Evaluation Report

Non - CBI

Valley Comfort Systems, Inc. (Blaze King)

30.2 Series

Report Number: 0142WS021E

***OMNI*-Test Laboratories, Inc.**

Product Testing & Certification

www.omni-test.com

Document Edition # 000 (04/09/24)

Mailing: PO Box # 301367, 97294 Phone: 1-(503)-643-3788

Facility: 13327 NE Airport Way, 97230 Fax: 1-(503)-643-3799

Evaluation Report

Particulate Emissions of a Wood-Fired Freestanding Room Heater, Catalytic type.

Non - CBI

Valley Comfort Systems, Inc. (Blaze King)

Model(s): Sirocco SC30.2, Ashford AF30.2, Ashford AF30.2A and Chinook CK30.2

Prepared For: Valley Comfort Systems, Inc. (Blaze King)
1290 Commercial Way
Penticton, BC V2A 3H5
CANADA

Prepared By: OMNI-Test Laboratories, Inc.
13327 NE Airport Way
Portland, OR 97230
(503) 643-3788

Test Period: 03/05/24 - 03/08/24

Report Date: April 9, 2024

Report Number: 0142WS021E
Project Number: 0142WS021E

** **AUTHORIZED SIGNATORIES** **

This Evaluation Report was drafted, reviewed, and approved by the following qualified OMNI representatives:

Evaluator:

Ken Morgan
Technical Services Director
kmorgan@omni-test.com

Report Issue Date:
April 9, 2024

TABLE OF CONTENTS

TABLE OF CONTENTS

Continued

1. INTRODUCTION

1.1 Purpose of Test Program

The Valley Comfort Systems, Inc. (Blaze King) 30.2 series Wood-Fired Freestanding Room Heater, Catalytic type is an appliance designed for use in residential heating applications and is identified as being an affected facility under the US Environmental Protection Agency's jurisdiction (EPA SCC code 2104008330) and is subject to the US EPA's performance requirements. Valley Comfort Systems, Inc. (Blaze King) contracted with OMNI to re-test the particulate emissions of the appliance in accordance with EPA regulations.

Testing was performed by OMNI at OMNI-Test Laboratories facility located at 13327 NE Airport Way - Portland, Oregon (45.563° latitude, -122.525° longitude and at an altitude of 30 feet above sea level). The unit was received in good condition and logged in on 02/15/24 , then assigned and labeled with OMNI ID #2244. OMNI representative Riley Tiegs, Tony Tong and Ken Morgan conducted the certification testing and completed all testing by 03/08/24. This report is organized in accordance with the EPA-recommended outline and is summarized in the Table of Contents immediately preceding this section. The results in this report are limited to the item submitted.

1.2 Executive Summary

Weighted Average Emission-Rate :	**0.81**	grams per hour
Weighted Average Efficiency (HHV) :	**83.0**	percent

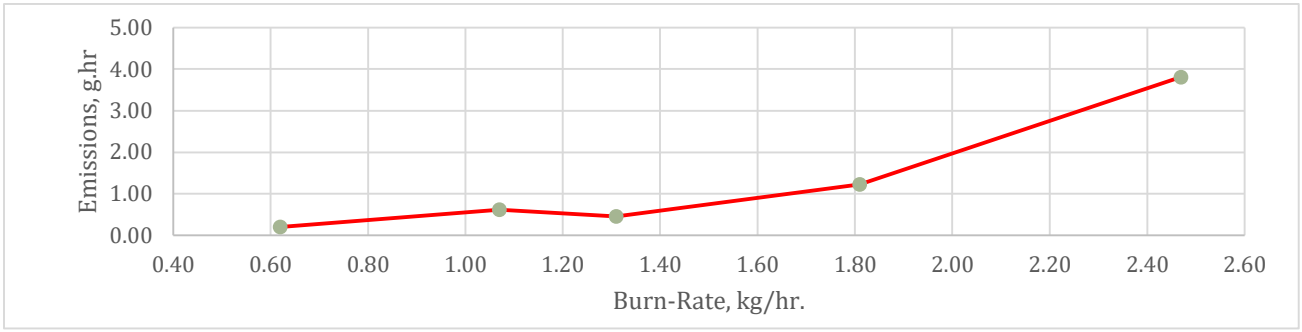


Figure 1 - Emissions Plot by Burn-Rate

Figure 2 - Efficiency Plot (HHV) by Burn-Rate

2. Materials and Methods

2.1 - Test Methodology

The testing methodology used for the evaluation of the appliance described in this report s composed of four distinct

- **Particulate Matter Emissions:**

  The 30.2 Series wood stove was tested in accordance with the U.S. EPA 40 CFR Part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters using ASTM E2515-11 "Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel". ALT -154 was also used during this evaluation.

- **Appliance Operation Procedure:**

  The 30.2 Series wood stove was fueled and operated following written instructions from the manufacturer and in accordance with ASTM E2780-10 (2017) "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters" in conjunction with EPA Method 28R.

- **Stack Loss Efficiency:**

  Stack-loss efficiencies were evaluated following CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". It is also used to calculate the emissions of carbon monoxide. Example calculations for CSA B415.1:22 are not provided in this report because OMNI uses software provided by CSA. Printouts of the software's reporting is provided in the test data section of this report for each test run.

- **Applicable Alternate Test Method(s):**

  ALT -154 was used during this evaluation. See appendix X for a copy of this alternate method.

2.2 Description of Appliance Under Test

The Valley Comfort Systems, Inc. (Blaze King) 30.2 Series are variable burn-rate catalytic appliances consisting of the model variants Sirocco SC30.2, Ashford AF30.2, Ashford AF30.2A and Chinook CK30.2. The model evaluated in this report was the Ashford 30.2.

Type

Wood-Fired Freestanding Room Heater, Catalytic, EPA SCC code 2104008330

All critical components, air flow pathways, and "K-List" items (aside from overall stove dimensions) are identical between the three models. They differ only in their outer “shells” to offer different styles to consumers. The differences between these heater models do not affect emissions performance. The firebox has a usable volume of 2.874 ft^3.

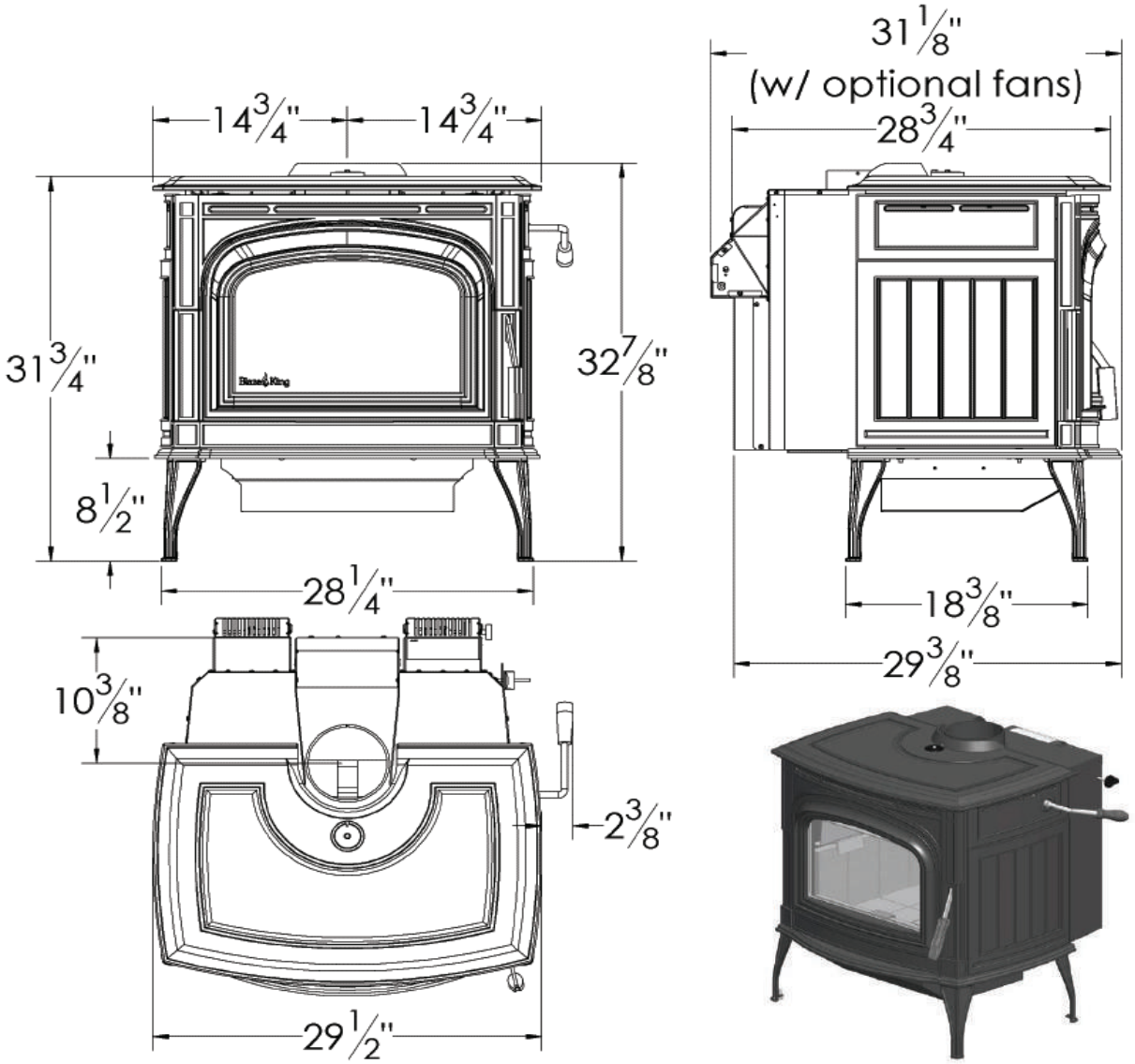


Figure 3 - Tested Model Ashford AF30.2 Over-all Dimensions

Materials of Construction

The 30.2 series wood heaters are constructed primarily of mild steel. The firebox is lined with low density (pumice) firebrick that measures 1.25 x 4.5 x 9". The feed door has a 10.875 x 17.875 inch glass panel and 7/8" diameter rope gasket.

Air Introduction System

Primary air enters through an opening located in the rear/bottom area of the appliance. Air is controlled through this opening by a rotating flap that is located at the rear/top of the appliance and is operated by a rod extending out the right side of the appliance near the rear/top. The rotating flap is further controlled by a Bi-metallic spring that closes the flap as the spring is heated. Primary air is channeled from the primary control through two round tubes which (internally) direct air to the air wash manifold located above the fuel loading door. There is no dedicated secondary air introduction system supplying air to the catalytic combustor.

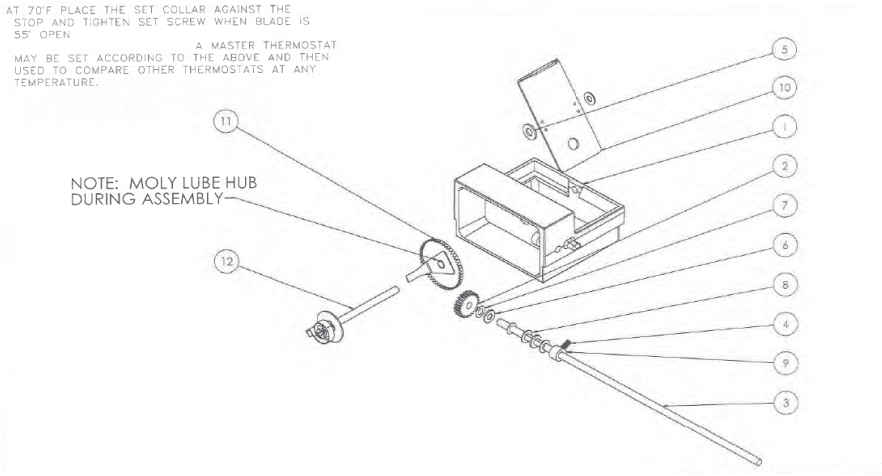


Figure 4 - Primary Air Control Arrangement

Combustion Control Mechanisms

Combustion rate is controlled by rotating the Primary Air Control Rod. This rotates the primary air flap and simultaneously adjusts the pre-loading of the integral bimetallic coil. Full clockwise rotation opens the air flap and relieves pre-load of the bimetallic coil making it less responsive to temperature resulting in maximum heat output. As the Bi-metallic spring cools it allows the air control to open slightly, it will then close as the increased combustion heats it up, thus maintaining a constant range of heat output. Full counter-clockwise rotation closes the air flap and adds pre-load of the bimetallic coil making it more responsive to temperature resulting in minimum heat output. An adjustment knob for the purpose of rotating the primary air control rod is located on the left side of the appliance. Refer to Figure 4.

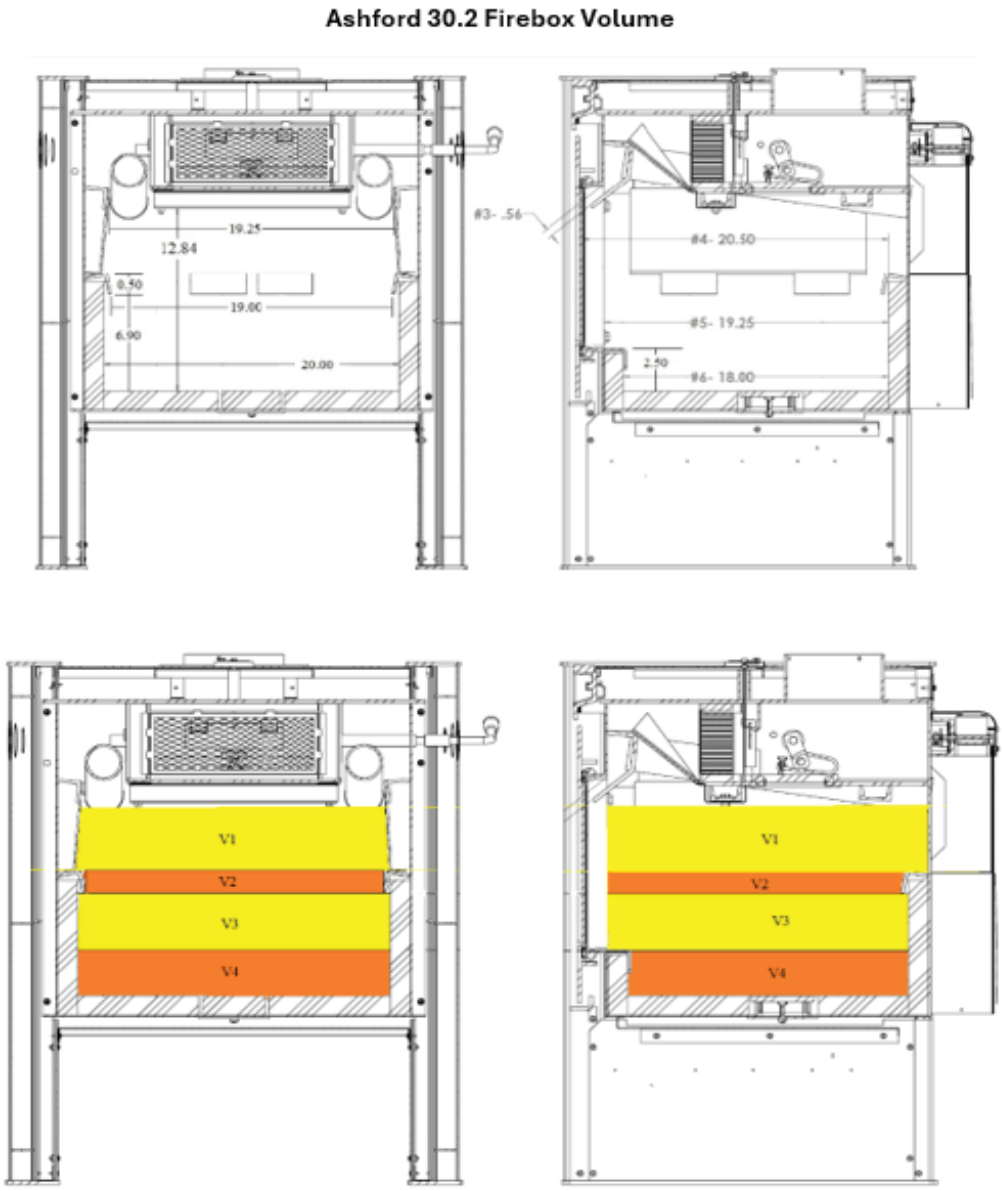
Combustor:
A metal combustor measuring 10.65 x 4 x 2.15 (inches) is mounted at the top of the firebox near the middle. The metal combustor is factory mounted inside a metal can with tabs used to assist in installation and removal.

