	-0.030	9.56	0.01
193	31.364	0.163	0.50	77	-2	99	75	-0.030	9.72	0.01
194	31.527	0.163	0.50	77	-2	99	75	-0.030	9.79	0.01
195	31.689	0.163	0.50	77	-2	99	75	-0.030	9.87	0.00
196	31.852	0.163	0.50	77	-2	99	75	-0.030	9.90	0.00
197	32.014	0.163	0.50	77	-2	99	75	-0.030	9.92	0.00
198	32.177	0.163	0.50	77	-2	100	75	-0.030	10.00	0.00
199	32.339	0.163	0.50	77	-2	100	75	-0.030	10.02	0.00
200	32.502	0.163	0.50	77	-2	100	75	-0.030	9.99	0.00
201	32.664	0.163	0.50	77	-2	100	75	-0.030	9.88	0.01
202	32.827	0.163	0.50	77	-2	100	75	-0.030	9.89	0.01
203	32.989	0.163	0.50	77	-2	99	75	-0.030	9.95	0.01
204	33.152	0.163	0.50	77	-2	99	75	-0.030	9.89	0.01
205	33.314	0.163	0.50	77	-2	99	75	-0.030	9.89	0.01
206	33.477	0.163	0.50	77	-2	99	75	-0.030	9.89	0.01
207	33.640	0.163	0.50	77	-2	99	75	-0.030	9.98	0.01
208	33.802	0.163	0.50	77	-2	100	75	-0.030	9.99	0.01
209	33.965	0.163	0.50	77	-2	99	75	-0.030	10.07	0.01
210	34.127	0.163	0.50	77	-2	99	75	-0.030	10.05	0.01
211	34.290	0.163	0.50	77	-2	99	75	-0.030	10.09	0.01
212	34.452	0.163	0.50	77	-2	100	75	-0.030	10.04	0.01
213	34.615	0.163	0.50	77	-2	100	75	-0.030	10.16	0.01
214	34.777	0.163	0.50	77	-2	100	75	-0.030	10.15	0.01
215	34.940	0.163	0.50	77	-2	100	75	-0.030	10.18	0.01
216	35.102	0.163	0.50	77	-2	100	75	-0.030	9.84	0.01
217	35.265	0.163	0.50	77	-2	100	75	-0.030	9.72	0.01
218	35.427	0.163	0.50	77	-2	100	75	-0.030	9.71	0.01
219	35.590	0.163	0.50	77	-2	100	75	-0.030	9.53	0.01
220	35.752	0.163	0.50	77	-2	100	75	-0.030	9.13	0.01
221	35.915	0.163	0.50	77	-2	100	75	-0.030	9.11	0.01
222	36.077	0.163	0.50	77	-2	100	75	-0.030	9.11	0.01
223	36.240	0.163	0.50	77	-2	100	75	-0.030	9.15	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
224	36.402	0.163	0.50	77	-2	100	75	-0.030	9.20	0.01
225	36.565	0.163	0.50	77	-2	100	75	-0.030	9.24	0.01
226	36.727	0.163	0.50	77	-2	100	75	-0.030	9.28	0.01
227	36.890	0.163	0.50	77	-2	100	75	-0.030	9.31	0.01
228	37.052	0.163	0.50	77	-2	100	75	-0.030	9.37	0.01
229	37.215	0.163	0.50	77	-2	100	75	-0.030	9.45	0.01
230	37.377	0.163	0.50	77	-2	100	75	-0.030	9.60	0.00
231	37.540	0.163	0.50	77	-2	100	75	-0.030	9.59	0.01
232	37.702	0.163	0.50	77	-2	100	75	-0.030	9.65	0.01
233	37.865	0.163	0.50	77	-2	100	75	-0.030	9.67	0.01
234	38.027	0.163	0.50	77	-2	100	75	-0.030	9.69	0.01
235	38.190	0.163	0.50	77	-2	100	75	-0.030	9.62	0.01
236	38.352	0.163	0.50	77	-2	100	75	-0.030	9.62	0.01
237	38.515	0.163	0.50	77	-2	100	75	-0.030	9.60	0.01
238	38.677	0.163	0.50	77	-2	100	75	-0.030	9.58	0.01
239	38.840	0.163	0.50	77	-2	100	75	-0.030	9.58	0.01
240	39.002	0.163	0.50	77	-2	100	75	-0.030	9.64	0.01
241	39.165	0.163	0.50	77	-2	100	75	-0.030	9.66	0.01
242	39.327	0.163	0.50	77	-2	100	75	-0.030	9.65	0.01
243	39.490	0.163	0.50	77	-2	100	75	-0.030	9.66	0.01
244	39.652	0.163	0.50	76	-2	100	75	-0.030	9.67	0.01
245	39.815	0.163	0.50	76	-2	100	75	-0.030	9.60	0.01
246	39.977	0.163	0.50	76	-2	100	75	-0.030	9.35	0.01
247	40.140	0.163	0.50	76	-2	100	75	-0.030	9.40	0.01
248	40.302	0.163	0.50	76	-2	100	75	-0.030	9.38	0.01
249	40.465	0.163	0.50	76	-2	100	75	-0.030	9.44	0.01
250	40.627	0.163	0.50	76	-2	100	75	-0.030	9.23	0.01
251	40.790	0.163	0.50	76	-2	100	75	-0.030	9.14	0.01
252	40.952	0.163	0.50	76	-2	100	75	-0.030	9.18	0.01
253	41.115	0.163	0.50	76	-2	100	75	-0.030	8.84	0.01
254	41.277	0.163	0.50	76	-2	100	75	-0.030	8.72	0.01
255	41.440	0.163	0.50	76	-2	100	75	-0.030	8.64	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
256	41.602	0.163	0.50	76	-2	100	75	-0.030	8.52	0.01
257	41.765	0.163	0.50	76	-2	100	74	-0.030	8.45	0.01
Avg/Tot	41.765	0.163	0.50	75	-2.00	100	75	-0.035	11.88	0.12



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 19

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	492	496	248	398	611	448.9	763
1	484	487	243	394	612	443.7	721
2	473	477	236	395	611	438.5	826
3	463	468	230	396	611	433.5	876
4	452	458	224	398	609	428.4	910
5	443	449	219	401	607	423.8	927
6	435	441	216	402	604	419.7	923
7	427	434	212	404	601	415.8	935
8	420	427	209	405	598	411.8	926
9	414	421	206	405	595	408.1	914
10	408	415	203	405	591	404.4	910
11	403	410	200	406	588	401.5	923
12	398	406	199	408	584	398.9	937
13	394	401	197	410	580	396.7	950
14	390	398	195	412	577	394.5	965
15	387	395	195	416	574	393.1	988
16	384	392	194	420	570	391.9	1008
17	380	390	193	423	567	390.5	1018
18	378	388	192	426	564	389.6	1030
19	376	386	192	430	561	388.9	1040
20	374	385	191	434	558	388.4	1055
21	373	384	192	438	555	388.1	1068
22	371	383	192	443	552	388.2	1075
23	371	382	192	448	549	388.4	1080
24	370	382	192	452	547	388.7	1083
25	370	382	193	457	544	389.1	1089
26	370	382	194	461	542	389.9	1089
27	370	383	195	465	540	390.6	1091
28	371	384	196	469	537	391.6	1103
29	373	386	197	475	535	393.1	1118
30	375	388	198	480	533	394.9	1134
31	378	390	198	486	531	396.6	1138
32	381	393	199	490	529	398.4	1125
33	384	395	200	494	527	400.2	1118
34	387	398	201	498	525	401.9	1120
35	391	401	202	501	523	403.8	1128
36	394	405	204	506	522	406.1	1141
37	398	409	207	510	520	408.7	1152
38	401	413	209	515	518	411.2	1161
39	405	417	211	520	517	413.9	1176
40	409	422	214	525	515	416.8	1183
41	414	426	216	529	514	419.9	1187
42	419	431	219	532	512	422.7	1187
43	424	435	221	535	511	425.3	1188
44	430	440	223	538	509	428.1	1186
45	435	444	225	540	508	430.5	1180
46	440	449	228	542	506	433.1	1176
47	446	454	230	543	505	435.5	1171

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 19

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
48	451	458	233	544	503	437.7	1161	
49	457	462	234	544	502	439.7	1153	
50	462	466	235	544	500	441.5	1149	
51	468	469	236	545	499	443.2	1152	
52	473	472	236	545	497	444.7	1161	
53	480	474	236	545	496	446.3	1162	
54	487	475	235	546	494	447.4	1155	
55	491	475	234	547	492	447.9	1152	
56	496	475	233	546	491	448.2	1148	
57	499	474	232	546	490	448.0	1148	
58	501	473	231	545	488	447.6	1145	
59	504	472	230	544	487	447.5	1139	
60	506	471	229	544	485	447.2	1143	
61	508	470	229	544	484	447.0	1140	
62	509	469	228	543	483	446.6	1138	
63	510	468	228	545	482	446.6	1144	
64	510	468	228	544	481	446.2	1135	
65	511	467	226	542	481	445.4	1117	
66	512	466	225	541	480	444.8	1105	
67	512	465	224	539	479	443.9	1105	
68	511	464	222	539	478	442.9	1118	
69	509	463	222	538	477	441.9	1133	
70	507	462	220	538	477	441.0	1143	
71	507	462	221	538	476	440.6	1146	
72	509	462	222	538	475	441.1	1164	
73	512	463	222	539	474	441.7	1173	
74	514	463	222	539	473	442.3	1172	
75	516	464	223	537	473	442.6	1142	
76	519	465	224	536	472	443.2	1140	
77	522	467	225	536	471	444.2	1160	
78	525	468	226	536	470	445.0	1165	
79	526	469	228	537	469	445.8	1165	
80	527	471	228	537	468	446.1	1163	
81	528	472	229	537	467	446.4	1162	
82	527	474	229	537	466	446.7	1156	
83	526	476	230	536	466	446.8	1149	
84	525	477	231	536	465	446.9	1141	
85	524	479	231	534	465	446.8	1126	
86	523	480	232	534	465	446.8	1136	
87	521	482	233	533	465	446.6	1129	
88	519	483	233	534	465	446.7	1148	
89	518	484	233	534	464	446.6	1151	
90	516	485	233	535	464	446.5	1149	
91	515	485	232	535	464	446.3	1149	
92	515	486	232	536	464	446.4	1149	
93	515	486	232	536	464	446.6	1147	
94	515	487	231	536	464	446.5	1138	
95	515	487	231	533	464	446.0	1109	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 19

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	517	487	230	529	465	445.4	1095
97	518	487	230	526	465	445.2	1088
98	520	486	230	524	466	445.1	1083
99	522	486	229	522	466	445.1	1081
100	524	486	229	520	467	445.2	1082
101	525	486	229	518	468	445.2	1083
102	526	486	230	517	469	445.4	1083
103	526	487	230	516	470	445.7	1089
104	526	488	230	516	471	446.1	1100
105	526	489	232	517	472	447.3	1119
106	526	491	233	520	473	448.6	1138
107	525	494	235	522	474	450.1	1152
108	525	497	236	524	475	451.5	1162
109	526	500	239	526	476	453.5	1170
110	527	504	240	528	478	455.4	1163
111	530	508	243	527	479	457.2	1149
112	533	512	245	527	480	459.3	1140
113	536	516	247	526	481	461.1	1133
114	540	520	249	525	482	463.1	1125
115	544	523	251	523	483	464.9	1115
116	549	527	253	522	484	467.0	1106
117	555	530	254	520	485	468.9	1106
118	561	532	255	520	487	470.9	1111
119	568	533	256	518	488	472.5	1111
120	574	534	256	517	489	474.1	1112
121	580	534	256	516	490	475.1	1118
122	585	534	256	516	491	476.2	1121
123	589	533	256	515	492	477.1	1121
124	593	531	256	515	493	477.6	1118
125	597	530	255	515	493	478.0	1113
126	601	528	255	514	494	478.3	1110
127	603	527	254	514	495	478.5	1110
128	606	526	254	513	496	479.0	1113
129	609	525	255	513	497	479.8	1113
130	613	524	255	513	497	480.5	1115
131	615	524	255	514	499	481.3	1114
132	619	523	254	513	499	481.8	1116
133	620	523	254	514	500	482.4	1118
134	623	521	253	515	501	482.5	1113
135	625	519	253	513	502	482.6	1104
136	629	517	253	513	502	483.0	1094
137	630	515	252	512	503	482.4	1087
138	631	512	251	512	504	481.8	1085
139	631	510	250	511	504	481.2	1085
140	630	507	249	511	504	480.3	1085
141	628	505	248	510	504	479.1	1081
142	625	503	247	508	504	477.6	1076
143	622	501	247	507	505	476.3	1066

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 19

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	617	499	246	505	505	474.5	1056
145	612	498	245	504	505	472.8	1048
146	605	496	245	502	506	470.8	1044
147	599	494	245	500	506	468.9	1039
148	593	493	244	499	507	467.0	1032
149	587	492	243	496	507	465.1	1024
150	582	491	243	494	508	463.6	1018
151	578	490	242	491	508	461.9	1014
152	574	489	242	488	509	460.4	1012
153	570	488	242	486	510	459.2	1008
154	566	487	241	484	511	458.0	1006
155	563	486	241	482	511	456.8	1006
156	560	485	241	480	512	455.8	1009
157	558	484	241	478	513	454.8	1009
158	556	484	242	477	513	454.2	1008
159	555	483	242	474	514	453.6	1003
160	554	483	242	472	515	453.2	995
161	554	483	244	471	516	453.4	990
162	554	483	244	469	516	453.4	988
163	555	484	246	469	517	454.1	990
164	555	484	247	469	518	454.6	994
165	555	485	249	467	518	454.9	1002
166	556	485	250	468	519	455.5	1012
167	555	486	251	468	519	455.8	1022
168	555	486	251	469	521	456.3	1026
169	554	486	252	469	522	456.6	1018
170	553	486	253	468	523	456.8	992
171	553	486	253	465	524	456.5	966
172	552	486	254	462	525	456.0	947
173	552	486	254	460	526	455.6	937
174	551	486	254	458	527	455.1	936
175	550	485	253	455	527	454.1	935
176	549	484	252	453	528	453.2	931
177	548	483	251	451	528	452.1	924
178	546	482	250	449	528	451.1	915
179	545	481	250	445	529	449.9	902
180	543	480	250	442	529	448.6	891
181	541	479	249	439	529	447.3	887
182	538	478	248	435	529	445.7	881
183	536	477	247	432	529	444.3	876
184	535	476	246	429	528	442.8	870
185	533	475	245	426	528	441.4	868
186	531	474	245	423	528	440.1	867
187	529	473	244	421	528	438.8	866
188	526	471	244	419	528	437.6	863
189	525	470	244	416	527	436.3	858
190	523	469	243	413	527	435.2	853
191	522	468	243	411	528	434.2	848

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 19

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	520	467	243	410	528	433.3	843
193	519	466	242	406	528	432.3	839
194	519	465	242	404	528	431.6	835
195	519	464	242	402	528	431.1	831
196	519	464	241	400	528	430.5	828
197	520	463	242	399	528	430.4	827
198	520	463	241	397	528	430.0	828
199	521	463	241	395	529	429.9	827
200	522	463	241	394	529	430.0	825
201	523	463	241	393	529	430.1	825
202	524	463	241	392	530	429.8	824
203	524	463	241	392	530	430.0	824
204	525	463	241	391	530	430.0	824
205	526	463	242	390	530	430.1	825
206	526	463	242	390	531	430.3	825
207	527	463	242	389	531	430.3	825
208	528	463	242	389	531	430.5	824
209	529	463	243	388	531	430.8	823
210	530	463	243	388	531	431.1	822
211	531	464	244	387	531	431.3	820
212	532	464	245	387	531	431.9	819
213	533	465	246	387	532	432.3	818
214	533	466	247	386	532	432.7	817
215	533	468	248	386	532	433.4	816
216	533	470	249	385	532	433.8	816
217	532	472	250	385	533	434.4	817
218	531	473	250	385	534	434.7	817
219	530	475	250	385	535	435.1	822
220	529	476	251	385	537	435.5	826
221	527	477	250	386	539	435.8	827
222	525	478	250	385	541	436.0	826
223	523	479	250	385	544	436.0	824
224	521	480	249	385	546	436.2	823
225	519	480	250	385	548	436.4	822
226	517	481	249	385	551	436.4	821
227	515	481	249	385	553	436.5	821
228	512	481	249	384	555	436.2	820
229	511	482	249	384	557	436.3	819
230	509	482	249	383	558	436.3	817
231	506	482	250	383	559	436.1	815
232	504	483	250	382	560	435.8	814
233	502	483	250	381	561	435.6	812
234	501	483	251	381	562	435.5	811
235	499	484	251	380	562	435.3	811
236	497	484	252	380	563	435.2	811
237	496	484	253	379	563	435.1	812
238	495	485	253	379	563	434.9	812
239	494	485	253	379	564	435.0	812

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 3

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 19

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	494	486	253	379	564	435.1	812
241	494	486	253	379	564	435.0	811
242	494	486	254	378	564	435.1	811
243	493	487	254	378	564	435.3	810
244	492	487	255	378	564	435.3	809
245	492	488	254	378	564	435.2	809
246	492	487	255	378	564	435.2	810
247	491	487	256	378	564	435.2	811
248	491	486	256	377	564	434.9	812
249	490	485	257	377	564	434.8	813
250	489	484	257	377	564	434.4	812
251	488	483	257	377	564	433.9	811
252	487	482	257	376	564	433.2	810
253	487	481	257	376	563	432.8	809
254	486	480	257	376	562	432.3	809
255	486	479	257	375	562	431.7	810
256	485	478	257	375	561	431.2	811
257	484	477	255	374	561	430.2	812
Average	510	472	236	466	519	441	1003

## LAB SAMPLE DATA - ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 3Technician: SJBDate: 10/10/2018**TRAIN A (1st Hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3372	120.6	119.3	1.3
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	1.3
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**TRAIN A (Post 1st hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3373	122.3	121.3	1.0
B. Rear filter catch	Filter	3374	122.6	122.8	-0.2
C. Probe catch*	Probe	8A	116829.8	116829.9	0.0
D. O-Ring catch*	O-Ring	8A	3552.0	3551.3	0.7

Sub-Total	Total Particulate, mg:	1.5
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Train A Aggregate	Total Particulate, mg:	<b>2.8</b>
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**TRAIN B**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3375	121.2	119.9	1.3
B. Rear filter catch	Filter	3376	121.2	121.3	-0.1
C. Probe catch*	Probe	8B	116825.3	116825.4	0.0
D. O-Ring catch*	O-Ring	8B	3586.0	3584.8	1.2

Total Particulate, mg:	<b>2.4</b>
------------------------	------------

**AMBIENT**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:	<b>0.0</b>
------------------------	------------

\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 3 Test Date: 10/10/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): Medium High Setting (35 degrees closed from fully open)

#### Preburn Notes

Time	Notes
6:05	Loaded 12 lbs of kindling
7:33	At 1.6 lbs, loaded pre-burn fuel, turned fan on high setting
8:29	At 8.4 lbs, set air to test setting, turned fan down to medium high setting (2/3 open)
9:56	Leveled coal bed, zeroed scale in preparation for fuel loading

#### Test Notes

Test Burn Start Time: 9:56 Test Fuel Loaded by: 40 seconds  
 Door Closed: 45 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min	Changed 1-hour filter.
257 min	End of Test

Test Burn End Time: 14:13

#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:50	-	8:55	14:30	-	14:34
CO <sub>2</sub>	0.00	-	10.04	0.01	-	10.12
CO	0.00	-	2.52	0.01	-	2.50

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature: 

Date: 10/10/2018



**WOOD STOVE TEST DATA PACKET**  
**ASTM E2780/E2515**



**Run 4 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/10/2018

A handwritten signature in black ink, appearing to be "R. L.", written over a horizontal line.

Techician Signature

10/23/2018

Date

## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 4

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/10/2018

<b>Burn Rate (kg/hr):</b>	<b>2.20</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	30.911	31.691	9.710
Average Gas Velocity in Dilution Tunnel (ft/sec)	12.8			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	7960.2			
Average Gas Meter Temperature (°F)	70.2	75.2	76.0	76.5
Total Sample Volume (dscf)	0.000	29.387	29.966	9.209
Average Tunnel Temperature (°F)	103.4			
Total Time of Test (min)	191			
Total Particulate Catch (mg)	0.0	4.8	5.4	3.5
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001633	0.0001802	0.0003800
Total PM Emissions (g)	0.00	4.14	4.57	3.03
Particulate Emission Rate (g/hr)	0.00	1.30	1.43	3.03
Emissions Factor (g/kg)	-	0.59	0.65	-
Difference from Average Total Particulate Emissions (g)	-	0.21	0.21	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	4.35
Particulate Emission Rate (g/hr)	1.37
Emissions Factor (g/kg)	0.62
HHV Efficiency (%)	76.7%
LHV Efficiency (%)	82.9%
CO Emissions (g/min)	1.48

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	82.1	OK
Face Velocity	< 30 ft/min	8.9	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 68.15 / Max: 72.5	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	68.7	OK

## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/10/18  
**Run:** 4  
**Control #:** 18-421  
**Test Duration:** 191  
**Output Category:** 4

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	76.7%	82.9%
<b>Combustion Efficiency</b>	97.1%	97.1%
<b>Heat Transfer Efficiency</b>	78.9%	85.3%

<b>Output Rate (kJ/h)</b>	33,184	31,478	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	2.18	4.82	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	43,280	41,056	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.95	15.33	<b>dry lb</b>
<b>MC wet (%)</b>	18.90		
<b>MC dry (%)</b>	23.30		
<b>Particulate (g )</b>	4.35		
<b>CO (g)</b>	283		
<b>Test Duration (h)</b>	3.18		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.04	2.68
<b>g/kg Dry Fuel</b>	0.63	40.72
<b>g/h</b>	1.37	88.96
<b>g/min</b>	0.02	1.48
<b>lb/MM Btu Output</b>	0.10	6.23

<b>Air/Fuel Ratio (A/F)</b>	10.26
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	23.8		2x4	17.00	19.2
2x4	17.00	21.7		2x4	17.00	20.8
2x4	17.00	19.8				
2x4	17.00	22.5				
2x4	17.00	23.1				
2x4	17.00	21.2				
2x4	17.00	22.6				
2x4	17.00	24.5				
Total Fuel Weight (lbs):		18.42		Average Moisture (%DB):		21.9

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.70  
 Total 4x4 Crib Weight, with spacers (lbs): 9.20  
 Total Wet Fuel Weight, with spacers (lbs): 18.90

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.78  
 Max (lbs): 4.73

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	17.00	2.04	23.8	23.8	22.8	1.65
2x4	17.00	1.80	25.0	24.6	24.9	1.44
2x4	17.00	2.02	24.9	24.3	25.0	1.62
2x4	17.00	1.94	19.9	20.9	20.5	1.61
4x4	17.00	4.04	22.7	22.5	23.8	3.28
4x4	17.00	4.08	22.7	22.7	24.6	3.31
Total Dry Weight, no spacers (lbs):						12.92
Total Dry Weight, with spacers (lbs):						15.41

Spacer Moisture Readings (%DB)						
21.1	21.0	19.1	23.8	23.3	17.1	
17.7	13.4	14.7	18.8	24.8	24.4	
18.6	17.5	23.8	19.5	23.8	24.4	
19.0	17.0	24.7	13.7	17.2	15.0	

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	28.9	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.49	OK
2x4 Fuel Mix	35 - 65 % of total weight	51%	OK

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018Preburn Start Time: 14:20Recording Interval (min): 1Run Time (min): 93

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	19.9	-0.040	469	459	312	388	555	436.6	322	636	69
1	19.8	-0.040	460	450	269	380	554	422.6	325	703	70
2	19.7	-0.040	451	441	251	375	552	414.0	324	774	70
3	19.6	-0.040	442	432	238	374	550	407.1	321	877	70
4	19.3	-0.040	434	424	230	380	548	403.2	320	1007	70
5	19.1	-0.040	426	418	224	391	545	400.9	321	1138	70
6	18.9	-0.040	420	414	220	406	542	400.1	324	1217	70
7	18.6	-0.040	415	410	216	423	538	400.4	327	1238	70
8	18.3	-0.040	410	408	213	440	535	401.2	331	1257	70
9	18.1	-0.040	407	407	210	456	531	402.3	335	1273	70
10	17.8	-0.040	405	407	209	472	527	403.8	339	1268	69
11	17.5	-0.050	404	408	207	483	523	405.0	342	1254	70
12	17.3	-0.050	405	409	206	492	519	406.2	346	1260	70
13	17.0	-0.050	406	411	204	500	515	407.3	349	1266	70
14	16.7	-0.050	408	414	203	509	511	409.1	352	1280	70
15	16.5	-0.050	409	418	203	520	508	411.5	356	1300	69
16	16.2	-0.050	412	422	204	530	504	414.3	360	1308	70
17	15.9	-0.050	414	426	204	539	501	416.8	364	1302	70
18	15.7	-0.050	417	431	204	546	498	419.2	368	1292	70
19	15.4	-0.050	420	436	205	552	495	421.6	371	1273	70
20	15.1	-0.050	424	442	206	555	492	423.6	374	1265	70
21	14.8	-0.050	428	448	206	556	490	425.7	376	1243	70
22	14.5	-0.050	433	455	207	557	487	427.8	378	1231	70
23	14.3	-0.050	438	461	207	559	485	430.2	380	1224	70
24	14.0	-0.050	442	468	208	561	483	432.4	382	1214	70
25	13.7	-0.050	448	475	208	560	482	434.5	383	1202	69
26	13.5	-0.050	453	481	209	559	480	436.7	384	1187	69
27	13.2	-0.050	458	488	210	557	479	438.7	385	1172	69
28	12.9	-0.050	465	496	211	554	478	440.8	386	1157	70
29	12.7	-0.040	471	503	212	551	478	442.7	387	1148	70
30	12.4	-0.050	477	510	213	549	477	445.1	387	1140	70
31	12.1	-0.040	484	516	214	546	477	447.2	388	1139	70
32	11.9	-0.050	490	523	214	544	477	449.5	388	1129	69
33	11.6	-0.050	498	529	215	542	477	452.0	388	1121	70
34	11.3	-0.050	505	535	216	540	477	454.4	388	1126	70
35	11.1	-0.040	512	541	216	538	478	457.0	389	1123	70
36	10.9	-0.040	519	547	218	537	478	460.0	389	1128	70
37	10.6	-0.040	526	553	218	537	479	462.8	389	1151	70
38	10.4	-0.040	532	559	220	538	480	465.8	390	1147	70
39	10.2	-0.040	538	565	220	538	481	468.7	390	1157	69
40	10.0	-0.040	544	571	222	539	483	472.0	391	1152	70
41	9.8	-0.040	550	578	225	540	484	475.2	391	1159	70
42	9.6	-0.040	555	584	226	539	485	477.9	393	1176	70
43	9.3	-0.040	561	588	227	542	487	481.1	394	1185	70
44	9.2	-0.040	567	592	229	544	488	484.1	395	1191	70

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Preburn Start Time: 14:20  
 Recording Interval (min): 1  
 Run Time (min): 93

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	9.0	-0.040	574	595	230	547	490	487.1	396	1200	70
46	8.8	-0.040	580	598	230	550	493	490.1	398	1190	70
47	8.6	-0.040	585	603	232	551	495	493.2	399	1166	70
48	8.4	-0.040	590	609	234	551	497	496.1	400	1155	70
49	8.2	-0.040	594	615	235	551	499	498.8	401	1154	70
50	8.0	-0.040	598	620	237	551	501	501.5	402	1163	70
51	7.9	-0.040	603	625	239	552	504	504.4	403	1170	70
52	7.7	-0.040	607	629	240	552	506	506.8	405	1196	71
53	7.5	-0.040	613	631	241	555	509	509.8	407	1213	71
54	7.4	-0.040	619	632	242	559	511	512.6	408	1218	70
55	7.2	-0.040	625	634	243	561	514	515.3	409	1220	71
56	7.1	-0.040	631	635	244	564	516	518.1	410	1224	71
57	6.9	-0.040	639	637	246	567	519	521.4	411	1249	71
58	6.7	-0.040	647	637	246	575	522	525.4	413	1252	71
59	6.6	-0.040	654	638	248	579	525	528.7	414	1216	71
60	6.5	-0.040	661	639	249	578	527	530.5	415	1196	71
61	6.3	-0.040	667	639	251	577	529	532.5	416	1186	71
62	6.2	-0.040	672	639	252	576	530	533.9	417	1181	70
63	6.1	-0.040	678	639	254	574	532	535.4	418	1181	70
64	5.9	-0.040	682	639	255	573	533	536.6	419	1175	70
65	5.8	-0.040	687	640	258	572	535	538.2	420	1169	70
66	5.7	-0.040	691	641	258	571	536	539.4	420	1162	71
67	5.6	-0.040	694	643	261	569	537	540.8	421	1158	71
68	5.4	-0.040	697	645	261	567	538	541.7	422	1161	71
69	5.3	-0.040	700	649	263	568	539	543.7	423	1176	71
70	5.2	-0.040	700	655	266	569	540	546.1	425	1174	71
71	5.1	-0.040	698	661	269	569	541	547.5	425	1175	71
72	5.1	-0.040	694	666	272	565	542	547.8	425	1139	70
73	5.0	-0.040	691	670	274	560	543	547.5	425	1102	71
74	4.9	-0.040	686	674	276	554	545	546.8	424	1073	71
75	4.8	-0.040	683	678	277	547	546	546.2	423	1050	70
76	4.7	-0.040	680	682	279	541	546	545.6	421	1031	71
77	4.7	-0.040	676	685	281	535	547	544.6	420	1018	71
78	4.6	-0.040	674	687	281	528	547	543.4	419	1011	70
79	4.6	-0.040	671	689	281	523	547	542.3	417	1003	71
80	4.5	-0.040	668	690	282	517	548	541.0	415	988	71
81	4.4	-0.040	664	690	283	512	548	539.3	414	980	71
82	4.4	-0.040	660	687	283	507	548	536.9	412	980	72
83	4.3	-0.040	655	683	282	503	548	534.1	410	984	72
84	4.3	-0.040	651	679	280	500	548	531.5	408	988	72
85	4.2	-0.040	646	674	278	497	547	528.6	406	992	71
86	4.2	-0.040	643	670	276	493	547	525.8	404	991	71
87	4.2	-0.040	638	665	275	491	547	523.4	401	1001	71
88	4.1	-0.040	633	661	274	489	547	520.8	399	998	72
89	4.1	-0.040	628	658	272	486	547	518.2	396	987	72

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Preburn Start Time: 14:20  
 Recording Interval (min): 1  
 Run Time (min): 93

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
90	4.0	-0.040	624	654	271	483	547	515.9	394	970	72
91	4.0	-0.040	620	651	269	480	547	513.3	391	957	72
92	4.0	-0.040	617	647	268	477	548	511.2	388	948	72
93	3.9	-0.040	614	643	267	473	549	509.2	385	938	72

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4  
 Test Start Time: 15:55

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Total Sampling Time (min): 191  
 Recording Interval (min): 1

Meter Box  $\gamma$  Factor: 1.002 (A)  
 Meter Box  $\gamma$  Factor: 0.998 (B)  
 Meter Box  $\gamma$  Factor: 0.000 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100%  
 Date Flue Pipe Last Cleaned: 10/7/2018

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	<u>28.75</u>	<u>28.75</u>
Relative Humidity (%)	<u>34.2</u>	<u>34.2</u>
Room Air Velocity (ft/min)	<u>0</u>	<u>0</u>
Scale Audit (lbs)	<u>10.0</u>	<u>10.0</u>
Ambient Sample Volume:		<u>0.000</u> ft <sup>3</sup>

**Sample Train Post-Test Leak Checks**

(A)	<u>0.002</u>	cfm @	<u>-24</u> in. Hg
(B)	<u>0.002</u>	cfm @	<u>-25</u> in. Hg
(Ambient)	<u>0.000</u>	cfm @	<u>0</u> in. Hg

### DILUTION TUNNEL FLOW

#### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	<u>0.028</u>	<u>107</u>
2	<u>0.040</u>	<u>107</u>
3	<u>0.038</u>	<u>107</u>
4	<u>0.020</u>	<u>107</u>
5	<u>0.022</u>	<u>107</u>
6	<u>0.036</u>	<u>107</u>
7	<u>0.044</u>	<u>107</u>
8	<u>0.032</u>	<u>107</u>
Center	<u>0.046</u>	<u>107</u>

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 6 inches  
 Pitot Tube Cp: 0.99 [unitless]  
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole  
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole  
 Tunnel Area: 0.1963 ft<sup>2</sup>

$V_{strav}$ : 12.81 ft/sec  
 $V_{scent}$ : 15.03 ft/sec  
 $F_p$ : 0.852 [ratio]

Initial Tunnel Flow: 129.4 scf/min

Static Pressure: -0.190 in. H<sub>2</sub>O

### TEST FUEL PROPERTIES

#### Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	<u>19,810</u>	<u>19,887</u>
%C	<u>48.73</u>	<u>50</u>
%H	<u>6.87</u>	<u>6.6</u>
%O	<u>43.9</u>	<u>42.9</u>
%Ash	<u>0.5</u>	<u>0.5</u>

#### Actual Fuel Used Properties

Fuel Type:	<u>D. Fir</u>
HHV (kJ/kg)	<u>19,810</u>
%C	<u>48.73</u>
%H	<u>6.87</u>
%O	<u>43.9</u>
%Ash	<u>0.5</u>
MC (%DB)	<u>23.3</u>



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.046	0.50	75	-0.5		18.9		119	381	76	72
1	0.162	0.162	0.046	0.50	76	-0.5	100	18.9	-0.05	109	379	77	72
2	0.324	0.162	0.046	0.50	76	-0.5	100	18.7	-0.17	108	377	77	72
3	0.486	0.162	0.046	0.50	76	-0.5	100	18.5	-0.17	109	375	78	72
4	0.647	0.162	0.046	0.50	76	-0.5	100	18.3	-0.25	109	375	79	72
5	0.809	0.162	0.046	0.50	76	-0.5	100	18.0	-0.23	110	375	79	73
6	0.971	0.162	0.046	0.50	76	-0.5	101	17.8	-0.23	111	376	79	72
7	1.133	0.162	0.046	0.50	76	-0.5	101	17.6	-0.24	112	376	80	72
8	1.295	0.162	0.046	0.50	76	-0.5	101	17.3	-0.24	112	377	80	72
9	1.457	0.162	0.046	0.50	76	-0.5	101	17.1	-0.24	112	377	80	72
10	1.618	0.162	0.046	0.50	76	-0.5	101	16.9	-0.23	112	377	80	72
11	1.780	0.162	0.046	0.50	76	-0.5	101	16.6	-0.22	113	378	80	72
12	1.942	0.162	0.046	0.50	76	-0.5	101	16.4	-0.24	113	379	80	72
13	2.104	0.162	0.046	0.50	76	-0.5	101	16.2	-0.23	113	380	81	72
14	2.266	0.162	0.046	0.50	76	-0.5	101	15.9	-0.22	113	381	81	72
15	2.428	0.162	0.046	0.50	76	-0.5	101	15.7	-0.22	113	382	81	72
16	2.589	0.162	0.046	0.50	76	-0.5	101	15.5	-0.23	113	383	81	72
17	2.751	0.162	0.046	0.50	76	-0.5	101	15.3	-0.23	114	384	81	72
18	2.913	0.162	0.046	0.50	76	-0.5	101	15.0	-0.22	115	386	81	71
19	3.075	0.162	0.046	0.50	76	-0.5	101	14.8	-0.21	115	387	81	72
20	3.237	0.162	0.046	0.50	76	-0.5	101	14.6	-0.25	114	389	81	71
21	3.399	0.162	0.046	0.50	76	-0.5	101	14.4	-0.2	115	390	81	72
22	3.560	0.162	0.046	0.50	76	-0.5	101	14.2	-0.23	115	392	81	72
23	3.722	0.162	0.046	0.50	76	-0.5	101	13.9	-0.23	115	393	81	72
24	3.884	0.162	0.046	0.50	76	-0.5	101	13.7	-0.23	115	394	81	72
25	4.046	0.162	0.046	0.50	77	-0.5	101	13.5	-0.23	115	395	81	72
26	4.208	0.162	0.046	0.50	77	-0.5	101	13.2	-0.22	114	395	81	72
27	4.370	0.162	0.046	0.50	77	-0.5	101	13.0	-0.24	114	396	81	72
28	4.531	0.162	0.046	0.50	77	-0.5	101	12.8	-0.21	114	396	81	72
29	4.693	0.162	0.046	0.50	77	-0.5	101	12.6	-0.2	114	397	81	72
30	4.855	0.162	0.046	0.50	77	-0.5	101	12.4	-0.2	113	398	81	72
31	5.017	0.162	0.046	0.50	77	-0.5	101	12.2	-0.21	113	398	80	72

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	5.179	0.162	0.046	0.50	77	-0.5	101	12.0	-0.22	113	399	80	72
33	5.341	0.162	0.046	0.50	77	-0.5	101	11.8	-0.21	113	399	80	72
34	5.502	0.162	0.046	0.50	77	-0.5	100	11.6	-0.18	112	400	80	72
35	5.664	0.162	0.046	0.50	77	-0.5	100	11.4	-0.16	112	402	80	72
36	5.826	0.162	0.046	0.50	77	-0.5	100	11.3	-0.15	111	403	80	71
37	5.988	0.162	0.046	0.50	77	-0.5	100	11.1	-0.15	110	403	80	71
38	6.150	0.162	0.046	0.50	77	-0.5	100	11.0	-0.14	110	404	80	71
39	6.312	0.162	0.046	0.50	77	-0.5	100	10.8	-0.14	110	404	80	72
40	6.474	0.162	0.046	0.50	77	-0.5	100	10.7	-0.14	110	404	80	71
41	6.635	0.162	0.046	0.50	77	-0.5	100	10.6	-0.12	109	404	80	72
42	6.797	0.162	0.046	0.50	77	-0.5	100	10.4	-0.15	109	404	80	72
43	6.959	0.162	0.046	0.50	77	-0.5	100	10.3	-0.13	109	404	80	72
44	7.121	0.162	0.046	0.50	77	-0.5	100	10.2	-0.14	109	404	80	71
45	7.283	0.162	0.046	0.50	77	-0.5	100	10.0	-0.13	109	404	80	71
46	7.445	0.162	0.046	0.50	77	-0.5	100	9.9	-0.14	108	404	80	71
47	7.606	0.162	0.046	0.50	77	-0.5	100	9.7	-0.14	108	404	79	71
48	7.768	0.162	0.046	0.50	77	-0.5	100	9.6	-0.14	108	405	79	71
49	7.930	0.162	0.046	0.50	77	-0.5	100	9.5	-0.13	108	405	79	71
50	8.092	0.162	0.046	0.50	77	-0.5	100	9.3	-0.14	107	406	79	71
51	8.254	0.162	0.046	0.50	77	-0.5	100	9.2	-0.13	107	406	79	71
52	8.416	0.162	0.046	0.50	77	-0.5	100	9.1	-0.13	107	407	79	72
53	8.577	0.162	0.046	0.50	77	-0.5	100	8.9	-0.13	107	407	79	71
54	8.739	0.162	0.046	0.50	77	-0.5	100	8.8	-0.13	107	407	79	71
55	8.901	0.162	0.046	0.50	77	-0.5	100	8.7	-0.13	107	408	79	71
56	9.063	0.162	0.046	0.50	77	-0.5	100	8.5	-0.14	107	408	79	71
57	9.225	0.162	0.046	0.50	76	-0.5	100	8.4	-0.13	107	409	79	71
58	9.387	0.162	0.046	0.50	76	-0.5	100	8.3	-0.15	106	409	79	71
59	9.548	0.162	0.046	0.50	76	-0.5	100	8.1	-0.13	106	410	79	71
60	9.710	0.162	0.046	0.50	76	-0.5	100	8.0	-0.12	106	410	78	71
61	9.872	0.162	0.046	0.50	76	-0.5	100	7.9	-0.13	106	409	78	70
62	10.034	0.162	0.046	0.50	76	-0.5	100	7.8	-0.1	105	409	79	70
63	10.196	0.162	0.046	0.50	76	-0.5	100	7.7	-0.12	106	409	79	71

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.358	0.162	0.046	0.50	76	-0.5	100	7.5	-0.12	106	408	79	70
65	10.519	0.162	0.046	0.50	76	-0.5	100	7.4	-0.12	105	408	79	70
66	10.681	0.162	0.046	0.50	76	-0.5	100	7.3	-0.11	106	408	79	70
67	10.843	0.162	0.046	0.50	76	-0.5	100	7.2	-0.12	106	407	79	70
68	11.005	0.162	0.046	0.50	76	-0.5	100	7.1	-0.14	107	408	79	70
69	11.167	0.162	0.046	0.50	76	-0.5	100	6.9	-0.13	107	409	79	70
70	11.329	0.162	0.046	0.50	76	-0.5	100	6.8	-0.12	107	409	79	70
71	11.490	0.162	0.046	0.50	76	-0.5	100	6.6	-0.16	107	410	79	70
72	11.652	0.162	0.046	0.50	76	-0.5	100	6.5	-0.12	106	411	79	70
73	11.814	0.162	0.046	0.50	76	-0.5	100	6.4	-0.1	106	411	79	70
74	11.976	0.162	0.046	0.50	76	-0.5	100	6.3	-0.13	106	411	79	70
75	12.138	0.162	0.046	0.50	76	-0.5	100	6.2	-0.1	106	411	79	70
76	12.300	0.162	0.046	0.50	76	-0.5	100	6.1	-0.1	105	410	79	70
77	12.462	0.162	0.046	0.50	76	-0.5	100	6.0	-0.11	105	410	79	70
78	12.623	0.162	0.046	0.50	76	-0.5	100	5.9	-0.1	105	409	79	70
79	12.785	0.162	0.046	0.50	76	-0.5	100	5.8	-0.11	105	408	78	70
80	12.947	0.162	0.046	0.50	76	-0.5	100	5.7	-0.08	104	407	78	70
81	13.109	0.162	0.046	0.50	76	-0.5	100	5.6	-0.1	104	406	78	70
82	13.271	0.162	0.046	0.50	76	-0.5	100	5.5	-0.12	104	405	78	70
83	13.433	0.162	0.046	0.50	76	-0.5	100	5.4	-0.09	104	404	78	70
84	13.594	0.162	0.046	0.50	76	-0.5	100	5.3	-0.08	104	404	78	70
85	13.756	0.162	0.046	0.50	76	-0.5	100	5.2	-0.1	104	404	78	70
86	13.918	0.162	0.046	0.50	76	-0.5	100	5.1	-0.08	104	403	78	70
87	14.080	0.162	0.046	0.50	76	-0.5	100	5.0	-0.08	104	402	78	70
88	14.242	0.162	0.046	0.50	76	-0.5	100	5.0	-0.09	104	401	78	70
89	14.404	0.162	0.046	0.50	76	-0.5	100	4.9	-0.07	103	400	78	70
90	14.565	0.162	0.046	0.50	76	-0.5	100	4.8	-0.07	103	399	78	70
91	14.727	0.162	0.046	0.50	76	-0.5	100	4.7	-0.08	103	397	78	70
92	14.889	0.162	0.046	0.50	76	-0.5	100	4.7	-0.08	103	396	78	70
93	15.051	0.162	0.046	0.50	76	-0.5	100	4.6	-0.07	103	395	78	70
94	15.213	0.162	0.046	0.50	76	-0.5	100	4.5	-0.08	103	394	78	70
95	15.375	0.162	0.046	0.50	76	-0.5	100	4.4	-0.07	103	393	78	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.536	0.162	0.046	0.50	75	-0.5	100	4.4	-0.07	103	393	78	70
97	15.698	0.162	0.046	0.50	75	-0.5	100	4.3	-0.09	103	393	78	70
98	15.860	0.162	0.046	0.50	75	-0.5	100	4.2	-0.07	103	394	78	70
99	16.022	0.162	0.046	0.50	75	-0.5	100	4.1	-0.1	102	395	78	70
100	16.184	0.162	0.046	0.50	75	-0.5	100	4.0	-0.07	102	395	78	70
101	16.346	0.162	0.046	0.50	75	-0.5	100	4.0	-0.07	102	396	78	69
102	16.507	0.162	0.046	0.50	75	-0.5	100	3.9	-0.08	103	396	78	70
103	16.669	0.162	0.046	0.50	75	-0.5	100	3.8	-0.08	102	396	78	70
104	16.831	0.162	0.046	0.50	75	-0.5	100	3.7	-0.08	102	396	78	70
105	16.993	0.162	0.046	0.50	75	-0.5	100	3.7	-0.06	102	396	77	70
106	17.155	0.162	0.046	0.50	75	-0.5	100	3.6	-0.08	102	396	77	70
107	17.317	0.162	0.046	0.50	75	-0.5	100	3.5	-0.09	102	396	77	70
108	17.478	0.162	0.046	0.50	75	-0.5	100	3.4	-0.06	102	395	77	70
109	17.640	0.162	0.046	0.50	75	-0.5	100	3.4	-0.06	101	394	77	70
110	17.802	0.162	0.046	0.50	75	-0.5	100	3.3	-0.06	101	393	77	69
111	17.964	0.162	0.046	0.50	75	-0.5	100	3.3	-0.04	100	392	77	70
112	18.126	0.162	0.046	0.50	75	-0.5	100	3.2	-0.07	100	390	77	70
113	18.288	0.162	0.046	0.50	75	-0.5	100	3.2	-0.05	100	388	77	70
114	18.449	0.162	0.046	0.50	75	-0.5	100	3.1	-0.04	100	385	77	70
115	18.611	0.162	0.046	0.50	75	-0.5	100	3.1	-0.06	100	383	77	70
116	18.773	0.162	0.046	0.50	75	-0.5	100	3.0	-0.04	100	381	77	70
117	18.935	0.162	0.046	0.50	75	-0.5	100	3.0	-0.06	100	379	77	70
118	19.097	0.162	0.046	0.50	75	-0.5	100	2.9	-0.06	99	377	77	70
119	19.259	0.162	0.046	0.50	75	-0.5	100	2.8	-0.05	99	375	77	69
120	19.421	0.162	0.046	0.50	75	-0.5	100	2.8	-0.05	99	374	77	70
121	19.582	0.162	0.046	0.50	75	-0.5	100	2.7	-0.05	99	373	77	70
122	19.744	0.162	0.046	0.50	75	-0.5	100	2.7	-0.07	99	372	77	70
123	19.906	0.162	0.046	0.50	75	-0.5	100	2.6	-0.04	99	372	77	70
124	20.068	0.162	0.046	0.50	75	-0.5	100	2.6	-0.06	99	371	77	69
125	20.230	0.162	0.046	0.50	75	-0.5	100	2.5	-0.05	99	371	77	69
126	20.392	0.162	0.046	0.50	75	-0.5	100	2.5	-0.05	99	371	77	69
127	20.553	0.162	0.046	0.50	75	-0.5	100	2.4	-0.06	99	371	77	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.715	0.162	0.046	0.50	75	-0.5	100	2.4	-0.06	99	371	77	69
129	20.877	0.162	0.046	0.50	75	-0.5	100	2.3	-0.05	99	372	77	69
130	21.039	0.162	0.046	0.50	75	-0.5	100	2.3	-0.05	99	372	77	69
131	21.201	0.162	0.046	0.50	75	-0.5	100	2.2	-0.06	99	371	77	69
132	21.363	0.162	0.046	0.50	75	-0.5	100	2.1	-0.07	99	371	77	70
133	21.524	0.162	0.046	0.50	75	-0.5	100	2.1	-0.04	99	371	77	70
134	21.686	0.162	0.046	0.50	74	-0.5	100	2.0	-0.07	99	371	77	69
135	21.848	0.162	0.046	0.50	74	-0.5	100	2.0	-0.05	99	372	77	70
136	22.010	0.162	0.046	0.50	74	-0.5	100	1.9	-0.05	99	372	77	69
137	22.172	0.162	0.046	0.50	74	-0.5	100	1.9	-0.05	98	372	76	69
138	22.334	0.162	0.046	0.50	74	-0.5	100	1.8	-0.04	98	372	76	69
139	22.495	0.162	0.046	0.50	74	-0.5	100	1.8	-0.03	98	372	76	69
140	22.657	0.162	0.046	0.50	74	-0.5	100	1.8	-0.04	98	371	76	69
141	22.819	0.162	0.046	0.50	74	-0.5	100	1.7	-0.04	98	369	76	70
142	22.981	0.162	0.046	0.50	74	-0.5	100	1.7	-0.04	97	366	76	70
143	23.143	0.162	0.046	0.50	74	-0.5	100	1.6	-0.03	97	364	76	69
144	23.305	0.162	0.046	0.50	74	-0.5	100	1.6	-0.03	97	361	76	70
145	23.466	0.162	0.046	0.50	74	-0.5	100	1.6	-0.03	97	359	76	69
146	23.628	0.162	0.046	0.50	74	-0.5	100	1.5	-0.05	97	357	76	69
147	23.790	0.162	0.046	0.50	74	-0.5	100	1.5	-0.02	97	354	76	69
148	23.952	0.162	0.046	0.50	74	-0.5	100	1.5	-0.04	97	352	76	69
149	24.114	0.162	0.046	0.50	74	-0.5	100	1.4	-0.04	97	350	76	69
150	24.276	0.162	0.046	0.50	74	-0.5	100	1.4	-0.05	97	348	76	70
151	24.437	0.162	0.046	0.50	74	-0.5	100	1.4	-0.02	96	347	76	69
152	24.599	0.162	0.046	0.50	74	-0.5	100	1.3	-0.04	97	345	76	69
153	24.761	0.162	0.046	0.50	74	-0.5	100	1.3	-0.02	97	343	76	69
154	24.923	0.162	0.046	0.50	74	-0.5	100	1.2	-0.06	96	342	76	69
155	25.085	0.162	0.046	0.50	74	-0.5	100	1.2	-0.02	96	340	76	69
156	25.247	0.162	0.046	0.50	74	-0.5	100	1.2	-0.02	97	339	76	69
157	25.409	0.162	0.046	0.50	74	-0.5	100	1.1	-0.06	97	337	76	69
158	25.570	0.162	0.046	0.50	74	-0.5	100	1.1	-0.02	96	336	76	69
159	25.732	0.162	0.046	0.50	74	-0.5	100	1.1	-0.02	96	335	76	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.894	0.162	0.046	0.50	74	-0.5	100	1.1	-0.05	96	334	76	69
161	26.056	0.162	0.046	0.50	74	-0.5	100	1.0	-0.03	96	332	75	69
162	26.218	0.162	0.046	0.50	74	-0.5	100	1.0	-0.03	96	331	75	69
163	26.380	0.162	0.046	0.50	74	-0.5	100	1.0	-0.04	96	330	75	69
164	26.541	0.162	0.046	0.50	73	-0.5	100	0.9	-0.02	96	329	75	69
165	26.703	0.162	0.046	0.50	73	-0.5	100	0.9	-0.03	96	328	75	69
166	26.865	0.162	0.046	0.50	73	-0.5	100	0.9	-0.04	97	327	75	69
167	27.027	0.162	0.046	0.50	73	-0.5	100	0.8	-0.03	96	325	75	69
168	27.189	0.162	0.046	0.50	73	-0.5	100	0.8	-0.02	96	324	75	69
169	27.351	0.162	0.046	0.50	73	-0.5	100	0.8	-0.04	96	323	75	69
170	27.512	0.162	0.046	0.50	73	-0.5	100	0.8	-0.02	96	322	75	69
171	27.674	0.162	0.046	0.50	73	-0.5	100	0.7	-0.04	96	322	75	69
172	27.836	0.162	0.046	0.50	73	-0.5	100	0.7	-0.04	96	321	75	69
173	27.998	0.162	0.046	0.50	73	-0.5	100	0.6	-0.03	96	320	75	69
174	28.160	0.162	0.046	0.50	73	-0.5	100	0.6	-0.01	96	319	75	69
175	28.322	0.162	0.046	0.50	73	-0.5	100	0.6	-0.04	96	318	75	69
176	28.483	0.162	0.046	0.50	73	-0.5	100	0.6	-0.03	96	318	75	69
177	28.645	0.162	0.046	0.50	73	-0.5	100	0.5	-0.03	96	317	75	69
178	28.807	0.162	0.046	0.50	73	-0.5	100	0.5	-0.02	96	316	75	69
179	28.969	0.162	0.046	0.50	73	-0.5	100	0.5	-0.04	96	315	75	69
180	29.131	0.162	0.046	0.50	73	-0.5	100	0.4	-0.03	96	314	75	69
181	29.293	0.162	0.046	0.50	73	-0.5	100	0.4	-0.04	96	313	75	69
182	29.454	0.162	0.046	0.50	73	-0.5	100	0.4	-0.02	96	313	75	69
183	29.616	0.162	0.046	0.50	73	-0.5	100	0.4	-0.03	96	312	75	69
184	29.778	0.162	0.046	0.50	73	-0.5	100	0.3	-0.04	96	311	75	68
185	29.940	0.162	0.046	0.50	73	-0.5	100	0.3	-0.03	96	311	75	69
186	30.102	0.162	0.046	0.50	73	-0.5	100	0.3	-0.03	96	311	75	68
187	30.264	0.162	0.046	0.50	73	-0.5	100	0.2	-0.03	96	310	75	68
188	30.425	0.162	0.046	0.50	73	-0.5	100	0.2	-0.04	96	311	75	69
189	30.587	0.162	0.046	0.50	73	-0.5	100	0.1	-0.04	96	311	75	68
190	30.749	0.162	0.046	0.50	73	-0.5	100	0.1	-0.03	95	312	75	68
191	30.911	0.162	0.046	0.50	73	-0.5	100	0.0	-0.11	95	313	74	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>Valley Comfort</u>	Job #: <u>18-421</u>
Model: <u>Blaze King PE32</u>	Tracking #: <u>0012</u>
Run #: <u>4</u>	Technician: <u>SJB</u>
	Date: <u>10/10/2018</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
Avg/Tot	30.911	0.162	0.046	0.50	75	-0.50	100			103	376	78	70.2

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	74	-2		76	-0.040	7.69	0.02
1	0.166	0.166	0.50	74	-2	101	77	-0.040	5.45	0.01
2	0.332	0.166	0.50	74	-2	101	78	-0.040	8.94	0.01
3	0.498	0.166	0.50	74	-2	101	79	-0.040	11.12	0.02
4	0.664	0.166	0.50	75	-2	101	79	-0.040	14.06	0.20
5	0.830	0.166	0.50	75	-2	101	80	-0.040	14.90	0.56
6	0.996	0.166	0.50	75	-2	101	80	-0.040	14.80	0.27
7	1.161	0.166	0.50	75	-2	101	80	-0.040	15.82	1.49
8	1.327	0.166	0.50	75	-2	101	81	-0.040	15.70	0.91
9	1.493	0.166	0.50	75	-2	101	81	-0.050	15.40	0.77
10	1.659	0.166	0.50	75	-2	101	81	-0.040	15.37	0.70
11	1.825	0.166	0.50	75	-2	101	81	-0.050	15.50	0.67
12	1.991	0.166	0.50	75	-2	101	81	-0.050	15.59	0.68
13	2.157	0.166	0.50	75	-2	101	82	-0.050	15.82	0.73
14	2.323	0.166	0.50	76	-2	101	81	-0.040	15.63	0.59
15	2.489	0.166	0.50	76	-2	101	82	-0.040	15.69	0.59
16	2.655	0.166	0.50	76	-2	101	82	-0.050	15.91	0.76
17	2.821	0.166	0.50	76	-2	101	82	-0.050	16.13	0.84
18	2.987	0.166	0.50	76	-2	101	82	-0.050	16.35	1.00
19	3.153	0.166	0.50	76	-2	101	82	-0.050	16.47	1.15
20	3.318	0.166	0.50	77	-2	101	82	-0.040	16.49	1.30
21	3.484	0.166	0.50	77	-2	101	82	-0.040	10.09	0.65
22	3.650	0.166	0.50	77	-2	101	82	-0.040	15.89	1.90
23	3.816	0.166	0.50	77	-2	101	82	-0.040	16.26	2.18
24	3.982	0.166	0.50	77	-2	101	82	-0.050	16.22	2.53
25	4.148	0.166	0.50	77	-2	101	82	-0.050	16.13	2.66
26	4.314	0.166	0.50	77	-2	101	82	-0.040	16.22	2.36
27	4.480	0.166	0.50	77	-2	101	82	-0.040	16.10	2.43
28	4.646	0.166	0.50	77	-2	101	82	-0.040	16.13	2.09
29	4.812	0.166	0.50	77	-2	101	82	-0.050	16.20	1.87
30	4.978	0.166	0.50	78	-2	101	82	-0.040	16.29	2.01
31	5.144	0.166	0.50	78	-2	101	81	-0.040	16.29	2.18



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	5.309	0.166	0.50	78	-2	101	81	-0.040	16.49	2.43
33	5.475	0.166	0.50	78	-2	100	81	-0.040	16.45	2.52
34	5.641	0.166	0.50	78	-2	100	81	-0.040	16.00	1.87
35	5.807	0.166	0.50	78	-2	100	81	-0.040	14.71	1.01
36	5.973	0.166	0.50	78	-2	100	81	-0.040	13.82	0.74
37	6.139	0.166	0.50	78	-2	100	81	-0.040	13.75	0.64
38	6.305	0.166	0.50	78	-2	100	81	-0.040	13.64	0.57
39	6.471	0.166	0.50	78	-2	100	81	-0.040	13.51	0.59
40	6.637	0.166	0.50	78	-2	100	81	-0.040	13.41	0.53
41	6.803	0.166	0.50	78	-2	100	81	-0.040	13.24	0.51
42	6.969	0.166	0.50	79	-2	100	81	-0.040	9.92	0.43
43	7.135	0.166	0.50	79	-2	100	81	-0.040	13.30	0.47
44	7.301	0.166	0.50	79	-2	100	81	-0.040	13.27	0.49
45	7.466	0.166	0.50	79	-2	100	81	-0.040	13.46	0.48
46	7.632	0.166	0.50	79	-2	100	81	-0.040	13.56	0.51
47	7.798	0.166	0.50	78	-2	100	81	-0.040	13.62	0.47
48	7.964	0.166	0.50	78	-2	100	80	-0.040	13.68	0.45
49	8.130	0.166	0.50	78	-2	100	80	-0.040	13.75	0.51
50	8.296	0.166	0.50	78	-2	100	80	-0.040	13.52	0.53
51	8.462	0.166	0.50	78	-2	100	80	-0.040	13.73	0.59
52	8.628	0.166	0.50	78	-2	100	80	-0.040	13.74	0.58
53	8.794	0.166	0.50	78	-2	100	80	-0.040	13.82	0.56
54	8.960	0.166	0.50	78	-2	100	80	-0.040	13.89	0.49
55	9.126	0.166	0.50	78	-2	100	80	-0.040	14.11	0.55
56	9.292	0.166	0.50	78	-2	100	80	-0.040	14.39	0.45
57	9.458	0.166	0.50	77	-2	100	80	-0.040	14.30	0.56
58	9.623	0.166	0.50	77	-2	100	80	-0.040	14.34	0.61
59	9.789	0.166	0.50	77	-2	100	80	-0.040	14.07	0.60
60	9.955	0.166	0.50	77	-2	100	79	-0.040	13.80	0.59
61	10.121	0.166	0.50	77	-2	100	79	-0.040	13.42	0.45
62	10.287	0.166	0.50	77	-2	100	79	-0.040	13.42	0.45
63	10.453	0.166	0.50	77	-2	100	79	-0.040	13.26	0.41

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	10.619	0.166	0.50	77	-2	100	79	-0.040	13.27	0.41
65	10.785	0.166	0.50	77	-2	100	79	-0.040	12.93	0.32
66	10.951	0.166	0.50	77	-2	100	79	-0.040	13.16	0.55
67	11.117	0.166	0.50	77	-2	100	79	-0.040	12.99	0.42
68	11.283	0.166	0.50	77	-2	100	79	-0.040	14.71	0.23
69	11.449	0.166	0.50	77	-2	100	79	-0.040	15.14	0.41
70	11.615	0.166	0.50	77	-2	100	79	-0.040	15.28	0.45
71	11.780	0.166	0.50	77	-2	100	79	-0.040	14.97	0.33
72	11.946	0.166	0.50	77	-2	100	79	-0.040	14.72	0.06
73	12.112	0.166	0.50	77	-2	100	79	-0.040	14.27	0.00
74	12.278	0.166	0.50	77	-2	100	79	-0.040	13.87	0.00
75	12.444	0.166	0.50	77	-2	100	79	-0.040	13.48	0.00
76	12.610	0.166	0.50	77	-2	100	79	-0.040	13.17	0.00
77	12.776	0.166	0.50	76	-2	100	79	-0.040	12.88	0.00
78	12.942	0.166	0.50	76	-2	100	79	-0.040	12.45	0.00
79	13.108	0.166	0.50	76	-2	100	79	-0.040	12.57	0.00
80	13.274	0.166	0.50	76	-2	100	79	-0.040	12.63	0.00
81	13.440	0.166	0.50	76	-2	100	79	-0.040	12.64	0.00
82	13.606	0.166	0.50	76	-2	100	79	-0.040	12.88	0.01
83	13.771	0.166	0.50	76	-2	100	79	-0.040	12.97	0.03
84	13.937	0.166	0.50	76	-2	100	79	-0.040	12.55	0.01
85	14.103	0.166	0.50	76	-2	100	79	-0.040	12.27	0.01
86	14.269	0.166	0.50	76	-2	100	79	-0.040	12.36	0.01
87	14.435	0.166	0.50	76	-2	100	79	-0.040	12.04	0.04
88	14.601	0.166	0.50	76	-2	100	79	-0.040	11.85	0.04
89	14.767	0.166	0.50	76	-2	100	79	-0.040	11.81	0.03
90	14.933	0.166	0.50	76	-2	100	79	-0.040	11.56	0.01
91	15.099	0.166	0.50	76	-2	100	79	-0.040	11.55	0.01
92	15.265	0.166	0.50	76	-2	100	78	-0.040	11.41	0.00
93	15.431	0.166	0.50	76	-2	100	78	-0.040	11.45	0.00
94	15.597	0.166	0.50	76	-2	100	79	-0.040	11.51	0.00
95	15.763	0.166	0.50	76	-2	100	78	-0.040	11.72	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	15.928	0.166	0.50	76	-2	100	78	-0.040	11.83	0.00
97	16.094	0.166	0.50	76	-2	100	78	-0.040	11.93	0.00
98	16.260	0.166	0.50	76	-2	100	78	-0.040	11.99	0.00
99	16.426	0.166	0.50	76	-2	100	78	-0.040	12.04	0.00
100	16.592	0.166	0.50	76	-2	100	78	-0.040	11.81	0.00
101	16.758	0.166	0.50	76	-2	100	78	-0.040	11.65	0.00
102	16.924	0.166	0.50	76	-2	100	78	-0.040	11.69	0.00
103	17.090	0.166	0.50	76	-2	100	78	-0.040	11.76	0.00
104	17.256	0.166	0.50	76	-2	100	78	-0.040	11.91	0.00
105	17.422	0.166	0.50	76	-2	100	78	-0.040	12.07	0.00
106	17.588	0.166	0.50	76	-2	100	78	-0.040	11.95	0.00
107	17.754	0.166	0.50	76	-2	100	78	-0.040	11.53	0.00
108	17.920	0.166	0.50	76	-2	100	78	-0.040	11.00	0.00
109	18.085	0.166	0.50	76	-2	100	78	-0.040	10.70	0.00
110	18.251	0.166	0.50	76	-2	100	78	-0.040	10.39	0.00
111	18.417	0.166	0.50	76	-2	100	78	-0.040	10.11	0.00
112	18.583	0.166	0.50	76	-2	100	78	-0.040	9.78	0.00
113	18.749	0.166	0.50	76	-2	100	78	-0.040	9.80	0.00
114	18.915	0.166	0.50	76	-2	100	78	-0.040	9.90	0.00
115	19.081	0.166	0.50	76	-2	100	78	-0.040	10.05	0.00
116	19.247	0.166	0.50	76	-2	100	78	-0.040	9.96	0.00
117	19.413	0.166	0.50	76	-2	100	78	-0.040	10.03	0.00
118	19.579	0.166	0.50	76	-2	100	78	-0.040	10.11	0.00
119	19.745	0.166	0.50	76	-2	100	78	-0.040	10.18	0.00
120	19.911	0.166	0.50	76	-2	100	77	-0.040	10.16	0.00
121	20.076	0.166	0.50	76	-2	100	77	-0.040	10.22	0.00
122	20.242	0.166	0.50	76	-2	100	77	-0.040	10.19	0.00
123	20.408	0.166	0.50	76	-2	100	77	-0.040	10.13	0.00
124	20.574	0.166	0.50	76	-2	100	77	-0.040	10.22	0.00
125	20.740	0.166	0.50	76	-2	100	77	-0.040	10.35	0.00
126	20.906	0.166	0.50	76	-2	100	77	-0.040	10.48	0.00
127	21.072	0.166	0.50	76	-2	100	77	-0.040	10.58	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	21.238	0.166	0.50	76	-2	100	77	-0.040	10.18	0.00
129	21.404	0.166	0.50	76	-2	100	77	-0.040	10.15	0.00
130	21.570	0.166	0.50	76	-2	100	77	-0.040	9.81	0.00
131	21.736	0.166	0.50	76	-2	100	77	-0.040	9.88	0.00
132	21.902	0.166	0.50	76	-2	100	77	-0.040	9.98	0.00
133	22.068	0.166	0.50	76	-2	100	77	-0.040	10.25	0.00
134	22.233	0.166	0.50	76	-2	100	77	-0.040	10.44	0.00
135	22.399	0.166	0.50	76	-2	100	77	-0.040	10.39	0.00
136	22.565	0.166	0.50	75	-2	100	77	-0.040	10.08	0.00
137	22.731	0.166	0.50	75	-2	100	77	-0.040	9.74	0.00
138	22.897	0.166	0.50	75	-2	100	77	-0.040	9.63	0.00
139	23.063	0.166	0.50	75	-2	100	77	-0.040	9.03	0.00
140	23.229	0.166	0.50	75	-2	100	77	-0.040	8.72	0.00
141	23.395	0.166	0.50	75	-2	100	77	-0.040	8.73	0.00
142	23.561	0.166	0.50	75	-2	100	77	-0.040	8.60	0.00
143	23.727	0.166	0.50	75	-2	100	77	-0.040	8.57	0.00
144	23.893	0.166	0.50	75	-2	100	77	-0.040	8.57	0.00
145	24.059	0.166	0.50	75	-2	100	77	-0.040	8.67	0.00
146	24.225	0.166	0.50	75	-2	100	77	-0.040	8.65	0.00
147	24.390	0.166	0.50	75	-2	100	77	-0.040	8.71	0.00
148	24.556	0.166	0.50	75	-2	100	77	-0.040	8.78	0.00
149	24.722	0.166	0.50	75	-2	100	76	-0.040	8.94	0.00
150	24.888	0.166	0.50	75	-2	100	76	-0.040	8.91	0.00
151	25.054	0.166	0.50	75	-2	100	76	-0.040	8.82	0.00
152	25.220	0.166	0.50	75	-2	100	76	-0.040	8.73	0.00
153	25.386	0.166	0.50	75	-2	100	76	-0.040	8.65	0.00
154	25.552	0.166	0.50	75	-2	100	76	-0.040	8.63	0.00
155	25.718	0.166	0.50	75	-2	100	76	-0.040	8.54	0.00
156	25.884	0.166	0.50	75	-2	100	76	-0.040	8.51	0.00
157	26.050	0.166	0.50	75	-2	100	76	-0.040	8.38	0.00
158	26.216	0.166	0.50	75	-2	100	76	-0.040	8.39	0.00
159	26.382	0.166	0.50	75	-2	100	76	-0.040	8.32	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	26.547	0.166	0.50	75	-2	100	76	-0.040	8.30	0.00
161	26.713	0.166	0.50	75	-2	100	76	-0.040	8.35	0.00
162	26.879	0.166	0.50	75	-2	100	76	-0.040	8.30	0.00
163	27.045	0.166	0.50	75	-2	100	76	-0.040	8.25	0.00
164	27.211	0.166	0.50	75	-2	100	76	-0.040	8.24	0.00
165	27.377	0.166	0.50	75	-2	100	76	-0.040	8.12	0.00
166	27.543	0.166	0.50	74	-2	100	76	-0.040	8.19	0.00
167	27.709	0.166	0.50	75	-2	100	76	-0.040	8.09	0.00
168	27.875	0.166	0.50	74	-2	100	76	-0.040	8.11	0.00
169	28.041	0.166	0.50	74	-2	100	76	-0.040	8.17	0.00
170	28.207	0.166	0.50	74	-2	100	76	-0.040	8.13	0.00
171	28.373	0.166	0.50	74	-2	100	76	-0.040	7.94	0.00
172	28.538	0.166	0.50	74	-2	100	76	-0.040	7.98	0.00
173	28.704	0.166	0.50	74	-2	100	76	-0.040	7.98	0.00
174	28.870	0.166	0.50	74	-2	100	76	-0.040	7.96	0.00
175	29.036	0.166	0.50	74	-2	100	76	-0.040	7.93	0.00
176	29.202	0.166	0.50	74	-2	100	76	-0.040	7.86	0.00
177	29.368	0.166	0.50	74	-2	100	76	-0.040	7.92	0.00
178	29.534	0.166	0.50	74	-2	100	76	-0.040	8.01	0.00
179	29.700	0.166	0.50	74	-2	100	76	-0.040	8.05	0.00
180	29.866	0.166	0.50	74	-2	100	76	-0.040	8.11	0.00
181	30.032	0.166	0.50	74	-2	100	76	-0.040	8.12	0.00
182	30.198	0.166	0.50	74	-2	100	76	-0.040	8.11	0.00
183	30.364	0.166	0.50	74	-2	100	76	-0.040	8.23	0.00
184	30.530	0.166	0.50	74	-2	100	75	-0.040	8.19	0.00
185	30.695	0.166	0.50	74	-2	100	76	-0.040	8.32	0.00
186	30.861	0.166	0.50	74	-2	100	76	-0.040	8.49	0.00
187	31.027	0.166	0.50	74	-2	100	76	-0.040	7.81	0.00
188	31.193	0.166	0.50	74	-2	100	76	-0.040	7.76	0.00
189	31.359	0.166	0.50	74	-2	100	76	-0.040	7.91	0.00
190	31.525	0.166	0.50	74	-2	100	75	-0.040	7.96	0.00
191	31.691	0.166	0.50	74	-2	100	75	-0.040	8.01	0.00

**BOX B TEST DATA - ASTM E2780 / ASTM E2515**

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
Avg/Tot	31.691	0.166	0.50	76	-2.00	100	78	-0.041	11.59	0.32

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 69

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
0	604	631	264	464	552	503.0	845	
1	590	616	258	459	554	495.3	871	
2	574	599	250	461	555	487.9	977	
3	558	583	242	462	556	480.4	1026	
4	545	568	236	468	557	475.0	1122	
5	534	555	232	478	558	471.4	1192	
6	525	544	228	487	558	468.2	1202	
7	517	535	225	494	558	465.9	1193	
8	511	527	223	500	557	463.7	1175	
9	507	520	220	505	556	461.7	1166	
10	504	515	218	510	555	460.4	1171	
11	502	510	217	515	553	459.3	1183	
12	499	505	216	520	551	458.2	1196	
13	497	501	215	524	549	457.5	1206	
14	496	498	213	528	547	456.5	1209	
15	495	495	212	533	544	456.0	1211	
16	495	493	212	538	542	455.9	1225	
17	495	492	212	543	539	456.0	1243	
18	495	491	211	549	537	456.5	1257	
19	496	490	211	553	534	456.8	1269	
20	498	490	210	559	532	457.8	1274	
21	500	490	211	563	529	458.9	1273	
22	503	491	211	567	527	459.6	1266	
23	506	492	212	569	524	460.5	1251	
24	508	493	212	570	521	461.2	1229	
25	512	496	213	570	519	462.0	1208	
26	515	499	214	571	516	463.0	1188	
27	518	503	215	570	514	464.1	1177	
28	521	507	216	569	512	465.1	1181	
29	524	512	216	568	510	466.0	1185	
30	527	516	218	568	508	467.3	1179	
31	530	521	218	565	505	467.9	1165	
32	534	526	219	563	504	468.9	1150	
33	538	531	220	561	502	470.4	1179	
34	542	535	221	563	500	472.1	1238	
35	545	539	222	565	499	473.9	1229	
36	548	543	223	566	497	475.2	1204	
37	550	546	224	565	497	476.5	1189	
38	553	550	226	563	496	477.7	1178	
39	556	553	228	562	495	478.9	1170	
40	558	556	230	560	493	479.5	1166	
41	561	557	230	558	492	479.6	1166	
42	563	557	232	557	490	479.7	1166	
43	565	557	233	556	489	480.0	1175	
44	567	557	234	556	488	480.5	1179	
45	569	557	235	555	487	480.4	1185	
46	570	557	235	555	485	480.3	1188	
47	572	557	236	555	484	480.7	1192	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 69

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
48	574	557	236	555	482	480.8	1195	
49	575	558	236	554	481	481.0	1195	
50	577	558	238	554	480	481.4	1193	
51	579	559	237	554	479	481.5	1194	
52	581	559	238	552	477	481.6	1193	
53	583	559	238	552	476	481.7	1191	
54	586	560	239	551	475	482.1	1190	
55	588	560	239	550	474	482.3	1185	
56	590	561	239	551	473	482.8	1190	
57	592	561	239	551	473	483.0	1208	
58	594	561	239	552	472	483.5	1211	
59	595	561	239	553	471	483.9	1209	
60	597	562	240	553	470	484.5	1204	
61	597	563	239	553	470	484.4	1194	
62	598	564	239	553	469	484.5	1192	
63	599	566	239	553	468	485.0	1188	
64	600	568	239	552	468	485.4	1184	
65	602	570	240	552	467	486.4	1190	
66	606	573	240	551	467	487.2	1197	
67	609	574	240	552	466	488.2	1190	
68	615	575	240	551	466	489.4	1163	
69	622	576	240	552	465	491.1	1172	
70	631	578	241	552	465	493.2	1178	
71	640	579	241	553	464	495.4	1185	
72	648	579	241	555	464	497.4	1188	
73	654	580	241	556	463	498.6	1168	
74	659	580	241	555	463	499.7	1148	
75	663	580	241	553	462	499.9	1131	
76	666	579	240	552	462	499.8	1119	
77	667	579	241	549	461	499.3	1114	
78	667	578	241	547	461	498.8	1101	
79	666	577	242	545	461	498.1	1098	
80	665	577	242	543	460	497.2	1099	
81	663	576	241	542	460	496.4	1107	
82	661	576	242	541	460	496.0	1118	
83	659	575	241	542	460	495.5	1130	
84	657	575	241	542	461	495.1	1139	
85	654	576	241	542	461	494.7	1139	
86	652	576	240	541	461	494.2	1138	
87	650	578	240	542	462	494.1	1159	
88	648	579	239	542	462	494.1	1159	
89	645	581	238	541	463	493.7	1142	
90	644	582	238	539	464	493.3	1131	
91	642	583	236	538	464	492.7	1128	
92	640	584	235	536	465	491.9	1124	
93	637	584	235	534	466	491.2	1118	
94	635	584	236	531	467	490.6	1102	
95	633	585	237	528	468	490.2	1082	



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 69

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	632	585	239	525	469	489.8	1070
97	631	585	240	522	470	489.5	1066
98	631	585	241	518	470	489.3	1063
99	632	586	241	516	471	489.3	1067
100	632	587	243	514	472	489.4	1070
101	632	588	243	513	473	489.5	1072
102	633	588	242	510	474	489.3	1073
103	633	588	243	510	475	489.6	1071
104	635	587	243	508	475	489.5	1063
105	637	587	243	505	476	489.7	1043
106	640	586	243	503	477	489.8	1022
107	644	586	244	498	478	489.9	1006
108	646	586	244	495	479	489.9	1000
109	646	585	244	493	479	489.6	1008
110	645	585	244	491	480	488.9	1014
111	643	584	243	490	481	488.1	1013
112	640	583	241	488	482	486.8	1006
113	638	582	240	485	483	485.6	993
114	635	580	239	482	484	484.0	978
115	633	579	239	478	485	482.8	964
116	633	577	239	474	486	481.8	950
117	632	576	239	470	487	480.8	939
118	631	575	239	466	488	480.0	931
119	631	574	239	463	490	479.3	925
120	631	574	240	459	491	478.8	919
121	630	573	242	456	492	478.5	914
122	631	572	242	453	493	478.1	910
123	630	572	244	449	494	477.8	905
124	630	571	246	447	495	477.8	902
125	629	571	246	445	496	477.5	901
126	629	572	248	443	497	477.7	902
127	628	572	248	441	498	477.7	912
128	628	573	247	441	499	477.6	939
129	628	573	247	440	500	477.7	945
130	628	573	247	439	502	477.4	929
131	627	573	246	437	503	477.2	920
132	627	572	246	436	503	477.1	923
133	627	572	247	436	504	477.3	929
134	628	573	246	435	505	477.4	923
135	628	573	247	435	506	477.4	914
136	628	573	247	433	506	477.3	912
137	627	573	247	433	507	477.5	921
138	626	572	246	433	508	477.0	938
139	624	571	245	433	508	476.2	930
140	622	569	245	433	509	475.4	918
141	619	567	242	431	509	473.6	904
142	617	565	241	430	509	472.3	895
143	614	563	240	427	509	470.6	882

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 69

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	611	561	239	425	510	469.1	870
145	609	559	238	422	510	467.6	863
146	607	557	237	419	511	466.1	856
147	604	556	237	416	511	464.7	848
148	603	554	236	414	511	463.8	843
149	603	554	235	412	511	463.0	842
150	603	552	235	409	512	462.1	842
151	602	552	234	407	512	461.5	843
152	601	551	234	406	512	460.8	842
153	600	550	233	403	512	459.8	842
154	599	549	233	402	512	459.1	842
155	598	548	233	400	512	458.3	838
156	596	547	232	399	513	457.5	837
157	595	546	232	398	513	456.7	834
158	593	544	231	396	513	455.5	833
159	591	542	232	395	513	454.7	833
160	589	541	231	394	513	453.5	833
161	588	539	230	392	514	452.7	831
162	586	538	230	391	514	451.7	831
163	584	536	229	390	514	450.7	831
164	582	534	229	389	514	449.7	830
165	580	532	228	387	514	448.5	825
166	579	530	227	387	515	447.5	824
167	576	528	227	385	515	446.3	824
168	574	527	227	385	516	445.5	824
169	571	525	227	384	516	444.7	827
170	570	523	226	383	517	443.9	828
171	568	522	226	382	517	442.9	827
172	566	520	225	381	517	442.1	826
173	564	519	225	381	518	441.3	827
174	563	517	224	380	518	440.5	825
175	561	516	224	379	519	439.9	824
176	559	515	224	378	519	439.1	822
177	558	514	223	377	520	438.4	821
178	556	513	223	376	520	437.7	816
179	555	512	222	375	521	436.9	812
180	553	511	222	374	522	436.4	809
181	553	510	222	373	522	436.0	808
182	552	509	222	372	523	435.6	807
183	550	509	222	371	524	435.3	805
184	549	509	222	370	524	435.1	803
185	549	510	222	369	525	434.9	802
186	548	510	223	369	525	435.0	801
187	547	511	224	368	526	435.0	793
188	545	511	224	366	527	434.7	786
189	544	511	225	366	528	434.6	781
190	543	510	227	364	528	434.6	778
191	542	510	227	363	529	434.3	777

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
Model: Blaze King PE32  
Run #: 4

Job #: 18-421  
Tracking #: 0012  
Technician: SJB  
Date: 10/10/2018

Stove  $\Delta$ T: 69

Elapsed Time (min)	Temperature Data ( $^{\circ}$ F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Stove ΔT: 69

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			





**WOODSTOVE SURFACE TEMPERATURE DATA**

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

Stove ΔT: 69

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			









## WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort

Job #: 18-421

Model: Blaze King PE32

Tracking #: 0012

Run #: 4

Technician: SJB

Date: 10/10/2018

**Stove ΔT:** 69

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
Model: Blaze King PE32  
Run #: 4

Job #: 18-421  
Tracking #: 0012  
Technician: SJB  
Date: 10/10/2018

Stove ΔT: 69

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 4

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/10/2018

**Stove ΔT:** 69

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
Average	591	553	234	486	499	472	1032

## LAB SAMPLE DATA - ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 4Technician: SJBDate: 10/10/2018**TRAIN A (1st Hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3377	126.5	123.0	3.5
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	3.5
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**TRAIN A (Post 1st hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3378	121.2	121.1	0.1
B. Rear filter catch	Filter	3379	119.4	119.7	-0.3
C. Probe catch*	Probe	9A	116713.6	116713.2	0.4
D. O-Ring catch*	O-Ring	9A	3582.2	3581.1	1.1

Sub-Total	Total Particulate, mg:	1.3
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Train A Aggregate	Total Particulate, mg:	<b>4.8</b>
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**TRAIN B**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3380	124.9	120.9	4.0
B. Rear filter catch	Filter	3381	122.9	122.9	0.0
C. Probe catch*	Probe	9B	117135.6	117135.3	0.3
D. O-Ring catch*	O-Ring	9B	3524.9	3523.8	1.1

Total Particulate, mg:	<b>5.4</b>
------------------------	------------

**AMBIENT**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:	<b>0.0</b>
------------------------	------------

\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 4 Test Date: 10/10/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): High Setting (fully open)

#### Preburn Notes

Time	Notes
14:20 15:54	Added 1.5 lbs of hot coals to empty firebox, loaded pre-burn fuel, turned fan on high setting. Leveled coal bed, zeroed scale in preparation for fuel loading

#### Test Notes

Test Burn Start Time: 15:56 Test Fuel Loaded by: 40 seconds  
 Door Closed: 40 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min 191 min	Changed 1-hour filter. End of Test

Test Burn End Time: 19:07

#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	14:30	-	14:34	19:20	-	19:25
CO <sub>2</sub>	0.00	-	10.04	0.03	-	10.12
CO	0.00	-	2.52	0.01	-	2.49

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature:  Date: 10/11/2018

**WOOD STOVE TEST DATA PACKET  
ASTM E2780/E2515**



**Run 5 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/11/2018

  
\_\_\_\_\_  
Technician Signature

10/23/2018  
\_\_\_\_\_  
Date



## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 5

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/11/2018

<b>Burn Rate (kg/hr):</b>	<b>1.38</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	47.660	48.318	9.694
Average Gas Velocity in Dilution Tunnel (ft/sec)	12.8			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	8276.8			
Average Gas Meter Temperature (°F)	69.5	74.8	75.9	71.7
Total Sample Volume (dscf)	0.000	45.536	45.881	9.315
Average Tunnel Temperature (°F)	87.6			
Total Time of Test (min)	295			
Total Particulate Catch (mg)	0.0	6.6	7.5	0.4
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001449	0.0001635	0.0000429
Total PM Emissions (g)	0.00	5.90	6.65	0.36
Particulate Emission Rate (g/hr)	0.00	1.20	1.35	0.36
Emissions Factor (g/kg)	-	0.87	0.98	-
Difference from Average Total Particulate Emissions (g)	-	0.38	0.38	-
Difference from Average Emissions Factor (g/kg)	-	0.06	0.06	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	6.28
Particulate Emission Rate (g/hr)	1.28
Emissions Factor (g/kg)	0.92
HHV Efficiency (%)	73.7%
LHV Efficiency (%)	79.7%
CO Emissions (g/min)	1.72

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	77.7	OK
Face Velocity	< 30 ft/min	8.8	OK
Leakage Rate	Less than 4% of average sample rate	0.003 cfm	OK
Ambient Temp	55-90 °F	Min: 67.26 / Max: 72.9	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	39.7	OK

## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/11/18  
**Run:** 5  
**Control #:** 18-421  
**Test Duration:** 295  
**Output Category:** 3

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	73.7%	79.7%
<b>Combustion Efficiency</b>	94.6%	94.6%
<b>Heat Transfer Efficiency</b>	77.9%	84.2%

<b>Output Rate (kJ/h)</b>	20,182	19,145	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.38	3.05	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	27,386	25,978	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.80	14.98	<b>dry lb</b>
<b>MC wet (%)</b>	18.32		
<b>MC dry (%)</b>	22.43		
<b>Particulate (g )</b>	6.28		
<b>CO (g)</b>	507		
<b>Test Duration (h)</b>	4.92		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.06	5.11
<b>g/kg Dry Fuel</b>	0.92	74.58
<b>g/h</b>	1.28	103.11
<b>g/min</b>	0.02	1.72
<b>lb/MM Btu Output</b>	0.15	11.87

<b>Air/Fuel Ratio (A/F)</b>	9.70
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	21.7		2x4	17.00	19.3
2x4	17.00	20.1		2x4	17.00	19.0
2x4	17.00	22.6				
2x4	17.00	19.4				
2x4	17.00	23.0				
2x4	17.00	22.5				
2x4	17.00	19.9				
2x4	17.00	21.5				
Total Fuel Weight (lbs):		18.04	Average Moisture (%DB):		20.9	

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.18  
 Total 4x4 Crib Weight, with spacers (lbs): 9.16  
 Total Wet Fuel Weight, with spacers (lbs): 18.34

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.67  
 Max (lbs): 4.59

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	17.00	1.72	24.8	24.6	24.7	1.38
2x4	17.00	1.78	21.9	22.1	22.1	1.46
2x4	17.00	1.76	22.3	22.0	22.2	1.44
2x4	17.00	2.08	21.7	22.0	22.0	1.71
4x4	17.00	4.06	23.0	20.1	22.6	3.33
4x4	17.00	4.00	20.9	22.7	22.0	3.28
Total Dry Weight, no spacers (lbs):						12.60
Total Dry Weight, with spacers (lbs):						14.99

Spacer Moisture Readings (%DB)						
23.8	23.8	24.4	24.2	22.0	24.4	
23.8	23.8	26.0	24.9	22.5	24.4	
25.4	23.8	23.8	21.6	15.9	16.1	
23.8	24.4	15.8	25.0	23.4	24.3	

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	28.1	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.30	OK
2x4 Fuel Mix	35 - 65 % of total weight	50%	OK

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018Preburn Start Time: 9:09Recording Interval (min): 1Run Time (min): 62