Internal Baffles:
Air travels through a catalytic combustor located above the firebox. The baffle also has a bypass opening where exhaust travels when the bypass is open. Internal baffles to direct flame path are not used, the catalyst and bypass are mounted in a "dome" attached to the firebox top.

Flue Outlet:
A 6" diameter flue outlet is located on the top of the appliance, toward the back side.

Other Features:
Two fans operated by one power switch are located under the firebox near the rear; the power switch is also a rheostat that is used to adjust fan speed. Fans are provided on all models, not as an option.

Usable Firebox Volume:



V1 = [(20 + 19.25) / 2] x (12.84 – (6.90 + 0.50)) x (19.25 + 1.25) = 19.625 x 5.44 x 20.5 = 2188.58
V2 = 19.25 x 19.0 x 0.50 = 182.875
V3 = (6.9-2.5) x 20.0 x 19.25 = 1694
V4 = 2.5 x 20.0 x 18 = 900

VT = V1 + V2 + V3 + V4 = 5965.455 in^3 = 2.874 ft^3

Figure 5 - Firebox Volume

Model Variant: Ashford AF30.2A

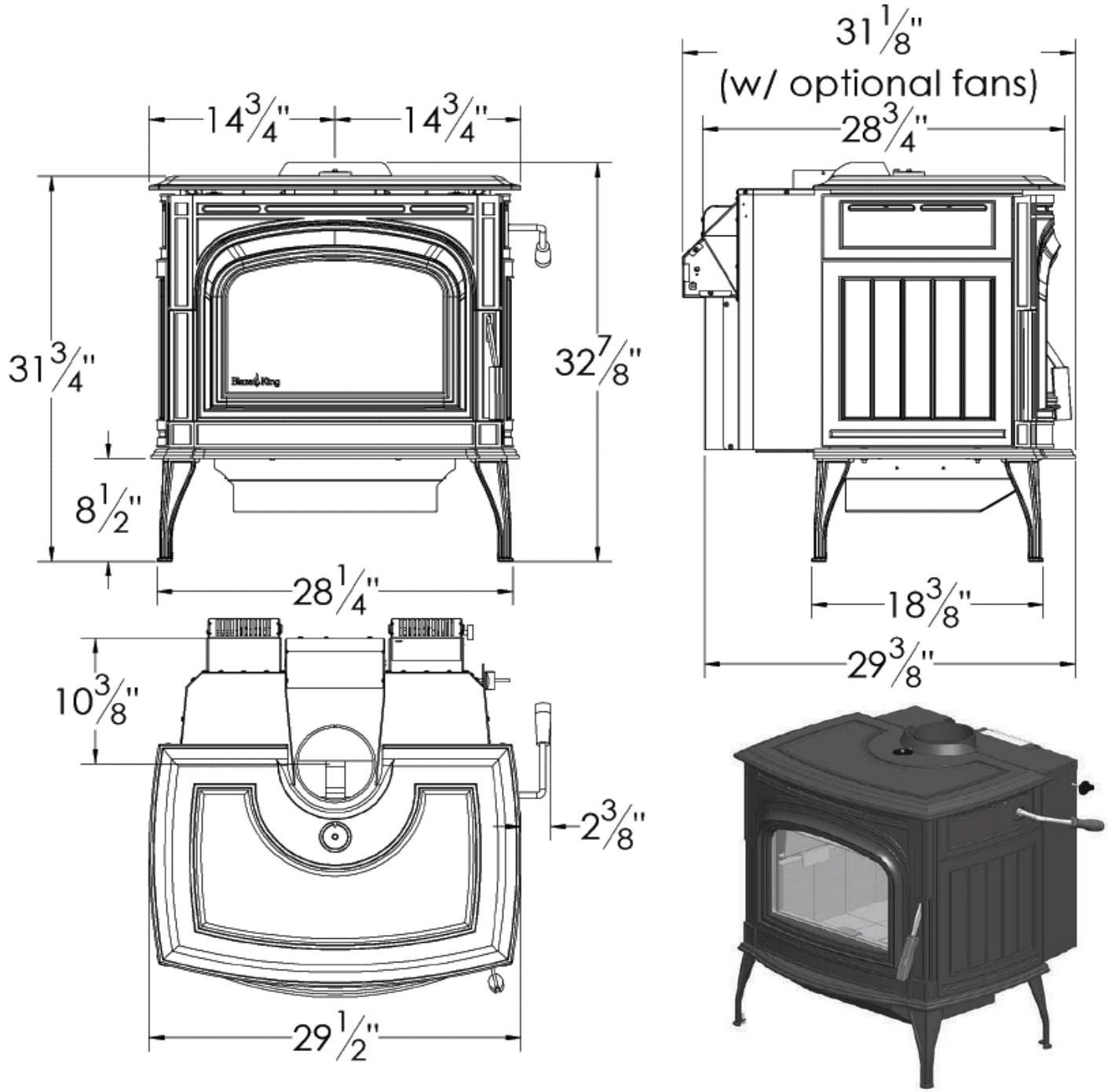


Figure 6 - Over-all Dimensions of model variant Ashford AF30.2A

Model Variant: Sirocco SC30.2 (Pedestal Option)

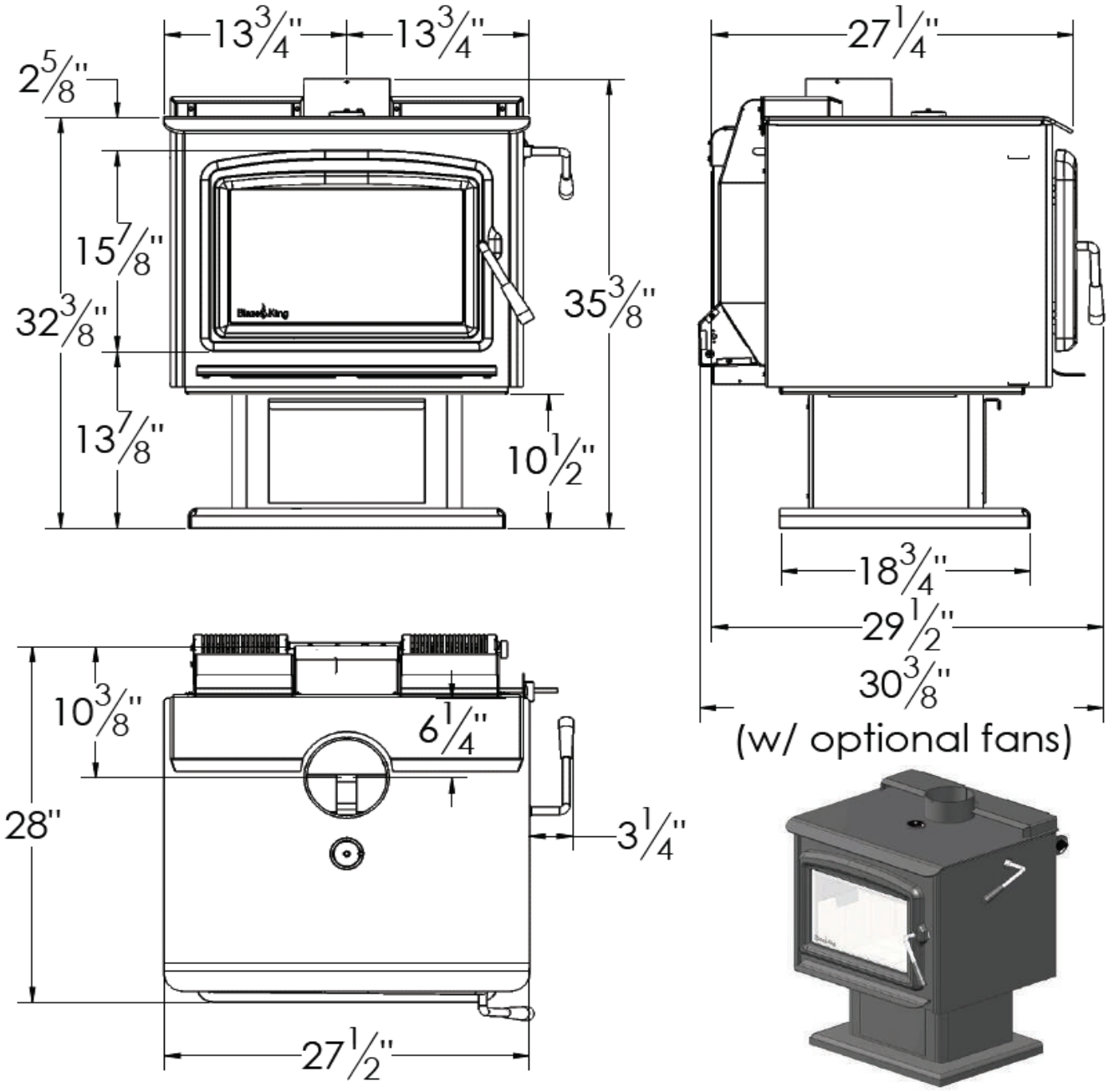


Figure 7 - Over-all Dimensions of model variant SC30.2A (with Pedestal Option)

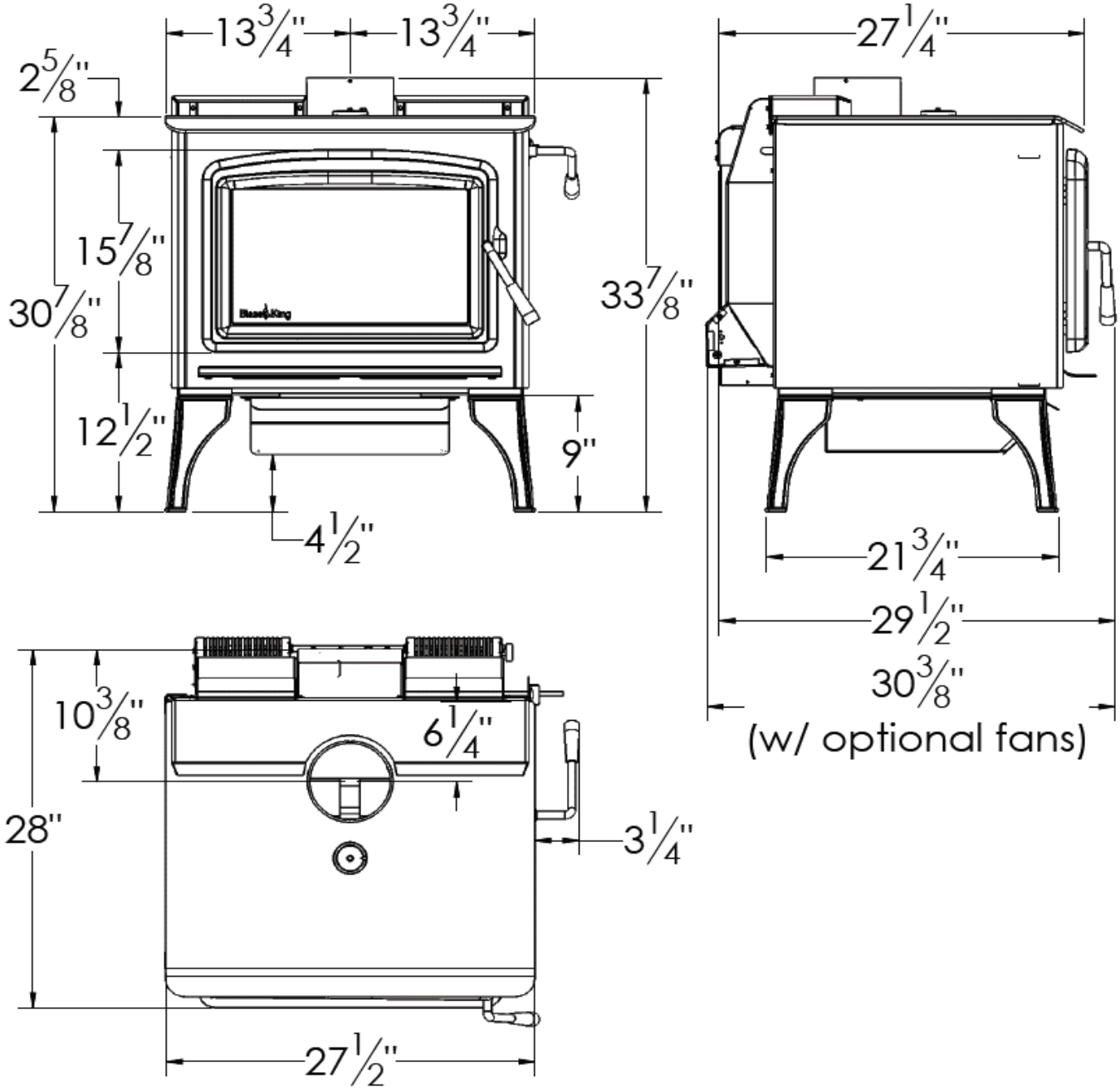


Figure 8 - Over-all Dimensions of model variant SC30.2A (with Leg Option)