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	5.2	-0.030	666	711	426	641	530	594.9	513	1097	68
1	5.2	-0.030	663	705	426	637	532	592.7	511	1056	68
2	5.2	-0.030	657	695	426	630	533	588.2	510	1022	68
3	5.1	-0.030	649	684	426	622	534	583.1	507	1006	68
4	5.1	-0.030	640	673	425	616	535	577.8	505	997	68
5	5.1	-0.030	631	662	424	610	535	572.2	502	989	68
6	5.1	-0.030	621	650	422	601	534	565.8	499	981	68
7	5.1	-0.030	612	639	420	598	534	560.5	496	971	69
8	5.1	-0.020	602	628	417	590	533	554.1	492	962	68
9	5.1	-0.020	593	617	415	588	531	548.9	488	957	68
10	5.1	-0.020	584	607	412	582	530	542.9	484	949	67
11	5.1	-0.020	575	597	409	575	528	536.9	480	939	67
12	5.1	-0.020	566	587	406	567	526	530.6	476	929	67
13	5.1	-0.020	558	578	403	563	524	525.1	471	918	67
14	5.1	-0.020	549	569	400	556	522	519.1	467	907	68
15	5.1	-0.020	542	560	397	551	519	513.6	463	894	67
16	5.1	-0.020	533	551	394	544	517	508.0	458	879	67
17	5.1	-0.020	526	543	391	538	515	502.4	454	864	67
18	5.1	-0.020	519	535	388	531	512	497.1	449	850	67
19	5.1	-0.020	512	528	385	525	509	491.6	445	836	67
20	5.1	-0.020	505	520	381	518	507	486.1	440	823	67
21	5.1	-0.020	497	513	378	512	504	480.9	436	811	67
22	5.1	-0.020	491	506	375	505	502	475.6	432	799	68
23	5.1	-0.020	485	499	372	498	499	470.4	427	789	68
24	5.1	-0.020	479	492	369	491	496	465.4	423	779	67
25	5.1	-0.020	473	485	366	486	494	460.7	419	770	67
26	5.1	-0.020	467	479	363	478	491	455.5	414	761	68
27	5.1	-0.020	462	473	360	473	488	451.1	410	753	67
28	5.1	-0.020	456	467	357	464	485	445.8	406	745	68
29	5.1	-0.020	451	461	354	458	483	441.4	401	737	68
30	5.1	-0.020	445	456	351	456	480	437.6	398	731	68
31	5.1	-0.020	440	450	348	451	477	433.2	394	725	68
32	5.1	-0.020	436	445	345	445	474	429.0	390	720	67
33	5.2	-0.020	431	439	342	440	472	424.7	386	718	68
34	5.1	-0.020	426	434	339	437	469	421.1	382	722	68
35	5.1	-0.020	422	429	336	433	466	417.3	379	731	67
36	5.1	-0.020	418	425	333	427	464	413.3	376	747	67
37	5.1	-0.020	415	420	330	427	461	410.6	373	753	67
38	5.1	-0.020	412	416	327	425	459	407.7	369	751	67
39	5.1	-0.020	410	412	324	421	457	404.7	366	750	67
40	5.1	-0.020	407	409	322	418	455	402.1	363	751	67
41	5.1	-0.020	406	406	320	418	453	400.4	360	752	68
42	5.1	-0.020	405	403	317	414	452	398.1	357	753	67
43	5.0	-0.020	405	401	315	413	451	396.9	355	756	67
44	5.0	-0.020	405	399	313	408	450	395.0	353	758	67

## WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018Preburn Start Time: 9:09Recording Interval (min): 1Run Time (min): 62

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	5.0	-0.020	405	398	312	407	450	394.4	351	760	68
46	5.0	-0.020	406	397	311	409	451	394.5	349	765	67
47	4.9	-0.040	407	396	310	408	452	394.5	348	773	68
48	4.6	-0.020	409	395	309	407	453	394.7	348	754	68
49	4.6	-0.030	411	396	309	406	455	395.5	347	741	68
50	4.6	-0.030	414	396	309	403	457	396.0	346	748	68
51	4.6	-0.030	416	397	309	404	460	397.3	346	753	68
52	4.5	-0.030	419	398	309	405	462	398.5	346	757	68
53	4.5	-0.030	421	399	309	402	464	399.2	346	762	68
54	4.5	-0.030	423	400	309	403	467	400.5	346	768	67
55	4.5	-0.030	425	401	309	404	469	401.9	346	773	68
56	4.4	-0.030	427	402	310	404	472	403.1	347	778	67
57	4.4	-0.030	430	403	310	404	475	404.2	347	782	68
58	4.4	-0.030	431	404	311	404	477	405.5	348	785	68
59	4.4	-0.030	434	406	311	407	479	407.4	349	788	68
60	4.3	-0.030	436	407	312	406	482	408.5	349	791	68
61	4.3	-0.030	437	408	312	407	484	409.8	350	793	68
62	4.3	-0.030	440	410	313	407	486	411.2	351	793	68

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: **Valley Comfort**  
 Model: **Blaze King PE32**  
 Run #: **5**  
 Test Start Time: **10:12**

Job #: **18-421**  
 Tracking #: **0012**  
 Technician: **SJB**  
 Date: **10/11/2018**

Total Sampling Time (min): **295**  
 Recording Interval (min): **1**

Meter Box  $\gamma$  Factor: **1.002** (A)  
 Meter Box  $\gamma$  Factor: **0.998** (B)  
 Meter Box  $\gamma$  Factor: **0.000** (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): **0**  
 Smoke Capture Check (%): **100%**  
 Date Flue Pipe Last Cleaned: **10/7/2018**

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	28.89	28.85
Relative Humidity (%)	28.8	27.9
Room Air Velocity (ft/min)	0	0
Scale Audit (lbs)	10.0	10.0
Ambient Sample Volume:	<b>0.000</b> ft <sup>3</sup>	

**Sample Train Post-Test Leak Checks**

(A)	0.001	cfm @	-25	in. Hg
(B)	0.003	cfm @	-24	in. Hg
(Ambient)	0.000	cfm @	0	in. Hg

## DILUTION TUNNEL FLOW

### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.030	80
2	0.044	80
3	0.030	80
4	0.022	80
5	0.026	80
6	0.036	80
7	0.050	80
8	0.034	80
Center	0.048	80

Dilution Tunnel H<sub>2</sub>O: **2.00** percent  
 Tunnel Diameter: **6** inches  
 Pitot Tube Cp: **0.99** [unitless]  
 Dilution Tunnel MW(dry): **29.00** lb/lb-mole  
 Dilution Tunnel MW(wet): **28.78** lb/lb-mole  
 Tunnel Area: **0.1963** ft<sup>2</sup>

V<sub>strav</sub>: **12.75** ft/sec  
 V<sub>scant</sub>: **14.95** ft/sec  
 F<sub>p</sub>: **0.853** [ratio]

Initial Tunnel Flow: **135.9** scf/min

Static Pressure: **-0.200** in. H<sub>2</sub>O

## TEST FUEL PROPERTIES

### Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

### Actual Fuel Used Properties

Fuel Type:	D. Fir
HHV (kJ/kg)	19,810
%C	48.73
%H	6.87
%O	43.9
%Ash	0.5
MC (%DB)	22.4

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.048	0.50	71	-0.5		18.3		102	354	71	68
1	0.162	0.162	0.048	0.50	71	-0.5	101	18.2	-0.1	90	353	72	68
2	0.323	0.162	0.048	0.50	71	-0.5	101	18.1	-0.1	87	353	72	68
3	0.485	0.162	0.048	0.50	71	-0.5	101	18.1	-0.06	87	352	72	68
4	0.646	0.162	0.048	0.50	71	-0.5	101	18.0	-0.07	86	350	72	68
5	0.808	0.162	0.048	0.50	71	-0.5	101	17.9	-0.07	86	348	72	68
6	0.969	0.162	0.048	0.50	71	-0.5	101	17.9	-0.09	86	346	72	68
7	1.131	0.162	0.048	0.50	71	-0.5	101	17.8	-0.08	86	345	72	67
8	1.292	0.162	0.048	0.50	71	-0.5	101	17.7	-0.09	86	343	73	67
9	1.454	0.162	0.048	0.50	71	-0.5	101	17.6	-0.09	87	342	73	68
10	1.616	0.162	0.048	0.50	71	-0.5	101	17.5	-0.1	87	341	73	68
11	1.777	0.162	0.048	0.50	71	-0.5	101	17.4	-0.11	88	340	73	68
12	1.939	0.162	0.048	0.50	71	-0.5	101	17.3	-0.07	88	340	73	68
13	2.100	0.162	0.048	0.50	71	-0.5	101	17.2	-0.12	88	339	73	68
14	2.262	0.162	0.048	0.50	71	-0.5	101	17.1	-0.09	88	338	73	68
15	2.423	0.162	0.048	0.50	71	-0.5	101	17.0	-0.1	89	338	73	68
16	2.585	0.162	0.048	0.50	71	-0.5	101	16.9	-0.12	89	338	73	68
17	2.747	0.162	0.048	0.50	71	-0.5	101	16.8	-0.11	89	337	73	68
18	2.908	0.162	0.048	0.50	71	-0.5	101	16.7	-0.1	90	337	73	68
19	3.070	0.162	0.048	0.50	71	-0.5	101	16.6	-0.12	90	337	73	68
20	3.231	0.162	0.048	0.50	71	-0.5	101	16.5	-0.07	90	337	73	68
21	3.393	0.162	0.048	0.50	71	-0.5	101	16.3	-0.14	91	336	74	68
22	3.554	0.162	0.048	0.50	71	-0.5	101	16.3	-0.09	91	337	74	68
23	3.716	0.162	0.048	0.50	71	-0.5	101	16.1	-0.11	91	337	74	68
24	3.877	0.162	0.048	0.50	71	-0.5	101	16.0	-0.11	91	338	74	68
25	4.039	0.162	0.048	0.50	71	-0.5	101	15.9	-0.11	91	338	74	68
26	4.201	0.162	0.048	0.50	71	-0.5	101	15.8	-0.1	91	339	74	68
27	4.362	0.162	0.048	0.50	71	-0.5	101	15.7	-0.12	92	341	74	68
28	4.524	0.162	0.048	0.50	72	-0.5	101	15.6	-0.12	92	342	74	68
29	4.685	0.162	0.048	0.50	72	-0.5	101	15.5	-0.1	92	343	74	68
30	4.847	0.162	0.048	0.50	72	-0.5	101	15.4	-0.12	92	345	74	68
31	5.008	0.162	0.048	0.50	72	-0.5	101	15.2	-0.14	93	347	74	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	5.170	0.162	0.048	0.50	72	-0.5	101	15.1	-0.1	93	349	74	68
33	5.331	0.162	0.048	0.50	72	-0.5	101	15.0	-0.12	93	350	74	68
34	5.493	0.162	0.048	0.50	72	-0.5	101	14.9	-0.13	93	352	74	68
35	5.655	0.162	0.048	0.50	72	-0.5	101	14.8	-0.12	93	354	74	68
36	5.816	0.162	0.048	0.50	72	-0.5	101	14.6	-0.13	94	355	74	68
37	5.978	0.162	0.048	0.50	72	-0.5	101	14.5	-0.12	94	357	75	68
38	6.139	0.162	0.048	0.50	72	-0.5	101	14.4	-0.15	94	359	75	68
39	6.301	0.162	0.048	0.50	72	-0.5	101	14.2	-0.13	94	361	75	68
40	6.462	0.162	0.048	0.50	72	-0.5	101	14.1	-0.11	94	364	75	68
41	6.624	0.162	0.048	0.50	72	-0.5	101	14.0	-0.11	94	366	75	68
42	6.785	0.162	0.048	0.50	72	-0.5	101	13.9	-0.13	94	368	75	68
43	6.947	0.162	0.048	0.50	72	-0.5	101	13.8	-0.12	95	371	75	68
44	7.109	0.162	0.048	0.50	72	-0.5	101	13.6	-0.14	95	373	75	68
45	7.270	0.162	0.048	0.50	72	-0.5	101	13.5	-0.13	95	376	75	68
46	7.432	0.162	0.048	0.50	72	-0.5	101	13.3	-0.14	95	380	75	68
47	7.593	0.162	0.048	0.50	72	-0.5	101	13.2	-0.15	96	383	75	68
48	7.755	0.162	0.048	0.50	72	-0.5	101	13.1	-0.14	96	386	75	68
49	7.916	0.162	0.048	0.50	72	-0.5	101	12.9	-0.15	96	389	75	68
50	8.078	0.162	0.048	0.50	72	-0.5	101	12.7	-0.16	96	392	75	68
51	8.240	0.162	0.048	0.50	73	-0.5	101	12.6	-0.12	96	396	75	68
52	8.401	0.162	0.048	0.50	73	-0.5	101	12.5	-0.16	95	399	75	68
53	8.563	0.162	0.048	0.50	73	-0.5	101	12.3	-0.14	95	402	75	68
54	8.724	0.162	0.048	0.50	73	-0.5	101	12.2	-0.11	95	405	75	68
55	8.886	0.162	0.048	0.50	73	-0.5	101	12.1	-0.12	94	408	75	68
56	9.047	0.162	0.048	0.50	73	-0.5	101	12.0	-0.13	95	410	75	68
57	9.209	0.162	0.048	0.50	73	-0.5	101	11.9	-0.11	95	412	75	68
58	9.370	0.162	0.048	0.50	73	-0.5	101	11.7	-0.13	94	415	75	68
59	9.532	0.162	0.048	0.50	73	-0.5	101	11.6	-0.08	94	416	75	68
60	9.694	0.162	0.048	0.50	73	-0.5	101	11.5	-0.11	94	418	75	68
61	9.855	0.162	0.048	0.50	73	-0.5	101	11.4	-0.09	94	420	74	68
62	10.017	0.162	0.048	0.50	73	-0.5	101	11.3	-0.12	94	421	75	68
63	10.178	0.162	0.048	0.50	73	-0.5	101	11.2	-0.1	94	423	76	68



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.340	0.162	0.048	0.50	73	-0.5	101	11.1	-0.13	94	425	76	68
65	10.501	0.162	0.048	0.50	73	-0.5	101	11.0	-0.11	93	427	76	68
66	10.663	0.162	0.048	0.50	73	-0.5	101	10.9	-0.12	94	430	76	68
67	10.824	0.162	0.048	0.50	73	-0.5	101	10.7	-0.15	93	431	76	68
68	10.986	0.162	0.048	0.50	73	-0.5	101	10.6	-0.12	93	433	76	68
69	11.148	0.162	0.048	0.50	74	-0.5	101	10.5	-0.12	93	434	76	68
70	11.309	0.162	0.048	0.50	74	-0.5	101	10.3	-0.15	93	435	76	69
71	11.471	0.162	0.048	0.50	74	-0.5	101	10.2	-0.12	93	437	76	69
72	11.632	0.162	0.048	0.50	74	-0.5	101	10.1	-0.13	93	438	76	69
73	11.794	0.162	0.048	0.50	74	-0.5	101	9.9	-0.13	92	439	76	69
74	11.955	0.162	0.048	0.50	74	-0.5	101	9.8	-0.1	92	440	76	69
75	12.117	0.162	0.048	0.50	74	-0.5	101	9.7	-0.13	92	441	76	69
76	12.279	0.162	0.048	0.50	74	-0.5	101	9.6	-0.11	92	443	75	69
77	12.440	0.162	0.048	0.50	74	-0.5	101	9.5	-0.12	92	444	76	68
78	12.602	0.162	0.048	0.50	74	-0.5	100	9.4	-0.1	91	445	75	68
79	12.763	0.162	0.048	0.50	74	-0.5	100	9.3	-0.1	91	446	75	68
80	12.925	0.162	0.048	0.50	74	-0.5	100	9.2	-0.1	91	447	75	69
81	13.086	0.162	0.048	0.50	74	-0.5	100	9.1	-0.13	91	448	75	69
82	13.248	0.162	0.048	0.50	74	-0.5	100	9.0	-0.09	91	449	75	69
83	13.409	0.162	0.048	0.50	74	-0.5	100	8.9	-0.09	90	449	75	69
84	13.571	0.162	0.048	0.50	74	-0.5	100	8.8	-0.11	90	450	75	69
85	13.733	0.162	0.048	0.50	74	-0.5	100	8.7	-0.1	90	450	75	69
86	13.894	0.162	0.048	0.50	74	-0.5	100	8.6	-0.08	89	450	75	69
87	14.056	0.162	0.048	0.50	74	-0.5	100	8.5	-0.09	89	450	75	69
88	14.217	0.162	0.048	0.50	74	-0.5	100	8.4	-0.1	88	450	75	68
89	14.379	0.162	0.048	0.50	74	-0.5	100	8.3	-0.08	88	450	75	69
90	14.540	0.162	0.048	0.50	74	-0.5	100	8.2	-0.1	88	450	75	69
91	14.702	0.162	0.048	0.50	74	-0.5	100	8.1	-0.1	89	449	75	69
92	14.863	0.162	0.048	0.50	75	-0.5	100	8.0	-0.09	89	449	75	69
93	15.025	0.162	0.048	0.50	75	-0.5	100	7.9	-0.1	88	449	75	69
94	15.187	0.162	0.048	0.50	75	-0.5	100	7.8	-0.11	88	449	75	69
95	15.348	0.162	0.048	0.50	75	-0.5	100	7.7	-0.1	88	448	75	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.510	0.162	0.048	0.50	75	-0.5	100	7.6	-0.11	88	448	75	69
97	15.671	0.162	0.048	0.50	75	-0.5	100	7.5	-0.09	88	448	75	69
98	15.833	0.162	0.048	0.50	75	-0.5	100	7.4	-0.12	88	448	75	69
99	15.994	0.162	0.048	0.50	75	-0.5	100	7.3	-0.08	88	448	75	69
100	16.156	0.162	0.048	0.50	75	-0.5	100	7.2	-0.1	87	448	75	70
101	16.317	0.162	0.048	0.50	75	-0.5	100	7.1	-0.13	88	448	75	69
102	16.479	0.162	0.048	0.50	75	-0.5	100	7.0	-0.07	88	448	75	70
103	16.641	0.162	0.048	0.50	75	-0.5	100	6.9	-0.12	88	448	75	70
104	16.802	0.162	0.048	0.50	75	-0.5	100	6.8	-0.07	88	449	75	69
105	16.964	0.162	0.048	0.50	75	-0.5	100	6.7	-0.08	88	450	75	69
106	17.125	0.162	0.048	0.50	75	-0.5	100	6.6	-0.1	87	450	75	69
107	17.287	0.162	0.048	0.50	75	-0.5	100	6.6	-0.07	87	450	75	69
108	17.448	0.162	0.048	0.50	75	-0.5	100	6.5	-0.09	87	450	75	69
109	17.610	0.162	0.048	0.50	75	-0.5	100	6.4	-0.07	87	449	75	69
110	17.772	0.162	0.048	0.50	75	-0.5	100	6.4	-0.06	87	448	75	69
111	17.933	0.162	0.048	0.50	75	-0.5	100	6.3	-0.09	87	448	75	69
112	18.095	0.162	0.048	0.50	75	-0.5	100	6.2	-0.05	87	447	75	69
113	18.256	0.162	0.048	0.50	75	-0.5	100	6.1	-0.07	86	446	75	69
114	18.418	0.162	0.048	0.50	75	-0.5	100	6.1	-0.07	86	445	75	69
115	18.579	0.162	0.048	0.50	75	-0.5	100	6.0	-0.06	86	444	75	69
116	18.741	0.162	0.048	0.50	75	-0.5	100	5.9	-0.07	86	443	75	69
117	18.902	0.162	0.048	0.50	75	-0.5	100	5.9	-0.05	86	441	75	69
118	19.064	0.162	0.048	0.50	75	-0.5	100	5.8	-0.05	86	440	75	69
119	19.226	0.162	0.048	0.50	75	-0.5	100	5.8	-0.05	85	439	75	69
120	19.387	0.162	0.048	0.50	75	-0.5	100	5.7	-0.05	85	437	75	69
121	19.549	0.162	0.048	0.50	75	-0.5	100	5.7	-0.08	85	436	75	69
122	19.710	0.162	0.048	0.50	75	-0.5	100	5.6	-0.05	86	435	75	69
123	19.872	0.162	0.048	0.50	75	-0.5	100	5.6	-0.05	86	434	75	69
124	20.033	0.162	0.048	0.50	75	-0.5	100	5.5	-0.07	86	434	75	69
125	20.195	0.162	0.048	0.50	75	-0.5	100	5.4	-0.05	86	433	75	69
126	20.356	0.162	0.048	0.50	75	-0.5	100	5.4	-0.05	86	432	75	69
127	20.518	0.162	0.048	0.50	75	-0.5	100	5.3	-0.07	86	432	75	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.680	0.162	0.048	0.50	75	-0.5	100	5.3	-0.06	86	431	75	69
129	20.841	0.162	0.048	0.50	75	-0.5	100	5.2	-0.06	86	431	75	70
130	21.003	0.162	0.048	0.50	75	-0.5	100	5.2	-0.04	86	430	75	69
131	21.164	0.162	0.048	0.50	75	-0.5	100	5.1	-0.07	86	430	75	70
132	21.326	0.162	0.048	0.50	75	-0.5	100	5.0	-0.05	86	429	75	70
133	21.487	0.162	0.048	0.50	75	-0.5	100	5.0	-0.05	86	429	75	69
134	21.649	0.162	0.048	0.50	75	-0.5	100	4.9	-0.06	86	428	75	70
135	21.811	0.162	0.048	0.50	75	-0.5	100	4.9	-0.06	86	428	75	70
136	21.972	0.162	0.048	0.50	75	-0.5	100	4.8	-0.06	86	428	75	70
137	22.134	0.162	0.048	0.50	75	-0.5	100	4.8	-0.05	86	427	75	69
138	22.295	0.162	0.048	0.50	76	-0.5	100	4.7	-0.06	86	427	75	70
139	22.457	0.162	0.048	0.50	76	-0.5	100	4.6	-0.06	86	427	75	70
140	22.618	0.162	0.048	0.50	76	-0.5	100	4.6	-0.05	86	426	75	70
141	22.780	0.162	0.048	0.50	76	-0.5	100	4.6	-0.04	86	426	75	70
142	22.941	0.162	0.048	0.50	76	-0.5	100	4.5	-0.05	86	426	75	70
143	23.103	0.162	0.048	0.50	76	-0.5	100	4.5	-0.05	86	426	75	70
144	23.265	0.162	0.048	0.50	76	-0.5	100	4.4	-0.07	86	426	75	70
145	23.426	0.162	0.048	0.50	76	-0.5	100	4.4	-0.03	86	425	75	70
146	23.588	0.162	0.048	0.50	76	-0.5	100	4.3	-0.07	86	425	75	70
147	23.749	0.162	0.048	0.50	76	-0.5	100	4.2	-0.04	86	425	75	70
148	23.911	0.162	0.048	0.50	76	-0.5	100	4.2	-0.03	86	425	75	70
149	24.072	0.162	0.048	0.50	76	-0.5	100	4.2	-0.06	86	425	75	70
150	24.234	0.162	0.048	0.50	76	-0.5	100	4.1	-0.06	86	425	75	70
151	24.395	0.162	0.048	0.50	76	-0.5	100	4.1	-0.04	86	425	75	70
152	24.557	0.162	0.048	0.50	76	-0.5	100	4.0	-0.05	86	425	75	70
153	24.719	0.162	0.048	0.50	76	-0.5	100	4.0	-0.05	86	425	75	70
154	24.880	0.162	0.048	0.50	76	-0.5	100	3.9	-0.03	86	425	75	70
155	25.042	0.162	0.048	0.50	76	-0.5	100	3.9	-0.06	86	425	75	70
156	25.203	0.162	0.048	0.50	76	-0.5	100	3.8	-0.06	86	425	75	70
157	25.365	0.162	0.048	0.50	76	-0.5	100	3.8	-0.02	86	424	75	70
158	25.526	0.162	0.048	0.50	76	-0.5	100	3.7	-0.06	86	424	75	70
159	25.688	0.162	0.048	0.50	76	-0.5	100	3.7	-0.04	86	424	75	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.849	0.162	0.048	0.50	76	-0.5	100	3.6	-0.06	86	425	75	70
161	26.011	0.162	0.048	0.50	76	-0.5	100	3.6	-0.05	86	425	75	70
162	26.173	0.162	0.048	0.50	76	-0.5	100	3.5	-0.05	86	425	75	70
163	26.334	0.162	0.048	0.50	76	-0.5	100	3.5	-0.05	87	426	75	70
164	26.496	0.162	0.048	0.50	76	-0.5	100	3.4	-0.06	86	427	75	70
165	26.657	0.162	0.048	0.50	76	-0.5	100	3.4	-0.06	86	428	75	70
166	26.819	0.162	0.048	0.50	76	-0.5	100	3.3	-0.03	86	430	75	70
167	26.980	0.162	0.048	0.50	76	-0.5	100	3.3	-0.05	86	431	75	70
168	27.142	0.162	0.048	0.50	76	-0.5	100	3.2	-0.06	86	432	75	70
169	27.304	0.162	0.048	0.50	76	-0.5	100	3.2	-0.04	86	433	75	70
170	27.465	0.162	0.048	0.50	76	-0.5	100	3.2	-0.02	86	434	75	70
171	27.627	0.162	0.048	0.50	76	-0.5	100	3.1	-0.05	86	435	75	71
172	27.788	0.162	0.048	0.50	76	-0.5	100	3.1	-0.03	85	435	75	71
173	27.950	0.162	0.048	0.50	76	-0.5	100	3.1	-0.01	85	435	75	70
174	28.111	0.162	0.048	0.50	76	-0.5	100	3.0	-0.04	86	434	75	70
175	28.273	0.162	0.048	0.50	76	-0.5	100	3.0	-0.02	85	433	75	70
176	28.434	0.162	0.048	0.50	76	-0.5	99	3.0	-0.02	85	432	75	70
177	28.596	0.162	0.048	0.50	76	-0.5	99	3.0	-0.01	85	431	75	70
178	28.758	0.162	0.048	0.50	76	-0.5	99	2.9	-0.05	85	430	75	70
179	28.919	0.162	0.048	0.50	76	-0.5	99	2.9	0	85	428	75	70
180	29.081	0.162	0.048	0.50	76	-0.5	99	2.9	-0.04	85	427	75	70
181	29.242	0.162	0.048	0.50	76	-0.5	99	2.9	0	85	425	75	71
182	29.404	0.162	0.048	0.50	76	-0.5	99	2.9	-0.03	85	424	75	71
183	29.565	0.162	0.048	0.50	76	-0.5	99	2.8	-0.03	85	422	75	71
184	29.727	0.162	0.048	0.50	76	-0.5	99	2.8	-0.01	85	420	75	70
185	29.888	0.162	0.048	0.50	76	-0.5	99	2.8	-0.03	85	418	75	70
186	30.050	0.162	0.048	0.50	76	-0.5	99	2.7	-0.05	85	416	75	71
187	30.212	0.162	0.048	0.50	76	-0.5	99	2.7	-0.01	84	413	75	71
188	30.373	0.162	0.048	0.50	76	-0.5	99	2.7	-0.02	84	411	75	71
189	30.535	0.162	0.048	0.50	76	-0.5	99	2.7	-0.02	84	409	75	71
190	30.696	0.162	0.048	0.50	76	-0.5	99	2.7	-0.03	84	406	75	71
191	30.858	0.162	0.048	0.50	76	-0.5	99	2.6	-0.01	83	403	75	71

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	31.019	0.162	0.048	0.50	76	-0.5	99	2.6	-0.02	83	401	75	71
193	31.181	0.162	0.048	0.50	76	-0.5	99	2.6	-0.03	83	398	75	71
194	31.343	0.162	0.048	0.50	76	-0.5	99	2.6	-0.02	84	396	75	71
195	31.504	0.162	0.048	0.50	76	-0.5	99	2.6	-0.02	84	394	75	71
196	31.666	0.162	0.048	0.50	76	-0.5	99	2.5	-0.03	84	392	75	71
197	31.827	0.162	0.048	0.50	76	-0.5	99	2.5	-0.01	84	390	75	71
198	31.989	0.162	0.048	0.50	76	-0.5	99	2.5	-0.02	84	387	75	71
199	32.150	0.162	0.048	0.50	76	-0.5	99	2.5	-0.04	84	386	75	71
200	32.312	0.162	0.048	0.50	76	-0.5	99	2.4	-0.01	84	384	75	71
201	32.473	0.162	0.048	0.50	76	-0.5	99	2.4	0	84	382	75	71
202	32.635	0.162	0.048	0.50	76	-0.5	99	2.4	-0.04	84	381	75	71
203	32.797	0.162	0.048	0.50	76	-0.5	99	2.4	-0.03	84	379	75	71
204	32.958	0.162	0.048	0.50	76	-0.5	99	2.4	-0.01	85	378	75	71
205	33.120	0.162	0.048	0.50	76	-0.5	99	2.3	-0.03	85	377	75	71
206	33.281	0.162	0.048	0.50	76	-0.5	99	2.3	-0.01	84	376	75	71
207	33.443	0.162	0.048	0.50	76	-0.5	99	2.3	-0.03	85	375	75	71
208	33.604	0.162	0.048	0.50	76	-0.5	99	2.3	-0.03	85	373	75	71
209	33.766	0.162	0.048	0.50	76	-0.5	99	2.2	-0.03	85	372	75	71
210	33.927	0.162	0.048	0.50	76	-0.5	99	2.2	-0.03	85	371	75	71
211	34.089	0.162	0.048	0.50	76	-0.5	99	2.2	-0.01	85	371	75	72
212	34.251	0.162	0.048	0.50	76	-0.5	99	2.2	-0.02	85	369	75	71
213	34.412	0.162	0.048	0.50	76	-0.5	99	2.2	-0.02	85	369	75	71
214	34.574	0.162	0.048	0.50	76	-0.5	99	2.1	-0.04	85	368	75	71
215	34.735	0.162	0.048	0.50	76	-0.5	99	2.1	-0.01	85	368	75	71
216	34.897	0.162	0.048	0.50	76	-0.5	99	2.1	-0.03	85	367	75	71
217	35.058	0.162	0.048	0.50	76	-0.5	99	2.0	-0.04	85	367	75	71
218	35.220	0.162	0.048	0.50	76	-0.5	99	2.0	-0.02	85	367	75	71
219	35.381	0.162	0.048	0.50	76	-0.5	99	2.0	-0.02	85	367	75	71
220	35.543	0.162	0.048	0.50	76	-0.5	99	2.0	-0.02	86	367	75	71
221	35.705	0.162	0.048	0.50	76	-0.5	100	1.9	-0.04	86	367	75	72
222	35.866	0.162	0.048	0.50	76	-0.5	100	1.9	-0.01	86	367	75	71
223	36.028	0.162	0.048	0.50	77	-0.5	100	1.9	-0.03	86	367	75	72

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.189	0.162	0.048	0.50	77	-0.5	100	1.9	-0.04	86	367	75	72
225	36.351	0.162	0.048	0.50	77	-0.5	100	1.8	-0.02	86	367	75	72
226	36.512	0.162	0.048	0.50	77	-0.5	100	1.8	-0.01	87	367	75	72
227	36.674	0.162	0.048	0.50	77	-0.5	100	1.8	-0.04	87	368	76	72
228	36.836	0.162	0.048	0.50	77	-0.5	100	1.8	-0.03	87	368	76	72
229	36.997	0.162	0.048	0.50	77	-0.5	100	1.7	-0.01	87	368	76	72
230	37.159	0.162	0.048	0.50	77	-0.5	100	1.7	-0.03	87	368	76	73
231	37.320	0.162	0.048	0.50	77	-0.5	100	1.7	-0.02	87	368	76	73
232	37.482	0.162	0.048	0.50	77	-0.5	100	1.7	-0.02	87	368	76	72
233	37.643	0.162	0.048	0.50	77	-0.5	100	1.6	-0.04	88	369	76	73
234	37.805	0.162	0.048	0.50	77	-0.5	100	1.6	-0.02	88	369	76	73
235	37.966	0.162	0.048	0.50	77	-0.5	100	1.6	-0.03	88	369	76	73
236	38.128	0.162	0.048	0.50	77	-0.5	100	1.6	-0.02	88	369	76	73
237	38.290	0.162	0.048	0.50	77	-0.5	100	1.5	-0.02	88	370	76	73
238	38.451	0.162	0.048	0.50	77	-0.5	100	1.5	-0.05	88	370	76	73
239	38.613	0.162	0.048	0.50	77	-0.5	100	1.5	-0.02	88	370	76	73
240	38.774	0.162	0.048	0.50	77	-0.5	100	1.4	-0.04	88	371	76	73
241	38.936	0.162	0.048	0.50	77	-0.5	100	1.4	-0.01	88	371	76	72
242	39.097	0.162	0.048	0.50	77	-0.5	100	1.4	-0.03	88	372	76	72
243	39.259	0.162	0.048	0.50	77	-0.5	100	1.4	-0.02	88	372	76	73
244	39.420	0.162	0.048	0.50	77	-0.5	100	1.4	-0.02	88	372	76	73
245	39.582	0.162	0.048	0.50	77	-0.5	100	1.3	-0.03	88	373	76	73
246	39.744	0.162	0.048	0.50	77	-0.5	100	1.3	-0.03	88	373	76	73
247	39.905	0.162	0.048	0.50	77	-0.5	100	1.3	-0.03	88	373	76	73
248	40.067	0.162	0.048	0.50	77	-0.5	100	1.3	-0.01	88	373	76	73
249	40.228	0.162	0.048	0.50	77	-0.5	100	1.2	-0.03	88	373	76	73
250	40.390	0.162	0.048	0.50	77	-0.5	100	1.2	-0.03	88	373	76	73
251	40.551	0.162	0.048	0.50	77	-0.5	100	1.2	-0.03	88	373	76	72
252	40.713	0.162	0.048	0.50	77	-0.5	99	1.1	-0.03	87	373	76	72
253	40.875	0.162	0.048	0.50	77	-0.5	99	1.1	-0.01	86	374	76	72
254	41.036	0.162	0.048	0.50	77	-0.5	99	1.1	-0.04	86	374	76	70
255	41.198	0.162	0.048	0.50	77	-0.5	100	1.1	-0.02	86	374	76	71

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.359	0.162	0.048	0.50	76	-0.5	99	1.0	-0.02	85	374	76	70
257	41.521	0.162	0.048	0.50	76	-0.5	100	1.0	-0.03	85	374	75	69
258	41.682	0.162	0.048	0.50	76	-0.5	100	1.0	-0.04	85	375	75	69
259	41.844	0.162	0.048	0.50	76	-0.5	100	0.9	-0.03	85	375	75	70
260	42.005	0.162	0.048	0.50	76	-0.5	100	0.9	-0.02	85	375	75	70
261	42.167	0.162	0.048	0.50	76	-0.5	100	0.9	-0.03	85	375	75	69
262	42.329	0.162	0.048	0.50	76	-0.5	100	0.9	-0.02	85	376	75	69
263	42.490	0.162	0.048	0.50	76	-0.5	100	0.8	-0.03	85	376	74	69
264	42.652	0.162	0.048	0.50	75	-0.5	100	0.8	-0.02	85	377	74	69
265	42.813	0.162	0.048	0.50	75	-0.5	100	0.8	-0.04	85	377	74	69
266	42.975	0.162	0.048	0.50	75	-0.5	100	0.8	-0.01	85	378	74	69
267	43.136	0.162	0.048	0.50	75	-0.5	100	0.7	-0.03	84	378	74	69
268	43.298	0.162	0.048	0.50	75	-0.5	100	0.7	-0.01	85	379	74	69
269	43.459	0.162	0.048	0.50	75	-0.5	100	0.7	-0.04	85	380	74	69
270	43.621	0.162	0.048	0.50	75	-0.5	100	0.7	-0.03	84	380	74	69
271	43.783	0.162	0.048	0.50	75	-0.5	100	0.7	-0.01	84	381	74	68
272	43.944	0.162	0.048	0.50	75	-0.5	100	0.6	-0.03	84	381	74	68
273	44.106	0.162	0.048	0.50	75	-0.5	100	0.6	-0.02	84	381	73	68
274	44.267	0.162	0.048	0.50	75	-0.5	100	0.6	-0.03	84	382	73	69
275	44.429	0.162	0.048	0.50	75	-0.5	100	0.6	-0.02	84	382	73	68
276	44.590	0.162	0.048	0.50	75	-0.5	100	0.5	-0.03	84	382	73	68
277	44.752	0.162	0.048	0.50	75	-0.5	100	0.5	-0.01	84	383	73	68
278	44.913	0.162	0.048	0.50	74	-0.5	100	0.5	-0.03	84	383	73	69
279	45.075	0.162	0.048	0.50	74	-0.5	100	0.5	-0.03	83	383	73	69
280	45.237	0.162	0.048	0.50	74	-0.5	100	0.4	-0.01	84	384	73	68
281	45.398	0.162	0.048	0.50	74	-0.5	100	0.4	-0.02	84	384	73	68
282	45.560	0.162	0.048	0.50	74	-0.5	100	0.4	-0.03	84	384	73	68
283	45.721	0.162	0.048	0.50	74	-0.5	100	0.4	-0.01	84	384	73	69
284	45.883	0.162	0.048	0.50	74	-0.5	100	0.4	-0.03	84	384	73	68
285	46.044	0.162	0.048	0.50	74	-0.5	100	0.3	-0.03	84	384	73	68
286	46.206	0.162	0.048	0.50	74	-0.5	100	0.3	-0.03	84	384	73	68
287	46.368	0.162	0.048	0.50	74	-0.5	100	0.3	-0.02	84	384	73	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	46.529	0.162	0.048	0.50	74	-0.5	100	0.3	-0.02	84	384	73	68
289	46.691	0.162	0.048	0.50	74	-0.5	100	0.2	-0.04	84	385	73	68
290	46.852	0.162	0.048	0.50	74	-0.5	100	0.2	-0.01	83	385	73	68
291	47.014	0.162	0.048	0.50	74	-0.5	100	0.2	-0.02	84	385	73	68
292	47.175	0.162	0.048	0.50	74	-0.5	100	0.1	-0.04	84	385	73	68
293	47.337	0.162	0.048	0.50	74	-0.5	100	0.1	0	84	385	73	67
294	47.498	0.162	0.048	0.50	74	-0.5	100	0.1	-0.03	84	385	73	68
295	47.660	0.162	0.048	0.50	74	-0.5	100	0.0	-0.11	84	385	73	68
Avg/Tot	47.660	0.162	0.048	0.50	75	-0.50	100			88	399	75	69.5



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	70	-2		72	-0.030	10.04	0.03
1	0.164	0.164	0.50	70	-2	101	73	-0.030	4.06	0.03
2	0.328	0.164	0.50	70	-2	101	73	-0.030	6.45	0.01
3	0.491	0.164	0.50	70	-2	101	73	-0.030	7.92	0.01
4	0.655	0.164	0.50	70	-2	101	73	-0.030	7.47	0.01
5	0.819	0.164	0.50	70	-2	101	73	-0.030	7.03	0.01
6	0.983	0.164	0.50	70	-2	101	73	-0.030	7.87	0.01
7	1.147	0.164	0.50	71	-2	101	73	-0.030	8.64	0.01
8	1.310	0.164	0.50	71	-2	101	73	-0.030	9.21	0.01
9	1.474	0.164	0.50	71	-2	101	73	-0.030	9.01	0.01
10	1.638	0.164	0.50	71	-2	101	73	-0.030	9.16	0.01
11	1.802	0.164	0.50	71	-2	101	74	-0.040	9.78	0.01
12	1.965	0.164	0.50	71	-2	101	74	-0.030	9.15	0.00
13	2.129	0.164	0.50	71	-2	101	74	-0.030	9.24	0.01
14	2.293	0.164	0.50	71	-2	101	74	-0.040	8.93	0.01
15	2.457	0.164	0.50	71	-2	101	74	-0.040	9.25	0.01
16	2.621	0.164	0.50	71	-2	101	74	-0.040	9.76	0.01
17	2.784	0.164	0.50	72	-2	101	74	-0.040	9.77	0.01
18	2.948	0.164	0.50	72	-2	101	74	-0.040	9.72	0.01
19	3.112	0.164	0.50	72	-2	101	74	-0.040	9.85	0.01
20	3.276	0.164	0.50	72	-2	101	74	-0.040	9.76	0.01
21	3.440	0.164	0.50	72	-2	101	74	-0.040	9.68	0.01
22	3.603	0.164	0.50	72	-2	101	74	-0.040	9.61	0.01
23	3.767	0.164	0.50	72	-2	101	74	-0.040	9.80	0.01
24	3.931	0.164	0.50	72	-2	101	75	-0.040	10.03	0.01
25	4.095	0.164	0.50	72	-2	101	75	-0.040	10.31	0.01
26	4.259	0.164	0.50	72	-2	101	75	-0.040	10.52	0.01
27	4.422	0.164	0.50	73	-2	101	75	-0.040	10.81	0.01
28	4.586	0.164	0.50	73	-2	101	75	-0.040	10.88	0.01
29	4.750	0.164	0.50	73	-2	101	75	-0.040	11.07	0.01
30	4.914	0.164	0.50	73	-2	101	75	-0.040	11.24	0.01
31	5.077	0.164	0.50	73	-2	101	75	-0.040	11.54	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	5.241	0.164	0.50	73	-2	101	75	-0.040	11.78	0.01
33	5.405	0.164	0.50	73	-2	101	75	-0.040	12.01	0.01
34	5.569	0.164	0.50	73	-2	101	75	-0.040	12.20	0.01
35	5.733	0.164	0.50	73	-2	101	75	-0.040	12.45	0.01
36	5.896	0.164	0.50	73	-2	101	75	-0.040	12.76	0.02
37	6.060	0.164	0.50	73	-2	101	76	-0.040	13.37	0.04
38	6.224	0.164	0.50	73	-2	101	76	-0.040	13.45	0.04
39	6.388	0.164	0.50	73	-2	101	76	-0.040	13.10	0.02
40	6.552	0.164	0.50	73	-2	101	76	-0.040	13.00	0.02
41	6.715	0.164	0.50	74	-2	101	76	-0.040	13.12	0.03
42	6.879	0.164	0.50	74	-2	101	76	-0.040	13.14	0.02
43	7.043	0.164	0.50	74	-2	101	76	-0.040	13.30	0.03
44	7.207	0.164	0.50	74	-2	101	76	-0.040	13.97	0.07
45	7.371	0.164	0.50	74	-2	101	76	-0.040	14.37	0.09
46	7.534	0.164	0.50	74	-2	101	76	-0.040	14.63	0.10
47	7.698	0.164	0.50	74	-2	101	76	-0.040	15.02	0.86
48	7.862	0.164	0.50	74	-2	101	76	-0.040	15.25	1.32
49	8.026	0.164	0.50	74	-2	101	76	-0.040	15.39	1.35
50	8.189	0.164	0.50	74	-2	101	76	-0.040	15.22	1.36
51	8.353	0.164	0.50	74	-2	101	76	-0.040	15.05	1.43
52	8.517	0.164	0.50	74	-2	101	76	-0.040	15.07	1.43
53	8.681	0.164	0.50	74	-2	101	76	-0.040	15.05	0.88
54	8.845	0.164	0.50	74	-2	101	76	-0.040	14.94	0.56
55	9.008	0.164	0.50	74	-2	101	76	-0.040	14.38	0.43
56	9.172	0.164	0.50	74	-2	101	76	-0.040	14.07	0.38
57	9.336	0.164	0.50	75	-2	101	76	-0.040	13.95	0.34
58	9.500	0.164	0.50	75	-2	101	76	-0.040	13.82	0.28
59	9.664	0.164	0.50	75	-2	101	76	-0.040	13.61	0.26
60	9.827	0.164	0.50	75	-2	101	76	-0.030	13.55	0.38
61	9.991	0.164	0.50	75	-2	101	76	-0.040	13.48	0.48
62	10.155	0.164	0.50	75	-2	101	76	-0.040	13.40	0.65
63	10.319	0.164	0.50	75	-2	101	76	-0.040	13.47	0.89

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	10.483	0.164	0.50	75	-2	101	76	-0.040	13.47	1.23
65	10.646	0.164	0.50	75	-2	101	76	-0.040	13.54	1.56
66	10.810	0.164	0.50	75	-2	101	76	-0.040	13.71	2.02
67	10.974	0.164	0.50	75	-2	101	76	-0.040	13.97	2.00
68	11.138	0.164	0.50	75	-2	101	76	-0.040	14.02	2.16
69	11.301	0.164	0.50	75	-2	101	77	-0.040	14.04	2.33
70	11.465	0.164	0.50	75	-2	101	77	-0.040	14.05	2.44
71	11.629	0.164	0.50	75	-2	101	77	-0.040	13.82	2.43
72	11.793	0.164	0.50	75	-2	101	77	-0.040	13.70	2.26
73	11.957	0.164	0.50	75	-2	101	77	-0.040	13.58	2.13
74	12.120	0.164	0.50	75	-2	101	77	-0.040	13.41	2.10
75	12.284	0.164	0.50	75	-2	101	77	-0.040	13.31	2.10
76	12.448	0.164	0.50	75	-2	100	76	-0.040	13.32	2.13
77	12.612	0.164	0.50	75	-2	100	77	-0.040	13.29	2.06
78	12.776	0.164	0.50	76	-2	100	77	-0.040	13.34	2.00
79	12.939	0.164	0.50	76	-2	100	76	-0.030	13.22	1.89
80	13.103	0.164	0.50	76	-2	100	76	-0.030	13.12	1.95
81	13.267	0.164	0.50	76	-2	100	76	-0.040	13.04	1.92
82	13.431	0.164	0.50	76	-2	100	76	-0.030	13.03	1.93
83	13.595	0.164	0.50	76	-2	100	76	-0.040	13.11	1.88
84	13.758	0.164	0.50	76	-2	100	76	-0.040	13.15	1.93
85	13.922	0.164	0.50	76	-2	100	76	-0.040	13.17	1.89
86	14.086	0.164	0.50	76	-2	100	76	-0.030	13.18	1.79
87	14.250	0.164	0.50	76	-2	100	76	-0.030	13.09	1.68
88	14.414	0.164	0.50	76	-2	100	76	-0.030	12.98	1.68
89	14.577	0.164	0.50	76	-2	100	76	-0.030	12.95	1.69
90	14.741	0.164	0.50	76	-2	100	76	-0.030	12.96	1.70
91	14.905	0.164	0.50	76	-2	100	76	-0.030	13.01	1.84
92	15.069	0.164	0.50	76	-2	100	76	-0.030	13.11	1.97
93	15.232	0.164	0.50	76	-2	100	76	-0.030	13.17	2.23
94	15.396	0.164	0.50	76	-2	100	76	-0.030	13.07	2.41
95	15.560	0.164	0.50	76	-2	100	76	-0.030	13.17	2.56

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	15.724	0.164	0.50	76	-2	100	76	-0.030	13.23	2.70
97	15.888	0.164	0.50	76	-2	100	76	-0.030	13.23	2.70
98	16.051	0.164	0.50	76	-2	100	76	-0.030	13.20	2.68
99	16.215	0.164	0.50	76	-2	100	76	-0.030	13.24	2.70
100	16.379	0.164	0.50	76	-2	100	76	-0.030	13.20	2.61
101	16.543	0.164	0.50	76	-2	100	76	-0.030	13.32	2.63
102	16.707	0.164	0.50	76	-2	100	76	-0.030	13.44	2.59
103	16.870	0.164	0.50	76	-2	100	76	-0.030	12.59	4.04
104	17.034	0.164	0.50	76	-2	100	76	-0.030	11.73	4.47
105	17.198	0.164	0.50	77	-2	100	76	-0.030	11.86	4.02
106	17.362	0.164	0.50	76	-2	100	76	-0.030	11.86	3.74
107	17.526	0.164	0.50	77	-2	100	76	-0.030	11.94	3.59
108	17.689	0.164	0.50	77	-2	100	76	-0.030	11.89	3.35
109	17.853	0.164	0.50	77	-2	100	76	-0.030	12.04	3.10
110	18.017	0.164	0.50	77	-2	100	76	-0.030	12.03	2.94
111	18.181	0.164	0.50	77	-2	100	76	-0.030	12.13	2.83
112	18.344	0.164	0.50	77	-2	100	76	-0.030	12.23	2.75
113	18.508	0.164	0.50	77	-2	100	76	-0.030	12.24	2.58
114	18.672	0.164	0.50	77	-2	100	76	-0.030	12.23	2.44
115	18.836	0.164	0.50	77	-2	100	76	-0.030	12.33	2.31
116	19.000	0.164	0.50	77	-2	100	76	-0.030	12.39	2.10
117	19.163	0.164	0.50	77	-2	100	76	-0.030	12.40	1.85
118	19.327	0.164	0.50	77	-2	100	76	-0.030	12.50	1.65
119	19.491	0.164	0.50	77	-2	100	76	-0.030	12.54	1.54
120	19.655	0.164	0.50	77	-2	100	75	-0.030	12.54	1.46
121	19.819	0.164	0.50	77	-2	100	75	-0.030	12.63	1.41
122	19.982	0.164	0.50	77	-2	100	76	-0.030	12.56	1.39
123	20.146	0.164	0.50	77	-2	100	76	-0.030	12.66	1.40
124	20.310	0.164	0.50	77	-2	100	76	-0.030	12.67	1.42
125	20.474	0.164	0.50	77	-2	100	75	-0.030	12.80	1.53
126	20.638	0.164	0.50	77	-2	100	75	-0.030	12.72	1.67
127	20.801	0.164	0.50	77	-2	100	75	-0.030	12.72	1.80

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	20.965	0.164	0.50	77	-2	100	75	-0.030	12.70	1.82
129	21.129	0.164	0.50	77	-2	100	76	-0.030	12.72	1.78
130	21.293	0.164	0.50	77	-2	100	76	-0.030	12.73	1.83
131	21.456	0.164	0.50	77	-2	100	75	-0.030	12.72	1.76
132	21.620	0.164	0.50	77	-2	100	76	-0.030	12.72	1.72
133	21.784	0.164	0.50	77	-2	100	76	-0.030	12.83	1.72
134	21.948	0.164	0.50	77	-2	100	76	-0.030	12.84	1.74
135	22.112	0.164	0.50	77	-2	100	76	-0.030	12.82	1.77
136	22.275	0.164	0.50	77	-2	100	76	-0.030	12.90	1.80
137	22.439	0.164	0.50	77	-2	100	76	-0.030	12.61	1.66
138	22.603	0.164	0.50	77	-2	100	76	-0.030	12.53	1.60
139	22.767	0.164	0.50	77	-2	100	76	-0.030	13.51	1.66
140	22.931	0.164	0.50	77	-2	100	76	-0.030	13.45	1.46
141	23.094	0.164	0.50	77	-2	100	76	-0.030	13.57	1.28
142	23.258	0.164	0.50	77	-2	100	76	-0.030	13.66	1.16
143	23.422	0.164	0.50	77	-2	100	76	-0.030	13.69	1.16
144	23.586	0.164	0.50	77	-2	100	76	-0.030	13.79	1.16
145	23.750	0.164	0.50	77	-2	100	76	-0.030	13.85	1.20
146	23.913	0.164	0.50	77	-2	100	76	-0.030	13.74	1.20
147	24.077	0.164	0.50	77	-2	100	76	-0.030	13.77	1.25
148	24.241	0.164	0.50	77	-2	100	76	-0.030	13.78	1.27
149	24.405	0.164	0.50	77	-2	100	76	-0.030	13.92	1.34
150	24.568	0.164	0.50	77	-2	100	76	-0.030	13.77	1.36
151	24.732	0.164	0.50	77	-2	100	76	-0.030	13.73	1.31
152	24.896	0.164	0.50	77	-2	100	76	-0.030	13.75	1.25
153	25.060	0.164	0.50	77	-2	100	76	-0.030	13.84	1.11
154	25.224	0.164	0.50	77	-2	100	76	-0.030	13.77	1.06
155	25.387	0.164	0.50	77	-2	100	76	-0.030	13.84	1.08
156	25.551	0.164	0.50	77	-2	100	76	-0.030	13.78	1.14
157	25.715	0.164	0.50	77	-2	100	76	-0.030	13.92	1.20
158	25.879	0.164	0.50	77	-2	100	76	-0.030	13.82	1.33
159	26.043	0.164	0.50	77	-2	100	76	-0.030	13.82	1.40

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	26.206	0.164	0.50	77	-2	100	76	-0.030	13.83	1.51
161	26.370	0.164	0.50	77	-2	100	76	-0.030	13.68	1.63
162	26.534	0.164	0.50	77	-2	100	76	-0.030	14.14	0.45
163	26.698	0.164	0.50	77	-2	100	76	-0.030	14.08	0.57
164	26.862	0.164	0.50	77	-2	100	76	-0.030	14.14	0.73
165	27.025	0.164	0.50	77	-2	100	76	-0.030	14.05	0.76
166	27.189	0.164	0.50	77	-2	100	76	-0.030	9.11	0.22
167	27.353	0.164	0.50	77	-2	100	76	-0.030	14.29	0.37
168	27.517	0.164	0.50	77	-2	100	76	-0.030	14.30	0.32
169	27.680	0.164	0.50	77	-2	100	76	-0.030	13.96	0.01
170	27.844	0.164	0.50	77	-2	100	76	-0.030	13.47	0.00
171	28.008	0.164	0.50	77	-2	100	76	-0.030	13.09	0.00
172	28.172	0.164	0.50	77	-2	100	76	-0.030	12.72	0.00
173	28.336	0.164	0.50	77	-2	100	76	-0.030	12.42	0.00
174	28.499	0.164	0.50	77	-2	100	76	-0.030	12.20	0.00
175	28.663	0.164	0.50	77	-2	100	76	-0.030	12.03	0.00
176	28.827	0.164	0.50	77	-2	99	76	-0.030	11.82	0.01
177	28.991	0.164	0.50	77	-2	99	76	-0.030	11.73	0.01
178	29.155	0.164	0.50	77	-2	99	76	-0.030	11.68	0.01
179	29.318	0.164	0.50	77	-2	99	76	-0.030	11.55	0.00
180	29.482	0.164	0.50	77	-2	99	76	-0.020	11.54	0.00
181	29.646	0.164	0.50	77	-2	99	76	-0.020	11.49	0.00
182	29.810	0.164	0.50	77	-2	99	76	-0.020	11.46	0.01
183	29.974	0.164	0.50	77	-2	99	76	-0.020	12.09	0.01
184	30.137	0.164	0.50	77	-2	99	76	-0.020	12.45	0.00
185	30.301	0.164	0.50	77	-2	99	76	-0.030	12.08	0.00
186	30.465	0.164	0.50	77	-2	99	76	-0.020	11.72	0.00
187	30.629	0.164	0.50	77	-2	99	76	-0.020	11.37	0.00
188	30.792	0.164	0.50	77	-2	99	76	-0.030	11.21	0.00
189	30.956	0.164	0.50	77	-2	99	76	-0.020	11.20	0.00
190	31.120	0.164	0.50	77	-2	99	76	-0.020	11.04	0.00
191	31.284	0.164	0.50	77	-2	99	76	-0.020	11.01	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
192	31.448	0.164	0.50	78	-2	99	76	-0.020	11.00	0.00
193	31.611	0.164	0.50	78	-2	99	76	-0.020	11.02	0.00
194	31.775	0.164	0.50	78	-2	99	76	-0.020	10.91	0.00
195	31.939	0.164	0.50	78	-2	99	76	-0.020	10.78	0.00
196	32.103	0.164	0.50	78	-2	99	76	-0.020	10.68	0.00
197	32.267	0.164	0.50	78	-2	99	76	-0.020	10.76	0.00
198	32.430	0.164	0.50	78	-2	99	76	-0.030	10.77	0.00
199	32.594	0.164	0.50	78	-2	99	76	-0.030	10.77	0.00
200	32.758	0.164	0.50	78	-2	99	76	-0.020	10.84	0.00
201	32.922	0.164	0.50	78	-2	99	76	-0.030	10.83	0.00
202	33.086	0.164	0.50	78	-2	99	76	-0.030	10.94	0.00
203	33.249	0.164	0.50	78	-2	99	76	-0.030	10.89	0.00
204	33.413	0.164	0.50	78	-2	99	76	-0.030	10.90	0.00
205	33.577	0.164	0.50	78	-2	99	76	-0.030	10.99	0.00
206	33.741	0.164	0.50	78	-2	99	76	-0.030	10.90	0.00
207	33.904	0.164	0.50	78	-2	99	76	-0.030	10.83	0.00
208	34.068	0.164	0.50	78	-2	99	76	-0.030	10.89	0.00
209	34.232	0.164	0.50	78	-2	99	76	-0.030	10.86	0.00
210	34.396	0.164	0.50	78	-2	99	76	-0.030	10.84	0.00
211	34.560	0.164	0.50	78	-2	99	76	-0.030	10.92	0.01
212	34.723	0.164	0.50	78	-2	99	76	-0.030	10.95	0.01
213	34.887	0.164	0.50	78	-2	99	76	-0.030	10.97	0.01
214	35.051	0.164	0.50	78	-2	99	76	-0.030	11.08	0.01
215	35.215	0.164	0.50	78	-2	99	76	-0.030	11.12	0.00
216	35.379	0.164	0.50	78	-2	99	76	-0.030	11.18	0.00
217	35.542	0.164	0.50	78	-2	99	76	-0.030	11.20	0.01
218	35.706	0.164	0.50	78	-2	99	76	-0.030	11.19	0.01
219	35.870	0.164	0.50	78	-2	99	76	-0.030	11.16	0.00
220	36.034	0.164	0.50	78	-2	99	76	-0.030	11.18	0.00
221	36.198	0.164	0.50	78	-2	99	76	-0.030	11.15	0.00
222	36.361	0.164	0.50	78	-2	100	76	-0.030	11.02	0.00
223	36.525	0.164	0.50	78	-2	100	76	-0.030	10.84	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
224	36.689	0.164	0.50	78	-2	100	76	-0.030	10.83	0.01
225	36.853	0.164	0.50	78	-2	100	76	-0.030	10.84	0.00
226	37.017	0.164	0.50	78	-2	100	77	-0.030	10.92	0.00
227	37.180	0.164	0.50	78	-2	100	77	-0.030	10.91	0.00
228	37.344	0.164	0.50	78	-2	100	77	-0.030	10.93	0.00
229	37.508	0.164	0.50	78	-2	100	77	-0.030	10.93	0.00
230	37.672	0.164	0.50	78	-2	100	77	-0.030	10.98	0.00
231	37.835	0.164	0.50	78	-2	100	77	-0.030	10.99	0.00
232	37.999	0.164	0.50	78	-2	100	77	-0.030	11.12	0.00
233	38.163	0.164	0.50	78	-2	100	77	-0.030	10.99	0.00
234	38.327	0.164	0.50	78	-2	100	77	-0.030	11.01	0.00
235	38.491	0.164	0.50	78	-2	100	77	-0.030	11.09	0.00
236	38.654	0.164	0.50	78	-2	100	77	-0.030	11.06	0.01
237	38.818	0.164	0.50	78	-2	100	77	-0.030	11.08	0.00
238	38.982	0.164	0.50	78	-2	100	77	-0.030	11.12	0.00
239	39.146	0.164	0.50	78	-2	100	77	-0.030	11.17	0.01
240	39.310	0.164	0.50	78	-2	100	77	-0.030	11.14	0.01
241	39.473	0.164	0.50	78	-2	100	77	-0.030	11.07	0.01
242	39.637	0.164	0.50	78	-2	100	77	-0.030	11.00	0.01
243	39.801	0.164	0.50	78	-2	100	77	-0.030	10.90	0.01
244	39.965	0.164	0.50	78	-2	100	77	-0.030	10.90	0.01
245	40.129	0.164	0.50	78	-2	100	77	-0.030	10.83	0.01
246	40.292	0.164	0.50	78	-2	100	77	-0.030	10.93	0.01
247	40.456	0.164	0.50	78	-2	100	77	-0.030	10.91	0.01
248	40.620	0.164	0.50	78	-2	100	78	-0.030	10.88	0.00
249	40.784	0.164	0.50	78	-2	100	78	-0.030	10.85	0.00
250	40.947	0.164	0.50	78	-2	100	78	-0.030	10.99	0.00
251	41.111	0.164	0.50	78	-2	100	78	-0.030	10.96	0.00
252	41.275	0.164	0.50	78	-2	99	77	-0.030	10.88	0.00
253	41.439	0.164	0.50	78	-2	99	77	-0.030	10.82	0.00
254	41.603	0.164	0.50	78	-2	99	77	-0.030	10.82	0.00
255	41.766	0.164	0.50	78	-2	99	77	-0.030	10.85	0.00



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
256	41.930	0.164	0.50	78	-2	99	77	-0.030	10.75	0.00
257	42.094	0.164	0.50	78	-2	99	76	-0.030	10.72	0.00
258	42.258	0.164	0.50	77	-2	100	76	-0.030	10.69	0.01
259	42.422	0.164	0.50	77	-2	99	76	-0.030	10.81	0.01
260	42.585	0.164	0.50	77	-2	100	76	-0.030	10.79	0.00
261	42.749	0.164	0.50	77	-2	100	75	-0.030	10.80	0.00
262	42.913	0.164	0.50	77	-2	100	75	-0.030	10.83	0.00
263	43.077	0.164	0.50	77	-2	100	75	-0.030	10.71	0.00
264	43.241	0.164	0.50	77	-2	100	75	-0.030	10.78	0.00
265	43.404	0.164	0.50	76	-2	100	75	-0.030	10.70	0.00
266	43.568	0.164	0.50	76	-2	100	75	-0.030	10.63	0.00
267	43.732	0.164	0.50	76	-2	100	75	-0.030	10.69	0.00
268	43.896	0.164	0.50	76	-2	100	74	-0.030	10.59	0.00
269	44.059	0.164	0.50	76	-2	100	74	-0.030	10.54	0.00
270	44.223	0.164	0.50	76	-2	100	74	-0.030	10.51	0.00
271	44.387	0.164	0.50	76	-2	100	74	-0.030	10.48	0.00
272	44.551	0.164	0.50	76	-2	100	74	-0.030	10.48	0.00
273	44.715	0.164	0.50	76	-2	100	74	-0.030	10.47	0.00
274	44.878	0.164	0.50	76	-2	100	74	-0.030	10.32	0.00
275	45.042	0.164	0.50	76	-2	100	74	-0.030	10.37	0.00
276	45.206	0.164	0.50	75	-2	100	74	-0.030	10.25	0.00
277	45.370	0.164	0.50	75	-2	100	74	-0.030	10.25	0.00
278	45.534	0.164	0.50	75	-2	100	74	-0.030	10.25	0.00
279	45.697	0.164	0.50	75	-2	100	74	-0.030	10.23	0.00
280	45.861	0.164	0.50	75	-2	100	74	-0.030	10.17	0.00
281	46.025	0.164	0.50	75	-2	100	74	-0.030	10.11	0.00
282	46.189	0.164	0.50	75	-2	100	74	-0.030	10.09	0.00
283	46.353	0.164	0.50	75	-2	100	74	-0.030	10.16	0.00
284	46.516	0.164	0.50	75	-2	100	74	-0.030	10.26	0.00
285	46.680	0.164	0.50	75	-2	100	74	-0.030	10.35	0.00
286	46.844	0.164	0.50	75	-2	100	74	-0.030	10.41	0.01
287	47.008	0.164	0.50	75	-2	100	74	-0.030	10.38	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
288	47.171	0.164	0.50	75	-2	100	74	-0.030	10.49	0.01
289	47.335	0.164	0.50	75	-2	100	74	-0.030	10.49	0.01
290	47.499	0.164	0.50	75	-2	100	74	-0.030	10.49	0.01
291	47.663	0.164	0.50	75	-2	100	74	-0.030	10.40	0.01
292	47.827	0.164	0.50	75	-2	100	74	-0.030	10.47	0.01
293	47.990	0.164	0.50	75	-2	100	74	-0.030	10.52	0.01
294	48.154	0.164	0.50	75	-2	100	74	-0.030	10.44	0.01
295	48.318	0.164	0.50	75	-2	100	73	-0.030	10.48	0.01
Avg/Tot	48.318	0.164	0.50	76	-2.00	100	76	-0.032	11.87	0.71

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

**Stove ΔT:** 40

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	440	409	312	408	489	411.5	733
1	435	405	308	404	491	408.8	669
2	428	399	303	406	493	406.0	731
3	422	393	299	408	494	403.0	787
4	414	387	294	407	494	399.3	795
5	408	380	290	408	494	395.9	788
6	401	373	286	408	494	392.5	808
7	395	368	282	411	493	389.7	839
8	390	362	279	411	492	386.8	865
9	385	357	276	414	491	384.4	874
10	380	352	273	416	490	382.2	901
11	376	348	270	422	488	380.9	929
12	373	345	268	424	486	379.2	922
13	369	341	265	426	485	377.2	914
14	366	338	263	428	483	375.5	915
15	363	335	261	431	481	374.2	938
16	361	333	259	434	479	373.2	963
17	359	331	257	437	477	372.1	970
18	358	329	255	437	475	370.7	971
19	356	327	254	442	473	370.4	973
20	355	325	252	445	472	369.7	976
21	354	324	250	448	470	369.3	974
22	353	323	249	449	468	368.5	978
23	353	322	248	447	467	367.3	992
24	352	320	247	454	466	367.8	1011
25	351	320	246	459	464	368.0	1025
26	350	319	245	462	463	368.0	1040
27	350	319	245	467	462	368.5	1052
28	350	319	245	471	461	369.1	1058
29	350	318	245	472	460	369.1	1063
30	351	319	245	477	460	370.2	1068
31	351	319	245	482	459	371.3	1071
32	352	320	245	483	459	371.7	1072
33	354	320	245	488	458	373.0	1072
34	356	321	245	493	458	374.6	1073
35	358	322	245	497	458	376.0	1078
36	361	324	246	504	458	378.4	1087
37	364	326	246	507	458	380.3	1091
38	368	328	247	513	458	382.7	1096
39	371	330	248	517	458	384.7	1099
40	374	332	248	520	458	386.6	1100
41	378	334	249	529	458	389.7	1106
42	381	337	250	533	459	391.8	1108
43	385	339	251	537	459	394.3	1116
44	390	342	252	542	459	397.0	1134
45	394	344	254	548	460	399.9	1145
46	399	348	255	554	460	403.2	1155
47	404	352	258	560	460	406.7	1153

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

**Stove ΔT:** 40

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	410	356	260	563	461	409.9	1148
49	416	361	262	566	461	413.4	1147
50	422	367	265	569	461	417.0	1146
51	429	372	268	572	462	420.6	1140
52	435	378	270	574	462	424.0	1138
53	442	384	273	575	462	427.2	1147
54	447	389	275	583	462	431.1	1150
55	451	394	277	580	462	432.9	1143
56	455	399	279	587	462	436.5	1133
57	459	403	280	589	462	438.7	1124
58	462	408	282	592	462	441.2	1120
59	465	411	284	591	462	442.4	1118
60	466	415	286	595	461	444.7	1124
61	468	419	287	598	461	446.5	1135
62	469	423	290	599	460	448.1	1152
63	469	427	292	602	460	450.1	1165
64	470	431	295	603	460	451.5	1161
65	470	435	298	604	459	453.1	1151
66	471	438	301	603	458	454.2	1136
67	472	442	304	599	458	454.9	1130
68	473	445	306	597	457	455.9	1129
69	475	448	309	596	457	456.9	1127
70	476	451	311	592	457	457.5	1125
71	478	454	313	592	456	458.6	1123
72	479	457	316	590	456	459.5	1121
73	480	460	317	585	455	459.6	1122
74	482	462	320	586	455	460.9	1124
75	483	465	322	586	455	461.9	1128
76	484	467	324	585	454	462.8	1130
77	485	470	326	587	454	464.2	1130
78	485	472	327	586	453	464.7	1131
79	486	474	329	582	453	464.7	1132
80	486	476	330	586	453	466.2	1130
81	487	478	332	587	452	467.0	1125
82	487	480	333	585	452	467.2	1123
83	487	481	334	578	451	466.3	1116
84	488	483	335	578	451	466.8	1113
85	487	485	336	582	450	468.0	1111
86	487	486	337	580	450	468.0	1109
87	487	487	337	583	449	468.6	1111
88	487	489	338	581	448	468.5	1114
89	486	491	339	579	448	468.6	1114
90	486	492	339	575	447	468.0	1110
91	486	494	340	578	447	468.9	1106
92	486	497	340	578	446	469.4	1102
93	486	499	341	575	445	469.3	1082
94	486	502	342	571	445	469.1	1064
95	487	504	342	568	444	469.0	1051

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

**Stove ΔT:** 40

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	487	506	343	566	443	469.3	1044
97	488	508	343	562	442	468.8	1038
98	489	510	344	559	442	468.8	1032
99	490	512	344	557	441	468.9	1026
100	492	513	345	555	440	469.0	1020
101	492	514	346	553	439	469.0	1015
102	493	514	346	551	439	468.4	1020
103	492	513	345	555	438	468.5	1107
104	491	510	344	558	437	467.8	1159
105	489	507	342	569	436	468.6	1176
106	487	504	341	575	435	468.5	1186
107	484	501	340	581	434	467.9	1191
108	482	498	339	587	434	467.8	1193
109	479	494	338	593	433	467.4	1194
110	477	492	337	596	432	466.6	1195
111	475	489	336	600	431	466.3	1195
112	473	486	335	604	430	465.7	1194
113	471	484	335	608	430	465.4	1194
114	469	483	334	609	429	464.6	1194
115	467	481	333	611	428	464.1	1194
116	466	479	333	611	428	463.4	1193
117	464	478	332	614	427	462.9	1193
118	463	476	331	614	427	462.3	1192
119	462	475	331	614	426	461.6	1193
120	461	474	330	614	426	460.9	1193
121	460	472	330	616	425	460.5	1193
122	459	471	330	616	425	460.0	1192
123	458	470	329	618	424	459.8	1192
124	457	469	329	619	424	459.4	1192
125	456	468	329	619	423	459.0	1192
126	455	467	329	618	423	458.5	1192
127	455	467	329	620	423	458.7	1191
128	455	466	329	621	422	458.6	1191
129	454	466	329	621	422	458.3	1190
130	454	465	329	620	422	457.9	1192
131	454	465	329	618	422	457.7	1195
132	454	465	328	621	422	457.8	1195
133	453	465	328	622	422	458.0	1194
134	453	465	328	621	421	457.7	1194
135	453	465	328	621	421	457.9	1194
136	454	465	328	621	421	457.8	1194
137	454	465	329	618	421	457.4	1195
138	454	465	329	621	421	458.0	1197
139	454	465	329	621	421	458.0	1198
140	454	466	329	622	421	458.4	1199
141	454	466	329	620	421	458.1	1199
142	454	466	329	618	421	457.8	1199
143	454	466	330	616	422	457.7	1199

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

**Stove ΔT:** 40

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
144	454	467	330	620	422	458.7	1199	
145	455	467	330	619	422	458.7	1199	
146	455	467	331	621	422	459.2	1198	
147	456	468	331	622	422	459.8	1198	
148	456	469	332	622	423	460.1	1198	
149	456	469	332	621	423	460.3	1198	
150	457	470	333	621	423	460.7	1197	
151	458	470	333	621	424	461.2	1195	
152	458	471	334	619	424	461.1	1193	
153	458	472	334	620	424	461.8	1191	
154	459	472	335	621	425	462.3	1189	
155	459	473	335	620	425	462.5	1186	
156	460	474	336	618	426	462.7	1186	
157	460	474	337	619	426	463.3	1185	
158	461	475	338	618	426	463.7	1184	
159	461	476	338	619	427	464.3	1183	
160	461	477	339	618	427	464.6	1183	
161	463	478	341	615	428	465.0	1169	
162	464	480	345	613	428	466.1	1109	
163	466	483	349	610	429	467.5	1071	
164	468	487	353	602	429	467.9	1047	
165	470	490	357	596	430	468.7	1026	
166	472	494	361	588	431	469.3	1013	
167	474	498	365	582	431	470.0	1006	
168	476	502	368	576	432	470.6	1005	
169	477	505	371	569	432	470.8	1005	
170	478	508	373	568	433	471.9	992	
171	479	511	374	562	433	471.7	978	
172	479	512	375	559	433	471.6	969	
173	479	513	375	556	434	471.5	963	
174	479	513	375	553	434	471.1	956	
175	479	513	375	550	434	470.3	946	
176	478	513	375	540	435	468.1	934	
177	477	512	374	539	435	467.5	923	
178	477	511	374	533	436	466.1	916	
179	475	510	373	530	437	465.0	909	
180	474	509	373	520	437	462.7	904	
181	473	508	372	518	438	461.9	901	
182	472	507	371	517	439	461.1	896	
183	472	507	370	510	439	459.4	892	
184	471	506	368	510	440	459.0	885	
185	470	506	367	507	440	457.9	880	
186	468	505	365	503	441	456.4	877	
187	467	504	363	501	442	455.2	874	
188	465	503	361	497	443	453.6	871	
189	463	502	359	494	444	452.2	868	
190	461	500	357	492	445	451.0	866	
191	459	499	355	489	447	449.6	864	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

**Stove ΔT:** 40

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	457	497	353	483	448	447.8	862
193	456	496	351	481	450	446.7	859
194	454	495	349	481	452	446.0	855
195	453	493	347	477	454	444.7	850
196	451	491	345	477	456	444.2	847
197	450	490	343	474	458	443.1	847
198	449	489	341	473	461	442.5	847
199	448	487	340	471	463	441.9	847
200	447	486	338	469	465	441.2	848
201	447	485	337	467	468	440.7	849
202	446	485	336	467	470	440.5	850
203	445	484	334	466	472	440.4	851
204	444	484	333	464	475	440.0	852
205	444	484	332	461	477	439.5	852
206	443	484	331	463	480	440.0	851
207	443	483	330	461	482	439.9	851
208	443	483	329	459	485	439.8	850
209	443	483	328	459	487	440.1	850
210	444	483	327	459	489	440.3	849
211	444	482	326	457	492	440.2	847
212	445	482	325	456	494	440.3	847
213	446	481	325	457	496	440.8	850
214	446	481	324	452	498	440.2	857
215	447	481	324	456	500	441.6	863
216	447	482	324	456	502	442.1	869
217	448	482	323	455	504	442.5	874
218	449	483	323	456	506	443.5	878
219	449	484	323	456	508	444.0	882
220	450	485	323	452	510	444.0	884
221	451	486	324	457	511	445.8	884
222	451	488	324	456	513	446.2	879
223	451	489	324	459	515	447.6	876
224	451	490	324	458	517	447.8	875
225	452	490	324	454	518	447.6	875
226	452	491	324	456	520	448.3	876
227	452	491	324	459	521	449.6	876
228	453	491	324	456	523	449.4	876
229	453	491	324	460	524	450.5	876
230	454	491	325	458	525	450.7	876
231	454	492	325	460	526	451.4	877
232	454	492	325	461	527	452.0	878
233	455	493	325	459	528	452.0	879
234	455	493	326	459	529	452.4	879
235	456	493	326	461	530	453.1	878
236	457	494	327	460	530	453.5	877
237	457	494	327	461	531	454.1	876
238	458	494	328	461	531	454.4	876
239	458	495	328	461	532	454.8	876

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 5

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/11/2018

**Stove ΔT:** 40

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	460	496	328	461	532	455.4	877
241	460	496	329	459	533	455.4	877
242	461	497	329	462	533	456.1	874
243	461	497	329	462	533	456.3	871
244	461	497	329	459	533	455.9	870
245	461	497	330	460	534	456.3	869
246	462	496	330	460	534	456.3	868
247	462	495	330	460	534	456.5	869
248	463	494	330	461	535	456.5	868
249	463	493	330	458	535	455.9	867
250	464	493	330	460	534	456.2	867
251	465	492	331	456	535	455.7	866
252	466	492	331	455	535	455.9	866
253	468	491	331	456	535	456.1	866
254	469	491	332	456	534	456.4	868
255	470	491	332	461	534	457.5	869
256	471	490	332	460	534	457.1	870
257	472	489	331	461	533	457.3	871
258	473	489	332	458	533	456.7	873
259	474	488	332	458	533	456.7	873
260	474	487	332	461	532	457.5	870
261	475	487	333	461	532	457.4	868
262	476	486	333	461	531	457.6	867
263	477	486	334	459	531	457.3	867
264	478	486	335	460	530	457.7	868
265	479	485	336	459	530	457.6	868
266	479	485	336	459	529	457.8	869
267	479	484	337	459	529	457.6	869
268	480	483	338	458	528	457.5	869
269	481	483	339	459	528	457.7	868
270	481	482	339	459	527	457.8	869
271	482	481	340	459	526	457.8	868
272	483	481	341	458	525	457.6	868
273	483	480	342	457	524	457.3	866
274	484	479	342	456	523	456.9	863
275	484	478	343	457	522	456.6	860
276	485	477	343	457	521	456.6	859
277	486	476	343	456	520	456.0	858
278	486	475	344	455	519	455.9	858
279	487	473	344	454	518	455.2	858
280	488	472	344	455	517	455.3	858
281	489	471	345	455	517	455.3	858
282	489	470	345	453	516	454.5	859
283	491	469	345	454	515	454.6	859
284	492	468	345	453	514	454.4	858
285	493	467	345	453	513	454.1	856
286	494	466	345	454	512	454.1	852
287	496	465	344	452	512	453.8	849



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort

Job #: 18-421

Model: Blaze King PE32

Tracking #: 0012

Run #: 5

Technician: SJB

Date: 10/11/2018

**Stove ΔT:** 40

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	498	463	344	450	510	453.2	847
289	499	463	344	451	509	453.1	844
290	499	462	344	450	508	452.7	841
291	500	461	344	449	507	452.2	839
292	501	460	344	449	506	452.1	838
293	502	459	345	448	505	451.7	838
294	503	458	345	448	504	451.6	838
295	504	458	345	447	503	451.2	838
Average	452	456	321	521	470	444	1003

## LAB SAMPLE DATA - ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 5Technician: SJBDate: 10/11/2018**TRAIN A (1st Hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3382	120.4	120.0	0.4
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	0.4
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**TRAIN A (Post 1st hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3383	126.1	121.1	5.0
B. Rear filter catch	Filter	3384	122.9	123.1	-0.2
C. Probe catch*	Probe	10A	116826.4	116826.3	0.1
D. O-Ring catch*	O-Ring	10A	3432.2	3430.9	1.3

Sub-Total	Total Particulate, mg:	6.2
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Train A Aggregate	Total Particulate, mg:	<b>6.6</b>
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**TRAIN B**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3385	126.7	120.7	6.0
B. Rear filter catch	Filter	3386	123.4	123.3	0.1
C. Probe catch*	Probe	10B	117167.9	117167.5	0.4
D. O-Ring catch*	O-Ring	10B	3571.1	3570.1	1.0

Total Particulate, mg:	<b>7.5</b>
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**AMBIENT**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:	<b>0.0</b>
------------------------	------------

\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 5 Test Date: 10/11/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): Fan Confirmation Medium Low Setting (40 degrees closed from fully open)

#### Preburn Notes

Time	Notes
6:14	Loaded 12 lbs of kindling
7:48	At 1.5 lbs, loaded pre-burn fuel
9:09	At 5.3 lbs, set air to test setting
9:56	At 5.1 lbs, removed 0.5 lbs of coals
10:11	Leveled coal bed, zeroed scale in preparation for fuel loading
FAN CONFIRMATION TEST – FAN OFF FOR ENTIRE TEST	

#### Test Notes

Test Burn Start Time: 10:12 Test Fuel Loaded by: 35 seconds  
 Door Closed: 40 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min	Changed 1-hour filter.
295 min	End of Test
FAN CONFIRMATION TEST – FAN OFF FOR ENTIRE TEST	

Test Burn End Time: 15:07


#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:21	-	8:26	15:30	-	15:34
CO <sub>2</sub>	0.00	-	10.04	0.01	-	10.06
CO	0.00	-	2.52	0.00	-	2.51

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature:  Date: 10/12/2018

**WOOD STOVE TEST DATA PACKET  
ASTM E2780/E2515**



**Run 6 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/12/2018

A handwritten signature in black ink, appearing to be "JL", is written over a horizontal line.

Techician Signature

10/23/2018

Date

## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 6

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/12/2018

<b>Burn Rate (kg/hr):</b>	<b>1.17</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	57.850	56.156	9.696
Average Gas Velocity in Dilution Tunnel (ft/sec)	12.3			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	7880.0			
Average Gas Meter Temperature (°F)	70.9	75.9	76.5	71.9
Total Sample Volume (dscf)	0.000	54.960	53.079	9.281
Average Tunnel Temperature (°F)	86.8			
Total Time of Test (min)	358			
Total Particulate Catch (mg)	0.0	4.5	4.8	1.0
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000819	0.0000904	0.0001077
Total PM Emissions (g)	0.00	3.85	4.25	0.85
Particulate Emission Rate (g/hr)	0.00	0.65	0.71	0.85
Emissions Factor (g/kg)	-	0.55	0.61	-
Difference from Average Total Particulate Emissions (g)	-	0.20	0.20	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	4.05
Particulate Emission Rate (g/hr)	0.68
Emissions Factor (g/kg)	0.58
HHV Efficiency (%)	76.0%
LHV Efficiency (%)	82.2%
CO Emissions (g/min)	0.98

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	78.6	OK
Face Velocity	< 30 ft/min	8.7	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 67.37 / Max: 74.3	OK
Negative Probe Weight Evaluation	<5% of Total Catch	-2.1%	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	43.5	OK

## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/12/18  
**Run:** 6  
**Control #:** 18-421  
**Test Duration:** 358  
**Output Category:** 2

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	76.0%	82.2%
<b>Combustion Efficiency</b>	96.4%	96.4%
<b>Heat Transfer Efficiency</b>	78.8%	85.2%

<b>Output Rate (kJ/h)</b>	17,583	16,679	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.17	2.57	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	23,132	21,943	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.97	15.36	<b>dry lb</b>
<b>MC wet (%)</b>	18.84		
<b>MC dry (%)</b>	23.21		
<b>Particulate (g )</b>	4.05		
<b>CO (g)</b>	349		
<b>Test Duration (h)</b>	5.97		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.04	3.33
<b>g/kg Dry Fuel</b>	0.58	50.15
<b>g/h</b>	0.68	58.56
<b>g/min</b>	0.01	0.98
<b>lb/MM Btu Output</b>	0.09	7.74

<b>Air/Fuel Ratio (A/F)</b>	9.93
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	22.7		2x4	17.00	24.4
2x4	17.00	24.2		2x4	17.00	22.6
2x4	17.00	19.4				
2x4	17.00	24.7				
2x4	17.00	19.2				
2x4	17.00	19.0				
2x4	17.00	18.9				
2x4	17.00	18.9				
Total Fuel Weight (lbs):		17.5	Average Moisture (%DB):		21.4	

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.42  
 Total 4x4 Crib Weight, with spacers (lbs): 9.46  
 Total Wet Fuel Weight, with spacers (lbs): 18.92

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.78  
 Max (lbs): 4.73

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	17.00	1.68	20.9	19.8	20.5	1.40
2x4	17.00	1.64	23.8	23.0	23.8	1.33
2x4	17.00	2.02	22.8	22.6	25.0	1.64
2x4	17.00	1.90	24.6	24.6	23.8	1.53
4x4	17.00	4.16	24.7	24.3	24.2	3.34
4x4	17.00	4.18	22.4	23.8	23.2	3.39
Total Dry Weight, no spacers (lbs):						12.63
Total Dry Weight, with spacers (lbs):						15.35

Spacer Moisture Readings (%DB)						
25.3	23.0	15.4	16.9	23.8	24.3	
22.1	24.5	18.6	24.7	21.7	22.5	
24.9	23.8	24.8	23.8	23.8	23.3	
23.8	22.8	22.8	22.5	22.1	22.7	

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	28.2	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.50	OK
2x4 Fuel Mix	35 - 65 % of total weight	50%	OK

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018Preburn Start Time: 8:35Recording Interval (min): 1Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	4.8	-0.030	688	659	414	640	512	582.5	513	1102	68
1	4.7	-0.030	684	656	416	640	514	581.9	511	1061	68
2	4.7	-0.030	676	650	418	635	516	579.0	509	1030	68
3	4.7	-0.030	667	643	418	626	518	574.3	506	1007	69
4	4.7	-0.030	658	635	417	619	520	569.7	504	991	68
5	4.7	-0.030	648	627	416	613	521	564.9	501	976	68
6	4.7	-0.030	639	618	414	606	522	559.9	498	964	68
7	4.7	-0.020	628	610	412	599	523	554.2	494	952	68
8	4.7	-0.020	618	601	410	592	523	548.8	490	939	68
9	4.7	-0.020	608	592	407	576	523	541.2	487	927	68
10	4.7	-0.020	598	583	405	575	522	536.6	483	914	68
11	4.7	-0.020	589	575	402	571	521	531.5	479	901	68
12	4.7	-0.020	579	566	399	564	520	526.0	474	888	68
13	4.7	-0.020	570	558	396	557	519	520.2	470	874	68
14	4.7	-0.020	561	550	393	549	517	514.4	465	860	68
15	4.7	-0.020	552	543	390	537	516	507.6	460	847	68
16	4.7	-0.020	545	535	387	535	514	503.0	456	835	68
17	4.7	-0.020	537	527	384	530	512	498.0	451	822	68
18	4.7	-0.020	528	520	381	520	510	491.8	447	811	69
19	4.7	-0.020	521	513	378	511	508	486.1	442	799	68
20	4.7	-0.020	513	506	375	509	505	481.7	438	789	68
21	4.7	-0.020	506	500	371	502	503	476.4	433	778	68
22	4.7	-0.020	499	493	368	493	501	471.0	428	767	68
23	4.7	-0.020	492	487	366	487	499	466.1	424	758	68
24	4.7	-0.020	485	480	362	480	497	460.8	419	748	68
25	4.7	-0.020	479	474	359	473	494	456.0	415	738	68
26	4.7	-0.020	473	468	356	467	492	451.2	410	729	69
27	4.8	-0.020	467	462	353	464	490	447.1	406	720	68
28	4.8	-0.020	461	456	350	458	487	442.4	401	712	69
29	4.8	-0.020	455	451	347	448	485	437.3	397	703	68
30	4.8	-0.020	450	445	344	440	483	432.4	393	695	68
31	4.8	-0.020	444	439	341	439	481	428.8	389	688	69
32	4.8	-0.020	439	434	338	436	478	425.2	385	680	69
33	4.8	-0.020	434	429	336	431	476	421.2	382	673	68
34	4.8	-0.020	429	424	333	423	474	416.5	378	666	68
35	4.8	-0.020	424	419	330	417	472	412.2	374	659	68
36	4.8	-0.020	420	415	327	415	469	409.2	370	652	68
37	4.8	-0.020	415	410	324	409	467	405.1	367	645	68
38	4.8	-0.020	411	405	321	407	465	401.7	363	640	67
39	4.8	-0.020	406	401	319	398	463	397.3	360	635	68
40	4.7	-0.020	402	397	316	397	460	394.3	356	633	68
41	4.8	-0.020	397	393	313	394	458	391.0	353	633	68
42	4.8	-0.020	393	389	309	390	456	387.6	349	637	68
43	4.8	-0.020	389	385	307	387	454	384.6	346	643	69
44	4.8	-0.020	385	382	304	385	453	381.8	343	651	68



## WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Preburn Start Time: 8:35  
 Recording Interval (min): 1  
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	4.8	-0.020	382	379	301	382	451	378.9	340	662	68
46	4.8	-0.020	379	376	298	382	450	376.9	337	675	67
47	4.8	-0.020	376	373	296	381	448	374.9	334	689	68
48	4.8	-0.020	374	371	294	379	447	372.8	332	703	68
49	4.8	-0.020	371	369	292	380	446	371.6	329	720	68
50	4.8	-0.020	369	367	290	379	445	370.1	327	735	68
51	4.8	-0.020	368	366	289	381	445	369.7	326	742	68
52	4.7	-0.020	367	366	287	381	444	368.9	324	746	67
53	4.7	-0.020	366	365	287	381	443	368.4	323	752	67
54	4.7	-0.020	365	365	286	383	443	368.6	322	760	67
55	4.7	-0.020	365	366	286	380	443	368.0	321	767	67
56	4.7	-0.020	366	367	286	382	443	368.5	320	770	67
57	4.7	-0.020	366	368	286	383	444	369.2	320	775	68
58	4.6	-0.020	367	369	286	386	444	370.4	320	780	68
59	4.6	-0.020	368	371	286	385	445	370.8	320	780	68
60	4.6	-0.020	369	372	286	387	445	371.9	320	780	68

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: <b>Valley Comfort</b>	Job #: <b>18-421</b>
Model: <b>Blaze King PE32</b>	Tracking #: <b>0012</b>
Run #: <b>6</b>	Technician: <b>SJB</b>
Test Start Time: <b>9:36</b>	Date: <b>10/12/2018</b>

Total Sampling Time (min): **358**  
 Recording Interval (min): **1**

Meter Box  $\gamma$  Factor: **1.002** (A)  
 Meter Box  $\gamma$  Factor: **0.998** (B)  
 Meter Box  $\gamma$  Factor: **0.000** (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): **0**  
 Smoke Capture Check (%): **100%**  
 Date Flue Pipe Last Cleaned: **10/7/2018**

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	28.84	28.70
Relative Humidity (%)	26.0	20.6
Room Air Velocity (ft/min)	0	0
Scale Audit (lbs)	10.0	10.0
Ambient Sample Volume:	<b>0.000</b> ft <sup>3</sup>	

**Sample Train Post-Test Leak Checks**

(A)	0.001	cfm @	<b>23</b>	in. Hg
(B)	0.002	cfm @	<b>-24</b>	in. Hg
(Ambient)	0.000	cfm @	<b>0</b>	in. Hg

## DILUTION TUNNEL FLOW

**Traverse Data**

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.024	76
2	0.044	76
3	0.028	76
4	0.020	76
5	0.022	76
6	0.034	76
7	0.044	76
8	0.030	76
Center	0.046	76

Dilution Tunnel H<sub>2</sub>O: **2.00** percent  
 Tunnel Diameter: **6** inches  
 Pitot Tube Cp: **0.99** [unitless]  
 Dilution Tunnel MW(dry): **29.00** lb/lb-mole  
 Dilution Tunnel MW(wet): **28.78** lb/lb-mole  
 Tunnel Area: **0.1963** ft<sup>2</sup>

V<sub>strav</sub>: **12.12** ft/sec  
 V<sub>scant</sub>: **14.59** ft/sec  
 F<sub>p</sub>: **0.831** [ratio]

Initial Tunnel Flow: **129.3** scf/min

Static Pressure: **-0.190** in. H<sub>2</sub>O

## TEST FUEL PROPERTIES

**Default Fuel Values**

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

**Actual Fuel Used Properties**

Fuel Type:	D. Fir
HHV (kJ/kg)	19,810
%C	48.73
%H	6.87
%O	43.9
%Ash	0.5
MC (%DB)	23.2

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.046	0.50	71	-0.5		18.9		100	322	71	68
1	0.162	0.162	0.046	0.50	71	-0.5	101	18.9	0	88	320	72	68
2	0.323	0.162	0.046	0.50	71	-0.5	101	18.9	-0.06	84	318	72	68
3	0.485	0.162	0.046	0.50	71	-0.5	100	18.8	-0.03	83	316	72	68
4	0.646	0.162	0.046	0.50	71	-0.5	100	18.8	-0.05	82	314	72	68
5	0.808	0.162	0.046	0.50	71	-0.5	100	18.7	-0.04	82	312	72	68
6	0.970	0.162	0.046	0.50	71	-0.5	100	18.7	-0.04	82	310	72	67
7	1.131	0.162	0.046	0.50	71	-0.5	101	18.6	-0.1	83	308	72	68
8	1.293	0.162	0.046	0.50	71	-0.5	101	18.5	-0.07	83	307	72	68
9	1.454	0.162	0.046	0.50	71	-0.5	101	18.4	-0.1	84	307	72	68
10	1.616	0.162	0.046	0.50	71	-0.5	101	18.3	-0.11	85	307	72	68
11	1.778	0.162	0.046	0.50	71	-0.5	101	18.2	-0.08	84	307	72	68
12	1.939	0.162	0.046	0.50	71	-0.5	101	18.1	-0.11	85	307	72	68
13	2.101	0.162	0.046	0.50	71	-0.5	101	18.0	-0.09	85	307	72	68
14	2.262	0.162	0.046	0.50	71	-0.5	101	17.9	-0.12	86	309	72	68
15	2.424	0.162	0.046	0.50	71	-0.5	101	17.8	-0.11	87	310	72	68
16	2.585	0.162	0.046	0.50	71	-0.5	101	17.7	-0.14	87	312	73	68
17	2.747	0.162	0.046	0.50	71	-0.5	101	17.5	-0.15	89	314	73	68
18	2.909	0.162	0.046	0.50	71	-0.5	101	17.4	-0.13	89	318	73	68
19	3.070	0.162	0.046	0.50	71	-0.5	101	17.2	-0.18	90	322	73	68
20	3.232	0.162	0.046	0.50	71	-0.5	101	17.1	-0.14	91	326	73	68
21	3.393	0.162	0.046	0.50	71	-0.5	101	16.9	-0.15	91	330	73	68
22	3.555	0.162	0.046	0.50	71	-0.5	101	16.8	-0.14	92	334	74	68
23	3.717	0.162	0.046	0.50	71	-0.5	101	16.6	-0.16	92	338	74	68
24	3.878	0.162	0.046	0.50	71	-0.5	101	16.5	-0.15	93	342	74	68
25	4.040	0.162	0.046	0.50	71	-0.5	101	16.3	-0.15	93	346	74	68
26	4.201	0.162	0.046	0.50	71	-0.5	101	16.2	-0.17	94	350	74	68
27	4.363	0.162	0.046	0.50	71	-0.5	102	16.0	-0.16	95	355	74	69
28	4.525	0.162	0.046	0.50	72	-0.5	102	15.8	-0.18	95	359	74	68
29	4.686	0.162	0.046	0.50	72	-0.5	102	15.6	-0.19	95	363	74	68
30	4.848	0.162	0.046	0.50	72	-0.5	102	15.5	-0.16	95	367	74	69
31	5.009	0.162	0.046	0.50	72	-0.5	102	15.3	-0.15	95	371	74	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	5.171	0.162	0.046	0.50	72	-0.5	102	15.2	-0.16	95	375	74	68
33	5.333	0.162	0.046	0.50	72	-0.5	102	15.0	-0.17	95	379	75	68
34	5.494	0.162	0.046	0.50	72	-0.5	102	14.8	-0.17	96	383	75	68
35	5.656	0.162	0.046	0.50	72	-0.5	102	14.6	-0.17	95	386	75	68
36	5.817	0.162	0.046	0.50	72	-0.5	102	14.5	-0.16	95	389	75	68
37	5.979	0.162	0.046	0.50	72	-0.5	101	14.3	-0.15	95	392	75	68
38	6.141	0.162	0.046	0.50	72	-0.5	101	14.2	-0.15	95	394	75	68
39	6.302	0.162	0.046	0.50	72	-0.5	101	14.1	-0.13	94	396	75	69
40	6.464	0.162	0.046	0.50	72	-0.5	101	13.9	-0.11	94	398	75	69
41	6.625	0.162	0.046	0.50	72	-0.5	101	13.8	-0.11	94	400	75	68
42	6.787	0.162	0.046	0.50	72	-0.5	101	13.7	-0.12	93	401	75	69
43	6.948	0.162	0.046	0.50	72	-0.5	101	13.6	-0.13	93	402	75	68
44	7.110	0.162	0.046	0.50	73	-0.5	101	13.5	-0.08	93	403	75	68
45	7.272	0.162	0.046	0.50	73	-0.5	101	13.4	-0.1	92	403	75	68
46	7.433	0.162	0.046	0.50	73	-0.5	101	13.3	-0.12	92	404	75	68
47	7.595	0.162	0.046	0.50	73	-0.5	101	13.2	-0.08	92	403	75	68
48	7.756	0.162	0.046	0.50	73	-0.5	101	13.1	-0.11	92	403	75	69
49	7.918	0.162	0.046	0.50	73	-0.5	101	13.0	-0.11	92	403	75	69
50	8.080	0.162	0.046	0.50	73	-0.5	101	12.9	-0.09	91	403	75	69
51	8.241	0.162	0.046	0.50	73	-0.5	101	12.8	-0.1	92	403	75	69
52	8.403	0.162	0.046	0.50	73	-0.5	101	12.7	-0.1	92	403	75	68
53	8.564	0.162	0.046	0.50	73	-0.5	101	12.6	-0.09	91	403	75	68
54	8.726	0.162	0.046	0.50	73	-0.5	101	12.5	-0.06	91	402	75	69
55	8.888	0.162	0.046	0.50	73	-0.5	101	12.4	-0.1	91	401	75	69
56	9.049	0.162	0.046	0.50	73	-0.5	101	12.4	-0.09	91	401	75	69
57	9.211	0.162	0.046	0.50	73	-0.5	101	12.3	-0.09	91	400	75	69
58	9.372	0.162	0.046	0.50	73	-0.5	101	12.2	-0.07	91	400	75	69
59	9.534	0.162	0.046	0.50	73	-0.5	101	12.1	-0.1	91	400	75	69
60	9.696	0.162	0.046	0.50	74	-0.5	101	12.0	-0.08	90	400	75	69
61	9.857	0.162	0.046	0.50	74	-0.5	101	11.9	-0.08	91	401	74	69
62	10.019	0.162	0.046	0.50	74	-0.5	101	11.8	-0.11	91	401	75	69
63	10.180	0.162	0.046	0.50	74	-0.5	101	11.7	-0.08	91	401	76	69

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.342	0.162	0.046	0.50	74	-0.5	101	11.6	-0.1	91	401	75	69
65	10.503	0.162	0.046	0.50	74	-0.5	101	11.6	-0.06	91	402	76	69
66	10.665	0.162	0.046	0.50	74	-0.5	101	11.5	-0.09	90	402	76	69
67	10.827	0.162	0.046	0.50	74	-0.5	101	11.4	-0.1	90	403	76	69
68	10.988	0.162	0.046	0.50	74	-0.5	101	11.3	-0.09	91	404	76	69
69	11.150	0.162	0.046	0.50	74	-0.5	101	11.2	-0.09	90	406	75	69
70	11.311	0.162	0.046	0.50	74	-0.5	101	11.1	-0.12	91	407	75	70
71	11.473	0.162	0.046	0.50	74	-0.5	101	11.0	-0.11	91	409	76	69
72	11.635	0.162	0.046	0.50	74	-0.5	101	10.9	-0.13	91	411	76	69
73	11.796	0.162	0.046	0.50	74	-0.5	101	10.7	-0.11	92	413	76	70
74	11.958	0.162	0.046	0.50	74	-0.5	101	10.6	-0.14	91	415	76	70
75	12.119	0.162	0.046	0.50	74	-0.5	101	10.5	-0.13	91	417	76	69
76	12.281	0.162	0.046	0.50	74	-0.5	101	10.4	-0.12	91	419	76	70
77	12.443	0.162	0.046	0.50	74	-0.5	101	10.2	-0.11	91	421	76	69
78	12.604	0.162	0.046	0.50	74	-0.5	101	10.1	-0.14	91	423	76	69
79	12.766	0.162	0.046	0.50	75	-0.5	101	10.0	-0.12	90	425	76	69
80	12.927	0.162	0.046	0.50	75	-0.5	101	9.9	-0.11	90	426	75	69
81	13.089	0.162	0.046	0.50	75	-0.5	101	9.8	-0.1	90	428	75	69
82	13.251	0.162	0.046	0.50	75	-0.5	100	9.7	-0.11	89	429	75	69
83	13.412	0.162	0.046	0.50	75	-0.5	100	9.6	-0.1	89	430	75	69
84	13.574	0.162	0.046	0.50	75	-0.5	100	9.5	-0.07	89	431	75	69
85	13.735	0.162	0.046	0.50	75	-0.5	100	9.4	-0.09	88	432	75	69
86	13.897	0.162	0.046	0.50	75	-0.5	100	9.3	-0.08	88	432	75	69
87	14.059	0.162	0.046	0.50	75	-0.5	100	9.2	-0.08	88	432	75	69
88	14.220	0.162	0.046	0.50	75	-0.5	100	9.2	-0.09	87	432	75	69
89	14.382	0.162	0.046	0.50	75	-0.5	100	9.1	-0.08	87	432	75	69
90	14.543	0.162	0.046	0.50	75	-0.5	100	9.0	-0.06	87	432	75	70
91	14.705	0.162	0.046	0.50	75	-0.5	100	8.9	-0.08	87	432	75	69
92	14.866	0.162	0.046	0.50	75	-0.5	100	8.8	-0.09	87	431	75	69
93	15.028	0.162	0.046	0.50	75	-0.5	100	8.8	-0.08	87	430	75	69
94	15.190	0.162	0.046	0.50	75	-0.5	100	8.7	-0.11	86	430	75	69
95	15.351	0.162	0.046	0.50	75	-0.5	100	8.6	-0.08	86	429	75	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.513	0.162	0.046	0.50	75	-0.5	100	8.5	-0.1	85	428	74	68
97	15.674	0.162	0.046	0.50	74	-0.5	100	8.4	-0.09	85	428	74	68
98	15.836	0.162	0.046	0.50	74	-0.5	100	8.3	-0.06	85	427	74	68
99	15.998	0.162	0.046	0.50	74	-0.5	100	8.2	-0.11	86	427	74	68
100	16.159	0.162	0.046	0.50	74	-0.5	100	8.1	-0.08	86	426	74	68
101	16.321	0.162	0.046	0.50	74	-0.5	100	8.1	-0.08	86	425	74	69
102	16.482	0.162	0.046	0.50	74	-0.5	100	8.0	-0.08	86	424	74	69
103	16.644	0.162	0.046	0.50	74	-0.5	100	7.9	-0.06	86	424	74	69
104	16.806	0.162	0.046	0.50	74	-0.5	100	7.8	-0.08	86	423	74	69
105	16.967	0.162	0.046	0.50	74	-0.5	100	7.8	-0.05	86	423	74	69
106	17.129	0.162	0.046	0.50	74	-0.5	100	7.7	-0.06	85	422	74	69
107	17.290	0.162	0.046	0.50	74	-0.5	100	7.7	-0.06	85	422	74	69
108	17.452	0.162	0.046	0.50	74	-0.5	100	7.6	-0.06	85	421	74	69
109	17.614	0.162	0.046	0.50	74	-0.5	100	7.5	-0.06	85	421	74	69
110	17.775	0.162	0.046	0.50	74	-0.5	100	7.5	-0.06	85	420	74	69
111	17.937	0.162	0.046	0.50	74	-0.5	100	7.4	-0.06	84	419	74	69
112	18.098	0.162	0.046	0.50	74	-0.5	100	7.4	-0.05	85	418	74	69
113	18.260	0.162	0.046	0.50	75	-0.5	100	7.3	-0.06	85	417	74	69
114	18.422	0.162	0.046	0.50	75	-0.5	100	7.3	-0.06	85	416	74	69
115	18.583	0.162	0.046	0.50	75	-0.5	100	7.2	-0.05	85	415	74	69
116	18.745	0.162	0.046	0.50	75	-0.5	100	7.1	-0.06	85	414	74	69
117	18.906	0.162	0.046	0.50	75	-0.5	100	7.1	-0.07	84	413	74	70
118	19.068	0.162	0.046	0.50	75	-0.5	100	7.0	-0.06	84	412	74	70
119	19.229	0.162	0.046	0.50	75	-0.5	100	7.0	-0.04	85	411	74	69
120	19.391	0.162	0.046	0.50	75	-0.5	100	6.9	-0.08	85	410	74	69
121	19.553	0.162	0.046	0.50	75	-0.5	100	6.8	-0.06	85	410	74	69
122	19.714	0.162	0.046	0.50	75	-0.5	100	6.8	-0.06	85	409	74	69
123	19.876	0.162	0.046	0.50	75	-0.5	100	6.7	-0.07	84	408	74	69
124	20.037	0.162	0.046	0.50	75	-0.5	100	6.6	-0.06	84	408	74	69
125	20.199	0.162	0.046	0.50	75	-0.5	100	6.6	-0.04	84	407	74	69
126	20.361	0.162	0.046	0.50	75	-0.5	100	6.5	-0.06	84	407	74	69
127	20.522	0.162	0.046	0.50	75	-0.5	100	6.5	-0.05	84	407	74	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.684	0.162	0.046	0.50	75	-0.5	100	6.4	-0.05	84	406	74	70
129	20.845	0.162	0.046	0.50	75	-0.5	100	6.4	-0.05	84	406	74	69
130	21.007	0.162	0.046	0.50	75	-0.5	100	6.4	-0.04	84	405	74	69
131	21.169	0.162	0.046	0.50	75	-0.5	100	6.3	-0.06	84	405	74	69
132	21.330	0.162	0.046	0.50	75	-0.5	100	6.3	-0.04	84	404	74	70
133	21.492	0.162	0.046	0.50	75	-0.5	100	6.2	-0.04	84	404	74	69
134	21.653	0.162	0.046	0.50	75	-0.5	100	6.2	-0.05	84	403	74	70
135	21.815	0.162	0.046	0.50	75	-0.5	100	6.1	-0.05	84	403	74	69
136	21.977	0.162	0.046	0.50	75	-0.5	100	6.1	-0.03	84	402	74	70
137	22.138	0.162	0.046	0.50	75	-0.5	100	6.0	-0.05	85	402	74	69
138	22.300	0.162	0.046	0.50	75	-0.5	100	6.0	-0.06	84	402	75	70
139	22.461	0.162	0.046	0.50	75	-0.5	100	5.9	-0.04	84	402	74	70
140	22.623	0.162	0.046	0.50	75	-0.5	100	5.9	-0.04	84	402	75	70
141	22.784	0.162	0.046	0.50	75	-0.5	100	5.8	-0.05	84	402	75	70
142	22.946	0.162	0.046	0.50	75	-0.5	100	5.8	-0.04	85	401	75	70
143	23.108	0.162	0.046	0.50	75	-0.5	100	5.7	-0.08	84	402	75	69
144	23.269	0.162	0.046	0.50	75	-0.5	100	5.7	-0.05	84	402	75	70
145	23.431	0.162	0.046	0.50	75	-0.5	100	5.6	-0.04	84	402	75	69
146	23.592	0.162	0.046	0.50	75	-0.5	100	5.6	-0.07	84	402	75	70
147	23.754	0.162	0.046	0.50	75	-0.5	100	5.5	-0.03	85	402	75	70
148	23.916	0.162	0.046	0.50	75	-0.5	100	5.5	-0.06	85	403	75	70
149	24.077	0.162	0.046	0.50	75	-0.5	100	5.4	-0.04	85	404	75	70
150	24.239	0.162	0.046	0.50	75	-0.5	100	5.4	-0.04	85	405	75	70
151	24.400	0.162	0.046	0.50	75	-0.5	100	5.3	-0.06	85	405	75	70
152	24.562	0.162	0.046	0.50	75	-0.5	100	5.3	-0.04	86	406	75	70
153	24.724	0.162	0.046	0.50	75	-0.5	100	5.2	-0.05	85	406	75	70
154	24.885	0.162	0.046	0.50	75	-0.5	100	5.2	-0.04	85	407	75	71
155	25.047	0.162	0.046	0.50	76	-0.5	100	5.2	-0.04	85	407	75	70
156	25.208	0.162	0.046	0.50	76	-0.5	100	5.1	-0.05	85	407	75	71
157	25.370	0.162	0.046	0.50	76	-0.5	100	5.1	-0.03	85	407	75	70
158	25.532	0.162	0.046	0.50	76	-0.5	100	5.0	-0.04	85	406	75	70
159	25.693	0.162	0.046	0.50	76	-0.5	100	5.0	-0.03	85	406	75	70

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.855	0.162	0.046	0.50	76	-0.5	100	5.0	-0.03	85	405	75	70
161	26.016	0.162	0.046	0.50	76	-0.5	100	4.9	-0.06	85	405	75	71
162	26.178	0.162	0.046	0.50	76	-0.5	100	4.9	-0.03	85	404	75	70
163	26.340	0.162	0.046	0.50	76	-0.5	100	4.9	-0.04	85	403	75	70
164	26.501	0.162	0.046	0.50	76	-0.5	100	4.8	-0.04	85	403	75	70
165	26.663	0.162	0.046	0.50	76	-0.5	100	4.8	-0.04	85	402	75	70
166	26.824	0.162	0.046	0.50	76	-0.5	100	4.7	-0.03	85	402	75	70
167	26.986	0.162	0.046	0.50	76	-0.5	100	4.7	-0.04	85	401	75	71
168	27.147	0.162	0.046	0.50	76	-0.5	100	4.7	-0.05	85	401	75	70
169	27.309	0.162	0.046	0.50	76	-0.5	100	4.6	-0.03	85	400	75	71
170	27.471	0.162	0.046	0.50	76	-0.5	100	4.6	-0.06	85	400	75	70
171	27.632	0.162	0.046	0.50	76	-0.5	100	4.5	-0.02	85	400	75	71
172	27.794	0.162	0.046	0.50	76	-0.5	100	4.5	-0.06	85	399	75	71
173	27.955	0.162	0.046	0.50	76	-0.5	100	4.5	-0.02	85	399	75	71
174	28.117	0.162	0.046	0.50	76	-0.5	100	4.4	-0.03	85	398	75	71
175	28.279	0.162	0.046	0.50	76	-0.5	100	4.4	-0.04	85	398	75	70
176	28.440	0.162	0.046	0.50	76	-0.5	100	4.4	-0.03	85	397	75	71
177	28.602	0.162	0.046	0.50	76	-0.5	100	4.3	-0.05	85	397	75	71
178	28.763	0.162	0.046	0.50	76	-0.5	100	4.3	-0.03	85	396	75	72
179	28.925	0.162	0.046	0.50	76	-0.5	100	4.3	-0.03	85	396	75	71
180	29.087	0.162	0.046	0.50	76	-0.5	100	4.2	-0.05	85	395	75	71
181	29.248	0.162	0.046	0.50	76	-0.5	100	4.2	-0.03	85	395	75	71
182	29.410	0.162	0.046	0.50	76	-0.5	100	4.1	-0.04	85	394	75	71
183	29.571	0.162	0.046	0.50	76	-0.5	100	4.1	-0.06	85	394	75	71
184	29.733	0.162	0.046	0.50	76	-0.5	100	4.0	-0.03	86	394	75	71
185	29.895	0.162	0.046	0.50	76	-0.5	100	4.0	-0.06	86	394	75	71
186	30.056	0.162	0.046	0.50	76	-0.5	100	4.0	-0.02	86	394	75	71
187	30.218	0.162	0.046	0.50	76	-0.5	100	3.9	-0.06	86	395	75	71
188	30.379	0.162	0.046	0.50	76	-0.5	100	3.8	-0.06	86	396	75	71
189	30.541	0.162	0.046	0.50	77	-0.5	100	3.8	-0.03	86	397	76	72
190	30.703	0.162	0.046	0.50	77	-0.5	100	3.8	-0.06	86	397	76	72
191	30.864	0.162	0.046	0.50	77	-0.5	100	3.7	-0.07	86	398	76	72



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	31.026	0.162	0.046	0.50	77	-0.5	100	3.6	-0.05	86	400	76	71
193	31.187	0.162	0.046	0.50	77	-0.5	100	3.6	-0.05	87	401	76	71
194	31.349	0.162	0.046	0.50	77	-0.5	100	3.5	-0.06	87	401	76	71
195	31.510	0.162	0.046	0.50	77	-0.5	100	3.5	-0.05	86	402	76	71
196	31.672	0.162	0.046	0.50	77	-0.5	100	3.4	-0.06	86	403	76	71
197	31.834	0.162	0.046	0.50	77	-0.5	100	3.4	-0.04	86	404	76	71
198	31.995	0.162	0.046	0.50	77	-0.5	100	3.3	-0.06	86	406	76	71
199	32.157	0.162	0.046	0.50	77	-0.5	100	3.3	-0.06	86	407	76	71
200	32.318	0.162	0.046	0.50	77	-0.5	100	3.2	-0.04	86	408	76	71
201	32.480	0.162	0.046	0.50	77	-0.5	100	3.2	-0.05	86	409	76	72
202	32.642	0.162	0.046	0.50	77	-0.5	100	3.1	-0.04	86	411	76	71
203	32.803	0.162	0.046	0.50	77	-0.5	100	3.1	-0.04	86	412	76	72
204	32.965	0.162	0.046	0.50	77	-0.5	100	3.1	-0.03	86	413	76	71
205	33.126	0.162	0.046	0.50	77	-0.5	100	3.0	-0.05	86	414	76	71
206	33.288	0.162	0.046	0.50	77	-0.5	100	3.0	-0.02	86	415	76	72
207	33.450	0.162	0.046	0.50	77	-0.5	100	3.0	-0.03	86	416	76	72
208	33.611	0.162	0.046	0.50	77	-0.5	100	2.9	-0.03	85	416	76	72
209	33.773	0.162	0.046	0.50	77	-0.5	100	2.9	-0.02	85	417	76	72
210	33.934	0.162	0.046	0.50	77	-0.5	100	2.9	-0.03	85	416	76	72
211	34.096	0.162	0.046	0.50	77	-0.5	100	2.8	-0.03	85	416	76	72
212	34.258	0.162	0.046	0.50	77	-0.5	100	2.8	-0.01	85	415	76	72
213	34.419	0.162	0.046	0.50	77	-0.5	100	2.8	-0.02	85	414	76	72
214	34.581	0.162	0.046	0.50	77	-0.5	100	2.8	-0.01	85	413	76	72
215	34.742	0.162	0.046	0.50	77	-0.5	100	2.8	-0.01	84	411	76	71
216	34.904	0.162	0.046	0.50	77	-0.5	100	2.8	0	84	410	76	72
217	35.066	0.162	0.046	0.50	77	-0.5	100	2.8	-0.04	85	409	76	72
218	35.227	0.162	0.046	0.50	77	-0.5	100	2.7	-0.02	85	407	76	72
219	35.389	0.162	0.046	0.50	77	-0.5	100	2.7	-0.01	84	406	76	72
220	35.550	0.162	0.046	0.50	77	-0.5	100	2.7	-0.01	85	404	76	72
221	35.712	0.162	0.046	0.50	77	-0.5	100	2.7	0.02	85	402	76	72
222	35.873	0.162	0.046	0.50	77	-0.5	100	2.7	-0.02	85	401	76	72
223	36.035	0.162	0.046	0.50	77	-0.5	100	2.7	-0.02	85	399	76	72

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.197	0.162	0.046	0.50	78	-0.5	100	2.7	-0.01	85	398	76	72
225	36.358	0.162	0.046	0.50	78	-0.5	100	2.7	-0.02	85	396	76	72
226	36.520	0.162	0.046	0.50	78	-0.5	100	2.7	-0.01	85	394	76	72
227	36.681	0.162	0.046	0.50	78	-0.5	100	2.6	-0.01	85	393	76	72
228	36.843	0.162	0.046	0.50	78	-0.5	100	2.6	-0.03	85	391	76	73
229	37.005	0.162	0.046	0.50	78	-0.5	99	2.6	-0.01	85	390	76	73
230	37.166	0.162	0.046	0.50	78	-0.5	99	2.6	-0.01	85	388	76	72
231	37.328	0.162	0.046	0.50	78	-0.5	99	2.6	-0.02	84	387	76	72
232	37.489	0.162	0.046	0.50	78	-0.5	99	2.6	-0.01	85	386	76	72
233	37.651	0.162	0.046	0.50	78	-0.5	99	2.6	-0.01	84	384	76	72
234	37.813	0.162	0.046	0.50	78	-0.5	99	2.5	-0.02	84	383	76	73
235	37.974	0.162	0.046	0.50	78	-0.5	99	2.5	-0.02	84	382	76	73
236	38.136	0.162	0.046	0.50	78	-0.5	99	2.5	-0.02	84	381	76	72
237	38.297	0.162	0.046	0.50	78	-0.5	99	2.5	0.01	84	380	76	72
238	38.459	0.162	0.046	0.50	78	-0.5	99	2.5	-0.03	84	379	76	73
239	38.621	0.162	0.046	0.50	78	-0.5	99	2.5	-0.02	84	378	76	73
240	38.782	0.162	0.046	0.50	78	-0.5	99	2.4	-0.01	84	376	76	73
241	38.944	0.162	0.046	0.50	78	-0.5	99	2.4	-0.02	84	376	76	73
242	39.105	0.162	0.046	0.50	78	-0.5	99	2.4	-0.01	84	375	76	73
243	39.267	0.162	0.046	0.50	78	-0.5	99	2.4	-0.02	85	374	76	73
244	39.428	0.162	0.046	0.50	78	-0.5	99	2.4	-0.02	84	373	76	73
245	39.590	0.162	0.046	0.50	78	-0.5	99	2.4	-0.01	85	372	76	73
246	39.752	0.162	0.046	0.50	78	-0.5	99	2.3	-0.02	84	371	76	73
247	39.913	0.162	0.046	0.50	78	-0.5	99	2.3	-0.01	85	370	76	73
248	40.075	0.162	0.046	0.50	78	-0.5	99	2.3	-0.01	85	370	76	73
249	40.236	0.162	0.046	0.50	78	-0.5	99	2.3	-0.02	85	368	76	73
250	40.398	0.162	0.046	0.50	78	-0.5	99	2.3	-0.03	85	368	76	73
251	40.560	0.162	0.046	0.50	78	-0.5	99	2.3	0	84	367	76	73
252	40.721	0.162	0.046	0.50	78	-0.5	99	2.2	-0.03	84	366	76	73
253	40.883	0.162	0.046	0.50	78	-0.5	99	2.2	-0.01	84	365	76	73
254	41.044	0.162	0.046	0.50	78	-0.5	99	2.2	-0.01	84	364	76	73
255	41.206	0.162	0.046	0.50	78	-0.5	99	2.2	-0.03	84	363	76	73

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.368	0.162	0.046	0.50	78	-0.5	99	2.2	-0.01	85	362	77	73
257	41.529	0.162	0.046	0.50	78	-0.5	99	2.2	-0.02	85	362	77	73
258	41.691	0.162	0.046	0.50	78	-0.5	99	2.1	-0.03	85	361	77	73
259	41.852	0.162	0.046	0.50	78	-0.5	99	2.1	0	85	360	77	73
260	42.014	0.162	0.046	0.50	78	-0.5	99	2.1	-0.03	85	360	77	73
261	42.176	0.162	0.046	0.50	78	-0.5	99	2.1	-0.01	85	359	77	73
262	42.337	0.162	0.046	0.50	78	-0.5	99	2.1	-0.02	85	358	77	73
263	42.499	0.162	0.046	0.50	78	-0.5	99	2.1	-0.02	86	358	77	73
264	42.660	0.162	0.046	0.50	78	-0.5	99	2.0	-0.01	86	357	77	73
265	42.822	0.162	0.046	0.50	78	-0.5	99	2.0	-0.02	85	357	77	73
266	42.984	0.162	0.046	0.50	78	-0.5	99	2.0	-0.03	86	357	77	73
267	43.145	0.162	0.046	0.50	78	-0.5	99	2.0	-0.02	86	356	77	73
268	43.307	0.162	0.046	0.50	78	-0.5	99	1.9	-0.03	86	356	77	73
269	43.468	0.162	0.046	0.50	78	-0.5	99	2.0	0.01	86	356	77	73
270	43.630	0.162	0.046	0.50	78	-0.5	99	1.9	-0.04	86	355	77	73
271	43.791	0.162	0.046	0.50	78	-0.5	99	1.9	0	86	355	77	73
272	43.953	0.162	0.046	0.50	78	-0.5	99	1.9	-0.03	86	355	77	73
273	44.115	0.162	0.046	0.50	78	-0.5	99	1.8	-0.04	86	355	77	73
274	44.276	0.162	0.046	0.50	78	-0.5	99	1.8	-0.02	86	355	77	73
275	44.438	0.162	0.046	0.50	78	-0.5	99	1.8	0.01	86	355	77	73
276	44.599	0.162	0.046	0.50	78	-0.5	99	1.8	-0.04	86	355	77	73
277	44.761	0.162	0.046	0.50	78	-0.5	99	1.8	-0.02	86	355	77	73
278	44.923	0.162	0.046	0.50	78	-0.5	99	1.8	-0.02	86	355	77	73
279	45.084	0.162	0.046	0.50	78	-0.5	99	1.7	-0.03	86	355	77	73
280	45.246	0.162	0.046	0.50	78	-0.5	99	1.7	-0.02	86	356	77	73
281	45.407	0.162	0.046	0.50	78	-0.5	99	1.7	-0.01	86	356	77	73
282	45.569	0.162	0.046	0.50	78	-0.5	99	1.7	-0.04	86	356	77	73
283	45.731	0.162	0.046	0.50	78	-0.5	99	1.6	-0.02	86	356	77	73
284	45.892	0.162	0.046	0.50	78	-0.5	99	1.6	-0.01	86	357	77	73
285	46.054	0.162	0.046	0.50	78	-0.5	99	1.6	-0.03	86	357	77	73
286	46.215	0.162	0.046	0.50	78	-0.5	100	1.6	0	86	357	77	73
287	46.377	0.162	0.046	0.50	78	-0.5	99	1.6	-0.04	86	358	77	73

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	46.539	0.162	0.046	0.50	78	-0.5	99	1.5	-0.03	86	358	77	73
289	46.700	0.162	0.046	0.50	78	-0.5	99	1.5	-0.01	86	359	77	73
290	46.862	0.162	0.046	0.50	78	-0.5	99	1.5	-0.02	86	359	77	73
291	47.023	0.162	0.046	0.50	78	-0.5	99	1.5	-0.02	86	359	77	73
292	47.185	0.162	0.046	0.50	78	-0.5	99	1.4	-0.03	86	359	77	73
293	47.347	0.162	0.046	0.50	78	-0.5	99	1.4	-0.03	86	359	77	73
294	47.508	0.162	0.046	0.50	78	-0.5	100	1.4	-0.02	86	360	77	73
295	47.670	0.162	0.046	0.50	79	-0.5	99	1.4	-0.01	86	360	77	73
296	47.831	0.162	0.046	0.50	79	-0.5	99	1.4	-0.03	87	361	77	73
297	47.993	0.162	0.046	0.50	78	-0.5	99	1.3	-0.03	86	361	77	73
298	48.154	0.162	0.046	0.50	78	-0.5	99	1.3	0	86	362	77	73
299	48.316	0.162	0.046	0.50	78	-0.5	99	1.3	-0.04	86	362	77	73
300	48.478	0.162	0.046	0.50	79	-0.5	100	1.3	-0.03	87	363	77	73
301	48.639	0.162	0.046	0.50	79	-0.5	100	1.2	-0.01	87	363	77	74
302	48.801	0.162	0.046	0.50	79	-0.5	100	1.2	-0.03	87	364	77	73
303	48.962	0.162	0.046	0.50	79	-0.5	100	1.2	-0.02	87	365	77	73
304	49.124	0.162	0.046	0.50	79	-0.5	100	1.2	-0.03	87	365	77	74
305	49.286	0.162	0.046	0.50	79	-0.5	100	1.1	-0.02	87	366	77	74
306	49.447	0.162	0.046	0.50	79	-0.5	100	1.1	-0.02	87	367	77	73
307	49.609	0.162	0.046	0.50	79	-0.5	100	1.1	-0.03	87	367	77	74
308	49.770	0.162	0.046	0.50	79	-0.5	100	1.1	-0.02	87	368	77	73
309	49.932	0.162	0.046	0.50	79	-0.5	100	1.1	-0.01	87	368	77	74
310	50.094	0.162	0.046	0.50	79	-0.5	100	1.0	-0.05	87	368	77	74
311	50.255	0.162	0.046	0.50	79	-0.5	100	1.0	-0.01	87	369	77	74
312	50.417	0.162	0.046	0.50	79	-0.5	100	1.0	-0.02	87	369	77	73
313	50.578	0.162	0.046	0.50	79	-0.5	100	1.0	-0.01	87	369	77	73
314	50.740	0.162	0.046	0.50	79	-0.5	100	1.0	-0.01	87	369	77	73
315	50.902	0.162	0.046	0.50	79	-0.5	100	0.9	-0.04	87	369	77	73
316	51.063	0.162	0.046	0.50	79	-0.5	100	0.9	-0.03	87	369	77	73
317	51.225	0.162	0.046	0.50	79	-0.5	100	0.9	-0.01	87	369	77	73
318	51.386	0.162	0.046	0.50	79	-0.5	100	0.9	-0.02	87	369	77	73
319	51.548	0.162	0.046	0.50	79	-0.5	100	0.8	-0.02	87	369	77	73

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	51.709	0.162	0.046	0.50	79	-0.5	100	0.8	-0.02	87	368	77	74
321	51.871	0.162	0.046	0.50	79	-0.5	100	0.8	-0.02	87	368	77	74
322	52.033	0.162	0.046	0.50	79	-0.5	100	0.8	-0.01	87	368	77	74
323	52.194	0.162	0.046	0.50	79	-0.5	100	0.8	-0.03	87	368	77	74
324	52.356	0.162	0.046	0.50	79	-0.5	100	0.7	-0.02	87	368	77	73
325	52.517	0.162	0.046	0.50	79	-0.5	100	0.7	-0.02	87	367	77	74
326	52.679	0.162	0.046	0.50	79	-0.5	100	0.7	-0.04	87	367	77	74
327	52.841	0.162	0.046	0.50	79	-0.5	100	0.7	0	87	367	77	74
328	53.002	0.162	0.046	0.50	79	-0.5	100	0.7	-0.02	87	367	77	74
329	53.164	0.162	0.046	0.50	79	-0.5	100	0.6	-0.02	88	367	77	74
330	53.325	0.162	0.046	0.50	79	-0.5	100	0.6	-0.01	88	367	77	74
331	53.487	0.162	0.046	0.50	79	-0.5	100	0.6	-0.02	87	367	77	74
332	53.649	0.162	0.046	0.50	79	-0.5	100	0.6	-0.02	88	367	78	74
333	53.810	0.162	0.046	0.50	79	-0.5	100	0.6	-0.03	88	367	78	74
334	53.972	0.162	0.046	0.50	79	-0.5	100	0.5	-0.02	88	367	78	74
335	54.133	0.162	0.046	0.50	79	-0.5	100	0.5	-0.01	87	367	78	74
336	54.295	0.162	0.046	0.50	79	-0.5	100	0.5	-0.03	87	367	78	74
337	54.457	0.162	0.046	0.50	79	-0.5	100	0.5	0	88	367	78	74
338	54.618	0.162	0.046	0.50	79	-0.5	100	0.5	-0.04	88	367	78	74
339	54.780	0.162	0.046	0.50	79	-0.5	100	0.4	-0.02	88	367	78	74
340	54.941	0.162	0.046	0.50	79	-0.5	100	0.4	-0.01	88	367	78	74
341	55.103	0.162	0.046	0.50	79	-0.5	99	0.4	-0.02	87	367	78	74
342	55.265	0.162	0.046	0.50	79	-0.5	100	0.4	-0.02	88	367	78	74
343	55.426	0.162	0.046	0.50	79	-0.5	100	0.4	-0.02	88	367	78	74
344	55.588	0.162	0.046	0.50	79	-0.5	100	0.4	-0.02	88	367	78	74
345	55.749	0.162	0.046	0.50	79	-0.5	100	0.3	-0.02	88	367	78	74
346	55.911	0.162	0.046	0.50	79	-0.5	100	0.3	-0.02	88	367	78	74
347	56.072	0.162	0.046	0.50	79	-0.5	100	0.3	-0.01	88	367	78	74
348	56.234	0.162	0.046	0.50	79	-0.5	99	0.3	-0.02	88	367	78	74
349	56.396	0.162	0.046	0.50	79	-0.5	99	0.3	-0.02	88	367	78	74
350	56.557	0.162	0.046	0.50	79	-0.5	100	0.2	-0.03	88	367	78	74
351	56.719	0.162	0.046	0.50	79	-0.5	99	0.2	-0.02	87	367	78	74

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 6Technician: SJBDate: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	56.880	0.162	0.046	0.50	79	-0.5	99	0.2	-0.01	87	367	78	74
353	57.042	0.162	0.046	0.50	79	-0.5	99	0.2	-0.03	87	367	78	74
354	57.204	0.162	0.046	0.50	79	-0.5	99	0.2	-0.01	86	367	78	72
355	57.365	0.162	0.046	0.50	79	-0.5	99	0.1	-0.02	86	367	78	73
356	57.527	0.162	0.046	0.50	79	-0.5	99	0.1	-0.02	85	367	77	73
357	57.688	0.162	0.046	0.50	79	-0.5	99	0.1	-0.04	86	367	77	73
358	57.850	0.162	0.046	0.50	79	-0.5	99	0.0	-0.08	85	367	77	73
Avg/Tot	57.850	0.162	0.046	0.50	76	-0.50	100			87	385	76	70.9

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	70	-2		72	-0.030	8.83	0.04
1	0.157	0.157	0.50	70	-2	101	72	-0.030	3.18	0.28
2	0.314	0.157	0.50	70	-2	101	72	-0.030	5.33	0.01
3	0.471	0.157	0.50	70	-2	101	72	-0.030	5.44	0.01
4	0.627	0.157	0.50	70	-2	101	72	-0.030	5.45	0.01
5	0.784	0.157	0.50	70	-2	101	72	-0.030	5.47	0.01
6	0.941	0.157	0.50	70	-2	101	72	-0.030	5.60	0.01
7	1.098	0.157	0.50	70	-2	101	72	-0.030	6.45	0.01
8	1.255	0.157	0.50	70	-2	101	72	-0.030	9.43	0.01
9	1.412	0.157	0.50	70	-2	101	72	-0.030	9.13	0.01
10	1.569	0.157	0.50	71	-2	101	72	-0.030	10.33	0.01
11	1.725	0.157	0.50	71	-2	101	72	-0.030	9.84	0.01
12	1.882	0.157	0.50	71	-2	101	73	-0.030	9.28	0.01
13	2.039	0.157	0.50	71	-2	101	73	-0.030	9.89	0.01
14	2.196	0.157	0.50	71	-2	101	73	-0.030	10.53	0.00
15	2.353	0.157	0.50	71	-2	101	73	-0.030	10.26	0.00
16	2.510	0.157	0.50	71	-2	101	73	-0.040	11.56	0.01
17	2.667	0.157	0.50	71	-2	101	73	-0.030	12.94	0.03
18	2.823	0.157	0.50	71	-2	101	73	-0.040	13.44	0.00
19	2.980	0.157	0.50	71	-2	101	74	-0.040	13.67	0.08
20	3.137	0.157	0.50	72	-2	101	74	-0.040	14.03	0.05
21	3.294	0.157	0.50	72	-2	101	74	-0.040	13.44	0.03
22	3.451	0.157	0.50	72	-2	101	74	-0.040	13.19	0.03
23	3.608	0.157	0.50	72	-2	101	74	-0.040	12.91	0.03
24	3.765	0.157	0.50	72	-2	101	74	-0.040	13.11	0.03
25	3.922	0.157	0.50	72	-2	101	74	-0.040	13.42	0.04
26	4.078	0.157	0.50	72	-2	101	74	-0.040	13.98	0.08
27	4.235	0.157	0.50	72	-2	101	75	-0.040	14.85	0.38
28	4.392	0.157	0.50	72	-2	102	75	-0.040	15.42	1.31
29	4.549	0.157	0.50	73	-2	101	75	-0.040	15.42	1.21
30	4.706	0.157	0.50	73	-2	101	75	-0.040	15.29	0.77
31	4.863	0.157	0.50	73	-2	101	75	-0.040	15.25	0.54

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	5.020	0.157	0.50	73	-2	101	75	-0.040	15.29	0.57
33	5.176	0.157	0.50	73	-2	101	75	-0.040	15.41	0.90
34	5.333	0.157	0.50	73	-2	101	75	-0.040	15.16	1.67
35	5.490	0.157	0.50	73	-2	101	75	-0.040	14.85	2.37
36	5.647	0.157	0.50	73	-2	101	75	-0.040	14.57	2.15
37	5.804	0.157	0.50	73	-2	101	75	-0.040	14.60	1.55
38	5.961	0.157	0.50	73	-2	101	75	-0.040	14.25	1.19
39	6.118	0.157	0.50	74	-2	101	75	-0.040	14.06	0.96
40	6.274	0.157	0.50	74	-2	101	75	-0.040	13.96	0.72
41	6.431	0.157	0.50	74	-2	101	75	-0.040	13.69	0.50
42	6.588	0.157	0.50	74	-2	101	75	-0.040	13.50	0.35
43	6.745	0.157	0.50	74	-2	101	75	-0.040	13.20	0.33
44	6.902	0.157	0.50	74	-2	101	75	-0.040	12.83	0.29
45	7.059	0.157	0.50	74	-2	101	75	-0.040	12.87	0.21
46	7.216	0.157	0.50	74	-2	101	75	-0.040	12.93	0.11
47	7.372	0.157	0.50	74	-2	101	75	-0.030	13.09	0.13
48	7.529	0.157	0.50	74	-2	101	75	-0.040	12.88	0.12
49	7.686	0.157	0.50	74	-2	101	75	-0.040	12.78	0.04
50	7.843	0.157	0.50	74	-2	101	75	-0.040	12.83	0.00
51	8.000	0.157	0.50	74	-2	101	75	-0.040	12.42	0.00
52	8.157	0.157	0.50	74	-2	101	75	-0.040	12.18	0.00
53	8.314	0.157	0.50	74	-2	101	75	-0.040	11.81	0.00
54	8.470	0.157	0.50	74	-2	101	76	-0.040	11.64	0.00
55	8.627	0.157	0.50	75	-2	101	76	-0.030	11.28	0.00
56	8.784	0.157	0.50	75	-2	101	76	-0.030	11.26	0.00
57	8.941	0.157	0.50	75	-2	101	76	-0.030	11.38	0.00
58	9.098	0.157	0.50	75	-2	101	76	-0.030	11.83	0.00
59	9.255	0.157	0.50	75	-2	101	76	-0.040	12.31	0.00
60	9.412	0.157	0.50	75	-2	101	76	-0.040	12.52	0.00
61	9.568	0.157	0.50	75	-2	101	76	-0.030	12.84	0.05
62	9.725	0.157	0.50	75	-2	101	76	-0.030	12.97	0.04
63	9.882	0.157	0.50	75	-2	101	76	-0.030	13.04	0.12



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	10.039	0.157	0.50	75	-2	101	76	-0.030	12.69	0.02
65	10.196	0.157	0.50	75	-2	101	76	-0.040	12.58	0.00
66	10.353	0.157	0.50	75	-2	101	76	-0.030	12.89	0.00
67	10.510	0.157	0.50	75	-2	101	76	-0.040	13.11	0.03
68	10.667	0.157	0.50	75	-2	101	76	-0.040	13.66	0.19
69	10.823	0.157	0.50	75	-2	101	76	-0.030	13.82	0.65
70	10.980	0.157	0.50	75	-2	101	76	-0.030	13.82	1.23
71	11.137	0.157	0.50	75	-2	101	76	-0.040	13.80	2.36
72	11.294	0.157	0.50	75	-2	101	76	-0.040	13.62	2.81
73	11.451	0.157	0.50	75	-2	101	76	-0.030	13.79	2.94
74	11.608	0.157	0.50	75	-2	101	76	-0.030	13.73	2.91
75	11.765	0.157	0.50	75	-2	101	76	-0.040	13.76	2.92
76	11.921	0.157	0.50	76	-2	101	76	-0.030	13.79	2.98
77	12.078	0.157	0.50	76	-2	101	76	-0.040	13.82	3.01
78	12.235	0.157	0.50	76	-2	101	76	-0.040	13.70	2.93
79	12.392	0.157	0.50	76	-2	100	76	-0.030	13.72	2.89
80	12.549	0.157	0.50	76	-2	100	76	-0.040	13.71	2.85
81	12.706	0.157	0.50	76	-2	100	76	-0.030	13.51	2.67
82	12.863	0.157	0.50	76	-2	100	76	-0.040	13.35	2.36
83	13.019	0.157	0.50	76	-2	100	76	-0.030	13.28	2.16
84	13.176	0.157	0.50	76	-2	100	76	-0.030	13.17	1.91
85	13.333	0.157	0.50	76	-2	100	76	-0.030	13.23	1.78
86	13.490	0.157	0.50	76	-2	100	76	-0.030	13.22	1.68
87	13.647	0.157	0.50	76	-2	100	76	-0.030	13.21	1.55
88	13.804	0.157	0.50	76	-2	100	76	-0.030	13.18	1.54
89	13.961	0.157	0.50	76	-2	100	76	-0.030	13.19	1.67
90	14.117	0.157	0.50	76	-2	100	76	-0.030	13.28	1.66
91	14.274	0.157	0.50	76	-2	100	76	-0.030	13.09	1.90
92	14.431	0.157	0.50	76	-2	100	75	-0.030	13.10	2.04
93	14.588	0.157	0.50	76	-2	100	75	-0.030	12.99	2.22
94	14.745	0.157	0.50	76	-2	100	75	-0.030	13.12	2.38
95	14.902	0.157	0.50	76	-2	100	75	-0.030	13.01	2.45

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	15.059	0.157	0.50	76	-2	100	75	-0.030	13.02	2.76
97	15.215	0.157	0.50	75	-2	100	74	-0.030	13.02	2.88
98	15.372	0.157	0.50	75	-2	100	74	-0.030	13.00	2.88
99	15.529	0.157	0.50	75	-2	100	74	-0.030	13.10	2.74
100	15.686	0.157	0.50	75	-2	100	74	-0.030	13.17	2.88
101	15.843	0.157	0.50	75	-2	100	74	-0.030	13.07	2.62
102	16.000	0.157	0.50	75	-2	100	74	-0.030	13.11	2.37
103	16.157	0.157	0.50	75	-2	100	74	-0.030	12.89	2.01
104	16.313	0.157	0.50	75	-2	100	74	-0.030	12.93	1.57
105	16.470	0.157	0.50	75	-2	100	74	-0.030	12.95	1.27
106	16.627	0.157	0.50	75	-2	100	74	-0.030	12.95	1.06
107	16.784	0.157	0.50	75	-2	100	74	-0.030	12.90	0.79
108	16.941	0.157	0.50	75	-2	100	74	-0.030	12.92	0.76
109	17.098	0.157	0.50	75	-2	100	74	-0.030	12.93	0.71
110	17.255	0.157	0.50	75	-2	100	74	-0.030	12.98	0.58
111	17.411	0.157	0.50	76	-2	100	74	-0.020	12.94	0.57
112	17.568	0.157	0.50	76	-2	100	75	-0.030	13.03	0.66
113	17.725	0.157	0.50	76	-2	100	75	-0.030	13.11	0.64
114	17.882	0.157	0.50	76	-2	100	75	-0.030	13.08	0.83
115	18.039	0.157	0.50	76	-2	100	75	-0.030	13.03	0.82
116	18.196	0.157	0.50	76	-2	100	75	-0.030	13.07	0.96
117	18.353	0.157	0.50	76	-2	100	75	-0.030	13.13	1.04
118	18.510	0.157	0.50	76	-2	100	75	-0.030	13.09	1.02
119	18.666	0.157	0.50	76	-2	100	75	-0.030	13.23	1.14
120	18.823	0.157	0.50	76	-2	100	75	-0.030	13.19	1.07
121	18.980	0.157	0.50	76	-2	100	75	-0.030	13.16	1.14
122	19.137	0.157	0.50	76	-2	100	75	-0.030	13.41	0.95
123	19.294	0.157	0.50	76	-2	100	75	-0.030	13.50	0.95
124	19.451	0.157	0.50	76	-2	100	75	-0.030	13.43	0.85
125	19.608	0.157	0.50	76	-2	100	75	-0.030	13.24	0.77
126	19.764	0.157	0.50	76	-2	100	74	-0.030	13.36	0.72
127	19.921	0.157	0.50	76	-2	100	74	-0.030	13.41	0.59

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	20.078	0.157	0.50	76	-2	100	74	-0.030	13.23	0.38
129	20.235	0.157	0.50	76	-2	100	75	-0.030	13.20	0.27
130	20.392	0.157	0.50	76	-2	100	75	-0.030	13.27	0.20
131	20.549	0.157	0.50	76	-2	100	75	-0.030	13.22	0.17
132	20.706	0.157	0.50	76	-2	100	75	-0.030	13.16	0.11
133	20.862	0.157	0.50	76	-2	100	75	-0.030	13.17	0.07
134	21.019	0.157	0.50	76	-2	100	75	-0.030	13.13	0.14
135	21.176	0.157	0.50	76	-2	100	75	-0.030	13.04	0.11
136	21.333	0.157	0.50	76	-2	100	75	-0.030	13.18	0.12
137	21.490	0.157	0.50	76	-2	100	75	-0.030	13.19	0.12
138	21.647	0.157	0.50	76	-2	100	75	-0.030	13.34	0.12
139	21.804	0.157	0.50	76	-2	100	75	-0.030	13.47	0.16
140	21.960	0.157	0.50	76	-2	100	75	-0.030	13.62	0.19
141	22.117	0.157	0.50	76	-2	100	75	-0.030	13.60	0.31
142	22.274	0.157	0.50	76	-2	100	75	-0.030	13.74	0.46
143	22.431	0.157	0.50	76	-2	100	75	-0.030	13.75	0.56
144	22.588	0.157	0.50	76	-2	100	75	-0.030	13.72	0.56
145	22.745	0.157	0.50	76	-2	100	75	-0.030	13.62	0.57
146	22.902	0.157	0.50	76	-2	100	75	-0.030	13.64	0.56
147	23.058	0.157	0.50	76	-2	100	75	-0.030	13.68	0.33
148	23.215	0.157	0.50	76	-2	100	75	-0.030	13.36	0.25
149	23.372	0.157	0.50	76	-2	100	75	-0.030	13.35	0.21
150	23.529	0.157	0.50	76	-2	100	75	-0.030	13.24	0.18
151	23.686	0.157	0.50	76	-2	100	75	-0.030	13.15	0.14
152	23.843	0.157	0.50	76	-2	100	75	-0.030	13.22	0.11
153	24.000	0.157	0.50	76	-2	100	75	-0.030	13.12	0.10
154	24.156	0.157	0.50	76	-2	100	75	-0.030	12.89	0.08
155	24.313	0.157	0.50	77	-2	100	75	-0.030	12.82	0.03
156	24.470	0.157	0.50	77	-2	100	75	-0.030	12.68	0.06
157	24.627	0.157	0.50	77	-2	100	75	-0.030	12.65	0.03
158	24.784	0.157	0.50	77	-2	100	75	-0.030	12.44	0.04
159	24.941	0.157	0.50	77	-2	100	75	-0.030	12.47	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	25.098	0.157	0.50	77	-2	100	75	-0.030	12.47	0.00
161	25.255	0.157	0.50	77	-2	100	75	-0.030	12.58	0.00
162	25.411	0.157	0.50	77	-2	100	75	-0.030	12.62	0.00
163	25.568	0.157	0.50	77	-2	100	75	-0.030	12.59	0.07
164	25.725	0.157	0.50	77	-2	100	75	-0.030	12.59	0.06
165	25.882	0.157	0.50	77	-2	100	75	-0.030	12.70	0.07
166	26.039	0.157	0.50	77	-2	100	75	-0.030	12.43	0.03
167	26.196	0.157	0.50	77	-2	100	76	-0.030	12.38	0.01
168	26.353	0.157	0.50	77	-2	100	76	-0.030	12.58	0.01
169	26.509	0.157	0.50	77	-2	100	76	-0.030	12.57	0.00
170	26.666	0.157	0.50	77	-2	100	76	-0.030	12.68	0.00
171	26.823	0.157	0.50	77	-2	100	76	-0.030	12.66	0.01
172	26.980	0.157	0.50	77	-2	100	75	-0.030	12.76	0.00
173	27.137	0.157	0.50	77	-2	100	75	-0.030	12.43	0.00
174	27.294	0.157	0.50	77	-2	100	75	-0.020	12.15	0.00
175	27.451	0.157	0.50	77	-2	100	75	-0.030	12.11	0.00
176	27.607	0.157	0.50	77	-2	100	75	-0.020	11.98	0.01
177	27.764	0.157	0.50	77	-2	100	75	-0.020	12.05	0.01
178	27.921	0.157	0.50	77	-2	100	76	-0.020	12.04	0.01
179	28.078	0.157	0.50	77	-2	100	76	-0.030	12.06	0.01
180	28.235	0.157	0.50	77	-2	100	76	-0.030	12.12	0.01
181	28.392	0.157	0.50	77	-2	100	76	-0.030	12.19	0.01
182	28.549	0.157	0.50	77	-2	100	76	-0.030	12.32	0.01
183	28.705	0.157	0.50	77	-2	100	76	-0.030	12.42	0.01
184	28.862	0.157	0.50	77	-2	100	76	-0.030	12.52	0.00
185	29.019	0.157	0.50	77	-2	100	76	-0.030	12.75	0.00
186	29.176	0.157	0.50	77	-2	100	76	-0.030	13.05	0.00
187	29.333	0.157	0.50	77	-2	100	76	-0.030	13.19	0.00
188	29.490	0.157	0.50	77	-2	100	76	-0.030	13.49	0.07
189	29.647	0.157	0.50	77	-2	100	76	-0.030	13.69	0.22
190	29.803	0.157	0.50	77	-2	100	76	-0.030	13.98	0.30
191	29.960	0.157	0.50	77	-2	100	76	-0.030	13.94	0.40

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
192	30.117	0.157	0.50	77	-2	100	76	-0.030	13.95	0.62
193	30.274	0.157	0.50	77	-2	100	76	-0.030	13.95	0.95
194	30.431	0.157	0.50	77	-2	100	76	-0.030	13.84	1.03
195	30.588	0.157	0.50	77	-2	100	76	-0.030	13.87	0.77
196	30.745	0.157	0.50	77	-2	100	76	-0.030	13.79	0.62
197	30.901	0.157	0.50	77	-2	100	76	-0.030	13.75	0.67
198	31.058	0.157	0.50	77	-2	100	76	-0.030	13.77	0.60
199	31.215	0.157	0.50	77	-2	100	76	-0.030	13.87	0.56
200	31.372	0.157	0.50	77	-2	100	76	-0.030	13.69	0.55
201	31.529	0.157	0.50	77	-2	100	76	-0.030	13.70	0.47
202	31.686	0.157	0.50	77	-2	100	76	-0.030	13.64	0.43
203	31.843	0.157	0.50	77	-2	100	76	-0.030	13.39	0.28
204	32.000	0.157	0.50	78	-2	100	76	-0.030	13.14	0.17
205	32.156	0.157	0.50	78	-2	100	76	-0.030	12.70	0.06
206	32.313	0.157	0.50	78	-2	100	76	-0.020	12.56	0.05
207	32.470	0.157	0.50	78	-2	100	76	-0.020	12.20	0.02
208	32.627	0.157	0.50	78	-2	100	76	-0.020	11.76	0.01
209	32.784	0.157	0.50	78	-2	100	76	-0.020	11.55	0.01
210	32.941	0.157	0.50	78	-2	100	76	-0.020	11.35	0.01
211	33.098	0.157	0.50	78	-2	100	76	-0.020	11.15	0.01
212	33.254	0.157	0.50	78	-2	100	76	-0.020	11.00	0.01
213	33.411	0.157	0.50	78	-2	100	76	-0.020	11.05	0.01
214	33.568	0.157	0.50	78	-2	100	76	-0.020	10.94	0.01
215	33.725	0.157	0.50	78	-2	100	76	-0.020	10.83	0.01
216	33.882	0.157	0.50	78	-2	100	76	-0.020	10.79	0.01
217	34.039	0.157	0.50	78	-2	100	76	-0.020	10.82	0.01
218	34.196	0.157	0.50	78	-2	100	76	-0.020	10.67	0.01
219	34.352	0.157	0.50	78	-2	100	77	-0.020	10.69	0.01
220	34.509	0.157	0.50	78	-2	100	77	-0.020	10.67	0.01
221	34.666	0.157	0.50	78	-2	100	77	-0.020	10.69	0.01
222	34.823	0.157	0.50	78	-2	100	77	-0.020	10.51	0.01
223	34.980	0.157	0.50	78	-2	100	77	-0.020	10.80	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
224	35.137	0.157	0.50	78	-2	100	77	-0.020	10.75	0.01
225	35.294	0.157	0.50	78	-2	100	77	-0.020	10.81	0.01
226	35.450	0.157	0.50	78	-2	100	77	-0.020	10.79	0.01
227	35.607	0.157	0.50	78	-2	100	77	-0.020	10.76	0.01
228	35.764	0.157	0.50	78	-2	100	77	-0.020	10.83	0.01
229	35.921	0.157	0.50	78	-2	100	77	-0.020	10.75	0.01
230	36.078	0.157	0.50	78	-2	100	77	-0.020	10.72	0.01
231	36.235	0.157	0.50	78	-2	100	77	-0.020	10.73	0.01
232	36.392	0.157	0.50	78	-2	100	77	-0.020	10.78	0.01
233	36.548	0.157	0.50	78	-2	99	77	-0.020	10.84	0.01
234	36.705	0.157	0.50	78	-2	99	77	-0.020	10.77	0.01
235	36.862	0.157	0.50	78	-2	99	77	-0.020	10.81	0.00
236	37.019	0.157	0.50	78	-2	99	77	-0.020	10.91	0.00
237	37.176	0.157	0.50	78	-2	99	77	-0.020	10.79	0.00
238	37.333	0.157	0.50	78	-2	99	77	-0.020	10.92	0.00
239	37.490	0.157	0.50	78	-2	99	77	-0.020	10.97	0.00
240	37.646	0.157	0.50	78	-2	99	77	-0.020	11.04	0.00
241	37.803	0.157	0.50	78	-2	99	77	-0.020	10.99	0.00
242	37.960	0.157	0.50	78	-2	99	77	-0.020	11.06	0.00
243	38.117	0.157	0.50	78	-2	99	77	-0.020	11.02	0.00
244	38.274	0.157	0.50	78	-2	99	77	-0.020	10.41	0.00
245	38.431	0.157	0.50	78	-2	99	77	-0.020	10.36	0.00
246	38.588	0.157	0.50	78	-2	99	77	-0.020	10.16	0.00
247	38.745	0.157	0.50	78	-2	99	77	-0.020	10.05	0.00
248	38.901	0.157	0.50	78	-2	99	77	-0.020	10.04	0.00
249	39.058	0.157	0.50	78	-2	100	77	-0.020	10.00	0.00
250	39.215	0.157	0.50	78	-2	99	77	-0.020	9.90	0.01
251	39.372	0.157	0.50	78	-2	99	77	-0.020	9.98	0.01
252	39.529	0.157	0.50	78	-2	99	77	-0.020	10.00	0.01
253	39.686	0.157	0.50	78	-2	99	77	-0.020	10.00	0.01
254	39.843	0.157	0.50	78	-2	99	77	-0.020	10.12	0.00
255	39.999	0.157	0.50	78	-2	99	77	-0.020	10.23	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
256	40.156	0.157	0.50	78	-2	99	77	-0.020	10.14	0.00
257	40.313	0.157	0.50	78	-2	99	77	-0.020	10.25	0.00
258	40.470	0.157	0.50	78	-2	100	77	-0.020	10.27	0.00
259	40.627	0.157	0.50	78	-2	100	77	-0.020	10.38	0.00
260	40.784	0.157	0.50	78	-2	100	77	-0.020	10.43	0.00
261	40.941	0.157	0.50	78	-2	100	77	-0.020	10.46	0.00
262	41.097	0.157	0.50	78	-2	100	77	-0.020	10.41	0.00
263	41.254	0.157	0.50	78	-2	100	77	-0.020	10.60	0.00
264	41.411	0.157	0.50	78	-2	100	77	-0.020	10.57	0.00
265	41.568	0.157	0.50	78	-2	100	77	-0.020	10.60	0.00
266	41.725	0.157	0.50	78	-2	100	77	-0.020	10.54	0.01
267	41.882	0.157	0.50	78	-2	100	77	-0.020	10.66	0.01
268	42.039	0.157	0.50	78	-2	100	77	-0.020	10.64	0.01
269	42.195	0.157	0.50	78	-2	100	77	-0.020	10.63	0.01
270	42.352	0.157	0.50	78	-2	100	77	-0.020	10.67	0.01
271	42.509	0.157	0.50	78	-2	100	77	-0.020	10.67	0.01
272	42.666	0.157	0.50	78	-2	100	77	-0.020	10.89	0.01
273	42.823	0.157	0.50	78	-2	100	77	-0.020	10.72	0.01
274	42.980	0.157	0.50	78	-2	100	77	-0.020	10.88	0.01
275	43.137	0.157	0.50	78	-2	100	77	-0.020	10.86	0.01
276	43.293	0.157	0.50	78	-2	100	77	-0.020	10.90	0.01
277	43.450	0.157	0.50	78	-2	100	77	-0.020	10.75	0.01
278	43.607	0.157	0.50	78	-2	100	77	-0.020	10.85	0.01
279	43.764	0.157	0.50	78	-2	100	77	-0.020	10.89	0.01
280	43.921	0.157	0.50	78	-2	100	77	-0.020	10.80	0.01
281	44.078	0.157	0.50	78	-2	100	78	-0.020	10.87	0.01
282	44.235	0.157	0.50	78	-2	100	77	-0.020	10.83	0.01
283	44.391	0.157	0.50	79	-2	100	78	-0.020	10.90	0.01
284	44.548	0.157	0.50	79	-2	100	77	-0.020	10.97	0.01
285	44.705	0.157	0.50	79	-2	100	78	-0.020	10.88	0.01
286	44.862	0.157	0.50	79	-2	100	78	-0.020	10.82	0.01
287	45.019	0.157	0.50	79	-2	100	78	-0.020	10.74	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
288	45.176	0.157	0.50	79	-2	100	78	-0.020	10.82	0.01
289	45.333	0.157	0.50	79	-2	100	78	-0.020	10.77	0.01
290	45.489	0.157	0.50	79	-2	100	78	-0.020	10.74	0.00
291	45.646	0.157	0.50	79	-2	100	78	-0.020	10.85	0.00
292	45.803	0.157	0.50	79	-2	100	78	-0.020	10.87	0.00
293	45.960	0.157	0.50	79	-2	100	78	-0.020	10.89	0.00
294	46.117	0.157	0.50	79	-2	100	78	-0.020	10.83	0.00
295	46.274	0.157	0.50	79	-2	100	78	-0.020	10.81	0.00
296	46.431	0.157	0.50	79	-2	100	78	-0.020	10.92	0.00
297	46.588	0.157	0.50	79	-2	100	78	-0.020	10.80	0.00
298	46.744	0.157	0.50	79	-2	100	78	-0.020	10.85	0.00
299	46.901	0.157	0.50	79	-2	100	78	-0.020	10.96	0.00
300	47.058	0.157	0.50	79	-2	100	78	-0.020	11.21	0.00
301	47.215	0.157	0.50	79	-2	100	78	-0.020	11.04	0.00
302	47.372	0.157	0.50	79	-2	100	78	-0.020	11.10	0.00
303	47.529	0.157	0.50	79	-2	100	78	-0.020	11.05	0.00
304	47.686	0.157	0.50	79	-2	100	78	-0.020	11.15	0.00
305	47.842	0.157	0.50	79	-2	100	78	-0.020	10.92	0.00
306	47.999	0.157	0.50	79	-2	100	78	-0.020	10.90	0.00
307	48.156	0.157	0.50	79	-2	100	78	-0.020	10.91	0.00
308	48.313	0.157	0.50	79	-2	100	78	-0.020	10.99	0.00
309	48.470	0.157	0.50	79	-2	100	78	-0.020	10.91	0.01
310	48.627	0.157	0.50	79	-2	100	78	-0.020	10.80	0.01
311	48.784	0.157	0.50	79	-2	100	78	-0.020	10.71	0.01
312	48.940	0.157	0.50	79	-2	100	78	-0.020	10.81	0.01
313	49.097	0.157	0.50	79	-2	100	78	-0.020	10.77	0.01
314	49.254	0.157	0.50	79	-2	100	78	-0.020	10.85	0.01
315	49.411	0.157	0.50	79	-2	100	78	-0.020	10.80	0.01
316	49.568	0.157	0.50	79	-2	100	78	-0.020	10.79	0.01
317	49.725	0.157	0.50	79	-2	100	78	-0.020	10.72	0.01
318	49.882	0.157	0.50	79	-2	100	78	-0.020	10.72	0.01
319	50.038	0.157	0.50	79	-2	100	78	-0.020	10.83	0.01



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
320	50.195	0.157	0.50	79	-2	100	78	-0.020	10.81	0.01
321	50.352	0.157	0.50	79	-2	100	78	-0.020	10.78	0.01
322	50.509	0.157	0.50	79	-2	100	78	-0.020	10.71	0.01
323	50.666	0.157	0.50	79	-2	100	78	-0.020	10.76	0.01
324	50.823	0.157	0.50	79	-2	100	78	-0.020	10.72	0.01
325	50.980	0.157	0.50	79	-2	100	78	-0.020	10.90	0.01
326	51.136	0.157	0.50	79	-2	100	78	-0.020	10.84	0.01
327	51.293	0.157	0.50	79	-2	100	78	-0.020	10.84	0.01
328	51.450	0.157	0.50	79	-2	100	78	-0.020	10.90	0.01
329	51.607	0.157	0.50	79	-2	100	78	-0.020	10.94	0.01
330	51.764	0.157	0.50	79	-2	100	78	-0.020	10.96	0.00
331	51.921	0.157	0.50	79	-2	100	78	-0.020	10.86	0.00
332	52.078	0.157	0.50	79	-2	100	78	-0.020	11.07	0.00
333	52.234	0.157	0.50	79	-2	100	78	-0.020	11.00	0.00
334	52.391	0.157	0.50	79	-2	100	78	-0.020	10.85	0.00
335	52.548	0.157	0.50	79	-2	100	78	-0.020	10.93	0.00
336	52.705	0.157	0.50	79	-2	100	78	-0.020	10.74	0.00
337	52.862	0.157	0.50	79	-2	100	78	-0.020	10.77	0.00
338	53.019	0.157	0.50	79	-2	100	78	-0.020	10.86	0.00
339	53.176	0.157	0.50	79	-2	100	78	-0.020	10.85	0.00
340	53.333	0.157	0.50	79	-2	100	78	-0.020	10.82	0.00
341	53.489	0.157	0.50	79	-2	100	78	-0.020	10.75	0.00
342	53.646	0.157	0.50	79	-2	100	78	-0.020	10.82	0.00
343	53.803	0.157	0.50	79	-2	100	78	-0.020	10.81	0.00
344	53.960	0.157	0.50	79	-2	100	79	-0.020	10.73	0.00
345	54.117	0.157	0.50	79	-2	100	79	-0.020	10.65	0.00
346	54.274	0.157	0.50	79	-2	100	79	-0.020	10.68	0.00
347	54.431	0.157	0.50	79	-2	100	78	-0.020	10.70	0.00
348	54.587	0.157	0.50	79	-2	100	79	-0.020	10.75	0.00
349	54.744	0.157	0.50	79	-2	100	79	-0.020	10.59	0.00
350	54.901	0.157	0.50	79	-2	100	79	-0.020	10.62	0.00
351	55.058	0.157	0.50	79	-2	100	79	-0.020	10.64	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
352	55.215	0.157	0.50	79	-2	100	79	-0.020	10.57	0.00
353	55.372	0.157	0.50	79	-2	100	79	-0.020	10.46	0.00
354	55.529	0.157	0.50	79	-2	99	78	-0.020	10.46	0.00
355	55.685	0.157	0.50	79	-2	99	78	-0.020	10.58	0.00
356	55.842	0.157	0.50	79	-2	99	78	-0.020	10.55	0.00
357	55.999	0.157	0.50	79	-2	99	78	-0.020	10.65	0.00
358	56.156	0.157	0.50	79	-2	99	77	-0.020	10.54	0.01
Avg/Tot	56.156	0.157	0.50	77	-2.00	100	76	-0.027	11.92	0.39

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	369	371	285	387	446	371.6	696
1	366	368	281	382	447	368.6	609
2	361	363	276	380	448	365.4	639
3	356	357	271	378	448	361.8	686
4	349	351	266	378	448	358.5	706
5	343	345	262	375	448	354.7	713
6	337	340	258	376	447	351.7	726
7	332	334	255	377	447	349.0	771
8	327	329	252	380	446	346.9	851
9	323	324	250	382	445	345.1	852
10	320	320	249	384	444	343.3	873
11	316	317	247	388	444	342.4	873
12	314	313	246	390	442	341.0	859
13	311	310	244	394	441	340.2	876
14	310	307	243	398	440	339.6	914
15	308	305	242	402	439	339.3	929
16	308	303	242	407	437	339.5	965
17	308	303	242	414	436	340.3	1021
18	308	302	241	425	435	342.2	1063
19	309	301	241	438	434	344.5	1107
20	309	301	241	448	432	346.6	1128
21	310	302	242	458	431	348.7	1118
22	311	302	243	470	431	351.3	1105
23	313	302	243	479	430	353.3	1098
24	314	303	244	487	429	355.4	1103
25	315	304	245	492	428	357.0	1109
26	317	306	247	500	427	359.5	1123
27	320	308	249	509	427	362.5	1147
28	322	311	251	515	427	365.1	1148
29	326	314	252	519	426	367.3	1138
30	329	317	254	524	426	369.9	1143
31	333	320	255	530	426	372.9	1149
32	336	324	257	532	426	374.8	1152
33	340	327	259	541	426	378.6	1158
34	343	330	261	545	426	381.2	1146
35	347	334	263	547	426	383.4	1122
36	352	337	265	549	426	386.0	1112
37	357	341	266	552	426	388.6	1121
38	361	345	268	552	427	390.5	1128
39	366	348	269	557	427	393.3	1135
40	371	351	269	560	427	395.6	1145
41	376	355	268	562	427	397.6	1155
42	380	358	268	567	427	400.1	1154
43	384	360	267	570	427	401.8	1144
44	387	363	267	574	428	403.5	1137
45	390	365	266	577	428	405.0	1136
46	392	367	266	580	428	406.4	1138
47	394	369	265	580	428	407.3	1134

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	396	370	265	586	428	409.0	1127
49	398	372	265	587	428	410.0	1118
50	400	374	265	584	428	410.2	1114
51	402	376	265	588	429	411.9	1108
52	404	379	264	588	429	412.7	1095
53	405	381	264	585	429	412.9	1087
54	407	383	264	585	429	413.6	1086
55	408	385	264	584	429	413.8	1086
56	409	386	264	583	428	413.9	1092
57	409	387	264	583	428	414.2	1102
58	409	387	264	582	428	414.1	1117
59	409	388	264	584	428	414.6	1130
60	409	388	265	585	427	414.9	1145
61	409	389	265	590	427	415.8	1156
62	410	390	265	593	426	416.7	1150
63	411	391	265	592	426	417.0	1135
64	413	392	265	594	425	417.8	1130
65	414	394	266	595	425	418.6	1132
66	414	396	266	596	424	419.3	1157
67	415	399	267	600	424	420.8	1169
68	415	401	268	602	423	422.0	1187
69	416	404	269	605	423	423.5	1189
70	418	407	271	607	422	425.0	1186
71	420	410	273	604	422	425.7	1166
72	423	414	275	603	421	427.1	1139
73	427	417	278	598	420	428.0	1116
74	431	421	281	588	420	428.3	1100
75	436	425	284	589	419	430.6	1091
76	441	429	287	582	419	431.4	1084
77	446	432	290	578	418	432.9	1076
78	451	436	292	570	418	433.3	1070
79	457	438	295	572	417	435.8	1067
80	462	441	297	567	417	436.8	1068
81	467	443	298	567	416	438.3	1086
82	471	444	299	567	416	439.4	1111
83	474	445	300	567	416	440.2	1124
84	477	445	300	569	415	441.2	1132
85	479	445	300	571	415	442.2	1138
86	481	445	301	571	415	442.5	1140
87	482	444	301	574	415	443.1	1142
88	483	443	301	577	414	443.6	1142
89	483	442	301	576	414	443.1	1141
90	482	442	301	579	414	443.6	1139
91	482	441	301	583	414	444.1	1133
92	481	441	302	583	413	443.9	1126
93	481	441	302	584	413	444.0	1119
94	482	440	302	580	413	443.5	1108
95	483	440	302	578	412	443.2	1093

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	485	440	302	574	412	442.9	1077
97	487	440	302	571	412	442.5	1065
98	490	440	303	571	412	443.0	1054
99	491	439	302	571	411	443.1	1048
100	494	439	303	567	411	442.6	1047
101	496	438	303	561	411	441.8	1050
102	497	438	303	564	410	442.3	1055
103	498	437	303	562	410	441.7	1067
104	497	436	302	565	409	442.0	1089
105	496	435	302	567	408	441.8	1105
106	495	434	302	570	408	441.6	1112
107	493	433	302	572	407	441.2	1120
108	491	432	301	575	406	441.0	1123
109	489	431	301	577	406	440.8	1120
110	488	430	300	576	405	439.9	1118
111	487	429	300	574	404	438.7	1116
112	485	428	299	579	404	438.9	1112
113	484	427	299	580	403	438.7	1109
114	484	427	298	579	402	438.1	1102
115	484	426	298	579	402	437.8	1097
116	483	426	298	579	401	437.4	1093
117	483	426	298	577	401	436.8	1091
118	484	425	297	574	400	436.2	1087
119	485	425	297	573	400	436.0	1083
120	486	425	297	570	399	435.5	1084
121	487	425	297	571	399	435.7	1087
122	488	425	296	570	399	435.4	1088
123	489	425	297	569	398	435.6	1087
124	491	425	297	566	398	435.4	1087
125	492	425	297	569	398	436.0	1089
126	492	424	297	569	397	435.9	1091
127	493	424	296	570	397	436.0	1092
128	493	424	296	570	396	435.8	1094
129	492	424	296	571	396	435.8	1094
130	492	424	295	571	396	435.4	1095
131	491	424	295	569	395	434.7	1095
132	490	423	295	571	395	434.8	1094
133	489	423	294	571	394	434.4	1095
134	487	423	294	574	394	434.4	1094
135	486	423	293	569	394	433.2	1091
136	485	423	293	570	393	433.0	1089
137	485	423	293	572	393	433.4	1086
138	484	424	294	574	393	433.6	1086
139	484	424	294	569	393	432.7	1087
140	484	425	294	573	393	433.6	1089
141	484	425	294	572	393	433.6	1090
142	484	426	295	572	393	433.9	1091
143	484	427	295	570	393	433.8	1089

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	485	428	296	569	393	434.1	1086
145	486	429	296	568	393	434.5	1082
146	487	430	297	562	393	434.0	1077
147	488	431	298	567	394	435.7	1078
148	489	432	299	569	394	436.6	1093
149	489	434	299	570	394	437.3	1105
150	490	434	299	569	395	437.3	1112
151	490	435	299	571	395	438.0	1116
152	489	435	299	575	395	438.7	1116
153	489	436	299	572	395	438.1	1114
154	488	436	299	575	395	438.6	1111
155	487	436	298	574	395	438.2	1104
156	487	436	298	575	395	438.3	1098
157	486	436	298	572	395	437.6	1088
158	486	435	298	569	395	436.7	1080
159	486	435	298	568	395	436.6	1073
160	486	435	298	564	395	435.5	1066
161	486	435	298	562	395	435.2	1060
162	486	435	297	559	395	434.4	1057
163	487	435	297	553	395	433.3	1055
164	487	435	298	556	395	433.9	1053
165	487	435	298	552	395	433.3	1049
166	488	435	298	552	395	433.4	1042
167	488	434	298	549	395	432.7	1038
168	488	434	298	546	395	432.3	1037
169	489	434	298	545	395	431.9	1040
170	488	434	298	541	395	431.1	1051
171	488	434	298	543	395	431.5	1062
172	489	433	298	541	395	431.0	1065
173	489	433	298	542	395	431.2	1057
174	489	432	298	540	395	430.6	1042
175	489	432	297	538	394	430.2	1030
176	489	431	297	539	394	430.1	1021
177	488	431	297	538	395	429.8	1018
178	488	430	297	536	395	429.2	1019
179	488	429	297	535	395	428.8	1018
180	487	429	297	534	395	428.5	1014
181	487	428	298	529	395	427.5	1010
182	487	428	298	531	395	427.8	1008
183	487	427	298	531	395	427.8	1009
184	487	427	299	531	396	427.8	1014
185	487	427	299	533	396	428.4	1021
186	487	427	300	534	397	428.9	1033
187	487	427	301	534	397	429.2	1047
188	488	428	302	538	397	430.4	1064
189	489	428	302	539	398	431.2	1079
190	490	429	303	542	398	432.6	1084
191	491	430	305	543	399	433.4	1083

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	493	431	306	546	399	434.9	1076
193	495	432	307	546	400	435.9	1064
194	497	433	308	548	400	437.3	1054
195	499	434	309	548	401	438.3	1050
196	501	435	311	549	401	439.5	1052
197	503	436	313	548	402	440.2	1051
198	504	437	315	549	402	441.4	1047
199	506	438	317	547	402	442.0	1038
200	508	439	319	544	403	442.4	1030
201	510	440	321	546	403	443.8	1024
202	511	441	323	546	403	444.9	1017
203	513	442	325	544	403	445.3	1012
204	514	443	326	540	403	445.3	1009
205	515	444	328	540	404	445.9	1008
206	515	444	329	537	404	445.7	996
207	516	444	330	531	404	445.0	981
208	515	445	331	530	404	444.7	964
209	514	445	332	527	404	444.2	947
210	513	444	332	522	403	443.1	931
211	512	444	333	517	404	441.8	916
212	510	443	333	516	403	441.1	904
213	508	442	333	513	403	439.8	896
214	506	441	333	508	403	438.3	889
215	504	440	333	506	403	437.1	881
216	501	439	333	503	403	435.8	874
217	499	438	333	495	402	433.3	866
218	496	437	333	496	402	432.7	859
219	493	435	333	491	402	430.9	853
220	491	434	333	486	402	429.3	845
221	489	433	333	486	401	428.3	840
222	486	431	333	484	401	427.0	835
223	484	430	333	478	401	425.0	830
224	482	428	333	476	400	423.7	823
225	479	426	333	473	400	422.2	816
226	477	425	332	469	400	420.7	811
227	475	423	332	465	399	419.0	806
228	473	422	332	462	399	417.6	802
229	471	421	332	461	398	416.5	798
230	469	419	332	458	398	415.1	796
231	467	418	332	454	397	413.6	795
232	465	417	332	453	397	412.6	795
233	464	415	331	450	396	411.3	794
234	462	413	331	448	396	410.1	793
235	460	412	331	445	395	408.8	792
236	459	411	331	444	395	407.9	791
237	457	410	331	443	394	407.0	790
238	455	408	331	441	394	405.9	789
239	454	407	331	439	393	405.0	788

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	453	406	331	438	393	404.1	787
241	452	405	331	436	392	403.3	785
242	450	404	331	435	392	402.4	784
243	450	403	331	434	391	401.7	781
244	449	402	331	431	391	400.7	778
245	449	401	330	430	390	400.1	769
246	448	400	330	428	390	399.3	760
247	448	399	330	426	389	398.5	757
248	447	399	329	425	389	397.8	758
249	446	398	329	423	389	397.0	759
250	446	398	329	422	388	396.4	759
251	444	397	328	420	388	395.6	760
252	444	397	328	419	388	395.1	761
253	443	397	327	417	388	394.5	762
254	442	397	326	415	388	393.7	763
255	441	397	326	412	388	392.7	765
256	440	397	325	415	388	393.2	767
257	440	397	324	416	388	393.0	769
258	439	397	324	415	388	392.7	773
259	439	397	323	415	389	392.5	777
260	438	397	322	415	389	392.2	781
261	438	397	322	413	389	391.8	784
262	438	397	322	416	390	392.4	787
263	437	397	321	415	390	392.2	791
264	437	398	321	417	390	392.5	794
265	436	398	320	417	391	392.5	797
266	436	399	320	418	391	392.8	799
267	436	399	320	417	392	392.9	799
268	436	400	320	418	393	393.3	797
269	436	401	320	418	393	393.5	796
270	436	402	320	418	394	393.9	795
271	436	402	320	418	395	394.3	795
272	436	404	320	419	395	394.8	797
273	436	405	320	420	396	395.3	800
274	436	405	320	419	397	395.6	803
275	436	406	321	420	398	396.2	804
276	436	407	321	420	399	396.7	806
277	437	408	322	421	399	397.2	806
278	437	409	322	421	400	397.7	806
279	437	410	323	421	401	398.3	805
280	437	410	323	421	402	398.8	803
281	438	411	324	422	403	399.4	803
282	438	412	325	422	403	400.0	803
283	439	413	325	422	404	400.6	802
284	439	413	326	423	405	401.2	802
285	439	414	327	423	406	401.8	803
286	439	415	327	423	406	402.2	803
287	440	416	328	423	407	402.8	803



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	441	417	329	422	407	403.2	803
289	441	417	330	423	408	403.8	802
290	441	418	331	423	408	404.2	800
291	442	419	331	422	409	404.7	797
292	442	420	332	423	409	405.3	796
293	443	421	333	423	410	405.7	797
294	443	421	333	424	410	406.1	797
295	444	422	334	424	410	406.6	797
296	444	422	335	424	411	407.2	799
297	444	423	336	424	411	407.5	800
298	445	423	336	423	411	407.8	801
299	445	424	337	424	411	408.4	802
300	446	425	338	421	411	408.2	801
301	446	426	339	424	412	409.3	798
302	446	426	340	425	412	409.8	797
303	446	427	341	425	412	410.2	798
304	446	428	342	424	413	410.5	799
305	446	429	343	425	413	411.2	800
306	446	430	344	425	414	411.7	801
307	446	431	344	424	414	411.9	804
308	447	431	345	426	415	412.7	806
309	447	432	345	426	416	413.0	809
310	447	432	345	427	417	413.5	810
311	447	433	345	426	418	413.6	808
312	448	433	345	427	418	414.4	809
313	448	434	344	427	419	414.6	806
314	448	433	344	427	420	414.6	805
315	449	433	344	428	421	414.9	807
316	449	433	343	428	422	415.0	808
317	449	433	343	428	423	415.1	809
318	449	433	343	428	424	415.2	811
319	449	434	342	428	424	415.4	813
320	449	434	342	429	425	415.6	814
321	449	434	341	426	426	415.1	813
322	449	434	341	429	427	415.9	812
323	449	434	340	429	427	416.0	813
324	449	434	340	430	428	416.2	813
325	449	434	340	430	429	416.3	813
326	449	434	340	430	429	416.3	814
327	449	434	339	429	430	416.4	814
328	449	434	339	430	431	416.5	815
329	450	434	339	430	431	416.8	814
330	450	434	339	431	432	416.9	815
331	449	434	339	431	432	416.9	816
332	449	434	339	430	433	417.0	815
333	449	434	339	431	433	417.3	813
334	449	434	339	431	434	417.3	811
335	449	434	339	430	434	417.3	808

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

**Stove ΔT:** 43

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	448	434	339	431	434	417.3	806
337	448	434	339	430	434	417.2	803
338	448	434	340	429	435	417.0	801
339	448	433	340	430	435	417.1	801
340	448	433	340	429	435	416.9	801
341	448	433	341	427	435	416.7	801
342	447	432	341	429	435	417.1	801
343	447	432	341	428	435	416.9	801
344	447	432	342	427	436	416.6	801
345	447	431	342	428	436	416.9	801
346	447	431	342	428	436	416.8	802
347	447	431	342	427	436	416.7	803
348	447	430	343	427	436	416.5	805
349	447	429	343	428	436	416.6	807
350	447	429	343	426	436	416.2	807
351	447	428	343	426	436	416.2	807
352	447	428	343	427	436	416.3	807
353	447	428	343	427	436	416.0	806
354	447	428	343	425	436	415.8	807
355	447	427	343	426	436	415.8	807
356	447	427	343	426	435	415.6	806
357	447	426	343	425	435	415.3	805
358	447	426	343	425	435	415.1	805
Average	447	411	306	499	411	415	958

## LAB SAMPLE DATA - ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 6

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/12/2018

### TRAIN A (1st Hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3387	120.4	119.4	1.0
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total      Total Particulate, mg:      1.0

### TRAIN A (Post 1st hour)

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3388	122.6	119.9	2.7
B. Rear filter catch	Filter	3389	123.0	123.4	-0.4
C. Probe catch*	Probe	11A	117034.9	117034.8	0.1
D. O-Ring catch*	O-Ring	11A	3425.1	3424.0	1.1

Sub-Total      Total Particulate, mg:      3.5

Train A Aggregate      Total Particulate, mg:      **4.5**

### TRAIN B

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3390	123.0	119.5	3.5
B. Rear filter catch	Filter	3391	120.6	120.9	-0.3
C. Probe catch*	Probe	11B	116673.9	116674.0	0.0
D. O-Ring catch*	O-Ring	11B	4236.2	4234.6	1.6

Total Particulate, mg:      **4.8**

### AMBIENT

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:      **0.0**

\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 6 Test Date: 10/12/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): Fan Confirmation Medium Low Setting (47 degrees closed from fully open)

#### Preburn Notes

Time	Notes
6:05	Loaded 12 lbs of kindling
7:19	At 1.4 lbs, loaded pre-burn fuel
8:35	At 4.7 lbs, set air to test setting
9:35	Leveled coal bed, zeroed scale in preparation for fuel loading
FAN CONFIRMATION TEST – FAN OFF FOR ENTIRE TEST	

#### Test Notes

Test Burn Start Time: 9:36 Test Fuel Loaded by: 40 seconds  
 Door Closed: 45 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min	Changed 1-hour filter.
358 min	End of Test
FAN CONFIRMATION TEST – FAN OFF FOR ENTIRE TEST	

Test Burn End Time: 15:34

#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:05	-	8:07	15:51	-	15:55
CO <sub>2</sub>	0.00	-	10.04	0.02	-	10.09
CO	0.00	-	2.52	0.01	-	2.49

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature: 

Date: 10/12/2018

**WOOD STOVE TEST DATA PACKET  
ASTM E2780/E2515**



**Run 7 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/23/2018

A handwritten signature in black ink, appearing to be "R. L.", is written over a horizontal line.