Model Variant: Chinook CH30.2

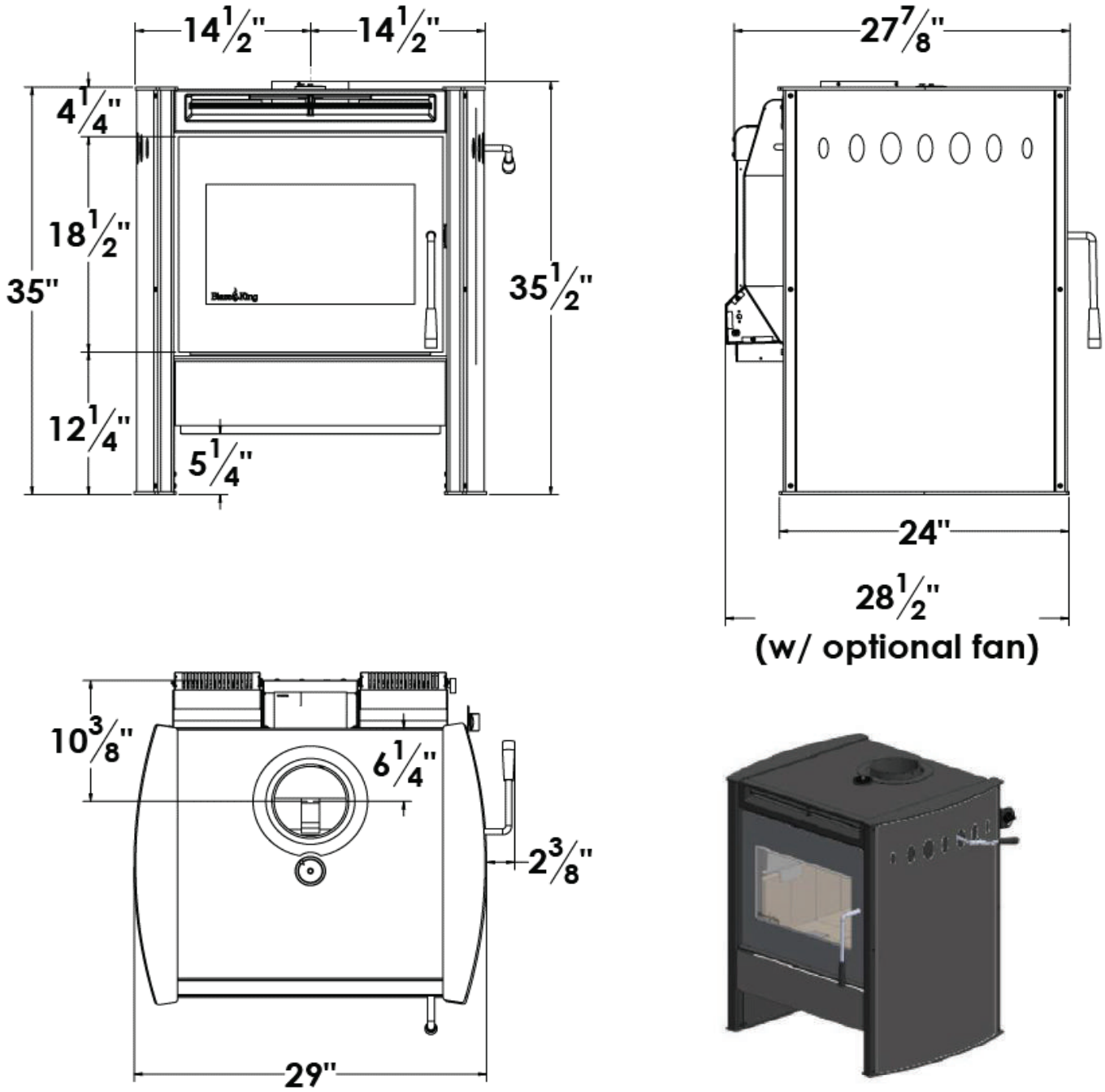


Figure 9 - Over-all Dimensions of model variant CH30.2

2.3 Appliance Installation

The appliance was placed on a 1000 lb. capacity scale and fitted with a section of 6-inch diameter single wall connector pipe that extended upward to a height approximately eight feet from the top surface of the scale. Six-inch solid pack chimney was added further extending the total flue conveyance pipe upward to an over-all height of 15 feet as measured from the top of the platform scale. The lower portion of the solid pack chimney was fitted with a 3/8-inch diameter hole where a flue gas probe was inserted and with a 3/16" diameter hole where a shielded Type K thermocouple probe was inserted. A 3/8" diameter hole was drilled into the lower single wall connector pipe within 1 foot of the appliance and a draft probe was inserted. All joining sections of pipe and flue attachment were sealed with furnace cement. Type K thermocouples were attached to the top, bottom, back, left and right sides of the appliance for surface temperature measurement. A shielded type K thermocouple probe was inserted into a 1/8" diameter hole in the top of the appliance for the purpose of measuring catalyst exit temperatures.

2.4 Appliance Conditioning

Due to the unsealing of a previously tested and archived specimen for the purpose of this re-certification testing, the requirement of a minimum 50 hours of conditioning was deemed as already having been met and was waived by the EPA. The original 50 hour of conditioning has been added to Appendix E of this report.

2.5 Dilution Tunnel

OMNI's facility uses permanent and dedicated dilution tunnels that are designed and are maintained to meet the specifications of the dilution tunnel specifications prescribed in ASTM E2515. The dilution tunnel was cleaned on 3/05/24 immediately prior to the test series. Prior to testing, sample point and traverse point locations are verified to ensure their locations are within the prescribed specifications. Collection hood, tunnel diameter, and mixing section length are also verified to be within specifications.

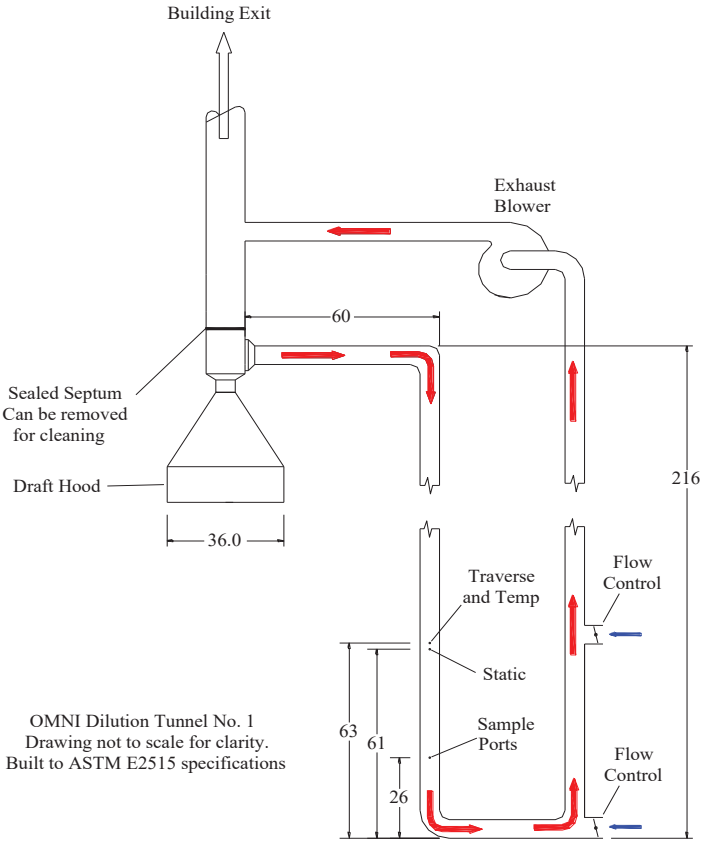


Figure 10 - Dilution Tunnel at OMNI-Test Laboratories Portland, Oregon Facility

2.6 Particulate Sampling Systems

The sampling systems consisted of two independent datalogging systems, each managing two dry gas meters (a total of four dry gas meter sampling systems). One of the dual systems was designated for sampling of Trains A and B for the duration of test(s), and the other dual system was designated for sampling of the First Hour emissions with one dry gas meter system (Train C) and background ambient particulate (Train D) with the other. Each of these system trains were arranged identically and in accordance with Section 6 of ASTM E2515. The only exceptions are; 1) the pressure drop through an orifice on the exhaust end of each meter were monitored with a monometer to aid in identifying and responding to changes in the sample flow rates during operation as well as being used to account for internal meter pressures.

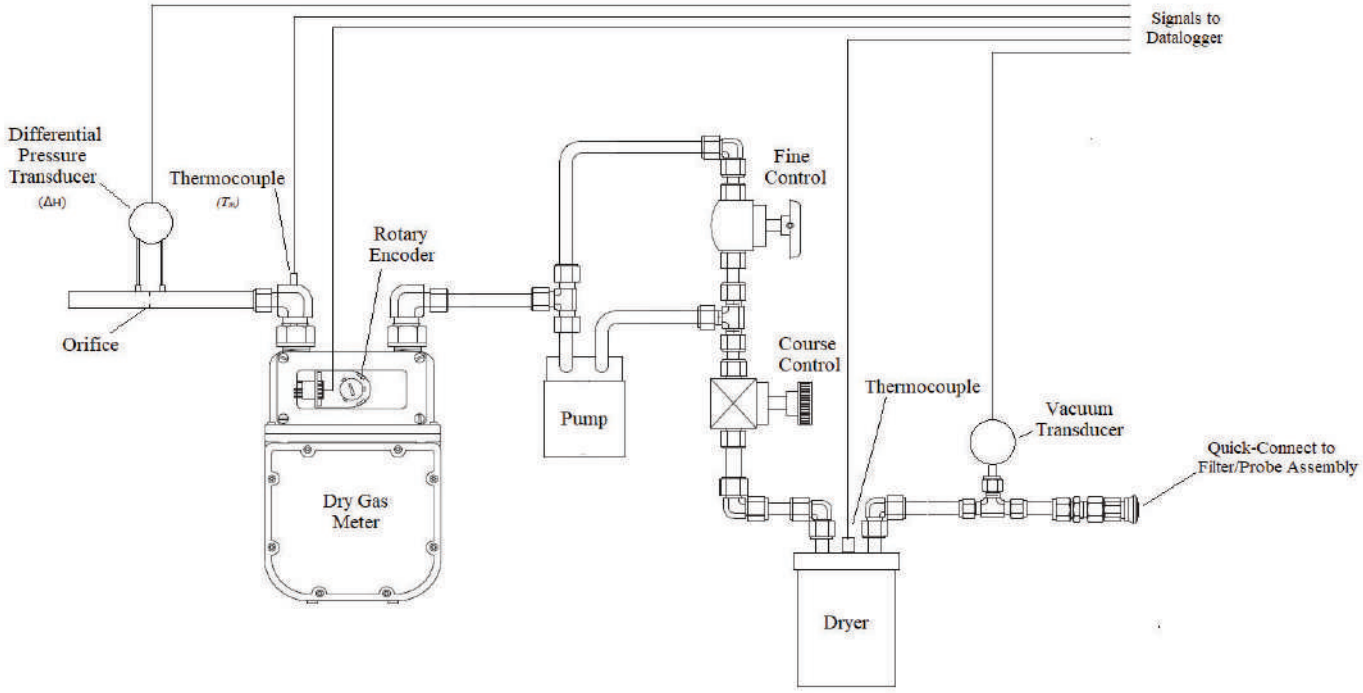


Figure 11 - Sampling System (typical) Used At OMNI-Test Laboratories

2.7 Particulate Sampling Probes and Filters

The probes used were 1/4" OD stainless steel. The probe holders used were Gelman 2220 stainless steel. The O-ring seals used were 47mm x 3mm diameter Vitron. The filters used were PALL A/E glass Fiber, 1µm, 47mm diameter.

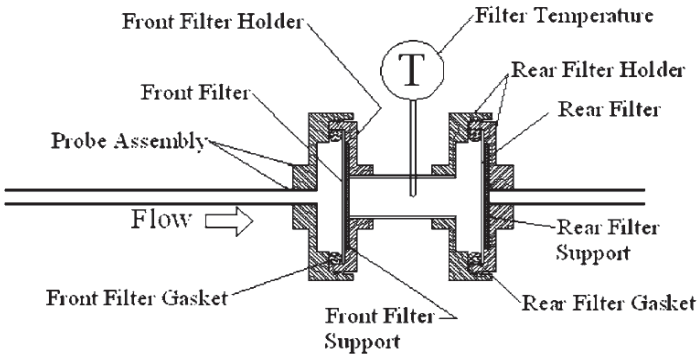


Figure 12 - Sample Probe Assembly as specified in ASTM E2515-11

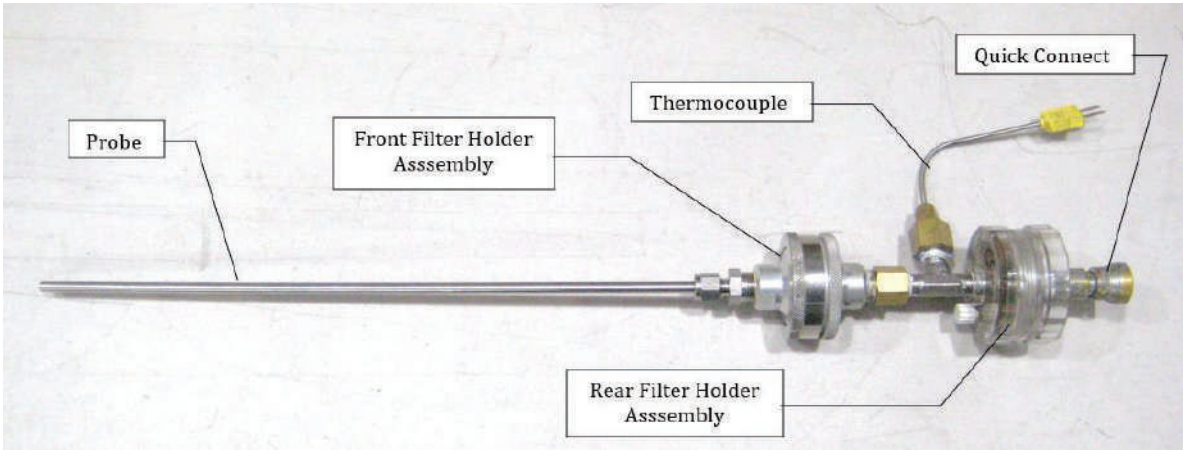


Figure 13 - Sample Probe used by OMNI

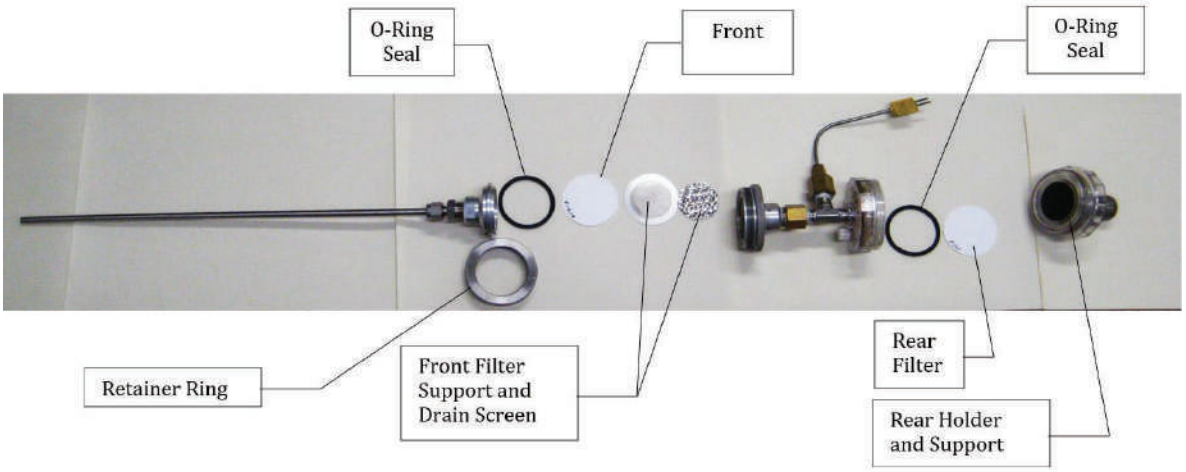


Figure 14 - Exploded View of Sample Probe Assembly used by OMNI

Clause 6.1.1 of ASTM E2515-11 requires that the filter face velocity shall not exceed 150 mm/sec (30 ft/sec). The O-ring seal covers a narrow portion of the perimeter of the filter thus reducing it's effective diameter from 47mm to 43mm. The area used in subsequent calculations of the filter face velocity is therefore based on 43mm diameter.