Techician Signature

10/29/2018

Date

## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 7

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/23/2018

<b>Burn Rate (kg/hr):</b>	<b>0.69</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	89.699	102.917	8.867
Average Gas Velocity in Dilution Tunnel (ft/sec)	12.0			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	7838.6			
Average Gas Meter Temperature (°F)	67.4	71.8	73.4	69.3
Total Sample Volume (dscf)	0.000	85.631	97.560	8.503
Average Tunnel Temperature (°F)	77.3			
Total Time of Test (min)	607			
Total Particulate Catch (mg)	0.0	1.3	1.7	0.1
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000152	0.0000174	0.0000118
Total PM Emissions (g)	0.00	1.20	1.38	0.09
Particulate Emission Rate (g/hr)	0.00	0.12	0.14	0.09
Emissions Factor (g/kg)	-	0.17	0.20	-
Difference from Average Total Particulate Emissions (g)	-	0.09	0.09	-
Difference from Average Emissions Factor (g/kg)	-	0.01	0.01	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	1.29
Particulate Emission Rate (g/hr)	0.13
Emissions Factor (g/kg)	0.19
HHV Efficiency (%)	84.0%
LHV Efficiency (%)	90.8%
CO Emissions (g/min)	0.12

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	71.9	OK
Face Velocity	< 30 ft/min	9.1	OK
Leakage Rate	Less than 4% of average sample rate	0.003 cfm	OK
Ambient Temp	55-90 °F	Min: 65.41 / Max: 68.7	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	7.9	OK

## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/23/18  
**Run:** 7  
**Control #:** 18-421  
**Test Duration:** 607  
**Output Category:** 1

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	84.0%	90.8%
<b>Combustion Efficiency</b>	99.5%	99.5%
<b>Heat Transfer Efficiency</b>	84.4%	91.3%

<b>Output Rate (kJ/h)</b>	11,428	10,840	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.69	1.51	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	13,603	12,904	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.95	15.31	<b>dry lb</b>
<b>MC wet (%)</b>	18.25		
<b>MC dry (%)</b>	22.33		
<b>Particulate (g )</b>	1.29		
<b>CO (g)</b>	72		
<b>Test Duration (h)</b>	10.12		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.01	0.63
<b>g/kg Dry Fuel</b>	0.19	10.41
<b>g/h</b>	0.13	7.15
<b>g/min</b>	0.00	0.12
<b>lb/MM Btu Output</b>	0.03	1.45

<b>Air/Fuel Ratio (A/F)</b>	13.56
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	24.8		2x4	17.00	24.1
2x4	17.00	24.8		2x4	17.00	21.3
2x4	17.00	24.7				
2x4	17.00	23.0				
2x4	17.00	23.1				
2x4	17.00	25.4				
2x4	17.00	21.6				
2x4	17.00	20.8				
Total Fuel Weight (lbs):		19.26		Average Moisture (%DB):		23.4

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.79  
 Total 4x4 Crib Weight, with spacers (lbs): 8.90  
 Total Wet Fuel Weight, with spacers (lbs): 18.69

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.74  
 Max (lbs): 4.67

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	16.00	1.92	21.7	20.3	19.8	1.59
2x4	16.00	1.86	21.4	21.1	22.5	1.53
2x4	16.00	1.92	21.9	21.9	21.7	1.58
2x4	16.00	1.96	21.1	20.3	22.4	1.62
4x4	16.00	3.78	22.7	24.7	24.8	3.05
4x4	16.00	4.00	24.3	24.3	25.0	3.21
Total Dry Weight, no spacers (lbs):						12.57
Total Dry Weight, with spacers (lbs):						15.31

Spacer Moisture Readings (%DB)						
14.6	18.6	17.1	23.0	16.6	12.8	
17.7	19.1	18.6	23.2	22.4	22.4	
18.6	18.7	18.7	21.3	21.1	23.2	
17.6	14.5	18.0	14.3	14.8	22.1	

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	29.8	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.42	OK
2x4 Fuel Mix	35 - 65 % of total weight	52%	OK



# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018Preburn Start Time: 9:16Recording Interval (min): 1Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	4.7	-0.040	720	677	350	545	513	561.0	389	1015	66
1	4.7	-0.030	716	674	375	551	516	566.5	317	997	67
2	4.6	-0.030	708	667	381	551	520	565.4	275	980	66
3	4.6	-0.030	697	659	383	549	523	562.0	247	963	66
4	4.6	-0.030	685	650	381	544	526	557.1	227	950	66
5	4.6	-0.030	673	639	379	540	528	551.9	213	938	66
6	4.5	-0.030	661	629	376	537	530	546.6	201	927	66
7	4.5	-0.030	649	619	373	531	531	540.6	192	918	66
8	4.5	-0.030	637	608	368	528	532	534.7	185	912	66
9	4.5	-0.030	626	598	363	524	532	528.4	178	907	66
10	4.5	-0.030	614	588	359	520	531	522.5	173	903	66
11	4.5	-0.030	603	578	354	516	531	516.3	167	898	66
12	4.5	-0.030	592	569	349	511	529	510.1	164	889	66
13	4.5	-0.020	582	559	345	508	528	504.4	160	878	66
14	4.5	-0.020	571	550	340	502	527	497.9	157	865	66
15	4.5	-0.020	561	540	335	497	525	491.7	154	850	67
16	4.5	-0.020	552	532	330	491	523	485.4	151	835	66
17	4.5	-0.020	542	523	326	485	521	479.4	149	819	66
18	4.5	-0.020	533	515	321	477	519	472.9	147	804	66
19	4.5	-0.020	524	507	317	471	516	466.9	145	789	67
20	4.5	-0.020	516	499	312	464	514	460.8	142	776	66
21	4.5	-0.020	507	491	308	458	511	455.2	142	763	66
22	4.5	-0.020	499	483	304	451	509	449.2	139	750	67
23	4.5	-0.020	491	476	300	443	506	443.2	137	738	67
24	4.5	-0.020	484	468	296	437	503	437.6	136	727	66
25	4.5	-0.020	476	461	292	431	500	432.3	134	716	67
26	4.5	-0.020	469	455	288	425	498	426.9	132	706	66
27	4.5	-0.020	462	447	284	418	495	421.3	130	696	66
28	4.5	-0.020	455	441	281	412	492	416.2	130	686	66
29	4.5	-0.020	448	435	279	404	489	411.2	128	678	66
30	4.5	-0.020	442	429	276	400	486	406.5	127	670	66
31	4.5	-0.020	435	423	272	395	483	401.6	126	668	67
32	4.5	-0.020	429	417	268	388	481	396.4	125	662	66
33	4.5	-0.020	423	411	265	384	478	391.9	124	655	66
34	4.5	-0.020	417	406	262	378	475	387.3	123	648	66
35	4.5	-0.020	411	400	259	372	472	382.8	122	641	66
36	4.5	-0.020	405	395	256	368	469	378.5	121	635	66
37	4.5	-0.020	400	389	253	362	466	374.2	120	628	66
38	4.5	-0.020	394	384	250	358	464	370.2	119	622	66
39	4.5	-0.020	389	379	248	354	461	366.3	118	617	66
40	4.5	-0.020	384	375	245	349	458	362.3	117	611	67
41	4.5	-0.020	379	370	243	346	455	358.4	116	606	66
42	4.6	-0.020	374	365	240	341	452	354.6	115	600	66
43	4.6	-0.020	369	361	238	338	449	350.9	115	595	66
44	4.5	-0.020	365	357	236	333	446	347.3	114	590	66

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Preburn Start Time: 9:16  
 Recording Interval (min): 1  
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	6.4	-0.040	360	352	233	331	443	343.8	150	592	66
46	4.5	-0.020	355	348	230	326	440	339.8	149	566	66
47	4.6	-0.020	350	344	228	321	437	336.1	137	545	67
48	4.5	-0.020	346	340	225	317	434	332.5	129	538	66
49	4.6	-0.020	342	337	223	312	431	328.8	124	537	67
50	4.6	-0.020	337	333	221	309	427	325.5	120	536	66
51	4.6	-0.020	333	329	218	306	424	322.1	116	534	66
52	4.6	-0.020	329	326	216	303	421	319.0	114	531	66
53	4.6	-0.020	325	322	213	299	418	315.7	112	527	66
54	4.6	-0.020	322	319	211	296	415	312.6	110	523	66
55	4.6	-0.010	318	316	209	293	413	309.6	109	518	66
56	4.6	-0.010	314	312	207	290	410	306.6	107	513	66
57	4.6	-0.010	310	309	205	287	407	303.7	106	508	66
58	4.6	-0.010	307	306	203	284	404	300.9	106	505	66
59	4.6	-0.010	303	303	201	282	401	298.0	105	505	66
60	4.6	-0.010	300	300	199	279	399	295.3	106	507	66

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7  
 Test Start Time: 10:16

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Total Sampling Time (min): 607  
 Recording Interval (min): 1

Meter Box  $\gamma$  Factor: 1.002 (A)  
 Meter Box  $\gamma$  Factor: 0.998 (B)  
 Meter Box  $\gamma$  Factor: 0.000 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100%  
 Date Flue Pipe Last Cleaned: 10/7/2018

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	28.69	28.68
Relative Humidity (%)	36.2	36.9
Room Air Velocity (ft/min)	0	0
Scale Audit (lbs)	10.0	10.0
Ambient Sample Volume:		<u>0.000</u> ft <sup>3</sup>

**Sample Train Post-Test Leak Checks**

(A)	<u>0.002</u>	cfm @	<u>-22</u> in. Hg
(B)	<u>0.003</u>	cfm @	<u>-24</u> in. Hg
(Ambient)	<u>0.000</u>	cfm @	<u>0</u> in. Hg

### DILUTION TUNNEL FLOW

**Traverse Data**

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	0.022	77
2	0.040	77
3	0.026	77
4	0.020	77
5	0.020	77
6	0.038	77
7	0.046	77
8	0.028	77
Center	0.046	77

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 6 inches  
 Pitot Tube Cp: 0.99 [unitless]  
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole  
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole  
 Tunnel Area: 0.1963 ft<sup>2</sup>

V<sub>strav</sub>: 12.01 ft/sec  
 V<sub>scant</sub>: 14.64 ft/sec  
 F<sub>p</sub>: 0.820 [ratio]

Initial Tunnel Flow: 127.1 scf/min

Static Pressure: -0.205 in. H<sub>2</sub>O

### TEST FUEL PROPERTIES

**Default Fuel Values**

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

**Actual Fuel Used Properties**

Fuel Type:	<u>D. Fir</u>
HHV (kJ/kg)	<u>19,810</u>
%C	<u>48.73</u>
%H	<u>6.87</u>
%O	<u>43.9</u>
%Ash	<u>0.5</u>
MC (%DB)	<u>22.3</u>

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.046	0.50	69	-0.5		18.7		72	106	68	66
1	0.148	0.148	0.046	0.50	69	-0.5	101	18.7	0	80	154	68	66
2	0.296	0.148	0.046	0.50	69	-0.5	100	18.7	-0.01	75	140	68	67
3	0.443	0.148	0.046	0.50	69	-0.5	100	18.7	0.01	74	133	68	66
4	0.591	0.148	0.046	0.50	69	-0.5	100	18.7	-0.03	74	129	68	66
5	0.739	0.148	0.046	0.50	69	-0.5	100	18.7	0.01	73	126	68	67
6	0.887	0.148	0.046	0.50	69	-0.5	100	18.7	-0.02	73	126	68	66
7	1.034	0.148	0.046	0.50	69	-0.5	100	18.7	0	73	126	68	67
8	1.182	0.148	0.046	0.50	69	-0.5	100	18.7	-0.01	73	127	68	66
9	1.330	0.148	0.046	0.50	69	-0.5	100	18.7	0	73	128	68	66
10	1.478	0.148	0.046	0.50	69	-0.5	100	18.7	-0.03	73	129	68	66
11	1.626	0.148	0.046	0.50	69	-0.5	100	18.7	0	73	131	68	66
12	1.773	0.148	0.046	0.50	69	-0.5	100	18.6	-0.01	73	133	68	66
13	1.921	0.148	0.046	0.50	69	-0.5	100	18.6	-0.03	73	134	68	66
14	2.069	0.148	0.046	0.50	69	-0.5	100	18.6	-0.01	73	135	68	66
15	2.217	0.148	0.046	0.50	69	-0.5	100	18.6	-0.02	73	137	68	66
16	2.364	0.148	0.046	0.50	69	-0.5	100	18.6	-0.03	73	140	68	66
17	2.512	0.148	0.046	0.50	69	-0.5	100	18.5	-0.01	73	142	68	66
18	2.660	0.148	0.046	0.50	69	-0.5	100	18.5	-0.01	73	145	68	66
19	2.808	0.148	0.046	0.50	69	-0.5	100	18.5	-0.03	74	148	68	66
20	2.956	0.148	0.046	0.50	69	-0.5	100	18.5	-0.04	74	152	68	66
21	3.103	0.148	0.046	0.50	69	-0.5	100	18.4	-0.05	74	155	68	66
22	3.251	0.148	0.046	0.50	69	-0.5	100	18.4	-0.02	74	158	69	66
23	3.399	0.148	0.046	0.50	69	-0.5	100	18.4	-0.04	74	161	68	66
24	3.547	0.148	0.046	0.50	69	-0.5	100	18.3	-0.04	75	165	69	66
25	3.694	0.148	0.046	0.50	69	-0.5	100	18.3	-0.03	75	169	69	66
26	3.842	0.148	0.046	0.50	69	-0.5	100	18.2	-0.09	75	173	69	66
27	3.990	0.148	0.046	0.50	69	-0.5	100	18.1	-0.05	76	180	69	66
28	4.138	0.148	0.046	0.50	69	-0.5	100	18.1	-0.05	76	187	69	66
29	4.286	0.148	0.046	0.50	69	-0.5	100	18.0	-0.07	77	191	69	66
30	4.433	0.148	0.046	0.50	69	-0.5	100	18.0	-0.07	77	195	69	66
31	4.581	0.148	0.046	0.50	69	-0.5	100	17.9	-0.05	77	199	69	66

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.729	0.148	0.046	0.50	69	-0.5	100	17.8	-0.06	77	202	69	66
33	4.877	0.148	0.046	0.50	69	-0.5	100	17.8	-0.06	77	202	69	66
34	5.024	0.148	0.046	0.50	69	-0.5	100	17.7	-0.06	78	204	69	66
35	5.172	0.148	0.046	0.50	69	-0.5	101	17.7	-0.06	78	205	69	66
36	5.320	0.148	0.046	0.50	69	-0.5	101	17.6	-0.06	78	205	69	66
37	5.468	0.148	0.046	0.50	69	-0.5	101	17.5	-0.06	78	206	69	66
38	5.615	0.148	0.046	0.50	69	-0.5	101	17.5	-0.06	78	207	69	66
39	5.763	0.148	0.046	0.50	69	-0.5	101	17.4	-0.07	78	208	69	66
40	5.911	0.148	0.046	0.50	69	-0.5	101	17.4	-0.04	78	208	69	66
41	6.059	0.148	0.046	0.50	69	-0.5	101	17.3	-0.07	78	209	69	66
42	6.207	0.148	0.046	0.50	69	-0.5	101	17.2	-0.07	79	210	69	66
43	6.354	0.148	0.046	0.50	69	-0.5	101	17.2	-0.07	79	212	69	66
44	6.502	0.148	0.046	0.50	69	-0.5	101	17.1	-0.06	79	213	69	66
45	6.650	0.148	0.046	0.50	69	-0.5	101	17.0	-0.08	79	215	69	66
46	6.798	0.148	0.046	0.50	69	-0.5	101	17.0	-0.07	80	217	69	66
47	6.945	0.148	0.046	0.50	69	-0.5	101	16.9	-0.08	80	216	69	66
48	7.093	0.148	0.046	0.50	69	-0.5	101	16.8	-0.07	80	217	69	66
49	7.241	0.148	0.046	0.50	69	-0.5	101	16.8	-0.05	80	217	69	66
50	7.389	0.148	0.046	0.50	69	-0.5	101	16.7	-0.06	80	216	70	66
51	7.537	0.148	0.046	0.50	70	-0.5	101	16.6	-0.08	80	217	70	66
52	7.684	0.148	0.046	0.50	70	-0.5	101	16.5	-0.08	80	217	70	66
53	7.832	0.148	0.046	0.50	70	-0.5	101	16.5	-0.07	80	218	70	66
54	7.980	0.148	0.046	0.50	70	-0.5	101	16.4	-0.07	81	219	70	66
55	8.128	0.148	0.046	0.50	70	-0.5	101	16.3	-0.13	81	224	70	66
56	8.275	0.148	0.046	0.50	70	-0.5	101	16.2	-0.07	81	227	70	66
57	8.423	0.148	0.046	0.50	70	-0.5	101	16.1	-0.09	81	230	70	66
58	8.571	0.148	0.046	0.50	70	-0.5	101	16.0	-0.1	82	232	70	66
59	8.719	0.148	0.046	0.50	70	-0.5	101	15.9	-0.07	82	234	70	66
60	8.867	0.148	0.046	0.50	70	-0.5	101	15.8	-0.11	82	235	70	66
61	9.014	0.148	0.046	0.50	70	-0.5	101	15.8	-0.05	82	237	70	66
62	9.162	0.148	0.046	0.50	70	-0.5	101	15.7	-0.1	82	239	70	66
63	9.310	0.148	0.046	0.50	70	-0.5	101	15.6	-0.08	82	238	70	66

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.458	0.148	0.046	0.50	70	-0.5	101	15.5	-0.07	82	237	70	66
65	9.605	0.148	0.046	0.50	70	-0.5	101	15.4	-0.09	82	238	70	66
66	9.753	0.148	0.046	0.50	70	-0.5	101	15.4	-0.06	82	237	70	66
67	9.901	0.148	0.046	0.50	70	-0.5	101	15.3	-0.08	82	237	70	66
68	10.049	0.148	0.046	0.50	70	-0.5	101	15.2	-0.07	82	236	70	66
69	10.197	0.148	0.046	0.50	70	-0.5	101	15.1	-0.13	82	237	70	66
70	10.344	0.148	0.046	0.50	70	-0.5	101	15.1	-0.04	82	238	70	66
71	10.492	0.148	0.046	0.50	70	-0.5	101	15.0	-0.08	82	238	70	66
72	10.640	0.148	0.046	0.50	70	-0.5	101	14.9	-0.08	83	240	70	66
73	10.788	0.148	0.046	0.50	70	-0.5	101	14.8	-0.08	83	240	70	66
74	10.935	0.148	0.046	0.50	70	-0.5	101	14.7	-0.09	82	239	71	66
75	11.083	0.148	0.046	0.50	70	-0.5	101	14.6	-0.09	83	241	71	67
76	11.231	0.148	0.046	0.50	70	-0.5	101	14.6	-0.07	82	240	70	66
77	11.379	0.148	0.046	0.50	70	-0.5	101	14.5	-0.08	82	240	70	66
78	11.527	0.148	0.046	0.50	70	-0.5	101	14.4	-0.06	82	241	71	66
79	11.674	0.148	0.046	0.50	70	-0.5	101	14.3	-0.09	82	237	70	66
80	11.822	0.148	0.046	0.50	70	-0.5	101	14.3	-0.06	82	235	70	66
81	11.970	0.148	0.046	0.50	70	-0.5	101	14.2	-0.04	82	236	70	66
82	12.118	0.148	0.046	0.50	70	-0.5	101	14.1	-0.09	82	234	70	66
83	12.265	0.148	0.046	0.50	70	-0.5	101	14.1	-0.05	81	231	70	66
84	12.413	0.148	0.046	0.50	70	-0.5	101	14.0	-0.08	81	231	70	66
85	12.561	0.148	0.046	0.50	70	-0.5	101	14.0	-0.05	81	230	70	66
86	12.709	0.148	0.046	0.50	70	-0.5	101	13.9	-0.07	81	229	70	66
87	12.857	0.148	0.046	0.50	70	-0.5	101	13.8	-0.06	81	229	70	66
88	13.004	0.148	0.046	0.50	70	-0.5	101	13.8	-0.06	81	228	70	66
89	13.152	0.148	0.046	0.50	70	-0.5	101	13.7	-0.05	80	226	70	66
90	13.300	0.148	0.046	0.50	71	-0.5	101	13.7	-0.07	80	226	70	66
91	13.448	0.148	0.046	0.50	71	-0.5	101	13.6	-0.06	80	223	70	66
92	13.595	0.148	0.046	0.50	71	-0.5	100	13.5	-0.07	80	223	70	65
93	13.743	0.148	0.046	0.50	71	-0.5	100	13.5	-0.06	80	221	70	66
94	13.891	0.148	0.046	0.50	71	-0.5	100	13.4	-0.04	80	220	70	66
95	14.039	0.148	0.046	0.50	71	-0.5	100	13.4	-0.07	80	218	70	66

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	14.186	0.148	0.046	0.50	71	-0.5	100	13.3	-0.05	80	217	70	66
97	14.334	0.148	0.046	0.50	71	-0.5	100	13.3	-0.04	80	215	70	66
98	14.482	0.148	0.046	0.50	71	-0.5	100	13.2	-0.06	80	216	70	66
99	14.630	0.148	0.046	0.50	71	-0.5	100	13.1	-0.06	80	217	70	67
100	14.778	0.148	0.046	0.50	71	-0.5	100	13.1	-0.06	80	217	70	66
101	14.925	0.148	0.046	0.50	71	-0.5	100	13.0	-0.06	80	215	70	66
102	15.073	0.148	0.046	0.50	71	-0.5	100	13.0	-0.05	80	214	70	66
103	15.221	0.148	0.046	0.50	71	-0.5	100	12.9	-0.04	80	215	70	66
104	15.369	0.148	0.046	0.50	71	-0.5	100	12.9	-0.06	80	212	70	66
105	15.516	0.148	0.046	0.50	71	-0.5	100	12.8	-0.05	80	212	70	66
106	15.664	0.148	0.046	0.50	71	-0.5	100	12.8	-0.06	80	211	70	66
107	15.812	0.148	0.046	0.50	71	-0.5	100	12.7	-0.04	80	211	70	66
108	15.960	0.148	0.046	0.50	71	-0.5	100	12.7	-0.05	80	211	70	67
109	16.108	0.148	0.046	0.50	71	-0.5	100	12.6	-0.05	80	210	70	67
110	16.255	0.148	0.046	0.50	71	-0.5	100	12.6	-0.06	80	209	70	67
111	16.403	0.148	0.046	0.50	71	-0.5	100	12.5	-0.04	80	209	70	67
112	16.551	0.148	0.046	0.50	71	-0.5	100	12.5	-0.05	80	209	70	67
113	16.699	0.148	0.046	0.50	71	-0.5	100	12.4	-0.06	80	209	70	67
114	16.846	0.148	0.046	0.50	71	-0.5	100	12.4	-0.04	80	208	70	67
115	16.994	0.148	0.046	0.50	71	-0.5	100	12.3	-0.05	80	208	70	67
116	17.142	0.148	0.046	0.50	71	-0.5	100	12.3	-0.05	80	207	70	67
117	17.290	0.148	0.046	0.50	71	-0.5	100	12.2	-0.03	80	206	70	67
118	17.438	0.148	0.046	0.50	71	-0.5	100	12.2	-0.05	79	206	70	67
119	17.585	0.148	0.046	0.50	71	-0.5	100	12.2	-0.04	80	204	70	67
120	17.733	0.148	0.046	0.50	71	-0.5	100	12.1	-0.03	80	204	70	67
121	17.881	0.148	0.046	0.50	71	-0.5	100	12.1	-0.06	80	203	70	67
122	18.029	0.148	0.046	0.50	71	-0.5	100	12.0	-0.02	79	203	70	67
123	18.176	0.148	0.046	0.50	71	-0.5	100	12.0	-0.04	79	202	70	67
124	18.324	0.148	0.046	0.50	71	-0.5	100	12.0	-0.04	79	201	70	67
125	18.472	0.148	0.046	0.50	71	-0.5	100	11.9	-0.04	79	200	70	67
126	18.620	0.148	0.046	0.50	71	-0.5	100	11.9	-0.05	79	200	70	67
127	18.768	0.148	0.046	0.50	71	-0.5	100	11.8	-0.03	79	200	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	18.915	0.148	0.046	0.50	71	-0.5	100	11.8	-0.05	79	201	70	67
129	19.063	0.148	0.046	0.50	71	-0.5	100	11.8	-0.03	79	200	70	67
130	19.211	0.148	0.046	0.50	71	-0.5	100	11.7	-0.05	79	200	70	67
131	19.359	0.148	0.046	0.50	71	-0.5	100	11.7	-0.06	79	200	70	67
132	19.506	0.148	0.046	0.50	71	-0.5	100	11.7	0	80	200	71	67
133	19.654	0.148	0.046	0.50	71	-0.5	100	11.6	-0.06	79	200	71	67
134	19.802	0.148	0.046	0.50	71	-0.5	100	11.6	-0.03	79	201	71	67
135	19.950	0.148	0.046	0.50	71	-0.5	100	11.5	-0.04	79	199	71	67
136	20.098	0.148	0.046	0.50	71	-0.5	100	11.5	-0.04	79	198	71	67
137	20.245	0.148	0.046	0.50	71	-0.5	100	11.4	-0.04	79	198	71	67
138	20.393	0.148	0.046	0.50	71	-0.5	100	11.4	-0.04	79	198	71	68
139	20.541	0.148	0.046	0.50	71	-0.5	100	11.4	-0.04	79	198	71	67
140	20.689	0.148	0.046	0.50	71	-0.5	100	11.3	-0.05	79	197	71	67
141	20.836	0.148	0.046	0.50	71	-0.5	100	11.3	-0.01	79	196	71	67
142	20.984	0.148	0.046	0.50	71	-0.5	100	11.3	-0.04	79	196	71	67
143	21.132	0.148	0.046	0.50	71	-0.5	100	11.2	-0.03	79	197	71	67
144	21.280	0.148	0.046	0.50	72	-0.5	100	11.2	-0.05	79	196	71	67
145	21.428	0.148	0.046	0.50	72	-0.5	100	11.2	-0.03	79	196	70	67
146	21.575	0.148	0.046	0.50	72	-0.5	100	11.1	-0.03	79	194	70	68
147	21.723	0.148	0.046	0.50	72	-0.5	100	11.1	-0.03	79	196	70	67
148	21.871	0.148	0.046	0.50	72	-0.5	100	11.0	-0.05	79	195	70	67
149	22.019	0.148	0.046	0.50	72	-0.5	100	11.0	-0.03	79	195	71	67
150	22.166	0.148	0.046	0.50	72	-0.5	100	11.0	-0.03	79	192	71	67
151	22.314	0.148	0.046	0.50	72	-0.5	100	10.9	-0.04	79	193	71	67
152	22.462	0.148	0.046	0.50	72	-0.5	100	10.9	-0.02	79	193	71	67
153	22.610	0.148	0.046	0.50	72	-0.5	100	10.9	-0.04	79	193	70	67
154	22.757	0.148	0.046	0.50	72	-0.5	100	10.9	-0.03	79	192	70	67
155	22.905	0.148	0.046	0.50	72	-0.5	100	10.8	-0.02	79	194	70	67
156	23.053	0.148	0.046	0.50	72	-0.5	100	10.8	-0.03	79	193	70	67
157	23.201	0.148	0.046	0.50	72	-0.5	100	10.8	-0.04	78	192	70	67
158	23.349	0.148	0.046	0.50	72	-0.5	100	10.7	-0.04	78	191	70	67
159	23.496	0.148	0.046	0.50	72	-0.5	100	10.7	-0.02	78	192	70	67



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	23.644	0.148	0.046	0.50	72	-0.5	100	10.7	-0.03	78	192	70	67
161	23.792	0.148	0.046	0.50	72	-0.5	100	10.6	-0.03	78	192	70	67
162	23.940	0.148	0.046	0.50	72	-0.5	100	10.6	-0.04	79	192	70	67
163	24.087	0.148	0.046	0.50	72	-0.5	100	10.6	-0.04	78	191	70	68
164	24.235	0.148	0.046	0.50	72	-0.5	100	10.6	-0.01	78	190	70	68
165	24.383	0.148	0.046	0.50	72	-0.5	100	10.5	-0.03	78	191	70	68
166	24.531	0.148	0.046	0.50	72	-0.5	100	10.5	-0.03	78	190	70	67
167	24.679	0.148	0.046	0.50	72	-0.5	100	10.5	-0.04	78	189	70	67
168	24.826	0.148	0.046	0.50	72	-0.5	100	10.4	-0.03	78	188	70	68
169	24.974	0.148	0.046	0.50	72	-0.5	100	10.4	-0.02	78	188	70	67
170	25.122	0.148	0.046	0.50	72	-0.5	100	10.4	-0.01	78	187	70	67
171	25.270	0.148	0.046	0.50	72	-0.5	100	10.4	-0.04	78	187	70	67
172	25.417	0.148	0.046	0.50	72	-0.5	100	10.3	-0.02	78	187	70	68
173	25.565	0.148	0.046	0.50	72	-0.5	100	10.3	-0.02	78	187	70	68
174	25.713	0.148	0.046	0.50	72	-0.5	100	10.3	-0.03	78	186	70	68
175	25.861	0.148	0.046	0.50	72	-0.5	100	10.3	-0.01	78	186	70	68
176	26.009	0.148	0.046	0.50	72	-0.5	100	10.2	-0.03	78	187	70	68
177	26.156	0.148	0.046	0.50	72	-0.5	100	10.2	-0.02	78	187	70	68
178	26.304	0.148	0.046	0.50	72	-0.5	100	10.2	-0.03	78	185	70	67
179	26.452	0.148	0.046	0.50	72	-0.5	100	10.2	-0.02	78	184	70	67
180	26.600	0.148	0.046	0.50	72	-0.5	100	10.1	-0.03	78	184	70	68
181	26.747	0.148	0.046	0.50	72	-0.5	100	10.1	-0.01	78	184	70	67
182	26.895	0.148	0.046	0.50	72	-0.5	100	10.1	-0.02	78	185	70	67
183	27.043	0.148	0.046	0.50	72	-0.5	100	10.1	-0.04	78	185	70	67
184	27.191	0.148	0.046	0.50	72	-0.5	100	10.1	-0.01	78	185	70	68
185	27.339	0.148	0.046	0.50	72	-0.5	100	10.0	-0.02	78	186	70	67
186	27.486	0.148	0.046	0.50	72	-0.5	100	10.0	-0.02	78	185	70	67
187	27.634	0.148	0.046	0.50	72	-0.5	100	10.0	-0.04	78	185	70	67
188	27.782	0.148	0.046	0.50	72	-0.5	100	10.0	-0.03	78	186	70	68
189	27.930	0.148	0.046	0.50	72	-0.5	100	9.9	-0.02	78	185	70	67
190	28.077	0.148	0.046	0.50	72	-0.5	100	9.9	-0.02	78	187	70	68
191	28.225	0.148	0.046	0.50	72	-0.5	100	9.9	-0.01	78	187	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	28.373	0.148	0.046	0.50	72	-0.5	100	9.9	-0.03	78	186	70	68
193	28.521	0.148	0.046	0.50	72	-0.5	100	9.9	-0.02	78	187	70	67
194	28.669	0.148	0.046	0.50	72	-0.5	100	9.8	-0.03	78	188	70	68
195	28.816	0.148	0.046	0.50	72	-0.5	100	9.8	-0.03	78	188	70	67
196	28.964	0.148	0.046	0.50	72	-0.5	100	9.8	-0.02	78	188	70	67
197	29.112	0.148	0.046	0.50	72	-0.5	100	9.7	-0.03	78	187	70	67
198	29.260	0.148	0.046	0.50	72	-0.5	100	9.7	-0.02	78	189	70	68
199	29.407	0.148	0.046	0.50	72	-0.5	100	9.7	-0.03	78	189	70	68
200	29.555	0.148	0.046	0.50	72	-0.5	100	9.7	-0.02	78	190	70	68
201	29.703	0.148	0.046	0.50	72	-0.5	100	9.7	-0.02	78	191	70	68
202	29.851	0.148	0.046	0.50	72	-0.5	100	9.6	-0.04	78	191	70	68
203	29.999	0.148	0.046	0.50	72	-0.5	100	9.6	-0.02	78	192	70	68
204	30.146	0.148	0.046	0.50	72	-0.5	100	9.6	-0.03	78	192	70	68
205	30.294	0.148	0.046	0.50	72	-0.5	100	9.5	-0.03	78	192	70	68
206	30.442	0.148	0.046	0.50	72	-0.5	100	9.5	-0.04	79	194	70	68
207	30.590	0.148	0.046	0.50	72	-0.5	100	9.5	-0.01	79	195	70	68
208	30.737	0.148	0.046	0.50	72	-0.5	100	9.4	-0.04	79	196	70	68
209	30.885	0.148	0.046	0.50	72	-0.5	100	9.4	-0.04	79	196	70	68
210	31.033	0.148	0.046	0.50	72	-0.5	100	9.4	-0.03	79	197	70	68
211	31.181	0.148	0.046	0.50	72	-0.5	100	9.3	-0.03	79	198	70	67
212	31.329	0.148	0.046	0.50	72	-0.5	100	9.3	-0.03	79	199	70	68
213	31.476	0.148	0.046	0.50	72	-0.5	100	9.3	-0.05	79	199	70	68
214	31.624	0.148	0.046	0.50	72	-0.5	100	9.2	-0.03	79	200	70	68
215	31.772	0.148	0.046	0.50	72	-0.5	100	9.2	-0.03	79	201	70	68
216	31.920	0.148	0.046	0.50	72	-0.5	100	9.2	-0.03	79	202	70	68
217	32.067	0.148	0.046	0.50	72	-0.5	100	9.2	-0.02	79	201	70	68
218	32.215	0.148	0.046	0.50	72	-0.5	100	9.1	-0.05	79	201	70	68
219	32.363	0.148	0.046	0.50	72	-0.5	100	9.1	-0.02	80	202	70	68
220	32.511	0.148	0.046	0.50	72	-0.5	100	9.1	-0.03	80	203	70	68
221	32.658	0.148	0.046	0.50	72	-0.5	100	9.0	-0.06	80	205	70	68
222	32.806	0.148	0.046	0.50	72	-0.5	100	9.0	-0.02	80	204	70	68
223	32.954	0.148	0.046	0.50	72	-0.5	100	8.9	-0.04	80	205	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	33.102	0.148	0.046	0.50	72	-0.5	100	8.9	-0.03	80	205	71	68
225	33.250	0.148	0.046	0.50	72	-0.5	100	8.9	-0.03	80	206	71	68
226	33.397	0.148	0.046	0.50	72	-0.5	100	8.8	-0.06	80	205	71	68
227	33.545	0.148	0.046	0.50	72	-0.5	100	8.8	-0.01	80	205	71	68
228	33.693	0.148	0.046	0.50	72	-0.5	100	8.8	-0.05	80	206	71	68
229	33.841	0.148	0.046	0.50	72	-0.5	100	8.7	-0.03	80	206	71	68
230	33.988	0.148	0.046	0.50	72	-0.5	100	8.7	-0.04	80	207	71	68
231	34.136	0.148	0.046	0.50	72	-0.5	100	8.6	-0.04	80	207	71	68
232	34.284	0.148	0.046	0.50	72	-0.5	100	8.6	-0.03	80	207	71	68
233	34.432	0.148	0.046	0.50	72	-0.5	100	8.6	-0.04	80	209	71	68
234	34.580	0.148	0.046	0.50	72	-0.5	100	8.5	-0.03	80	209	71	68
235	34.727	0.148	0.046	0.50	72	-0.5	100	8.5	-0.05	80	209	71	68
236	34.875	0.148	0.046	0.50	72	-0.5	100	8.5	0.01	80	211	71	68
237	35.023	0.148	0.046	0.50	72	-0.5	100	8.5	-0.04	80	211	71	68
238	35.171	0.148	0.046	0.50	72	-0.5	100	8.4	-0.04	80	211	71	68
239	35.318	0.148	0.046	0.50	72	-0.5	100	8.4	-0.04	80	210	71	68
240	35.466	0.148	0.046	0.50	72	-0.5	100	8.3	-0.04	81	212	71	68
241	35.614	0.148	0.046	0.50	72	-0.5	100	8.3	-0.05	80	212	71	68
242	35.762	0.148	0.046	0.50	72	-0.5	100	8.3	-0.04	81	214	71	68
243	35.910	0.148	0.046	0.50	72	-0.5	100	8.2	-0.06	81	215	71	68
244	36.057	0.148	0.046	0.50	72	-0.5	100	8.2	-0.03	81	217	71	68
245	36.205	0.148	0.046	0.50	72	-0.5	100	8.1	-0.04	81	217	71	68
246	36.353	0.148	0.046	0.50	72	-0.5	100	8.1	-0.05	81	219	71	68
247	36.501	0.148	0.046	0.50	72	-0.5	100	8.0	-0.05	81	218	71	68
248	36.648	0.148	0.046	0.50	72	-0.5	100	8.0	-0.03	81	220	71	68
249	36.796	0.148	0.046	0.50	72	-0.5	100	7.9	-0.06	81	222	71	68
250	36.944	0.148	0.046	0.50	72	-0.5	100	7.9	-0.06	81	223	71	68
251	37.092	0.148	0.046	0.50	72	-0.5	100	7.8	-0.06	81	224	71	68
252	37.240	0.148	0.046	0.50	72	-0.5	100	7.8	-0.05	81	224	71	68
253	37.387	0.148	0.046	0.50	72	-0.5	100	7.7	-0.05	82	227	71	68
254	37.535	0.148	0.046	0.50	72	-0.5	100	7.7	-0.05	82	226	71	68
255	37.683	0.148	0.046	0.50	72	-0.5	100	7.6	-0.08	82	226	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	37.831	0.148	0.046	0.50	73	-0.5	100	7.5	-0.06	82	228	71	68
257	37.978	0.148	0.046	0.50	73	-0.5	100	7.5	-0.07	82	228	71	68
258	38.126	0.148	0.046	0.50	73	-0.5	100	7.4	-0.06	82	228	71	68
259	38.274	0.148	0.046	0.50	73	-0.5	100	7.3	-0.06	82	229	71	68
260	38.422	0.148	0.046	0.50	73	-0.5	100	7.3	-0.08	82	230	71	68
261	38.570	0.148	0.046	0.50	73	-0.5	100	7.2	-0.07	82	230	71	68
262	38.717	0.148	0.046	0.50	73	-0.5	100	7.1	-0.08	82	231	71	68
263	38.865	0.148	0.046	0.50	73	-0.5	100	7.0	-0.08	82	232	71	68
264	39.013	0.148	0.046	0.50	73	-0.5	100	7.0	-0.05	82	232	71	68
265	39.161	0.148	0.046	0.50	73	-0.5	100	6.9	-0.08	82	230	71	68
266	39.308	0.148	0.046	0.50	73	-0.5	100	6.8	-0.07	82	228	71	68
267	39.456	0.148	0.046	0.50	73	-0.5	100	6.8	-0.05	82	227	71	68
268	39.604	0.148	0.046	0.50	73	-0.5	100	6.7	-0.06	82	225	71	68
269	39.752	0.148	0.046	0.50	73	-0.5	100	6.6	-0.08	82	223	71	68
270	39.900	0.148	0.046	0.50	73	-0.5	100	6.6	-0.06	82	222	71	68
271	40.047	0.148	0.046	0.50	73	-0.5	100	6.5	-0.05	81	219	71	68
272	40.195	0.148	0.046	0.50	73	-0.5	100	6.5	-0.06	81	216	71	68
273	40.343	0.148	0.046	0.50	73	-0.5	100	6.4	-0.04	81	214	71	68
274	40.491	0.148	0.046	0.50	73	-0.5	100	6.4	-0.06	81	210	71	68
275	40.638	0.148	0.046	0.50	73	-0.5	100	6.3	-0.04	81	207	71	68
276	40.786	0.148	0.046	0.50	73	-0.5	100	6.3	-0.04	80	203	71	68
277	40.934	0.148	0.046	0.50	73	-0.5	100	6.2	-0.06	80	199	71	68
278	41.082	0.148	0.046	0.50	73	-0.5	100	6.2	-0.03	80	196	71	68
279	41.229	0.148	0.046	0.50	73	-0.5	100	6.2	-0.01	80	194	71	68
280	41.377	0.148	0.046	0.50	73	-0.5	100	6.1	-0.06	80	189	71	68
281	41.525	0.148	0.046	0.50	73	-0.5	100	6.1	-0.03	79	185	71	68
282	41.673	0.148	0.046	0.50	73	-0.5	100	6.0	-0.05	79	184	71	68
283	41.821	0.148	0.046	0.50	73	-0.5	100	6.0	-0.02	79	181	71	68
284	41.968	0.148	0.046	0.50	73	-0.5	100	6.0	-0.04	79	178	71	68
285	42.116	0.148	0.046	0.50	73	-0.5	100	6.0	-0.02	79	175	71	68
286	42.264	0.148	0.046	0.50	73	-0.5	100	5.9	-0.02	79	172	71	68
287	42.412	0.148	0.046	0.50	73	-0.5	100	5.9	-0.04	78	170	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	42.559	0.148	0.046	0.50	73	-0.5	100	5.9	-0.02	78	166	71	68
289	42.707	0.148	0.046	0.50	73	-0.5	100	5.9	-0.03	78	164	71	68
290	42.855	0.148	0.046	0.50	73	-0.5	100	5.8	-0.03	78	162	71	68
291	43.003	0.148	0.046	0.50	73	-0.5	100	5.8	-0.01	78	160	71	68
292	43.151	0.148	0.046	0.50	73	-0.5	100	5.8	-0.02	78	158	71	68
293	43.298	0.148	0.046	0.50	73	-0.5	100	5.8	-0.03	78	156	71	68
294	43.446	0.148	0.046	0.50	73	-0.5	100	5.8	-0.01	78	155	71	68
295	43.594	0.148	0.046	0.50	73	-0.5	100	5.7	-0.02	77	153	71	68
296	43.742	0.148	0.046	0.50	73	-0.5	100	5.7	-0.02	77	152	71	68
297	43.889	0.148	0.046	0.50	73	-0.5	100	5.7	-0.03	77	150	71	68
298	44.037	0.148	0.046	0.50	73	-0.5	100	5.7	-0.02	77	149	71	68
299	44.185	0.148	0.046	0.50	73	-0.5	100	5.6	-0.02	77	148	71	68
300	44.333	0.148	0.046	0.50	73	-0.5	100	5.6	-0.01	77	146	71	68
301	44.481	0.148	0.046	0.50	73	-0.5	100	5.6	-0.01	77	145	71	68
302	44.628	0.148	0.046	0.50	73	-0.5	100	5.6	-0.03	77	145	71	68
303	44.776	0.148	0.046	0.50	73	-0.5	100	5.6	-0.01	76	144	71	68
304	44.924	0.148	0.046	0.50	73	-0.5	100	5.6	-0.02	76	143	71	68
305	45.072	0.148	0.046	0.50	73	-0.5	100	5.5	-0.02	76	143	71	68
306	45.219	0.148	0.046	0.50	73	-0.5	100	5.5	-0.01	76	143	71	68
307	45.367	0.148	0.046	0.50	73	-0.5	100	5.5	-0.03	76	143	71	68
308	45.515	0.148	0.046	0.50	73	-0.5	100	5.5	-0.01	76	144	71	68
309	45.663	0.148	0.046	0.50	73	-0.5	100	5.5	-0.02	76	144	71	68
310	45.811	0.148	0.046	0.50	73	-0.5	100	5.4	-0.03	76	145	71	68
311	45.958	0.148	0.046	0.50	73	-0.5	100	5.4	-0.03	76	146	71	68
312	46.106	0.148	0.046	0.50	73	-0.5	100	5.4	-0.02	76	146	71	68
313	46.254	0.148	0.046	0.50	73	-0.5	100	5.4	-0.02	76	147	71	68
314	46.402	0.148	0.046	0.50	73	-0.5	100	5.4	-0.02	76	148	71	68
315	46.549	0.148	0.046	0.50	73	-0.5	100	5.3	-0.03	76	150	71	68
316	46.697	0.148	0.046	0.50	73	-0.5	100	5.3	-0.04	76	151	71	68
317	46.845	0.148	0.046	0.50	73	-0.5	100	5.3	-0.02	76	152	71	68
318	46.993	0.148	0.046	0.50	73	-0.5	100	5.2	-0.03	76	153	71	68
319	47.141	0.148	0.046	0.50	73	-0.5	100	5.2	-0.03	77	154	71	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	47.288	0.148	0.046	0.50	73	-0.5	100	5.2	-0.02	77	154	71	68
321	47.436	0.148	0.046	0.50	73	-0.5	100	5.2	-0.03	77	156	71	68
322	47.584	0.148	0.046	0.50	73	-0.5	100	5.1	-0.04	77	157	71	68
323	47.732	0.148	0.046	0.50	73	-0.5	100	5.1	-0.02	77	159	71	69
324	47.879	0.148	0.046	0.50	73	-0.5	100	5.1	-0.04	77	161	71	69
325	48.027	0.148	0.046	0.50	73	-0.5	100	5.0	-0.03	77	161	71	68
326	48.175	0.148	0.046	0.50	73	-0.5	100	5.0	-0.03	77	162	71	68
327	48.323	0.148	0.046	0.50	73	-0.5	100	5.0	-0.03	77	163	71	68
328	48.471	0.148	0.046	0.50	73	-0.5	100	4.9	-0.03	77	162	71	68
329	48.618	0.148	0.046	0.50	73	-0.5	100	4.9	-0.03	77	164	71	68
330	48.766	0.148	0.046	0.50	73	-0.5	100	4.9	-0.05	77	165	71	69
331	48.914	0.148	0.046	0.50	73	-0.5	100	4.8	-0.02	77	165	71	69
332	49.062	0.148	0.046	0.50	73	-0.5	100	4.8	-0.02	77	166	71	69
333	49.209	0.148	0.046	0.50	73	-0.5	100	4.8	-0.02	77	168	70	68
334	49.357	0.148	0.046	0.50	73	-0.5	100	4.7	-0.06	77	167	71	68
335	49.505	0.148	0.046	0.50	73	-0.5	100	4.7	-0.04	77	167	71	68
336	49.653	0.148	0.046	0.50	73	-0.5	100	4.7	-0.03	77	168	70	68
337	49.800	0.148	0.046	0.50	73	-0.5	100	4.6	-0.04	77	168	71	68
338	49.948	0.148	0.046	0.50	73	-0.5	100	4.6	-0.03	77	169	71	68
339	50.096	0.148	0.046	0.50	73	-0.5	100	4.6	-0.02	77	169	71	68
340	50.244	0.148	0.046	0.50	73	-0.5	100	4.5	-0.03	77	168	70	69
341	50.392	0.148	0.046	0.50	73	-0.5	100	4.5	-0.04	77	170	70	68
342	50.539	0.148	0.046	0.50	73	-0.5	100	4.5	-0.03	77	169	70	68
343	50.687	0.148	0.046	0.50	73	-0.5	100	4.5	-0.02	77	169	70	68
344	50.835	0.148	0.046	0.50	73	-0.5	100	4.4	-0.04	77	168	71	68
345	50.983	0.148	0.046	0.50	73	-0.5	100	4.4	-0.06	77	168	70	68
346	51.130	0.148	0.046	0.50	73	-0.5	100	4.4	0	77	168	71	68
347	51.278	0.148	0.046	0.50	73	-0.5	100	4.3	-0.05	77	167	70	68
348	51.426	0.148	0.046	0.50	73	-0.5	100	4.3	-0.02	77	166	70	68
349	51.574	0.148	0.046	0.50	73	-0.5	100	4.2	-0.04	77	165	70	68
350	51.722	0.148	0.046	0.50	73	-0.5	100	4.2	-0.02	77	164	70	68
351	51.869	0.148	0.046	0.50	73	-0.5	100	4.2	-0.03	77	163	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	52.017	0.148	0.046	0.50	73	-0.5	100	4.2	-0.04	77	162	70	68
353	52.165	0.148	0.046	0.50	73	-0.5	100	4.1	-0.02	77	161	70	68
354	52.313	0.148	0.046	0.50	73	-0.5	100	4.1	-0.05	77	160	70	68
355	52.460	0.148	0.046	0.50	73	-0.5	100	4.1	-0.02	77	159	70	68
356	52.608	0.148	0.046	0.50	73	-0.5	100	4.1	-0.01	76	159	70	68
357	52.756	0.148	0.046	0.50	73	-0.5	100	4.0	-0.04	76	157	70	68
358	52.904	0.148	0.046	0.50	73	-0.5	100	4.0	-0.03	76	156	70	68
359	53.052	0.148	0.046	0.50	73	-0.5	100	3.9	-0.04	76	155	70	68
360	53.199	0.148	0.046	0.50	73	-0.5	100	3.9	-0.01	76	153	70	69
361	53.347	0.148	0.046	0.50	73	-0.5	100	3.9	-0.04	76	151	70	69
362	53.495	0.148	0.046	0.50	73	-0.5	100	3.9	0	76	150	70	68
363	53.643	0.148	0.046	0.50	73	-0.5	100	3.9	-0.03	76	148	70	68
364	53.790	0.148	0.046	0.50	73	-0.5	100	3.8	-0.04	76	146	70	68
365	53.938	0.148	0.046	0.50	73	-0.5	100	3.8	-0.03	76	146	70	68
366	54.086	0.148	0.046	0.50	73	-0.5	100	3.8	-0.01	76	145	70	68
367	54.234	0.148	0.046	0.50	73	-0.5	100	3.8	-0.02	76	144	70	68
368	54.382	0.148	0.046	0.50	73	-0.5	100	3.8	-0.01	76	142	70	68
369	54.529	0.148	0.046	0.50	73	-0.5	100	3.7	-0.03	76	142	70	68
370	54.677	0.148	0.046	0.50	73	-0.5	100	3.7	-0.03	76	140	70	68
371	54.825	0.148	0.046	0.50	73	-0.5	100	3.7	-0.01	76	139	70	68
372	54.973	0.148	0.046	0.50	73	-0.5	100	3.7	-0.01	76	137	70	68
373	55.120	0.148	0.046	0.50	73	-0.5	100	3.7	-0.02	76	136	70	68
374	55.268	0.148	0.046	0.50	73	-0.5	100	3.6	-0.02	75	135	70	68
375	55.416	0.148	0.046	0.50	73	-0.5	100	3.6	-0.02	75	133	70	69
376	55.564	0.148	0.046	0.50	73	-0.5	100	3.6	-0.01	75	132	70	69
377	55.712	0.148	0.046	0.50	73	-0.5	100	3.6	-0.02	75	131	70	68
378	55.859	0.148	0.046	0.50	73	-0.5	100	3.6	0.01	75	130	70	68
379	56.007	0.148	0.046	0.50	73	-0.5	100	3.6	-0.02	75	129	70	68
380	56.155	0.148	0.046	0.50	73	-0.5	100	3.6	0	75	128	70	68
381	56.303	0.148	0.046	0.50	73	-0.5	100	3.5	-0.03	75	127	70	68
382	56.450	0.148	0.046	0.50	73	-0.5	100	3.5	0	75	126	70	68
383	56.598	0.148	0.046	0.50	73	-0.5	100	3.5	-0.02	75	125	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	56.746	0.148	0.046	0.50	73	-0.5	100	3.5	0.02	75	124	70	69
385	56.894	0.148	0.046	0.50	73	-0.5	100	3.5	-0.01	75	123	70	68
386	57.042	0.148	0.046	0.50	73	-0.5	100	3.5	-0.02	75	122	70	68
387	57.189	0.148	0.046	0.50	73	-0.5	100	3.5	-0.01	75	122	70	68
388	57.337	0.148	0.046	0.50	73	-0.5	100	3.5	-0.01	75	122	70	68
389	57.485	0.148	0.046	0.50	73	-0.5	100	3.5	-0.01	75	121	70	68
390	57.633	0.148	0.046	0.50	73	-0.5	100	3.5	0.01	74	121	70	68
391	57.780	0.148	0.046	0.50	73	-0.5	100	3.5	-0.03	74	121	70	68
392	57.928	0.148	0.046	0.50	73	-0.5	100	3.5	0.01	74	122	70	68
393	58.076	0.148	0.046	0.50	73	-0.5	100	3.5	-0.01	74	121	70	68
394	58.224	0.148	0.046	0.50	73	-0.5	100	3.5	-0.01	74	122	70	68
395	58.371	0.148	0.046	0.50	73	-0.5	100	3.4	-0.02	74	122	70	69
396	58.519	0.148	0.046	0.50	73	-0.5	100	3.4	-0.01	74	122	70	69
397	58.667	0.148	0.046	0.50	73	-0.5	100	3.4	0	74	123	70	68
398	58.815	0.148	0.046	0.50	73	-0.5	100	3.4	-0.01	74	124	70	68
399	58.963	0.148	0.046	0.50	73	-0.5	100	3.4	0	74	125	70	68
400	59.110	0.148	0.046	0.50	73	-0.5	100	3.4	-0.02	74	125	70	68
401	59.258	0.148	0.046	0.50	73	-0.5	100	3.4	-0.01	74	125	70	68
402	59.406	0.148	0.046	0.50	73	-0.5	100	3.4	-0.01	74	126	70	68
403	59.554	0.148	0.046	0.50	73	-0.5	100	3.4	-0.01	74	127	70	68
404	59.701	0.148	0.046	0.50	73	-0.5	100	3.4	0	74	128	70	68
405	59.849	0.148	0.046	0.50	73	-0.5	100	3.3	-0.02	74	129	70	68
406	59.997	0.148	0.046	0.50	73	-0.5	100	3.3	-0.01	74	129	70	68
407	60.145	0.148	0.046	0.50	73	-0.5	100	3.3	0	74	130	70	68
408	60.293	0.148	0.046	0.50	73	-0.5	100	3.3	-0.01	74	131	70	68
409	60.440	0.148	0.046	0.50	73	-0.5	100	3.3	-0.03	74	134	70	68
410	60.588	0.148	0.046	0.50	73	-0.5	100	3.3	0	74	134	70	68
411	60.736	0.148	0.046	0.50	73	-0.5	100	3.3	-0.02	74	135	70	68
412	60.884	0.148	0.046	0.50	73	-0.5	100	3.3	-0.02	74	136	70	68
413	61.031	0.148	0.046	0.50	73	-0.5	100	3.3	0	75	137	70	68
414	61.179	0.148	0.046	0.50	73	-0.5	100	3.2	-0.01	75	137	70	68
415	61.327	0.148	0.046	0.50	73	-0.5	100	3.2	-0.04	75	138	70	69



## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	61.475	0.148	0.046	0.50	73	-0.5	100	3.2	0.01	75	139	70	68
417	61.623	0.148	0.046	0.50	73	-0.5	100	3.2	-0.02	75	140	70	68
418	61.770	0.148	0.046	0.50	73	-0.5	100	3.2	-0.03	75	141	70	68
419	61.918	0.148	0.046	0.50	73	-0.5	100	3.2	0.01	75	142	70	68
420	62.066	0.148	0.046	0.50	73	-0.5	100	3.2	-0.02	75	143	70	68
421	62.214	0.148	0.046	0.50	73	-0.5	100	3.1	-0.03	75	144	70	68
422	62.361	0.148	0.046	0.50	73	-0.5	100	3.1	-0.02	75	145	70	68
423	62.509	0.148	0.046	0.50	72	-0.5	100	3.1	-0.01	75	145	70	68
424	62.657	0.148	0.046	0.50	72	-0.5	100	3.1	-0.03	75	147	70	68
425	62.805	0.148	0.046	0.50	72	-0.5	100	3.1	0.01	75	147	70	68
426	62.953	0.148	0.046	0.50	72	-0.5	100	3.0	-0.03	75	149	70	68
427	63.100	0.148	0.046	0.50	73	-0.5	100	3.0	-0.02	75	150	70	68
428	63.248	0.148	0.046	0.50	72	-0.5	100	3.0	-0.02	75	151	70	68
429	63.396	0.148	0.046	0.50	72	-0.5	100	3.0	-0.02	75	150	70	68
430	63.544	0.148	0.046	0.50	72	-0.5	100	3.0	-0.01	75	151	70	68
431	63.691	0.148	0.046	0.50	72	-0.5	100	3.0	-0.02	75	152	70	68
432	63.839	0.148	0.046	0.50	72	-0.5	100	2.9	-0.02	75	154	70	68
433	63.987	0.148	0.046	0.50	72	-0.5	100	2.9	-0.02	75	155	70	68
434	64.135	0.148	0.046	0.50	72	-0.5	100	2.9	-0.02	75	155	70	68
435	64.283	0.148	0.046	0.50	72	-0.5	100	2.9	-0.02	75	155	70	68
436	64.430	0.148	0.046	0.50	72	-0.5	100	2.9	-0.01	75	156	70	68
437	64.578	0.148	0.046	0.50	72	-0.5	100	2.8	-0.03	75	158	70	68
438	64.726	0.148	0.046	0.50	72	-0.5	100	2.8	-0.02	75	158	70	68
439	64.874	0.148	0.046	0.50	72	-0.5	100	2.8	-0.02	75	158	70	68
440	65.021	0.148	0.046	0.50	72	-0.5	100	2.8	-0.02	75	158	70	68
441	65.169	0.148	0.046	0.50	72	-0.5	100	2.8	-0.02	75	158	70	68
442	65.317	0.148	0.046	0.50	73	-0.5	100	2.7	-0.01	75	158	70	68
443	65.465	0.148	0.046	0.50	73	-0.5	100	2.7	-0.03	75	159	70	68
444	65.613	0.148	0.046	0.50	73	-0.5	100	2.7	-0.02	76	160	70	68
445	65.760	0.148	0.046	0.50	72	-0.5	100	2.7	-0.03	75	159	70	67
446	65.908	0.148	0.046	0.50	72	-0.5	100	2.6	-0.02	75	160	70	68
447	66.056	0.148	0.046	0.50	72	-0.5	100	2.6	-0.01	76	161	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	66.204	0.148	0.046	0.50	72	-0.5	100	2.6	-0.03	76	160	70	68
449	66.351	0.148	0.046	0.50	72	-0.5	100	2.6	-0.03	76	161	70	68
450	66.499	0.148	0.046	0.50	72	-0.5	100	2.6	-0.01	76	161	70	68
451	66.647	0.148	0.046	0.50	72	-0.5	100	2.5	-0.02	76	162	70	68
452	66.795	0.148	0.046	0.50	72	-0.5	100	2.5	-0.01	76	164	70	68
453	66.943	0.148	0.046	0.50	72	-0.5	100	2.5	-0.03	76	164	70	68
454	67.090	0.148	0.046	0.50	72	-0.5	100	2.5	-0.02	76	163	70	68
455	67.238	0.148	0.046	0.50	72	-0.5	100	2.5	-0.02	76	164	70	68
456	67.386	0.148	0.046	0.50	72	-0.5	100	2.4	-0.04	76	164	70	68
457	67.534	0.148	0.046	0.50	72	-0.5	100	2.4	0	76	163	70	68
458	67.681	0.148	0.046	0.50	72	-0.5	100	2.4	-0.03	76	165	70	68
459	67.829	0.148	0.046	0.50	72	-0.5	100	2.4	-0.02	76	165	70	68
460	67.977	0.148	0.046	0.50	72	-0.5	100	2.3	-0.03	76	165	70	68
461	68.125	0.148	0.046	0.50	72	-0.5	100	2.3	-0.02	76	165	70	68
462	68.272	0.148	0.046	0.50	72	-0.5	100	2.3	-0.03	76	165	70	68
463	68.420	0.148	0.046	0.50	72	-0.5	100	2.3	-0.02	76	165	70	68
464	68.568	0.148	0.046	0.50	72	-0.5	100	2.3	-0.02	76	166	70	68
465	68.716	0.148	0.046	0.50	72	-0.5	100	2.2	-0.02	76	166	70	68
466	68.864	0.148	0.046	0.50	72	-0.5	100	2.2	-0.04	76	168	70	68
467	69.011	0.148	0.046	0.50	72	-0.5	100	2.2	-0.01	76	166	70	68
468	69.159	0.148	0.046	0.50	72	-0.5	100	2.1	-0.04	76	166	70	68
469	69.307	0.148	0.046	0.50	72	-0.5	100	2.1	-0.01	76	166	70	68
470	69.455	0.148	0.046	0.50	72	-0.5	100	2.1	-0.03	76	165	70	68
471	69.602	0.148	0.046	0.50	72	-0.5	100	2.1	0	76	165	70	68
472	69.750	0.148	0.046	0.50	72	-0.5	100	2.1	-0.02	76	165	70	68
473	69.898	0.148	0.046	0.50	72	-0.5	100	2.1	-0.03	76	164	70	68
474	70.046	0.148	0.046	0.50	72	-0.5	100	2.0	-0.02	76	163	70	68
475	70.194	0.148	0.046	0.50	72	-0.5	100	2.0	-0.02	76	163	70	68
476	70.341	0.148	0.046	0.50	72	-0.5	100	2.0	-0.01	76	161	70	68
477	70.489	0.148	0.046	0.50	72	-0.5	100	2.0	-0.02	76	159	70	68
478	70.637	0.148	0.046	0.50	72	-0.5	100	1.9	-0.04	76	159	70	68
479	70.785	0.148	0.046	0.50	72	-0.5	100	1.9	-0.02	76	157	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	70.932	0.148	0.046	0.50	72	-0.5	100	1.9	0	76	156	70	68
481	71.080	0.148	0.046	0.50	72	-0.5	100	1.9	0	76	155	70	68
482	71.228	0.148	0.046	0.50	72	-0.5	100	1.9	-0.03	76	154	70	68
483	71.376	0.148	0.046	0.50	72	-0.5	100	1.9	-0.01	76	154	70	68
484	71.524	0.148	0.046	0.50	72	-0.5	100	1.9	-0.02	76	153	70	68
485	71.671	0.148	0.046	0.50	72	-0.5	100	1.8	-0.02	75	153	70	68
486	71.819	0.148	0.046	0.50	72	-0.5	100	1.8	-0.01	75	152	70	68
487	71.967	0.148	0.046	0.50	72	-0.5	100	1.8	-0.02	75	151	70	67
488	72.115	0.148	0.046	0.50	72	-0.5	100	1.8	-0.01	75	151	70	68
489	72.262	0.148	0.046	0.50	72	-0.5	100	1.8	-0.02	75	151	70	68
490	72.410	0.148	0.046	0.50	72	-0.5	100	1.8	-0.02	75	150	70	68
491	72.558	0.148	0.046	0.50	72	-0.5	100	1.8	-0.01	75	150	70	68
492	72.706	0.148	0.046	0.50	72	-0.5	100	1.7	-0.02	75	150	70	68
493	72.854	0.148	0.046	0.50	72	-0.5	100	1.7	-0.01	75	149	70	68
494	73.001	0.148	0.046	0.50	72	-0.5	100	1.7	0.01	75	148	70	68
495	73.149	0.148	0.046	0.50	72	-0.5	100	1.7	-0.04	75	147	70	68
496	73.297	0.148	0.046	0.50	72	-0.5	100	1.7	-0.01	75	146	70	68
497	73.445	0.148	0.046	0.50	72	-0.5	100	1.7	-0.01	75	146	70	68
498	73.592	0.148	0.046	0.50	72	-0.5	100	1.7	-0.02	75	145	70	67
499	73.740	0.148	0.046	0.50	72	-0.5	100	1.6	-0.01	75	146	70	68
500	73.888	0.148	0.046	0.50	72	-0.5	100	1.6	-0.01	75	146	70	68
501	74.036	0.148	0.046	0.50	72	-0.5	100	1.6	0	75	144	70	68
502	74.184	0.148	0.046	0.50	72	-0.5	100	1.6	-0.03	75	144	70	67
503	74.331	0.148	0.046	0.50	72	-0.5	100	1.6	0	75	144	70	68
504	74.479	0.148	0.046	0.50	72	-0.5	100	1.6	0	75	143	70	68
505	74.627	0.148	0.046	0.50	72	-0.5	100	1.6	-0.02	75	143	70	68
506	74.775	0.148	0.046	0.50	72	-0.5	100	1.6	0	75	144	70	67
507	74.922	0.148	0.046	0.50	72	-0.5	100	1.6	-0.03	75	143	70	68
508	75.070	0.148	0.046	0.50	72	-0.5	100	1.6	0	75	143	70	67
509	75.218	0.148	0.046	0.50	72	-0.5	100	1.5	-0.02	75	143	70	67
510	75.366	0.148	0.046	0.50	72	-0.5	100	1.5	-0.01	75	143	70	68
511	75.514	0.148	0.046	0.50	72	-0.5	100	1.5	-0.01	75	143	70	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	75.661	0.148	0.046	0.50	72	-0.5	100	1.5	0	75	143	70	68
513	75.809	0.148	0.046	0.50	72	-0.5	100	1.5	-0.02	75	144	70	68
514	75.957	0.148	0.046	0.50	72	-0.5	100	1.5	-0.01	75	144	70	68
515	76.105	0.148	0.046	0.50	72	-0.5	100	1.5	0	75	144	70	68
516	76.252	0.148	0.046	0.50	72	-0.5	100	1.5	-0.02	75	146	70	68
517	76.400	0.148	0.046	0.50	72	-0.5	100	1.4	-0.02	75	146	70	67
518	76.548	0.148	0.046	0.50	72	-0.5	100	1.4	-0.01	75	146	70	68
519	76.696	0.148	0.046	0.50	72	-0.5	100	1.4	-0.01	75	146	70	68
520	76.843	0.148	0.046	0.50	72	-0.5	100	1.4	-0.01	75	146	70	68
521	76.991	0.148	0.046	0.50	72	-0.5	100	1.4	-0.01	75	147	70	68
522	77.139	0.148	0.046	0.50	72	-0.5	100	1.4	-0.02	75	147	70	67
523	77.287	0.148	0.046	0.50	72	-0.5	100	1.4	0	75	148	70	68
524	77.435	0.148	0.046	0.50	72	-0.5	100	1.4	-0.01	75	149	70	68
525	77.582	0.148	0.046	0.50	72	-0.5	100	1.4	-0.01	75	149	69	68
526	77.730	0.148	0.046	0.50	72	-0.5	100	1.3	-0.02	75	150	69	68
527	77.878	0.148	0.046	0.50	72	-0.5	100	1.3	-0.02	75	150	69	68
528	78.026	0.148	0.046	0.50	72	-0.5	100	1.3	0	75	151	70	68
529	78.173	0.148	0.046	0.50	72	-0.5	100	1.3	-0.02	75	151	69	68
530	78.321	0.148	0.046	0.50	72	-0.5	100	1.3	-0.01	75	152	69	67
531	78.469	0.148	0.046	0.50	72	-0.5	100	1.3	0.01	75	155	69	67
532	78.617	0.148	0.046	0.50	72	-0.5	100	1.3	-0.03	75	156	69	67
533	78.765	0.148	0.046	0.50	72	-0.5	100	1.3	-0.01	75	155	69	67
534	78.912	0.148	0.046	0.50	72	-0.5	100	1.2	-0.02	74	155	69	67
535	79.060	0.148	0.046	0.50	72	-0.5	100	1.2	-0.01	74	156	69	67
536	79.208	0.148	0.046	0.50	72	-0.5	100	1.2	-0.02	74	156	69	67
537	79.356	0.148	0.046	0.50	72	-0.5	100	1.2	-0.02	74	158	69	67
538	79.503	0.148	0.046	0.50	72	-0.5	100	1.2	0.01	74	158	69	67
539	79.651	0.148	0.046	0.50	71	-0.5	100	1.2	-0.02	74	159	69	67
540	79.799	0.148	0.046	0.50	71	-0.5	100	1.2	-0.01	74	159	69	67
541	79.947	0.148	0.046	0.50	71	-0.5	100	1.2	-0.02	74	160	69	67
542	80.095	0.148	0.046	0.50	71	-0.5	100	1.1	-0.01	74	160	69	67
543	80.242	0.148	0.046	0.50	71	-0.5	100	1.1	-0.02	74	161	69	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
544	80.390	0.148	0.046	0.50	71	-0.5	100	1.1	-0.01	74	161	69	67
545	80.538	0.148	0.046	0.50	71	-0.5	100	1.1	-0.01	74	165	69	66
546	80.686	0.148	0.046	0.50	71	-0.5	100	1.1	-0.03	74	165	69	66
547	80.833	0.148	0.046	0.50	71	-0.5	100	1.0	-0.03	74	167	68	66
548	80.981	0.148	0.046	0.50	71	-0.5	100	1.0	0	75	167	68	67
549	81.129	0.148	0.046	0.50	71	-0.5	100	1.0	-0.01	75	168	68	67
550	81.277	0.148	0.046	0.50	71	-0.5	100	1.0	-0.02	75	170	69	67
551	81.425	0.148	0.046	0.50	71	-0.5	100	1.0	-0.02	75	170	69	67
552	81.572	0.148	0.046	0.50	71	-0.5	100	1.0	-0.02	75	172	69	67
553	81.720	0.148	0.046	0.50	71	-0.5	100	1.0	-0.02	75	173	69	67
554	81.868	0.148	0.046	0.50	71	-0.5	100	0.9	-0.02	76	173	69	67
555	82.016	0.148	0.046	0.50	71	-0.5	100	0.9	-0.01	76	174	69	67
556	82.163	0.148	0.046	0.50	71	-0.5	100	0.9	-0.04	76	174	69	67
557	82.311	0.148	0.046	0.50	71	-0.5	100	0.9	-0.01	76	174	69	67
558	82.459	0.148	0.046	0.50	71	-0.5	100	0.9	-0.01	76	175	69	67
559	82.607	0.148	0.046	0.50	71	-0.5	100	0.8	-0.02	76	176	69	67
560	82.755	0.148	0.046	0.50	71	-0.5	100	0.8	-0.02	76	176	69	67
561	82.902	0.148	0.046	0.50	71	-0.5	100	0.8	-0.02	76	176	69	67
562	83.050	0.148	0.046	0.50	71	-0.5	100	0.8	-0.04	76	178	69	67
563	83.198	0.148	0.046	0.50	71	-0.5	100	0.8	-0.01	76	179	69	67
564	83.346	0.148	0.046	0.50	71	-0.5	100	0.7	-0.04	76	179	69	67
565	83.493	0.148	0.046	0.50	71	-0.5	100	0.7	-0.02	77	181	69	67
566	83.641	0.148	0.046	0.50	71	-0.5	100	0.7	-0.02	77	183	69	67
567	83.789	0.148	0.046	0.50	71	-0.5	100	0.7	-0.02	77	184	69	67
568	83.937	0.148	0.046	0.50	71	-0.5	100	0.6	-0.04	77	184	69	67
569	84.085	0.148	0.046	0.50	71	-0.5	100	0.6	-0.02	77	185	69	67
570	84.232	0.148	0.046	0.50	71	-0.5	100	0.6	-0.03	77	184	69	67
571	84.380	0.148	0.046	0.50	71	-0.5	100	0.5	-0.03	77	183	69	67
572	84.528	0.148	0.046	0.50	71	-0.5	100	0.5	-0.01	77	182	70	67
573	84.676	0.148	0.046	0.50	71	-0.5	100	0.5	-0.02	77	181	70	67
574	84.823	0.148	0.046	0.50	71	-0.5	100	0.5	-0.01	76	180	70	67
575	84.971	0.148	0.046	0.50	71	-0.5	100	0.5	-0.02	76	179	70	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
576	85.119	0.148	0.046	0.50	71	-0.5	100	0.4	-0.03	77	177	70	67
577	85.267	0.148	0.046	0.50	71	-0.5	100	0.4	0	77	175	70	67
578	85.414	0.148	0.046	0.50	71	-0.5	100	0.4	-0.01	77	173	70	67
579	85.562	0.148	0.046	0.50	71	-0.5	100	0.4	-0.03	76	172	70	67
580	85.710	0.148	0.046	0.50	71	-0.5	100	0.4	-0.01	76	172	70	67
581	85.858	0.148	0.046	0.50	71	-0.5	100	0.4	-0.02	76	171	70	67
582	86.006	0.148	0.046	0.50	71	-0.5	100	0.4	-0.01	76	169	70	67
583	86.153	0.148	0.046	0.50	71	-0.5	100	0.4	0	76	170	70	67
584	86.301	0.148	0.046	0.50	71	-0.5	100	0.4	-0.01	76	169	70	67
585	86.449	0.148	0.046	0.50	71	-0.5	100	0.3	-0.02	76	169	70	67
586	86.597	0.148	0.046	0.50	71	-0.5	100	0.3	-0.02	76	168	70	67
587	86.744	0.148	0.046	0.50	71	-0.5	100	0.3	-0.01	76	168	69	67
588	86.892	0.148	0.046	0.50	71	-0.5	100	0.3	-0.02	76	168	69	67
589	87.040	0.148	0.046	0.50	71	-0.5	100	0.3	-0.01	76	167	69	67
590	87.188	0.148	0.046	0.50	71	-0.5	100	0.3	0	76	165	69	67
591	87.336	0.148	0.046	0.50	71	-0.5	100	0.3	-0.01	76	165	69	67
592	87.483	0.148	0.046	0.50	71	-0.5	100	0.3	-0.01	76	164	69	67
593	87.631	0.148	0.046	0.50	71	-0.5	100	0.2	-0.01	76	164	69	67
594	87.779	0.148	0.046	0.50	71	-0.5	100	0.2	-0.03	76	164	69	66
595	87.927	0.148	0.046	0.50	71	-0.5	100	0.2	0	76	164	69	66
596	88.074	0.148	0.046	0.50	72	-0.5	100	0.2	-0.02	76	162	69	66
597	88.222	0.148	0.046	0.50	71	-0.5	100	0.2	-0.01	75	162	69	66
598	88.370	0.148	0.046	0.50	71	-0.5	100	0.2	0.01	75	162	69	67
599	88.518	0.148	0.046	0.50	71	-0.5	100	0.2	-0.02	76	162	69	67
600	88.666	0.148	0.046	0.50	71	-0.5	100	0.2	-0.01	76	162	69	67
601	88.813	0.148	0.046	0.50	71	-0.5	100	0.2	0	76	163	69	67
602	88.961	0.148	0.046	0.50	71	-0.5	100	0.1	-0.02	76	163	69	67
603	89.109	0.148	0.046	0.50	71	-0.5	100	0.1	0	76	162	69	67
604	89.257	0.148	0.046	0.50	71	-0.5	100	0.1	-0.02	76	163	69	67
605	89.404	0.148	0.046	0.50	71	-0.5	100	0.1	-0.01	76	163	69	67
606	89.552	0.148	0.046	0.50	71	-0.5	100	0.1	0	76	165	69	67
607	89.699	0.147	0.046	0.50	71	-0.5	99	0.0	-0.11	76	164	69	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>Valley Comfort</u>	Job #: <u>18-421</u>
Model: <u>Blaze King PE32</u>	Tracking #: <u>0012</u>
Run #: <u>7</u>	Technician: <u>SJB</u>
	Date: <u>10/23/2018</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
Avg/Tot	89.699	0.148	0.046	0.50	72	-0.50	100			77	176	70	67.4

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	68	-2		68	-0.010	4.06	0.01
1	0.170	0.170	0.50	68	-2	101	69	-0.020	4.13	0.09
2	0.339	0.170	0.50	68	-2	101	69	-0.020	2.89	0.23
3	0.509	0.170	0.50	68	-2	101	69	-0.020	1.97	0.67
4	0.678	0.170	0.50	68	-2	101	68	-0.020	1.89	0.82
5	0.848	0.170	0.50	68	-2	101	68	-0.020	2.08	0.76
6	1.017	0.170	0.50	68	-2	101	68	-0.020	2.26	0.70
7	1.187	0.170	0.50	68	-2	101	68	-0.020	2.40	0.64
8	1.356	0.170	0.50	68	-2	101	69	-0.020	2.54	0.60
9	1.526	0.170	0.50	68	-2	101	68	-0.020	2.72	0.56
10	1.696	0.170	0.50	68	-2	100	68	-0.020	2.90	0.53
11	1.865	0.170	0.50	69	-2	100	69	-0.020	3.11	0.47
12	2.035	0.170	0.50	69	-2	100	68	-0.020	3.29	0.41
13	2.204	0.170	0.50	69	-2	100	69	-0.020	3.46	0.35
14	2.374	0.170	0.50	69	-2	100	68	-0.020	3.62	0.27
15	2.543	0.170	0.50	69	-2	100	69	-0.020	3.80	0.20
16	2.713	0.170	0.50	69	-2	100	68	-0.020	3.99	0.12
17	2.882	0.170	0.50	69	-2	100	69	-0.020	4.18	0.03
18	3.052	0.170	0.50	69	-2	100	69	-0.020	4.36	0.01
19	3.221	0.170	0.50	69	-2	100	69	-0.020	4.51	0.01
20	3.391	0.170	0.50	69	-2	100	69	-0.020	4.77	0.01
21	3.561	0.170	0.50	69	-2	100	69	-0.020	5.87	0.01
22	3.730	0.170	0.50	69	-2	100	69	-0.020	6.39	0.01
23	3.900	0.170	0.50	70	-2	100	69	-0.020	6.34	0.01
24	4.069	0.170	0.50	70	-2	100	69	-0.020	6.41	0.01
25	4.239	0.170	0.50	70	-2	100	69	-0.020	6.67	0.01
26	4.408	0.170	0.50	70	-2	101	69	-0.030	7.33	0.01
27	4.578	0.170	0.50	70	-2	101	69	-0.030	8.31	0.01
28	4.747	0.170	0.50	70	-2	101	69	-0.030	8.85	0.01
29	4.917	0.170	0.50	70	-2	101	69	-0.030	8.62	0.01
30	5.087	0.170	0.50	70	-2	101	69	-0.030	8.45	0.01
31	5.256	0.170	0.50	70	-2	101	69	-0.030	8.33	0.01



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	5.426	0.170	0.50	70	-2	101	69	-0.030	8.21	0.01
33	5.595	0.170	0.50	70	-2	101	69	-0.030	8.02	0.01
34	5.765	0.170	0.50	70	-2	101	69	-0.030	7.97	0.01
35	5.934	0.170	0.50	70	-2	101	69	-0.030	8.00	0.01
36	6.104	0.170	0.50	70	-2	101	69	-0.030	8.10	0.01
37	6.273	0.170	0.50	71	-2	101	69	-0.030	8.22	0.01
38	6.443	0.170	0.50	71	-2	101	69	-0.030	8.02	0.01
39	6.612	0.170	0.50	71	-2	101	69	-0.030	7.90	0.01
40	6.782	0.170	0.50	71	-2	101	69	-0.030	7.85	0.01
41	6.952	0.170	0.50	71	-2	101	69	-0.030	7.90	0.01
42	7.121	0.170	0.50	71	-2	101	70	-0.030	7.97	0.01
43	7.291	0.170	0.50	71	-2	101	70	-0.030	8.39	0.01
44	7.460	0.170	0.50	71	-2	101	70	-0.030	8.54	0.01
45	7.630	0.170	0.50	71	-2	101	70	-0.030	8.43	0.01
46	7.799	0.170	0.50	71	-2	101	70	-0.030	8.71	0.01
47	7.969	0.170	0.50	71	-2	101	70	-0.030	8.98	0.01
48	8.138	0.170	0.50	71	-2	101	70	-0.030	8.52	0.01
49	8.308	0.170	0.50	71	-2	101	70	-0.030	8.35	0.01
50	8.478	0.170	0.50	71	-2	101	70	-0.030	8.26	0.01
51	8.647	0.170	0.50	71	-2	101	70	-0.030	8.38	0.01
52	8.817	0.170	0.50	71	-2	101	70	-0.030	8.48	0.01
53	8.986	0.170	0.50	71	-2	101	70	-0.030	8.57	0.01
54	9.156	0.170	0.50	71	-2	101	70	-0.030	9.00	0.01
55	9.325	0.170	0.50	71	-2	101	70	-0.030	10.29	0.01
56	9.495	0.170	0.50	71	-2	101	70	-0.030	10.64	0.02
57	9.664	0.170	0.50	71	-2	101	70	-0.030	10.34	0.02
58	9.834	0.170	0.50	72	-2	101	70	-0.030	10.48	0.03
59	10.003	0.170	0.50	72	-2	101	70	-0.030	10.45	0.04
60	10.173	0.170	0.50	72	-2	101	70	-0.030	10.35	0.02
61	10.343	0.170	0.50	72	-2	101	70	-0.030	10.30	0.02
62	10.512	0.170	0.50	72	-2	101	71	-0.030	10.26	0.02
63	10.682	0.170	0.50	72	-2	101	71	-0.030	10.27	0.03

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	10.851	0.170	0.50	72	-2	101	71	-0.030	10.11	0.02
65	11.021	0.170	0.50	72	-2	101	71	-0.030	9.93	0.01
66	11.190	0.170	0.50	72	-2	101	71	-0.030	9.84	0.01
67	11.360	0.170	0.50	72	-2	101	71	-0.030	9.48	0.01
68	11.529	0.170	0.50	72	-2	101	71	-0.030	9.66	0.01
69	11.699	0.170	0.50	72	-2	101	71	-0.030	9.96	0.01
70	11.869	0.170	0.50	72	-2	101	71	-0.030	10.36	0.01
71	12.038	0.170	0.50	72	-2	101	71	-0.030	10.89	0.01
72	12.208	0.170	0.50	72	-2	101	71	-0.030	11.16	0.01
73	12.377	0.170	0.50	72	-2	101	71	-0.030	11.19	0.01
74	12.547	0.170	0.50	72	-2	101	71	-0.030	11.17	0.01
75	12.716	0.170	0.50	72	-2	101	71	-0.040	11.05	0.01
76	12.886	0.170	0.50	72	-2	101	71	-0.030	10.90	0.01
77	13.055	0.170	0.50	72	-2	101	71	-0.030	10.69	0.01
78	13.225	0.170	0.50	72	-2	101	71	-0.030	10.48	0.01
79	13.394	0.170	0.50	72	-2	101	71	-0.030	10.29	0.01
80	13.564	0.170	0.50	72	-2	101	71	-0.030	10.19	0.01
81	13.734	0.170	0.50	72	-2	101	71	-0.030	10.06	0.01
82	13.903	0.170	0.50	72	-2	101	71	-0.030	10.00	0.01
83	14.073	0.170	0.50	72	-2	101	71	-0.030	9.92	0.01
84	14.242	0.170	0.50	72	-2	101	71	-0.030	9.87	0.01
85	14.412	0.170	0.50	72	-2	101	71	-0.030	9.86	0.01
86	14.581	0.170	0.50	72	-2	101	71	-0.030	9.79	0.01
87	14.751	0.170	0.50	72	-2	101	71	-0.030	9.62	0.01
88	14.920	0.170	0.50	72	-2	101	71	-0.030	9.68	0.01
89	15.090	0.170	0.50	72	-2	101	71	-0.030	9.74	0.01
90	15.260	0.170	0.50	72	-2	101	71	-0.030	9.78	0.01
91	15.429	0.170	0.50	72	-2	101	70	-0.030	9.91	0.01
92	15.599	0.170	0.50	72	-2	101	70	-0.030	9.95	0.01
93	15.768	0.170	0.50	72	-2	101	70	-0.030	10.18	0.01
94	15.938	0.170	0.50	72	-2	101	70	-0.030	10.37	0.01
95	16.107	0.170	0.50	72	-2	101	70	-0.030	10.27	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	16.277	0.170	0.50	72	-2	101	70	-0.030	9.95	0.01
97	16.446	0.170	0.50	72	-2	101	70	-0.030	9.72	0.01
98	16.616	0.170	0.50	72	-2	101	70	-0.030	9.53	0.01
99	16.785	0.170	0.50	72	-2	101	71	-0.030	9.57	0.01
100	16.955	0.170	0.50	72	-2	101	70	-0.030	10.11	0.01
101	17.125	0.170	0.50	72	-2	101	70	-0.030	9.68	0.01
102	17.294	0.170	0.50	72	-2	101	71	-0.030	9.31	0.01
103	17.464	0.170	0.50	72	-2	101	71	-0.030	9.18	0.01
104	17.633	0.170	0.50	72	-2	101	71	-0.030	9.08	0.01
105	17.803	0.170	0.50	72	-2	100	71	-0.030	9.15	0.01
106	17.972	0.170	0.50	72	-2	100	71	-0.030	9.51	0.01
107	18.142	0.170	0.50	72	-2	100	71	-0.030	10.00	0.01
108	18.311	0.170	0.50	72	-2	100	71	-0.030	10.10	0.01
109	18.481	0.170	0.50	72	-2	100	71	-0.030	10.20	0.01
110	18.651	0.170	0.50	72	-2	100	71	-0.030	10.22	0.01
111	18.820	0.170	0.50	72	-2	100	71	-0.030	10.21	0.01
112	18.990	0.170	0.50	72	-2	100	71	-0.030	10.13	0.01
113	19.159	0.170	0.50	72	-2	100	71	-0.030	10.25	0.01
114	19.329	0.170	0.50	72	-2	100	71	-0.030	10.23	0.01
115	19.498	0.170	0.50	72	-2	100	71	-0.030	10.13	0.01
116	19.668	0.170	0.50	73	-2	100	71	-0.030	9.88	0.01
117	19.837	0.170	0.50	73	-2	100	71	-0.030	9.64	0.01
118	20.007	0.170	0.50	73	-2	100	71	-0.030	9.21	0.01
119	20.176	0.170	0.50	73	-2	100	71	-0.030	8.94	0.01
120	20.346	0.170	0.50	73	-2	100	71	-0.030	8.70	0.01
121	20.516	0.170	0.50	73	-2	100	71	-0.030	8.71	0.01
122	20.685	0.170	0.50	73	-2	100	71	-0.030	8.76	0.01
123	20.855	0.170	0.50	73	-2	100	71	-0.030	8.83	0.01
124	21.024	0.170	0.50	73	-2	100	71	-0.030	9.01	0.01
125	21.194	0.170	0.50	73	-2	100	71	-0.030	9.14	0.01
126	21.363	0.170	0.50	73	-2	100	71	-0.030	9.26	0.01
127	21.533	0.170	0.50	73	-2	100	71	-0.030	9.38	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	21.702	0.170	0.50	73	-2	100	71	-0.030	9.43	0.01
129	21.872	0.170	0.50	73	-2	100	71	-0.030	9.53	0.01
130	22.042	0.170	0.50	73	-2	100	71	-0.030	9.47	0.01
131	22.211	0.170	0.50	73	-2	100	71	-0.030	9.49	0.01
132	22.381	0.170	0.50	73	-2	100	71	-0.030	9.59	0.01
133	22.550	0.170	0.50	73	-2	100	71	-0.030	9.62	0.01
134	22.720	0.170	0.50	73	-2	100	71	-0.030	9.41	0.01
135	22.889	0.170	0.50	73	-2	100	71	-0.030	9.32	0.01
136	23.059	0.170	0.50	73	-2	100	71	-0.030	9.23	0.01
137	23.228	0.170	0.50	73	-2	100	71	-0.030	9.18	0.01
138	23.398	0.170	0.50	73	-2	100	71	-0.030	9.16	0.01
139	23.567	0.170	0.50	73	-2	100	71	-0.030	9.15	0.01
140	23.737	0.170	0.50	73	-2	100	71	-0.030	9.09	0.01
141	23.907	0.170	0.50	73	-2	100	71	-0.030	9.09	0.01
142	24.076	0.170	0.50	73	-2	100	71	-0.030	9.11	0.01
143	24.246	0.170	0.50	73	-2	100	71	-0.030	9.11	0.01
144	24.415	0.170	0.50	73	-2	100	71	-0.030	9.18	0.01
145	24.585	0.170	0.50	73	-2	100	71	-0.030	9.16	0.01
146	24.754	0.170	0.50	73	-2	100	71	-0.030	9.17	0.01
147	24.924	0.170	0.50	73	-2	100	71	-0.030	9.12	0.01
148	25.093	0.170	0.50	73	-2	100	71	-0.030	9.11	0.01
149	25.263	0.170	0.50	73	-2	100	71	-0.030	9.12	0.01
150	25.433	0.170	0.50	73	-2	100	71	-0.030	9.13	0.01
151	25.602	0.170	0.50	73	-2	100	71	-0.030	9.13	0.01
152	25.772	0.170	0.50	73	-2	100	71	-0.030	9.11	0.01
153	25.941	0.170	0.50	73	-2	100	71	-0.030	9.10	0.01
154	26.111	0.170	0.50	73	-2	100	71	-0.030	9.08	0.01
155	26.280	0.170	0.50	73	-2	100	71	-0.030	9.10	0.01
156	26.450	0.170	0.50	73	-2	100	71	-0.030	9.10	0.01
157	26.619	0.170	0.50	73	-2	100	71	-0.020	9.11	0.01
158	26.789	0.170	0.50	73	-2	100	71	-0.030	9.06	0.01
159	26.958	0.170	0.50	73	-2	100	71	-0.030	9.06	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	27.128	0.170	0.50	73	-2	100	71	-0.030	9.04	0.01
161	27.298	0.170	0.50	73	-2	100	71	-0.030	8.83	0.01
162	27.467	0.170	0.50	73	-2	100	71	-0.030	8.68	0.01
163	27.637	0.170	0.50	73	-2	100	71	-0.030	8.52	0.01
164	27.806	0.170	0.50	73	-2	100	71	-0.030	8.31	0.01
165	27.976	0.170	0.50	73	-2	100	71	-0.030	8.10	0.01
166	28.145	0.170	0.50	73	-2	100	71	-0.030	7.97	0.01
167	28.315	0.170	0.50	73	-2	100	71	-0.030	7.88	0.01
168	28.484	0.170	0.50	73	-2	100	71	-0.030	7.83	0.01
169	28.654	0.170	0.50	73	-2	100	71	-0.030	7.83	0.01
170	28.824	0.170	0.50	73	-2	100	71	-0.030	7.80	0.01
171	28.993	0.170	0.50	73	-2	100	71	-0.020	7.78	0.01
172	29.163	0.170	0.50	73	-2	100	71	-0.030	7.80	0.01
173	29.332	0.170	0.50	74	-2	100	71	-0.020	7.82	0.01
174	29.502	0.170	0.50	74	-2	100	71	-0.020	7.81	0.01
175	29.671	0.170	0.50	74	-2	100	71	-0.020	7.82	0.01
176	29.841	0.170	0.50	74	-2	100	71	-0.020	7.83	0.01
177	30.010	0.170	0.50	74	-2	100	71	-0.020	7.84	0.01
178	30.180	0.170	0.50	74	-2	100	71	-0.020	7.88	0.01
179	30.349	0.170	0.50	74	-2	100	71	-0.020	7.88	0.01
180	30.519	0.170	0.50	74	-2	100	71	-0.020	7.88	0.01
181	30.689	0.170	0.50	74	-2	100	71	-0.020	7.90	0.01
182	30.858	0.170	0.50	74	-2	100	71	-0.020	7.92	0.01
183	31.028	0.170	0.50	74	-2	100	71	-0.020	7.94	0.01
184	31.197	0.170	0.50	74	-2	100	71	-0.020	7.95	0.01
185	31.367	0.170	0.50	74	-2	100	71	-0.020	7.97	0.01
186	31.536	0.170	0.50	74	-2	100	71	-0.020	8.02	0.01
187	31.706	0.170	0.50	74	-2	100	71	-0.020	8.06	0.01
188	31.875	0.170	0.50	74	-2	100	71	-0.020	8.07	0.01
189	32.045	0.170	0.50	74	-2	100	71	-0.020	8.10	0.01
190	32.215	0.170	0.50	74	-2	100	71	-0.020	8.05	0.01
191	32.384	0.170	0.50	74	-2	100	71	-0.020	8.02	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
192	32.554	0.170	0.50	74	-2	100	71	-0.020	8.01	0.01
193	32.723	0.170	0.50	74	-2	100	71	-0.020	8.06	0.01
194	32.893	0.170	0.50	74	-2	100	71	-0.020	8.13	0.01
195	33.062	0.170	0.50	74	-2	100	71	-0.020	8.20	0.01
196	33.232	0.170	0.50	74	-2	100	71	-0.020	8.18	0.01
197	33.401	0.170	0.50	74	-2	100	71	-0.020	8.09	0.01
198	33.571	0.170	0.50	74	-2	100	71	-0.020	8.05	0.01
199	33.740	0.170	0.50	74	-2	100	71	-0.030	8.09	0.01
200	33.910	0.170	0.50	74	-2	100	71	-0.020	8.16	0.01
201	34.080	0.170	0.50	74	-2	100	71	-0.020	8.24	0.01
202	34.249	0.170	0.50	74	-2	100	71	-0.030	8.32	0.01
203	34.419	0.170	0.50	74	-2	100	71	-0.030	8.38	0.01
204	34.588	0.170	0.50	74	-2	100	71	-0.030	8.47	0.01
205	34.758	0.170	0.50	74	-2	100	71	-0.030	8.57	0.01
206	34.927	0.170	0.50	74	-2	100	71	-0.030	8.61	0.01
207	35.097	0.170	0.50	74	-2	100	71	-0.030	8.74	0.02
208	35.266	0.170	0.50	74	-2	100	71	-0.030	8.80	0.01
209	35.436	0.170	0.50	74	-2	100	71	-0.030	8.87	0.01
210	35.606	0.170	0.50	74	-2	100	71	-0.030	8.87	0.01
211	35.775	0.170	0.50	74	-2	100	71	-0.030	8.93	0.01
212	35.945	0.170	0.50	74	-2	100	71	-0.030	8.95	0.01
213	36.114	0.170	0.50	74	-2	100	71	-0.030	8.91	0.01
214	36.284	0.170	0.50	74	-2	100	71	-0.030	8.95	0.01
215	36.453	0.170	0.50	74	-2	100	71	-0.030	8.96	0.01
216	36.623	0.170	0.50	74	-2	100	71	-0.030	9.09	0.01
217	36.792	0.170	0.50	74	-2	100	71	-0.030	9.18	0.01
218	36.962	0.170	0.50	74	-2	100	71	-0.030	9.13	0.01
219	37.132	0.170	0.50	74	-2	100	71	-0.030	9.00	0.01
220	37.301	0.170	0.50	74	-2	100	71	-0.030	8.98	0.01
221	37.471	0.170	0.50	74	-2	100	71	-0.030	8.99	0.01
222	37.640	0.170	0.50	74	-2	100	71	-0.030	8.98	0.01
223	37.810	0.170	0.50	74	-2	100	71	-0.030	9.01	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
224	37.979	0.170	0.50	74	-2	100	71	-0.030	9.04	0.01
225	38.149	0.170	0.50	74	-2	100	71	-0.030	9.08	0.01
226	38.318	0.170	0.50	74	-2	100	71	-0.030	9.04	0.01
227	38.488	0.170	0.50	74	-2	100	71	-0.030	9.01	0.02
228	38.657	0.170	0.50	74	-2	100	71	-0.030	9.04	0.01
229	38.827	0.170	0.50	74	-2	100	71	-0.030	9.09	0.01
230	38.997	0.170	0.50	74	-2	100	71	-0.030	9.11	0.02
231	39.166	0.170	0.50	74	-2	100	71	-0.030	9.18	0.01
232	39.336	0.170	0.50	74	-2	100	71	-0.030	9.20	0.01
233	39.505	0.170	0.50	74	-2	100	71	-0.030	9.24	0.01
234	39.675	0.170	0.50	74	-2	100	71	-0.030	9.25	0.01
235	39.844	0.170	0.50	74	-2	100	71	-0.030	9.33	0.01
236	40.014	0.170	0.50	74	-2	100	71	-0.030	8.17	0.01
237	40.183	0.170	0.50	74	-2	100	71	-0.030	8.45	0.01
238	40.353	0.170	0.50	74	-2	100	71	-0.030	9.25	0.01
239	40.523	0.170	0.50	74	-2	100	71	-0.030	9.43	0.01
240	40.692	0.170	0.50	74	-2	100	71	-0.030	9.47	0.01
241	40.862	0.170	0.50	74	-2	100	71	-0.030	9.73	0.01
242	41.031	0.170	0.50	74	-2	100	71	-0.030	9.91	0.02
243	41.201	0.170	0.50	74	-2	100	71	-0.030	10.16	0.02
244	41.370	0.170	0.50	74	-2	100	71	-0.030	10.30	0.01
245	41.540	0.170	0.50	74	-2	100	71	-0.030	10.42	0.02
246	41.709	0.170	0.50	74	-2	100	71	-0.030	10.49	0.02
247	41.879	0.170	0.50	74	-2	100	72	-0.030	10.60	0.02
248	42.048	0.170	0.50	74	-2	100	72	-0.030	10.72	0.02
249	42.218	0.170	0.50	74	-2	100	72	-0.030	10.90	0.02
250	42.388	0.170	0.50	74	-2	100	72	-0.030	11.06	0.02
251	42.557	0.170	0.50	74	-2	100	72	-0.030	11.17	0.02
252	42.727	0.170	0.50	74	-2	100	72	-0.030	11.36	0.02
253	42.896	0.170	0.50	74	-2	100	72	-0.030	11.57	0.02
254	43.066	0.170	0.50	74	-2	100	72	-0.030	11.76	0.02
255	43.235	0.170	0.50	74	-2	100	72	-0.030	11.99	0.04

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
256	43.405	0.170	0.50	74	-2	100	72	-0.030	12.24	0.12
257	43.574	0.170	0.50	74	-2	100	72	-0.030	12.37	0.18
258	43.744	0.170	0.50	74	-2	100	72	-0.030	12.50	0.26
259	43.914	0.170	0.50	74	-2	100	72	-0.030	12.56	0.45
260	44.083	0.170	0.50	74	-2	100	72	-0.030	12.74	0.60
261	44.253	0.170	0.50	74	-2	100	72	-0.030	12.70	0.87
262	44.422	0.170	0.50	74	-2	100	72	-0.030	12.68	1.08
263	44.592	0.170	0.50	74	-2	100	72	-0.030	12.74	1.35
264	44.761	0.170	0.50	74	-2	100	72	-0.030	12.70	1.62
265	44.931	0.170	0.50	74	-2	100	72	-0.030	12.58	1.63
266	45.100	0.170	0.50	74	-2	100	72	-0.030	12.41	1.55
267	45.270	0.170	0.50	74	-2	100	72	-0.030	12.32	1.47
268	45.439	0.170	0.50	74	-2	100	72	-0.030	12.22	1.50
269	45.609	0.170	0.50	74	-2	100	72	-0.030	12.08	1.48
270	45.779	0.170	0.50	74	-2	100	72	-0.030	11.92	1.69
271	45.948	0.170	0.50	74	-2	100	72	-0.030	11.76	1.44
272	46.118	0.170	0.50	74	-2	100	72	-0.030	11.67	1.31
273	46.287	0.170	0.50	74	-2	100	72	-0.030	11.68	1.07
274	46.457	0.170	0.50	74	-2	100	72	-0.030	11.51	0.89
275	46.626	0.170	0.50	74	-2	100	72	-0.030	11.43	0.71
276	46.796	0.170	0.50	74	-2	100	72	-0.030	11.26	0.56
277	46.965	0.170	0.50	74	-2	100	72	-0.030	11.10	0.44
278	47.135	0.170	0.50	74	-2	100	72	-0.030	10.92	0.34
279	47.305	0.170	0.50	74	-2	100	72	-0.030	10.85	0.24
280	47.474	0.170	0.50	74	-2	100	72	-0.030	10.65	0.19
281	47.644	0.170	0.50	75	-2	100	72	-0.030	10.53	0.13
282	47.813	0.170	0.50	75	-2	100	72	-0.030	10.41	0.08
283	47.983	0.170	0.50	75	-2	100	72	-0.020	10.32	0.05
284	48.152	0.170	0.50	75	-2	100	72	-0.020	10.23	0.04
285	48.322	0.170	0.50	75	-2	100	72	-0.020	10.09	0.03
286	48.491	0.170	0.50	75	-2	100	72	-0.020	9.95	0.02
287	48.661	0.170	0.50	75	-2	100	72	-0.020	9.67	0.02



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
288	48.830	0.170	0.50	75	-2	100	72	-0.020	9.47	0.02
289	49.000	0.170	0.50	75	-2	100	71	-0.020	9.29	0.02
290	49.170	0.170	0.50	75	-2	100	71	-0.020	9.05	0.02
291	49.339	0.170	0.50	75	-2	100	71	-0.020	8.86	0.02
292	49.509	0.170	0.50	75	-2	100	71	-0.020	8.69	0.02
293	49.678	0.170	0.50	75	-2	100	71	-0.020	8.53	0.02
294	49.848	0.170	0.50	75	-2	100	71	-0.020	8.41	0.02
295	50.017	0.170	0.50	75	-2	100	71	-0.020	8.29	0.02
296	50.187	0.170	0.50	75	-2	100	71	-0.020	8.22	0.02
297	50.356	0.170	0.50	75	-2	100	71	-0.020	8.12	0.02
298	50.526	0.170	0.50	75	-2	100	71	-0.020	8.13	0.02
299	50.696	0.170	0.50	75	-2	100	71	-0.020	8.26	0.02
300	50.865	0.170	0.50	75	-2	100	71	-0.020	8.52	0.02
301	51.035	0.170	0.50	75	-2	100	71	-0.020	8.60	0.02
302	51.204	0.170	0.50	75	-2	100	71	-0.020	8.61	0.02
303	51.374	0.170	0.50	75	-2	100	71	-0.020	8.65	0.02
304	51.543	0.170	0.50	75	-2	100	71	-0.020	8.63	0.02
305	51.713	0.170	0.50	75	-2	100	71	-0.020	8.65	0.02
306	51.882	0.170	0.50	75	-2	100	71	-0.020	8.71	0.02
307	52.052	0.170	0.50	75	-2	100	71	-0.020	8.82	0.02
308	52.221	0.170	0.50	75	-2	100	71	-0.020	8.93	0.02
309	52.391	0.170	0.50	75	-2	100	71	-0.020	9.01	0.02
310	52.561	0.170	0.50	75	-2	100	71	-0.020	9.18	0.02
311	52.730	0.170	0.50	75	-2	100	71	-0.020	9.36	0.02
312	52.900	0.170	0.50	75	-2	100	71	-0.020	9.52	0.02
313	53.069	0.170	0.50	75	-2	100	71	-0.020	9.66	0.02
314	53.239	0.170	0.50	75	-2	100	71	-0.020	9.79	0.02
315	53.408	0.170	0.50	75	-2	100	71	-0.020	9.92	0.02
316	53.578	0.170	0.50	75	-2	100	71	-0.020	10.09	0.02
317	53.747	0.170	0.50	75	-2	100	71	-0.020	10.28	0.02
318	53.917	0.170	0.50	75	-2	100	71	-0.020	10.34	0.02
319	54.087	0.170	0.50	75	-2	100	71	-0.020	10.42	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
320	54.256	0.170	0.50	75	-2	100	71	-0.020	10.57	0.02
321	54.426	0.170	0.50	75	-2	100	71	-0.020	10.63	0.02
322	54.595	0.170	0.50	75	-2	100	71	-0.020	10.78	0.02
323	54.765	0.170	0.50	75	-2	100	71	-0.020	10.84	0.02
324	54.934	0.170	0.50	75	-2	100	71	-0.020	10.88	0.02
325	55.104	0.170	0.50	75	-2	100	71	-0.020	11.00	0.03
326	55.273	0.170	0.50	75	-2	100	71	-0.020	11.02	0.03
327	55.443	0.170	0.50	75	-2	100	71	-0.020	11.06	0.04
328	55.612	0.170	0.50	75	-2	100	71	-0.020	11.07	0.05
329	55.782	0.170	0.50	75	-2	100	71	-0.020	10.99	0.04
330	55.952	0.170	0.50	75	-2	100	71	-0.020	11.05	0.03
331	56.121	0.170	0.50	75	-2	100	71	-0.020	11.14	0.03
332	56.291	0.170	0.50	75	-2	100	71	-0.020	11.12	0.02
333	56.460	0.170	0.50	75	-2	100	71	-0.020	11.18	0.03
334	56.630	0.170	0.50	75	-2	100	71	-0.020	11.19	0.03
335	56.799	0.170	0.50	75	-2	100	71	-0.020	11.30	0.04
336	56.969	0.170	0.50	75	-2	100	71	-0.020	11.36	0.03
337	57.138	0.170	0.50	75	-2	100	71	-0.020	11.43	0.04
338	57.308	0.170	0.50	75	-2	100	71	-0.020	11.36	0.05
339	57.478	0.170	0.50	75	-2	100	71	-0.020	11.43	0.05
340	57.647	0.170	0.50	75	-2	100	71	-0.020	11.39	0.06
341	57.817	0.170	0.50	75	-2	100	71	-0.020	11.22	0.06
342	57.986	0.170	0.50	75	-2	100	71	-0.020	11.31	0.08
343	58.156	0.170	0.50	75	-2	100	71	-0.020	11.29	0.08
344	58.325	0.170	0.50	75	-2	100	71	-0.020	11.26	0.08
345	58.495	0.170	0.50	75	-2	100	71	-0.020	11.23	0.09
346	58.664	0.170	0.50	75	-2	100	71	-0.020	11.26	0.09
347	58.834	0.170	0.50	75	-2	100	71	-0.020	11.28	0.11
348	59.003	0.170	0.50	75	-2	100	71	-0.020	11.24	0.08
349	59.173	0.170	0.50	75	-2	100	71	-0.020	11.23	0.09
350	59.343	0.170	0.50	75	-2	100	71	-0.020	11.20	0.08
351	59.512	0.170	0.50	75	-2	100	71	-0.020	11.21	0.08

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
352	59.682	0.170	0.50	75	-2	100	71	-0.020	11.20	0.09
353	59.851	0.170	0.50	75	-2	100	71	-0.020	11.08	0.07
354	60.021	0.170	0.50	75	-2	100	71	-0.020	11.17	0.08
355	60.190	0.170	0.50	75	-2	100	71	-0.020	11.13	0.08
356	60.360	0.170	0.50	75	-2	100	71	-0.020	11.19	0.09
357	60.529	0.170	0.50	75	-2	100	71	-0.020	11.14	0.10
358	60.699	0.170	0.50	75	-2	100	71	-0.020	11.11	0.11
359	60.869	0.170	0.50	75	-2	100	71	-0.020	11.09	0.14
360	61.038	0.170	0.50	75	-2	100	71	-0.020	10.99	0.16
361	61.208	0.170	0.50	75	-2	100	71	-0.020	10.89	0.15
362	61.377	0.170	0.50	75	-2	100	71	-0.020	10.78	0.19
363	61.547	0.170	0.50	75	-2	100	71	-0.020	10.75	0.18
364	61.716	0.170	0.50	75	-2	100	71	-0.020	10.63	0.20
365	61.886	0.170	0.50	75	-2	100	71	-0.020	10.59	0.20
366	62.055	0.170	0.50	75	-2	100	71	-0.020	10.56	0.21
367	62.225	0.170	0.50	75	-2	100	71	-0.020	10.46	0.17
368	62.394	0.170	0.50	75	-2	100	71	-0.020	10.32	0.15
369	62.564	0.170	0.50	75	-2	100	71	-0.020	10.30	0.10
370	62.734	0.170	0.50	75	-2	100	71	-0.020	10.18	0.04
371	62.903	0.170	0.50	75	-2	100	71	-0.020	9.90	0.02
372	63.073	0.170	0.50	75	-2	100	71	-0.020	9.53	0.02
373	63.242	0.170	0.50	75	-2	100	71	-0.020	9.30	0.02
374	63.412	0.170	0.50	75	-2	100	71	-0.020	9.03	0.02
375	63.581	0.170	0.50	75	-2	100	71	-0.020	8.88	0.02
376	63.751	0.170	0.50	75	-2	100	71	-0.020	8.62	0.02
377	63.920	0.170	0.50	75	-2	100	71	-0.020	8.42	0.02
378	64.090	0.170	0.50	75	-2	100	71	-0.020	8.29	0.02
379	64.260	0.170	0.50	75	-2	100	71	-0.020	8.17	0.02
380	64.429	0.170	0.50	75	-2	100	71	-0.020	8.01	0.02
381	64.599	0.170	0.50	75	-2	100	71	-0.020	7.86	0.02
382	64.768	0.170	0.50	75	-2	100	71	-0.020	7.72	0.02
383	64.938	0.170	0.50	75	-2	100	71	-0.020	7.59	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
384	65.107	0.170	0.50	75	-2	100	71	-0.020	7.49	0.02
385	65.277	0.170	0.50	75	-2	100	71	-0.020	7.44	0.02
386	65.446	0.170	0.50	75	-2	100	71	-0.020	7.38	0.02
387	65.616	0.170	0.50	75	-2	100	71	-0.020	7.35	0.02
388	65.785	0.170	0.50	75	-2	100	71	-0.020	7.36	0.02
389	65.955	0.170	0.50	75	-2	99	71	-0.020	7.33	0.02
390	66.125	0.170	0.50	75	-2	99	70	-0.010	7.31	0.02
391	66.294	0.170	0.50	75	-2	99	70	-0.020	7.28	0.02
392	66.464	0.170	0.50	75	-2	99	70	-0.020	7.33	0.02
393	66.633	0.170	0.50	75	-2	99	70	-0.010	7.47	0.02
394	66.803	0.170	0.50	75	-2	99	70	-0.010	7.66	0.02
395	66.972	0.170	0.50	75	-2	99	70	-0.010	7.83	0.02
396	67.142	0.170	0.50	75	-2	99	70	-0.020	7.82	0.02
397	67.311	0.170	0.50	75	-2	100	70	-0.020	7.76	0.02
398	67.481	0.170	0.50	75	-2	99	70	-0.020	7.74	0.02
399	67.651	0.170	0.50	75	-2	99	70	-0.020	7.72	0.02
400	67.820	0.170	0.50	75	-2	99	70	-0.020	7.79	0.02
401	67.990	0.170	0.50	75	-2	99	70	-0.020	7.82	0.02
402	68.159	0.170	0.50	75	-2	99	70	-0.020	7.92	0.02
403	68.329	0.170	0.50	75	-2	100	70	-0.020	8.03	0.02
404	68.498	0.170	0.50	75	-2	99	70	-0.020	8.05	0.02
405	68.668	0.170	0.50	75	-2	100	70	-0.020	8.17	0.02
406	68.837	0.170	0.50	75	-2	100	70	-0.020	8.24	0.02
407	69.007	0.170	0.50	75	-2	100	70	-0.020	8.31	0.02
408	69.177	0.170	0.50	75	-2	100	70	-0.020	8.32	0.02
409	69.346	0.170	0.50	75	-2	100	70	-0.020	8.38	0.02
410	69.516	0.170	0.50	75	-2	100	70	-0.020	8.45	0.02
411	69.685	0.170	0.50	75	-2	100	70	-0.020	8.52	0.02
412	69.855	0.170	0.50	75	-2	100	70	-0.020	8.62	0.02
413	70.024	0.170	0.50	74	-2	100	70	-0.020	8.66	0.02
414	70.194	0.170	0.50	74	-2	100	70	-0.020	8.65	0.02
415	70.363	0.170	0.50	75	-2	100	70	-0.020	8.64	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
416	70.533	0.170	0.50	75	-2	100	70	-0.020	8.69	0.02
417	70.702	0.170	0.50	75	-2	100	70	-0.020	8.75	0.02
418	70.872	0.170	0.50	74	-2	100	70	-0.020	8.79	0.02
419	71.042	0.170	0.50	75	-2	100	70	-0.020	8.89	0.02
420	71.211	0.170	0.50	74	-2	100	70	-0.020	8.95	0.02
421	71.381	0.170	0.50	75	-2	100	70	-0.020	9.03	0.02
422	71.550	0.170	0.50	75	-2	100	70	-0.020	9.16	0.02
423	71.720	0.170	0.50	74	-2	100	70	-0.020	9.25	0.02
424	71.889	0.170	0.50	74	-2	100	70	-0.020	9.32	0.02
425	72.059	0.170	0.50	74	-2	100	70	-0.020	9.36	0.02
426	72.228	0.170	0.50	74	-2	100	70	-0.020	9.43	0.02
427	72.398	0.170	0.50	74	-2	100	70	-0.020	9.48	0.02
428	72.568	0.170	0.50	74	-2	100	70	-0.020	9.55	0.02
429	72.737	0.170	0.50	74	-2	100	70	-0.020	9.59	0.02
430	72.907	0.170	0.50	74	-2	100	70	-0.020	9.63	0.02
431	73.076	0.170	0.50	74	-2	100	70	-0.020	9.71	0.02
432	73.246	0.170	0.50	74	-2	100	70	-0.020	9.76	0.02
433	73.415	0.170	0.50	74	-2	100	70	-0.020	9.83	0.02
434	73.585	0.170	0.50	74	-2	100	70	-0.020	9.90	0.02
435	73.754	0.170	0.50	74	-2	100	70	-0.020	9.92	0.02
436	73.924	0.170	0.50	74	-2	100	70	-0.020	9.92	0.02
437	74.093	0.170	0.50	74	-2	100	70	-0.020	9.94	0.02
438	74.263	0.170	0.50	74	-2	100	70	-0.020	9.84	0.02
439	74.433	0.170	0.50	74	-2	100	70	-0.020	9.82	0.02
440	74.602	0.170	0.50	74	-2	100	70	-0.020	9.88	0.02
441	74.772	0.170	0.50	74	-2	100	70	-0.020	9.73	0.02
442	74.941	0.170	0.50	74	-2	100	70	-0.020	9.71	0.02
443	75.111	0.170	0.50	74	-2	100	70	-0.020	9.77	0.02
444	75.280	0.170	0.50	74	-2	100	70	-0.020	9.77	0.02
445	75.450	0.170	0.50	74	-2	100	70	-0.020	9.78	0.02
446	75.619	0.170	0.50	74	-2	100	70	-0.020	9.91	0.02
447	75.789	0.170	0.50	74	-2	100	70	-0.020	10.33	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
448	75.959	0.170	0.50	74	-2	100	70	-0.020	10.47	0.02
449	76.128	0.170	0.50	74	-2	100	70	-0.020	10.47	0.02
450	76.298	0.170	0.50	74	-2	100	70	-0.020	10.46	0.02
451	76.467	0.170	0.50	74	-2	100	70	-0.020	10.49	0.02
452	76.637	0.170	0.50	74	-2	100	70	-0.020	10.52	0.02
453	76.806	0.170	0.50	74	-2	100	70	-0.020	10.58	0.02
454	76.976	0.170	0.50	74	-2	100	70	-0.020	10.58	0.02
455	77.145	0.170	0.50	74	-2	100	70	-0.020	10.64	0.02
456	77.315	0.170	0.50	74	-2	100	70	-0.020	10.66	0.00
457	77.484	0.170	0.50	74	-2	100	70	-0.020	10.65	0.02
458	77.654	0.170	0.50	74	-2	100	70	-0.020	10.66	0.02
459	77.824	0.170	0.50	74	-2	100	70	-0.020	10.67	0.02
460	77.993	0.170	0.50	74	-2	100	70	-0.020	10.68	0.02
461	78.163	0.170	0.50	74	-2	100	70	-0.020	10.70	0.02
462	78.332	0.170	0.50	74	-2	100	70	-0.020	10.68	0.02
463	78.502	0.170	0.50	74	-2	100	70	-0.020	10.67	0.02
464	78.671	0.170	0.50	74	-2	100	70	-0.020	10.41	0.02
465	78.841	0.170	0.50	74	-2	100	70	-0.020	10.22	0.02
466	79.010	0.170	0.50	74	-2	100	70	-0.020	10.41	0.02
467	79.180	0.170	0.50	74	-2	100	70	-0.020	10.46	0.02
468	79.350	0.170	0.50	74	-2	100	70	-0.020	10.33	0.02
469	79.519	0.170	0.50	74	-2	100	70	-0.020	10.23	0.02
470	79.689	0.170	0.50	74	-2	100	70	-0.020	10.12	0.02
471	79.858	0.170	0.50	74	-2	100	70	-0.020	9.99	0.02
472	80.028	0.170	0.50	74	-2	100	70	-0.020	9.77	0.02
473	80.197	0.170	0.50	74	-2	100	70	-0.020	9.58	0.02
474	80.367	0.170	0.50	74	-2	100	70	-0.020	9.52	0.02
475	80.536	0.170	0.50	74	-2	100	70	-0.020	9.43	0.02
476	80.706	0.170	0.50	74	-2	100	70	-0.020	9.34	0.01
477	80.875	0.170	0.50	74	-2	100	70	-0.020	9.27	0.01
478	81.045	0.170	0.50	74	-2	100	70	-0.020	9.25	0.02
479	81.215	0.170	0.50	74	-2	100	70	-0.020	9.24	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
480	81.384	0.170	0.50	74	-2	100	70	-0.020	9.24	0.01
481	81.554	0.170	0.50	74	-2	100	70	-0.020	9.21	0.02
482	81.723	0.170	0.50	74	-2	100	70	-0.020	9.14	0.02
483	81.893	0.170	0.50	74	-2	100	70	-0.020	9.08	0.02
484	82.062	0.170	0.50	74	-2	100	70	-0.020	9.08	0.02
485	82.232	0.170	0.50	74	-2	100	70	-0.020	9.07	0.02
486	82.401	0.170	0.50	74	-2	100	70	-0.020	9.06	0.02
487	82.571	0.170	0.50	74	-2	100	70	-0.020	8.91	0.01
488	82.741	0.170	0.50	74	-2	100	70	-0.020	8.74	0.02
489	82.910	0.170	0.50	74	-2	100	70	-0.020	8.66	0.02
490	83.080	0.170	0.50	74	-2	100	70	-0.020	8.56	0.02
491	83.249	0.170	0.50	74	-2	100	70	-0.020	8.61	0.02
492	83.419	0.170	0.50	74	-2	100	70	-0.020	8.67	0.02
493	83.588	0.170	0.50	74	-2	100	70	-0.020	8.59	0.02
494	83.758	0.170	0.50	74	-2	100	70	-0.020	8.54	0.02
495	83.927	0.170	0.50	74	-2	100	70	-0.020	8.54	0.02
496	84.097	0.170	0.50	74	-2	100	70	-0.020	8.43	0.02
497	84.266	0.170	0.50	74	-2	100	70	-0.020	8.30	0.01
498	84.436	0.170	0.50	74	-2	100	70	-0.020	8.23	0.01
499	84.606	0.170	0.50	74	-2	100	70	-0.020	8.17	0.02
500	84.775	0.170	0.50	74	-2	100	70	-0.020	8.15	0.02
501	84.945	0.170	0.50	74	-2	100	70	-0.020	8.10	0.02
502	85.114	0.170	0.50	74	-2	100	70	-0.020	8.06	0.01
503	85.284	0.170	0.50	74	-2	100	70	-0.020	8.03	0.02
504	85.453	0.170	0.50	74	-2	100	70	-0.020	8.00	0.02
505	85.623	0.170	0.50	74	-2	100	70	-0.020	7.98	0.01
506	85.792	0.170	0.50	74	-2	100	70	-0.020	7.92	0.01
507	85.962	0.170	0.50	74	-2	100	70	-0.020	7.90	0.02
508	86.132	0.170	0.50	74	-2	100	70	-0.020	7.83	0.01
509	86.301	0.170	0.50	74	-2	100	70	-0.020	7.80	0.01
510	86.471	0.170	0.50	74	-2	100	70	-0.020	7.82	0.02
511	86.640	0.170	0.50	74	-2	100	70	-0.020	7.81	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
512	86.810	0.170	0.50	74	-2	100	70	-0.020	7.80	0.01
513	86.979	0.170	0.50	74	-2	100	70	-0.020	7.78	0.01
514	87.149	0.170	0.50	74	-2	100	70	-0.020	7.79	0.02
515	87.318	0.170	0.50	74	-2	100	70	-0.020	7.78	0.02
516	87.488	0.170	0.50	74	-2	100	70	-0.020	7.83	0.01
517	87.657	0.170	0.50	74	-2	100	70	-0.020	7.88	0.02
518	87.827	0.170	0.50	74	-2	100	70	-0.020	7.77	0.02
519	87.997	0.170	0.50	74	-2	100	70	-0.020	7.58	0.01
520	88.166	0.170	0.50	74	-2	100	70	-0.020	7.44	0.02
521	88.336	0.170	0.50	74	-2	100	70	-0.020	7.38	0.02
522	88.505	0.170	0.50	74	-2	100	70	-0.020	7.38	0.02
523	88.675	0.170	0.50	74	-2	100	70	-0.020	7.37	0.02
524	88.844	0.170	0.50	74	-2	100	70	-0.020	7.36	0.02
525	89.014	0.170	0.50	74	-2	100	70	-0.020	7.39	0.02
526	89.183	0.170	0.50	74	-2	100	70	-0.020	7.35	0.02
527	89.353	0.170	0.50	74	-2	100	70	-0.020	7.38	0.02
528	89.523	0.170	0.50	74	-2	100	70	-0.020	7.39	0.02
529	89.692	0.170	0.50	74	-2	100	70	-0.020	7.41	0.02
530	89.862	0.170	0.50	74	-2	100	70	-0.020	7.41	0.02
531	90.031	0.170	0.50	74	-2	100	70	-0.020	7.43	0.02
532	90.201	0.170	0.50	74	-2	100	70	-0.020	7.51	0.02
533	90.370	0.170	0.50	74	-2	100	70	-0.020	7.55	0.01
534	90.540	0.170	0.50	74	-2	100	70	-0.020	7.62	0.01
535	90.709	0.170	0.50	74	-2	100	70	-0.020	7.65	0.01
536	90.879	0.170	0.50	74	-2	100	70	-0.020	7.74	0.02
537	91.048	0.170	0.50	74	-2	100	69	-0.020	7.74	0.02
538	91.218	0.170	0.50	73	-2	100	69	-0.020	7.76	0.02
539	91.388	0.170	0.50	73	-2	100	69	-0.020	7.70	0.02
540	91.557	0.170	0.50	73	-2	100	69	-0.020	7.57	0.01
541	91.727	0.170	0.50	73	-2	100	69	-0.020	7.61	0.02
542	91.896	0.170	0.50	73	-2	100	69	-0.020	7.73	0.01
543	92.066	0.170	0.50	73	-2	100	69	-0.020	7.84	0.02



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
544	92.235	0.170	0.50	73	-2	100	69	-0.020	7.97	0.02
545	92.405	0.170	0.50	73	-2	100	69	-0.020	8.05	0.02
546	92.574	0.170	0.50	73	-2	100	69	-0.020	8.23	0.02
547	92.744	0.170	0.50	72	-2	100	69	-0.020	8.39	0.02
548	92.914	0.170	0.50	72	-2	100	69	-0.020	8.47	0.02
549	93.083	0.170	0.50	72	-2	100	69	-0.020	8.57	0.02
550	93.253	0.170	0.50	72	-2	100	69	-0.020	8.66	0.02
551	93.422	0.170	0.50	72	-2	100	69	-0.020	8.73	0.02
552	93.592	0.170	0.50	72	-2	100	69	-0.020	8.73	0.02
553	93.761	0.170	0.50	72	-2	100	69	-0.020	8.76	0.02
554	93.931	0.170	0.50	72	-2	100	69	-0.020	8.78	0.02
555	94.100	0.170	0.50	72	-2	100	69	-0.020	8.84	0.02
556	94.270	0.170	0.50	72	-2	100	69	-0.020	8.84	0.02
557	94.439	0.170	0.50	73	-2	100	69	-0.020	8.82	0.02
558	94.609	0.170	0.50	73	-2	100	69	-0.020	8.89	0.02
559	94.779	0.170	0.50	73	-2	100	69	-0.020	8.98	0.02
560	94.948	0.170	0.50	73	-2	100	70	-0.020	9.04	0.02
561	95.118	0.170	0.50	73	-2	100	70	-0.020	9.06	0.02
562	95.287	0.170	0.50	73	-2	100	70	-0.020	8.82	0.02
563	95.457	0.170	0.50	73	-2	100	70	-0.020	9.08	0.02
564	95.626	0.170	0.50	73	-2	100	70	-0.020	9.41	0.02
565	95.796	0.170	0.50	73	-2	100	70	-0.020	9.54	0.02
566	95.965	0.170	0.50	73	-2	100	70	-0.020	9.67	0.02
567	96.135	0.170	0.50	73	-2	100	70	-0.020	9.62	0.02
568	96.305	0.170	0.50	73	-2	100	70	-0.020	9.38	0.02
569	96.474	0.170	0.50	73	-2	100	70	-0.020	9.42	0.02
570	96.644	0.170	0.50	73	-2	100	70	-0.020	9.39	0.01
571	96.813	0.170	0.50	73	-2	100	70	-0.020	9.00	0.01
572	96.983	0.170	0.50	73	-2	100	70	-0.020	8.47	0.01
573	97.152	0.170	0.50	73	-2	100	70	-0.020	8.24	0.01
574	97.322	0.170	0.50	73	-2	100	70	-0.020	8.07	0.02
575	97.491	0.170	0.50	73	-2	100	70	-0.020	7.82	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
576	97.661	0.170	0.50	73	-2	100	70	-0.020	7.69	0.01
577	97.830	0.170	0.50	73	-2	100	70	-0.020	7.55	0.01
578	98.000	0.170	0.50	73	-2	100	70	-0.020	7.46	0.01
579	98.170	0.170	0.50	73	-2	100	70	-0.020	7.37	0.02
580	98.339	0.170	0.50	73	-2	100	70	-0.020	7.28	0.02
581	98.509	0.170	0.50	73	-2	100	70	-0.020	7.27	0.01
582	98.678	0.170	0.50	73	-2	100	70	-0.020	7.28	0.01
583	98.848	0.170	0.50	73	-2	100	70	-0.020	7.25	0.01
584	99.017	0.170	0.50	73	-2	100	70	-0.020	7.20	0.01
585	99.187	0.170	0.50	73	-2	100	70	-0.020	7.11	0.01
586	99.356	0.170	0.50	73	-2	100	70	-0.020	7.01	0.02
587	99.526	0.170	0.50	73	-2	100	70	-0.020	6.95	0.01
588	99.696	0.170	0.50	73	-2	100	70	-0.020	6.91	0.02
589	99.865	0.170	0.50	73	-2	100	70	-0.020	6.87	0.01
590	100.035	0.170	0.50	73	-2	100	70	-0.020	6.87	0.02
591	100.204	0.170	0.50	73	-2	100	70	-0.020	6.79	0.01
592	100.374	0.170	0.50	73	-2	100	70	-0.020	6.84	0.02
593	100.543	0.170	0.50	73	-2	100	70	-0.020	6.84	0.01
594	100.713	0.170	0.50	73	-2	100	70	-0.020	6.78	0.01
595	100.882	0.170	0.50	73	-2	100	70	-0.020	6.80	0.01
596	101.052	0.170	0.50	73	-2	100	70	-0.020	6.78	0.02
597	101.221	0.170	0.50	73	-2	100	70	-0.020	6.73	0.01
598	101.391	0.170	0.50	73	-2	100	70	-0.020	6.67	0.01
599	101.561	0.170	0.50	73	-2	100	70	-0.020	6.68	0.02
600	101.730	0.170	0.50	73	-2	100	70	-0.020	6.72	0.02
601	101.900	0.170	0.50	73	-2	100	70	-0.020	6.69	0.01
602	102.069	0.170	0.50	73	-2	100	70	-0.020	6.68	0.01
603	102.239	0.170	0.50	73	-2	100	70	-0.020	6.70	0.01
604	102.408	0.170	0.50	73	-2	100	70	-0.020	6.68	0.02
605	102.578	0.170	0.50	73	-2	100	70	-0.020	6.69	0.02
606	102.747	0.170	0.50	73	-2	100	70	-0.020	6.49	0.02
607	102.917	0.170	0.50	73	-2	100	69	-0.020	6.43	0.02

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
Avg/Tot	102.917	0.170	0.50	73	-2.00	100	70	-0.024	8.96	0.07

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
0	300	300	199	279	399	295.3	507	
1	296	296	197	276	396	292.0	464	
2	291	292	194	271	394	288.3	423	
3	287	287	190	267	391	284.6	406	
4	282	283	187	264	388	280.9	402	
5	278	278	184	261	386	277.3	406	
6	273	273	181	257	384	273.7	414	
7	269	269	178	254	381	270.2	425	
8	265	264	175	251	379	266.8	437	
9	261	260	172	249	376	263.5	449	
10	257	256	169	247	374	260.5	462	
11	253	252	167	245	372	257.7	475	
12	249	248	164	244	369	254.9	488	
13	245	244	162	243	367	252.3	500	
14	241	241	160	242	365	249.9	512	
15	238	237	158	242	363	247.7	524	
16	235	234	157	241	361	245.6	535	
17	232	231	155	241	359	243.6	546	
18	229	229	153	242	357	241.8	556	
19	226	226	152	242	355	240.1	569	
20	224	224	151	243	353	238.8	585	
21	222	222	149	245	351	237.6	603	
22	220	220	148	247	349	236.7	620	
23	218	219	147	249	347	235.8	636	
24	216	217	146	251	346	235.1	653	
25	215	216	145	254	344	234.6	674	
26	214	215	144	257	342	234.5	702	
27	213	215	144	262	341	234.8	737	
28	212	214	143	268	340	235.5	768	
29	211	214	143	274	338	236.1	784	
30	210	214	142	280	337	236.6	791	
31	209	214	142	284	336	237.1	790	
32	209	214	142	288	336	237.5	784	
33	208	214	141	291	335	237.8	779	
34	207	214	140	294	335	238.1	780	
35	207	214	140	296	334	238.4	778	
36	206	215	140	299	334	238.9	785	
37	206	216	140	302	334	239.5	785	
38	206	216	140	303	334	239.8	780	
39	206	217	140	304	334	240.2	775	
40	206	218	140	306	334	240.7	768	
41	206	219	140	307	334	241.2	766	
42	206	220	140	308	334	241.8	776	
43	207	220	141	310	335	242.7	792	
44	207	221	142	312	335	243.5	799	
45	208	222	142	314	336	244.4	798	
46	209	222	144	315	336	245.3	797	
47	210	223	145	317	337	246.3	794	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	211	224	145	318	337	247.1	790
49	212	224	146	319	338	247.9	782
50	213	225	147	320	338	248.7	780
51	214	226	148	321	339	249.5	777
52	215	227	149	322	340	250.3	781
53	216	228	149	323	340	251.4	784
54	218	230	150	324	341	252.6	801
55	220	232	150	329	342	254.6	849
56	223	234	150	335	343	256.8	883
57	225	237	150	341	343	259.3	896
58	227	239	150	347	344	261.8	908
59	229	242	151	354	345	264.3	917
60	231	244	151	360	346	266.6	917
61	233	246	152	366	347	268.7	917
62	235	248	153	371	348	271.0	918
63	237	250	153	376	348	272.9	920
64	239	253	154	380	349	274.9	918
65	241	255	154	384	350	276.6	915
66	243	256	154	387	351	278.1	911
67	244	258	154	390	351	279.6	904
68	246	260	155	393	352	281.2	903
69	247	262	156	396	353	282.7	911
70	249	264	157	400	353	284.5	926
71	251	266	158	404	354	286.4	947
72	252	268	159	408	354	288.4	961
73	254	270	161	411	355	290.2	966
74	256	272	162	415	355	292.1	966
75	257	273	164	419	356	293.8	964
76	259	275	165	422	356	295.4	962
77	261	276	166	424	356	296.7	961
78	262	278	167	426	357	297.9	960
79	263	279	168	427	357	299.0	960
80	264	280	169	430	357	300.2	959
81	266	281	170	433	357	301.3	959
82	267	282	171	435	358	302.3	960
83	268	283	171	437	358	303.2	961
84	269	283	172	438	358	303.9	961
85	269	284	172	439	358	304.6	960
86	270	285	172	441	358	305.4	952
87	271	286	172	441	358	305.8	945
88	272	287	173	442	358	306.4	939
89	273	288	173	442	358	306.8	935
90	274	289	173	442	358	307.4	930
91	275	291	173	441	359	307.5	927
92	275	293	173	442	358	308.3	925
93	276	294	173	443	358	308.9	923
94	277	296	173	442	358	309.4	922
95	278	299	173	442	358	309.9	920

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	279	300	173	442	358	310.4	920
97	279	301	173	442	358	310.6	921
98	280	302	173	443	358	311.0	923
99	281	304	173	443	358	311.6	927
100	282	306	172	444	357	312.2	928
101	283	308	172	443	357	312.6	925
102	284	308	172	443	357	312.9	922
103	285	310	172	443	357	313.3	919
104	286	311	172	442	356	313.3	914
105	287	312	171	442	356	313.5	913
106	287	313	171	441	356	313.5	913
107	287	314	170	440	355	313.5	914
108	287	316	170	439	355	313.6	912
109	287	318	170	438	354	313.5	907
110	287	320	170	437	354	313.5	903
111	287	321	170	437	353	313.8	901
112	288	324	170	436	353	314.0	900
113	288	326	169	435	353	314.1	894
114	288	328	169	435	352	314.3	893
115	288	330	168	434	352	314.5	898
116	288	332	168	434	352	314.6	899
117	288	333	168	433	351	314.7	896
118	288	334	167	433	351	314.7	894
119	288	334	167	432	351	314.6	894
120	288	335	167	432	350	314.5	894
121	288	335	167	429	350	313.8	892
122	288	334	167	430	350	313.7	891
123	287	334	167	428	350	313.0	891
124	287	333	167	427	349	312.7	891
125	287	334	167	426	349	312.4	892
126	287	333	166	424	349	312.0	892
127	287	333	166	423	349	311.7	894
128	287	333	166	423	349	311.7	894
129	287	333	166	423	349	311.6	896
130	287	333	167	422	349	311.3	896
131	287	333	167	420	349	311.1	896
132	287	333	167	420	349	311.1	896
133	287	333	167	419	349	311.1	896
134	287	333	167	420	349	311.2	894
135	288	333	167	418	349	310.8	892
136	288	333	167	418	349	310.8	889
137	288	332	167	418	350	311.0	886
138	288	331	167	417	350	310.8	882
139	288	331	167	416	350	310.7	880
140	289	330	167	415	351	310.4	877
141	289	330	168	413	351	310.1	873
142	289	329	168	413	351	310.0	871
143	289	329	168	412	352	309.9	869

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
144	290	328	168	411	352	309.8	867	
145	290	328	168	410	353	309.7	865	
146	290	327	168	409	353	309.5	862	
147	290	327	168	407	354	309.2	859	
148	290	327	168	407	354	309.2	857	
149	291	326	168	406	355	309.2	854	
150	291	326	168	405	355	309.0	853	
151	291	326	169	404	356	308.8	852	
152	291	325	169	403	356	308.8	852	
153	291	325	169	402	356	308.7	852	
154	291	325	169	402	357	308.7	852	
155	292	325	168	401	357	308.4	851	
156	292	325	169	401	357	308.5	851	
157	292	324	169	400	357	308.4	851	
158	292	324	169	400	358	308.4	851	
159	292	324	169	399	358	308.4	851	
160	292	324	169	398	358	308.1	851	
161	292	324	168	398	358	308.0	849	
162	292	324	168	398	358	308.0	849	
163	293	323	167	397	359	307.6	849	
164	293	323	167	396	359	307.4	844	
165	293	322	166	395	359	307.1	837	
166	293	322	166	394	359	306.7	830	
167	292	321	166	393	359	306.2	823	
168	292	321	165	391	359	305.6	817	
169	292	320	165	390	359	305.1	813	
170	291	320	165	387	358	304.1	809	
171	291	319	164	387	358	303.9	807	
172	291	318	164	385	358	303.2	804	
173	290	317	164	383	358	302.4	799	
174	290	317	164	382	357	302.0	796	
175	290	316	164	380	357	301.2	794	
176	290	315	163	380	357	300.9	793	
177	289	314	163	379	356	300.4	793	
178	289	314	163	378	356	300.0	793	
179	289	313	163	377	356	299.5	794	
180	289	313	163	376	356	299.1	794	
181	288	312	162	375	355	298.6	794	
182	288	311	162	375	355	298.3	794	
183	288	311	162	374	355	297.9	795	
184	288	310	162	373	355	297.6	795	
185	287	310	162	373	355	297.3	796	
186	287	309	161	373	355	297.1	797	
187	287	309	161	373	354	296.9	798	
188	287	309	161	372	354	296.6	800	
189	286	308	161	372	354	296.4	801	
190	286	308	161	372	354	296.2	803	
191	286	308	161	373	354	296.2	804	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	286	307	161	372	354	295.9	805
193	285	307	161	372	354	295.7	807
194	285	307	161	372	354	295.7	809
195	285	306	160	372	354	295.4	811
196	284	306	160	373	354	295.4	813
197	284	305	160	373	354	295.3	814
198	284	305	160	373	354	295.3	816
199	284	305	160	374	354	295.3	818
200	283	304	160	374	354	295.2	821
201	283	304	160	375	354	295.3	824
202	283	304	160	375	354	295.3	828
203	283	303	160	376	354	295.5	832
204	283	303	160	377	354	295.5	837
205	283	303	160	378	354	295.7	842
206	283	302	160	380	354	296.0	847
207	283	302	160	381	354	296.2	854
208	284	302	160	383	354	296.7	861
209	284	302	161	385	354	297.1	868
210	284	302	161	387	355	297.7	873
211	284	302	161	390	355	298.3	878
212	284	302	161	391	355	298.7	880
213	284	302	161	393	355	299.1	882
214	285	303	161	395	355	299.7	885
215	285	303	162	396	355	300.0	889
216	285	303	162	399	355	300.7	894
217	285	303	162	400	355	301.2	892
218	286	303	163	402	355	301.8	891
219	286	303	163	403	355	302.2	892
220	287	304	163	404	355	302.7	893
221	287	304	163	406	356	303.2	895
222	287	304	164	407	356	303.5	897
223	288	304	164	408	356	304.0	899
224	288	304	164	409	356	304.5	901
225	289	305	164	411	356	305.0	902
226	289	305	164	411	357	305.4	904
227	290	305	164	412	357	305.7	906
228	290	305	165	413	357	306.0	907
229	291	306	165	413	357	306.3	910
230	291	306	165	415	358	306.9	914
231	292	306	165	417	358	307.5	917
232	292	306	165	418	358	307.9	920
233	293	307	165	419	359	308.4	923
234	293	307	165	421	359	308.8	929
235	293	307	165	423	359	309.2	939
236	293	307	165	425	359	309.9	946
237	294	307	165	428	359	310.5	951
238	294	307	165	430	360	311.1	956
239	294	307	165	433	360	311.7	960



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
240	294	307	165	434	360	312.2	965
241	295	307	166	439	360	313.3	972
242	295	307	166	441	360	313.9	982
243	296	307	166	445	361	315.0	993
244	296	308	166	448	361	316.0	1002
245	297	308	167	452	361	316.9	1010
246	297	308	167	456	362	318.0	1018
247	298	308	168	460	362	319.2	1026
248	299	308	168	464	362	320.3	1034
249	299	309	168	469	363	321.8	1042
250	300	309	169	474	363	323.1	1050
251	301	310	169	478	363	324.3	1058
252	302	310	170	484	364	325.9	1066
253	302	311	170	490	364	327.5	1076
254	303	312	171	495	365	329.2	1087
255	304	312	172	501	365	330.8	1096
256	305	313	172	507	365	332.6	1104
257	306	314	173	513	366	334.4	1113
258	307	315	174	520	366	336.3	1121
259	308	316	175	525	366	337.9	1128
260	309	317	176	531	366	339.6	1135
261	310	318	176	536	367	341.3	1141
262	311	319	177	540	367	342.9	1146
263	312	320	178	546	367	344.6	1150
264	314	321	178	549	367	345.8	1151
265	315	322	179	552	368	347.1	1147
266	316	323	180	554	368	348.1	1142
267	317	324	181	556	368	349.1	1138
268	318	325	182	557	368	350.1	1134
269	319	325	183	559	368	350.9	1129
270	320	327	183	558	368	351.3	1124
271	321	327	184	558	369	351.9	1118
272	322	328	185	558	369	352.2	1111
273	323	329	185	557	369	352.4	1104
274	324	329	186	556	369	352.6	1096
275	324	330	186	554	369	352.6	1086
276	325	330	187	552	369	352.6	1075
277	325	331	187	550	369	352.6	1064
278	326	331	188	546	368	351.9	1051
279	326	332	189	543	368	351.6	1039
280	326	332	189	539	368	350.8	1026
281	327	332	189	535	368	350.1	1014
282	327	332	190	532	368	349.4	1004
283	327	331	190	527	367	348.4	994
284	327	331	190	523	367	347.6	984
285	326	331	191	518	367	346.5	974
286	326	331	191	513	366	345.5	963
287	326	330	191	509	366	344.4	952

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	325	329	191	504	365	343.0	941
289	325	329	191	498	365	341.5	929
290	324	328	191	493	364	340.1	917
291	324	327	191	486	363	338.3	905
292	323	327	191	481	363	336.8	892
293	322	326	191	476	362	335.2	880
294	321	325	191	470	361	333.5	868
295	320	323	191	464	360	331.6	856
296	319	323	190	457	360	329.8	845
297	318	321	190	452	359	327.8	836
298	317	320	190	446	358	326.2	827
299	315	319	189	441	357	324.3	820
300	314	318	189	436	356	322.5	814
301	313	317	189	429	355	320.5	809
302	312	316	189	427	354	319.3	804
303	310	315	189	422	353	317.7	801
304	309	314	188	418	352	316.1	797
305	308	313	188	414	351	314.6	795
306	307	311	188	410	350	313.2	794
307	305	310	188	407	349	311.9	794
308	304	309	188	404	348	310.7	795
309	303	308	188	401	348	309.6	797
310	302	307	188	400	347	308.7	801
311	301	306	188	398	346	307.8	806
312	300	306	188	396	345	307.0	811
313	299	304	188	396	344	306.3	816
314	298	304	188	395	344	305.8	822
315	297	303	188	395	343	305.3	830
316	297	302	188	395	342	305.0	838
317	296	301	189	396	341	304.7	845
318	295	301	189	397	341	304.6	853
319	294	300	190	398	340	304.6	859
320	294	300	191	400	339	304.6	866
321	293	299	191	402	338	304.7	873
322	293	299	192	402	338	304.7	881
323	293	298	192	406	337	305.1	888
324	292	298	193	408	336	305.4	894
325	292	298	193	410	336	305.7	899
326	292	298	194	412	335	306.0	904
327	291	298	194	414	335	306.3	908
328	291	298	195	416	334	306.8	911
329	291	297	196	419	333	307.2	914
330	291	297	196	420	333	307.6	917
331	291	297	197	421	332	307.9	920
332	291	297	198	424	332	308.6	923
333	291	297	199	426	331	309.1	926
334	291	297	200	429	331	309.7	929
335	292	297	201	431	330	310.1	932

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	292	297	202	432	330	310.6	936
337	292	297	203	435	329	311.3	940
338	292	297	204	436	329	311.8	943
339	293	298	204	438	328	312.2	945
340	293	298	205	440	328	312.9	946
341	293	298	206	442	327	313.3	946
342	294	298	207	443	327	313.6	946
343	294	298	208	444	326	314.1	945
344	294	298	209	445	326	314.3	943
345	295	298	209	446	325	314.7	942
346	295	299	210	447	325	315.0	940
347	295	299	211	447	324	315.2	938
348	296	299	212	447	323	315.3	936
349	296	299	212	447	323	315.5	933
350	297	299	213	447	322	315.5	931
351	297	299	214	447	322	315.8	928
352	297	299	214	447	321	315.8	925
353	297	299	215	447	320	315.8	922
354	298	300	216	444	320	315.3	918
355	298	300	216	445	319	315.5	915
356	298	299	217	445	319	315.6	912
357	298	299	218	444	318	315.5	909
358	298	299	218	443	317	315.3	906
359	298	299	219	442	316	315.1	901
360	299	299	219	441	316	314.8	895
361	299	299	220	439	315	314.3	889
362	299	299	220	437	314	313.8	883
363	299	298	221	437	314	313.6	877
364	299	298	221	434	313	312.9	870
365	298	298	221	433	312	312.4	863
366	298	297	221	431	311	311.7	856
367	298	297	221	428	311	310.9	850
368	298	297	221	426	310	310.3	844
369	297	296	222	423	309	309.4	839
370	297	296	221	422	308	308.8	832
371	296	295	221	419	307	307.8	823
372	296	295	221	415	307	306.6	813
373	295	294	221	413	306	305.7	803
374	295	293	220	410	305	304.5	792
375	294	293	220	406	304	303.4	782
376	293	292	220	403	303	302.2	772
377	292	291	219	398	302	300.7	761
378	292	290	219	395	301	299.4	750
379	291	290	218	390	300	297.8	739
380	290	289	218	386	299	296.3	729
381	289	288	217	382	298	294.8	718
382	288	287	216	376	297	292.9	708
383	287	286	216	373	296	291.6	698

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	286	285	215	369	295	290.0	689
385	285	284	215	365	294	288.4	680
386	284	283	214	360	293	286.8	673
387	283	282	213	356	292	285.2	667
388	281	281	213	352	291	283.6	662
389	280	280	212	349	290	282.1	657
390	279	279	211	345	289	280.5	653
391	278	278	211	341	288	279.0	650
392	277	277	210	338	287	277.6	648
393	276	276	209	335	286	276.3	648
394	275	275	209	332	285	275.0	649
395	274	274	208	329	284	273.7	650
396	273	273	208	327	283	272.6	650
397	272	272	207	323	282	271.1	651
398	271	271	207	323	281	270.4	651
399	270	270	206	321	280	269.4	652
400	269	269	206	319	279	268.5	653
401	268	268	206	318	278	267.6	654
402	267	267	205	316	277	266.5	656
403	266	267	205	316	276	265.9	658
404	265	266	205	314	276	265.1	660
405	265	265	204	314	275	264.5	663
406	264	264	204	312	274	263.7	666
407	263	264	204	312	273	263.2	670
408	263	263	204	312	272	262.7	673
409	262	263	203	311	272	262.1	677
410	261	262	203	311	271	261.8	681
411	261	262	203	310	270	261.3	685
412	261	262	203	311	270	261.2	688
413	260	261	203	310	269	260.7	692
414	260	261	203	311	268	260.6	696
415	260	261	203	311	268	260.3	699
416	259	260	203	311	267	260.1	702
417	259	260	203	312	266	260.1	706
418	259	260	203	313	266	260.0	710
419	258	260	203	313	265	259.8	714
420	258	260	203	314	265	260.0	718
421	258	260	203	315	264	260.0	723
422	258	260	203	316	264	260.2	727
423	258	261	202	317	263	260.3	732
424	258	261	202	318	263	260.5	737
425	258	261	203	319	262	260.7	742
426	258	262	203	320	262	260.9	746
427	258	262	203	322	261	261.4	750
428	259	262	203	324	261	261.8	754
429	259	263	203	325	261	262.0	759
430	259	263	203	327	260	262.6	763
431	259	264	203	328	260	262.9	767

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	260	264	203	330	259	263.3	771
433	260	265	203	332	259	263.9	774
434	260	266	204	334	259	264.5	778
435	261	266	204	336	258	265.1	781
436	261	267	204	337	258	265.5	784
437	262	268	204	338	258	266.0	786
438	263	269	205	340	257	266.7	787
439	263	269	205	342	257	267.4	788
440	264	270	205	343	257	267.9	789
441	264	271	205	345	257	268.3	789
442	265	271	206	346	257	268.7	789
443	265	272	206	347	256	269.3	790
444	266	273	206	347	256	269.6	792
445	266	273	206	349	256	270.2	793
446	267	274	206	350	256	270.7	796
447	267	275	206	351	256	271.2	800
448	268	276	207	353	256	271.9	805
449	269	277	207	354	256	272.6	809
450	270	278	207	356	256	273.4	812
451	270	279	207	358	256	274.1	815
452	271	280	208	359	256	274.9	818
453	272	281	208	361	256	275.7	820
454	273	283	209	363	256	276.6	822
455	273	284	209	365	256	277.4	824
456	274	285	209	366	257	278.2	826
457	275	286	210	368	257	279.0	828
458	276	287	211	369	257	279.9	829
459	276	288	211	371	257	280.8	831
460	277	289	211	372	257	281.5	832
461	278	290	212	374	258	282.4	832
462	279	292	212	375	258	283.2	833
463	280	293	212	376	258	283.8	833
464	280	293	213	376	259	284.4	833
465	281	294	214	378	259	285.1	835
466	281	295	214	379	260	285.6	838
467	281	295	214	380	260	286.2	840
468	282	295	215	381	261	286.7	840
469	282	296	215	382	261	287.2	840
470	282	296	215	382	262	287.4	838
471	283	297	215	382	263	288.0	833
472	283	298	215	381	264	288.3	815
473	284	299	216	379	265	288.4	792
474	284	300	216	376	266	288.4	772
475	285	301	216	373	267	288.3	758
476	285	303	216	369	268	288.2	747
477	286	304	216	367	269	288.4	740
478	287	305	216	364	270	288.3	733
479	287	307	216	361	271	288.3	726

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	288	308	216	358	272	288.2	720
481	288	309	216	354	273	288.1	716
482	288	310	216	352	274	288.2	712
483	289	311	215	350	275	288.1	709
484	289	312	215	347	276	288.0	706
485	289	314	215	345	278	288.0	703
486	289	315	214	343	279	288.1	702
487	290	316	214	341	279	287.9	700
488	290	317	213	339	280	287.9	700
489	290	318	213	338	281	287.9	700
490	290	320	212	336	282	288.0	699
491	290	321	211	335	283	287.8	697
492	290	321	211	333	284	287.8	694
493	290	322	210	332	285	287.8	689
494	290	323	209	331	285	287.6	685
495	289	324	209	328	286	287.3	681
496	289	324	208	328	287	287.2	678
497	289	324	208	326	287	286.9	675
498	289	324	207	325	288	286.6	672
499	289	325	206	324	289	286.4	670
500	289	325	205	322	289	285.9	667
501	288	325	205	321	290	285.6	665
502	288	325	204	320	290	285.4	663
503	288	325	203	319	291	285.0	662
504	287	325	202	318	291	284.6	661
505	287	325	202	317	291	284.1	661
506	286	325	201	316	292	283.7	661
507	286	324	200	315	292	283.3	660
508	285	324	199	314	293	283.0	660
509	284	324	198	314	293	282.6	660
510	283	324	197	313	293	282.1	661
511	283	324	196	312	293	281.6	662
512	282	323	195	312	294	281.2	663
513	281	323	195	312	294	280.9	665
514	281	323	194	311	294	280.4	666
515	280	322	193	311	294	280.0	666
516	279	322	192	310	294	279.5	667
517	279	322	192	310	294	279.3	666
518	278	321	191	309	295	278.8	665
519	277	321	190	309	295	278.3	664
520	276	320	190	309	295	278.1	665
521	276	319	189	309	295	277.7	666
522	275	319	189	309	295	277.2	669
523	275	318	188	309	296	276.9	671
524	274	317	187	308	296	276.5	673
525	274	316	186	308	296	276.2	675
526	273	315	186	308	297	275.7	678
527	273	314	185	308	297	275.5	681

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	272	314	184	308	298	275.2	684
529	271	313	184	308	299	275.1	686
530	271	312	183	308	299	274.8	689
531	270	312	183	309	300	274.8	692
532	270	312	182	309	300	274.7	695
533	270	312	181	309	301	274.6	698
534	269	311	181	310	302	274.6	701
535	269	311	180	308	302	274.0	704
536	269	311	180	310	303	274.4	707
537	268	310	179	311	303	274.5	708
538	268	310	179	311	304	274.5	709
539	268	310	178	312	304	274.6	709
540	267	310	178	313	305	274.7	708
541	267	310	177	313	305	274.5	711
542	267	310	177	314	306	274.7	716
543	266	310	177	315	306	274.7	724
544	266	310	176	316	306	274.8	731
545	265	310	176	317	306	275.0	737
546	265	310	175	319	306	275.1	745
547	264	310	175	321	306	275.2	754
548	264	310	175	323	306	275.7	762
549	264	310	174	325	306	275.9	769
550	264	310	175	327	306	276.2	774
551	263	310	174	329	306	276.5	779
552	263	310	174	331	306	276.9	783
553	263	310	175	334	306	277.5	787
554	263	311	175	335	306	277.8	790
555	263	311	174	337	306	278.3	793
556	263	312	175	339	305	278.9	795
557	264	312	175	341	305	279.4	798
558	264	313	175	342	305	279.9	800
559	264	314	175	344	305	280.6	804
560	264	315	176	346	305	281.2	807
561	265	315	176	349	306	282.1	809
562	265	316	177	350	306	282.7	810
563	265	317	177	352	306	283.3	815
564	266	318	177	353	306	284.0	827
565	266	319	177	356	306	284.9	841
566	267	320	177	358	307	285.7	855
567	268	321	177	360	307	286.5	864
568	268	321	177	364	308	287.7	867
569	269	322	178	365	308	288.6	853
570	270	323	178	365	309	289.3	821
571	271	324	179	363	310	289.5	791
572	273	325	179	360	312	289.6	770
573	274	326	179	356	313	289.6	752
574	275	326	180	355	314	290.0	736
575	275	327	180	352	316	290.0	724

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 7

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/23/2018

**Stove ΔT:** 8

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
576	276	328	180	349	317	290.1	714
577	277	328	180	346	319	290.0	706
578	278	328	180	342	321	289.8	700
579	279	328	180	340	323	289.9	695
580	280	328	180	338	325	290.0	692
581	280	328	180	334	327	289.8	689
582	281	328	180	333	329	289.9	687
583	281	327	180	331	331	290.0	686
584	282	327	180	328	333	289.9	683
585	282	327	180	326	335	289.9	679
586	283	326	180	325	337	290.0	676
587	283	326	180	324	339	290.1	673
588	283	325	179	322	340	290.0	672
589	284	325	179	320	342	290.0	671
590	284	324	179	319	344	289.8	670
591	284	323	179	318	346	289.8	669
592	284	322	178	316	348	289.6	669
593	284	321	178	314	350	289.5	669
594	284	321	178	313	351	289.4	668
595	284	320	178	313	353	289.6	668
596	284	320	178	312	354	289.5	668
597	284	319	177	309	356	288.9	668
598	284	318	177	310	357	289.1	668
599	284	317	177	310	358	289.0	668
600	284	316	176	309	360	288.8	668
601	284	314	176	307	361	288.5	668
602	283	314	176	307	362	288.4	668
603	283	313	176	307	363	288.4	669
604	283	312	175	306	364	288.1	669
605	283	311	175	306	365	288.0	670
606	282	310	175	306	366	287.8	669
607	282	309	174	305	367	287.4	669
<b>Average</b>	279	298	182	379	328	293	815



## LAB SAMPLE DATA - ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 7Technician: SJBDate: 10/23/2018**TRAIN A (1st Hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3398	120.5	120.4	0.1
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	0.1
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**TRAIN A (Post 1st hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3399	124.1	123.5	0.6
B. Rear filter catch	Filter	3400	120.3	120.7	-0.4
C. Probe catch*	Probe	13A	117456.6	117456.5	0.1
D. O-Ring catch*	O-Ring	13A	3461.7	3460.8	0.9

Sub-Total	Total Particulate, mg:	1.2
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Train A Aggregate	Total Particulate, mg:	<b>1.3</b>
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**TRAIN B**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3401	121.1	120.0	1.1
B. Rear filter catch	Filter	3402	123.1	123.3	-0.2
C. Probe catch*	Probe	13B	117065.3	117065.2	0.1
D. O-Ring catch*	O-Ring	13B	3501.3	3500.6	0.7

Total Particulate, mg:	<b>1.7</b>
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**AMBIENT**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:	<b>0.0</b>
------------------------	------------

\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 7 Test Date: 10/23/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): Low Setting (77 degrees closed from fully open)

#### Preburn Notes

Time	Notes
6:33	Loaded 12 lbs of kindling
7:50	At 1.4 lbs, loaded pre-burn fuel, turned fan on to high setting
9:16	At 4.7 lbs, set air to test setting, turned fan to lowest setting
10:01	Stirred/leveled coal bed.
10:16	Zeroed scale in preparation for fuel loading
CATALYST EQUIVALENCY TEST – CLARIANT METAL COMBUSTOR	

#### Test Notes

Test Burn Start Time: 10:16 Test Fuel Loaded by: 30 seconds  
 Door Closed: 35 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min	Changed 1-hour filter.
607 min	End of Test
CATALYST EQUIVALENCY TEST – CLARIANT METAL COMBUSTOR	

Test Burn End Time: 20:23

#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	9:29	-	9:34	20:45	-	20:50
CO <sub>2</sub>	0.00	-	10.04	0.01	-	10.15
CO	0.00	-	2.52	0.01	-	2.50

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature:  Date: 10/24/2018

**WOOD STOVE TEST DATA PACKET**  
**ASTM E2780/E2515**



**Run 8 Data Summary**

Client:	Valley Comfort
Model:	Blaze King PE32
Job #:	18-421
Tracking #:	0012
Test Date:	10/24/2018

A handwritten signature in black ink, appearing to be "JL", is written over a horizontal line.

Techician Signature

10/29/2018

Date

## TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Valley Comfort

Model: Blaze King PE32

Run #: 8

Job #: 18-421

Tracking #: 0012

Technician: SJB

Date: 10/24/2018

<b>Burn Rate (kg/hr):</b>	<b>2.33</b>
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft <sup>3</sup> )	0.000	26.000	32.937	8.966
Average Gas Velocity in Dilution Tunnel (ft/sec)	12.2			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	7549.4			
Average Gas Meter Temperature (°F)	68.0	73.7	74.7	72.9
Total Sample Volume (dscf)	0.000	24.822	31.261	8.572
Average Tunnel Temperature (°F)	108.9			
Total Time of Test (min)	174			
Total Particulate Catch (mg)	0.0	3.5	4.2	2.4
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001410	0.0001344	0.0002800
Total PM Emissions (g)	0.00	3.09	2.94	2.11
Particulate Emission Rate (g/hr)	0.00	1.06	1.01	2.11
Emissions Factor (g/kg)	-	0.46	0.43	-
Difference from Average Total Particulate Emissions (g)	-	0.07	0.07	-
Difference from Average Emissions Factor (g/kg)	-	0.01	0.01	-

<b>Final Average Results</b>	
Total Particulate Emissions (g)	3.01
Particulate Emission Rate (g/hr)	1.04
Emissions Factor (g/kg)	0.45
HHV Efficiency (%)	76.6%
LHV Efficiency (%)	82.8%
CO Emissions (g/min)	1.21

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	82.1	OK
Face Velocity	< 30 ft/min	10.1	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 66.98 / Max: 69.1	OK
Negative Probe Weight Evaluation	<5% of Total Catch	-2.4%	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	2.3	OK

## B415.1 Efficiency Results

**Manufacturer:** Valley Comfort  
**Model:** Blaze King PE32  
**Date:** 10/24/18  
**Run:** 8  
**Control #:** 18-421  
**Test Duration:** 174  
**Output Category:** 4

### Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	76.6%	82.8%
<b>Combustion Efficiency</b>	97.9%	97.9%
<b>Heat Transfer Efficiency</b>	78.3%	84.6%

<b>Output Rate (kJ/h)</b>	35,467	33,644	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	2.34	5.15	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	46,304	43,925	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	6.78	14.94	<b>dry lb</b>
<b>MC wet (%)</b>	18.89		
<b>MC dry (%)</b>	23.29		
<b>Particulate (g )</b>	3.01		
<b>CO (g)</b>	211		
<b>Test Duration (h)</b>	2.90		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.03	2.05
<b>g/kg Dry Fuel</b>	0.44	31.12
<b>g/h</b>	1.04	72.74
<b>g/min</b>	0.02	1.21
<b>lb/MM Btu Output</b>	0.07	4.77

<b>Air/Fuel Ratio (A/F)</b>	10.12
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VERSION:

2.2

12/14/2009

# WOODSTOVE FUEL DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	17.00	24.8		2x4	17.00	19.9
2x4	17.00	20.6		2x4	17.00	19.7
2x4	17.00	24.5				
2x4	17.00	20.1				
2x4	17.00	24.5				
2x4	17.00	19.3				
2x4	17.00	21.5				
2x4	17.00	18.9				
Total Fuel Weight (lbs):		18.72	Average Moisture (%DB):		21.4	

Firebox Volume (ft<sup>3</sup>): 2.91  
 Total 2x4 Crib Weight, with spacers (lbs): 9.06  
 Total 4x4 Crib Weight, with spacers (lbs): 9.36  
 Total Wet Fuel Weight, with spacers (lbs): 18.42

**Coal Bed Range (20-25%):**  
 Min (lbs): 3.68  
 Max (lbs): 4.61

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
2x4	16.00	1.80	22.2	22.4	23.8	1.47
2x4	16.00	1.98	22.4	23.8	22.4	1.61
2x4	16.00	1.94	24.5	24.8	24.2	1.56
2x4	16.00	1.58	22.0	20.6	21.9	1.30
4x4	16.00	4.48	23.8	21.9	24.7	3.63
4x4	16.00	4.04	24.6	25.1	24.2	3.24
Total Dry Weight, no spacers (lbs):						12.81
Total Dry Weight, with spacers (lbs):						14.91

Spacer Moisture Readings (%DB)						
18.8	18.7	26.6	19.1	27.7	25.6	
25.0	25.2	27.0	15.7	23.1	18.6	
23.1	22.7	26.7	24.0	25.7	23.0	
24.9	26.0	24.4	25.4	23.0	22.8	

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft <sup>3</sup> , DB)	30.4	OK
Loading Density	6.3 - 7.7 (lbs/ft <sup>3</sup> , WB)	6.33	OK
2x4 Fuel Mix	35 - 65 % of total weight	49%	OK

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018Preburn Start Time: 7:42Recording Interval (min): 1Run Time (min): 105

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
0	20.4	-0.050	628	619	321	501	518	517.3	452	857	66
1	20.2	-0.050	612	605	299	492	522	505.9	415	896	67
2	20.1	-0.050	594	589	283	488	524	495.9	408	945	67
3	19.9	-0.050	579	575	273	491	526	488.6	413	1059	67
4	19.6	-0.050	564	561	265	500	526	483.3	429	1203	67
5	19.4	-0.050	552	548	260	516	526	480.2	446	1266	67
6	19.1	-0.050	542	537	255	529	524	477.5	455	1250	67
7	18.9	-0.050	534	528	252	540	522	475.0	461	1239	67
8	18.6	-0.050	527	521	249	550	519	473.2	465	1247	66
9	18.3	-0.050	522	515	246	556	516	471.2	464	1249	66
10	18.1	-0.050	518	510	244	564	513	469.7	466	1261	66
11	17.8	-0.050	515	506	242	572	510	469.0	468	1268	66
12	17.5	-0.050	512	503	241	580	506	468.3	472	1273	66
13	17.2	-0.050	510	500	240	587	503	468.0	473	1276	66
14	16.9	-0.050	510	499	239	592	499	467.8	475	1271	66
15	16.6	-0.050	509	498	238	596	496	467.6	474	1271	66
16	16.3	-0.050	510	498	238	600	492	467.6	476	1263	66
17	16.0	-0.050	512	499	238	603	489	468.0	476	1274	66
18	15.8	-0.050	513	500	238	605	485	468.3	476	1279	66
19	15.5	-0.050	516	502	238	607	482	468.8	473	1270	66
20	15.2	-0.050	518	504	238	608	479	469.5	474	1260	66
21	14.9	-0.050	521	507	238	608	476	470.2	473	1252	66
22	14.6	-0.050	524	510	239	607	474	470.6	469	1244	66
23	14.4	-0.050	527	514	239	607	471	471.6	469	1233	66
24	14.1	-0.050	530	519	239	605	469	472.6	467	1229	66
25	13.8	-0.050	533	524	240	603	467	473.5	467	1221	66
26	13.5	-0.050	536	530	241	602	465	474.8	465	1212	66
27	13.3	-0.050	539	536	241	599	463	475.7	463	1200	66
28	13.0	-0.050	543	542	242	597	461	477.1	461	1194	66
29	12.8	-0.050	547	548	243	594	460	478.3	455	1186	66
30	12.5	-0.050	551	554	244	590	458	479.6	454	1179	66
31	12.2	-0.050	555	560	245	588	457	480.9	453	1176	66
32	12.0	-0.050	558	566	245	586	456	482.5	450	1170	66
33	11.7	-0.050	563	571	246	584	455	483.9	450	1166	66
34	11.4	-0.050	567	577	247	582	455	485.5	449	1157	66
35	11.2	-0.050	571	581	248	580	455	487.1	446	1147	66
36	10.9	-0.050	576	586	249	577	455	488.6	446	1141	67
37	10.7	-0.050	580	591	250	575	455	490.1	445	1137	66
38	10.4	-0.050	584	595	251	573	455	491.8	443	1133	66
39	10.1	-0.050	589	599	252	571	456	493.3	439	1128	67
40	9.9	-0.050	593	603	254	569	456	495.0	438	1127	67
41	9.7	-0.050	597	608	255	568	457	496.9	434	1131	67
42	9.5	-0.050	601	612	256	567	458	499.1	433	1136	67
43	9.3	-0.050	605	617	258	567	460	501.3	434	1143	67
44	9.1	-0.050	609	621	260	567	461	503.7	433	1148	67

# WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018Preburn Start Time: 7:42Recording Interval (min): 1Run Time (min): 105

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
45	8.9	-0.050	614	626	261	567	463	506.2	432	1146	67
46	8.7	-0.050	617	631	263	567	466	508.7	432	1144	68
47	8.5	-0.050	621	637	266	567	468	511.8	431	1137	68
48	8.3	-0.050	625	645	268	567	471	515.1	429	1133	68
49	8.1	-0.050	627	652	270	568	474	518.1	431	1147	68
50	7.9	-0.050	628	657	269	569	477	520.1	431	1144	68
51	7.7	-0.050	630	661	270	570	480	522.0	431	1150	68
52	7.5	-0.050	631	663	270	570	484	523.5	429	1154	68
53	7.4	-0.050	632	667	270	571	488	525.5	430	1153	68
54	7.2	-0.050	634	669	270	573	491	527.5	429	1156	68
55	7.0	-0.050	636	672	271	574	496	529.6	429	1156	68
56	6.9	-0.050	638	675	271	576	500	532.1	428	1161	68
57	6.7	-0.050	640	678	272	579	504	534.6	427	1172	68
58	6.5	-0.050	641	683	274	584	509	538.0	427	1189	68
59	6.4	-0.050	643	689	275	590	513	541.8	426	1199	68
60	6.2	-0.050	645	694	277	596	517	545.8	427	1206	68
61	6.1	-0.050	647	700	278	599	521	548.8	425	1203	68
62	6.0	-0.050	649	704	281	598	525	551.3	425	1200	68
63	5.8	-0.050	651	708	283	597	529	553.5	423	1197	68
64	5.7	-0.050	656	712	287	596	532	556.6	420	1188	68
65	5.6	-0.050	661	715	290	594	536	559.2	417	1189	68
66	5.5	-0.050	665	716	295	593	540	561.6	413	1164	68
67	5.4	-0.050	668	716	298	589	543	562.7	411	1119	68
68	5.4	-0.050	672	714	300	583	545	562.9	406	1098	68
69	5.3	-0.040	675	713	301	578	547	562.6	401	1092	68
70	5.2	-0.040	677	713	300	573	548	562.1	398	1096	68
71	5.1	-0.040	677	712	301	569	550	561.6	395	1097	68
72	5.0	-0.050	676	711	301	565	551	560.8	392	1099	68
73	4.9	-0.050	674	709	312	569	552	563.2	429	1101	67
74	4.8	-0.050	676	710	311	558	553	561.7	407	1025	68
75	4.8	-0.050	681	709	313	549	554	561.2	395	992	68
76	4.7	-0.040	685	705	315	540	555	560.1	387	972	68
77	4.7	-0.040	688	700	321	532	555	559.1	384	962	68
78	4.6	-0.040	689	692	328	524	555	557.7	377	952	68
79	4.5	-0.040	689	685	332	517	554	555.4	373	943	68
80	4.5	-0.040	689	677	333	510	554	552.6	370	936	68
81	4.5	-0.040	688	669	333	504	553	549.3	367	930	68
82	4.4	-0.040	687	661	332	498	552	546.0	362	926	68
83	4.4	-0.040	685	655	329	492	551	542.4	360	918	68
84	4.3	-0.040	682	647	327	487	550	538.6	359	913	68
85	4.3	-0.040	679	640	325	482	548	534.6	357	910	68
86	4.3	-0.040	674	633	322	477	547	530.6	356	908	68
87	4.3	-0.040	669	625	319	472	545	526.2	354	912	68
88	4.2	-0.040	661	619	314	469	544	521.5	355	927	68
89	4.2	-0.040	653	613	309	467	543	516.8	356	927	68



## WOODSTOVE PREBURN DATA - ASTM E2780

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Preburn Start Time: 7:42  
 Recording Interval (min): 1  
 Run Time (min): 105

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H <sub>2</sub> O)	Temperatures (°F)								
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Catalyst Exit	Ambient
90	4.2	-0.040	644	606	305	463	541	512.1	353	922	68
91	4.1	-0.040	636	600	301	460	540	507.2	351	915	68
92	4.1	-0.040	627	594	297	456	538	502.5	352	908	69
93	4.1	-0.040	619	587	293	453	537	497.8	350	902	68
94	4.1	-0.040	610	582	289	449	536	493.4	349	895	69
95	4.0	-0.040	603	576	285	445	535	489.0	347	887	69
96	4.0	-0.040	595	571	282	442	534	484.9	347	886	68
97	4.0	-0.040	587	567	278	439	533	480.8	346	885	68
98	4.0	-0.040	580	562	273	436	532	476.8	345	882	68
99	3.9	-0.040	574	558	270	432	532	473.0	344	876	69
100	3.9	-0.040	568	554	267	429	531	469.6	341	871	68
101	3.9	-0.040	561	549	264	426	530	466.2	343	866	68
102	3.9	-0.040	556	545	261	423	530	463.1	341	861	69
103	3.8	-0.040	550	542	259	420	530	460.1	340	858	69
104	3.8	-0.040	546	539	256	417	529	457.4	338	855	69
105	3.8	-0.040	540	535	254	414	530	454.5	353	838	68

## DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8  
 Test Start Time: 9:28

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Total Sampling Time (min): 174  
 Recording Interval (min): 1

Meter Box  $\gamma$  Factor: 1.002 (A)  
 Meter Box  $\gamma$  Factor: 0.998 (B)  
 Meter Box  $\gamma$  Factor: 0.000 (Ambient)

Induced Draft Check (in. H<sub>2</sub>O): 0  
 Smoke Capture Check (%): 100%  
 Date Flue Pipe Last Cleaned: 10/7/2018

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	<u>28.80</u>	<u>28.78</u>
Relative Humidity (%)	<u>33.0</u>	<u>33.2</u>
Room Air Velocity (ft/min)	<u>0</u>	<u>0</u>
Scale Audit (lbs)	<u>10.0</u>	<u>10.0</u>
Ambient Sample Volume:	<u>0.000</u> ft <sup>3</sup>	

**Sample Train Post-Test Leak Checks**

(A)	<u>0.002</u>	cfm @	<u>-24</u> in. Hg
(B)	<u>0.000</u>	cfm @	<u>-24</u> in. Hg
(Ambient)	<u>0.000</u>	cfm @	<u>0</u> in. Hg