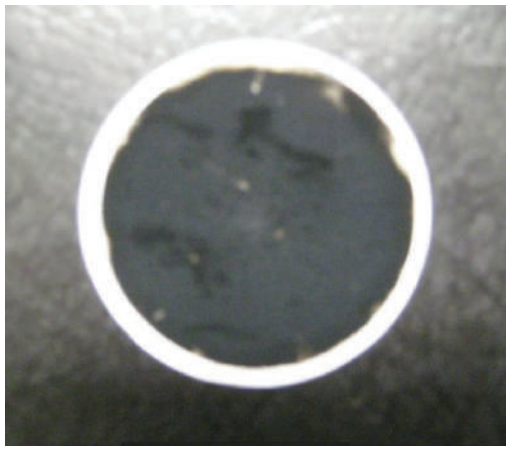


Figure 15 - Effective facial area of sample filter (file photo, not from the evaluation in this report)

2.8 Flue Gas Sampling Equipment

Carbon dioxide (CO_2) and carbon monoxide (CO) concentration measurements of the flue gases are required by CSA B415.1 to determine stack loss based efficiencies. Oxygen measurements are not taken as CSA B415.1 calculates oxygen empirically using mass-balance equations based upon the measured CO_2 and CO concentrations.

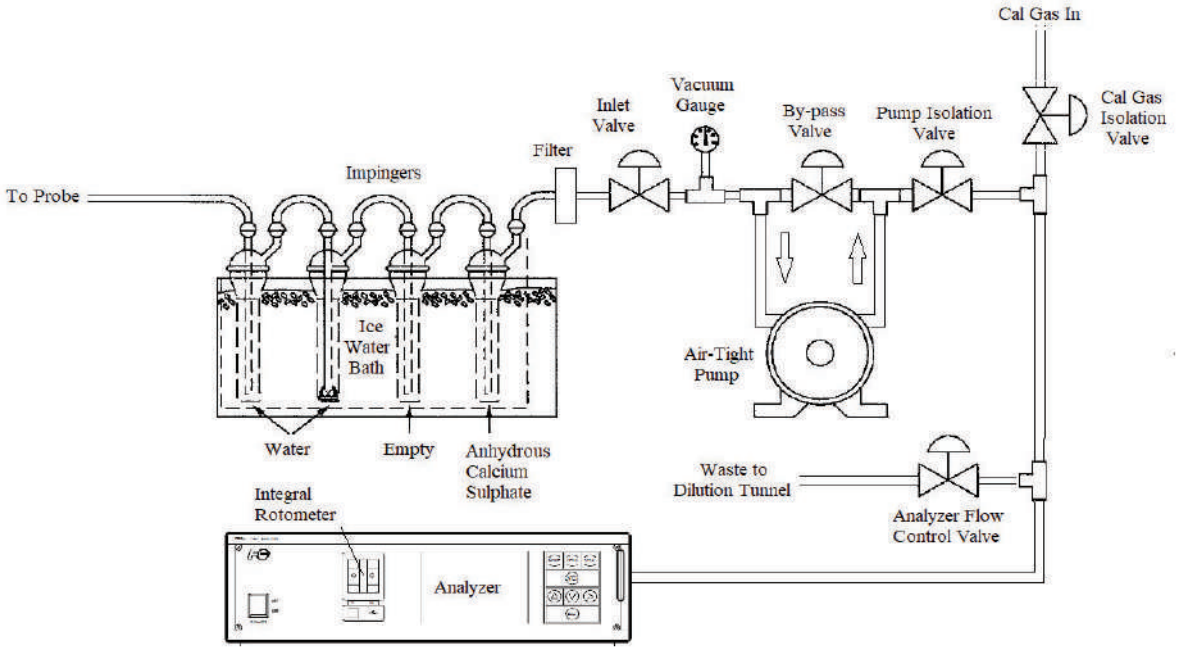


Figure 16 - Flue Gas Measurement System

2.9 Gravimetric Analysis Equipment

All taring of filters, Probes and O-Ring seals take place in a dedicated room for this purpose with ample facility for the preparation and handling of tared reagents as well as post-test processing. Upon test program completion, all filters are placed in plastic petri dishes, marked and stored for a period of 6 months.

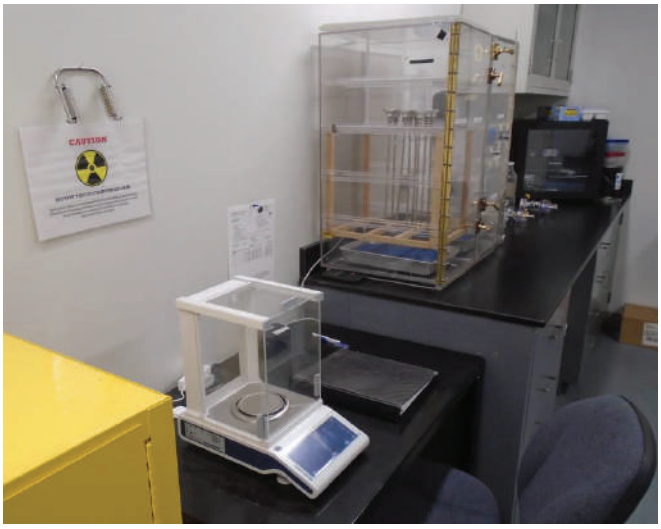


Figure 17 - Analytical Scale and Desiccator

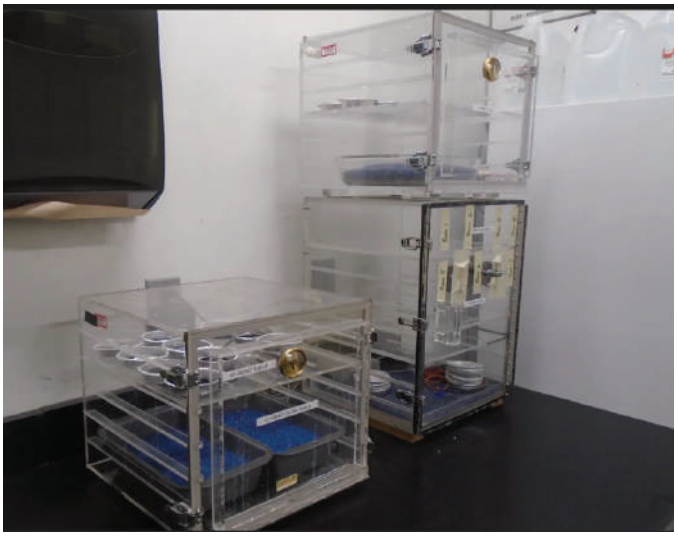


Figure 18 - Additional Desiccators

2.10 Test Fuel Acquisition

ASTM E2780, clause 3.2.3 requires Douglas fir, untreated, standard or better grade with agency grade stamp: D. Fir or Douglas Fir. Green air dried Douglas Fir. Mr. Charles Bishop of Blaze King procured a sizable lot of suitable Douglas Fir lumber with appropriate markings from a multitude of home improvement box stores in the Walla-Walla Washington area and transported them to OMNI along with the appliance sample. All testing was performed with this selection of wood fuel.

Figure 19 - Typical of all stampings on the fuel lot

Figure 20 - Typical Stamping locations on random pieces of lumber

2.11 Specific Manufacturer's Written Operating Instructions

February 20, 2024
Prepared by Aaron Saxton
Product Development, Blaze King Industries

Blaze King Ashford AF30.2 EPA Test Burn Instructions to The Lab

The following literature shall be used as a guideline when operating a Blaze King Ashford AF30.2 during an ASTM E2780/E2515 and 28R Wood Heater Test.

** before starting any test run ensure unit is clean; use vacuum to remove any material left from previous burns and zero scale**

Kindling Load

- prepare 12 lbs of Douglas Fir cordwood (kindling load)
- with the thermostat set to high and the bypass door open, light the fire
- leave the loading door cracked open and bypass open until fire is well established
- once loading door is closed and combustor temperature begins to climb, close the bypass door (Rotate bypass handle clockwise until an audible click is heard), turn fan on to high
- once load has burned down to 1.5-2.0 lbs, open bypass door (by rotating the bypass handle counter clockwise) and then loading door and break down load into chunks of coal
- scoop out coals (as much as possible) and zero scale
- place coals back in firebox and rake to make an even coal bed; rake hotter coals to front of unit for better preburn light off
- close loading door and bypass door and prepare to load preburn

Preburn Load

- when ready to load preburn, open bypass door then loading door and place 5(16.75inch) pieces onto coal bed in a front-to-back orientation (North-South), evenly spaced. Then place 5(16.75inch) pieces on top in a side-to-side orientation (East-West), evenly spaced, with the front top piece laid down flat. Close loading door, then bypass door and ensure thermostat and fan are both set to high. Keep loading time to a minimum.
- let unit burn until the following weights are reached for their respective turn down settings

Burn Category	Pre-Burn Shut-down Weight, lb.	Primary Air Setting (From Horizontal Position)
I	(0.25 x TLW) + 0	10° (80° CCW)
II	(0.25 x TLW) + 0	30° (60° CCW)
III	(0.25 x TLW) + x	50° (40° CCW)
IV	n/a	0°
Fan Confirmation	(0.25 x TLW) + x	43° (47° CCW)

  - Category 1 (low burn) = 4.4 lbs
  - Category 2 (medium low burn) = 5.3 lbs
  - Category 3 (medium high burn) = 8.0 lbs
  - Category 4 (high burn) = no turn down
  - **note: turn down weight is based on fuel load weight (variable)
- at turn down time, fan speed is also reduced respectively:
  - low burn = rheostat knob at lowest point
  - medium low burn = rheostat knob 1/3 open
  - medium high burn = rheostat knob 2/3 open
  - high burn = rheostat knob fully open
- once preburn has burned down to desired coal bed weight (60-80 minutes after turndown) and catalyst temperature is trending upwards, open the bypass door then open the loading door and rake down preburn load into a coal bed. Bring the hotter coals towards the front of the firebox with a slight angle forward (helps prevent test load from rolling forward into door glass). Close the loading door and bypass, prepare to load test fuel. Keep loading time to a minimum.

Test Load

- when ready to load; Leave thermostat knob at the test setting, turn fan off, open the bypass door, open loading door and load test fuel (four 2x4's and two 4x4's, 16.75inches in length) making sure to slightly angle the front two stacked 2x4's back into the stove to help prevent them from rolling forward into the door glass. Close loading door and bypass as soon as test fuel is loaded.
- Turn the fan on to its respective burn category position (as shown above)..

3. Test Results

3.1 - Test Result Tables

Table 1 - Individual test run result summaries, sorted primarily by inclusion, secondarily by burn-rate

				Uncorrected[1]		Corrected[2]		Efficiency, %		
Run No.		Category	BR, kg/hr.	ER. g/hr.	First Hour	ER, g/hr.	First Hour	HHV	LHV	Included in WA? (1 = yes))
1	3/5/2024	1	0.62	0.20	1.58	0.20	1.58	85.9	92.8	1
2	3/5/2024	2	1.07	0.62	2.31	0.62	2.31	83.6	90.4	1
5	3/7/2024	3	1.31	0.46	2.72	0.47	2.72	83.2	89.9	1
4	3/6/2024	3	1.81	1.23	2.75	1.23	2.75	80.2	86.7	1
6	3/7/2024	4	2.47	3.81	9.79	3.81	9.79	77.6	83.9	1
7	3/8/2024	2	1.08	0.43	1.31	0.43	1.31	81.1	87.7	0
3	3/6/2024	4	2.48	3.56	8.52	3.56	8.52	76.8	83.0	0
							Number of runs included in Weighted Average			5

Table 2 - Weighted Average Weighting Factors, Sorted by Burn-Rate

Run No.	Burn-Rate, kg/hr.	ER, g/hr.	k_i	k_i x EU, Uncorrected[1]	k_i x EC_i, Corrected[2]	k_i x HHV_i	k_i x LHV_i	Contribution %
1	0.62	0.20	0.4282	0.0856	0.0856	36.7824	39.7370	23.11
2	1.07	0.62	0.5184	0.3214	0.3214	43.3382	46.8634	27.98
5	1.31	0.46	0.4482	0.2062	0.2107	37.2902	40.2932	24.19
4	1.81	1.23	0.3342	0.4111	0.4111	26.8028	28.9751	18.04
6	2.47	3.81	0.1236	0.4709	0.4709	9.5914	10.3700	6.67
Sums			1.8526	1.4952	1.4997	153.8051	166.2387	100.00
				ER, g/hr. Uncorrected	ER, g/hr. Corrected	HHV, %	LHV, %	
Weighted Averages (ΣkE / Σk)				**0.81**	**0.81**	**83.0**	**89.7**	

[1] Uncorrected refers to gravimetric analysis that takes negative filter weights as a negative value in cases where filter residue was transferred to (stuck to) O-ring gaskets to account for the mass transfer.

[2] Corrected refers to gravimetric analysis where negative filter weights are taken as zero, thus reporting a higher value by over-reporting of transferred filter material. The corrected values were added to OMNI's reporting in response to a request by the US EPA.

Table 3 - Heat Output and CO Emissions (CSA B415.1:22), Sorted by Burn-Rate

Run No.	*Burn-Rate kg/hr.*	*Heat Input* [1] *Btu/hr.*	*Heat Output* [1] *(HHV) Btu/hr.*	*CO Emissions*		
				g/MJ	*g/kg*	*g/min*
1	0.62	11751	10094	0.19	3.19	0.03
2	1.07	20015	16743	1.09	18.04	0.32
5	1.31	24688	20534	1.07	17.68	0.39
4	1.81	34108	27364	1.69	26.82	0.81
6	2.47	46487	36076	2.67	40.98	1.69
7	1.08	20351	16508	3.64	58.57	1.06
3	2.48	46637	35802	2.33	35.51	1.47
			Average of All runs	1.81	28.68	0.82
			Average of runs included in Weighed Average Only	1.34	21.34	0.65

[1] Based on a calorific value of 8516.77 Btu/dry pound. (Source: CSA B415.1:22 for Douglas Fir)
Runs 3 and 7 were not included in weighted average.

Table 4 - Test Facility Conditions

Run No.	*Room Temperature, °F*		*Barometric Pressure, in Hg*		*Room Air Relative Humidity, %*		*Room Air Velocity, fpm*	
	Before	*After*	*Before*	*After*	*Before*	*After*	*Before*	*After*
1	71	70	30.01	30.05	25	29	16	0
2	70	68	30.07	30.12	29	31	0	10
3	73	68	30.11	30.09	30	30	23	16
4	69	69	30.09	30.11	29	29	35	12
5	69	67	30.22	30.23	27	27	12	6
6	66	65	30.26	30.27	29	31	6	8
7	66	67	30.09	29.98	32	32	16	12

Table 5 - Preburn Test Fuel load description

Run No.	*Number of Pieces*	*Pre-Test Fuel Weight, lb.*	*Pre-Test Moisture %, Dry Basis*	*Coal Bed Weight lb.*
1	10	19.9	22.4	3.4
2	10	17.7	21.6	4.4
3	10	18.0	22.8	3.4
4	10	18.3	21.6	4.3
5	10	18.4	22.5	4.5
6	10	19.5	23.0	3.4
7	10	19.7	23.6	4.7

Table 6 - Test Fuel Properties

Run No.	*Mass lb., Wet*	*Mass, lb. Dry*	*Moisture content %, wb*	*Moisture content %, db*	*Length In.*	*Density lb./ft3*	*Loading Density lb./ft3*	*2 x 4 pieces used*	*4 x 4 pieces used*	*Direction [1] E/W or N/S*
1	18.7	15.30	18.19	22.24	16.75	28.89	6.51	4	2	E/W
2	18.9	15.69	16.99	20.47	16.75	32.51	6.58	4	2	E/W
3	18.6	15.22	18.15	22.18	16.75	29.48	6.47	4	2	E/W
4	19.1	15.73	17.62	21.39	16.75	29.38	6.65	4	2	E/W
5	18.5	15.25	17.57	21.32	16.75	28.2	6.44	4	2	E/W
6	18.5	15.27	17.48	21.19	16.75	28.89	6.44	4	2	E/W
7	18.9	15.67	17.07	20.58	16.75	28.82	6.58	4	2	E/W

[1] "E/W" means "East-West", meaning the lengths of the fuel pieces ran from right-to-left within the firebox relative to the firebox door opening. "N/S" means "North-South", meaning the lengths of the fuel pieces ran front-to-rear within the firebox relative to the firebox door opening.

Table 7 - Dilution Tunnel Gas Measurements Summary

Run no.	*Length of test, min*	*Velocity, ft/sec*	*Flow Rate, dscfm*	*Temperature °F*
1	666	17.298	196.4	78.4
2	401	18.091	205.3	79.7
3	167	18.408	202.4	97.3
4	236	22.101	249.3	83.1
5	316	19.259	219.0	81.0
6	168	21.948	246.3	88.9
7	394	17.285	198.6	76.9

Table 8 - Appliance Average Surface Temperature Data

Run No.	*Beginning*	*Ending*	*Δ T*
1	302	320	18
2	362	385	23
3	510	418	92
4	386	388	2
5	376	410	34
6	472	411	61
7	346	372	26

4. Discussion

4.1 The Test Series - Started March 4, 2024

The plan for this test series required a minimum of 5 test runs: (1) A burn-rate of less than 0.80 kg/hr. (Category I), (2) a burn-rate between 0.80 and 1.25 kg/hr. (Category II), (3) a burn-rate between 1.25 and 1.80 kg/hr. (Category III) , (4) a Burn-rate that of the maximum potential of the appliance (Category IV) and (5) a fan-confirmation test. Two additional tests were conducted. Test Run 3 experienced major loading of elemental carbon on filters creating a situation that was impossible to replace all filter assemblies before imminent proportionality issues would occur. Note, this simultaneously effected the first hour and both trains A and B. The test was allowed to finish, but the results were invalid due to failing proportionalities. Test Run 6 was performed to replace test Run 3. Test Run 4 over-shot an attempt at a category III. It was a valid test and included in the weighted average, however an additional test, test Run 5 was required to fulfill the category III requirement. The dilution tunnel was cleaned on March 5, 2024 in advance of the test series.

Note on the Primary Air Control - The air control mechanisms used by Valley comfort on several of their models, including the 30.2 series is unique in that it utilizes a bimetallic actuated control, a "flapper", for the entry of combustion air. The desired burn-rate is controlled by rotating the flapper, which in turn either increases or decreases the pre-loading tension of the bimetallic coil. This changes the sensitivity of the bimetallic coil that maintains control over the selected heat output range. Rotating the control knob fully clockwise (CW) stops with the indicator on the knob pointing straight down. This straight-down position has been noted as "0°" for the purpose of defining a point of reference in this test program and report. This is the fully open high-burn position. Turning counter-clockwise (CCW) reduces the burn-rate. Because of the sensitivity of this control, it is possible to turn the control so low that the appliance will burn-out. This is a Blaze King design philosophy as it permits low burn-rates in various installation climates and conditions that effect draft. The EPA has inquired for further detail regarding this feature in past Valley Comfort emissions reports. See Appendix B for the description and explanation from Valley Comfort that was originally submitted to and accepted by the EPA..

A paper scale resembling the one in Figure 21 was applied to the appliance and used during testing. Attempts to photograph test settings proved to be problematic due to flash intensity and difficulty over coming parallax errors.

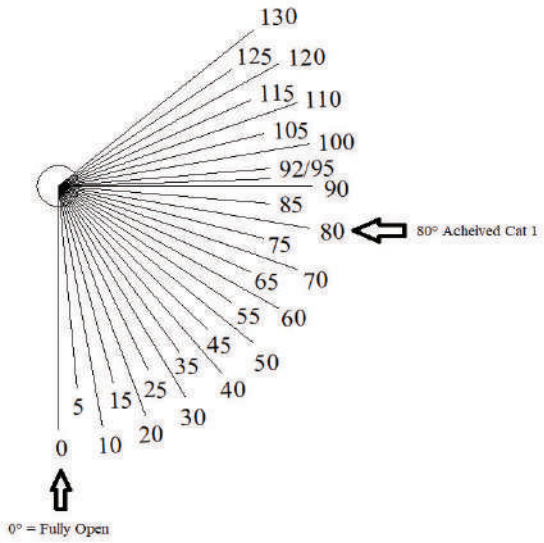


Figure 21 - Primary Air Control Setting Scale used for testing

For each test run within this series, a small kindling fire with scrap fuel was created within the cold appliance and allowed to burn somewhat robustly with the intent of driving out any moisture mass that may have accumulated in the appliance, particularly the refractory materials. The coals are removed, the scaled re-zeroed, then the coals are placed back inside and leveled and ready to receive the pre-burn charge. This is a standard operating principle at OMNI and one which is also performed by Blaze King in their laboratory.

During the course of the testing, their were some tests (Runs 1, 2, 3, 4, and 6) where the pre-burn scale weights were effected by the addition of the flue gas probe. On these tests, the pre-test calibrations of the continuous analyzers and the subsequent bias-checks were not performed before the start of the pre-burn. Therefore, weight was added to the system when the probe was positioned. The amount of weight added to the system varies between 0.1 and 0.2 lb. depending on the circumstance of how the probe and line were supported. In these cases the data presented for the pre-burns in the test data section of this report have not been adjusted, however a note has been added at the bottom of the data.

OMNI personnel present and participating in the testing were Riley Tiegs, Tony Tong and Ken Morgan. OMNI was committed to completing this testing on a strict schedule worked out with the manufacturer which resulted in varying number of team members for any given test run as well as some over-night testing. Therefore, a multitude of signatures may be found in the written notes with some apparent inconsistencies. This was due to the need to be flexible with personnel scheduling.

Manufacturer representative Charles Bishop was present for the entirety of the test program. Mr. Bishop was present primarily to observe and to provide recommendation regarding specific air control settings as they pertained to achieving burn-rate categories. Blaze King historically has understood that burn-rates experienced by them in Walla Walla Washington differ slightly from those they have experienced in Portland, Oregon with the burn-rates in Portland being a little faster. This is presumed to be due to the difference in elevation between the two locations. This indeed turned-out to be the case and without Mr. Bishop's knowledge of the appliance's sensitivity to changes in the control setting much unnecessary time and testing may have taken place in trying to hit required burn-rate categories. Mr. Bishop also helped in fuel load preparation, however all fuel load measurements and final assembly was performed by OMNI personnel.

With regard to the manufacturer's written instructions, they were closely followed with two notable exceptions:

1. "Bring hotter coal beds to front of the firebox" - This was not done. The coal bed was simply tamped and leveled without regard to any particular coal bed ember condition.

2. "When ready to load, turn fan off.." - This was not done. The manufacturer representative explained that this was to make the loading experience more pleasant for the technician by not blowing heated air into his/her face. It was decided to leave the fan on to avoid accidental forgetfulness of turning it back on later.

4.2 - Individual Test Run Narratives

Run 1 - March 5, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, the preburn charge weighing 19.9 lb. was placed within the fire chamber and allowed to burn at full intensity. With a weight of 4.3 pounds remaining, the primary air control was adjusted to the test setting and the convection fan speed control was adjusted to its low setting. At this moment, datalogging of the pre-burn was also imitated. The flue gas probe was added after logging of the preburn had begun and added 0.2 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 64 minutes the pre-burn was ended with a suitable coal bed of 3.9 lb. (4.1 lb. indicated on scale). No other anomalies occurred during the preburn.

During the pre-burn, the sample train probes were assembled, the continuous gas analyzers were calibrated and the velocity traverse measurements were made. Upon completion of the pre-burn, the remaining coals were raked and leveled. The platform scale was zeroed, and loading of the appliance and initiation of the sampling pumps were done simultaneously.

Sampling portion Start-up Procedures

Bypass:	Used to load fuel, then closed at same time as fuel loading door.
Fuel Loading:	Fuel completely loaded by 45 seconds.
Door:	Fuel loading door closed at 45 seconds.
Primary Air:	80° from CCW from full open position. (Refer to Figure 21)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Low for duration of test.

Figure 22 - Run 1 - Test Fuel

Figure 23 - Run 1 - Freshly Loaded Stove

At exactly one hour from the start of sampling, the first-hour (Sample Train C) was stopped and a leak check was immediately performed on it. The test continued without incident until it ended with zero mass remaining on the scale at 666 minutes from the start of the test and a resulting dry burn-rate of 0.62 kg/hr.

Upon completion of the sampling portion of the test, all remaining sampling trains (A, B and ambient background) were leak-checked. Other tasks performed were (but not limited to) leak checking of pitot tube, recording of environmental conditions, post-test verification of continuous gas analyzers and placement of disassembled sample probe elements in desiccator.

This Category I test occurred without anomalies and a review of all of the data indicates that no parameters specified in ASTM E2515 and ASTM E2780 were outside the specifications. This test run is considered valid and appropriate for inclusion in the weighted average for this test series.

Run 2 - March 5, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, the preburn charge weighing 17.7 lb. was placed within the fire chamber and allowed to burn at full intensity. With a weight of 5.1 pounds remaining, the primary air control was adjusted to the test setting and the convection fan speed control was adjusted it's medium-low setting. At this moment, datalogging of the pre-burn was also initiated. The flue gas probe was added after logging of the preburn had begun and added 0.1 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 60 minutes the pre-burn was ended with a suitable coal bed of 4.3 lb. (4.4 lb. indicated on scale). No other anomalies occurred during the preburn.

During the pre-burn, the sample train probes were assembled, the continuous gas analyzers were calibrated and the velocity traverse measurements were made. Upon completion of the pre-burn, the remaining coals were raked and leveled. The platform scale was zeroed, and loading of the appliance and initiation of the sampling pumps were done simultaneously.

Sampling portion Start-up Procedures

Bypass:	Used to load fuel, then closed at same time as fuel loading door.
Fuel Loading:	Fuel completely loaded by 60 seconds.
Door:	Fuel loading door closed at 65 seconds.
Primary Air:	60° from CCW from full open position. (Refer to Figure 21)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Medium - Low for duration of test.

Figure 24 - Run 2 - Test Fuel

Figure 25 - Run 2 - Freshly Loaded Stove

At exactly one hour from the start of sampling, the first-hour (Sample Train C) was stopped and a leak check was immediately performed on it. The test continued without incident until it ended with zero mass remaining on the scale at 401 minutes from the start of the test and a resulting burn-rate of 1.07 kg/hr.

Upon completion of the sampling portion of the test, all remaining sampling trains (A, B and ambient background) were leak-checked. Other tasks performed were (but not limited to) leak checking of pitot tube, recording of environmental conditions, post-test verification of continuous gas analyzers and placement of disassembled sample probe elements in desiccator.

This Category II test run occurred without anomalies and a review of all of the data indicates that no parameters specified in ASTM E2515 or ASTM E2780 were outside the specifications. This test run is considered valid and appropriate for inclusion in the weighted average for this test series.

Run 3 - March 6, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, a preburn charge of 18.0 lb. was placed within the fire chamber and allowed to burn at full intensity. This was an attempt at a Category IV, therefore datalogging of the pre-burn was also initiated. The flue gas probe was added after logging of the preburn had begun and added 0.1 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 72 minutes the pre-burn was ended with a suitable coal bed of 4.1 lb. (4.2 lb. indicated on scale). No other anomalies occurred during the preburn.

During the pre-burn, the sample train probes were assembled, the continuous gas analyzers were calibrated and the velocity traverse measurements were made. Upon completion of the pre-burn, the remaining coals were raked and leveled. The platform scale was zeroed, and loading of the appliance and initiation of the sampling pumps were done simultaneously.

Sampling portion Start-up Procedures

Bypass:	Used to load fuel, then closed at same time as fuel loading door.
Fuel Loading:	Fuel completely loaded by 35 seconds.
Door:	Fuel loading door closed at 40 seconds.
Primary Air:	0° (Full open position - Refer to Figure 21)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, High duration of test.

Figure 26 - Run 3 - Test Fuel

Figure 27 - Run 3 Freshly Loaded Stove

At approximately 40 minutes into the test run, the sample flows began to drop-off and after several minutes of increasing pump strength in an effort to maintain sample flow-rates, it became apparent that all sampling trains were plugging to the point they would need to be replaced. The speed with which they were plugging coupled with the simultaneity of the event (three sample trains) made it clear that there would be no time to change-out each sample train. The decision was made to let the test run complete knowing that proportionality issues will cause an invalid test run.

At exactly one hour from the start of sampling, the first-hour (Sample Train C) was stopped and a leak check was immediately performed on it. The test continued without further incidents until it ended with zero mass remaining on the scale at 167 minutes from the start of the test and a resulting burn-rate of 2.48 kg/hr.

Upon completion of the sampling portion of the test, all remaining sampling trains (A, B and ambient background) were leak-checked. Other tasks performed were (but not limited to) leak checking of pitot tube, recording of environmental conditions, post-test verification of continuous gas analyzers and placement of disassembled sample probe elements in desiccator.

The resultant category IV test run suffered from multiple sample trains plugging to the point that all sampling train systems (except the background ambient) being invalidated due to poor proportionalities. The results for this test run were calculated and are reported, however these results should be regarded as meaningless. This test run is considered invalid and not appropriate for inclusion in the weighted average for this test series.