### DILUTION TUNNEL FLOW

#### Traverse Data

Point	dP (in H <sub>2</sub> O)	Temp (°F)
1	<u>0.022</u>	<u>115</u>
2	<u>0.040</u>	<u>115</u>
3	<u>0.024</u>	<u>115</u>
4	<u>0.020</u>	<u>115</u>
5	<u>0.020</u>	<u>114</u>
6	<u>0.038</u>	<u>114</u>
7	<u>0.044</u>	<u>114</u>
8	<u>0.026</u>	<u>114</u>
Center	<u>0.046</u>	<u>114</u>

Dilution Tunnel H<sub>2</sub>O: 2.00 percent  
 Tunnel Diameter: 6 inches  
 Pitot Tube Cp: 0.99 [unitless]  
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole  
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole  
 Tunnel Area: 0.1963 ft<sup>2</sup>

$V_{strav}$ : 12.26 ft/sec  
 $V_{scent}$ : 15.11 ft/sec  
 $F_p$ : 0.812 [ratio]

Initial Tunnel Flow: 121.6 scf/min

Static Pressure: -0.200 in. H<sub>2</sub>O

### TEST FUEL PROPERTIES

#### Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	<u>19,810</u>	<u>19,887</u>
%C	<u>48.73</u>	<u>50</u>
%H	<u>6.87</u>	<u>6.6</u>
%O	<u>43.9</u>	<u>42.9</u>
%Ash	<u>0.5</u>	<u>0.5</u>

#### Actual Fuel Used Properties

Fuel Type:	<u>D. Fir</u>
HHV (kJ/kg)	<u>19,810</u>
%C	<u>48.73</u>
%H	<u>6.87</u>
%O	<u>43.9</u>
%Ash	<u>0.5</u>
MC (%DB)	<u>23.3</u>

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.046	0.50	72	-0.5		18.4		114	360	72	69
1	0.149	0.149	0.046	0.50	72	-0.5	100	18.3	-0.14	109	355	73	69
2	0.299	0.149	0.046	0.50	72	-0.5	100	18.2	-0.13	109	361	73	69
3	0.448	0.149	0.046	0.50	72	-0.5	100	18.0	-0.15	109	366	74	69
4	0.598	0.149	0.046	0.50	72	-0.5	100	17.8	-0.16	109	374	74	69
5	0.747	0.149	0.046	0.50	72	-0.5	100	17.7	-0.15	109	379	74	69
6	0.897	0.149	0.046	0.50	72	-0.5	100	17.5	-0.15	110	384	75	69
7	1.046	0.149	0.046	0.50	72	-0.5	101	17.4	-0.18	111	392	75	68
8	1.195	0.149	0.046	0.50	72	-0.5	101	17.2	-0.19	112	401	76	68
9	1.345	0.149	0.046	0.50	72	-0.5	101	17.0	-0.2	114	407	76	68
10	1.494	0.149	0.046	0.50	72	-0.5	101	16.8	-0.19	114	415	76	68
11	1.644	0.149	0.046	0.50	72	-0.5	101	16.6	-0.2	115	420	77	69
12	1.793	0.149	0.046	0.50	72	-0.5	101	16.4	-0.19	116	422	77	68
13	1.943	0.149	0.046	0.50	72	-0.5	101	16.2	-0.21	117	429	77	68
14	2.092	0.149	0.046	0.50	72	-0.5	101	16.0	-0.21	117	433	77	68
15	2.241	0.149	0.046	0.50	72	-0.5	101	15.8	-0.2	118	436	77	69
16	2.391	0.149	0.046	0.50	72	-0.5	101	15.6	-0.2	118	439	78	69
17	2.540	0.149	0.046	0.50	72	-0.5	101	15.4	-0.21	119	441	78	69
18	2.690	0.149	0.046	0.50	72	-0.5	101	15.2	-0.2	120	441	78	69
19	2.839	0.149	0.046	0.50	72	-0.5	101	14.9	-0.22	120	443	78	69
20	2.989	0.149	0.046	0.50	72	-0.5	101	14.7	-0.21	120	446	78	69
21	3.138	0.149	0.046	0.50	72	-0.5	101	14.5	-0.2	120	449	79	68
22	3.287	0.149	0.046	0.50	72	-0.5	101	14.3	-0.22	121	451	79	69
23	3.437	0.149	0.046	0.50	72	-0.5	101	14.1	-0.2	121	451	79	69
24	3.586	0.149	0.046	0.50	73	-0.5	101	13.9	-0.22	121	452	79	68
25	3.736	0.149	0.046	0.50	73	-0.5	101	13.7	-0.23	121	453	79	69
26	3.885	0.149	0.046	0.50	73	-0.5	101	13.4	-0.22	121	453	79	69
27	4.034	0.149	0.046	0.50	73	-0.5	101	13.2	-0.22	121	453	79	69
28	4.184	0.149	0.046	0.50	73	-0.5	101	13.0	-0.23	121	454	79	68
29	4.333	0.149	0.046	0.50	73	-0.5	101	12.8	-0.19	121	456	79	69
30	4.483	0.149	0.046	0.50	73	-0.5	101	12.6	-0.23	121	454	79	69
31	4.632	0.149	0.046	0.50	73	-0.5	101	12.4	-0.19	122	453	79	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.782	0.149	0.046	0.50	73	-0.5	101	12.2	-0.21	122	453	79	69
33	4.931	0.149	0.046	0.50	73	-0.5	101	12.0	-0.21	121	450	79	68
34	5.080	0.149	0.046	0.50	73	-0.5	101	11.7	-0.22	121	450	79	68
35	5.230	0.149	0.046	0.50	73	-0.5	101	11.5	-0.23	121	448	79	69
36	5.379	0.149	0.046	0.50	73	-0.5	101	11.3	-0.19	121	446	79	68
37	5.529	0.149	0.046	0.50	73	-0.5	101	11.1	-0.19	120	446	79	68
38	5.678	0.149	0.046	0.50	73	-0.5	101	10.9	-0.19	119	444	79	69
39	5.828	0.149	0.046	0.50	73	-0.5	101	10.8	-0.17	119	442	79	68
40	5.977	0.149	0.046	0.50	73	-0.5	101	10.6	-0.18	118	440	79	68
41	6.126	0.149	0.046	0.50	73	-0.5	101	10.4	-0.19	118	438	79	68
42	6.276	0.149	0.046	0.50	73	-0.5	101	10.2	-0.16	118	434	78	69
43	6.425	0.149	0.046	0.50	73	-0.5	101	10.1	-0.18	118	435	79	68
44	6.575	0.149	0.046	0.50	74	-0.5	101	9.8	-0.22	118	437	79	68
45	6.724	0.149	0.046	0.50	74	-0.5	101	9.7	-0.19	118	437	79	68
46	6.874	0.149	0.046	0.50	74	-0.5	101	9.4	-0.21	118	439	78	68
47	7.023	0.149	0.046	0.50	74	-0.5	101	9.3	-0.18	117	438	78	68
48	7.172	0.149	0.046	0.50	74	-0.5	101	9.1	-0.17	117	437	78	68
49	7.322	0.149	0.046	0.50	74	-0.5	101	8.9	-0.19	117	436	78	69
50	7.471	0.149	0.046	0.50	74	-0.5	101	8.7	-0.17	116	435	78	68
51	7.621	0.149	0.046	0.50	74	-0.5	101	8.6	-0.17	116	434	78	68
52	7.770	0.149	0.046	0.50	74	-0.5	101	8.4	-0.17	116	432	78	68
53	7.920	0.149	0.046	0.50	74	-0.5	101	8.2	-0.16	116	431	78	68
54	8.069	0.149	0.046	0.50	74	-0.5	100	8.1	-0.16	115	429	78	68
55	8.218	0.149	0.046	0.50	74	-0.5	100	7.9	-0.16	115	426	78	68
56	8.368	0.149	0.046	0.50	74	-0.5	100	7.8	-0.14	115	424	78	68
57	8.517	0.149	0.046	0.50	74	-0.5	100	7.6	-0.14	115	422	78	68
58	8.667	0.149	0.046	0.50	74	-0.5	100	7.5	-0.15	115	422	77	69
59	8.816	0.149	0.046	0.50	74	-0.5	100	7.3	-0.14	114	423	77	68
60	8.966	0.149	0.046	0.50	74	-0.5	100	7.2	-0.12	114	422	76	69
61	9.115	0.149	0.046	0.50	74	-0.5	100	7.1	-0.12	113	420	76	69
62	9.264	0.149	0.046	0.50	74	-0.5	100	7.0	-0.1	113	417	76	69
63	9.414	0.149	0.046	0.50	74	-0.5	100	6.9	-0.15	113	414	77	68

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.563	0.149	0.046	0.50	74	-0.5	100	6.8	-0.1	112	410	77	68
65	9.713	0.149	0.046	0.50	74	-0.5	100	6.6	-0.13	112	409	77	69
66	9.862	0.149	0.046	0.50	74	-0.5	100	6.5	-0.1	111	404	77	68
67	10.011	0.149	0.046	0.50	74	-0.5	100	6.4	-0.12	111	402	77	68
68	10.161	0.149	0.046	0.50	75	-0.5	100	6.3	-0.1	111	398	77	68
69	10.310	0.149	0.046	0.50	75	-0.5	100	6.2	-0.12	111	397	77	68
70	10.460	0.149	0.046	0.50	75	-0.5	100	6.1	-0.09	111	400	77	69
71	10.609	0.149	0.046	0.50	75	-0.5	100	6.0	-0.11	110	401	77	69
72	10.759	0.149	0.046	0.50	75	-0.5	100	5.9	-0.1	110	403	77	69
73	10.908	0.149	0.046	0.50	75	-0.5	100	5.8	-0.1	110	403	77	69
74	11.057	0.149	0.046	0.50	75	-0.5	100	5.7	-0.11	110	402	77	68
75	11.207	0.149	0.046	0.50	75	-0.5	100	5.6	-0.11	110	399	77	69
76	11.356	0.149	0.046	0.50	75	-0.5	100	5.5	-0.11	110	396	77	68
77	11.506	0.149	0.046	0.50	75	-0.5	100	5.3	-0.11	109	397	77	69
78	11.655	0.149	0.046	0.50	75	-0.5	100	5.2	-0.1	109	396	77	68
79	11.805	0.149	0.046	0.50	75	-0.5	100	5.1	-0.11	109	395	77	68
80	11.954	0.149	0.046	0.50	75	-0.5	100	5.0	-0.09	109	394	77	69
81	12.103	0.149	0.046	0.50	75	-0.5	100	4.9	-0.11	109	395	77	68
82	12.253	0.149	0.046	0.50	75	-0.5	100	4.8	-0.1	108	396	77	68
83	12.402	0.149	0.046	0.50	75	-0.5	100	4.7	-0.1	108	396	77	68
84	12.552	0.149	0.046	0.50	75	-0.5	100	4.6	-0.11	108	396	77	68
85	12.701	0.149	0.046	0.50	75	-0.5	100	4.5	-0.08	108	397	77	68
86	12.851	0.149	0.046	0.50	75	-0.5	100	4.4	-0.1	108	396	77	68
87	13.000	0.149	0.046	0.50	75	-0.5	100	4.3	-0.11	108	395	77	67
88	13.149	0.149	0.046	0.50	75	-0.5	100	4.2	-0.09	108	395	77	68
89	13.299	0.149	0.046	0.50	75	-0.5	100	4.2	-0.08	107	393	77	68
90	13.448	0.149	0.046	0.50	75	-0.5	100	4.1	-0.09	107	393	77	68
91	13.598	0.149	0.046	0.50	74	-0.5	100	4.0	-0.09	107	392	77	68
92	13.747	0.149	0.046	0.50	74	-0.5	100	3.9	-0.09	107	389	77	68
93	13.897	0.149	0.046	0.50	74	-0.5	100	3.8	-0.08	107	387	76	68
94	14.046	0.149	0.046	0.50	74	-0.5	100	3.7	-0.09	107	386	76	68
95	14.195	0.149	0.046	0.50	74	-0.5	100	3.6	-0.09	106	384	76	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	14.345	0.149	0.046	0.50	74	-0.5	100	3.6	-0.07	106	383	76	68
97	14.494	0.149	0.046	0.50	74	-0.5	100	3.5	-0.09	106	385	76	67
98	14.644	0.149	0.046	0.50	74	-0.5	100	3.4	-0.07	106	380	76	68
99	14.793	0.149	0.046	0.50	74	-0.5	100	3.3	-0.09	105	379	76	67
100	14.943	0.149	0.046	0.50	74	-0.5	100	3.2	-0.07	105	378	76	68
101	15.092	0.149	0.046	0.50	74	-0.5	100	3.2	-0.07	105	376	76	68
102	15.241	0.149	0.046	0.50	74	-0.5	100	3.1	-0.07	105	372	76	68
103	15.391	0.149	0.046	0.50	74	-0.5	99	3.0	-0.06	104	371	76	67
104	15.540	0.149	0.046	0.50	74	-0.5	99	3.0	-0.07	104	369	76	68
105	15.690	0.149	0.046	0.50	74	-0.5	99	2.9	-0.06	104	368	76	68
106	15.839	0.149	0.046	0.50	74	-0.5	99	2.9	-0.06	104	368	76	68
107	15.989	0.149	0.046	0.50	74	-0.5	99	2.8	-0.07	104	367	76	68
108	16.138	0.149	0.046	0.50	74	-0.5	99	2.7	-0.06	103	365	76	68
109	16.287	0.149	0.046	0.50	74	-0.5	99	2.7	-0.06	103	364	76	68
110	16.437	0.149	0.046	0.50	74	-0.5	99	2.6	-0.07	103	363	76	68
111	16.586	0.149	0.046	0.50	74	-0.5	99	2.5	-0.05	102	362	76	67
112	16.736	0.149	0.046	0.50	74	-0.5	99	2.5	-0.05	102	360	76	68
113	16.885	0.149	0.046	0.50	74	-0.5	99	2.4	-0.06	102	359	75	68
114	17.034	0.149	0.046	0.50	74	-0.5	99	2.4	-0.05	102	357	75	68
115	17.184	0.149	0.046	0.50	74	-0.5	99	2.3	-0.04	102	358	75	68
116	17.333	0.149	0.046	0.50	74	-0.5	99	2.3	-0.06	102	355	75	68
117	17.483	0.149	0.046	0.50	74	-0.5	99	2.2	-0.05	102	355	75	67
118	17.632	0.149	0.046	0.50	74	-0.5	99	2.2	-0.06	102	356	75	67
119	17.782	0.149	0.046	0.50	74	-0.5	99	2.1	-0.04	102	357	75	68
120	17.931	0.149	0.046	0.50	74	-0.5	99	2.1	-0.05	103	358	75	68
121	18.080	0.149	0.046	0.50	74	-0.5	99	2.0	-0.06	103	357	75	68
122	18.230	0.149	0.046	0.50	74	-0.5	99	2.0	-0.05	103	358	75	68
123	18.379	0.149	0.046	0.50	74	-0.5	99	1.9	-0.07	103	357	75	68
124	18.529	0.149	0.046	0.50	74	-0.5	99	1.8	-0.06	103	355	75	68
125	18.678	0.149	0.046	0.50	74	-0.5	99	1.8	-0.04	103	355	75	67
126	18.828	0.149	0.046	0.50	74	-0.5	99	1.7	-0.08	103	355	75	67
127	18.977	0.149	0.046	0.50	74	-0.5	99	1.7	-0.05	103	356	75	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	19.126	0.149	0.046	0.50	74	-0.5	99	1.6	-0.06	103	354	75	67
129	19.276	0.149	0.046	0.50	74	-0.5	99	1.6	-0.05	103	353	75	68
130	19.425	0.149	0.046	0.50	74	-0.5	99	1.5	-0.04	103	355	75	68
131	19.575	0.149	0.046	0.50	74	-0.5	99	1.5	-0.06	103	356	75	68
132	19.724	0.149	0.046	0.50	74	-0.5	99	1.4	-0.04	102	355	75	68
133	19.874	0.149	0.046	0.50	74	-0.5	99	1.4	-0.05	102	353	75	68
134	20.023	0.149	0.046	0.50	74	-0.5	99	1.3	-0.05	102	352	75	67
135	20.172	0.149	0.046	0.50	74	-0.5	99	1.3	-0.02	102	351	75	68
136	20.322	0.149	0.046	0.50	74	-0.5	99	1.3	-0.03	102	350	75	68
137	20.471	0.149	0.046	0.50	74	-0.5	99	1.2	-0.06	102	352	75	68
138	20.621	0.149	0.046	0.50	74	-0.5	99	1.2	-0.03	102	352	75	68
139	20.770	0.149	0.046	0.50	74	-0.5	99	1.1	-0.04	102	350	75	68
140	20.920	0.149	0.046	0.50	74	-0.5	99	1.1	-0.02	102	349	75	67
141	21.069	0.149	0.046	0.50	74	-0.5	99	1.1	-0.05	102	350	75	67
142	21.218	0.149	0.046	0.50	74	-0.5	99	1.0	-0.03	102	349	75	68
143	21.368	0.149	0.046	0.50	74	-0.5	99	1.0	-0.04	102	347	75	67
144	21.517	0.149	0.046	0.50	74	-0.5	99	1.0	-0.04	102	347	75	67
145	21.667	0.149	0.046	0.50	74	-0.5	99	0.9	-0.02	102	349	75	68
146	21.816	0.149	0.046	0.50	74	-0.5	99	0.9	-0.03	102	346	75	67
147	21.966	0.149	0.046	0.50	74	-0.5	99	0.9	-0.05	102	346	75	67
148	22.115	0.149	0.046	0.50	74	-0.5	99	0.9	-0.01	102	344	75	68
149	22.264	0.149	0.046	0.50	74	-0.5	99	0.8	-0.03	101	343	75	67
150	22.414	0.149	0.046	0.50	74	-0.5	99	0.8	-0.05	102	347	75	67
151	22.563	0.149	0.046	0.50	74	-0.5	99	0.8	-0.02	102	347	75	67
152	22.713	0.149	0.046	0.50	74	-0.5	99	0.7	-0.03	102	344	75	67
153	22.862	0.149	0.046	0.50	74	-0.5	99	0.7	-0.03	102	342	75	67
154	23.011	0.149	0.046	0.50	74	-0.5	99	0.7	-0.03	102	340	75	67
155	23.161	0.149	0.046	0.50	74	-0.5	99	0.6	-0.04	102	340	75	67
156	23.310	0.149	0.046	0.50	74	-0.5	99	0.6	-0.02	102	340	75	68
157	23.460	0.149	0.046	0.50	74	-0.5	99	0.6	-0.04	102	341	75	68
158	23.609	0.149	0.046	0.50	74	-0.5	99	0.5	-0.03	102	341	75	67
159	23.759	0.149	0.046	0.50	74	-0.5	99	0.5	-0.02	102	340	75	67

## BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Dilution Tunnel dP (in H <sub>2</sub> O)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	23.908	0.149	0.046	0.50	74	-0.5	99	0.5	-0.03	102	342	75	67
161	24.057	0.149	0.046	0.50	74	-0.5	99	0.4	-0.04	102	341	75	68
162	24.207	0.149	0.046	0.50	74	-0.5	99	0.4	-0.03	102	338	75	67
163	24.356	0.149	0.046	0.50	74	-0.5	99	0.4	-0.02	102	340	75	67
164	24.506	0.149	0.046	0.50	74	-0.5	99	0.4	-0.04	102	338	75	67
165	24.655	0.149	0.046	0.50	74	-0.5	99	0.3	-0.01	102	338	75	68
166	24.805	0.149	0.046	0.50	74	-0.5	99	0.3	-0.03	102	342	75	68
167	24.954	0.149	0.046	0.50	74	-0.5	99	0.3	-0.04	101	343	75	68
168	25.103	0.149	0.046	0.50	74	-0.5	99	0.3	-0.02	101	339	75	68
169	25.253	0.149	0.046	0.50	74	-0.5	99	0.2	-0.03	101	337	75	67
170	25.402	0.149	0.046	0.50	74	-0.5	99	0.2	-0.03	101	336	75	68
171	25.552	0.149	0.046	0.50	74	-0.5	99	0.2	-0.03	101	337	75	68
172	25.701	0.149	0.046	0.50	74	-0.5	99	0.1	-0.02	101	335	75	68
173	25.851	0.149	0.046	0.50	74	-0.5	99	0.1	-0.03	101	331	75	68
174	26.000	0.149	0.046	0.50	74	-0.5	99	0.0	-0.11	101	331	74	68
Avg/Tot	26.000	0.149	0.046	0.50	74	-0.50	100			109	388	76	68.0



## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
0	0.000		0.50	70	-2		73	-0.040	5.43	0.04
1	0.189	0.189	0.50	70	-2	101	75	-0.040	4.92	0.01
2	0.379	0.189	0.50	70	-2	101	75	-0.040	8.58	0.01
3	0.568	0.189	0.50	70	-2	101	76	-0.040	9.90	0.01
4	0.757	0.189	0.50	70	-2	101	76	-0.040	10.34	0.04
5	0.946	0.189	0.50	70	-2	101	77	-0.040	10.24	0.01
6	1.136	0.189	0.50	70	-2	101	77	-0.040	10.52	0.01
7	1.325	0.189	0.50	71	-2	101	78	-0.050	11.04	0.07
8	1.514	0.189	0.50	71	-2	101	78	-0.050	12.59	0.31
9	1.704	0.189	0.50	71	-2	101	78	-0.050	12.53	0.26
10	1.893	0.189	0.50	71	-2	101	79	-0.050	12.57	0.23
11	2.082	0.189	0.50	71	-2	101	79	-0.050	12.77	0.29
12	2.272	0.189	0.50	71	-2	101	79	-0.050	12.89	0.29
13	2.461	0.189	0.50	71	-2	101	80	-0.050	13.09	0.39
14	2.650	0.189	0.50	72	-2	101	80	-0.050	13.44	0.39
15	2.839	0.189	0.50	72	-2	101	80	-0.050	13.50	0.33
16	3.029	0.189	0.50	72	-2	101	80	-0.050	13.77	0.36
17	3.218	0.189	0.50	72	-2	101	81	-0.050	14.03	0.36
18	3.407	0.189	0.50	72	-2	101	81	-0.050	14.33	0.37
19	3.597	0.189	0.50	72	-2	101	81	-0.050	14.49	0.45
20	3.786	0.189	0.50	72	-2	101	81	-0.050	14.70	0.44
21	3.975	0.189	0.50	73	-2	101	81	-0.050	14.78	0.46
22	4.164	0.189	0.50	73	-2	101	81	-0.050	14.96	0.53
23	4.354	0.189	0.50	73	-2	101	82	-0.050	15.27	0.62
24	4.543	0.189	0.50	73	-2	101	82	-0.050	15.56	0.73
25	4.732	0.189	0.50	73	-2	101	82	-0.050	15.84	1.02
26	4.922	0.189	0.50	73	-2	101	82	-0.050	15.93	1.32
27	5.111	0.189	0.50	73	-2	101	82	-0.050	15.94	1.48
28	5.300	0.189	0.50	73	-2	101	82	-0.050	15.96	1.29
29	5.490	0.189	0.50	74	-2	101	82	-0.050	15.96	1.14
30	5.679	0.189	0.50	74	-2	101	82	-0.050	15.92	0.94
31	5.868	0.189	0.50	74	-2	101	82	-0.050	15.59	1.76

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
32	6.057	0.189	0.50	74	-2	101	82	-0.050	15.52	1.60
33	6.247	0.189	0.50	74	-2	101	82	-0.050	15.46	1.84
34	6.436	0.189	0.50	74	-2	101	82	-0.050	15.42	1.94
35	6.625	0.189	0.50	74	-2	101	82	-0.050	15.43	2.01
36	6.815	0.189	0.50	74	-2	101	82	-0.050	15.45	1.78
37	7.004	0.189	0.50	74	-2	101	82	-0.050	15.37	1.36
38	7.193	0.189	0.50	75	-2	101	82	-0.050	15.20	1.06
39	7.382	0.189	0.50	75	-2	101	81	-0.050	15.07	0.97
40	7.572	0.189	0.50	75	-2	101	81	-0.050	14.99	0.93
41	7.761	0.189	0.50	75	-2	101	81	-0.050	14.96	0.95
42	7.950	0.189	0.50	75	-2	101	81	-0.050	14.94	0.93
43	8.140	0.189	0.50	75	-2	101	81	-0.050	15.09	0.95
44	8.329	0.189	0.50	75	-2	101	81	-0.050	15.02	1.58
45	8.518	0.189	0.50	75	-2	101	81	-0.050	14.90	2.15
46	8.707	0.189	0.50	75	-2	101	81	-0.050	14.97	1.91
47	8.897	0.189	0.50	75	-2	101	81	-0.050	15.06	1.61
48	9.086	0.189	0.50	75	-2	101	81	-0.050	15.10	1.28
49	9.275	0.189	0.50	75	-2	101	81	-0.050	15.17	1.10
50	9.465	0.189	0.50	75	-2	101	81	-0.050	15.30	1.12
51	9.654	0.189	0.50	75	-2	101	81	-0.050	15.35	1.07
52	9.843	0.189	0.50	75	-2	101	81	-0.050	15.39	1.08
53	10.033	0.189	0.50	75	-2	100	81	-0.050	15.49	0.98
54	10.222	0.189	0.50	75	-2	100	81	-0.050	15.58	0.81
55	10.411	0.189	0.50	75	-2	100	81	-0.050	15.55	0.48
56	10.600	0.189	0.50	75	-2	100	81	-0.050	15.26	0.21
57	10.790	0.189	0.50	75	-2	100	80	-0.050	15.09	0.08
58	10.979	0.189	0.50	76	-2	100	80	-0.050	14.87	0.02
59	11.168	0.189	0.50	76	-2	100	80	-0.050	14.70	0.00
60	11.358	0.189	0.50	76	-2	100	80	-0.040	14.32	0.00
61	11.547	0.189	0.50	76	-2	100	80	-0.040	13.87	0.00
62	11.736	0.189	0.50	76	-2	100	80	-0.050	13.63	0.00
63	11.925	0.189	0.50	76	-2	100	80	-0.050	13.49	0.00

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
64	12.115	0.189	0.50	76	-2	100	80	-0.050	13.34	0.00
65	12.304	0.189	0.50	76	-2	100	80	-0.050	13.18	0.00
66	12.493	0.189	0.50	76	-2	100	80	-0.050	13.09	0.00
67	12.683	0.189	0.50	76	-2	100	80	-0.050	12.92	0.00
68	12.872	0.189	0.50	76	-2	100	80	-0.050	12.95	0.00
69	13.061	0.189	0.50	76	-2	100	80	-0.050	12.95	0.01
70	13.251	0.189	0.50	76	-2	100	80	-0.050	13.06	0.01
71	13.440	0.189	0.50	76	-2	100	80	-0.050	13.17	0.01
72	13.629	0.189	0.50	76	-2	100	80	-0.050	10.83	0.01
73	13.818	0.189	0.50	76	-2	100	80	-0.050	13.13	0.01
74	14.008	0.189	0.50	76	-2	100	80	-0.040	13.24	0.01
75	14.197	0.189	0.50	76	-2	100	80	-0.040	13.30	0.01
76	14.386	0.189	0.50	76	-2	100	80	-0.040	13.32	0.01
77	14.576	0.189	0.50	76	-2	100	80	-0.050	13.12	0.01
78	14.765	0.189	0.50	76	-2	100	80	-0.040	13.07	0.01
79	14.954	0.189	0.50	76	-2	100	80	-0.040	12.97	0.01
80	15.143	0.189	0.50	76	-2	100	80	-0.040	12.97	0.01
81	15.333	0.189	0.50	76	-2	100	80	-0.040	12.96	0.01
82	15.522	0.189	0.50	76	-2	100	80	-0.040	13.04	0.00
83	15.711	0.189	0.50	76	-2	100	80	-0.040	13.15	0.00
84	15.901	0.189	0.50	76	-2	100	79	-0.040	13.19	0.00
85	16.090	0.189	0.50	76	-2	100	79	-0.040	13.15	0.00
86	16.279	0.189	0.50	76	-2	100	79	-0.040	13.17	0.00
87	16.469	0.189	0.50	76	-2	100	79	-0.040	13.25	0.05
88	16.658	0.189	0.50	76	-2	100	79	-0.040	13.29	0.07
89	16.847	0.189	0.50	76	-2	100	79	-0.040	13.21	0.11
90	17.036	0.189	0.50	76	-2	100	79	-0.040	13.05	0.08
91	17.226	0.189	0.50	76	-2	100	79	-0.040	12.91	0.09
92	17.415	0.189	0.50	76	-2	100	79	-0.040	12.84	0.03
93	17.604	0.189	0.50	76	-2	100	79	-0.040	12.74	0.01
94	17.794	0.189	0.50	76	-2	100	79	-0.040	12.72	0.01
95	17.983	0.189	0.50	76	-2	100	79	-0.040	12.72	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
96	18.172	0.189	0.50	76	-2	100	79	-0.040	12.71	0.01
97	18.361	0.189	0.50	76	-2	100	78	-0.040	12.64	0.01
98	18.551	0.189	0.50	76	-2	100	78	-0.040	12.48	0.01
99	18.740	0.189	0.50	76	-2	100	78	-0.040	12.32	0.01
100	18.929	0.189	0.50	76	-2	99	78	-0.040	12.00	0.01
101	19.119	0.189	0.50	76	-2	99	78	-0.040	11.77	0.01
102	19.308	0.189	0.50	76	-2	99	78	-0.040	11.66	0.01
103	19.497	0.189	0.50	75	-2	99	78	-0.040	11.59	0.01
104	19.686	0.189	0.50	76	-2	99	78	-0.040	11.52	0.01
105	19.876	0.189	0.50	76	-2	99	78	-0.040	11.48	0.01
106	20.065	0.189	0.50	76	-2	99	78	-0.040	11.45	0.01
107	20.254	0.189	0.50	75	-2	99	78	-0.040	11.48	0.01
108	20.444	0.189	0.50	75	-2	99	78	-0.040	11.24	0.01
109	20.633	0.189	0.50	75	-2	99	78	-0.040	10.98	0.01
110	20.822	0.189	0.50	75	-2	99	78	-0.040	10.90	0.01
111	21.012	0.189	0.50	75	-2	99	78	-0.040	10.72	0.01
112	21.201	0.189	0.50	75	-2	99	78	-0.040	10.33	0.01
113	21.390	0.189	0.50	75	-2	99	77	-0.040	10.11	0.01
114	21.579	0.189	0.50	75	-2	99	77	-0.040	9.96	0.01
115	21.769	0.189	0.50	75	-2	99	77	-0.040	9.98	0.01
116	21.958	0.189	0.50	75	-2	99	77	-0.040	10.09	0.01
117	22.147	0.189	0.50	75	-2	99	77	-0.040	10.16	0.01
118	22.337	0.189	0.50	75	-2	99	77	-0.040	10.22	0.01
119	22.526	0.189	0.50	75	-2	99	77	-0.040	10.28	0.01
120	22.715	0.189	0.50	75	-2	99	77	-0.040	10.29	0.01
121	22.904	0.189	0.50	75	-2	99	77	-0.040	10.39	0.01
122	23.094	0.189	0.50	75	-2	99	77	-0.040	10.48	0.01
123	23.283	0.189	0.50	75	-2	99	77	-0.040	10.56	0.01
124	23.472	0.189	0.50	75	-2	99	77	-0.040	10.63	0.01
125	23.662	0.189	0.50	75	-2	99	77	-0.040	10.62	0.01
126	23.851	0.189	0.50	75	-2	99	77	-0.040	10.67	0.01
127	24.040	0.189	0.50	75	-2	99	77	-0.040	10.71	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
128	24.230	0.189	0.50	75	-2	99	77	-0.040	10.75	0.01
129	24.419	0.189	0.50	75	-2	99	77	-0.040	10.66	0.01
130	24.608	0.189	0.50	75	-2	99	77	-0.040	10.46	0.01
131	24.797	0.189	0.50	75	-2	99	77	-0.040	10.17	0.01
132	24.987	0.189	0.50	75	-2	99	77	-0.040	9.77	0.01
133	25.176	0.189	0.50	75	-2	99	77	-0.040	9.60	0.01
134	25.365	0.189	0.50	75	-2	99	77	-0.040	9.53	0.01
135	25.555	0.189	0.50	75	-2	99	77	-0.040	9.49	0.01
136	25.744	0.189	0.50	75	-2	99	77	-0.040	9.40	0.01
137	25.933	0.189	0.50	75	-2	99	77	-0.040	9.31	0.01
138	26.122	0.189	0.50	75	-2	99	77	-0.040	9.18	0.01
139	26.312	0.189	0.50	75	-2	99	77	-0.040	9.12	0.01
140	26.501	0.189	0.50	75	-2	99	77	-0.040	9.04	0.01
141	26.690	0.189	0.50	75	-2	99	77	-0.040	8.99	0.01
142	26.880	0.189	0.50	75	-2	99	77	-0.040	8.95	0.01
143	27.069	0.189	0.50	75	-2	99	77	-0.040	8.85	0.01
144	27.258	0.189	0.50	75	-2	99	77	-0.040	8.83	0.01
145	27.448	0.189	0.50	75	-2	99	77	-0.040	8.83	0.01
146	27.637	0.189	0.50	75	-2	99	77	-0.040	8.77	0.01
147	27.826	0.189	0.50	75	-2	99	77	-0.040	8.48	0.01
148	28.015	0.189	0.50	75	-2	99	77	-0.040	8.32	0.01
149	28.205	0.189	0.50	75	-2	99	77	-0.040	8.31	0.01
150	28.394	0.189	0.50	75	-2	99	77	-0.040	8.31	0.01
151	28.583	0.189	0.50	75	-2	99	77	-0.040	8.31	0.01
152	28.773	0.189	0.50	75	-2	99	77	-0.040	8.31	0.01
153	28.962	0.189	0.50	75	-2	99	77	-0.040	8.29	0.01
154	29.151	0.189	0.50	75	-2	99	77	-0.040	8.30	0.01
155	29.340	0.189	0.50	75	-2	99	77	-0.040	8.14	0.01
156	29.530	0.189	0.50	75	-2	99	77	-0.040	8.11	0.01
157	29.719	0.189	0.50	75	-2	99	77	-0.040	8.03	0.01
158	29.908	0.189	0.50	75	-2	99	77	-0.040	8.01	0.01
159	30.098	0.189	0.50	75	-2	99	77	-0.040	7.92	0.01

## BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft <sup>3</sup> )	Sample Rate (cfm)	Orifice dH (in H <sub>2</sub> O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H <sub>2</sub> O)	CO <sub>2</sub> (%)	CO (%)
160	30.287	0.189	0.50	75	-2	99	77	-0.040	7.87	0.01
161	30.476	0.189	0.50	75	-2	99	77	-0.040	7.85	0.01
162	30.665	0.189	0.50	75	-2	99	77	-0.040	7.80	0.01
163	30.855	0.189	0.50	75	-2	99	77	-0.040	7.71	0.01
164	31.044	0.189	0.50	75	-2	99	77	-0.040	7.64	0.01
165	31.233	0.189	0.50	75	-2	99	77	-0.040	7.62	0.01
166	31.423	0.189	0.50	75	-2	99	77	-0.040	7.50	0.01
167	31.612	0.189	0.50	75	-2	99	77	-0.040	7.40	0.01
168	31.801	0.189	0.50	75	-2	99	77	-0.040	7.33	0.01
169	31.991	0.189	0.50	75	-2	99	77	-0.040	7.24	0.01
170	32.180	0.189	0.50	75	-2	99	77	-0.040	7.26	0.01
171	32.369	0.189	0.50	75	-2	99	77	-0.040	7.22	0.01
172	32.558	0.189	0.50	75	-2	99	77	-0.040	7.15	0.01
173	32.748	0.189	0.50	75	-2	99	77	-0.040	7.12	0.01
174	32.937	0.189	0.50	75	-2	99	75	-0.040	7.08	0.01
Avg/Tot	32.937	0.189	0.50	75	-2.00	100	79	-0.044	11.80	0.28

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

**Stove ΔT:** 2

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
0	530	526	248	407	530	448.2	716	
1	519	514	241	404	529	441.1	801	
2	507	502	233	404	529	434.9	891	
3	496	491	227	406	528	429.4	937	
4	485	480	223	410	527	424.7	968	
5	475	471	219	412	526	420.5	972	
6	466	463	216	416	525	417.1	980	
7	459	457	214	419	523	414.2	1029	
8	453	451	212	426	521	412.6	1080	
9	447	446	210	434	519	411.2	1115	
10	443	442	208	442	517	410.4	1135	
11	439	439	207	450	515	410.1	1148	
12	436	437	206	457	514	409.8	1146	
13	433	435	206	465	511	410.1	1159	
14	431	435	205	474	510	410.9	1160	
15	429	434	206	481	508	411.7	1159	
16	428	435	206	489	506	412.9	1163	
17	428	436	207	496	504	414.2	1168	
18	428	437	207	503	503	415.8	1177	
19	429	440	209	510	501	417.6	1191	
20	430	442	211	517	500	420.0	1199	
21	431	445	212	525	499	422.4	1208	
22	433	448	214	532	497	424.9	1223	
23	436	452	216	539	496	427.7	1230	
24	439	456	218	547	496	430.9	1243	
25	442	459	220	556	495	434.4	1251	
26	446	464	223	564	493	438.0	1244	
27	450	468	225	570	493	441.3	1239	
28	455	473	229	575	492	444.9	1235	
29	460	478	232	579	491	448.1	1238	
30	467	484	235	582	490	451.4	1228	
31	474	489	236	582	489	454.0	1215	
32	482	494	238	582	489	456.7	1211	
33	490	499	240	581	488	459.6	1199	
34	498	504	243	579	487	462.3	1190	
35	507	509	244	578	486	464.9	1183	
36	515	515	247	576	486	467.7	1188	
37	523	520	248	576	485	470.6	1196	
38	531	525	250	576	484	473.5	1196	
39	539	531	251	576	484	476.1	1191	
40	545	535	252	576	484	478.7	1186	
41	552	541	254	576	483	481.2	1185	
42	558	546	255	577	483	483.8	1184	
43	565	551	257	577	483	486.5	1184	
44	574	559	258	575	483	490.0	1177	
45	584	568	260	573	483	493.6	1173	
46	593	578	262	572	483	497.5	1172	
47	601	587	262	570	482	500.5	1171	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

**Stove ΔT:** 2

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	609	595	263	570	482	503.9	1178
49	615	603	264	571	482	507.1	1181
50	622	610	265	573	482	510.2	1185
51	628	616	266	574	481	513.1	1186
52	635	620	267	575	481	515.8	1188
53	642	624	269	576	481	518.6	1190
54	650	628	270	578	481	521.4	1195
55	657	630	271	581	480	524.1	1196
56	664	633	273	583	480	526.4	1189
57	669	635	274	584	480	528.6	1182
58	674	638	275	585	480	530.2	1173
59	678	639	276	585	480	531.5	1162
60	681	640	277	584	480	532.3	1142
61	682	641	278	582	480	532.5	1126
62	683	640	278	579	480	532.0	1117
63	683	640	278	577	481	531.7	1115
64	683	639	279	575	482	531.3	1111
65	683	638	280	573	482	531.1	1109
66	682	637	280	571	483	530.6	1115
67	681	637	280	568	484	529.8	1114
68	679	638	280	565	485	529.1	1107
69	676	639	280	562	486	528.4	1100
70	674	640	280	559	486	527.8	1094
71	673	641	281	556	486	527.3	1079
72	671	643	281	553	487	527.1	1070
73	670	646	281	550	487	526.7	1065
74	668	649	281	547	488	526.6	1059
75	666	652	281	545	489	526.5	1056
76	664	655	281	542	490	526.5	1052
77	662	658	282	540	491	526.5	1047
78	660	661	282	538	491	526.4	1043
79	659	663	283	535	492	526.5	1042
80	658	665	284	534	493	526.7	1046
81	657	666	285	534	493	526.9	1050
82	656	666	287	535	494	527.5	1058
83	656	667	289	535	494	528.2	1060
84	656	667	292	536	494	528.9	1057
85	656	668	295	536	494	529.8	1053
86	656	669	296	536	494	530.3	1051
87	656	670	298	535	495	530.9	1053
88	657	671	300	536	495	531.7	1057
89	657	673	302	536	496	532.7	1059
90	657	675	303	535	495	533.3	1052
91	658	676	304	534	496	533.5	1044
92	657	678	304	531	496	533.4	1031
93	657	680	305	529	496	533.3	1021
94	657	681	307	526	496	533.3	1017
95	657	682	308	523	496	533.3	1011



# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

**Stove ΔT:** 2

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
96	657	683	310	521	496	533.6	1006	
97	658	684	311	518	496	533.3	1000	
98	659	684	311	515	496	533.0	991	
99	660	685	310	511	496	532.6	982	
100	662	684	311	508	496	532.2	971	
101	663	684	311	505	496	531.7	962	
102	664	683	311	502	496	531.1	958	
103	664	682	310	498	497	530.2	955	
104	664	681	310	495	497	529.4	953	
105	665	679	311	493	497	528.9	951	
106	665	678	311	491	496	528.1	948	
107	664	676	310	488	496	526.9	945	
108	664	676	309	486	496	526.3	941	
109	662	674	308	483	496	524.6	935	
110	661	673	307	480	497	523.4	929	
111	659	673	307	477	497	522.7	922	
112	657	673	306	475	497	521.4	916	
113	655	672	304	472	497	520.2	917	
114	652	671	303	470	498	518.9	928	
115	649	668	301	470	499	517.4	937	
116	646	665	300	469	499	516.0	940	
117	644	663	298	468	500	514.6	941	
118	643	660	296	467	501	513.5	937	
119	642	656	294	466	502	512.2	932	
120	642	654	293	465	503	511.4	931	
121	642	651	293	464	503	510.7	929	
122	643	648	291	463	504	510.0	927	
123	645	646	291	461	505	509.7	924	
124	646	644	291	460	506	509.5	920	
125	647	643	291	458	507	509.1	915	
126	649	642	290	456	508	509.0	912	
127	650	642	291	454	509	509.2	909	
128	651	643	290	452	510	509.3	904	
129	652	643	291	451	511	509.5	901	
130	653	643	292	450	511	509.9	909	
131	654	641	293	450	511	510.0	915	
132	656	639	294	449	512	510.0	914	
133	656	635	296	448	512	509.6	911	
134	657	632	296	447	513	508.8	909	
135	657	628	297	446	513	508.2	907	
136	656	625	297	445	514	507.2	908	
137	654	622	296	444	513	505.8	910	
138	651	619	294	443	514	504.2	910	
139	647	616	292	442	514	502.3	909	
140	643	614	290	441	514	500.5	909	
141	639	612	288	440	514	498.5	910	
142	635	609	285	440	514	496.4	910	
143	630	607	283	439	514	494.5	910	

# WOODSTOVE SURFACE TEMPERATURE DATA

Client: Valley Comfort  
 Model: Blaze King PE32  
 Run #: 8

Job #: 18-421  
 Tracking #: 0012  
 Technician: SJB  
 Date: 10/24/2018

Stove ΔT: 2

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	626	604	281	437	514	492.5	909
145	622	602	279	436	514	490.6	907
146	618	600	277	435	514	488.8	905
147	613	597	276	434	515	486.9	899
148	609	595	274	432	515	485.0	897
149	605	592	272	432	515	483.2	898
150	601	589	272	430	515	481.5	899
151	597	587	269	430	516	479.8	895
152	593	585	268	428	517	478.3	892
153	590	583	267	426	519	476.9	888
154	586	580	266	425	520	475.6	888
155	583	578	265	424	522	474.3	889
156	579	576	264	423	524	472.9	890
157	575	573	263	422	526	471.7	891
158	571	571	262	421	527	470.4	894
159	568	567	261	420	529	468.9	895
160	564	564	260	419	530	467.5	894
161	561	561	259	418	531	466.0	893
162	558	558	258	417	532	464.8	891
163	555	555	256	416	533	463.1	890
164	552	552	256	415	534	462.0	889
165	549	549	255	414	534	460.4	888
166	546	546	254	413	535	458.9	884
167	544	543	253	412	535	457.4	878
168	541	540	252	410	535	455.8	875
169	539	537	251	408	535	454.1	868
170	536	535	251	406	535	452.7	860
171	534	532	252	405	534	451.3	856
172	531	529	250	402	533	449.3	854
173	528	527	250	400	533	447.7	851
174	526	524	249	398	533	446.0	847
Average	594	591	269	497	502	491	1027

## LAB SAMPLE DATA - ASTM E2515

Client: Valley ComfortJob #: 18-421Model: Blaze King PE32Tracking #: 0012Run #: 8Technician: SJBDate: 10/24/2018**TRAIN A (1st Hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3403	123.8	121.4	2.4
B. Rear filter catch	Filter				0.0
C. Probe catch*	Probe				0.0
D. O-Ring catch*	O-Ring				0.0

Sub-Total	Total Particulate, mg:	2.4
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**TRAIN A (Post 1st hour)**

Sample Component	Sample Type	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3404	119.0	119.2	-0.2
B. Rear filter catch	Filter	3405	121.0	120.9	0.1
C. Probe catch*	Probe	14A	116816.3	116816.2	0.1
D. O-Ring catch*	O-Ring	14A	3367.9	3366.8	1.1

Sub-Total	Total Particulate, mg:	1.1
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Train A Aggregate	Total Particulate, mg:	<b>3.5</b>
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**TRAIN B**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Front filter catch	Filter	3406	120.8	117.4	3.4
B. Rear filter catch	Filter	3407	120.7	121.4	-0.7
C. Probe catch*	Probe	14B	116770.1	116770.2	0.0
D. O-Ring catch*	O-Ring	14B	3342.1	3340.6	1.5

Total Particulate, mg:	<b>4.2</b>
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**AMBIENT**

Sample Component	Reagent	Filter, Probe, or O-Ring #	Weights		
			Final, mg	Tare, mg	Particulate, mg
A. Filter catch*	Filter	-	0.0	0.0	0.0

Total Particulate, mg:	<b>0.0</b>
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\*Particulate catch that results in a negative number, is assumed to be zero for probes and O-rings, negative numbers for filters are assumed to be part of the O-Ring weight. Negative ambient filter weights are assumed to be zero.

## ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Job Number: 18-421 Tracking #: 0012  
 Model: Blaze King PE32 Run Number: 8 Test Date: 10/24/2018

### Wood Heater Run Notes

#### Test Control Settings

Primary Air Setting(s): High Setting - Fully Open

#### Preburn Notes

Time	Notes
6:30	Loaded 12 lbs of kindling
7:42	At 1.4 lbs, loaded pre-burn fuel, set air to test setting, turned fan on to high setting
8:55	At 5.0 lbs, Stirred/leveled coal bed.
9:28	Zeroed scale in preparation for fuel loading
CATALYST EQUIVALENCY TEST – CLARIANT METAL COMBUSTOR	

#### Test Notes

Test Burn Start Time: 9:28 Test Fuel Loaded by: 30 seconds  
 Door Closed: 35 seconds Air Control Set at: 0 seconds  
 Other Loading Notes: Bypass closed during loading

Time	Notes
60 min	Changed 1-hour filter.
174 min	End of Test
CATALYST EQUIVALENCY TEST – CLARIANT METAL COMBUSTOR	

Test Burn End Time: 12:22

#### Flue Gas Concentration Measurement

**Calibration Gas Values:** Span Gas CO<sub>2</sub> (%): 10.04 CO (%): 2.52  
 Mid Gas CO<sub>2</sub> (%): - CO (%): -

#### Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	8:23	-	8:27	12:51	-	12:55
CO <sub>2</sub>	0.00	-	10.04	0.02	-	10.14
CO	0.00	-	2.52	0.01	-	2.49

**Flue Gas Probe Leak Check:** Initial: No Leakage Final: No Leakage

Technician Signature: 

Date: 10/24/2018

Sample Pre-Test Tare Sheet:  Probes

Filters

O-Rings

Date/Time In Desiccator: 9/27 - 10/30

Balance ID#: 107

Audit Weight ID# / Weight(mg): 109A-100mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
3351	10/2-13:30	123.4	10/3-7:15	123.3	-	-	-	-	SB	18-485 #4
3352		119.7		119.5	-	-	-	-	SB	
3353		121.1		121.1	-	-	-	-	SB	
3354		123.0		<del>123.4</del> 123.2	10/4-9:00	123.2	-	-	SB	
3355		119.4		119.5	-	-	-	-	SB	<del>SB</del> 18-485 #5
3356		120.9		120.8	-	-	-	-	SB	
3357		123.3		123.0	10/4-9:00	123.2	-	-	SB	
3358		119.9		119.5	10/4-9:00	119.7	-	-	SB	
3359		121.7		121.7	-	-	-	-	SB	
3360		121.5		121.3	-	-	-	-	SB	
3361		119.8		119.9	-	-	-	-	SB	
3362		122.8		122.7	-	-	-	-	SB	18-421 #1
3363		120.6		120.6	-	-	-	-	SB	
3364		120.0		119.9	-	-	-	-	SB	
3365		123.4		123.5	-	-	-	-	SB	
3366		120.5		120.6	-	-	-	-	SB	
3367		121.0		121.0	-	-	-	-	SB	18-421 #2
3368		122.4		122.4	-	-	-	-	SB	
3369		119.2		119.3	-	-	-	-	SB	
3370		121.5		121.4	-	-	-	-	SB	
3371		123.0		123.0	-	-	-	-	SB	
3372		119.5		119.3	-	-	-	-	SB	18-421 #3
3373		121.4		121.3	-	-	-	-	SB	
3374		122.8		122.8	-	-	-	-	SB	
3375		119.9		119.9	-	-	-	-	SB	
3376		121.2		121.3	-	-	-	-	SB	
3377		122.9		123.0	-	-	-	-	SB	
3378		121.1		121.1	-	-	-	-	SB	18-421 #4
3379		119.6		119.7	-	-	-	-	SB	
3380		120.9		120.9	-	-	-	-	SB	

Sample Post-Test Analysis Sheet:  Probes

Filters

O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109A-100mg

Sample ID	Tare (mg)	Date/Time in Desiccator	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials
3351	123.3	10/5-7:30	10/13-11:00	124.0	10/15-8:00	<del>123.4</del> 124.1	-	-	-	-	SB
3352	119.5	↓	↓	119.4	↓	119.4	-	-	-	-	SB
3353	121.1	↓	↓	122.0	↓	122.0	-	-	-	-	SB
3354	123.2	↓	↓	122.8	↓	122.8	-	-	-	-	SB
3355	119.5	↓	↓	119.4	↓	119.5	-	-	-	-	SB
3356	120.8	10/5-13:30	↓	121.3	↓	121.2	-	-	-	-	SB
3357	123.2	↓	↓	123.4	↓	123.4	-	-	-	-	SB
3358	119.7	↓	↓	119.6	↓	119.6	-	-	-	-	SB
3359	121.7	↓	↓	122.2	↓	122.3	-	-	-	-	SB
3360	121.3	↓	↓	121.0	↓	120.9	-	-	-	-	SB
3361	119.9	↓	↓	119.9	↓	119.9	-	-	-	-	SB
3362	122.7	10/13-11:00	10/15-8:00	123.3	10/15-16:00	123.3	-	-	-	-	SB
3363	120.6	↓	↓	121.3	↓	121.4	-	-	-	-	SB
3364	119.9	↓	↓	119.9	↓	119.9	-	-	-	-	SB
3365	123.5	↓	↓	124.0	↓	124.1	-	-	-	-	SB
3366	120.6	↓	↓	120.7	↓	120.7	-	-	-	-	SB
3367	121.0	↓	↓	121.2	↓	121.3	-	-	-	-	SB
3368	122.4	↓	↓	122.7	↓	122.7	-	-	-	-	SB
3369	119.3	↓	↓	118.9	↓	118.9	-	-	-	-	SB
3370	121.4	↓	↓	122.3	↓	122.3	-	-	-	-	SB
3371	123.0	↓	↓	122.5	↓	122.6	-	-	-	-	SB
3372	119.3	↓	↓	120.5	↓	120.6	-	-	-	-	SB
3373	121.3	↓	↓	122.3	↓	122.3	-	-	-	-	SB
3374	122.8	↓	↓	122.7	↓	122.6	-	-	-	-	SB
3375	119.9	↓	↓	SB+22 121.2	↓	121.2	-	-	-	-	SB
3376	121.3	↓	↓	121.2	↓	121.2	-	-	-	-	SB
3377	123.0	↓	↓	126.4	↓	126.5	-	-	-	-	SB
3378	121.1	↓	↓	121.2	↓	121.2	-	-	-	-	SB
3379	119.7	↓	↓	119.4	↓	119.4	-	-	-	-	SB
3380	120.9	↓	↓	125.0	↓	124.9	-	-	-	-	SB

Sample Pre-Test Tare Sheet:  Probes

Filters

O-Rings

Date/Time In Desiccator: 9/27 - 10:30 Balance ID#: 107 Audit Weight ID# / Weight(mg): 109A-100mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
3381	10/4 - 9:00	123.0	10/5 - 8:45	122.9	-	-	-	-	SB	18-421 #4
3382	↓	120.1	↓	120.0	-	-	-	-	SB	18-421 #5
3383		121.0		121.1	-	-	-	-	SB	18-421 #5
3384		123.2		123.1	-	-	-	-	SB	↓
3385		120.8		120.7	-	-	-	-	SB	
3386		123.2		123.3	-	-	-	-	SB	↓
3387		119.4		119.4	-	-	-	-	SB	
3388		119.8		119.9	-	-	-	-	SB	↓
3389		123.3		123.4	-	-	-	-	SB	
3390		119.4		119.5	-	-	-	-	SB	↓
3391		120.9		120.9	-	-	-	-	SB	
3392	122.7	122.6	-	-	-	-	SB	18-425 #6		
3393	119.2	119.2	-	-	-	-	SB	↓		
3394	120.7	120.6	-	-	-	-	SB			
3395	122.4	122.5	-	-	-	-	SB	↓		
3396	119.1	119.1	-	-	-	-	SB			
3397	120.7	120.6	-	-	-	-	SB	↓		
3398	120.2	120.4	-	-	-	-	SB		18-421 #7	
3399	123.5	123.5	-	-	-	-	SB	↓		
3400	120.8	120.7	-	-	-	-	SB			
3401	119.9	120.0	-	-	-	-	SB	↓		
3402	123.2	123.3	10/5 - 13:00	-	-	-	SB			
3403	121.4	121.4	-	-	-	-	SB	18-421 #8		
3404	119.1	119.2	-	-	-	-	SB	↓		
3405	120.9	120.9	-	-	-	-	SB			
3406	117.4	117.4	-	-	-	-	SB	↓		
3407	121.2	121.4	-	-	-	-	SB			
3408	122.3	122.3	-	-	-	-	SB	18-438 #R+D #1		
3409	118.4	118.4	-	-	-	-	SB	↓		
3410	119.7	119.5	-	-	-	-	SB			

Sample Post-Test Analysis Sheet:  Probes

Filters

O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109A-100mg

Sample ID	Tare (mg)	Date/Time in Desiccator	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials
3381	122.9	10/13-11:00	10/15-9:00	122.8	10/15-16:00	122.9	-	-	-	-	SB
3382	120.0	↓	↓	120.3	↓	120.4	-	-	-	-	SB
3383	121.1	↓	↓	126.2	↓	126.1	-	-	-	-	SB
3384	123.1	↓	↓	122.9	↓	122.9	-	-	-	-	SB
3385	120.7	↓	↓	126.8	↓	126.7	-	-	-	-	SB
3386	123.3	↓	↓	123.4	↓	123.4	-	-	-	-	SB
3387	119.4	↓	↓	120.4	↓	120.4	-	-	-	-	SB
3388	119.9	↓	↓	122.5	↓	122.6	-	-	-	-	SB
3389	123.4	↓	↓	122.9	↓	123.0	-	-	-	-	SB
3390	119.5	↓	↓	122.9	↓	123.0	-	-	-	-	SB
3391	120.9	↓	↓	120.5	↓	120.6	-	-	-	-	SB
3392	122.6	10/16-15:40	10/17-16:00	123.2	10/19-8:00	123.2	-	-	-	-	SB
3393	119.2	↓	↓	119.3	↓	119.3	-	-	-	-	SB
3394	120.6	↓	↓	120.6	↓	120.5	-	-	-	-	SB
3395	122.5	↓	↓	122.9	↓	123.0	-	-	-	-	SB
3396	119.1	↓	↓	119.0	↓	119.0	-	-	-	-	SB
3397	120.6	↓	↓	120.7	↓	120.6	-	-	-	-	SB
3398	120.4	10/25-8:15	10/26/18-8:30	120.4	10/28-14:30	120.5	-	-	-	-	SB
3399	123.5	↓	↓	124.1	↓	124.1	-	-	-	-	SB
3400	120.7	↓	↓	120.4	↓	120.3	-	-	-	-	SB
3401	120.0	↓	↓	121.1	↓	121.1	-	-	-	-	SB
3402	123.3	↓	↓	123.0	↓	123.1	-	-	-	-	SB
3403	121.4	↓	↓	123.8	↓	123.8	-	-	-	-	SB
3404	119.2	↓	↓	119.0	↓	119.0	-	-	-	-	SB
3405	120.9	↓	↓	121.0	↓	121.0	-	-	-	-	SB
3406	117.4	↓	↓	120.8	↓	120.8	-	-	-	-	SB
3407	121.4	↓	↓	120.7	↓	120.7	-	-	-	-	SB
3408	-	-	-	-	-	-	-	-	-	-	-
3409	-	-	-	-	-	-	-	-	-	-	-
3410	-	-	-	-	-	-	-	-	-	-	-



Sample Pre-Test Tare Sheet:  Probes

Filters

O-Rings

Date/Time In Desiccator: 9/24-8:00

Balance ID#: 107

Audit Weight ID# / Weight(mg): 109 B - 200mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
1A	9/27-7:30	115629.0	9/28-9:30	115628.6	10/1-7:40	115628.8	-	-	JB	18-425 #1
1B		115909.1		115909.1	-	-	-	-	JB	18-425 #1
2A		116240.5		116240.5	-	-	-	-	JB	18-425 #2
2B		116330.5		116330.6	-	-	-	-	JB	18-425 #2
3A		116073.9		116073.9	-	-	-	-	JB	18-425 #3
3B		116340.6		116340.9	10/1-7:40	116340.8	-	-	JB	18-425 #3
4A		116183.2		116183.3	-	-	-	-	JB	18-425 #4
4B		116365.9		116366.0	-	-	-	-	JB	18-425 #4
5A		116770.2		116770.2	-	-	-	-	JB	18-425 #5
5B		116880.4		116880.5	-	-	-	-	JB	18-425 #5
6A		116564.9		116565.1	-	-	-	-	JB	18-421 #1
6B		116117.4		116117.4	-	-	-	-	JB	18-421 #1
7A	10/3-7:15	116740.0		116740.1	-	-	-	-	JB	18-421 #2
7B		117304.9		117305.0	-	-	-	-	JB	18-421 #2
8A		116829.7		116829.9	-	-	-	-	JB	18-421 #3
8B		116825.4		116825.4	-	-	-	-	JB	18-421 #3
9A		116713.4		116713.2	-	-	-	-	JB	18-421 #4
9B		117134.9		117135.2	10/5-8:25	117135.3	-	-	JB	18-421 #4
10A		116826.5		116826.3	-	-	-	-	JB	18-421 #5
10B		117168.0		117167.5	10/5-8:25	117167.5	-	-	JB	18-421 #5
11A		117034.7		117034.8	-	-	-	-	JB	18-421 #6
11B		116673.9		116674.0	-	-	-	-	JB	18-421 #6
12A		116888.0		116888.1	-	-	-	-	JB	18-425 #6
12B		117051.8		117051.9	-	-	-	-	JB	18-425 #6
13A		117456.4		117456.5	-	-	-	-	JB	18-421 #7
13B		117065.3		117065.2	-	-	-	-	JB	18-421 #7
14A	10/19-8:00	116816.1	10/22-8:00	116816.2	-	-	-	-	JB	18-421 #8
14B	10/19-8:00	116770.3	10/22-8:00	116770.2	-	-	-	-	JB	18-421 #8

Sample Post-Test Analysis Sheet:  Probes

Filters

O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 1098-200 mg

Sample ID	Tare (mg)	Date/ Time in Desiccator*	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
1A	115628.8	10/1-16:30	10/2-17:00	115629.7	10/3-7:15	115629.1	10/4-9:00	115629.0	-	-	SB
1B	115903.1	10/1-16:30	10/2-17:00	115903.9	10/3-7:15	115903.2	10/4-9:00	115903.1	-	-	SB
2A	116240.5	10/2-17:25	10/3-18:00	116240.4	10/4-9:00	116240.5	-	-	-	-	SB
2B	116330.6	10/2-17:25	10/3-18:00	116330.7	10/4-9:00	116330.6	-	-	-	-	SB
3A	116073.9	-	-	-	-	-	-	-	-	-	SB
3B	116340.8	-	-	-	-	-	-	-	-	-	SB
4A	116183.5	10/5-7:30	10/13-11:00	116183.5	10/15-8:00	116183.4	-	-	-	-	SB
4B	116366.0	10/5-7:30	10/13-11:00	116366.2	10/15-8:00	116366.1	-	-	-	-	SB
5A	116770.2	10/5-13:30	10/13-11:00	116770.4	10/15-8:00	116770.4	-	-	-	-	SB
5B	116880.5	10/5-13:30	10/13-11:00	116880.8	10/15-8:00	116880.7	-	-	-	-	SB
6A	116565.1	10/13-11:00	10/15-8:00	116565.0	10/15-16:00	116565.1	-	-	-	-	SB
6B	116117.4	↓	10/15-8:00	116117.4	10/15-16:00	116117.4	-	-	-	-	SB
7A	116740.1	↓	10/15-8:00	116740.2	10/15-16:00	116740.1	-	-	-	-	SB
7B	117305.0	↓	10/15-8:00	117305.1	10/15-16:00	117305.2	-	-	-	-	SB
8A	116829.7	↓	10/15-8:00	116829.7	10/15-16:00	116829.8	-	-	-	-	SB
8B	116825.4	↓	10/15-8:00	116825.2	10/15-16:00	116825.3	-	-	-	-	SB
9A	116713.2	↓	10/15-8:00	116713.6	10/15-16:00	116713.6	-	-	-	-	SB
9B	117135.2	↓	10/15-9:00	117135.6	10/15-16:00	117135.6	-	-	-	-	SB
10A	116826.3	↓	10/15-8:00	116826.5	10/15-16:00	116826.4	-	-	-	-	SB
10B	117167.5	↓	10/15-8:00	117168.1	10/15-16:00	117167.9	-	-	-	-	SB
11A	117034.8	↓	10/15-8:00	117034.9	10/15-16:00	117034.9	-	-	-	-	SB
11B	116674.0	↓	10/15-8:00	116673.9	10/15-16:00	116673.9	-	-	-	-	SB
12A	116888.1	10/16-15:40	10/17-16:00	116888.0	10/19-8:00	116888.1	-	-	-	-	SB
12B	117051.9	10/16-15:40	10/17-16:00	117052.1	10/19-8:00	117052.0	-	-	-	-	SB
13A	117456.5	10/25-8:15	10/26-8:30	117456.5	10/28-14:30	117456.6	-	-	-	-	SB
13B	117065.2	10/25-8:15	10/26-8:30	117065.1	10/28-14:30	117065.3	-	-	-	-	SB
14A	116816.2	10/25-8:15	10/26-8:30	116816.3	10/28-14:30	116816.3	-	-	-	-	SB
14B	116770.2	10/25-8:15	10/26-8:30	116770.2	10/28-14:30	116770.1	-	-	-	-	SB

Sample Pre-Test Tare Sheet:  Probes

Filters

O-Rings

Date/Time In Desiccator: 9/24 - 8:00

Balance ID#: 107

Audit Weight ID# / Weight(mg): 109B-200mg

Sample ID	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Tech. Initials	Project/Run #
1A	9/27-7:30	3566.5	9/28-9:30	3566.5	-	-	-	-	SB	18-425 #1
1B		3555.0		3554.9	-	-	-	-	SB	18-425 #1
2A		3552.5		3552.4	-	-	-	-	SB	18-425 #2
2B		3571.2		3571.0	-	-	-	-	SB	18-425 #2
3A		3580.5		3579.8	10/1-7:40	3580.0	-	-	SB	18-425 #3
3B		3568.8		3568.3	10/1-7:40	3568.3	-	-	SB	18-425 #3
4A		3593.2		3593.2	-	-	-	-	SB	18-425 #4
4B		3580.9		3581.0	-	-	-	-	SB	18-425 #4
5A		3534.3		3534.4	-	-	-	-	SB	18-425 #5
5B		3530.7		3530.7	-	-	-	-	SB	18-425 #5
6A		3615.5		3615.6	-	-	-	-	SB	18-421 #1
6B		3396.5		3396.5	-	-	-	-	SB	18-421 #1
7A	10/3-7:15	3573.4	10/4-0:00	3573.4	-	-	-	-	SB	18-421 #2
7B		3521.4		3521.9	10/3-8:25	3521.8	-	-	SB	18-421 #2
8A		3551.5		3551.3	-	-	-	-	SB	18-421 #3
8B		3584.8		3584.8	-	-	-	-	SB	18-421 #3
9A		3581.0		3581.1	-	-	-	-	SB	18-421 #4
9B		3523.8		3523.8	-	-	-	-	SB	18-421 #4
10A		3430.9		3430.9	-	-	-	-	SB	18-421 #5
10B		3569.9		3570.1	-	-	-	-	SB	18-421 #5
11A		3423.8		3424.0	-	-	-	-	SB	18-421 #6
11B		4234.7		4234.6	-	-	-	-	SB	18-421 #6
12A		3432.4		3432.6	-	-	-	-	SB	18-425 #6
12B		3404.6		3404.6	-	-	-	-	SB	18-425 #6
13A		3461.2		3460.7	10/5-8:25	3460.8	-	-	SB	18-421 #7
13B		3501.1		3500.5	10/5-8:25	3500.6	-	-	SB	18-421 #7
14A	10/19-8:00	3367.2	10/22-8:00	3366.8	-	-	-	-	SB	18-421 #8
14B	10/19-8:00	3341.0	10/22-8:00	3340.0	-	-	-	-	SB	18-421 #8

Sample Post-Test Analysis Sheet:  Probes  Filters  O-Rings

Balance ID#: 107 Audit Weight ID# / Weight (mg): 109B-2amg

Sample ID	Tare (mg)	Date/ Time in Desiccator	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Date/ Time	Weight (mg)	Tech. Initials
1A	3566.5	10/1-16:30	10/2-17:00	3567.3	10/3-7:15	3567.2	-	-	-	-	SB
1B	3554.9	10/1-16:30	10/2-17:00	3555.6	10/3-7:15	3555.6	-	-	-	-	SB
2A	3552.4	10/2-17:25	10/3-18:00	3553.4	10/4-9:00	3553.5	-	-	-	-	SB
2B	3571.0	10/2-17:25	10/3-18:00	3571.8	10/4-9:00	3571.8	-	-	-	-	SB
3A	3580.0	-	-	-	-	-	-	-	-	-	SB
3B	3568.3	-	-	-	-	-	-	-	-	-	SB
4A	3593.2	10/5-7:30	10/13-11:00	3593.8	10/15-8:00	3593.8	-	-	-	-	SB
4B	3581.0	10/5-7:30	10/13-11:00	3581.6	10/15-8:00	3581.6	-	-	-	-	SB
5A	3534.4	10/5-13:30	10/13-11:00	3535.2	10/15-8:00	3535.3	-	-	-	-	SB
5B	3530.7	10/5-13:30	10/13-11:00	3531.7	10/15-8:00	3531.7	-	-	-	-	SB
6A	3615.6	10/13-11:00	10/15-8:00	3615.9	10/15-16:00	3615.8	-	-	-	-	SB
6B	3396.5		10/15-8:00	3397.3	10/15-16:00	3397.3	-	-	-	-	SB
7A	3573.4		10/15-8:00	3574.5	10/15-16:00	3574.5	-	-	-	-	SB
7B	3521.8		10/15-8:00	3522.0	10/15-16:00	3523.0	-	-	-	-	SB
8A	3551.3		10/15-8:00	3552.0	10/15-16:00	3552.0	-	-	-	-	SB
8B	3584.8		10/15-8:00	3585.9	10/15-16:00	3586.0	-	-	-	-	SB
9A	3581.1		10/15-8:00	3582.2	10/15-16:00	3582.2	-	-	-	-	SB
9B	3523.8		10/15-8:00	3525.0	10/15-16:00	3524.9	-	-	-	-	SB
10A	3430.9		10/15-8:00	3432.1	10/15-16:00	3432.2	-	-	-	-	SB
10B	3570.1		10/15-8:00	3571.2	10/15-16:00	3571.1	-	-	-	-	SB
11A	3424.0		10/15-8:00	3425.1	10/15-16:00	3425.1	-	-	-	-	SB
11B	4234.6		10/15-8:00	4236.2	10/15-16:00	4236.2	-	-	-	-	SB
12A	3432.6	10/16-15:40	10/17-16:00	3434.0	10/19-8:00	3433.9	-	-	-	-	SB
12B	3404.6	10/16-15:40	10/17-16:00	3405.7	10/19-8:00	3405.7	-	-	-	-	SB
13A	3460.8	10/25-8:15	10/26-8:30	3461.7	10/28-14:30	3461.7	-	-	-	-	SB
13B	3500.6	10/25-8:15	10/26-8:30	3501.4	10/28-14:30	3501.3	-	-	-	-	SB
14A	3366.8	10/25-8:15	10/26-8:30	3367.9	10/28-14:30	3367.9	-	-	-	-	SB
14B	3340.6	10/25-8:15	10/26-8:30	3342.0	10/28-14:30	3342.1	-	-	-	-	SB

# EPA Method 28R Weighted Average Emissions

Client: Valley Comfort Systems Inc.  
 Stove Model: PE32  
 Test Dates: 10/8/18 - 10/10/18  
 Job Number: 18-421

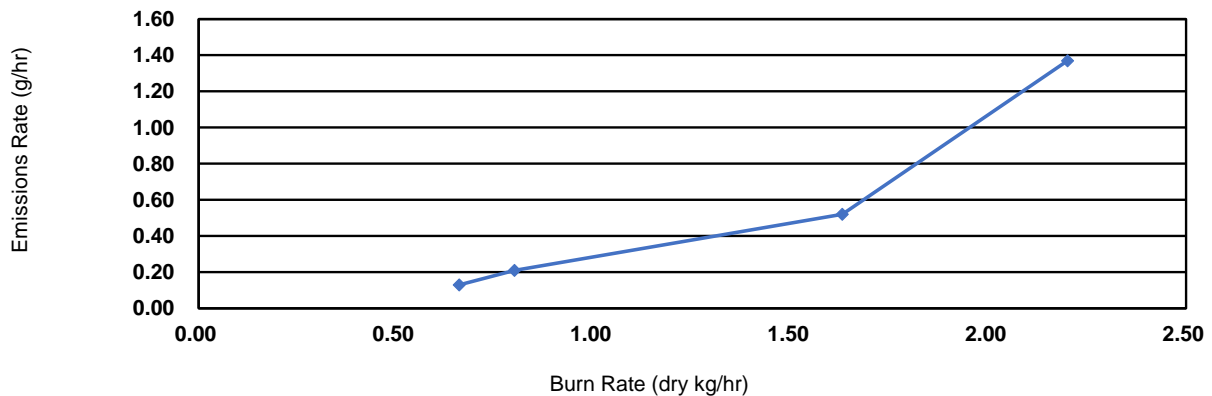
Signature/Date:  10/23/2018

<b>Weighted Average Particulate Emissions (g/hr):</b>	<b>0.4</b>
<b>Weighted Average HHV Efficiency (%):</b>	<b>79.9%</b>
<b>Weighted Average LHV Efficiency (%):</b>	<b>86.3%</b>
<b>Average CO Emissions (g/min):</b>	<b>0.5</b>

### Individual Run Summaries

<p>Run Number: 2                  Burn Rate (dry kg/hr): 0.66                  Emissions Rate (g/hr): 0.13                  HHV Efficiency (%): 82.2%                  LHV Efficiency (%): 88.9%                  Weighting Percentage (%): 12.16%</p>	<p>Run Number: 1                  Burn Rate (dry kg/hr): 0.80                  Emissions Rate (g/hr): 0.21                  HHV Efficiency (%): 80.6%                  LHV Efficiency (%): 87.1%                  Weighting Percentage (%): 38.04%</p>
<p>Run Number: 3                  Burn Rate (dry kg/hr): 1.63                  Emissions Rate (g/hr): 0.52                  HHV Efficiency (%): 79.3%                  LHV Efficiency (%): 85.7%                  Weighting Percentage (%): 39.58%</p>	<p>Run Number: 4                  Burn Rate (dry kg/hr): 2.20                  Emissions Rate (g/hr): 1.37                  HHV Efficiency (%): 76.7%                  LHV Efficiency (%): 82.9%                  Weighting Percentage (%): 10.23%</p>

**Emission Rate vs Burn Rate Plot**



# Blaze King

## PRINCESS PE32 SOLID FUEL CATALYTIC STOVE



**PE32 Firebox with  
Z4786 Door and  
Z1713 Parlor Leg Kit**



**PE32 Firebox with  
Z4786 Door and  
Z3284 Classic Base Kit**



**PE32 Firebox with  
Z4786 Door and  
Z3903 Pedestal Kit**



U.S. Environmental Protection Agency certified to comply with 2020 particulate emission standards using crib wood.



**Installer: Please complete the details on the back cover  
and leave this manual with the homeowner.  
Homeowner: Please SAVE THESE INSTRUCTIONS for future reference.**

The authority having jurisdiction (such a municipal building department, fire department, etc.) should be consulted before installation to determine the need to obtain a permit.

## OPERATION & INSTALLATION MANUAL

### Manufactured By

**Valley Comfort Systems Inc.**, 1290 Commercial Way, Penticton, BC, V2A 3H5, Canada

In Canada: Phone 250-493-7444, Fax 250-493-5833

In USA: Phone 509-522-2730, Fax 509-522-1701

web: [www.blazeking.com](http://www.blazeking.com), email: [info@blazeking.com](mailto:info@blazeking.com)

Pour la version française de nos manuels S.V.P. vous référez à notre site web: [www.blazeking.com](http://www.blazeking.com)

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**⚠ WARNING**

- **THIS APPLIANCE IS HOT WHEN OPERATED AND CAN CAUSE SEVERE BURNS IF CONTACTED. ANY CHANGES OR ALTERATIONS TO THIS APPLIANCE OR ITS CONTROLS CAN BE DANGEROUS AND IS PROHIBITED BY FEDERAL AND STATE LAWS.**
- Do not operate appliance before reading and understanding operating instructions. Failure to operate appliance according to operating instructions could cause fire or injury.
- Before installing this appliance, contact the local building or fire authority and follow their guidelines.
- This appliance must be installed by a qualified installer.
- Risk of burns. The appliance should be turned off and cooled before servicing.
- Do not operate without fully assembling all components.
- Do not let the appliance become hot enough for any part to glow red.
- Do not install damaged, incomplete or substitute components.
- Risk of cuts and abrasions. Wear protective gloves and safety glasses during installation. Sheet metal edges may be sharp.
- Children and adults should be alerted to the hazards of high surface temperature and should stay away to avoid burns or clothing ignition.
- Young children should be carefully supervised when they are in the same room as the appliance. Toddlers, young children and others may be susceptible to accidental contact burns. A physical barrier is recommended if there are at risk individuals in the house. To restrict access to an appliance or appliance, install an adjustable safety gate to keep toddlers, young children and other at risk individuals out of the room and away from hot surfaces.
- Clothing or other flammable material should not be placed on or near the appliance. Objects placed in front of the appliance must be kept a minimum of 48" away from the front face of the appliance.
- Due to high temperatures, the appliance should be located out of traffic and away from furniture and draperies.
- Ensure you have incorporated adequate safety measure to protect infants / toddlers from touching hot surfaces.
- Even after the appliance is out, all surfaces, including the glass and/or any attachment will remain hot for an extended period of time.
- Check with your local hearth specialty dealer for safety hearth guards to protect children from hot surfaces. These guards must be fastened to a wall and/or to the floor.
- Any safety guard removed for servicing must be replaced prior to operating the appliance.
- Under no circumstances should this appliance be modified.
- This appliance must not be connected to a chimney flue pipe servicing a separate solid fuel burning appliance.
- Do not operate the appliance with the glass door removed, cracked or broken. Replacement of the glass should be done by a licensed or qualified service person.
- Do not strike or slam shut the appliance glass door.
- Operate only with the doors tightly closed.
- Appliance will over-fire if door is not shut and latched.
- Only certified doors / optional fronts / and surrounds for inserts with the unit are to be installed on the appliance.
- Keep the packaging material out of reach of children and dispose of the material in a safe manner. As with all plastic bags, these are not toys and should be kept away from children and infants.
- If the appliance is not properly installed, a house fire may result. Do not expose the appliance to the elements (rain, etc.) and keep the appliance dry at all times.
- The chimney must be sound and free of cracks and obstructions. Clean your chimney regularly as required.
- Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or 'freshen up' a fire in this heater. Keep all such liquids well away from the heater while it is in use.
- Your appliance requires periodic maintenance and cleaning. Failure to maintain your appliance may lead to smoke spillage in your home.
- Higher efficiencies and lower emissions will generally result when burning air dried seasoned woods, as compared to wet, green or freshly cut wood. Burning wet unseasoned wood can cause excessive creosote accumulation. When ignited it can cause a chimney fire that may result in a serious house fire.
- The appliance is designed to burn seasoned wood only. Do not burn treated wood, coal, charcoal, colored paper, cardboard, solvents or garbage.
- Burn wood directly on the firebricks. Do not use a grate or elevate the fire.
- Do not store wood within appliance installation clearances or within the space required for re-fueling and ash removal.
- Ashes must be disposed in a metal container with a tight lid and placed on a non-combustible surface well away from the home or structure until completely cool.

**CALIFORNIA PROPOSITION 65**

**WARNING:** This product can expose you to chemicals including benzene, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information:

**[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

Model	Princess PE32 (catalytic)
Height (w/ Z1713 Parlor Leg Kit)	33 1/4" (845 mm)
Height (w/ Z3284 Classic Base Kit)	30 3/8" (772 mm)
Height (w/ Z3903 Pedestal Kit)	35 1/8" (893 mm)
Width	27" (686 mm) (without removable bypass handle)
Depth	29 3/8" (747 mm) (without optional fan kit)
Flue collar	6" I.D.
Fire door opening	16 1/2" x 8 3/4" (420 mm x 223 mm)
Firebox depth	17 1/2" (445 mm) brick to brick, 19" (483 mm) brick to glass
Firebox width	20 1/2" (521 mm)
Firebox height	12 1/2" (318 mm)
Firebox capacity	2.91 cu. ft.
Recommended Fuel length	16" max. (407 mm)
Wood capacity (approximate):	White oak - 60 lbs. (27.2 kg)
	Fir - 40 lbs. (18.1 kg)
Construction	10 gauge & 1/4" firebox, brick lined 16 gauge outer shields
Shipping Weight (Firebox only)	368 lbs. (166.9 kg)
Shipping Weight (Pedestal only)	50 lbs. (22.7 kg)
Shipping Weight (Legs only)	20 lbs. (9.1 kg)
Chimney recommendation (Minimum)	15' from stove top to chimney cap: Insulated liner recommended

This unit was tested and listed UL 1482-2011(R2015) and ULC-S627-00 (R2016) by PFS testing laboratories.

This manual describes the installation and operation of the Princess PE32 catalytic equipped wood heater.

This heater is certified to comply with the 2020 U.S. Environmental Protection Agency's particulate emission standards using crib wood.

Under specific test conditions this heater has been shown to deliver heat at rates ranging from 9114 to 30381 Btu/hr.

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

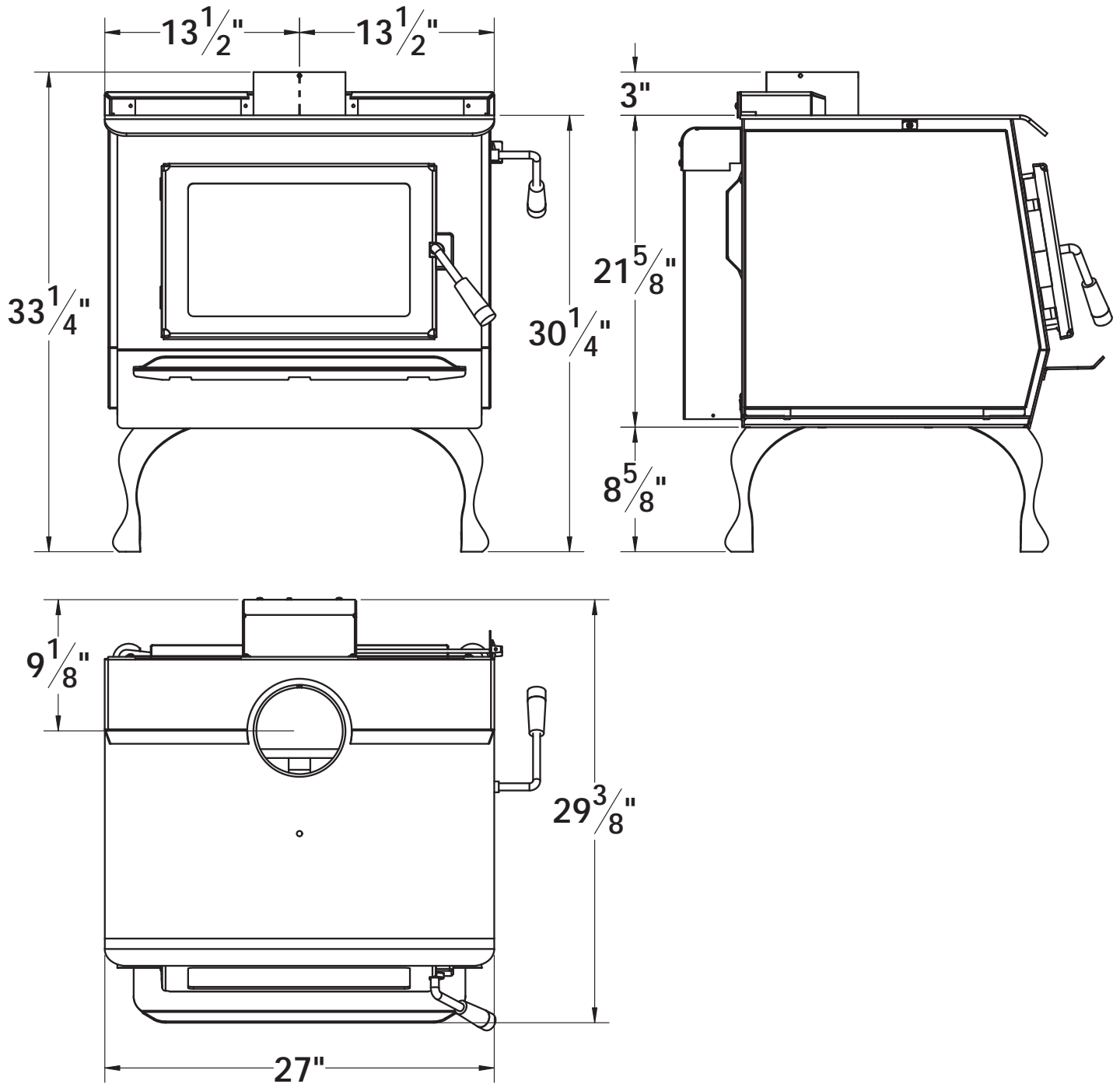
This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed.