Run 4 - March 6, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, a preburn charge of 18.3 lb. was placed within the fire chamber and allowed to burn at full intensity. With a mass of 7.2 lb. remaining in the appliance, the air control and fan speed control were adjusted to their respective test settings. At this moment, datalogging of the pre-burn was also initiated. The flue gas probe was added after logging of the preburn had begun and added 0.2 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 60 minutes the pre-burn was ended with a suitable coal bed of 4.1 lb. (4.3 lb. indicated on scale). No other anomalies occurred during the preburn.

During the pre-burn, the sample train probes were assembled, the continuous gas analyzers were calibrated and the velocity traverse measurements were made. Upon completion of the pre-burn, the remaining coals were raked and leveled. The platform scale was zeroed, and loading of the appliance and initiation of the sampling pumps were done simultaneously.

Sampling portion Start-up Procedures

Bypass:	Used to load fuel, then closed at same time as fuel loading door.
Fuel Loading:	Fuel completely loaded by 45 seconds.
Door:	Fuel loading door closed at 50 seconds.
Primary Air:	45° from fully Open - (Refer to Figure 21)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Medium-High for duration of test.

Figure 28 - Run 4 - Test Fuel

'Figure 29 - Run 4 - Loaded Stove

At exactly one hour from the start of sampling, the first-hour (Sample Train C) was stopped and a leak check was immediately performed on it. The test continued without incident until it ended with zero mass remaining on the scale at 236 minutes from the start of the test and a resulting burn-rate of 1.81 kg/hr.

Upon completion of the sampling portion of the test, all remaining sampling trains (A, B and ambient background) were leak-checked. Other tasks performed were (but not limited to) leak checking of pitot tube, recording of environmental conditions, post-test verification of continuous gas analyzers and placement of disassembled sample probe elements in desiccator.

The target was a category III, which was fulfilled. No anomalies occurred and a review of all of the data indicates that no parameters specified in ASTM E2515 or ASTM E2780 were outside the specifications and is considered valid and appropriate for inclusion in the weighted average for this test series.

Run 5 - March 7, 2024

With the primary air control set at full open and the convection fan control adjusted to it's highest setting, a preburn charge weighing 18.4 lb. was added and allowed to burn at full intensity until a weight of 5.8 pounds remained. At this time the primary air control was adjusted to the test setting and the convection fan speed control was adjusted it's Med-High setting. At 60 minutes from initiating the test setting, the pre-burn was ended with a suitable coal bed of 4.5 lb.

During the pre-burn, the sample train probes were assembled, the continuous gas analyzers were calibrated and the velocity traverse measurements were made. Upon completion of the pre-burn, the remaining coals were raked and leveled. The platform scale was zeroed, and loading of the appliance and initiation of the sampling pumps were done simultaneously.

Sampling portion Start-up Procedures

Bypass:	Used to load fuel, then closed at same time as fuel loading door.
Fuel Loading:	Fuel completely loaded by 45 seconds.
Door:	Fuel loading door closed at 50 seconds.
Primary Air:	40° from CCW from full open position. (Refer to Figure 21)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Med-High for duration of test.

Figure 30 - Run 5 - Test Fuel

Figure 31 - Run 5 - Freshly Loaded Stove

At exactly one hour from the start of sampling, the first-hour (Sample Train C) was stopped and a leak check was immediately performed on it. The test continued without incident until it ended with zero mass remaining on the scale at 316 minutes from the start of the test and a resulting burn-rate of 1.31 kg/hr.

Upon completion of the sampling portion of the test, all remaining sampling trains (A, B and ambient background) were leak-checked. Other tasks performed were (but not limited to) leak checking of pitot tube, recording of environmental conditions, post-test verification of continuous gas analyzers and placement of disassembled sample probe elements in desiccator.

The previous test (Test Run 4) was incorrectly categorized as a category IV burn-rate and the target of this test was a category III, which was fulfilled. No anomalies occurred and a review of all of the data indicates that no parameters specified in ASTM E2515 or ASTM E2780 were outside the specifications. Although this test was unnecessary, the results are considered valid and appropriate for inclusion in the weighted average for this test series.

Run 6 - March 7, 2024

The primary objective of this test run was that of a Category IV to replace the invalidated test of Run 3. After evaluating the type of particulate from run 3 (elemental carbon characterizes by deep blackness and relatively low mass), and noting that the high particle emissions were a temporary spike (evidenced by flue gas concentrations and visual observation during Test 3), precautions were undertaken which included slightly increasing the dilution tunnel flow-rate and slightly decreasing the sample flow-rates in order to make the sample slightly more dilute.

With both the primary air and convection fan controls adjusted to their highest respective settings, a preburn charge of 19.5 lb. was placed within the fire chamber and allowed to burn at full intensity. This was an attempt at a Category IV, therefore datalogging of the pre-burn was also initiated. The flue gas probe was added after logging of the preburn had begun and added 0.1 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 100 minutes the pre-burn was ended with a suitable coal bed of 3.8 lb. (3.9 lb. indicated on scale). No other anomalies occurred during the preburn.

During the pre-burn, the sample train probes were assembled, the continuous gas analyzers were calibrated and the velocity traverse measurements were made. Upon completion of the pre-burn, the remaining coals were raked and leveled. The platform scale was zeroed, and loading of the appliance and initiation of the sampling pumps were done simultaneously.

Sampling portion Start-up Procedures

Bypass:	Used to load fuel, then closed at same time as fuel loading door.
Fuel Loading:	Fuel completely loaded by 60 seconds.
Door:	Fuel loading door closed at 60 seconds.
Primary Air:	0° (Full open position - Refer to Figure 21)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	ON -HIGH

Figure 32 - Run 6 - Test Fuel

Figure 33 - Run 6 - Loaded Stove

At exactly one hour from the start of sampling, the first-hour (Sample Train C) was stopped and a leak check was immediately performed on it. The test continued without incident until it ended with zero mass remaining on the scale at 168 minutes from the start of the test and a resulting burn-rate of 2.47 kg/hr.

Upon completion of the sampling portion of the test, all remaining sampling trains (A, B and ambient background) were leak-checked. Other tasks performed were (but not limited to) leak checking of pitot tube, recording of environmental conditions, post-test verification of continuous gas analyzers and placement of disassembled sample probe elements in desiccator.

The target was a category IV, which was fulfilled. A review of all of the data indicates that no parameters specified in ASTM E2515 or ASTM E2780 were outside the specifications. This test run is considered valid and appropriate for inclusion of the weighted average.

Run 7 - March 8, 2024

The primary objective of this test run was that of a fan-confirmation. With the primary air control adjusted to its setting and with the fan unplugged from electrical power, a preburn charge weighing 19.7 lb. was placed within the fire chamber and allowed to burn at full intensity. With a weight of 5.2 lb. remaining, the primary air control was adjusted to the test setting. At this moment, datalogging of the pre-burn was also initiated. At 60 minutes from initiating the test setting, and with a suitable coal bed of 4.7 lb., the pre-test was ended.

During the pre-burn, the sample train probes were assembled, the continuous gas analyzers were calibrated and the velocity traverse measurements were made. Upon completion of the pre-burn, the remaining coals were raked and leveled. The platform scale was zeroed, and loading of the appliance and initiation of the sampling pumps were done simultaneously.

Sampling portion Start-up Procedures

Bypass:	Used to load fuel, then closed at same time as fuel loading door.
Fuel Loading:	Fuel completely loaded by 35 seconds.
Door:	Fuel loading door closed at 40 seconds.
Primary Air:	53° from CCW from full open position. (Refer to Figure 21)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	OFF - Fan Confirmation Test.

Figure 34 - Run 7 - Test Fuel

Figure 35 - Run 7 - Loaded Stove

At exactly one hour from the start of sampling, the first-hour (Sample Train C) was stopped and a leak check was immediately performed on it. The test continued without incident until it ended with zero mass remaining on the scale at 394 minutes from the start of the test and a resulting burn-rate of 1.08 kg/hr.

Upon completion of the sampling portion of the test, all remaining sampling trains (A, B and ambient background) were leak-checked. Other tasks performed were (but not limited to) leak checking of pitot tube, recording of environmental conditions, post-test verification of continuous gas analyzers and placement of disassembled sample probe elements in desiccator.

The target was a category II with no convection fan in operation which was fulfilled. A review of all of the data indicates that no parameters specified in ASTM E2515 or ASTM E2780 were outside the specifications. This test run is considered valid and appropriate for serving as validity of the optional nature of the convection fan. This test run was not used in the weighted average.

5. Test Data by Run

The data presented in this section is arranged as follows:

1. Test Run 1 as follows:
    a. Run 1 cover page
    b. Emissions Test Results
    c. CSA B415 Results and Data
    d. Test Fuel Properties
    e. Velocity Traverse and Supplemental Data
    f. Pre-Burn Data
    g. Sample Train A and Dilution Tunnel Data
    h. Sample Train B and Appliance Temperature Data
    i. Sample Train C (First Hour) Data
    j. Sample Train D (Background) and Flue Gas Data

2. Subsequent test runs in the same format as above

3. Reagent Tares

Run 1 Test Data

Test Date:	3/5/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	Ashford 30.2

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Project No.: 0142WS021E
Tracking No.: BK30.2
Run: 1
Test Date: 03/05/24

Burn-Rate Result

0.62 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	2.22	2.22	1.58	1.58
Emission Rate, g/hr	**0.20**	0.20	**1.58**	1.58
Emissions Factor, g/kg	0.32	0.32	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		79.8	78.4
Average Tunnel Gas Velocity (vs), feet/second		17.415	17.298
Average Tunnel Gas Flow Rate(Qsd),	DSCF/hr	11823.6	11783.5
	DSCF/min	197.1	196.4
Average Delta p, in. H2O		0.098	0.097
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	666

Particulate Sample Measurement Parameters

	Uncorrected				*Corrected*			
	AMBIENT	Train A	Train B	First Hour	AMBIENT	Train A	Train B	First Hour
Total Sample Volume (V_m), ft^3	106.130	106.835	107.063	9.568	106.130	106.835	107.063	9.568
Average Gas Meter Temperature, °F	79	82	82	70	79	82	82	70
Total Sample Volume (V_{mstd}), DSCF	105.882	106.417	106.096	9.748	105.882	106.417	106.096	9.748
Total Particulates (mn), mg - m_n	0.1	1.6	2.0	1.3	0.1	1.6	2.0	1.3
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00002	0.00002	0.00013	0.00000	0.00002	0.00002	0.00013
Total Particulate Emissions (ET), grams	n/a	1.97	2.47	1.58	n/a	1.97	2.47	1.58
Particulate Emission Rate, g/hr	n/a	0.18	0.22	1.58	n/a	0.18	0.22	1.58
Emissions Factor, g/kg	n/a	0.28	0.36	n/a	n/a	0.28	0.36	n/a
Difference, ET from from Average ET, grams	n/a	-0.25	0.25	n/a	n/a	-0.25	0.25	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	71	72	71	✓
Filter Face Velocity, fpm	< 30	8.68	8.73	8.73	✓
Dryer Exit Temperature, °F	< 80	59	51	54	✓
Tunnel Velocity, fpm	>800	1,045	1,038		✓
First Hour Leakage	0.006	0.000			✓
Train A Leakage Rate	0.006		0.002		✓
Train B Leakage Rate	0.006			0.002	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.9	0.6	1.1	✓
Pro-Rate Variation	< 90 for < 10% of θ	1.67%	0.00%	0.00%	✓
	> 110 for < 10% of θ	0.00%	0.000%	0.00%	✓
	# Readings < 80%	0	0	0	✓
	# Readings > 120%	0	0	0	✓
Ambient Temp, °F	> 55		69		✓
Ambient Temp, °F	< 90		73		✓
Trains A and B Precision	(*A*) < 7.5%		11.26%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.07		✓
Stove Surface ΔT	<= 125 °F		18		✓
Room Air Velocity	< 50 fpm		16		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	1
Test Date:	3/5/2024

Efficiency results reported herein are based on a stack-loss method in accordance with CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". OMNI uses the spreadsheet provided by CSA that is to be used in conjunction with the current version of the test standard. The most recent version of the software is version 2.4, dated April 15, 2010. OMNI received confirmation from CSA on October 18, 2023 that this is the current version of the software.

Stack Loss Efficiency

Manufacturer: Valley Comfort
Model: AF30.2
Date: 03/05/24
Run: 1
Control #: 2254
Test Duration: 666
Output Category: I

Technicians: _____

_____

_____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	85.9%	92.8%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	86%	93.3%

Output Rate (kJ/h)	10,641	10,094	**(Btu/h)**
Burn Rate (kg/h)	0.63	1.38	**(lb/h)**
Input (kJ/h)	12,388	11,751	**(Btu/h)**

Test Load Weight (dry kg)	6.94	15.30	**dry lb**
MC wet (%)	18.19		
MC dry (%)	22.23		
Particulate (g)	2.22		
CO (g)	22		
Test Duration (h)	11.10		

Emissions	**Particulate**	**CO**
g/MJ Output	0.02	0.19
g/kg Dry Fuel	0.32	3.19
g/h	0.20	1.99
lb/MM Btu Output	0.04	0.44

Air/Fuel Ratio (A/F)	9.52

VERSION: **2.4** **4/15/2010**

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	AF30.2				
Date:	3/5/2024		**Temp. Units**	F	(F or C)
Run:	1		**Weight Units**	lb	(kg or lb)
Control #:	2254				
Test Duration:	666				
Output Category:	I				

			Fuel Data		
				D. Fir	
Wood Moisture (% wet):	18.19		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	18.70		**%C**	48.73	
Burn Rate (dry kg/h):	0.63		**%H**	6.87	
Total Particulate Emissions:	2.22	g	**%O**	43.9	
			%Ash	0.5	

	Averages	**0.02**	**11.91**	**#DIV/0!**	**142.50**	**71.04**	
					Temp. (ºF)		
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**	
0	18.70	0.15	0.96		156.0	71.0	
1	18.60	0.10	0.28		164.0	71.0	
2	18.60	0.58	1.68		146.0	71.0	
3	18.60	0.50	2.96		134.0	70.0	
4	18.60	0.23	3.59		128.0	70.0	
5	18.60	0.05	3.92		125.0	71.0	
6	18.60	0.01	4.12		125.0	71.0	
7	18.60	0.01	4.26		126.0	70.0	
8	18.50	0.01	4.18		127.0	70.0	
9	18.50	0.01	4.51		128.0	70.0	
10	18.50	0.01	4.71		130.0	70.0	
11	18.50	0.01	4.71		130.0	71.0	
12	18.50	0.01	4.73		132.0	70.0	
13	18.50	0.01	4.73		133.0	70.0	
14	18.50	0.01	4.87		134.0	70.0	
15	18.50	0.01	4.97		136.0	70.0	
16	18.40	0.01	4.97		136.0	70.0	
17	18.40	0.01	5.09		136.0	70.0	
18	18.40	0.01	5.00		140.0	70.0	
19	18.40	0.01	5.12		141.0	70.0	
20	18.40	0.01	5.29		142.0	70.0	
21	18.40	0.01	5.48		146.0	70.0	
22	18.30	0.01	5.61		149.0	70.0	
23	18.30	0.01	5.78		150.0	70.0	
24	18.30	0.01	6.00		152.0	70.0	

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	18.30	0.01	6.21		154.0	70.0
26	18.30	0.01	6.55		155.0	70.0
27	18.20	0.01	6.62		158.0	70.0
28	18.20	0.01	6.92		161.0	70.0
29	18.20	0.01	8.38		170.0	70.0
30	18.10	0.01	14.87		177.0	71.0
31	18.00	0.01	13.52		187.0	71.0
32	17.90	0.01	12.87		193.0	70.0
33	17.80	0.01	12.61		198.0	70.0
34	17.70	0.00	12.76		205.0	70.0
35	17.70	0.00	12.79		210.0	70.0
36	17.60	0.00	12.01		214.0	71.0
37	17.50	0.00	11.67		217.0	71.0
38	17.40	0.00	12.15		219.0	71.0
39	17.30	0.00	12.40		222.0	71.0
40	17.20	0.00	12.96		222.0	71.0
41	17.10	0.00	12.43		224.0	71.0
42	17.00	0.00	12.13		224.0	70.0
43	17.00	0.00	12.04		223.0	71.0
44	16.90	0.00	11.94		224.0	71.0
45	16.80	0.00	12.29		224.0	71.0
46	16.70	0.00	11.91		226.0	71.0
47	16.60	0.00	11.52		224.0	71.0
48	16.50	0.00	11.26		222.0	71.0
49	16.50	0.00479	11.21		220	71
50	16.40	0.00492	10.99		220	71
51	16.30	0.00508	10.82		219	71
52	16.30	0.00534	10.92		217	71
53	16.20	0.00531	10.56		214	71
54	16.10	0.00518	10.75		213	71
55	16.10	0.00547	10.56		212	71
56	16.00	0.00563	11.25		211	71
57	15.90	0.00576	11.28		210	71
58	15.90	0.0065	11.45		211	71
59	15.80	0.00634	11.71		211	71
60	15.70	0.00615	11.89		209	71
61	15.60	0.00634	12.04		210	71
62	15.60	0.00709	12.26		209	71
63	15.50	0.00709	12.47		207	71
64	15.40	0.00728	12.6		207	71
65	15.30	0.01	12.46		208	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	15.30	0.00851	12.98		205	71
67	15.20	0.01	12.91		205	71
68	15.10	0.01	12.69		203	71
69	15.10	0.00877	12.02		202	71
70	15.00	0.00861	12.19		202	71
71	14.90	0.01	12.05		199	71
72	14.90	0.00855	11.61		197	71
73	14.80	0.00864	11.59		195	71
74	14.80	0.01	11.76		192	71
75	14.70	0.01	11.91		189	71
76	14.70	0.00845	11.9		189	71
77	14.60	0.00861	11.86		187	71
78	14.50	0.01	12.23		185	71
79	14.50	0.00861	12.33		183	71
80	14.40	0.00829	11.9		181	71
81	14.40	0.00825	12.11		180	71
82	14.30	0.00836	11.69		179	71
83	14.30	0.01	11.96		178	71
84	14.20	0.01	11.76		176	71
85	14.20	0.01	11.3		174	71
86	14.20	0.01	11.48		173	71
87	14.10	0.00874	11.22		172	71
88	14.10	0.01	11.51		171	71
89	14.00	0.01	11.47		170	71
90	14.00	0.01	11.34		170	71
91	13.90	0.01	11.21		171	71
92	13.90	0.01	10.92		169	71
93	13.80	0.01	11.07		168	71
94	13.80	0.01	11.48		167	71
95	13.80	0.01	11.14		166	71
96	13.70	0.01	11.11		165	71
97	13.70	0.01	11.52		164	71
98	13.70	0.01	11.06		164	71
99	13.60	0.01	10.81		164	71
100	13.60	0.01	11.27		162	72
101	13.50	0.01	11		162	71
102	13.50	0.01	11.06		161	72
103	13.50	0.01	11.19		161	72
104	13.40	0.01	11.28		161	72
105	13.40	0.01	11.2		160	72
106	13.30	0.01	11.09		160	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	13.30	0.01	11.02		159	72
108	13.30	0.01	10.95		160	72
109	13.20	0.01	10.99		161	72
110	13.20	0.01	11.09		160	72
111	13.20	0.01	11.1		159	72
112	13.10	0.01	11.33		159	72
113	13.10	0.01	11.15		159	72
114	13.10	0.01	10.71		161	72
115	13.00	0.01	10.84		159	72
116	13.00	0.01	11.35		158	72
117	12.90	0.01	10.98		159	72
118	12.90	0.01	10.89		158	72
119	12.90	0.01	11.21		159	72
120	12.80	0.01	10.79		159	72
121	12.80	0.01	10.98		159	72
122	12.80	0.01	11.08		159	72
123	12.70	0.01	11.27		159	72
124	12.70	0.01	11.04		158	72
125	12.60	0.01	11.23		159	72
126	12.60	0.01	10.96		159	72
127	12.60	0.01	11.06		159	72
128	12.50	0.01	11.07		158	72
129	12.50	0.01	11.48		157	72
130	12.50	0.01	11.2		157	72
131	12.40	0.01	10.97		157	72
132	12.40	0.01	10.98		159	72
133	12.30	0.01	11.35		158	72
134	12.30	0.01	11.47		158	72
135	12.30	0.01	11.3		159	72
136	12.20	0.01	11.7		159	72
137	12.20	0.01	11.56		160	72
138	12.20	0.01	11.7		161	72
139	12.10	0.01	11.62		160	72
140	12.10	0.01	11.93		161	72
141	12.00	0.01	11.99		161	72
142	12.00	0.01	12.38		160	72
143	12.00	0.01	12.26		160	72
144	11.90	0.01	12.28		161	72
145	11.90	0.01	12.12		162	72
146	11.80	0.01	12.5		159	72
147	11.80	0.01	12.45		161	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	11.70	0.01	12.58		161	72
149	11.70	0.01	12.97		162	72
150	11.70	0.01	13.12		162	72
151	11.60	0.01	12.98		162	72
152	11.60	0.01	13.15		163	72
153	11.50	0.01	13.28		163	71
154	11.50	0.01	13.48		164	71
155	11.40	0.01	13.63		164	71
156	11.40	0.01	13.54		162	71
157	11.40	0.01	13.52		164	71
158	11.30	0.01	13.44		165	71
159	11.30	0.01	13.48		166	71
160	11.20	0.01	13.46		166	71
161	11.20	0.01	13.59		166	71
162	11.10	0.01	13.76		167	71
163	11.10	0.01	13.51		167	71
164	11.00	0.01	13.84		168	71
165	11.00	0.01	13.97		167	71
166	10.90	0.01	13.8		168	71
167	10.90	0.01	13.82		168	71
168	10.90	0.01	14.15		166	71
169	10.80	0.01	14.09		166	71
170	10.80	0.01	14.11		167	71
171	10.70	0.01	14.14		166	71
172	10.70	0.01	13.77		166	71
173	10.60	0.01	14.2		166	71
174	10.60	0.01	13.69		165	71
175	10.50	0.01	13.78		164	71
176	10.50	0.01	14.27		164	71
177	10.50	0.01	13.95		163	71
178	10.40	0.01	13.7		165	71
179	10.40	0.01	13.82		164	71
180	10.30	0.01	13.92		163	71
181	10.30	0.01	13.89		161	70
182	10.20	0.01	13.51		159	70
183	10.20	0.01	13.49		160	71
184	10.20	0.01	13.42		160	70
185	10.10	0.01	13.46		159	70
186	10.10	0.01	13.77		158	70
187	10.00	0.01	13.58		156	70
188	10.00	0.01	13.08		156	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	10.00	0.01	13.39		154	70
190	9.90	0.01	12.95		154	70
191	9.90	0.01	13.02		153	70
192	9.90	0.01	12.86		152	70
193	9.80	0.01	13.13		153	70
194	9.80	0.01	13.3		151	70
195	9.80	0.01	13.07		151	70
196	9.70	0.01	12.88		150	70
197	9.70	0.01	13.02		150	70
198	9.70	0.01	13.29		149	70
199	9.60	0.01	13.26		149	70
200	9.60	0.01	13.49		147	70
201	9.60	0.01	13.34		147	70
202	9.50	0.01	13.26		148	70
203	9.50	0.01	13.11		148	70
204	9.50	0.01	13.57		148	70
205	9.40	0.01	13.67		147	70
206	9.40	0.01	13.69		147	70
207	9.40	0.01	13.98		148	70
208	9.30	0.01	13.89		148	70
209	9.30	0.00042	0.21		148	70
210	9.30	0.01	14.42		148	70
211	9.20	0.01	14.65		148	70
212	9.20	0.01	14.92		148	70
213	9.10	0.01	14.94		148	70
214	9.10	0.02	15.11		149	69
215	9.10	0.03	15.31		151	69
216	9.00	0.04	14.93		150	69
217	9.00	0.04	15		151	69
218	9.00	0.05	15.74		149	69
219	8.90	0.04	15.02		150	69
220	8.90	0.06	15.08		151	69
221	8.80	0.06	15.14		150	69
222	8.80	0.08	15.24		150	69
223	8.80	0.12	15.68		150	69
224	8.70	0.13	15.26		149	69
225	8.70	0.14	15.16		149	69
226	8.70	0.22	15.37		148	69
227	8.60	0.27	15.3		147	69
228	8.60	0.27	15.5		147	69
229	8.60	0.28	15.16		147	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	8.50	0.27	15.2		147	69
231	8.50	0.33	15.26		146	69
232	8.50	0.37	14.85		146	69
233	8.40	0.31	15.26		145	69
234	8.40	0.35	14.98		144	69
235	8.40	0.31	14.7		144	69
236	8.30	0.23	14.67		143	69
237	8.30	0.08	14.5		142	69
238	8.30	0.09	15.44		142	69
239	8.20	0.09	15.04		142	69
240	8.20	0.06	15.13		141	69
241	8.20	0.04	14.82		141	69
242	8.10	0.03	14.43		141	69
243	8.10	0.03	14.56		140	69
244	8.10	0.02	14.36		140	69
245	8.10	0.01	14.18		138	70
246	8.10	0.01	14.47		137	70
247	8.00	0.01	14.18		137	70
248	8.00	0.01	13.73		137	70
249	8.00	0.01	13.84		135	70
250	8.00	0.01	14.02		134	70
251	7.90	0.01	13.74		134	70
252	7.90	0.01	13.7		133	70
253	7.90	0.01	13.6		133	70
254	7.90	0.01	13		132	70
255	7.80	0.01	13.2		127	70
256	7.80	0.01	13.26		130	70
257	7.80	0.01	13.16		130	70
258	7.80	0.01	12.87		130	70
259	7.80	0.01	12.84		129	70
260	7.70	0.01	13.09		129	70
261	7.70	0.01	12.65		128	70
262	7.70	0.01	12.88		128	70
263	7.70	0.01	12.8		127	70
264	7.70	0.01	12.7		128	70
265	7.60	0.01	12.41		127	70
266	7.60	0.01	12.82		126	70
267	7.60	0.01	12.78		126	70
268	7.60	0.01	12.39		125	70
269	7.60	0.01	12.32		125	71
270	7.50	0.01	12.26		125	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	7.50	0.01	12.66		125	70
272	7.50	0.01	12.78		125	70
273	7.50	0.01	12.8		125	70
274	7.50	0.01	12.67		125	70
275	7.50	0.01	12.78		125	70
276	7.40	0.01	12.66		124	70
277	7.40	0.01	13.01		124	70
278	7.40	0.01	12.48		124	71
279	7.40	0.01	12.96		124	70
280	7.40	0.01	12.91		123	71
281	7.30	0.01	13.07		121	70
282	7.30	0.01	13.11		121	70
283	7.30	0.00459	9.64		122	71
284	7.30	0.01	13.41		120	71
285	7.30	0.01	13.19		121	71
286	7.20	0.01	13		121	71
287	7.20	0.01	13.52		122	71
288	7.20	0.01	13.6		123	71
289	7.20	0.01	13.52		123	71
290	7.20	0.01	13.71		123	71
291	7.10	0.01	13.78		123	71
292	7.10	0.01	13.44		124	71
293	7.10	0.01	13.67		123	71
294	7.10	0.01	13.65		125	71
295	7.00	0.01	13.45		125	71
296	7.00	0.01	13.63		125	71
297	7.00	0.01	13.84		125	71
298	7.00	0.01	13.63		125	71
299	6.90	0.01	13.98		125	71
300	6.90	0.01	13.81		127	71
301	6.90	0.01	13.7		128	71
302	6.90	0.01	13.87		127	71
303	6.90	0.01	14.38		127	71
304	6.80	0.01	14.32		127	71
305	6.80	0.01	14.31		127	71
306	6.80	0.01	14.22		127	71
307	6.70	0.01	14.2		127	71
308	6.70	0.01	14.1		128	71
309	6.70	0.01	14.28		129	71
310	6.70	0.01	14.25		128	71
311	6.60	0.01	14.11		128	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	6.60	0.01	13.97		129	71
313	6.60	0.01	14.02		129	71
314	6.60	0.01	14.14		129	71
315	6.50	0.01	14.13		130	71
316	6.50	0.01	13.85		130	71
317	6.50	0.01	13.91		129	71
318	6.50	0.01	14.5		129	71
319	6.40	0.01	14.39		128	71
320	6.40	0.01	14.07		128	71
321	6.40	0.01	14.02		128	71
322	6.40	0.01	13.7		129	71
323	6.30	0.01	13.81		129	71
324	6.30	0.01	14.02		129	71
325	6.30	0.01	13.75		129	71
326	6.30	0.01	13.87		128	71
327	6.20	0.01	13.58		126	71
328	6.20	0.01	13.82		127	71
329	6.20	0.01	13.72		126	71
330	6.20	0.01	13.15		126	71
331	6.20	0.01	13.24		126	71
332	6.10	0.01	13.17		126	71
333	6.10	0.01	13.16		125	71
334	6.10	0.01	13.3		124	71
335	6.10	0.01	13.06		124	71
336	6.00	0.01	12.94		123	72
337	6.00	0.01	13.15		123	72
338	6.00	0.01	13.43		122	72
339	6.00	0.01	13.38		121	72
340	6.00	0.01	13.4		120	72
341	5.90	0.01	13.34		120	72
342	5.90	0.01	13.44		120	72
343	5.90	0.01	13.41		119	72
344	5.90	0.01	13.59		118	72
345	5.90	0.01	13.93		118	72
346	5.90	0.00813	13.07		117	72
347	5.80	0.00851	13.34		117	72
348	5.80	0.00744	13.21		116	72
349	5.80	0.00754	13.11		116	72
350	5.80	0.00793	12.92		115	72
351	5.70	0.0077	12.58		116	72
352	5.70	0.00741	12.72		115	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	5.70	0.00777	12.62		115	72
354	5.70	0.00816	12.61		115	72
355	5.70	0.00806	12.7		114	72
356	5.70	0.00819	12.67		113	72
357	5.60	0.00809	12.6		114	72
358	5.60	0.0078	12.41		115	72
359	5.60	0.00806	12.31		113	72
360	5.60	0.008	12.35		113	72
361	5.60	0.00796	12.61		112	72
362	5.60	0.00835	12.28		112	72
363	5.60	0.00825	12.21		112	72
364	5.50	0.00822	12.39		112	72
365	5.50	0.00871	12.45		111	72
366	5.50	0.00871	12.13		111	72
367	5.50	0.00858	12.32		111	72
368	5.50	0.00871	12.47		110	72
369	5.50	0.00861	12.28		110	72
370	5.40	0.00894	12.5		109	72
371	5.40	0.00903	12.4		109	72
372	5.40	0.00871	12.34		109	72
373	5.40	0.00874	12.43		109	72
374	5.40	0.00864	12.31		109	72
375	5.40	0.00848	12.23		108	72
376	5.40	0.00825	12.18		108	72
377	5.30	0.00822	11.96		108	72
378	5.30	0.00835	12.26		108	72
379	5.30	0.00868	12.33		108	72
380	5.30	0.00835	11.73		109	72
381	5.20	0.00733	13.28		110	72
382	5.20	0.0065	14.4		111	72
383	5.20	0.01	13.71		112	71
384	5.20	0.01	13.46		113	72
385	5.20	0.02	13.49		113	72
386	5.20	0.02	13.52		113	72
387	5.10	0.01	13.22		113	72
388	5.10	0.01	13.19		112	72
389	5.10	0.01	12.86		112	72
390	5.10	0.01	12.79		111	72
391	5.10	0.01	13.01		110	72
392	5.10	0.01	12.69		111	72
393	5.00	0.01	12.77		111	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
394	5.00	0.01	12.61		110	73
395	5.00	0.01	12.57		110	72
396	5.00	0.01	12.47		111	72
397	5.00	0.01	12.45		110	72
398	5.00	0.01	12.53		110	72
399	4.90	0.01	12.41		110	72
400	4.90	0.01	12.62		109	71
401	4.90	0.01	12.66		109	71
402	4.90	0.01	12.63		110	72
403	4.90	0.01	12.64		110	71
404	4.90	0.01	12.55		111	71
405	4.90	0.01	12.51		112	71
406	4.80	0.01	12.72		112	71
407	4.80	0.01	12.27		113	72
408	4.80	0.01	12.38		115	71
409	4.80	0.01	12.46		115	71
410	4.80	0.01	12.79		115	71
411	4.80	0.01	12.43		116	71
412	4.70	0.01	12.58		116	71
413	4.70	0.01	12.46		117	71
414	4.70	0.01	12.63		117	71
415	4.70	0.01	12.61		117	71
416	4.70	0.01	12.58		117	71
417	4.70	0.01	12.64		117	71
418	4.70	0.01	12.67		118	71
419	4.60	0.01	12.83		118	71
420	4.60	0.01	12.78		118	71
421	4.60	0.01	12.76		118	71
422	4.60	0.01	12.8		119	71
423	4.60	0.01	12.59		118	71
424	4.60	0.01	12.85		118	71
425	4.60	0.01	12.74		119	71
426	4.50	0.01	12.66		118	71
427	4.50	0.01	12.76		119	71
428	4.50	0.01	12.65		118	71
429	4.50	0.01	12.65		120	71
430	4.50	0.01	12.6		118	71
431	4.50	0.01	12.47		118	71
432	4.50	0.01	12.5		119	71
433	4.40	0.01	12.48		119	71
434	4.40	0.01	12.48		118	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
435	4.40	0.01	12.2		118	71
436	4.40	0.01	12.46		117	71
437	4.40	0.01	12.48		117	71
438	4.40	0.01	11.93		118	71
439	4.40	0.00751	11.51		120	71
440	4.30	0.00757	11.36		118	71
441	4.30	0.00764	11.25		117	71
442	4.30	0.0079	11.14		117	71
443	4.30	0.0077	11.08		118	71
444	4.30	0.00813	11.28		118	71
445	4.30	0.00793	10.91		117	71
446	4.30	0.00786	11.02		119	71
447	4.30	0.00806	11		119	71
448	4.20	0.00796	11.34		119	71
449	4.20	0.00803	11.39		119	71
450	4.20	0.00793	11.28		119	71
451	4.20	0.0078	11.02		118	71
452	4.20	0.0078	11.11		119	71
453	4.20	0.0076	10.89		119	71
454	4.10	0.00773	10.94		120	71
455	4.10	0.00767	10.89		120	71
456	4.10	0.0076	10.75		121	71
457	4.10	0.00767	10.45		121	71
458	4.10	0.00851	10.5		121	71
459	4.10	0.00871	10.62		120	71
460	4.10	0.00835	10.63		121	71
461	4.10	0.00813	10.65		121	71
462	4.00	0.00767	10.57		122	71
463	4.00	0.00767	10.62		121	71
464	4.00	0.00813	10.23		121	71
465	4.00	0.0083	10.02		122	71
466	4.00	0.00803	10.12		122	71
467	4.00	0.00796	10.19		122	71
468	4.00	0.00783	10.15		122	71
469	3.90	0.00773	10.14		122	71
470	3.90	0.00764	10.32		122	71
471	3.90	0.00738	10.19		123	71
472	3.90	0.00725	10.18		123	71
473	3.90	0.00735	10.31		122	71
474	3.90	0.00722	10.06		123	71
475	3.90	0.00699	9.67		123	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
476	3.90	0.00703	9.82		124	71
477	3.90	0.00715	9.68		124	71
478	3.80	0.00751	9.83		125	71
479	3.80	0.00829	10.06		125	71
480	3.80	0.00829	10.25		125	71
481	3.80	0.00803	10.26		125	71
482	3.80	0.00835	10.36		125	71
483	3.80	0.00825	10.49		126	71
484	3.80	0.00829	10.5		125	71
485	3.70	0.00832	10.5		125	71
486	3.70	0.00813	10.5		126	71
487	3.70	0.00806	10.78		126	71
488	3.70	0.008	10.79		126	71
489	3.70	0.0079	10.66		127	71
490	3.70	0.00806	10.76		127	71
491	3.60	0.0078	10.55		126	71
492	3.60	0.00767	10.49		128	71
493	3.60	0.00754	10.54		128	71
494	3.60	0.00757	10.53		128	71
495	3.60	0.0076	10.54		127	71
496	3.60	0.00744	10.29		127	71
497	3.60	0.00706	10.4		127	71
498	3.50	0.00719	10.32		127	71
499	3.50	0.00751	10.28		128	71
500	3.50	0.00744	10.3		128	71
501	3.50	0.00738	10.33		128	71
502	3.50	0.00731	10.07		127	71
503	3.50	0.00731	10.15		127	71
504	3.50	0.00767	10.34		126	71
505	3.40	0.00783	10.13		126	71
506	3.40	0.00813	10.14		126	71
507	3.40	0.00819	10.17		127	71
508	3.40	0.00803	9.95		127	71
509	3.40	0.00816	10.11		127	71
510	3.40	0.0078	9.92		127	71
511	3.40	0.0077	10.32		126	71
512	3.40	0.00767	10.17		127	71
513	3.30	0.0076	10.07		127	71
514	3.30	0.00783	10.08		127	71
515	3.30	0.0078	10.08		126	71
516	3.30	0.0076	9.82		127	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
517	3.30	0.00773	9.85		127	71
518	3.30	0.0078	9.95		127	71
519	3.30	0.0078	9.79		126	71
520	3.30	0.00767	9.61		126	71
521	3.30	0.00773	9.54		126	71
522	3.20	0.00777	9.41		126	71
523	3.20	0.0079	9.4		126	71
524	3.20	0.00777	9.31		127	71
525	3.20	0.00796	9.43		126	71
526	3.20	0.0079	9.28		125	71
527	3.20	0.008	9.24		126	71
528	3.20	0.0079	9.19		126	71
529	3.20	0.0078	8.99		125	71
530	3.20	0.00783	8.96		125	71
531	3.20	0.00764	8.75		126	71
532	3.20	0.0078	8.86		126	71
533	3.10	0.0076	8.75		126	71
534	3.10	0.00793	8.83		125	71
535	3.10	0.00773	9.57		125	71
536	3.10	0.00748	10.36		125	71
537	3.10	0.00748	10.34		125	71
538	3.10	0.00773	10.16		126	71
539	3.10	0.0077	10.09		125	71
540	3.00	0.00777	9.93		125	71
541	3.00	0.00787	9.93		125	71
542	3.00	0.00819	9.73		125	71
543	3.00	0.00822	9.66		125	71
544	3.00	0.00845	9.62		124	71
545	3.00	0.00839	9.62		125	71
546	3.00	0.00839	9.41		125	71
547	3.00	0.00864	9.43		125	71
548	3.00	0.00858	9.28		125	71
549	3.00	0.00731	10.26		125	71
550	2.90	0.00706	10.5		167	71
551	2.90	0.00233	9.54		162	71
552	2.90	0.00566	13.21		151	71
553	2.90	0.00884	12.24		142	71
554	2.80	0.00835	12.08		138	71
555	2.80	0.00923	11.96		136	71
556	2.80	0.01	12.08		134	71
557	2.80	0.01	11.81		133	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
558	2.80	0.00965	12		132	71
559	2.70	0.01	11.98		131	71
560	2.70	0.00984	11.88		132	71
561	2.70	0.00965	11.8		131	71
562	2.70	0.00958	11.8		130	71
563	2.70	0.01	11.86		131	71
564	2.60	0.00932	11.5		133	71
565	2.60	0.00887	11.54		135	71
566	2.60	0.00962	11.84		136	71
567	2.60	0.00955	11.92		136	71
568	2.60	0.00994	12.04		137	71
569	2.50	0.01	12.15		139	71
570	2.50	0.01	12.41		141	71
571	2.50	0.01	12.89		142	71
572	2.50	0.01	12.95		144	71
573	2.40	0.01	13.32		145	71
574	2.40	0.01	13.43		145	71
575	2.40	0.01	13.17		144	71
576	2.30	0.01	12.84		145	71
577	2.30	0.01	12.77		146	71
578	2.30	0.01004	12.86		146	72
579	2.30	0.00968	12.61		147	72
580	2.20	0.00949	12.58		148	72
581	2.20	0.00932	12.78		147	71
582	2.20	0.00932	12.57		147	72
583	2.10	0.00926	12.6		147	71
584	2.10	0.00936	12.74		147	72
585	2.10	0.00971	12.99		148	72
586	2.10	0.01	13.05		149	72
587	2.00	0.00971	13.21		149	72
588	2.00	0.00974	13.37		149	72
589	2.00	0.00916	13.19		149	72
590	1.90	0.00894	13.22		150	72
591	1.90	0.00871	12.95		150	72
592	1.90	0.00867	12.88		150	71
593	1.90	0.00874	12.73		151	72
594	1.80	0.00858	12.39		151	72
595	1.80	0.00894	12.45		150	72
596	1.80	0.00858	12.05		150	72
597	1.80	0.00851	11.89		151	72
598	1.70	0.00919	12.07		151	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
599	1.70	0.0089	12.05		151	72
600	1.70	0.00868	11.91		151	72
601	1.70	0.00851	11.92		150	72
602	1.60	0.00845	11.93		150	72
603	1.60	0.00851	11.91		150	72
604	1.60	0.00842	11.98		150	72
605	1.60	0.00864	12.18		150	72
606	1.50	0.00832	12.08		151	72
607	1.50	0.00845	12.02		148	72
608	1.50	0.00822	11.95		148	72
609	1.50	0.00832	11.93		149	72
610	1.40	0.00838	11.78		149	72
611	1.40	0.00848	11.76		149	72
612	1.40	0.00845	12		149	72
613	1.40	0.00832	11.86		148	72
614	1.40	0.00809	11.51		149	72
615	1.30	0.00832	11.6		149	72
616	1.30	0.0089	11.49		148	72
617	1.30	0.00929	11.63		149	71
618	1.30	0.00923	11.58		149	72
619	1.20	0.00926	11.65		148	72
620	1.20	0.0091	11.52		148	72
621	1.20	0.00916	11.65		148	72
622	1.20	0.00907	11.63		147	71
623	1.20	0.00929	11.41		147	72
624	1.20	0.0089	11.42		147	72
625	1.10	0.009	11.41		147	72
626	1.10	0.0089	11.3		147	72
627	1.10	0.00887	11.23		146	72
628	1.10	0.00919	12.02		148	71
629	1.00	0.01	16.31		150	72
630	1.00	0.12	16.77		151	72
631	0.90	0.0101	14.65		153	72
632	0.90	0.01	14.58		155	72
633	0.80	0.05	15.64		158	72
634	0.80	0.43	16.68		159	72
635	0.80	0.15	15.91		162	72
636	0.70	0.03	15.37		163	72
637	0.70	0.01	15.12		163	72
638	0.70	0.01	14.34		162	72
639	0.60	0.02	14.11		163	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
640	0.60	0.01	13.38		162	72
641	0.50	0.01	12.96		161	72
642	0.50	0.00686	12.13		161	72
643	0.50	0.0065	11.77		160	72
644	0.50	0.00621	11.27		159	72
645	0.40	0.00621	11.25		157	72
646	0.40	0.00583	10.83		155	72
647	0.40	0.00586	10.89		154	72
648	0.40	0.00556	10.65		151	72
649	0.30	0.00537	10.38		151	71
650	0.30	0.00528	10.64		149	71
651	0.30	0.00521	10.25		148	71
652	0.30	0.00505	10.25		147	71
653	0.30	0.00502	10.18		147	71
654	0.30	0.00486	9.98		146	71
655	0.30	0.00502	10.07		146	71
656	0.20	0.00499	10.04		145	71
657	0.20	0.00495	9.96		143	71
658	0.20	0.00502	9.84		143	71
659	0.20	0.00486	9.87		143	71
660	0.20	0.00495	9.84		141	71
661	0.20	0.00476	9.58		142	71
662	0.20	0.00479	9.65		141	71
663	0.10	0.00482	9.65		139	71
664	0.10	0.00502	9.87		138	71
665	0.10	0.00499	9.77		138	71
666	0.00	0.00485	10.01		138	71