The combustor supplied with this heater is a 115-0556 or 115-0336-A-M metal combustor. Consult the catalytic combustor warranty also supplied with this wood heater. Warranty claims should be addressed to:

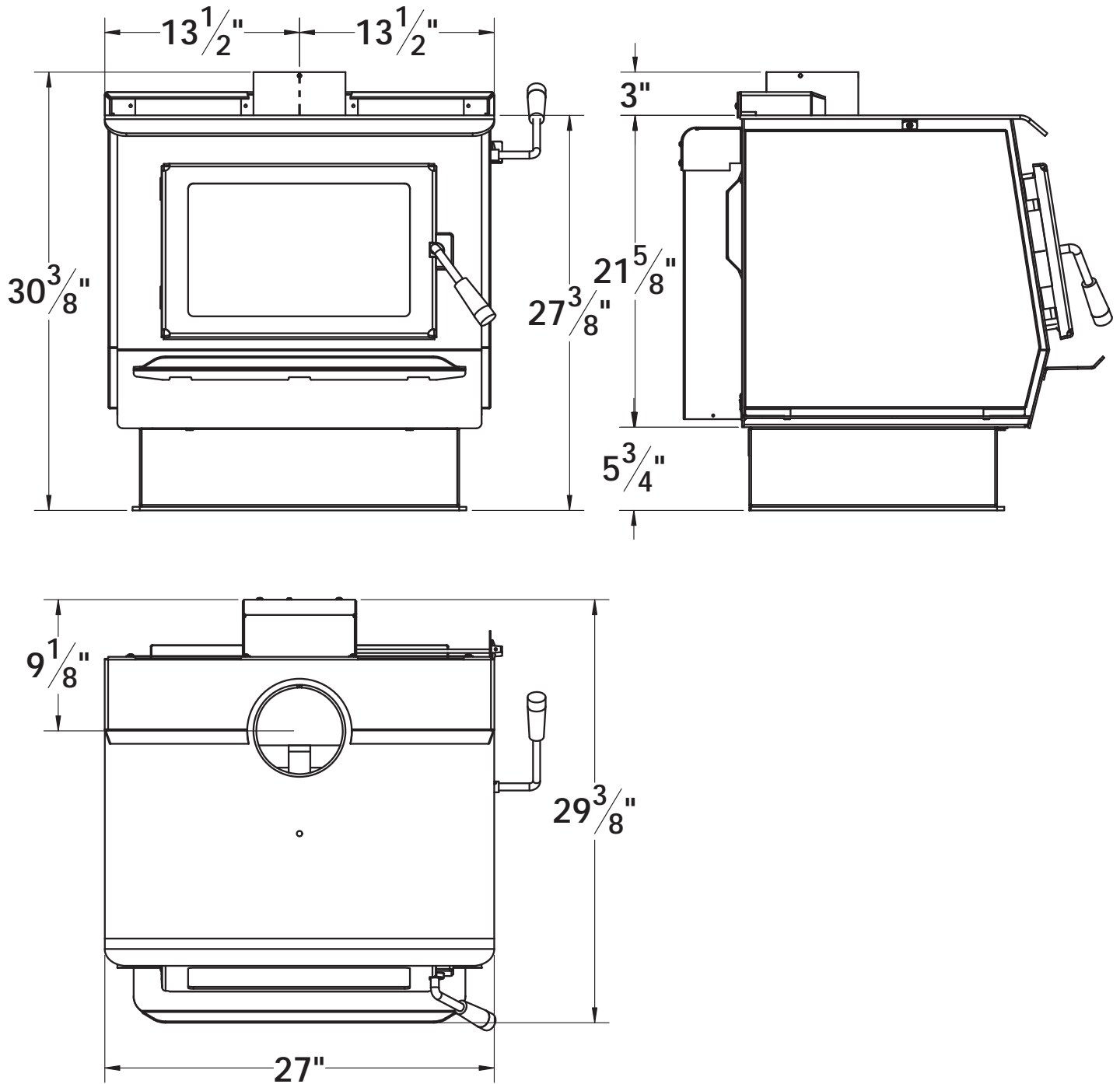
EMISSIONS	CO Average(%)	g/hr
Low Burn	0.29	0.21
Med-low Burn	0.09	0.13
Med-high Burn	0.31	0.52
High Burn	1.48	1.37
<b>EPA emission rate weighted average</b>		<b>0.44 g/hr</b>

in Canada	in USA
Blaze King Industries / Valley Comfort Systems Warranty Department, 1290 Commercial Way Penticton, BC Canada V2A 3H5, Ph: 250-493-7444	Blaze King Industries Warranty Department, 146 A Street Walla Walla, Washington 99362, Ph: 509-522-2730

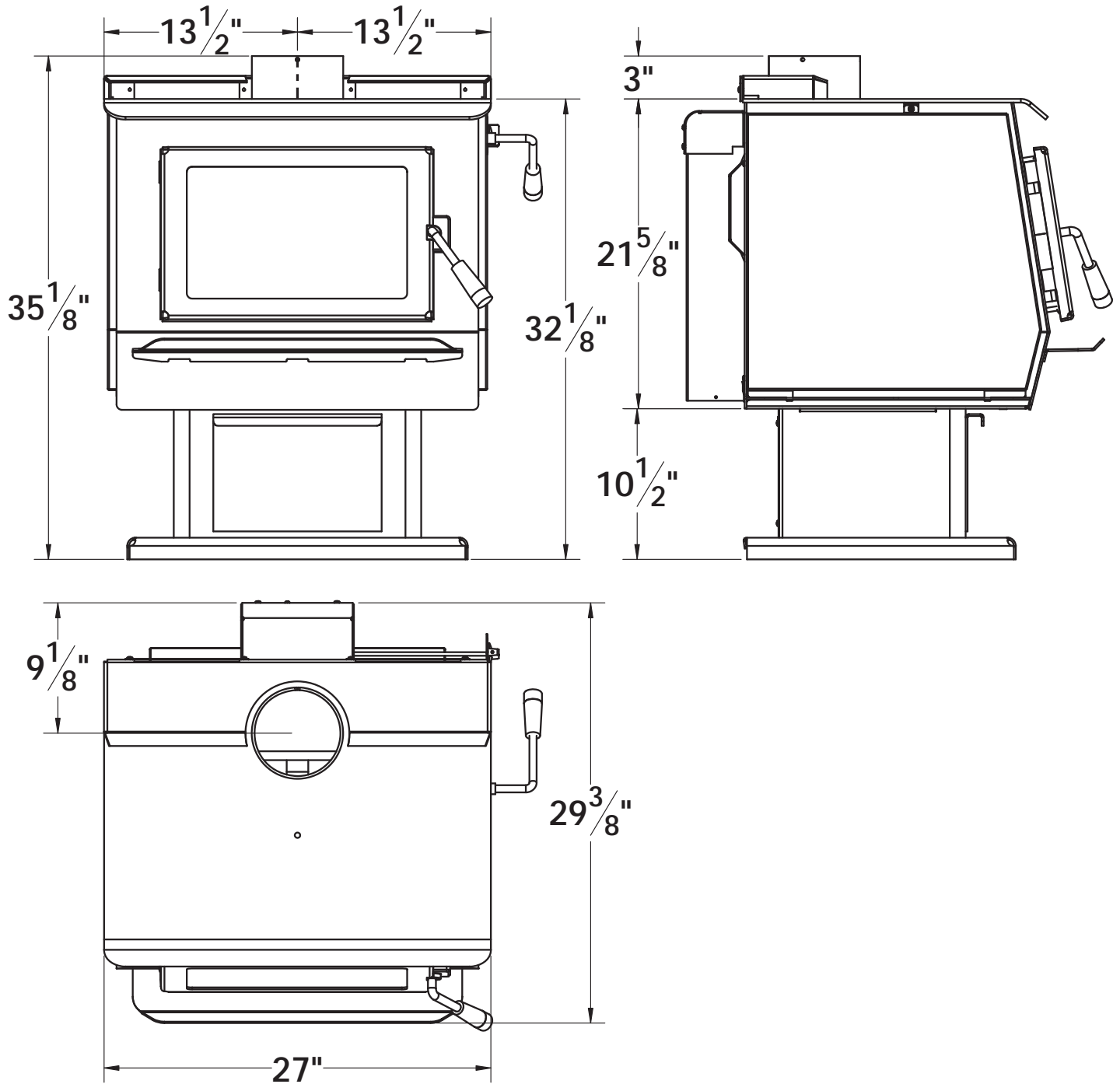
APPLIANCE DIMENSIONS - Princess PE32 with Door and Parlor Leg Kit



APPLIANCE DIMENSIONS - Princess PE32 with Door and Classic Base Kit



APPLIANCE DIMENSIONS - Princess PE32 with Door and Pedestal Kit





## PRINCESS PE32

**SN - 28.**

### BLAZE KING CATALYST STOVE - POÊLE À BOIS CATALYTIQUE

ROOM HEATER, SOLID FUEL TYPE, ALSO FOR USE IN MOBILE HOMES. / APPAREIL APPROUVÉ DE TYPE CARBURANT SOLIDE, AUSSI ADAPTÉ POUR INSTALLER DANS UNE MAISON MOBILE.

SUITABLE FOR MOBILE-HOME INSTALLATION / CONÇU POUR MAISONS MOBILES.

MODEL / MODÈLE: PE32  
 Tested to / Testé: UL 1482-2011(R2015) / ULC-S627-00 (R2016)  
 CERTIFIED IN BOTH UNITED STATES AND CANADA / CERTIFIÉ POUR LES ÉTATS-UNIS ET LE CANADA

PFS report#:F18-420

**PREVENT HOUSE FIRES-** Install and use only in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. The flue size is 6".

**CHIMNEYS: DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.** Except for installation detailed below, use 6" listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA or a masonry residential type chimney.

Mobile home, residential close clearance, and residential alcove installations require a 6" listed double wall close clearance chimney connector, with matching listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA. Mobile Home installations are only allowed with a roof exit. Do not install in a sleeping room. Passing through a wall or ceiling requires special methods: see instructions and local building codes.

**POUR PRÉVENIR UN INCENDIE -** Installer et employer seulement selon le manuel d'installation de Blaze King. Contacter les autorités locales en bâtiments ou en matière de prévention d'incendies au sujet des normes d'inspection et d'installation dans votre secteur. La dimension des conduits de cheminée est de 6".

**CHEMINÉES: NE PAS CONNECTER CETTE UNITÉ À UNE CONDUITE DE CHEMINÉE SERVANT UN AUTRE APPAREIL.** Excepté pour les situations détaillées ci-dessous, employer une cheminée de 6" homologuée par le fabricant à des fins d'utilisation pour combustibles solides conformément à la norme ULC629 au Canada ou UL-103HT aux États-Unis ou employer une cheminée en maçonnerie de type résidentiel.

L'installation dans une maison mobile, en espace restreint ou dans des endroits à faible dégagement, requiert l'utilisation de connecteurs muraux à doubles parois et ayant une épaisseur 6" pour la cheminée. Ceux-ci doivent être homologués par le fabricant à des fins d'utilisation pour combustibles solides conformément à la norme ULC629 au Canada ou UL-103HT aux États-Unis. L'installation dans une maison mobile est permise seulement avec une sortie passant par le toit. Ne pas installer dans une chambre à coucher. Passer à travers un mur ou un plafond requiert une méthode spécifique décrite dans les instructions et dans le code local du bâtiment.

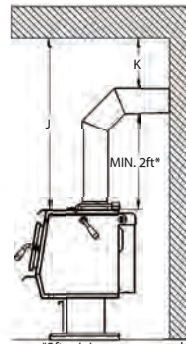
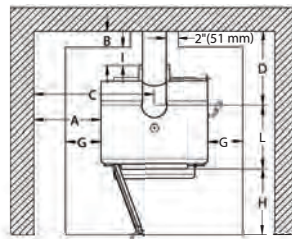
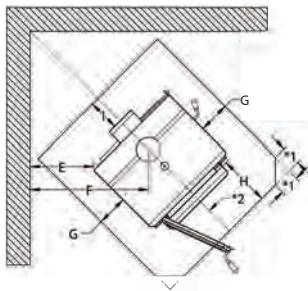
**MINIMUM CLEARANCES TO COMBUSTIBLES (See owners manual for complete description of all requirements)**

**DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)**

Residential Installations	A	B	C	D	E	F	J
Roof exit, parallel and corner. Sortie de toit, parallèle et coin.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125* 385 mm	4" 102 mm	17.125* 435 mm	44" 1118 mm
Wall exit, parallel and corner. Sortie de mur, parallèle et coin.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125* 385 mm	4" 102 mm	17.125* 435 mm	44* 1118 mm
Alcove roof exit. Fan kit or rear shield required. Sortie de toit en alcôve. Kit de ventilateur et protection arrière requise.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125* 385 mm	N/A	N/A	44" 1118 mm
Mobile Home Installations							
Roof exit, parallel and corner. Fan kit or rear shield required. Outside air kit required. La sortie du toit, parallèle et en coin. Kit de ventilateur et protection arrière requise. Kit d'air extérieur requis.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125* 385 mm	4" 102 mm	17.125* 435 mm	44" 1118 mm

\*Check with local codes and pipe manufacturers for pipe clearances. In Canada 18" clearances from single wall pipe is required.

\* Vérifier avec le code du bâtiment local et avec le fabricant de tuyaux pour les dégagements. Au Canada un dégagement de 18 po est exigé pour un tuyau à simple paroi.



- G - 3" (77 mm) in U.S.A.  
8" (203 mm) in Canada
- H - 16" (406 mm) in U.S.A.  
18" (456 mm) in Canada
- I - 0" (0 mm) in U.S.A.  
8" (203 mm) in Canada
- K - 18" (456 mm) \*
- L - 17.375" (442 mm)
- ALCOVE
- min. width / min. largeur 47"
- max. depth / max. profondeur 48"
- min. height above stove / hauteur min. au-dessus du poêle 44"

\*3ft minimum recommended

Floor protection may be any non-combustible material or Listed Floor Protector, and must extend at least 18" (456 mm) in Canada or 16" (406 mm) in U.S.A., in front of the loading door opening; In USA minimum size is 32 3/4" x 42 1/2" (832 mm x 1080 mm). In Canada, minimum size is 43" x 52 1/2" (1093 mm x 1334 mm)

US ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using crib wood. (EPA test methods 28R/5G with an emission-rate of 0.44g/hr). This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in the owner's manual, or if the catalytic element is deactivated or removed.

\*ONLY OPERATE WITH DOORS CLOSED. Open door to feed fire ONLY. \*DO NOT OBSTRUCT COMBUSTION AIR OPENINGS. Do not obstruct the space beneath the heater. For Use With Solid Wood Fuel Only - Do not burn other fuels, this may make the catalyst in the combustor inactive. The performance of the catalytic device or its durability has not been evaluated as part of the certification. Combustor part number: 115-0556 or 115-0336-A-M. Provide adequate outside air for combustion. \*Replace with only ceramic glass, 5 mm. thickness. Unit must be installed with Blaze King Leg Kit Z1713BK, Classic Base Z3903BK, or Pedestal Kit Z2903BK provided, attach as shown in the installation instructions.

La protection de plancher peut être de n'importe quel matériel non combustible ou Protecteur de plancher approuvé, et doit se prolonger au moins de 18" (456 mm) au Canada ou 16" (406 mm) aux États-Unis devant la porte de chargement; Aux États-Unis, la taille minimum est de 32 3/4" x 42 1/2" (832 mm x 1080 mm). Au Canada la taille minimum est de 43" x 52 1/2" (1093 mm x 1334 mm)

L'AGENCE DE PROTECTION ENVIRONNEMENTALE DES U.S. - Certifié conformément aux normes d'émission de particules 2020, en utilisant du bois machiné (méthodes d'essai EPA 28R / 5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.44g/hre). Cet appareil de chauffage au bois nécessite des inspections périodiques et des réparations pour un fonctionnement adéquat. Consulter le manuel du propriétaire pour plus d'informations. Il est contre les règlements fédéraux de faire fonctionner cet appareil de chauffage à l'encontre des instructions d'utilisation fournies dans le manuel du propriétaire, ou si l'élément catalytique est enlevé ou désactivé.

\*Utiliser le uniquement avec les portes fermées. Ouvrir la porte pour alimenter le feu SEULEMENT. \*Ne pas obstruer l'entrée d'air de combustion. Fournir l'apport d'air extérieur adéquat pour alimenter la combustion. Ne pas obstruer l'espace sous l'appareil. Utiliser uniquement avec des combustibles solides - ne pas brûler aucun autre combustible, ce qui peut rendre le catalyseur de la chambre à combustion inactif. La performance du catalyseur ou sa longévité n'a pas été évaluée dans le cadre de la certification. Numéro du catalyseur: 115-0556 ou 115-0336-A-M. \*Employer seulement le verre en céramique d'une épaisseur de 5mm si le remplacement est nécessaire. L'appareil doit être installé avec le Blaze King kit de jambe Z1713BK, Base Classique Z3903BK, ou Piédestal Kit Z2703BK fourni, attache comme indiqué dans les instructions d'installation.

**MANUFACTURED IN**

USA:  
 Blaze King Industries  
 146A Street  
 Walla Walla, WA.  
 99362

CANADA:  
 Valley Comfort Systems  
 1290 Commercial Way  
 Penticton, B.C.  
 V2A 3H5

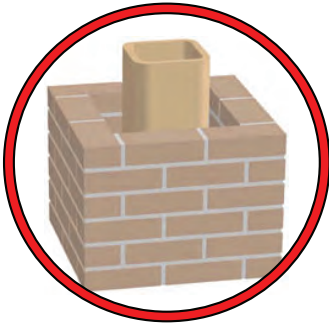
**MANUFACTURE DATE**

JAN  FEB  MAR  APR  MAY  JUN   
 JUL  AUG  SEP  OCT  NOV  DEC   
 2019  2020  2021  2022  2023  2024

170-0242[1025].indd

**IF THIS BLAZE KING APPLIANCE IS NOT PROPERLY INSTALLED OR OPERATED, A HOUSE FIRE MAY RESULT. TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.**

**PLEASE READ THIS ENTIRE MANUAL BEFORE YOU INSTALL AND USE YOUR NEW APPLIANCE. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY, OR EVEN DEATH.**



This appliance must be connected to a listed high temperature (**ULC629 IN CANADA OR UL-103HT IN THE USA**) residential type factory built solid fuel chimney or an approved masonry chimney with a flue liner.

Chimney and chimney connector must be in good condition and kept clean. NEVER vent the stove to other rooms of the building. Must be vented to the outside **ONLY**. NEVER use a chimney or chimney connector smaller than the stove exhaust, unless approved by your local inspector. NEVER vent the stove into a "Class B" gas vent chimney. **DO NOT CONNECT IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATIONS.**



Inspect the chimney connector and chimney regularly during each burning season and clean when necessary.

**DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.**

NEVER intentionally start a chimney fire to clean the flue.



When installed in a mobile home, this appliance must be bolted to the floor and provided with outside air.

**WARNING: DO NOT INSTALL IN A SLEEPING ROOM  
CAUTION: THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.**

Check with local building officials.



If the Optional Fan Kit is installed, connect this unit to a properly grounded, 110-volt electrical outlet. Do not route the power cord in front of or under the appliance.



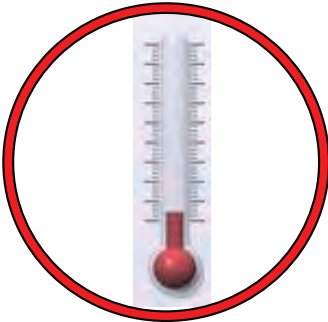
Do not make any changes or modifications to an existing masonry fireplace or chimney to install this appliance. Do not make any changes to the appliance to increase combustion air.



Never try to repair or replace any part of this appliance unless instructions are given in this manual. All other work must be done by a trained technician.



Do not place clothing or other flammable items on or near this appliance.



Allow the appliance to cool down before carrying out any maintenance or cleaning.



**DO NOT OVER FIRE THIS HEATER.** Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to the heater and to the catalytic combustor. Over firing the appliance may cause a house fire. Never burn the appliance so hot that the appliance or chimney connector begins to glow.



Maintain the door and glass seal and keep them in good condition. A leaking door seal will shorten burn times and may harm the combustor.



Do not use a grate or other device to elevate the fire off of the firebox floor. Burn the fire directly on the bricks.



Do not throw this manual away. This manual has important operating and maintenance instructions that you will need at a later time. Always follow the instructions in this manual.



Ashes should be placed in a steel container with a tightly fitting lid and moved outdoors immediately. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.



It is required in some jurisdictions to install smoke and carbon monoxide detectors where heaters are installed. Install at least one smoke detector on each floor of your home to ensure your safety. It should be located away from the wood appliance and close to the sleeping areas. Locating a smoke detector too close to a wood appliance can cause the smoke detector alarm to sound if a puff of smoke is emitted while the wood appliance door is open during reloading. Follow the smoke detector manufacturers placement, installation, and maintenance instructions.



This appliance is designed and approved for burning cord wood only. **DO NOT** burn garbage or flammable fluids such as gasoline, naphtha or engine oil; artificial or paper logs; gift wrappings; coal; lighter fluids; chemical cleaners; chemical starters; treated or painted wood; salt water driftwood or foil-backed paper such as gum wrappers or cigarette packages; lawn clippings or yard waste; materials containing rubber (including tires), plastic, asbestos; waste petroleum products, paints or paint thinners, or asphalt products; construction or demolition debris; railroad ties or pressure-treated wood; manure or animal remains; unseasoned wood or paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in the release of toxic fumes or render the heater ineffective and cause smoke. Burn natural wood only. It will void all warranties and safety listings and may damage the combustor.



Never burn the appliance with the loading door open. Leaving the door cracked open may damage the combustor.

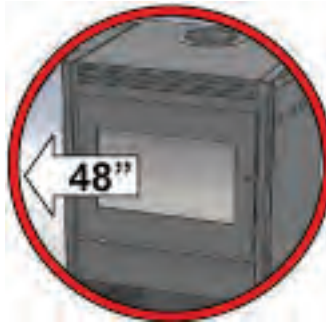
Never block free airflow through vents on this appliance.



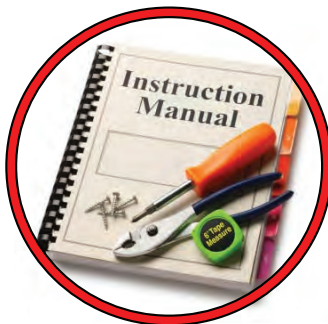
Do not use chemicals or fluids to start the fire. Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or 'freshen up' a fire in this heater. Keep all such liquids well away from the heater while it is in use. Some fuels could generate carbon monoxide and are very dangerous.

**HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.**

Do not touch the appliance when it is hot and educate all children of the danger of a high temperature appliance. Young children should be supervised when they are in the same room as the appliance.



Keep furniture, curtains, wood, paper and other combustibles a minimum of 48in (1219mm) away from the front of the appliance. **ALSO, DO NOT STORE COMBUSTIBLES UNDER THE APPLIANCE (WOOD, PAPER etc.).**



This appliance must be properly installed to prevent the possibility of a house fire. The instructions must be strictly adhered to. Do not use makeshift methods or compromise in the installation.



Contact local building officials to obtain a permit and information on any installation restriction or inspection requirements in your area. Notify your insurance company as well.

**⚠ WARNING**

- BEFORE INSTALLING THIS APPLIANCE, CONTACT THE LOCAL BUILDING OR FIRE OR OTHER AUTHORITY HAVING JURISDICTION AND FOLLOW THEIR GUIDELINES.
- THIS APPLIANCE MUST BE INSTALLED BY A QUALIFIED INSTALLER. FOLLOW THE INSTALLATION DIRECTIONS. DO NOT OPERATE WITHOUT FULLY ASSEMBLING ALL COMPONENTS.
- IF THIS APPLIANCE IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT.
- THIS APPLIANCE IS HOT WHEN OPERATED AND CAN CAUSE SEVERE BURNS IF CONTACTED. CHILDREN AND PETS MUST BE KEPT FROM TOUCHING THE APPLIANCE WHEN IT IS HOT.
- COMBUSTIBLE MATERIAL SUCH AS FIRE WOOD, WET CLOTHING, ETC. PLACED TOO CLOSE CAN CATCH FIRE. OBJECTS PLACED IN FRONT OF THE APPLIANCE MUST BE KEPT A MINIMUM OF 48”(1219 MM) FROM THE FRONT OF THE APPLIANCE.

Blaze King grants no warranty, implied or stated, for the installation or maintenance of the appliance and assumes no responsibility of any consequential damage(s).

*PARTS INCLUDED*

- |                                                                             |
|-----------------------------------------------------------------------------|
| 1. Poker                                                                    |
| 2. Manual kit (w/ warranty cards, thermometer, fire starter, bypass handle) |

*REQUIRED KIT (choose one)*

- |                           |                       |
|---------------------------|-----------------------|
| 1. Z1713 Parlor Leg Kit   | 2. Z3903 Pedestal Kit |
| 3. Z3284 Classic Base Kit |                       |

*OPTIONAL EQUIPMENT*

- |                      |                          |
|----------------------|--------------------------|
| 1. Z1714 Fan Kit     | 2. Z2620 Leg Ash Pan Kit |
| 3. Z4015 Rear Shield | 4. Z1726B Fresh Air Kit  |

**FLOOR PROTECTION**

If the stove sits on a combustible floor, a non-combustible shield must be used underneath the stove and extending 16” out from the front and 8” on either side of the fuel-loading door in the USA. In Canada a non-combustible shield must be used underneath the stove and extending 8” on either side and rear and 18” out in front of the loading door.

A non-combustible shield is also required underneath the chimney connector and extending at least 2” (50.8mm) on either side of the chimney connector.

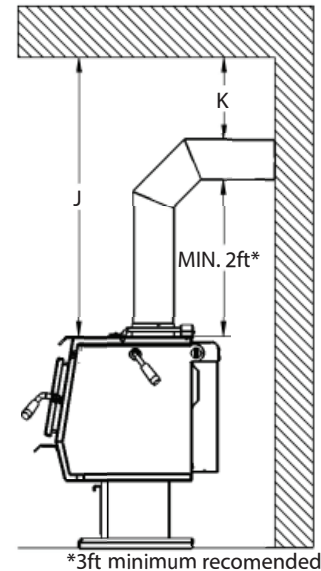
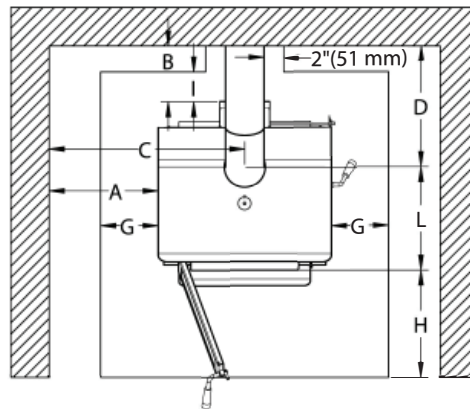
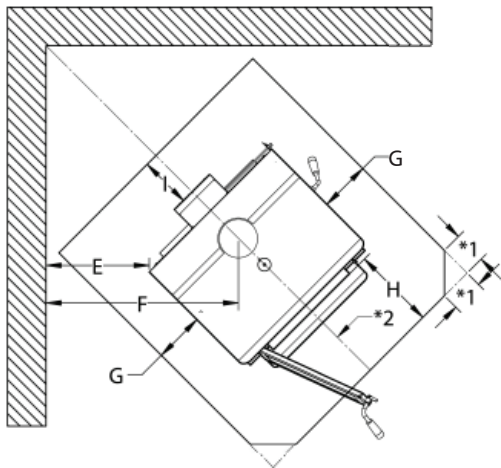
See the next page for minimum sizes depending on model. This floor protection is required to prevent sparks from falling onto the combustible floor. See CSA B365-M87). **This product does not require thermal hearth pad protection.**

## MINIMUM CLEARANCES

Residential Installations	A	B	C	D	E	F	J
Roof exit, parallel and corner.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125** 385 mm	4" 102 mm	17.125** 435 mm	44" 1118 mm
Wall exit, parallel and corner.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125** 385 mm	4" 102 mm	17.125** 435 mm	44** 1118 mm
Alcove, roof exit. Fan kit or rear shield required.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125** 385 mm	N/A	N/A	44" 1118 mm
Mobile Home Installation							
Roof exit, parallel and corner. Fan kit or rear shield required. Outside air kit required.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125** 385 mm	4" 102 mm	17.125** 435 mm	44" 1118 mm

\* Check with local codes and pipe manufacturer for pipe clearances. In Canada, 18" clearances from single wall pipe is required. Clearances may only be reduced by means approved by the regulatory authority

\* Check with local codes and pipe manufacturer for pipe clearances. In Canada, 18" clearances from single wall pipe is required.



\*1 = 5 5/8" in Canada and 2 1/8" in USA  
 \*2 = 59 1/2" in Canada and 57 1/2" in USA

G = 3" (76mm) in USA 8" (203mm) in Canada	H = 16" (406mm) in USA 18" (456mm) in Canada	I = 0" (0mm) in USA 8" (203mm) in Canada	K = 18" (456mm) for single wall pipe in Canada
----------------------------------------------	-------------------------------------------------	---------------------------------------------	------------------------------------------------

Ember protection shield (not required to have an insulation value)  
 is to be listed under UL 1618-2009 (type 1) and must have a minimum size of:  
 In USA: 32 3/4" x 42 1/2" (832 x 1080 mm)  
 In Canada: 43" x 52 1/2" (1093 x 1334 mm)

Min. Alcove minimum width 47", maximum depth 48", minimum height above stove top 44"

**This stove must be installed in compliance with all local codes and regulations.**

**COMBUSTION AIR**

Ensure adequate combustion air allowing for all other exhausting type appliances in the dwelling (range hoods, dryers, etc.). In air tight homes and modern constructions, careful considerations must be taken into account when using a wood burning appliance. Heat recovery ventilators (HRV) systems along with constant running fan motors in air handlers must be taken into account when balancing the system. Failure to do so may result in air starvation, smoke spillage and carbon monoxide threats. Consult a HVAC specialist for proper installation. Ensure adequate combustion air allowing for all other exhausting type appliances in the dwelling (range hoods, dryers, etc.). In airtight houses it is recommended to install a fresh air inlet into the room where the appliance is located, to prevent air starvation.

**DRAFTING PERFORMANCE**

Draft is the force which moves air into the appliance up through the chimney. The amount of draft created by your chimney depends upon length, offsets, insulating properties, obstructions (such as architectural design, trees), local geography and other factors.

External forces, such as outdoor temperature, wind, barometric pressure, topography, or factors inside the home (negative pressure from exhaust fans, chimneys, air infiltration, etc) may adversely affect draft.

Too much draft may cause excessive temperatures in the appliance and may damage the heater. An uncontrollable burn or excessive temperature indicates excessive draft.

Inadequate draft may cause back puffing (spillage) into the room and plugging of the chimney, chimney cap or spark arrestor screen. Inadequate draft may cause smoke to leak into the room through appliance or chimney connector joints. Poor draft can also lead to poor heat production and the inability for the combustor to remain active in lower burn rate settings.

High efficiency appliances, such as your Blaze King stove, may require some fine tuning of your chimney system in order to maximize performance.

Blaze King cannot be responsible for external forces leading to less than optimal performance.

**ROLE OF THE CHIMNEY**

Without a proper installed chimney, this appliance will not burn correctly.

The role of the chimney is to pull the proper amount of air into the firebox for the purpose of complete combustion. Incomplete combustion will lead to more smoke and pollution of the outside air. A proper operating chimney will allow the user to enjoy peak performance at all burn operating levels from low to high. Blaze King therefore recommends vertical installations with a minimum length of 15' from stove top to chimney cap. In all freestanding stove installations, use double wall stove pipe from the stove top to the ceiling support box. The use of double wall stove pipe does allow for reduced clearances, however most importantly, it helps to keep the chimney warm and improve draft.

For wall exits, the same suggestion applies. With the addition of the recommendation to use two 45 degree elbows rather than a single 90 degree elbow. The use of two 45 degree elbows will allow for both a smoother transition to the exterior chimney and will also shorten the horizontal run to the outside chimney. A minimum 36" rise is recommended prior to any elbows being used. When possible, outside chimney systems should be isolated from direct exposure to winter weather by building a chase around the chimney, observing all clearances as specified by the venting manufacturer. Doing so will help to keep the chimney warmer and improve draft. (see *RECOMMENDED FLUE HEIGHTS*)

***VENTING SYSTEMS***

The venting system consists of a chimney connector and a chimney. These get extremely hot during use. Temperatures inside the chimney may exceed 2000 degrees in the event of a creosote fire. To protect against the possibility of a house fire, the chimney connector and chimney must be properly installed and maintained. A listed thimble must be used when a connection is made through a combustible wall to a chimney. A chimney support package must be used when a connection is made through the ceiling to a listed prefabricated chimney. These accessories are absolutely necessary to provide safe clearances to combustible wall and ceiling material.

This stove may be connected to a lined masonry chimney or a listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA. Do not connect it to a chimney serving another appliance. To do so will affect the safe operation of both appliances, and will void the stove warranty. You must comply with the local authority having jurisdiction and/or in Canada, CSA installation standard B365-M87.

The chimney connector must be 6" diameter, 24 MSG Black/Blue steel. Do not use aluminum or galvanized steel. They cannot properly withstand the extreme temperatures of a wood fire. The chimney connector between the stove and the chimney should be as short and direct as possible.

The chimney connector must be attached to either an approved masonry chimney or one of the listed factory built chimneys suitable for use with solid wood fuel. All joints must be tight and fastened with sheet metal screws.

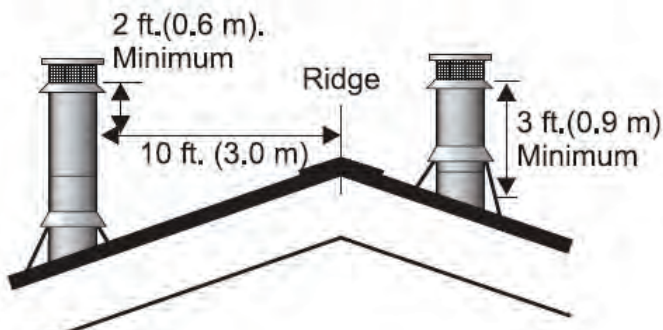
** WARNING**

**THE CHIMNEY CONNECTOR IS TO BE USED ONLY WITHIN THE ROOM, BETWEEN THE STOVE AND CEILING / WALL. NEVER USE A CHIMNEY CONNECTOR TO PASS THROUGH AN ATTIC OR ROOF SPACE, CLOSET OR SIMILAR CONCEALED SPACE, OR A FLOOR, OR CEILING. AN EFFECTIVE VAPOR BARRIER MUST BE MAINTAINED AT THE LOCATION WHERE THE CHIMNEY OR COMPONENT PENETRATES TO THE EXTERIOR OF THE STRUCTURE. ALWAYS MAINTAIN THE MINIMUM CLEARANCES TO COMBUSTIBLES AS REQUIRED BY THE APPLICABLE BUILDING CODES.**

*CONNECTION TO A METAL PREFABRICATED CHIMNEY*

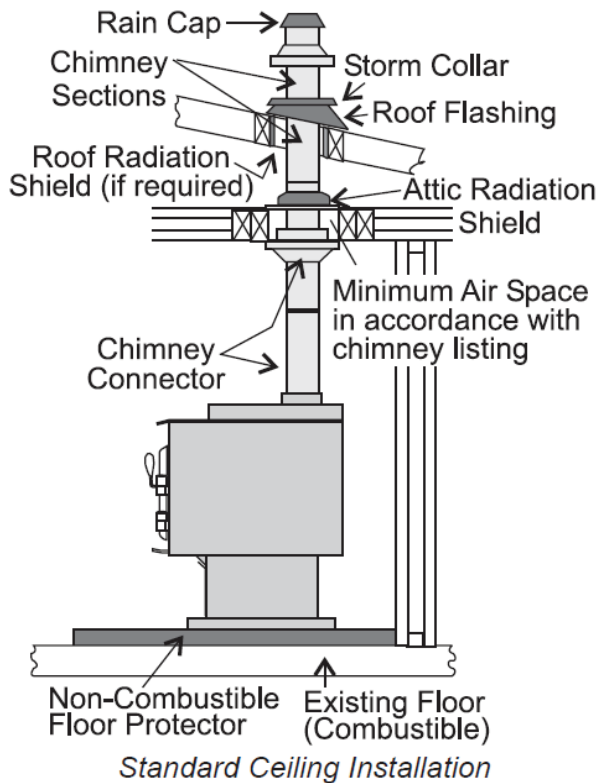
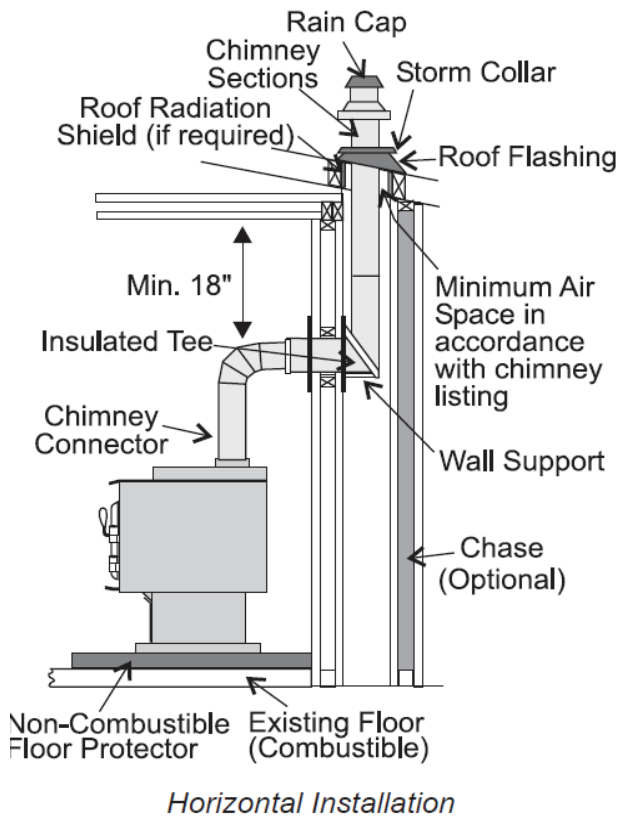
Refer to “**RECOMMENDED FLUE HEIGHTS**” chart for minimum flue height recommendations and ULC629 in Canada or UL-103HT in the USA for installation codes. When a metal prefabricated chimney is used, the manufacturer’s installation instructions must be followed precisely. You must also purchase (from the same manufacturer) and install the ceiling support package or wall pass through and “T” section package, fire stops (when needed), insulation shield, roof flashing, chimney cap, etc. Maintain the proper clearance to the structure as recommended by the manufacturer. This clearance is usually a minimum of 2 inches, although it may vary by manufacturer or for certain components.

There are basically two methods of metal chimney installation. One method is to install the chimney inside the residence through the ceiling(s) and the roof. The other method is to install an exterior chimney that runs up the outside of the residence (**not recommended**). If it is necessary to run the chimney outside, build an outside chase around the chimney.



**Fig. 1**

The chimney must be the required height above the roof or other obstruction for safety and for proper draft operation. The requirement is that the chimney must be at least 3 feet higher than the highest point where it passes through the roof and at least 2 feet higher than the highest part of the roof or structure that is within 10 feet of the chimney, measured horizontally (**Fig. 1**). The height requirement is necessary in the interest of safety and does not necessarily assure proper flue draft. Use a minimum total system height of 15 feet, measured from the stove flue collar to the top of the chimney, not including the chimney cap.



## CONNECTION TO A MASONRY CHIMNEY

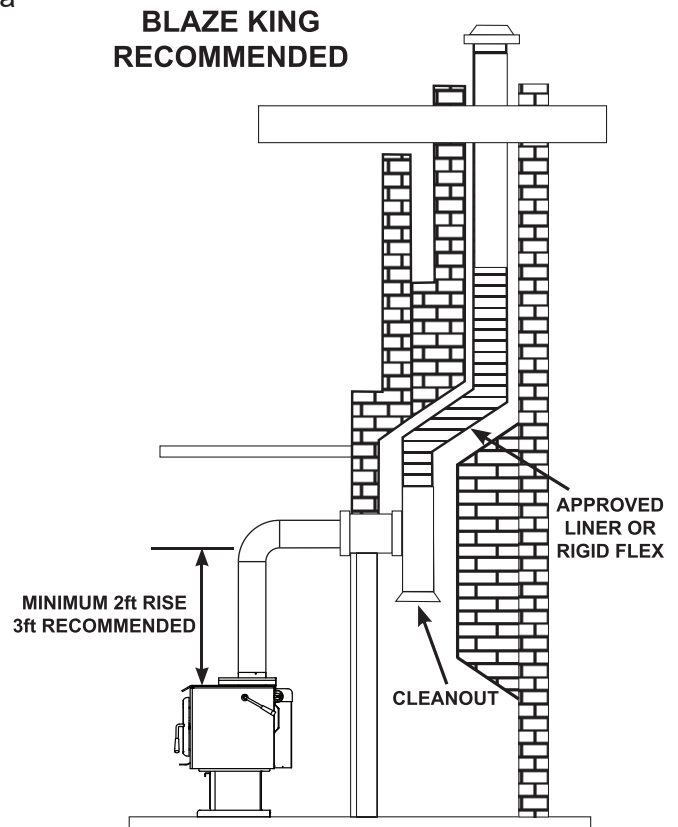
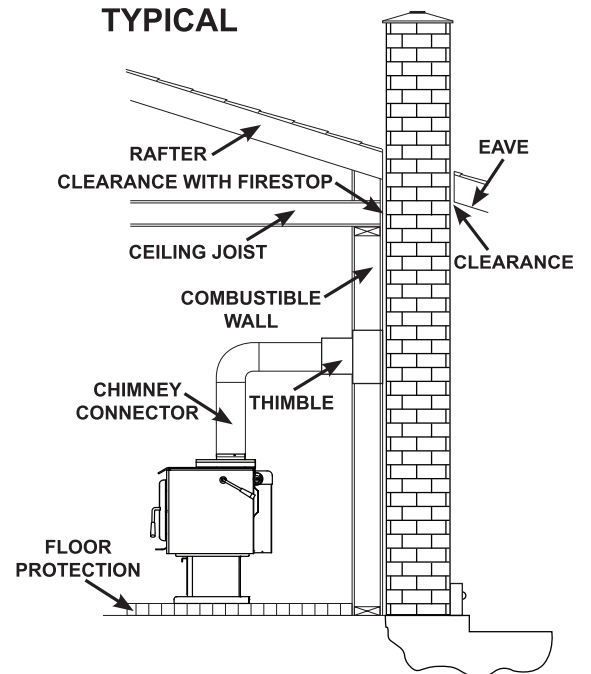
### Masonry chimney\*\*\*

Ensure that a masonry chimney meets the minimum standards (NFPA) by having it inspected by a professional. Make sure there are no cracks, loose mortar or other signs of deterioration and blockage. Have the chimney cleaned before the stove is installed and operated. When connecting the stove through a combustible wall to a masonry chimney, special methods are needed.

In Canada, the wall cut away is to provide 18" clearance for the connector. The resulting space must remain empty. A flush mounted sheet metal cover may be used on one side only. If covers are to be used on both sides, each cover must be mounted on noncombustible spacers at least 1" clear of the wall.

**\*\*\*Blaze King recommends the use of a Stainless steel liner, preferably insulated, inside a masonry chimney. This is to maintain proper draft and overall better operation of the unit.**

Your local dealer or local jurisdiction can provide details of approved methods of passing a chimney connector through a combustible wall in your area. In USA, the National Fire Protection Association has minimum standards to comply with. In Canada, this type of installation must conform to CAN/CSA-B365, Installation Code for Solid Fuel Burning Appliances and Equipment.



**RECOMMENDED FLUE HEIGHTS**

1. At sea level the minimum height is a 15 ft (4.6 m) straight run.
2. Add the following vertical height to the flue to compensate for:
  - 45° elbow = 1.0 ft (.30 m)
  - 90° elbow = 2.0 ft (.61 m)
  - "T" section = 3.0 ft (.91 m)
3. Each foot of horizontal run = 2 ft (.61 m) of vertical rise.

Example:      One 90° elbow            = 2ft (.61 m)  
                   2ft Horizontal run        = 4ft (1.2 m)  
                   One base "T"                = 3ft (.91 m)  
                   Total height addition            = 9ft (2.7 m) at sea level

MINIMUM RECOMMENDED FLUE HEIGHT				
ELEVATION ABOVE SEA LEVEL	NUMBER OF ELBOWS			
	0	2 X 15°	2 X 30°	2 X 45°
0 - 1000 ft 0 - 305 m	15 4.6 m	16 4.9 m	18 5.5 m	19 5.8 m
1000 - 2000 ft 305 - 610 m	15.5 4.7 m	16.5 5.0 m	18.5 5.6 m	19.5 5.9 m
2000 - 3000 ft 610 - 914 m	16 4.9 m	17 5.2 m	19 5.8 m	20 6.1 m
3000 - 4000 ft 914 - 1219 m	16.5 5.0 m	17.5 5.3 m	19.5 5.9 m	20.5 6.2 m
4000 - 5000 ft 1219 - 1524 m	17 5.2 m	18 5.5 m	20 6.1 m	21 6.4 m
5000 - 6000 ft 1524 - 1829 m	17.5 5.3 m	18.5 5.6 m	20.5 6.2 m	21.5 6.6 m
6000-7000 ft 1829 - 2134 m	18 5.5 m	19 5.8 m	21 6.4 m	22 6.7 m
7000 - 8000 ft 2134 - 2438 m	18.5 5.6 m	19.5 5.9 m	21.5 6.6 m	22.5 6.9 m
<b>NOTE: No more than one offset (two elbows allowed). Two 45° elbows equal one 90° elbow</b>				

Please note: These are only guidelines. Please refer to the section in the manual pertaining to draft. Every installation is unique and can be influenced by topographical and geographical phenomena.

The use of a manometer and an understanding of pressure planes and the stack effect are imperative in planning and executing a successful installation.



*MOBILE HOME (AND RESIDENTIAL ALCOVE INSTALLATIONS)*

Requires outside air kit, and either rear shield OR fan kit. (See next page for kits and part numbers). The outside air kit is easiest to mount before the stove is installed. See instructions packed with each kit. **NOTE: UNDER NO CIRCUMSTANCES SHOULD THE FRESH AIR TUBE EVER BE INSTALLED HIGHER THAN THE BOTTOM OF THE APPLIANCE FIREBOX FLOOR.**

When a metal prefabricated chimney is used, the manufacturer's installation instructions must be followed precisely. You must also purchase (from the same manufacturer) and install the ceiling support package, fire stops (when needed), insulation shield, roof flashing, chimney cap, etc. Maintain the proper clearance to the structure as recommended by the manufacturer.

Chimney connector must be double wall close clearance type with either ULC629 or ULCS610 designation. Single wall pipe is not allowed in Mobile Homes or in Alcove Installations. Insulated chimney components must be a listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA. For Mobile home, the chimney needs to be removable to allow for transportation of the mobile home.

**⚠ WARNING**

**DO NOT INSTALL IN SLEEPING ROOM. THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL AND CEILING / ROOF MUST BE MAINTAINED.**

**In mobile home installations, the stove must be securely fastened to the floor using the tie-downs provided in the Outside Air kit.**

- For Z1713 Parlor Leg kit, use the ZR8039 Leg Anchor Kit to secure stove to the floor. (Fig.2)
- For Z3903 Pedestal Kit use #10 screws and washers through the two holes in the back angle support to secure the stove to the floor. (Fig.3)
- For Z3284 Classic Base Kit use #10 screws and washers through the two holes in the base to secure the stove to the floor. (Fig.4)



**Fig. 2**

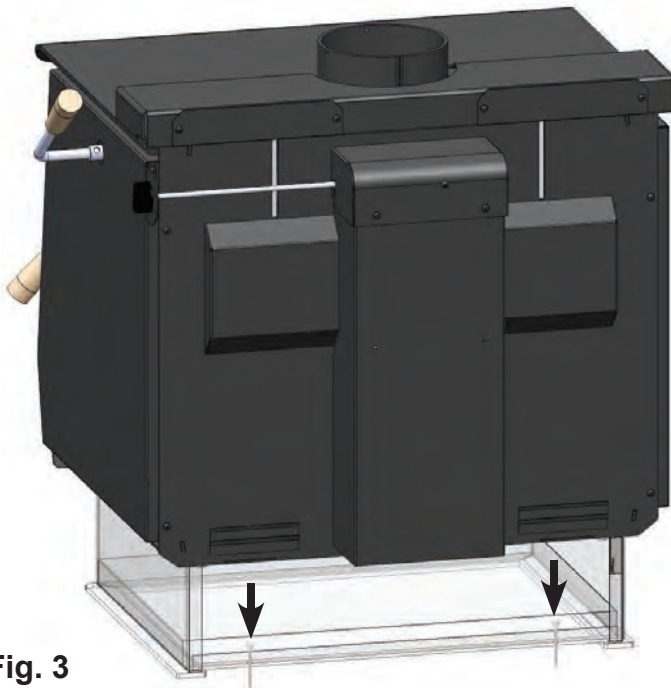


Fig. 3

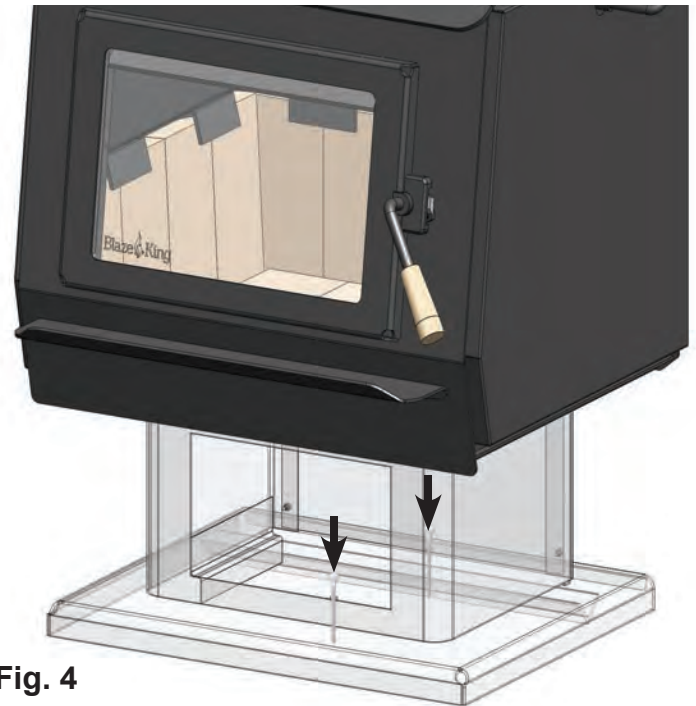


Fig. 4

**OPTIONAL ACCESSORIES**

**MOBILE HOMES** — Requires Outside Air Kit (Z1726B), and either Fan Kit (Z1714) or Rear Shield (Z4015).

**RESIDENTIAL ALCOVES** — Requires either Fan Kit (Z1714) or Rear Shield (Z4015)

**REAR SHIELD KIT (Z4015)**

EITHER this Rear Shield or Fan Kit (Z1714) is REQUIRED FOR:  
MOBILE HOMES and RESIDENTIAL ALCOVES

**FAN KIT (Z1714)**

EITHER this Fan Kit or Rear Shield (Z4015) is REQUIRED FOR:  
MOBILE HOMES and RESIDENTIAL ALCOVES

NOTE: Fan Kit should be installed before the stove is placed into position

**ELECTRICAL CONNECTION:**

Your Blaze King fan kit is equipped with a three-prong (grounded) plug to decrease shock hazard. THIS PLUG SHOULD BE INSERTED DIRECTLY INTO A PROPERLY-GROUNDED, THREE-HOLE RECEPTACLE. DO NOT CUT OR REMOVE THE GROUNDING PRONG FROM THIS PLUG. Do not route the power cord in front or under the stove.

**OUTSIDE AIR KIT (Z1726B)**

REQUIRED FOR:

**MOBILE HOMES**

The outside air inlet hose is a flexible tube to bring outside air for combustion into the stove from outside the residence, through the wall or up through the floor. The flexible tube will allow some adjustment over or around floor joists or plumbing. DO NOT CHANGE THE STRUCTURAL INTEGRITY OF THE FLOOR. This air hose must be kept open at all times to provide outside air for combustion.

*PARLOR LEG KIT (Z1713)*

**NOTE: EITHER Z1713 PARLOR LEG KIT, Z2384 CLASSIC BASE KIT, OR Z3903 PEDESTAL KIT, MUST BE INSTALLED BEFORE STOVE CAN BE DUCTED AND READY FOR USE.**

TOOLS NEEDED FOR INSTALLATION: 3/4" wrench or socket wrench

**INSTALLATION**

1. Lean stove rearwards to gain access to stove bottom. **NOTE: Use extreme caution when leaning the stove over to avoid injury or damage to the flooring or appliance. Place cardboard inside the firebox to support bricks when leaning the stove.**
2. Position each leg accordingly, use alignment holes in base, fasten to stove using the 1/2" bolts and washers supplied with the parlor leg kit. **(Fig. 5)**
3. Lift stove back to its upright position.
4. Adjust carriage bolts in order to level stove.



**Fig. 5**

## CLASSIC BASE KIT (Z3284)

**NOTE: EITHER Z1713 PARLOR LEG KIT, Z2384 CLASSIC BASE KIT, OR Z3903 PEDESTAL KIT, MUST BE INSTALLED BEFORE STOVE CAN BE DUCTED AND READY FOR USE.**

TOOLS NEEDED FOR INSTALLATION: 7/16" and 3/4" wrench or socket wrench

**INSTALLATION**

1. Lean stove rearwards to gain access to stove bottom. **NOTE: Use extreme caution when leaning the stove over to avoid injury or damage to the flooring or appliance. Place cardboard inside the firebox to support bricks when leaning the stove.**
2. There are two 1/2" x 3/4" long bolts with washers supplied with the classic base kit, thread them as shown in **Fig 6** until approximately a 1/4" of thread is showing.
3. Slide the classic base slots between the washers and the bottom of the appliance. (**Fig. 7**)
4. There are two 1/4" x 1/2" long bolts supplied with the classic base kit, thread them as shown in **Fig. 8** to secure the front of the classic base to the appliance.
5. Tighten the 1/2" x 3/4" long bolts with washers until snug.
6. Lift stove back to its upright position.



Fig. 6

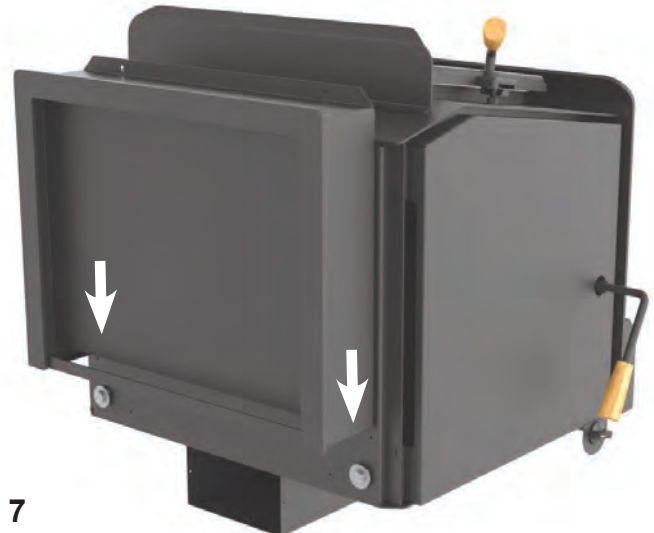


Fig. 7

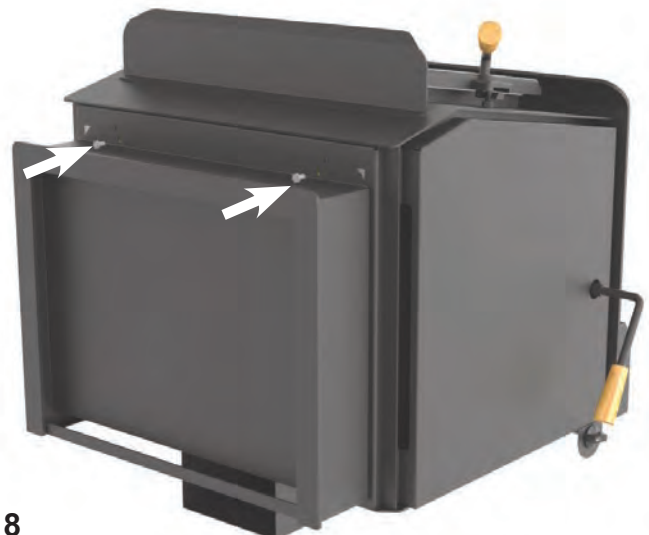


Fig. 8

**PEDESTAL KIT (Z3903)**

**NOTE: EITHER Z1713 PARLOR LEG KIT, Z2384 CLASSIC BASE KIT, OR Z3903 PEDESTAL KIT, MUST BE INSTALLED BEFORE STOVE CAN BE DUCTED AND READY FOR USE.**

TOOLS NEEDED FOR INSTALLATION: 7/16" wrench or socket wrench

**INSTALLATION**

1. Lean stove rearwards to gain access to stove bottom. **NOTE: Use extreme caution when leaning the stove over to avoid injury or damage to the flooring or appliance. Place cardboard inside the firebox to support bricks when leaning the stove.**
2. Remove "ASH CHANNEL SEAL" by unscrewing the 1/4" nut. (**Fig. 9**)
3. Thread all four 1/4"-20 button head cap screws into the stove base until halfway in (included w/ Pedestal Kit). (**Fig. 10**)
4. Remove the ash drawer from the assembled pedestal. (Can also remove pedestal back panel if needed)
5. Utilizing the key holes on the top of the pedestal body, slide the pedestal into place by pushing it against the bottom of the stove and then pushing it towards the back of the stove (use the half turned in screws as guide pins) (**Fig. 11** the pedestal base is not shown for clarity)
6. Once the pedestal is in position, finish tightening the four screws into the stove bottom and lift stove into its upright position.
7. Insert the ash drawer into the pedestal front. (Reattach pedestal back panel if removed during install)
8. Remove the ash plug from the firebox and insert the ash plug supplied with the pedestal kit.

**PUSH PEDESTAL AGAINST FIREBOX BOTTOM, THEN TOWARDS FIREBOX BACK TO CORRECTLY POSITION IN KEY HOLES**



Fig. 9

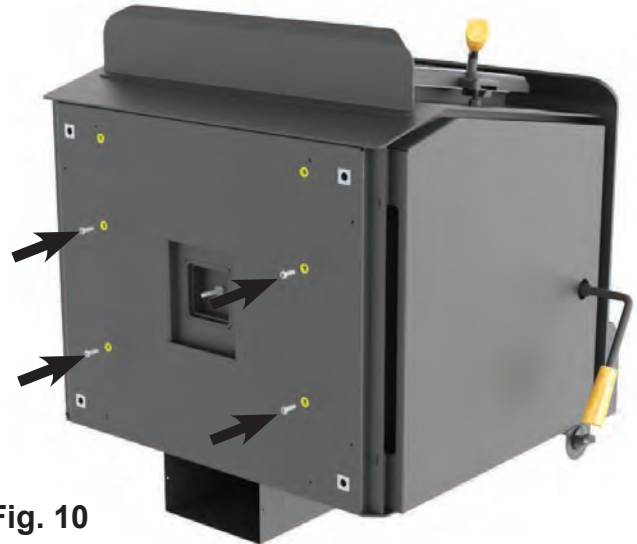


Fig. 10

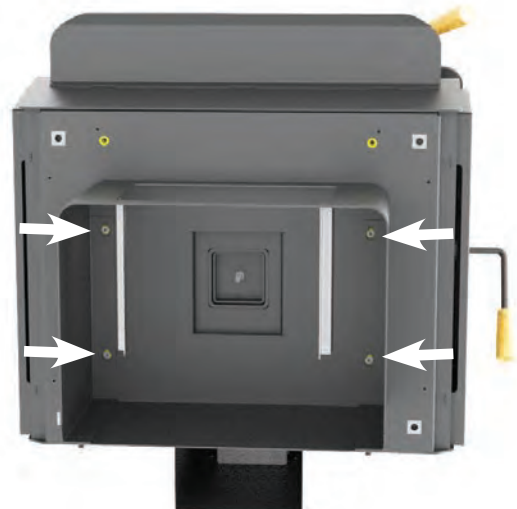


Fig. 11

### DOOR INSTALLATION AND CHANGE-OUT

To install the door upon stove installation or to change it out, follow these steps:

**WARNING: DOOR IS HEAVY, PLEASE HOLD FIRMLY.**

#### INSTALLATION

1. Align bottom door hinge hole with bottom firebox hinge pin.
2. Lower door onto bottom hinge pin, then align top door hinge hole with top firebox hinge pin.
3. Lower door onto pins until door hinge surface contacts firebox hinge surface.

**NOTE: If your door has a gold or silver plating on it, please follow the instructions on the PLATED DOOR & TRIM CARE card found in the manual pack.**



**INTRODUCTION**

All Blaze King free standing wood appliances are designed as radiant room space heaters. They have been designed and tested to be installed in insulated habitable rooms areas of your dwelling. The appliance has not been designed to be installed in a concrete uninsulated basement or in a shop/garage environment. Such applications may cause the thermostat to be unresponsive due the constant call for heat resulting in appliance being in a constant or over fire situation. Consequential damage from this type of operation will deem the warranty null and void.

All Blaze King wood appliances are designed to burn cord wood only. Dimensional timber off cuts, very low moisture content small diameter wood and pressed wood logs, when used in excess, may result in excessive internal firebox temperatures that can cause causing irreversible damage to the firebox's internal structure. Excessive temperatures can be caused by many small pieces of very low moisture content wood being used as a primary fuel source. This may be evident by warping or warped internal plates and retainers, possible cracking of the outer firebox and possibly premature failure of the catalytic combustor. All wood appliances should be cleaned out and inspected at the end of every burning season to identify if any internal components have been affected during the burning season. If problems are observed steps must be taken to identify and correct the problem before the subsequent burning season. Failure to do so will result in the warranty of the product being null and void.

**YOUR FIRST FIRE!**

The following pages contain information on the major components and operation of your heater. Please take time to read about them as it will give you a better understanding of how your appliance works. This understanding will help you to operate your appliance properly thus will extend the life of your appliance and allow you to get the highest efficiencies from your heater.

**BYPASS**

Your catalytic wood burning appliance has a bypass device to allow the smoke from the fire to temporarily bypass, or go around, the catalytic combustor. The bypass door is located inside the firebox at the top of the stove. The bypass is a steel plate door, hinged inside the stove, and is controlled by the bypass handle on the right side of the stove. When the handle is pointing at you, the bypass is open, when pointing away, it is closed. It is a clockwise rotation from open to closed. **NEVER OPEN THE LOADING DOOR WITHOUT OPENING THE BYPASS DOOR**

Note: To ensure the bypass is closed push down on the bypass handle until you hear a positive click.

**CATALYTIC THERMOMETER**

This thermometer is located on the top of the stove. It's purpose is to show you if the combustor is active. Always operate the stove in the "active" zone. When the combustor is not active the stove will emit smoke and will not be efficient. For an accurate reading, turn fans off for approximately 10 minutes and then read the thermometer.



**THERMOSTAT**

The thermostat knob is located on the top right rear corner of the stove. It controls the burn rate of the stove. Any thermostat position between **LOW**(thin line) and **HIGH**(wide line) will produce the desired clean burning characteristics. However, since each installation is different, you may find it necessary to operate the thermostat to suit your situation. A **HIGH**(wide line) thermostat setting will produce maximum heat which is more than suitable for heating the average size home. All adjustments to the thermostat should be done gradually. When you first light the stove set the thermostat to **HIGH**(wide line) setting for 20-30 minutes, or until the fire is well established. Once the fire is established turn the thermostat to **MED**(middle of line) for 5 minutes and then to a **LOW**(thin line) setting or the desired setting. Too rapid an adjustment may cause the stove to operate improperly. The most common mistake new owners make is continually adjusting the thermostat.

**LOW**(thin line)**MED**(middle of line)**HIGH**(wide line)**SELECTING WOOD****⚠ WARNING**

- **THIS APPLIANCE IS DESIGNED TO BURN NATURAL WOOD ONLY. DO NOT BURN TREATED WOOD, COAL, CHARCOAL, COLORED PAPER, CARDBOARD, SOLVENTS OR GARBAGE.**
- **HIGHER EFFICIENCIES AND LOWER EMISSIONS WILL GENERALLY RESULT WHEN BURNING AIR DRIED SEASONED WOODS, AS COMPARED TO WET, GREEN OR FRESHLY CUT WOODS.**
- **BURNING WET UNSEASONED WOOD CAN CAUSE EXCESSIVE CREOSOTE ACCUMULATION. WHEN IGNITED IT CAN CAUSE A CHIMNEY FIRE THAT MAY RESULT IN A SERIOUS HOUSE FIRE.**

Use dry seasoned wood, split and stacked and protected from rain for at least 24 months with a moisture content of 20% or lower. It takes a great deal of energy to evaporate the moisture contained in green wood and that energy will not be heating your house. Also, green or wet wood will greatly increase creosote problems. The only accurate method to determine moisture content in wood is to use a moisture meter. Never burn salt-water driftwood. It is very corrosive and will damage the firebox. Burning salty wood also voids the warranty.

This controlled combustion firebox has been designed for high efficiency and long burn times.

**The proper time to add more wood is when the last charge has been reduced to a glowing charcoal bed and while the catalytic thermometer is still active range.** There will be very little smoke at this stage in the burn cycle.

Both hardwood and softwood burn equally well in this appliance but hardwood, which is more dense, will weigh more per cord and burn a little slower and longer. Firewood should be split and stacked in a manner that air can get to all parts of it and covered in early spring to be ready for burning that fall.

**The only accurate way to determine wood moisture is to purchase a moisture meter.**

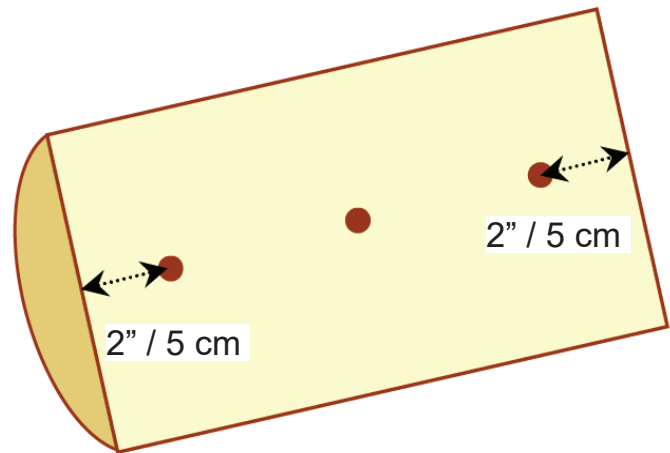
**⚠ WARNING**

- **NEVER START A FIRE UNLESS ALL BRICKS ARE CORRECTLY PLACED INSIDE THE FIREBOX. CHECK THE INSTALLATION INSTRUCTIONS CAREFULLY.**
- **ALWAYS OPEN THE BYPASS DOOR BEFORE OPENING THE LOADING DOOR.**
- **ONCE THE LOADING DOOR IS CLOSED, CLOSE THE BYPASS DOOR DIRECTLY AFTER THE CATALYTIC THERMOMETER NEEDLE IS IN THE ACTIVE ZONE.**



**HOW TO USE MOISTURE METERS**

1. Take a random selection of around 3-4 logs per cubic yard or cubic meter.
2. Split each log down the middle.
3. In the center of log push pins of meter along grain - three measurements are taken on the freshly split surface: 2" or 5 cm in from each end of the log and in the middle of the split surface with sufficient contact (see figure).
4. Do this to all the logs and take an average of the readings (this will be only an approximate indication but a good guide).

**EFFICIENCY**

Efficiency was determined using the method outlined in B415.1-10 test method. It is represented by the Higher Heating Value (HHV) as the fuel used during testing contains between 19% - 25% water moisture included in the total calculated fuel weight. (Other test methods such as LHV or Low Heating Value, does not take the water moisture into account).

Annual Fuel Utilization Efficiency (AFUE) attempts to represent the actual, season long, average efficiency of an appliance. HHV is the actual, calculated average efficiency obtained under test conditions. Using correctly seasoned wood is important when trying to gain efficiency. The more seasoned (dry) the wood, the higher the efficiency (less energy wasted on eliminating moisture during combustion). Operating your Blaze King at lower settings will result in higher efficiencies as the fuel will undergo a more complete combustion. For maximum efficiency, the appliance should be installed in a location that provides adequate intake/combustion air as well as a location that will allow for the straightest run of optimal chimney length to establish necessary draft .

**LIGHTING THE FIRE**

NOTE: As you heat up the stove for the first time, the paint will go through a curing process and will give off an odor. To minimize the inconvenience, burn the stove at a low temperature setting for several hours. It is advisable to open a door or window until the odor dissipates. You may also notice a change in color as the paint cures, this is normal and will appear uniform after subsequent firings.

1. **DO NOT USE A GRATE. BUILD THE FIRE DIRECTLY ON THE BRICK IN THE BOTTOM OF THE STOVE.**
2. Set the thermostat to **HIGH** (maximum) position and turn the fan(if fitted) **OFF**.
3. Open both the loading door and the bypass door (rotate the bypass handle forward).
4. Place 10 balls of non-glossy paper towards the front of the bottom of the firebox, or use a Blaze King fire starter puck, then stack 20 pieces of kindling on top of the paper in a crisscross fashion (leaving air gaps in between sticks).
5. Light the fire and allow it to get a good start while leaving the loading door cracked open (approximately 3 to 5 minutes). **DO NOT LEAVE THE STOVE UNATTENDED.**
6. Once the kindling is fully on fire, place two or three medium size logs onto the fire. Keeping the loading door unlatched, allow the logs to catch fire (approximately 5 minutes). **DO NOT LEAVE THE STOVE UNATTENDED.**
7. Once the logs are burning, latch the loading door shut **BUT** keep the bypass door open. Leaving the loading door open after the fire is well started may cause premature failure of the catalytic combustor.
8. When nearly all of the wood in the firebox is fully burning, finish loading the stove. Lay the wood as far back in the stove as possible. Latch the loading door shut and observe the catalytic thermometer. Once the needle is in the **ACTIVE ZONE**, close the bypass door (rotate the bypass handle backwards). Turning the thermostat down too soon may cause the fire to go out.
9. Let the fire burn, with the thermostat in a **HIGH** setting, for 20-30 minutes, or until the fire is well established. At that point, turn the thermostat down to the desired setting. It is good burning practice to burn the stove on **HIGH** for 20 to 30 minutes after every refuelling, this will help to condition the wood load for optimum combustion. The temperature in the stove and the gases entering the combustor must be raised to at least 500°(indicated by the thermometer needle in the **ACTIVE ZONE**) for catalytic activity to be initiated. During the start-up of a cold stove, a high fire must be maintained for at least 20-30 minutes. This ensures that the stove, catalyst, and fuel are all stabilized at proper operating temperatures. Even though it is possible for flue gas temperatures to reach 600° within 5 minutes of a fire being started. If the fire is allowed to die down immediately (thermostat set to a **LOW** setting too soon), it may go out or the combustor may stop working, indicated by the thermometer needle being in the **INACTIVE ZONE**. Once the combustor starts working, heat generated in it, by burning the exhaust smoke, will keep it working.
10. The fan (if fitted) can be turned on when the stove is hot or after the initial warm up period of 20-30 minutes.

Probably the least understood requirement in maintaining a good fire is that of establishing a good base of coals or embers. A good bed of hot coals or embers will maintain a more even temperature as well as getting the new load of wood started easily. Put as much wood into the stove as needed, practice will teach the amount of wood necessary to keep the fire going until the next reloading time. Don't be afraid to fill it completely if necessary. With the Blaze King automatic thermostat, the wood will only burn at the rate set on the thermostat. Once the full load is established, the stove should be left to complete the full burn cycle. This is evident by either a coal bed (ember bed) remaining or the catalyst's thermometer hovers just inside the active zone. This procedure will maximize the efficiency of the combustor as well as limit chimney emissions and smoke spillage.

**⚠ WARNING****DO NOT USE THE APPLIANCE WITHOUT A COMBUSTOR****RELOADING PROCEDURE (with the catalyst temperature in the ACTIVE ZONE)**

1. Have your next load of wood ready before beginning. Turn the thermostat to **HIGH** and the fan(if fitted) **OFF**. Wait 2 minutes for the air flow to stabilize.
2. Open the bypass door (rotate the bypass lever forward, on Princess Insert pull handle up) and again wait 2 minutes for the air flow to stabilize.
3. Unlatch the loading door and open just a crack to allow the ambient room air to be introduced to the firebox, this may take a few seconds to stabilize.
4. Slowly open the loading door and proceed to reload the firebox. If you experience excessive smoke spillage, slightly close the loading door to re-establish a draft through the chimney.
5. Once loaded, latch the loading door shut and close the bypass door (rotate the bypass handle backwards, on Princes Insert push handle down). Let the fire burn on the **HIGH** thermostat setting for 20 to 30 minutes **OR** until the fire is very well established. At that point, turn the thermostat down to the desired setting. Keep in mind you may not see a large amount of flame activity in the lower thermostat setting. The thermometer needle will remain in the active zone indicating that the burn cycle is continuing.
6. Should you burn the stove on a very low setting for extended periods of time, you will begin to see creosote deposits forming on the glass door. To remove these deposits, simple run the stove on **HIGH** for approximately 30 minutes. The **HIGH** setting will burn off most of the deposits

As every pile of wood is different you will learn, over time, which settings are necessary to achieve the optimal fire. This will be based on the type of wood, installation, weather conditions and the desired room temperature.

**RELOADING PROCEDURE (with the catalyst temperature still in the INACTIVE ZONE)**

Follow the procedure for "LIGHTING THE FIRE" on the previous page.

**OPTIMAL THERMOSTAT SETTING**

Any thermostat position between **LOW** and **HIGH** will produce the desired clean burning characteristics. However, since each application can vary, you may find it necessary to operate the thermostat to suit your application. A thermostat setting on **HIGH** will produce a maximum heat which is more than suitable for heating the average size home and offer the cleanest door glass.

1. Starting the fire. Each stove, home, installation, chimney installation, and homeowner combination works a little differently. The first several times you fuel the stove, it may not react as you expect. A little experimentation may be needed to find the right combination of fuel and thermostat setting to achieve the maximum efficiency. This is one of the joys of burning wood. You, the wood burner, make it work. And you can see what happens as it is working. Be patient, the air / fuel mixture and temperature must be stabilized before maximum combustion efficiency can be achieved.
2. As the combustor temperature (as indicated by the thermometer on top of the stove) passes into the active zone, further adjustment to achieve the desired room temperature should be made in small increments for the most effective cleaner burning operation. Changes should be made as few times each day as possible. When the thermostat knob is moved from high to low, more gases are produced, so the combustor has more fuel; consequently the combustor thermometer may register a higher heat for several hours after the thermostat is turned down.
3. Keep hot coals active so when you reload the stove you will reduce the time necessary to maintain an active combustor.
4. The thermostat is set at the factory. **DO NOT TAMPER WITH THE THERMOSTAT**, this will result in a malfunctioning thermostat.

***FAN OPERATION***

The fan(if fitted) should be off until the stove reaches normal operating temperatures. After approximately 30 minutes, the fan speed adjustment should match the thermostat control setting, i.e. if your stove is set at medium then your fan should also be set at medium, low—low, high—high etc.. We recommend the use of an optional fan system on all our wood stoves. The fan system recirculates the room air over the hot surfaces of your stove and helps spread this super heated air around your home.

***ICE - FORMATION AND PREVENTION***

Most of what you see coming from the chimney of a properly operating catalytic appliance is water vapor. In extremely cold weather - and with some exterior chimneys - this vapor may freeze in the chimney to the point of actually blocking the chimney and extinguishing the fire. In such weather, occasionally burn the appliance for 4 or 5 minutes with the thermostat setting on **HIGH** to melt any possible ice buildup.

***WOOD BURNING IN THE SHOULDER SEASON***

There are things to consider if you decide to light a fire in the spring and fall or when the outside temperature is milder, perhaps 55°F to 70°F (13°C to 21°C).

As you light the fire, with the loading door open, you may notice spillage, this is when a small amount of smoke comes back into the living space. When your fire begins to warm the chimney and the draft improves, spillage is greatly reduced. After a short period of time you can adjust the thermostat to a **LOW** setting and maintain a comfortable temperature in your home.

In reducing the thermostat setting you have also reduced the flue temperatures and your chimney begins to cool down. At this time the amount of draft is also decreasing and spillage may occur. The differences between the flue temperature and the outdoor air temperatures causes your chimney to draw and vent the flue gasses to the outside. This air movement, sometimes referred to as Stack Effect, is also influenced by air density and moisture differences. Small temperature differences produce less draw in your chimney system than large temperature differences.

General Rules for burning in the shoulder season:

- Run your appliance on high for 30 minutes after start up and reloading.
- Slowly turn the thermostat down to the desired heat setting.
- The heat setting needs to be high enough to keep the thermometer in the active zone.
- If the thermometer does not stay in the active zone turn the thermostat to a higher setting. Wait 15 minutes then confirm that the thermometer remains in the active zone. Repeat as needed.
- If your appliance is producing too much heat, build smaller hotter fires.
- Build smaller hotter fires on milder days in the spring and fall.

It is important to periodically monitor the operation of the catalytic combustor to ensure that it is functioning properly. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions. Following is a list of items that should be checked on a periodic basis:

- Combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustor is not recommended unless more detailed inspection is warranted because of decreased performance. Refer to “CATALYTIC COMBUSTOR TROUBLESHOOTING” on next page.
- This catalytic heater is equipped with a temperature probe to monitor catalyst operation. Properly functioning combustors typically maintain temperatures in excess of 500°F (indicated by the thermometer needle in the active zone), and often reach temperatures in excess of 1000°F. If catalyst temperatures fall below 500°F (indicated by the thermometer needle in the inactive zone), refer to next step and to “CATALYTIC COMBUSTOR, TESTING” below.
- You can get an indication of whether the catalyst is working by comparing the amount of smoke leaving the chimney when the smoke is going through the combustor and catalyst light-off has been achieved, to the amount of smoke leaving the chimney when smoke is not routed through the combustor (bypass mode):
  - Light the appliance as per the lighting instructions (see “LIGHTING THE FIRE”). With smoke routed through the catalyst, go outside and observe the emissions leaving the chimney.
  - Open the bypass mechanism, wait approximately 15 minutes, and again observe the emissions leaving the chimney. Significantly more smoke will be seen when the exhaust is not routed through the combustor (bypass mode). Some smoke may be visible shortly after you start the fire and shortly after reloading the fire. Allow 20 to 30 minutes for the fire to stabilize before making observations.

#### *CATALYTIC COMBUSTOR, TESTING*

Light the fire as per the lighting instructions (see *LIGHTING THE FIRE*). Then set the thermostat knob on a MED setting. When the fire is well established (within one to three hours) turn the thermostat knob between **LOW** and **MED**. A properly operating combustor will remain active, and the combustor thermometer will remain in the “active” zone until the wood load is mostly consumed. A “tired” or “dead” combustor will, with the thermostat on **MED** or lower, go out completely, and the thermometer needle will fall into the “inactive” zone. Repeat this procedure several times over several days (Remember that the combustor thermometer has a built-in lag of 4-8 minutes.) If, after several test burns, the thermometer will not indicate an “active” combustor, it may require cleaning or replacement. It is also possible that the thermometer, itself, may not be reading accurately. Before condemning the combustor, read “THERMOMETER”. If, after cleaning has been performed, your combustor is still not working you can Contact Blaze King for a replacement combustor. Please read “REPLACEMENT PARTS” section in this owners’ manual.

#### *CATALYTIC COMBUSTOR, CLEANING*

Under certain conditions, ash particles may become attached to the face of the combustor. These may be seen while the combustor is in the glowing stage, or when the fire is out. Any deposit on the visible face of the combustor should be removed. Wait until the fire is out and the appliance is cold before performing any cleaning. Brushing the combustor with a soft bristle paint brush will remove some deposits. Passing a vacuum cleaner wand or brush near the face of the combustor will remove most deposits. (Hot ash in a vacuum cleaner bag will burn, may melt the vacuum or cause a house fire. Exercise caution and never clean the appliance when the appliance or ashes are hot.) Never scrape the combustor with any hard tool or brush. Never run pipe cleaner through the individual cells of the combustor. This is not needed, and may do more harm than good. Limit cleaning to the face of the combustor. **NOTE: Never remove a combustor without approved combustor gasket in hand as original gasket will fall apart when removed from appliance.** Remember to re-install the Flame Shield (the perforated plate) in same position it was found. TIP: A hot fire will usually prove to be the best method of cleaning the combustor of deposits.

## CATALYTIC COMBUSTOR, TROUBLESHOOTING

**PROBLEM - CREOSOTE PLUGGING**

**Possible Cause:** Burning materials that produce a lot of char and fly-ash.

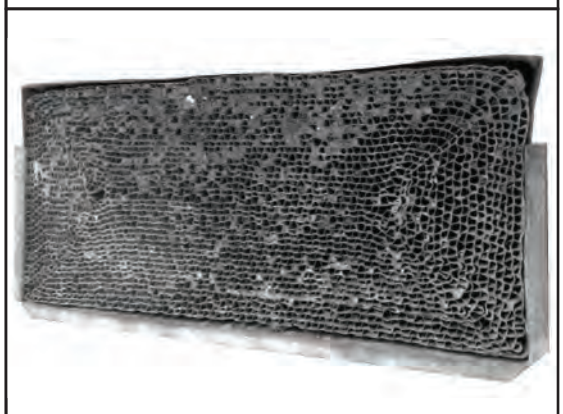
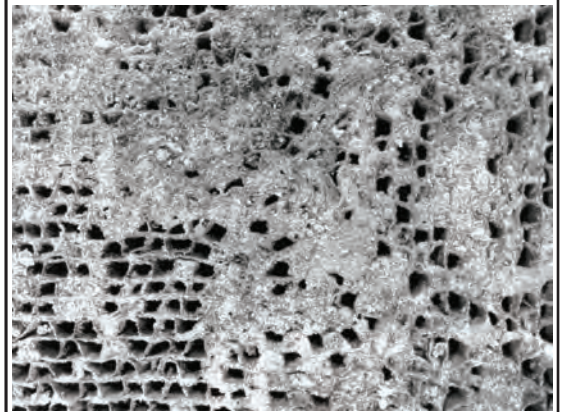
**Solution:** Do not burn materials such as garbage, gift wrap, or cardboard.

**Possible Cause:** Burning wet, pitchy woods or burning large loads of small diameter wood with the combustor in the operating position without the thermostat needle in the active zone.

**Solution:** Burn dry, seasoned wood, don't engage the bypass until the temperatures are high enough to initiate light-off (indicated by the thermostat needle in the active zone).

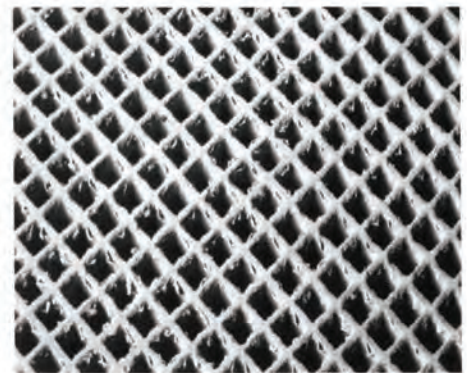
**Possible Cause:** Combustor not functioning. If proper burning procedures have been followed to no avail, the combustor is not functioning.

**Solution:** Replace the combustor with a genuine Blaze King combustor (failure to do so will void your warranty).

**PROBLEM - CATALYST PEELING**

**Possible Cause:** Extreme temperatures (above 1800°F, or 1000°C.) at combustor surface can cause the catalysts to peel. Over firing and flame impingement on the combustor are primary causes. Minor peeling photo shows minor peeling that is normal and does not affect function. Severe peeling photo shows that are closed or plugged.

**Solution:** Avoid extreme temperatures and flame impingement. If peeling is severe, remove and replace combustor.

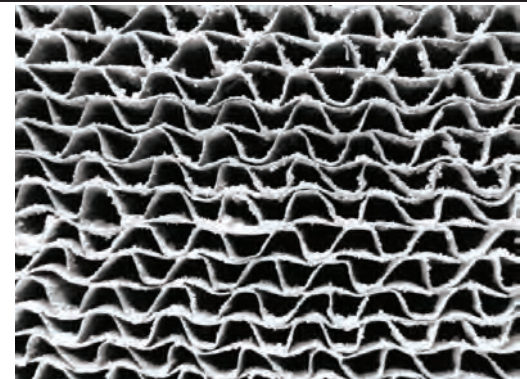


Minor Peeling

**PROBLEM - CATALYST DEACTIVATION**

**Possible Cause:** Burning large quantities of trash, pressure-treated lumber, or painted woods.

**Solution:** Burn quality woods available in your area. If you decide the catalyst has been deactivated, replace combustor with a genuine Blaze King combustor (failure to do so will void your warranty).



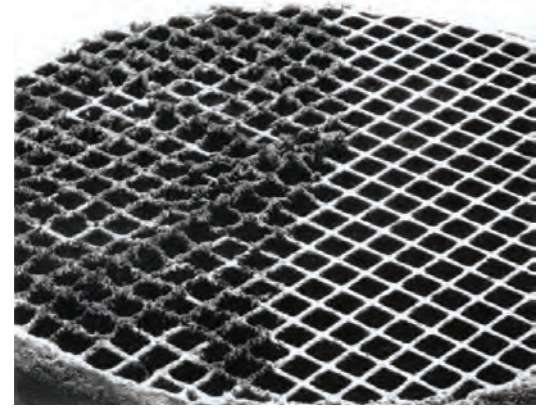
Severe Peeling

### PROBLEM - CATALYST MASKING

(The catalyst is coated with a layer of fly-ash or soot which prevents catalytic activity)

**Possible Cause:** Accumulation of fly-ash

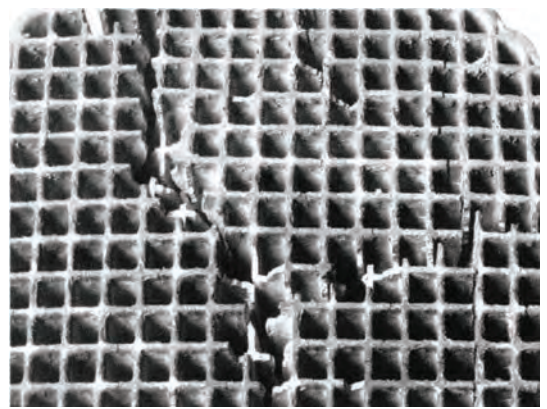
**Solution:** Brush cooled combustor with a soft-bristled brush or vacuum lightly at least once per burning season.



### PROBLEM - THERMAL CRACKING

**Possible Cause:** Normal operation, as long as the combustor remains intact.

**Solution:** If cracking causes large pieces to fall out, replace the combustor.



### PROBLEM - MECHANICAL CRACKING

**Possible Cause:** Mishandling, abuse, or operating without a properly gasket sealed combustor.

**Solution:** Handle with care

**Possible Cause:** Distortion of holding collar.

**Solution:** Combustor should be held firmly in its can. It should slide easily into and out of the holding collar of the stove. If severe cracking has resulted in loss of large chunks of combustor, replace combustor. Also replace any warped stove parts.



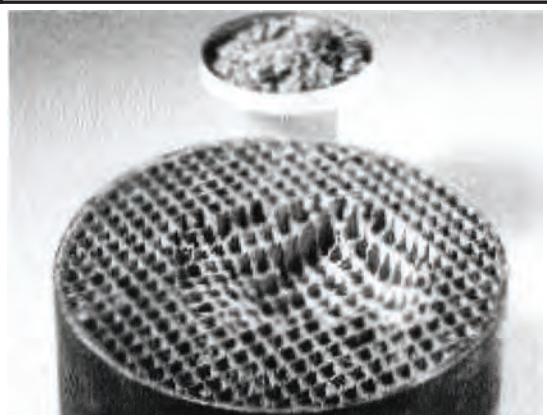
### PROBLEM - CRUMBLING

**Possible Cause:** Air leaks

**Solution:** Inspect door gasket. (see *MAINTENANCE*)

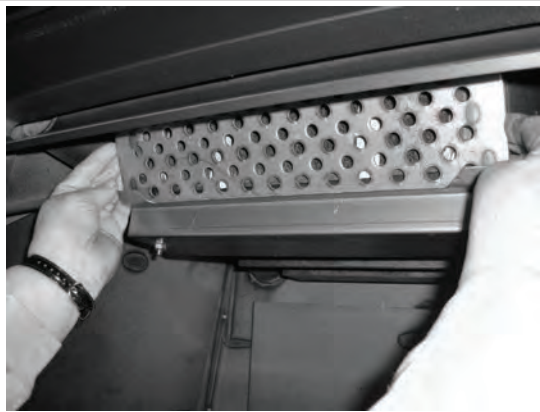
**Possible Cause:** High draft

**Solution:** Maintain draft to manufactured specifications.



*CATALYTIC COMBUSTOR, REPLACEMENT***BLAZE KING RECOMMENDS YOUR DEALER PERFORM THIS TASK**

The catalytic thermometer on top of the stove should read in the active zone after the stove has been in operation for several hours. If the thermometer's indicator needle does not stay in the active zone, even with a hot fire, over a 7-10 day period of regular use, the combustor may need replacement or cleaning (see *CATALYST MONITORING*). If the combustor needs replacing then discontinue use of the appliance until the combustor is replaced. If the combustor must be examined or replaced contact your Blaze King dealer.



**1.** The removal of a Blaze King Catalytic combustor requires a small flat blade screwdriver or pocket knife. The stove fire must be out for at least 12 hours prior to the removal process. A combustor can reach 1400°F and hold high temperatures for several hours even after the fire is out. After waiting 12 hours, first remove the flame shield by simply lifting the shield off the two tabs at either side. Pay particular attention to orientation as there is a top and bottom edge to the flame shield.

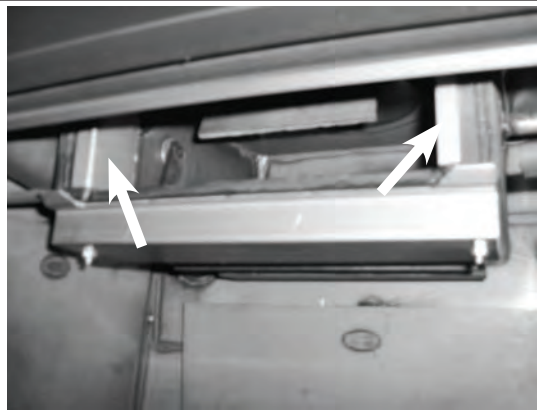


**2.** Once you remove the flame shield, you'll find the combustor. The honeycomb combustor can be made of different materials such as cordierite, mulite or even stainless steel. They are all the same with regard to removal and caution should be taken so as to not drop or damage the combustor. If your combustor has never been cleaned according the manufacturers directions, you may wish to clean the combustor before replacing it with a new combustor. (see *CATALYTIC COMBUSTOR CLEANING*)



**3.** The combustor has a metal tab across the bottom and on each side of the combustor. Using a flat blade screwdriver or pocket knife blade, slide the blade behind the metal tab and the heavy steel dome of the stove. The dome is the housing that surrounds the combustor. Apply slight pressure until the combustor begins to move forward, about 1/4". Repeat the process on the opposite end tab. By working back and forth the combustor will work free of the dome housing. It is normal for the gasket surrounding the metal band to fall apart during this process. New combustors are shipped with a new gasket.





4. Now that the combustor has been removed you'll be able to see one stainless bypass retainer on each side. These can remain in place and do not need to be removed. These clips are not fixed in position and can fall into the firebox. Make sure they are in position before replacing the combustor. Using the same screwdriver or pocket knife, scrape any old gasket from the surface areas of the dome. The dome is the housing that surrounds the combustor. If you clean your existing combustor, you'll need to order replacement combustor gasket. It is always a good idea to have a spare combustor gasket on hand prior to performing any maintenance. If you purchase a new combustor a new gasket will already be applied to the combustor.



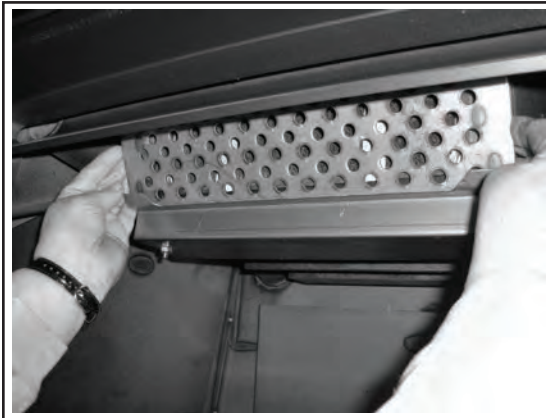
5. This new combustor already has the gasket installed. Note the 1" wide masking tape. This tape will help to keep the leading edge of the gasket from snagging during installation. If you've cleaned your combustor, wrap the combustor gasket as you see here and use the 1" masking tape around the perimeter front and rear. During the first fire the masking tape will burn off and the combustor gasket will swell providing a tight seal. It is this tight seal that improves efficiency and performance. You should never burn your stove without a combustor gasket installed.



6. Since the combustor is only 2" deep, there is ample room to lift the new combustor into place. **REMEMBER TO HAVE THE TAB ACROSS THE BOTTOM EDGE OF THE COMBUSTOR AS IT IS INSTALLED.** Slowly push the combustor in at the top apply even pressure to the left and right corners. This will allow for a better view of the bottom edge for the final fitting. **DO NOT FORCE THE COMBUSTOR INTO THE DOME. TAKE YOUR TIME AND WORK IT INTO PLACE SLOWLY.**



7. Once the combustor is installed completely so that all three tabs are touching the face of the dome, replace the flame shield. Note the flame shield sides are shaped like a triangle. The point of the triangle should face down when installed correctly. Never operate your stove without the flame shield in place. The flame shield will protect the face of the combustor against damages from wood when loading and other possible damages that can occur during the cleaning process.



8. The flame shield will rest on the two tabs located on the dome guard and lean slightly forward. Now that your combustor has been installed you can relight your stove. You will continue to receive excellent efficiency and clean burning for years to come. A few reminders, never burn anything other than dry, seasoned cordwood. Burning anything else may contaminate or ruin your new combustor. Also remember to keep your front loading door gasket seal properly adjusted. (see *LOADING DOOR TENSION ADJUSTMENT*). Doing so will improve burn times and extend combustor life span.

The combustor supplied with this heater is either a 115-0556 or 115-0336-A-M metal combustor. Consult the catalytic combustor warranty also supplied with this wood heater. Warranty claims should be addressed to:

in Canada	in USA
Blaze King Industries / Valley Comfort Systems Warranty Department, 1290 Commercial Way Penticton, BC Canada V2A 3H5, Ph: 250-493-7444	Blaze King Industries Warranty Department, 146A Street Walla Walla, Washington 99362, Ph: 509-522-2730

***RUN-AWAY OR CHIMNEY FIRE*****⚠ WARNING**

**A CHIMNEY FIRE CAN PERMANENTLY DAMAGE YOUR CHIMNEY SYSTEM. THIS DAMAGE CAN ONLY BE REPAIRED BY REPLACING THE DAMAGED COMPONENT PARTS. CHIMNEY FIRE DAMAGE IS NOT COVERED BY THE LIMITED WARRANTY.**

**CAUSES:**

1. Using incorrect fuel, or small fuel pieces which would normally be used as kindling.
2. Leaving the door ajar too long and creating extreme temperatures as the air rushes in the open door.
3. Improperly installed or worn gaskets.
4. Creosote build up in the chimney.

**SOLUTIONS:**

1. Do not burn treated or processed wood, coal, charcoal, colored paper or cardboard.
2. Be careful not to over fire the appliance by leaving the door open too long after the initial start-up.
3. Replace worn, dried out (inflexible) gaskets.
4. Have your chimney cleaned regularly.

**WHAT TO DO IF A RUN-AWAY OR CHIMNEY FIRE STARTS:**

1. Close the draft fully (lowest position) by shutting off thermostat, and make sure firebox is closed tightly.
2. Call the local fire department.
3. Examine the chimney, attic and roof of the house, to see if any part has become hot enough to catch fire. If necessary spray with a fire extinguisher or water from a garden hose.
4. Do not operate the appliance again until you are certain the chimney has not been damaged.

***CREOSOTE FORMATION AND REMOVAL***

When wood is burned slowly, it produces tar and other organic vapors which combine with expelled moisture to form creosote. These vapors condense in the relatively cooler chimney flue of a slow burning fire and when ignited, make an extremely hot fire. Check your chimney for creosote and soot regularly, until a safe frequency for cleaning is established. The chimney connector and chimney should be inspected regularly during the heating season to determine if a creosote build up has occurred. Be aware that the hotter the fire, the less creosote is deposited.

If accumulation is excessive, clean the chimney. You may want to call a professional chimney sweep to clean it. Both the chimney and the appliance have to be cleaned at least once a year or as often as necessary. Have a clearly understood plan to handle a chimney fire.

### *CHIMNEY MAINTENANCE*

The most efficient method to sweep the chimney is using a hard brush. Brush downwards so soot and creosote residues will come off the inner surface and fall to the bottom of the chimney where they can be removed easily.

The chimney must be checked regularly and if creosote has accumulated, it must be removed without delay. Cleaning on a regular basis should be sufficient during the coldest months. **ENSURE THE BYPASS DOOR IS OPEN PRIOR TO CLEANING THE CHIMNEY SO THE SOOT AND CREOSOTE FALLS INTO THE FIREBOX.**

Chimney / Flue Inspection:

1. The chimney should be inspected regularly during the heating season.
2. If possible, the chimney should be dismantled and cleaned.
3. The chimney should be inspected for possible damage.
4. If it is in good condition, put the chimney back in place; otherwise, it must be replaced.

### *FIRE EXTINGUISHERS AND SMOKE DETECTORS*

All homes with a solid fuel burning appliance should have at least one fire extinguisher in a central location, known to all, and at least one smoke detector in the room containing the appliance. If it sounds an alarm, correct the cause but do not de-activate or relocate the smoke detector.

### *ASH REMOVAL*

This appliance is required to be cleaned frequently because soot, creosote and ash may accumulate. Wait until the appliance is fully cooled off before the removal of ashes. **ALWAYS REMOVE THE ASH BUCKET IMMEDIATELY AFTER FILLING.** Ashes should be removed any time they come within one inch of the door opening. It is not necessary or advisable to completely remove all of the ashes when cleaning this appliance. Wood burns best in a bed of ashes 1/2" thick. Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground (outside), well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.

## **WARNING**

**NEVER STORE HOT ASHES IN A GARAGE OR BASEMENT. HOT ASHES WILL GENERATE CARBON MONOXIDE AND / OR FLAMMABLE GASES. THESE GASES MAY CAUSE SUFFOCATION AND POSSIBLE DEATH.**

**LOADING DOOR GASKET INSPECTION**

Inspect the door gasket for physical deterioration, missing sections or obvious leakage. The appliance front should make a groove in the gasket material - one side of the groove (toward the inside) will often be dark or black, and the other side (toward the outside) should be light or white. Dark smudges on the outside of the groove may indicate an air leak. If the groove is very shallow or missing, or if there is a heavy ash or creosote deposit along the bottom edge of the gasket, it may need to be replaced. Frayed or broken gasket material, or a gasket that is hard and unyielding, will also indicate need for replacement. Any time a piece of gasket is missing or is broken anywhere, the entire gasket must be replaced.

To check the gasket further, wait until the appliance is cooled and insert a piece of paper (a dollar bill will work) into the door opening and close and latch the door. Obvious resistance should be felt when pulling the paper out. Repeat this check several times around the perimeter of the door.

**BYPASS DOOR GASKET INSPECTION**

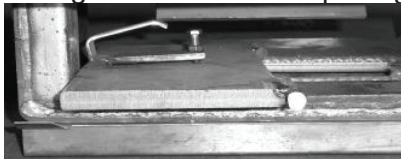
If you do not hear a positive click when closing your bypass door first try adjusting the tension, see number 9 below. If the seal is not tight after making the adjustment, the gasket may need to be replaced.

**LOADING DOOR GASKET REPLACEMENT****BLAZE KING RECOMMENDS YOUR DEALER PERFORM THIS TASK**

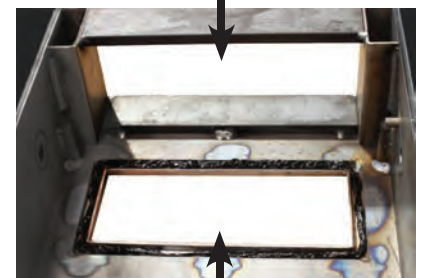
1. If the door gasket is to be replaced, be sure you have Blaze King 7/8" fiber glass gasket ready to re-install, as well as high temperature adhesive. See your Blaze King dealer.
2. Be sure the fire is out and the stove has cooled down. The door should be removed by lifting up and out, off of the hinge pins. Then lay the door flat.
3. With a pair of pliers, pull the old door gasket out of the channel and dispose of it.
4. Thoroughly clean out the channel so the new silicone adhesive will adhere and the gasket will fit smoothly.
5. Dry fit the new gasket first to ensure proper fit. Do not stretch or cut the gasket. Distribute the gasket evenly around the frame.
6. Run a small bead of a high temperature silicone adhesive along the center of the channel. **DO NOT USE HOUSEHOLD SILICONE CAULKING.** High temperature silicone may be obtained from wood stove dealer.
7. Start the new gasket in the lower right corner. Do not stretch or cut the gasket. Distribute the gasket evenly around the frame.
8. Allow the adhesive to dry before closing the loading door. The loading door tension may need to be adjusted. (see *LOADING DOOR TENSION ADJUSTMENT*)
9. Check the fit of the door gasket. Insert a narrow strip of paper into the door opening and close and latch the door. Obvious resistance should be felt when pulling the paper out. Repeat this check several times around the perimeter of the door. If no resistance is felt, adjust door latch catch. (see *LOADING DOOR TENSION ADJUSTMENT*)
10. A tight sealing door extends the burn times & protects the combustor.

*BYPASS DOOR GASKET REPLACEMENT***BLAZE KING RECOMMENDS YOUR DEALER PERFORM THIS TASK**

1. Will require THERMOSEAL® 1000SF high-temperature resistant cement and Blaze King 5/8" dense fiber glass gasket. See your Blaze King dealer. You will also require masking tape and combustor gasket as disassembly of the combustor will result in a damaged combustor gasket.
2. Be sure the fire is out and the stove has cooled down.
3. You will need to remove the liner from the collar of the stove, and have the ability to see straight down into the stove box through the collar.
4. Please follow steps in *CATALYTIC COMBUSTOR, REPLACEMENT* on how to remove your combustor.
5. After removing the combustor you will notice stainless bypass retainers on the left and right sides of the combustor opening. These tabs prevent the bypass door from popping out of its hinge holding pins during operation. Remove the stainless bypass retainers by pulling inwards. This will allow the bypass door to pop out of its hinge holding pins.
6. To remove the bypass door, move the bypass rod out of the way using the bypass handle on the side of the stove. Looking down through the collar, lift one end of the bypass door for clearance to turn inside the top assembly. Once the bypass plate is in this position, remove the plate through the combustor opening.

**BYPASS DOOR REMOVAL  
THROUGH COMBUSTOR OPENING**

7. Remove the old gasket and apply the THERMOSEAL® 1000SF high-temperature resistant cement along the door opening edge.
8. Place the gasket along the cement, and tap it in to seat it securely in the channel.
9. Replace bypass retainers.
10. Reverse method of removing bypass door to put it back in place.
11. Prior to reconnecting the liner, you will need to adjust the bypass ramp bolt. You must first loosen the retaining nut located under the head of the adjustment bolt. Then using a 7/16" box wrench, tighten the bolt until the bypass handle, when closed, has a slight cam-over feel. Do not over tighten.
12. Secure bolt adjustment by tightening the 7/16" nut against the ramp as seen in the photo to the left. Now work the bypass handle several times to make certain the bypass operation is smooth and working properly. When you are satisfied with the operation of the bypass, please lower the venting. Important: Apply high temp anti-seize lubricant to the under side of the bypass ramp where the rod contacts.
13. Please follow steps 5-8 on pages 30 & 31 to return the combustor into place. Please note that if the gasket of the combustor is damaged, it will have to be replaced.

**VIEW OF BYPASS DOOR AND  
CRANK THROUGH COLLAR****BYPASS RETAINERS****COMBUSTOR OPENING****BYPASS DOOR OPENING****APPLY LUBE TO THE UNDER  
SIDE OF THE BYPASS RAMP**

**DOOR GLASS GASKET INSPECTION**

When the appliance is cold, hold the glass by placing the palm of each hand on either side of the glass. Press firmly and try to move the glass. If the glass moves the door glass retainers may need to be tightened or the door glass gasket may need to be replaced.

1. Inspect the door glass gasket. If the gasket is frayed or missing sections replace the gasket.
2. Inspect the glass retainers and ensure the screws holding the retainers in place are tight. Hand tighten plus 1/4 turn. Do not over tighten.

**DOOR GLASS GASKET REPLACEMENT****BLAZE KING RECOMMENDS YOUR DEALER PERFORM THIS TASK**

1. You will require Blaze King glass gasket and Blaze King door gasket. Please see your Blaze King dealer.
2. Remove the old glass gasket.
3. Starting at the corner opposite of the “Blaze King” logo, carefully wrap the gasket around the edges, pressing firmly onto the sides of the glass with the gasket centered on the edge. Finish the wrapping with a 1/2” overlap. Ensure the thickness of the gasket remains consistent and uniform.
4. Install glass with the “Blaze King” logo to the lower left corner of the door. Install the glass retainers with original fasteners. Ensure the glass is parallel to the frame and tighten the fasteners evenly.
5. Follow steps on “**LOADING DOOR GASKET REPLACEMENT**”.

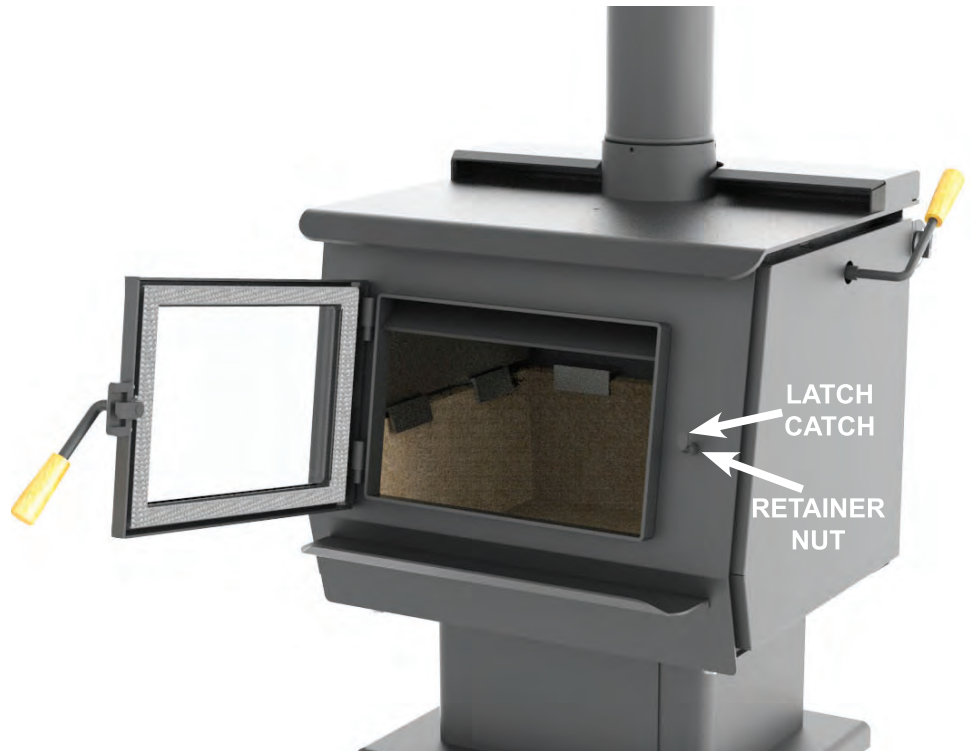
**DOOR GLASS, CLEANING**

The best way to keep the glass clean is to leave the appliance on high burn for a period of time after each reloading. The moisture which is driven from a new load of wood contributes much of the creosote on the inside of the glass. Removing that moisture at the beginning of the burn cycle helps to keep the glass clean. Leaving the thermostat on a higher setting for 30 minutes to an hour before turning to low for an overnight burn will also help. Heavier deposits may require hand cleaning. Manual glass cleaning should be done when the appliance and glass are cool. **DO NOT CLEAN THE GLASS WHILE IT IS HOT. WARNING: Do not use abrasive cleaners to clean the glass.** Use a soft cloth. After using any cleaner, thoroughly rinse the glass with water to remove any deposits left by the cleaner. Failure to remove all traces of glass cleaner will result in the glass cleaner residue baking on. This residue may be very difficult to remove.

*LOADING DOOR TENSION ADJUSTMENT*

To tighten the seal, use a 9/16" wrench to loosen retainer nut on the outside and tighten nut on inside firebox to move latch catch in (see figure beside). Secure retainer nut and (repeat) paper test. (see *LOADING DOOR GASKET INSPECTION*)

Use penetrating oil if necessary to make turning easier.  
DO NOT FORCE !!

**⚠ WARNING**

**DO NOT OPERATE THIS WOOD STOVE IF THE DOOR GASKET IS MISSING OR DAMAGED DANGEROUS OVER FIRING CAN OCCUR WHICH CAN DAMAGE THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY, POSSIBLY CAUSING A HOUSE FIRE. IF ANY PART OF THE WOODSTOVE OR FLUE SYSTEM IS GLOWING THE STOVE IS BEING OVER FIRED.**



***OPTIONAL FAN ASSEMBLY***

Routine maintenance of the OPTIONAL Fan Assembly on the back of the stove is not required. However, should it become necessary to replace an individual fan or rheostat, contact your local dealer.

***THERMOMETER***

The combustor thermometer tells you what was happening 4-8 minutes ago, and remember, it is only an indication of the temperatures of the gasses after they pass through the combustor. The thermometer probe, the part that fits into the stove, must be cleaned at least once a year. Lift it from the stove (be careful, it may be hot) and wipe or scrape it clean. At room temperature, away from the stove, the indicator should point near the bottom of the "Inactive" zone. If, after several years use, you find that the needle no longer points to the bottom of the "Inactive" zone when the thermometer has been at room temperature for 10 minutes or longer, it may need adjustment. Holding the probe with a pair of pliers, loosen the bolt on the top of the dial. Turn the dial to align the pointer with the bottom of the "Inactive" zone, then retighten the bolt.

**NOTE: IF YOUR BLAZE KING IS EQUIPPED WITH FANS, TURN OFF FANS AND WAIT 10 MINUTES PRIOR TO READING CATALYTIC THERMOMETER INDICATOR. AIR MOVEMENT ACROSS THE TOP OF THE STOVE MAY PROVIDE FALSE READING.**

***THERMOSTAT***

This wood heater thermostat has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual. If the thermostat malfunctions contact your dealer for replacement by a qualified installer.

Your Blaze King is designed to allow a wide selection of heat output levels. If you begin to lose control of the amount of heat the stove is emitting, determine the cause early so that major problems may be avoided.

The six major needs of a well-controlled fire are:

1. Knowledgeable operator.
2. Adequate air supply.
3. Firewood of good quality and proper size.
4. Catalytic combustor in good condition.
5. Clean chimney, properly sized and installed.
6. Door gasket tight and firm.

Considering all of the above, number one is the most important for safe and efficient operation of any woodstove. Please study the operation instructions carefully. Consult your BLAZE KING dealer or call the Customer Service Department at Blaze King in the U.S.A. at 509-522-2730 or in Canada at 250-493-7444 if you have any questions not answered in this manual.

All of the six above mentioned needs are interrelated. A deficiency in any one will affect all of the others. If you encounter a problem, determine the source of the problem and then follow-up by checking the other needs as possible contributing factors.

<b>PROBLEM: Chimney Fire</b>	
<b>CAUSE</b> Act immediately regardless of cause	<b>SOLUTION</b> Turn the thermostat to lowest setting, check loading door to be sure it is tightly closed. <b>Call Fire Department.</b>
After the fire is out, have your chimney and flue connector inspected by a certified chimney sweep. A damaged masonry chimney should be repaired or rebuilt. A prefabricated chimney (factory built) that is damaged should be replaced. Any damage to the flue connector should be corrected before the system is used again.	
Possible causes of a chimney fire, and remedies for those causes, can be found further in this section: "Excessive Creosote Formation", and "Spots of Creosote Accumulation in Chimney or Flue Connector".	

<b>PROBLEM: Not enough heat.</b>	
<b>CAUSE</b> Green or wet wood. Not enough fuel in stove.	<b>SOLUTION</b> Use seasoned wood. Don't be afraid to FULLY load the stove. A FULL load of wood won't burn any hotter than the thermostat is set.
Obstruction in chimney or cap screen. Combustor plugged or coated.	Remove obstruction. See "COMBUSTOR, TESTING" See "COMBUSTOR, CLEANING"
Combustor not functioning.	See "COMBUSTOR, TESTING". If needed, replace combustor, See "COMBUSTOR, REPLACING".
Thermostat set too low.	Raise thermostat setting.
Thermostat not operating properly.	Consult your Blaze King dealer.
Poor draft caused by an oversize flue	Measure draft with Manometer. See "CHIMNEY DRAFTS" Consult your Blaze King dealer or a chimney sweep.
Strong, gusting winds causing downdraft in chimney	Install wind-resistant chimney cap. Directional caps may not stay freely rotating. If you have a directional cap, check it frequently.
Tightly sealed house, inadequate air supply.	Slightly open a window, near the stove or install an outside air kit.
Reloading too much wood on top of too few coals.	Allow a larger bed of coals to build up.

<b>PROBLEM: Too much heat.</b>	
<b>CAUSE</b>	<b>SOLUTION</b>
By-Pass door left open.	Close the by-pass door.
Thermostat set too high.	Lower thermostat setting.
Loading door gasket leaking, admitting excess air into firebox.	Replace door gasket and/or adjust door. See "GASKET INSPECTION"
Excessive draft in the chimney.	Measure draft with a Manometer. See "DRAFTS". Consult your Blaze King dealer or a chimney sweep. Install a cap.
Thermostat not operating properly.	Consult your Blaze King dealer.
Wood is too small.	Use larger pieces.

<b>PROBLEM: One or both fans will not run, or there is no adjustment for fan speed.</b>	
<b>CAUSE</b>	<b>SOLUTION</b>
Fans mounted improperly.	Check that fan blade's not touch edges of hole.
Fan speed control.	Consult your Blaze King dealer for replacement.

<b>PROBLEM: Fans minimum speed too fast or maximum speed too slow.</b>	
<b>CAUSE</b>	<b>SOLUTION</b>
Fan speed control out of adjustment.	Consult your Blaze King Dealer.

<b>PROBLEM: Excessive creosote formation in chimney and chimney Connector.</b>	
<b>CAUSE</b>	<b>SOLUTION</b>
By-pass door left open.	Close by-pass door.
By-pass door not sealing tightly.	Inspect by-pass door and seal for warping. Ash or creosote buildup may occur on door or seat. With stove cold scrape and vacuum area around by-pass. Be sure all mating steel surfaces are clean and smooth.
Improper operation.	Check thermostat setting and operating procedures. See "THERMOSTAT & OPTIMAL THERMOSTAT SETTING"
Wood too green or wet.	Use seasoned wood. Use a moisture meter to confirm.
Catalytic combustor not operating properly.	Inspect the combustor. See "CATALYTIC COMBUSTOR, TESTING"
Poor draft caused by an oversize or short flue, etc.	Measure draft with Manometer. See "DRAFTS". Consult your Blaze King dealer or a chimney sweep.
Chimney too cold or poorly insulated.	Upgrade chimney system. Consult your Blaze King dealer or a chimney sweep.

<b>PROBLEM: Catalytic combustor thermometer (on top of stove) does not go into "Active" zone, or does not stay there for long. (Fans must be in "off" position for 10 minutes prior to checking)</b>	
<b>CAUSE</b>	<b>SOLUTION</b>
Improper operation.	Check thermostat setting and operating procedures. See "THERMOSTAT & OPTIMAL THERMOSTAT SETTING"
Obstruction in chimney or cap.	Clean chimney, remove obstructions.
Faulty combustor thermometer.	Replace thermometer and Recheck combustor operating Temperature.
Wood too green or wet.	Use seasoned wood.

Combustor plugged or coated.	Clean combustor. See "CATALYTIC COMBUSTOR TESTING"
Combustor not functioning.	Check and test combustor. If needed replace combustor. See "CATALYTIC COMBUSTOR, REPLACING"
Thermostat not operating properly.	Consult your blaze King Dealer.
By-pass door leaking or not closing completely.	Inspect and clean area around by-pass doors. Adjust or replace gasket if necessary. Consult your Blaze King Dealer.

**PROBLEM: Spots of creosote accumulation in chimney or chimney connector.**

CAUSE	SOLUTION
Air leaks in chimney or chimney connector.	Inspect chimney and / or chimney connector. Repair or replace as necessary. Check to be sure that the chimney connector is installed correctly.

**CAUTION: a leaking chimney connector is a fire hazard and demands immediate attention.**

Poor draft caused by an oversize flue, single wall pipe, to many elbows, etc.	Measure draft with Manometer. See "DRAFTS". Consult your Blaze King dealer or a chimney sweep.
-------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------

**PROBLEM: Door glass quickly becomes coated with creosote.**

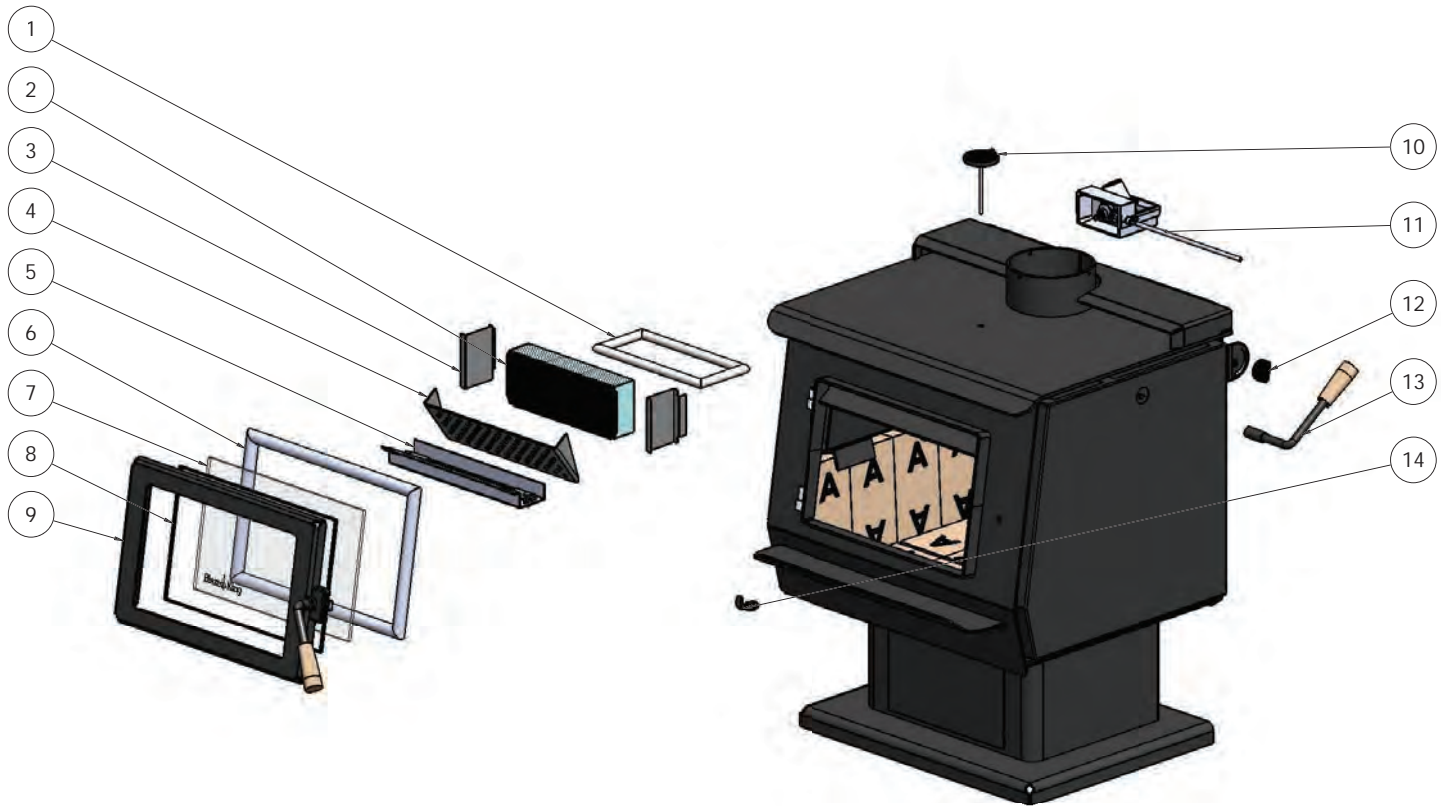
CAUSE	SOLUTION
Low thermostat setting or lowering the thermostat setting too far, too quickly.	Turn the thermostat to the warmest setting during the first 20-30 minutes or until the fire is well established after each reloading.
Poor draft caused by an oversize or short flue, etc.	Measure draft with Manometer. See "DRAFTS". Consult your Blaze King dealer or a chimney sweep.
Obstruction in chimney or cap screen.	Remove obstruction. Clean chimney and/or cap screen.
Strong, gusting winds causing downdraft in chimney.	Install wind-resistant chimney cap.
Tightly sealed house, inadequate air supply.	Open a window, slightly, near the stove.
Burning poorly seasoned wet wood, or wood with high pitch content.	Use seasoned wood with low pitch content, such as some types of pine.

**PROBLEM: The combustor temperature cannot be controlled. Turning the thermostat down often makes the combustor temperature go up.**

CAUSE
Turning the thermostat down, particularly in the first half of the burn cycle, causes the fire to emit more smoke, which is fuel for the combustor. The combustor temperature therefore climbs for up to several hours. This is normal, and is of no concern. As long as only the combustor temperature is elevated, there is nothing to worry about.

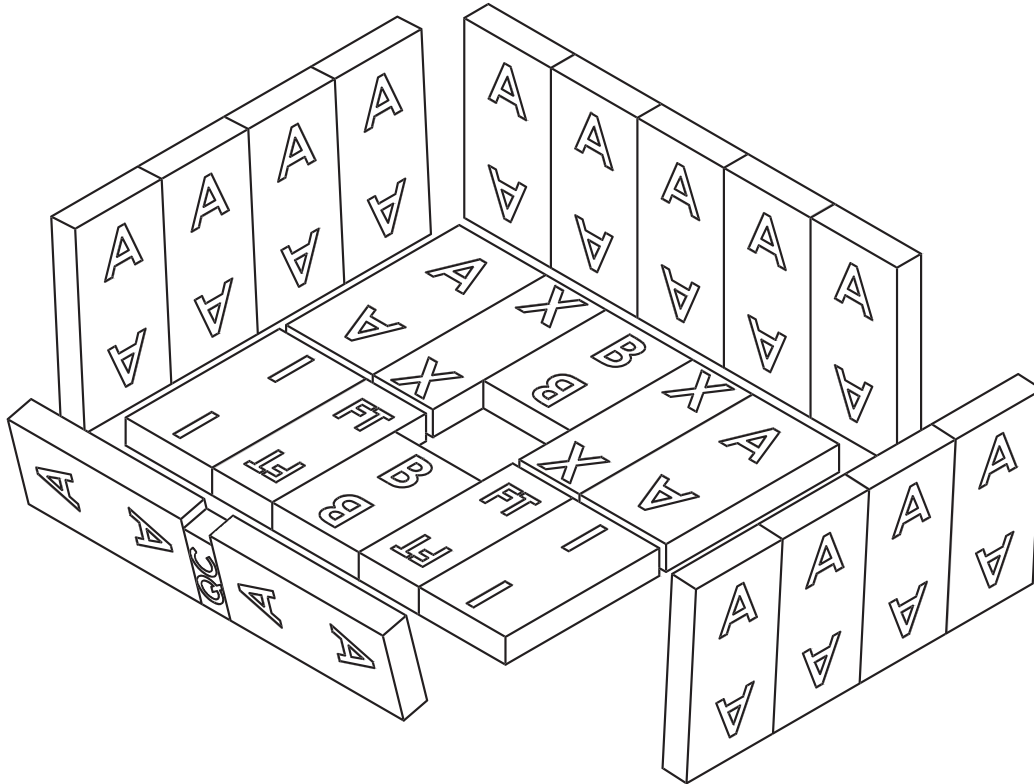
**PROBLEM: Smoke spills from door opening when loading fuel**

CAUSE	SOLUTION
Spark arrestor screen on cap plugged.	Clean spark arrestor screen to bare metal wire.
Chimney too cold.	Make certain double wall stove pipe is used in installation.
Not enough vertical rise.	Make certain a minimum vertical rise of 36" is observed prior to elbows. Use two 45 elbows instead of 90 elbow.
Chimney not drafting.	Turn thermostat to highest setting, open bypass, leave loading door closed and wait 5-10 minutes to increase chimney or flue temperature.



No. exploded view	Part #	Description	QTY
1	155-0255-B-3ft	BYPASS GASKET 5/8" DENSE ROUND	1
2	S.Z0556 or S.Z0336-A-M	COMBUSTOR 10.65" X 4" X 2" (INCL. GASKET)	1
3	S.Z4498	BYPASS RETAINER KIT	1
4	S.Z4438.1	FLAME SHIELD	1
5	S.Z4551	DOME GUARD REPLACEMENT KIT	1
6	155-0186-5ft	DOOR GASKET 7/8" ROUND - 5 FT	1
7	130-0246	GLASS CERAMIC 5MM PE	1
8	155-0254-AS-4ft	GLASS GASKET 1/8 x 3/4 301B W/PSA - 4 ft	1
9	S.Z4786	DOOR COMPLETE PE32/PI29 BLACK	1
10	120-0342-E	CAT THERMOMETER W/PAN 4" PROBE	1
11	Z3032	THERMOSTAT PE32	1
12	220-0102	KNOB BLK 1.50 X 75H (THERM)	1
13	S.Z2452.M	BYPASS HANDLE BLACK W/ MAPLE HANDLE	1
14	S.0693	LATCH CATCH	1

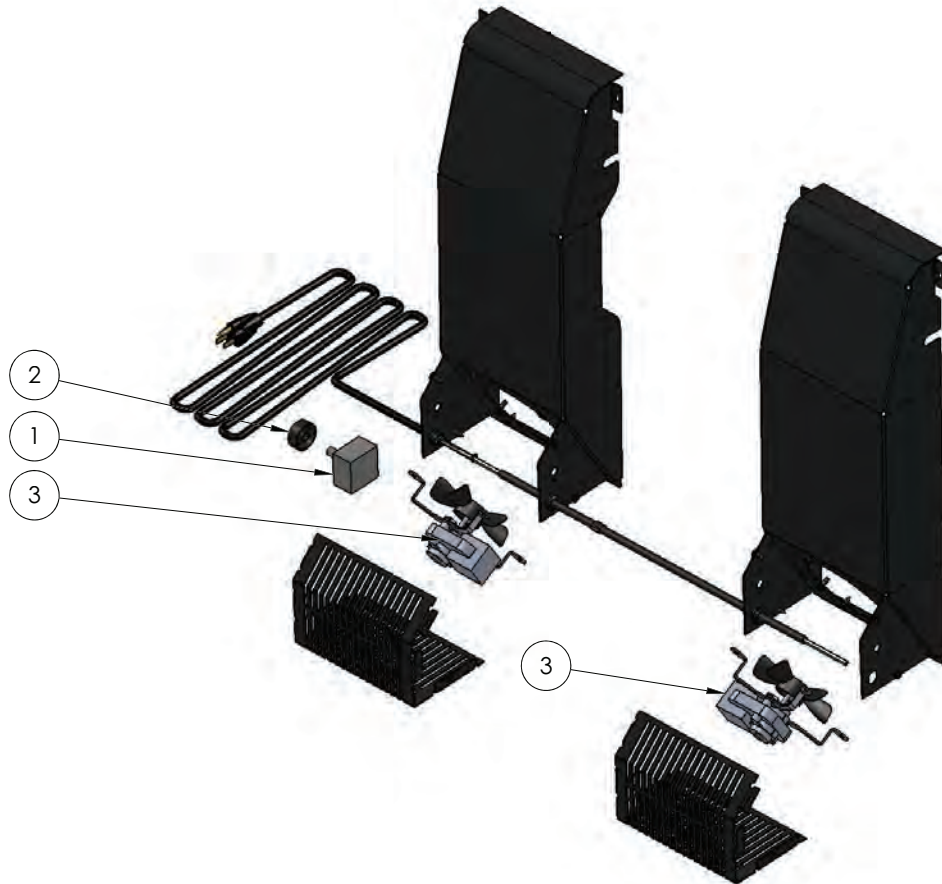
**Brick Layout**



Part #	QTY
A SIZE BRICK	17
B SIZE BRICK	2
FT SIZE BRICK	2
I SIZE BRICK	2
QC SIZE BRICK	1
X SIZE BRICK	2

# REPLACEMENT PARTS

## Z1714 Fan Kit Assembly



No. exploded view	Part #	Description	QTY
1	145-0136	RHEOSTAT WITH OFF (O/H/LOW)	1
2	220-0137	RHEOSTAT KNOB BLACK SILVER LINE	1
3	150-0175-C	FAN AXIAL SPIDER MOUNT	1

***BLAZE KING WOOD LIMITED WARRANTY***

Blaze King and Valley Comfort’s respective brands extend the following warranty for wood fired appliances purchased from an authorized Blaze King / Valley Comfort dealer and installed in the United States of America or Canada. Warranty starts with date of purchase by the original owner (End User) except as noted for replacement parts.

Warranty Period		Components Covered	
Parts	Labor	Wood	
1 Year		X	All parts, materials and surface finishes (flaking and peeling) Subject to Conditions, Exclusion, and Limitations listed.
2 Years		X	Fan assemblies and motors, thermal sensors, catalytic thermometer, bi-metallic thermostat assembly, door handle metal components.
5 Years	2 Years	X	Firebox & Heat Exchanger, Bypass Door Steel Components
6 Years		X	Catalyst Combustor ( see Conditions, Exclusions, and Limitations)
1 Year		X	Other Replacement Parts
See Conditions, Exclusions, and Limitations			



**Blaze King Wood Limited 5 Year Warranty**

Blaze King is the manufacturer of the Blaze King line of heating products. At Blaze King, our commitment to the highest level of quality and customer service is the most important thing we do. Each Blaze King stove is built on a tradition of using only the finest materials and is backed by our limited warranty to the original purchaser. With Blaze King, you're not just buying a stove; you're buying a company with years of unequalled performance and quality.

**Limited Six (6) Year Warranty:**

The CATALYTIC COMBUSTOR is under warranty by Blaze King for six (6) years from the date of original retail purchase. The purchaser shall pay the following share of the then current retail price for the combustor: The first three (3) years no charge, 4th year 60%; 5th year 70%, 6th year 80%. The Combustor must be returned to your dealer along with a completed COMBUSTOR FAILURE REPORT and original proof of purchase document.

**Limited (5) Year Warranty:**

Under this warranty, Blaze King covers the stove body and accessories against defects in materials and workmanship, for part repair or replacement for the first five (5) years \*\*\* to the original purchaser. This Warranty covers: All Steel firebox components against defects in material and workmanship. Please see the exclusions and limitation section below as certain restrictions and exclusions apply this warranty.

**Limited Two (2) Year Warranty:**

Under this warranty, Blaze King covers, fan assemblies, modular thermostat and door handle steel components against defects in materials and workmanship, for part repair or replacement and limited labor for the first two (2) years to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

**Limited One (1) Year Warranty:**

Under this warranty, Blaze King covers all parts and materials against defects in materials and workmanship including exterior paint finishes, for part repair or replacement and limited labor for the first year to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

**How the Warranty Works**

1. All warranties by the manufacturer are set herein and no claim shall be made against the manufacturer on any oral warranty or representation. All claims under this Limited Warranty must be made in writing by your dealer.
2. Any stove or part thereof that is repaired or replaced during the Limited Warranty period will be warranted under the terms of the Limited Warranty for a period not exceeding the remaining term of the original Limited Warranty or six (6) months, whichever is longer.
3. For any part or parts of this stove, which in our judgment show evidence of defects, Blaze King reserves the option to repair or to replace the defective part(s) through an accredited distributor or agent, provided the defective part is returned to the distributor or agent, transportation prepaid, if requested.
4. If you discover a problem that you think may be covered by the Limited Warranty, you **MUST REPORT** it to your Blaze King dealer **WITHIN 30 DAYS** from the date the problem was first detected, giving them proof of purchase and the date of purchase. The dealer will investigate the problem and work with Blaze King to determine whether the problem:
  - a) Is covered by the Limited Warranty or
  - b) Can be fixed in your home or does the product need to be returned to Blaze King for repair.
5. If Blaze King determines that the stove needs to be returned to Blaze King for repair, the customer has the responsibility and the expense of removing it from their home and shipping it to Blaze King. If the problem is covered by the Warranty, Blaze King will repair or replace the item at their discretion and the customer will be responsible for return shipping and re-installation in their home.
6. If the problem is not covered by the Limited Warranty, the customer will be responsible for all repair costs, as well as all storage, shipping and the cost of removing and re-installing the stove.

If you are not satisfied with the service provided by the Blaze King dealer, write to Blaze King at the address listed on the last page of the Owner's Manual. Include a copy of the original purchase invoice and a description of the problem.

**Exclusions and Limitations:**

1. This Warranty does not cover tarnish, discoloration or wear on the plated surfaces. Painted finishes will change color after initial firing and will continue to change through the lifetime of the stove. This is normal occurrence for all high temperature coatings.
2. This Warranty does not cover gasket material or firebrick.
3. Blaze King strongly recommends installation by a certified installer. Failure to comply may adversely affect coverage under the terms of this warranty. This Limited Warranty covers defects in materials and workmanship only if the product has been installed in accordance with local building and fire codes; in their absence refer to the owner's manual. If the product is damaged or broken as a result of any alteration, wilful abuse, mishandling, accident, neglect, or misuse of the product, the Limited Warranty does not apply.
4. The stove must be operated and maintained at all times in accordance with the instructions in the Owner's Manual. If the unit shows signs of neglect or misuse, it is not covered under the terms of this Warranty policy. Performance problems due to operator error will not be covered by the Limited Warranty policy. Some minor expansion, contraction, or movement of certain parts and resulting noise, is normal and not a defect and, therefore, is not covered under this Limited Warranty.
5. Misuse includes over-firing. Over-firing can be identified later by warped plates and paint pigment being burnt off. Over-firing this appliance can cause serious damage and will nullify the Limited Warranty.
6. The Limited Warranty will cover glass thermal breakage only and will not cover misuse of the stove glass, including but not limited to:
  - a) Glass that is struck, has surface contaminates or has had harsh or abrasive cleaners used on it.
  - b) If the door is slammed or is closed while wood in the firebox is protruding out the stove opening thus striking the glass.
7. This warranty does not cover products made or provided by other manufacturers and used in conjunction with the operation of this stove without prior authorization from Blaze King. The use of such products may nullify the Limited Warranty on this stove. If unsure as to the extent of this Limited Warranty, contact your authorized Blaze King dealer before installation.
8. Blaze King will not be responsible for inadequate performance caused by environmental conditions.
9. The Limited Warranty does not cover installation and operational related problems such as use of downdrafts or spillage caused by environmental conditions. Environmental conditions include but are not limited to nearby trees, buildings, roof tops, wind, hills, mountains, inadequate venting or ventilation, excessive offsets, negative air pressures or other influences caused by mechanical systems such as furnaces, fans, clothes dryers etc.
10. The Limited Warranty does not cover damage caused by burning salt-saturated wood, corrosive driftwood, chemically treated wood or any fuel not recommended in the Owner's Manual (use cord wood only).
11. The Limited Warranty is void if:
  - a) The stove has been operated in atmospheres contaminated by chlorine, fluorine or other damaging chemicals.
  - b) The stove is subject to submersion in water or prolonged periods of dampness or condensation.
  - c) Any damage to the unit, combustion chamber or other components due to water, or weather damage which is the result of, but not limited to, improper chimney/venting installation.
  - d) Salt air in coastal areas or high humidity can be corrosive to the finish; these environmental conditions can cause rusting. Damage caused by salt air or high humidity is not covered by the Limited Warranty.
12. Exclusions to the Limited Warranty include: injury, loss of use, damage, failure to function due to accident, negligence, misuse, improper installation, alteration or adjustment of the manufacturer's settings of components, lack of proper and regular maintenance, alteration, or act of God.
13. The Limited Warranty does not cover damage caused to the stove while in transit. If this occurs, do not operate the stove and contact your courier and/or dealer.
14. The Limited Warranty does not extend to or include paint, door or glass gaskets or firebricks damage caused by normal wear and tear, such as paint discoloration or chipping, worn or torn gaskets, chipped or cracked firebrick, etc.
15. The Limited Warranty does not include damage to the unit caused by abuse, improper installation, or modification of the unit.
16. Damage to plated surfaces caused by fingerprints, scratches, melted items, or other external scores and residues left on the plated surfaces from the use of abrasive cleaners or polishes is not covered in this warranty.

17. Blaze King is free of liability for any damages caused by the stove, as well as inconvenience expenses and materials. The Limited Warranty does not cover incidental or consequential damages.
18. The Limited Warranty does not cover any loss or damage incurred by the use or removal of any component or apparatus to or from the Blaze King stove without the express written permission of Blaze King and bearing a Blaze King label of approval.
19. Any statement or representation of Blaze King Products and their performance contained in Blaze King advertising, packaging literature, or printed material is not part of the Limited Warranty.
20. The Limited Warranty is automatically voided if the stove's serial number has been removed or altered in any way. If the stove is used for commercial purposes, it is excluded from the Limited Warranty.
21. No dealer, distributor, or similar person has the authority to represent or warrant Blaze King Products beyond the terms contained within the Limited Warranty. Blaze King assumes no liability for such warranties or representations.
22. Blaze King will not cover the cost of the removal or re-installation of the stove, hearth, facing, mantels, venting or other components.
23. Labor to replace or repair items under this Limited Warranty will be covered per our warranty service fee reimbursement and labor rates are set per component schedule. Labor rates vary from location to location and as such total labor costs may not be covered. Please consult with your dealer or service technician for any additional charges such as travel time or additional labor charges that may apply.
24. For parts of the Blaze King woodstove or fireplace insert warranted beyond the first year, the five year limited warranty will have the same obligations as described in this document, provided, however that the purchaser shall pay the following percentage of the then current retail cost of the repair or the replacement, according to the year after purchase in the which the defect is brought to the attention of Blaze King.\*\*\* During the 2nd year----purchaser pays 20%. 3rd year ----purchaser pays 40%. 4th year -----purchaser pays 60%. 5th year---- purchaser pays 80%.
25. If a defect or problem is determined by Blaze King to be non warrantable, Blaze King is not liable for travel costs for service work. In the event of in-home repair work, the customer will pay any in-home travel fees or service charges required by the Authorized Dealer.
26. At no time will Blaze King be liable for any consequential damages which exceed the purchase price of the unit. Blaze King has no obligation to enhance or modify any stove once manufactured (example: as a stove model evolves, field modifications or upgrades will not be performed).
27. This Limited Warranty is applicable only to the original purchaser and it is nontransferable.
28. This warranty only covers Blaze King Products that are purchased through an authorized Blaze King dealer.
29. If for any reason any section of the Limited Warranty is declared invalid, the balance of the warranty remains in effect and all other clauses shall remain in effect.
30. The Limited Warranty is the only warranty supplied by Blaze King, the manufacturer of the stove. All other warranties, whether express or implied, are hereby expressly disclaimed and the purchaser's recourse is expressly limited to the Limited Warranty.
31. Blaze King and its employees or representatives will not assume any liability for damages, either directly or indirectly, caused by improper usage, operation, installation, servicing or maintenance of this stove.
32. Blaze King reserves the right to make changes without notice. Please complete and mail the warranty registration card and have the installer fill in the installation data sheet in the back of the manual for warranty and future reference.
33. Blaze King is responsible for stocking parts for a maximum of seven (7) years after discontinuing the manufacture or incorporation of the item into its products. An exception to this would be if an OEM supplier is not able to supply a part.







# PRINCESS PE32

SN - 28.

## BLAZE KING CATALYST STOVE - POËLE À BOIS CATALYTIQUE

ROOM HEATER, SOLID FUEL TYPE, ALSO FOR USE IN MOBILE HOMES. / APPAREIL APPROUVÉ DE TYPE CARBURANT SOLIDE, AUSSI ADAPTÉ POUR INSTALLER DANS UNE MAISON MOBILE.

SUITABLE FOR MOBILE-HOME INSTALLATION / CONÇU POUR MAISONS MOBILES.

MODEL / MODELE: PE32

Tested to / Testé: UL 1482-2011(R2015) / ULC-S627-00 (R2016)

CERTIFIED IN BOTH UNITED STATES AND CANADA / CERTIFIÉ POUR LES ÉTATS-UNIS ET LE CANADA

PFS report#:F18-420

**PREVENT HOUSE FIRES-** Install and use only in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. The flue size is 6".

**CHIMNEYS:** DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. Except for installation detailed below, use 6" listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA or a masonry residential type chimney.

Mobile home, residential close clearance, and residential alcove installations require a 6" listed double wall close clearance chimney connector, with matching listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA. Mobile Home installations are only allowed with a roof exit. Do not install in a sleeping room. Passing through a wall or ceiling requires special methods: see instructions and local building codes.

**POUR PRÉVENIR UN INCENDIE -** Installer et employer seulement selon le manuel d'installation de Blaze King. Contacter les autorités locales en bâtiments ou en matière de prévention d'incendies au sujet des normes d'inspection et d'installation dans votre secteur. La dimension des conduits de cheminée est de 6".

**CHEMINÉE:** NE PAS CONNECTER CETTE UNITÉ À UNE CONDUITE DE CHEMINÉE SERVANT UN AUTRE APPAREIL. Excepté pour les situations détaillées ci-dessous, employer une cheminée de 6" homologuée par le fabricant à des fins d'utilisation pour combustibles solides conformément à la norme ULC629 au Canada ou UL-103HT aux Etats-Unis ou employer une cheminée en maçonnerie de type résidentiel.

L'installation dans une maison mobile, en espace restreint ou dans des endroits à faible dégagement, requiert l'utilisation de connecteurs muraux à doubles parois et ayant une épaisseur 6" pour la cheminée. Ceux-ci doivent être homologués par le fabricant à des fins d'utilisation pour combustibles solides conformément à la norme ULC629 au Canada ou UL-103HT aux Etats-Unis. L'installation dans une maison mobile est permise seulement avec une sortie passant par le toit. Ne pas installer dans une chambre à coucher. Passer à travers un mur ou un plafond requiert une méthode spécifique décrite dans les instructions et dans le code local du bâtiment.

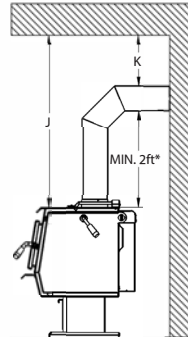
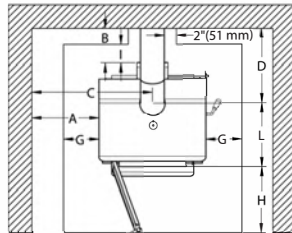
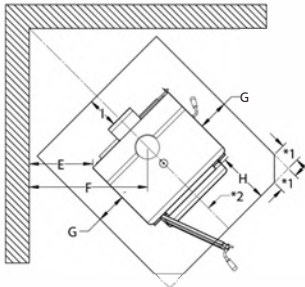
### MINIMUM CLEARANCES TO COMBUSTIBLES (See owners manual for complete description of all requirements)

### DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)

Residential Installations	A	B	C	D	E	F	J
Roof exit, parallel and corner. Sortie de toit, parallèle et coin.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125" 385 mm	4" 102 mm	17.125" 435 mm	44" 1118 mm
Wall exit, parallel and corner. Sortie de mur, parallèle et coin.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125" 385 mm	4" 102 mm	17.125" 435 mm	44" 1118 mm
Alcove roof exit. Fan kit or rear shield required. Sortie de toit en alcôve. Kit de ventilateur et protection arrière requise.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125" 385 mm	N/A	N/A	44" 1118 mm
Mobile Home Installations							
Roof exit, parallel and corner. Fan kit or rear shield required. Outside air kit required. La sortie de toit, parallèle et en coin. Kit de ventilateur et protection arrière requise. Kit d'air extérieur requis.	10" 254 mm	6" 153 mm	23.5" 597 mm	15.125" 385 mm	4" 102 mm	17.125" 435 mm	44" 1118 mm

\*Check with local codes and pipe manufacturers for pipe clearances. In Canada 18" clearances from single wall pipe is required.

\* Vérifier avec le code du bâtiment local et avec le fabricant de tuyaux pour les dégagements. Au Canada un dégagement de 18 po est exigé pour un tuyau à simple paroi.



G - 3" (77 mm) in U.S.A.  
8" (203 mm) in Canada

H - 16" (406 mm) in U.S.A.  
18" (456 mm) in Canada

I - 0" (0 mm) in U.S.A.  
8" (203 mm) in Canada

K - 18" (456 mm) \*

L - 17.375" (442 mm)

#### ALCOVE

min. width / min. largeur 47"

max. depth / max. profondeur 48"

min. height above stove / hauteur min. au-dessus du poêle 44"

Floor protection may be any non-combustible material or Listed Floor Protector, and must extend at least 18" (456 mm) in Canada or 16" (406 mm) in U.S.A., in front of the loading door opening; In USA minimum size is 32 3/4" x 42 1/2" (832 mm x 1080 mm).

In Canada, minimum size is 43" x 52 1/2" (1093 mm x 1334 mm)

US ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using crib wood. (EPA test methods 28R/5G with an emission-rate of 0.44g/hr). This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in the owner's manual, or if the catalytic element is deactivated or removed.

\*ONLY OPERATE WITH DOORS CLOSED. Open door to feed fire ONLY. \*DO NOT OBSTRUCT COMBUSTION AIR OPENINGS. Do not obstruct the space beneath the heater. For Use With Solid Wood Fuel Only - Do not burn other fuels, this may make the catalyst in the combustor inactive. The performance of the catalytic device or its durability has not been evaluated as part of the certification. Combustor part number: 115-0556 or 115-0336-A-M. Provide adequate outside air for combustion. \*Replace with only ceramic glass, 5 mm. thickness. Unit must be installed with Blaze King Leg Kit Z1713BK, Classic Base Z3903BK, or Pedestal Kit Z2903BK provided, attach as shown in the installation instructions.

La protection de plancher peut être de n'importe quel matériel non combustible ou Protecteur de plancher approuvé, et doit se prolonger au moins de 18" (456 mm) au Canada ou 16" (406 mm) aux Etats-Unis devant la porte de chargement; Aux Etats-Unis, la taille minimum est de 32 3/4" x 42 1/2" (832 mm x 1080 mm)

Au Canada la taille minimum est de 43" x 52 1/2" (1093 mm x 1334 mm)

L'AGENCE DE PROTECTION ENVIRONNEMENTALE DES U.S. - Certifié conformément aux normes d'émission de particules 2020 , en utilisant du bois machiné (méthodes d'essai EPA 28R / 5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.44g/hre). Cet appareil de chauffage au bois nécessite des inspections périodiques et des réparations pour un fonctionnement adéquat. Consulter le manuel du propriétaire pour plus d'informations. Il est contre les règlements fédéraux de faire fonctionner cet appareil de chauffage à l'encontre des instructions d'utilisation fournies dans le manuel du propriétaire, ou si l'élément catalytique est enlevé ou désactivé.

\*Utiliser le uniquement avec les portes fermées. Ouvrir la porte pour alimenter le feu SEULEMENT. \*Ne pas obstruer l'entrée d'air de combustion. Fournir l'apport d'air extérieur adéquat pour alimenter la combustion. Ne pas obstruer l'espace sous l'appareil. Utiliser uniquement avec des combustibles solides - ne pas brûler aucun autre combustible, ce qui peut rendre le catalyseur de la chambre à combustion inactif. La performance du catalyseur ou sa longévité n'a pas été évaluée dans le cadre de la certification. Numéro du catalyseur: 115-0556 ou 115-0336-A-M. \*Employer seulement le verre en céramique d'une épaisseur de 5mm si le remplacement est nécessaire. L'appareil doit être installé avec le Blaze King kit de jambe Z1713BK, Base Classique Z3903BK, ou Piédestal Kit Z2703BK fourni, attache comme indiqué dans les instructions d'installation.

#### MANUFACTURED IN

USA:

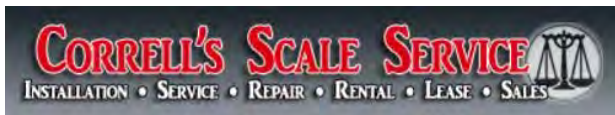
Blaze King Industries  
146A Street  
Walla Walla, WA.  
99362

CANADA:

Valley Comfort Systems  
1290 Commercial Way  
Penticton, B.C.  
V2A 3H5

#### MANUFACTURE DATE

JAN  FEB  MAR  APR  MAY  JUN   
JUL  AUG  SEP  OCT  NOV  DEC   
2019  2020  2021  2022  2023  2024



# Certificate of Calibration

4300 RD. K N.E.  
Moses Lake,  
Washington 98837  
Ph: (509) 765-7754  
Fax: (509) 765-4941  
rpugh@nctv.com

An R.B. Pugh Company LLC

Celebrating Over 40 Years of Sales and Service in the Columbia Basin

**Customer:** BLAZE KING  
**Address:** 146 A.STREET  
**City, State Zip:** WALLA WALLA, WASHINGTON 99362

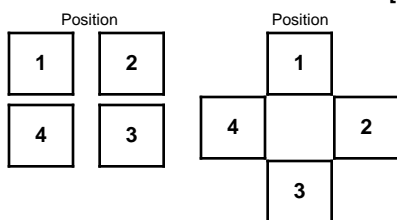
**Certificate ID:** BK-1181707  
**ISO Number:**  
**Date:** 7/17/2018

<b>Indicator Mfg.</b> Weigh-Tronix	<b>Base Mfg.</b> N/A	<b>Cal Date</b> 7/17/2018	<b>Scale ID</b> BK-1	<b>Scale Location</b> LAB
<b>Indicator Model</b> W1125	<b>Base Model</b> N/A	<b>Due Date</b> 7/17/2019	<b>Scale Class</b> III	<b>Scale Range</b> 0 - 1000 lb x 0.1 lb
<b>Indicator Serial</b> 123	<b>Base Serial</b> N/A	<b>Procedure</b> -	<b>Scale Status</b> Out Of Service	
<b>Test Interval</b> 1 Year				

## EQUIPMENT CONDITIONS

[Working] Non-Working Clean Dirty Out of Level Out of Service

**SHIFT TEST** Shift Test Result: [Pass] Fail Adjust Not Applicable **Shift Weight:** 100.0 lb



All tolerances calculated in conformance with Handbook 44 Table 6.

## LOAD TEST

Preliminary Load Test		
Test Wt.	Reading	Error
50.0 lb	50.0 lb	0.0 lb
100.0 lb	100.0 lb	0.0 lb
200.0 lb	200.0 lb	0.0 lb
300.0 lb	300.0 lb	0.0 lb
400.0 lb	400.0 lb	0.0 lb
500.0 lb	500.0 lb	0.0 lb

In acceptance tolerance? [Yes] No N/A

Final Load Test		
Test Wt.	Reading	Error
50.0 lb	50.0 lb	0.0 lb
100.0 lb	100.0 lb	0.0 lb
200.0 lb	200.0 lb	0.0 lb
300.0 lb	300.0 lb	0.0 lb
400.0 lb	400.0 lb	0.0 lb
500.0 lb	500.0 lb	0.0 lb

In acceptance tolerance? [Yes] No N/A

## TEST INFORMATION

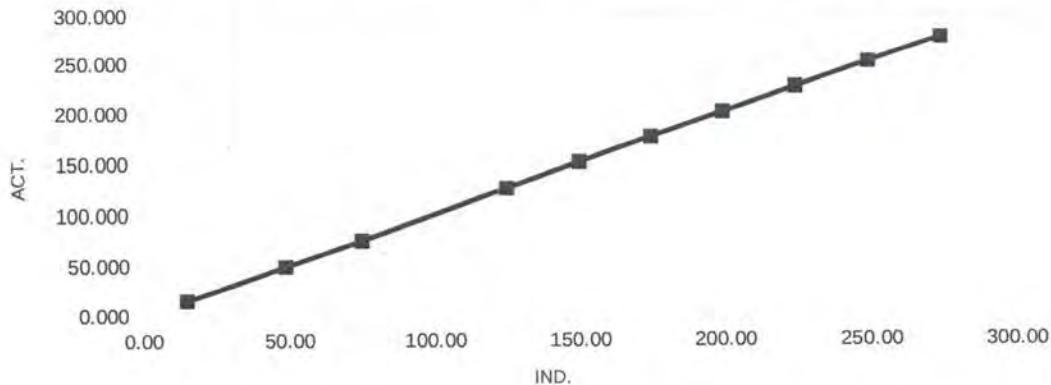
**Test Weight Classification:** F  
**Traceability Certificate Number(s):** I-5743 Cal Date: 10/5/2016 Recal Date: 10/5/2018  
**Standards Used:** 50 LB 50 lb #1, 2, 3, 4, 5, 6, 7, 8, 9, 10  
**Expanded Uncertainty:** Available on Request or Reported on this Document  
**Test Location:** [Onsite] Offsite  
**Overall Result:** [Pass] Fail Adjust  
**Was the scale within customers required accuracy?** [Y] N N/A  
**Environmental Conditions:** [Acceptable] Unacceptable  
**Comments / Notes:** N/A  
**Technician:** Dennis Hubbard A0101  
**INSPECT INDICATOR AND PLATFORM**  
**Certifying Technician:** NO ADJ MADE  
 Technician Signature not found.

Scales were calibrated with certified test weights. Adjustments made to restore and/or maintain the accuracy of the scale conform to the tolerances established by the National Institute of Standards and Technology as specified in Handbook 44 Section 2.2, or Manufacturers Specifications. Best measurement of uncertainty calculated using a coverage factor of K=2. This provides confidence level of 95%. This certificate shall not be reproduced, except in full, with the written approval of the laboratory. Measurement uncertainty available on request.

## CERTIFICATE OF CALIBRATION

<b>CUSTOMER:</b>	BLAZE KING WALLA WALLA WA	<b>CALIBRATION DATE:</b>	06/12/18
<b>PO NUMBER:</b>	116691	<b>CALIBRATION DUE:</b>	06/12/19
<b>INST. MANUFACTURER:</b>	EQUIMETER	<b>PROCEDURE:</b>	NAVAIR 17-20MG-02
<b>INST. DESCRIPTION:</b>	P.D. METER	<b>CALIBRATION FLUID:</b>	AIR @ 14.7 PSIA
<b>MODEL NUMBER:</b>	R-275	<b>STANDARD(S) USED:</b>	A4, A24 DUE 06-2020
<b>SERIAL NUMBER:</b>	2961604	<b>NIST TRACE #'S:</b>	1453296155, 1487830235
<b>RATED UNCERTAINTY:</b>	+/- .5 % RD.	<b>AMBIENT CONDITIONS:</b>	759 mm HGA 54 % RH 73 F
<b>UNCERTAINTY GIVEN:</b>	TOTAL measurement uncertainty: +/- .190 % RD. K=2	<b>CERTIFICATE FILE #:</b>	412047.18
<b>NOTES:</b>	AS RECEIVED/ AS LEFT WITHIN SPECS. REFERENCE CONDITIONS ARE: 760 mm HGA 70 F.		

TEST POINT NUMBER	UUT INDICATED SCFH	DM.STD. ACTUAL SCFH	CORRECTION FACTOR
1	14.93	14.970	1.00287
2	48.79	48.920	1.00258
3	74.86	75.020	1.00215
4	124.71	124.930	1.00178
5	149.96	150.210	1.00165
6	174.72	175.070	1.00202
7	199.54	199.910	1.00187
8	224.54	225.120	1.00260
9	249.42	249.980	1.00223
10	274.36	275.020	1.00242
<b>AVERAGE=</b>			<b>1.0022158</b>



All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NCSL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

**Dick Munns Company** • 11133 Winners Circle • Los Alamitos, CA 90720  
Phone (714) 827-1215 • Fax (714) 827-0823

This Calibration Certificate shall not be reproduced, in full, without approval by DICK MUNN'S COMPANY. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Date:

Approved By:

Calibration Technician:

6/12/2018

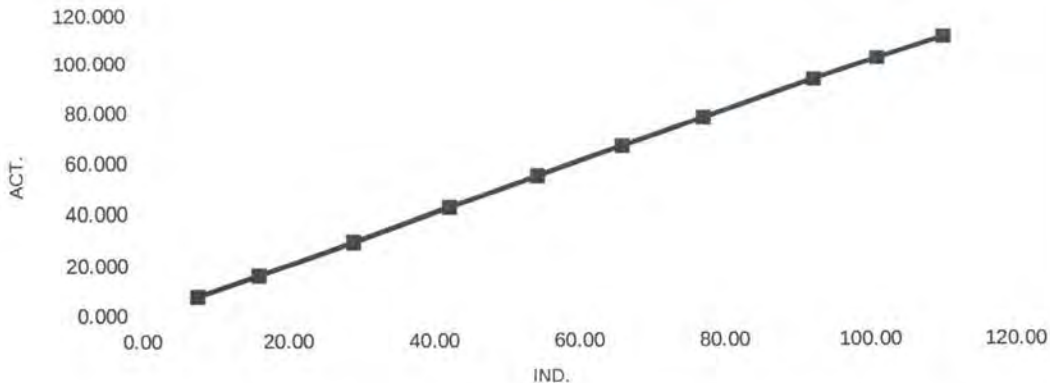
JA



## CERTIFICATE OF CALIBRATION

<b>CUSTOMER:</b>	BLAZE KING WALLA WALLA WA	<b>CALIBRATION DATE:</b>	06/12/18
<b>PO NUMBER:</b>	116691	<b>CALIBRATION DUE:</b>	06/12/19
<b>INST. MANUFACTURER:</b>	EQUIMETER	<b>PROCEDURE:</b>	NAVAIR 17-20MG-02
<b>INST. DESCRIPTION:</b>	P.D. METER	<b>CALIBRATION FLUID:</b>	AIR @ 14.7 PSIA
<b>MODEL NUMBER:</b>	T-110	<b>STANDARD(S) USED:</b>	A4, A24 DUE 06-2020
<b>SERIAL NUMBER:</b>	27722	<b>NIST TRACE #' S:</b>	1453296155, 1487830235
<b>RATED UNCERTAINTY:</b>	+/- .5 % RD.	<b>AMBIENT CONDITIONS:</b>	759 mm HGA 54 % RH 73 F
<b>UNCERTAINTY GIVEN:</b>	TOTAL measurement uncertainty: +/- .190 % RD. K=2	<b>CERTIFICATE FILE #:</b>	482797.18
<b>NOTES:</b>	AS RECEIVED/ AS LEFT WITHIN SPECS. REFERENCE CONDITIONS ARE: 760 mm HGA 70 F.		

TEST POINT NUMBER	UUT INDICATED SCFH	DM.STD. ACTUAL SCFH	CORRECTION FACTOR
1	7.59	7.560	0.99665
2	15.98	15.930	0.99687
3	28.97	28.890	0.99723
4	42.24	42.150	0.99780
5	54.42	54.320	0.99823
6	66.15	66.020	0.99802
7	77.39	77.190	0.99745
8	92.54	92.320	0.99767
9	101.23	101.020	0.99795
10	110.36	110.090	0.99757
<b>AVERAGE=</b>			0.9975433



All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NCSL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

**Dick Munns Company** • 11133 Winners Circle • Los Alamitos, CA 90720  
Phone (714) 827-1215 • Fax (714) 827-0823

This Calibration Certificate shall not be reproduced except in full, without approval by DICK MUNNS COMPANY. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Date:

Approved By:

Calibration Technician:

6/12/2018

JVA



# QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS  
2340 SE 11<sup>TH</sup> Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293  
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com



## Report of Calibration

Firm: Dirigo Laboratories  
Address: 11785 SE Hwy 212, Ste 305  
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17  
Submitted By: John Steiner  
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights  
Serial No.: Listed in Table

Manufacturer: Troemner

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Stainless Steel	7.95 g/cm <sup>3</sup>	200mg & 100mg	ASTM Class 1

### Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

### Standards Used:

100g to 1mg Working Standards Were Calibrated: 03/03/17 Due: 03/31/18 Standards ID: 723318  
Mass Comparators Used: MET-05 Tested by: D. Thompson

**Conventional Mass:** “The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). “Conventional Value of the Result of Weighing in Air” (Previously known as “Apparent Mass vs. 8.0g/cm<sup>3</sup>”).

**Uncertainty Statement:** The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

page 1 of 2

Quality Control Services, Inc.  
Metrology Laboratory Manager  
E-mail [dthompson@qc-services.com](mailto:dthompson@qc-services.com)

Date: 03/21/17

Signature David S. Thompson

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Member: National Conference of Standards Laboratories and Weights & Measures



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## Report of Calibration

Firm: Dirigo Laboratories  
Address: 11785 SE Hwy 212, Ste 305  
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17  
Submitted By: John Steiner  
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights  
Serial No.: Listed in Table

Manufacturer: Troemner

### Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.967	753.44	49.44

### Conventional Mass Value

Nominal Value	As Found grams	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200mg SN 1000101395	0.2000061	0.0061	0.0026	0.01
100mg SN 1000126267	0.1000046	0.0046	0.0028	0.01

\*Correction is the difference between the conventional mass value of a weight and its nominal value.

**Comments:** These weights were new from the manufacturer and were within ASTM Class 1 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 of 2

Quality Control Services, Inc.  
Metrology Laboratory Manager  
E-mail [dthompson@qc-services.com](mailto:dthompson@qc-services.com)

Date: 03/21/17

Signature David S. Thompson



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## Report of Calibration

Firm: Dirigo Laboratories  
Address: 11785 SE Hwy 212, Ste 305  
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16  
Purchase Order: 1001  
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights  
Serial No.: Listed in Table

Manufacturer: Unknown

### Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

### Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

\*Correction is the difference between the conventional mass value of a weight and its nominal value.

**Comments:** These weights were received in good condition and were within NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 of 2

**Quality Control Services, Inc.**  
Metrology Laboratory Manager  
E-mail [dthompson@qc-services.com](mailto:dthompson@qc-services.com)

Date: 01/15/16

Signature David S. Thompson



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PFS Teco  
11785 SE Hwy 212 STE#305  
Clackamas, OR 97015

Report Number: DIRI0134307497180613

## A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

### INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
g	0.0001	QC012	6/13/18	1/11/18	12/2018

### FUNCTIONAL CHECKS

ECCENTRICITY		LINEARITY		STANDARD DEVIATION			ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:		
100	0.0003	50 x 4	0.0002	100	0.0001		<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<b>As-Found:</b>		<b>As-Found:</b>		1.100.0000	5.100.0001	9.100.0001	Good Fair Poor
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	2.100.0000	6.100.0001	10.100.0001	
<b>As-Left:</b>		<b>As-Left:</b>		3.100.0000	7.100.0001	<b>Result</b>	Temperature: 22.8°C
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	4.100.0000	8.100.0001	0.00005	

### A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9980	200.0000	0.00015
100	99.9991	100.0000	0.00015
50	49.9995	50.0001	0.00015
20	19.9998	20.0000	0.00015
1	1.0000	1.0000	0.00015
0.1	0.1000	0.1000	0.00015

### CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20 kg to 1mg	2831W	1/3/18	1/2019	20152429

#### Permanent Information Concerning this Equipment:

6 month calibration cycle. Relative humidity= 47%

#### Comments/Info Concerning this Calibration:

6/13/18: Adjusted span.

Report prepared/reviewed by:

Jake C Date: 6/13/18

Technician: J. Colacchio

Signature: [Signature]

THIS CERTIFICATE SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

*NIST Traceable*  
**Calibration Report**



Reference Number: 1200788  
 PO Number: JSTEINERT013118

**PFS-TECO**  
 11785 SE Highway 212  
 Suite 305  
 Clackamas, OR 97015 United States

**Manufacturer:** Dwyer Instruments Inc.  
**Model Number:** 471  
**Description:** Air Velocity, Digital Thermo Anemometer  
**Asset Number:** #095  
**Serial Number:** #095  
**Procedure:** DS Universal Speed/Time/Temperature

**Calibration Date:** 02/14/2018  
**Calibration Due Date:** 02/14/2019  
**Condition As Found:** Limited In Tol See Comments  
**Condition As Left:** Limited See Comments

**Remarks:**

NIST-traceable calibration performed on the unit referenced above in accordance with customer requirements, published specifications and the lab's standard operating procedures. No adjustments were made to the unit.

This calibration is considered limited due to the requested test range.

**Standards Utilized**

Asset No.	Manufacturer	Model No.	Description	Cal. Date	Due Date
CP105979	Kanomax	X5602	Air Velocity, Wind Tunnel, Open Jet	01/06/2018	01/31/2019
CP144554	Fluke Corporation	1551A EX	Temperature, Stik Thermometer	01/08/2018	01/31/2019

**Calibration Data**

FUNCTION TESTED	Nominal Value	As Found	Out of Tol	As Left	Out of Tol	CALIBRATION TOLERANCE
Speed Accuracy Air Velocity	50 ft/min	43		Same		35 to 65 ft/min [EMU 1.3 ft/min][TUR 12:1]
Speed Accuracy Air Velocity	100 ft/min	90		Same		85 to 115 ft/min [EMU 1.5 ft/min][TUR 9.8:1]
Speed Accuracy Air Velocity	150 ft/min	140		Same		135 to 165 ft/min [EMU 1.8 ft/min][TUR 8.3:1]
Speed Accuracy Air Velocity	200 ft/min	192		Same		185 to 215 ft/min [EMU 2.1 ft/min][TUR 7.1:1]
Speed Accuracy Air Velocity	250 ft/min	240		Same		235 to 265 ft/min [EMU 2.4 ft/min][TUR 6.2:1]
Speed Accuracy Air Velocity	300 ft/min	288		Same		285 to 315 ft/min [EMU 2.7 ft/min][TUR 5.6:1]
Speed Accuracy Air Velocity	400 ft/min	395		Same		385 to 415 ft/min [EMU 3.3 ft/min][TUR 4.5:1]
Speed Accuracy Air Velocity	500 ft/min	485		Same		485 to 515 ft/min [EMU 3.9 ft/min][TUR 3.8:1]
Temperature Accuracy	72.0 °F	71.9		Same		70.0 to 74.0 °F [EMU 0.11 °F][TUR 18:1]

**Temperature:** 23° C  
**Humidity:** 20% RH  
**Rpt. No.:** 1375092

Calibration Performed By:				Quality Reviewer:	
Name	ID #	Title	Phone	Name	Date
Mathews, Rich	314	Metrologist	847-327-5314	Szplít, Tony	02/14/2018

*This report may not be reproduced, except in full, without written permission of Innocal. The results stated in this report relate only to the items tested or calibrated. Measurements reported herein are traceable to SI units via national standards maintained by NIST and were performed in compliance with MIL-STD-45662A, ANSI/NCSL Z540-1-1994, 10CFR50, Appendix B, ISO 9002-94, and ISO 17025:2005. Guard Banding, if reported on this certificate, is applied at a Z-factor of 30% for test points with a test uncertainty ratio (TUR) below 4:1. In Tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The estimated measurement uncertainty (EMU), if reported on this certificate, is being reported at a confidence level of 95% or K=2 unless otherwise noted in the remarks section.*





# Model 1430 Microtector® Electronic Point Gage

## Installation and Operating Instructions



**Model 1430 Microtector® Portable Electronic Point Gage** combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

### SPECIFICATIONS AND FEATURES

- Accurate and repeatable to  $\pm .00025$  inches water column
- Pressure range: 0 - 2" w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology

- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2" thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8" pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

**Maximum pressure: 100 psig with optional pipe thread connections.**

Tygon® is a registered trademark of Saint-Gobain Corporation

**DWYER INSTRUMENTS, INC.**

P.O. BOX 373

MICHIGAN CITY, INDIANA 46361, U.S.A.

Phone: 219/879-8000

Fax: 219/872-9057

www.dwyer-inst.com

e-mail: info@dwyer-inst.com



**Praxair**  
 5700 South Alameda Street  
 Los Angeles, CA 90058  
 Tel:(323)585-2154 Fax:(714)542-6689  
 PGVP ID: F22017

DocNumber: 000104669

# CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

**Customer & Order Information:**

PXPKG TUALATIN OR H  
 10450 SW TUALATIN SHERWOOD ROA  
 TUALATIN OR 97062

Praxair Order Number: 70187070  
 Customer PO Number:  
 Customer Reference Number:

Fill Date: 1/27/2017  
 Part Number: NI CD10CO33E-AS  
 Lot Number: 109702715  
 Cylinder Style and Outlet: AS CGA 590  
 Cylinder Pressure and Volume: 2000 psig 140 cu. ft.

**Certified Concentration:**

Expiration Date:	02/22/2025	NIST Traceable
Cylinder Number:	CC76915	Expanded Uncertainty:
10.04 %	CARBON DIOXIDE	± 0.4 %
2.52 %	CARBON MONOXIDE	± 0.7 %
10.52 %	OXYGEN	± 0.2 %
Balance	NITROGEN	

**Certification Information:** Certification Date : 2/22/2017 Term : 96 Months Expiration Date : 02/22/2025

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Do Not Use this Standard if Pressure is less than 100 PSIG.

CO2 responses have been corrected for O2 effect. O2 responses have been corrected for CO2 interference.

**Analytical Data:**

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

**1. Component:**

**CARBON DIOXIDE**

Requested Concentration: 10 %  
 Certified Concentration: 10.04 %  
 Instrument Used: Horiba VIA-510 S/N 20C194WK  
 Analytical Method: NDIR  
 Last Multipoint Calibration: 02/10/2017

<b>First Analysis Data:</b>				<b>Date:</b> 02/22/2017	
Z:	0	R:	13.97	C:	10.02
R:	13.96	Z:	0	C:	10.02
Z:	0	C:	10.02	R:	13.96
<b>UOM:</b> %		<b>Mean Test Assay:</b> 10.04 %			

Reference Standard Type: GMIS  
 Ref. Std. Cylinder #: CC283552  
 Ref. Std. Conc: 13.99%  
 Ref. Std. traceable to SRM #: 1675b  
 SRM Sample #: 6-F-51  
 SRM Cylinder #: CAL014538

<b>Second Analysis Data:</b>				<b>Date:</b>	
Z:	0	R:	0	C:	0
R:	0	Z:	0	C:	0
Z:	0	C:	0	R:	0
<b>UOM:</b> %		<b>Mean Test Assay:</b> 0 %			

**2. Component:**

**CARBON MONOXIDE**

Requested Concentration: 2.5 %  
 Certified Concentration: 2.52 %  
 Instrument Used: Horiba VIA-510 S/N UB9UCSYX  
 Analytical Method: NDIR  
 Last Multipoint Calibration: 02/10/2017

<b>First Analysis Data:</b>				<b>Date:</b> 02/22/2017	
Z:	0	R:	2.013	C:	2.508
R:	2.013	Z:	0	C:	2.519
Z:	0	C:	2.519	R:	2.013
<b>UOM:</b> %		<b>Mean Test Assay:</b> 2.52 %			

Reference Standard Type: GMIS  
 Ref. Std. Cylinder #: CC103175  
 Ref. Std. Conc: 2.017%  
 Ref. Std. traceable to SRM #: 2640a  
 SRM Sample #: 53-C-38  
 SRM Cylinder #: CAL013925

<b>Second Analysis Data:</b>				<b>Date:</b>	
Z:	0	R:	0	C:	0
R:	0	Z:	0	C:	0
Z:	0	C:	0	R:	0
<b>UOM:</b> %		<b>Mean Test Assay:</b> 0 %			

**3. Component:**

**OXYGEN**

Requested Concentration: 10.5 %  
 Certified Concentration: 10.52 %  
 Instrument Used: OXYMAT 5E  
 Analytical Method: PARAMAGNETIC  
 Last Multipoint Calibration: 02/05/2017

<b>First Analysis Data:</b>				<b>Date:</b> 02/22/2017	
Z:	0	R:	10.02	C:	10.53
R:	10.02	Z:	0	C:	10.53
Z:	0	C:	10.53	R:	10.02
<b>UOM:</b> %		<b>Mean Test Assay:</b> 10.52 %			

Reference Standard Type: GMIS  
 Ref. Std. Cylinder #: CC111177  
 Ref. Std. Conc: 10.01%  
 Ref. Std. traceable to SRM #: 2658a  
 SRM Sample #: 72-D-28  
 SRM Cylinder #: CAL016862

<b>Second Analysis Data:</b>				<b>Date:</b>	
Z:	0	R:	0	C:	0
R:	0	Z:	0	C:	0
Z:	0	C:	0	R:	0
<b>UOM:</b> %		<b>Mean Test Assay:</b> 0 %			

Analyzed by:

Ying Yu

Certified by:

Nassim Haddad

Information contained herein has been prepared at your request by qualified experts within Praxair Distribution, Inc. While we believe that the information is accurate within the limits of the analytical methods employed and is complete to the extent of the specified analyses performed, we make no warranty or representation as to the suitability of the use of the information for any purpose. The information is offered with the understanding that any use of the information is at the sole discretion and risk of the user. In no event shall the liability of Praxair Distribution, Inc. arising out of the use of the information contained herein exceed the fee established for providing such information.



# Report and Certificate of Calibration



6709 SE Lake Road  
Milwaukie, OR 97222  
1-800-356-4662  
CL-108

www.Cal-Cert.com

"Measure The Difference"

14 Inverness Drive East, Ste B-128  
Englewood, CO 80112  
1-800-983-7832  
CL-157



**Report #:** 2260-28789-46      **Customer PO#:**  
**Customer Name:** PFS TECO  
**Customer Address:** 11785 Southeast Highway 212  
**City:** Clackamas      **State:** OR      **Zip:** 97015  
**Contact:** John Steinert  
**Service Address:** 6709 Southeast Lake Road      Milwaukie, OR 97222

### Calibration Standards

10-RH/00192 Comark Thermohygrometer S/N 6217150049 Cal Date 11/17/17 Due Date 11/30/18 Vendor Cal-Cert REPORT # 1573-C-01
10-SR1/00515 SPI Steel Rule S/N 00515 Cal Date 3/21/17 Due Date 3/21/18 Vendor Cal-Cert REPORT# 59499-C-07

### Instrument Data

<b>Calibration Date:</b>	January 25, 2018	<b>Reference:</b>	Manufacturer's Spec
<b>Calibration Due Date:</b>	January 25, 2019	<b>Cal-Cert Procedure:</b>	CP-115
<b>Calibration Frequency:</b>	12 Months	<b>Indicating System:</b>	Scaling
<b>Manufacturer:</b>	Dewalt	<b>Temperature:</b>	71 °F
<b>Type:</b>	Tape Measure	<b>Humidity:</b>	29% RH
<b>Model Number:</b>	DWHT33372	<b>Asset #:</b>	#090
<b>Serial #:</b>	#1 TAPE	<b>Service Location:</b>	Cal-Cert Lab
<b>Capacity:</b>	192 Inches	<b>As Found:</b>	Pass
		<b>As Left:</b>	Pass

**Instrument Range:** 192.000 Inches      **Range Resolution:** 0.0625 Inches

Calibration Standard	As Found Reading	Verification Reading #1	Verification Reading #2
0.000	0.000	0.000	0.000
0.063	0.063	0.063	0.063
1.000	1.000	1.000	1.000
12.000	12.000	12.000	12.000
48.000	48.000	48.000	48.000
96.000	96.000	96.000	96.000
192.000	192.000	192.000	192.000

**Expanded Uncertainty ± 0.07217 Inches**

### Remarks:

We sincerely thank you for your business. Please call us at 1-800-356-4662 for all your sales and calibration needs. Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by the International Accreditation Service, Inc. (IAS) under Calibration Laboratory Code CL-108 & CL-157. IAS is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCCL Z540.3, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated. All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert

**Service Engineer:** TYSON MORAN      **Date:** January 25, 2018  
**Technical Manager:** MARSHALL DOYLE      **Signature:** *M Doyle*

# J-2000

owner's manual



**DELMHORST**<sup>®</sup>  
INSTRUMENT CO.

WHEN ACCURACY IS THE POINT.<sup>™</sup>



Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001



Cert. No.: 4198-9765787

Traceable® Certificate of Calibration for Hand Held Barometer

Customer : PFS TECO Suite 305 ,11785 SE Highway 212 ,Clackamas ,OR-97015 ,U.S.A.

Instrument Identification:

Model: 4198,

S/N: 80531676

Manufacturer: Control Company

Standards/Equipment:

Table with 4 columns: Description, Serial Number, Due Date, NIST Traceable Reference. Rows include Digital Barometer and Digital Thermometer.

Certificate Information:

Technician: 57

Procedure: CAL-32

Cal Date: 29 Aug 2018

Cal Due Date: 29 Aug 2019

Test Conditions: 62.73%RH 23.92°C 1018mBar

Calibration Data:

Table with 11 columns: Unit(s), Nominal, As Found, In Tol, Nominal, As Left, In Tol, Min, Max, ±U, TUR. Rows show calibration data for temperature and pressure.

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) - Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez

Nicol Rodriguez, Quality Manager

Aaron Justice

Aaron Justice, Technical Manager

Note :

Maintaining Accuracy:

In our opinion once calibrated your Hand Held Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Hand Held Barometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.control3.com

Control Company is an ISO/IEC 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by DNV GL, Certificate No. CERT-01805-2006-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).