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : Ashford 30.2
Tracking No. : BK30.2
Project No. : 0142WS021E
Test Date : 3/5/2024
Run No. : 1

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.874** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 20.118 lb.
Minimum Fuel Weight : 18.11 lb.
Maximum Fuel Weight : 22.13 lb.

Fuel Piece Data

PC #	Weight, lb	Size	Length, In	Moisture Readings, Dry Basis %			Average MC, % db	Dry Weight, lb.	Volume, ft3	Wet Weights, lb 4 x 4	Wet Weights, lb 2 x 4	Dry Weights, lb 4 x 4	Dry Weights, lb 2 x 4
1	2.00	2x4	16.75	23.8	21.3	22.7	22.6	1.63	0.0509		2.0		1.63
2	1.80	2x4	16.75	22.0	20.1	21.6	21.2	1.48	0.0509		1.8		1.48
3	1.90	2x4	16.75	24.3	19.7	23.8	22.6	1.55	0.0509		1.9		1.55
4	1.90	2x4	16.75	25.4	24.2	22.2	23.9	1.53	0.0509		1.9		1.53
5	4.00	4x4	16.75	20.3	20.0	22.2	20.8	3.31	0.1187	4.0		3.31	
6	4.00	4x4	16.75	24.8	24.6	22.0	23.8	3.23	0.1187	4.0		3.23	
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
22.4	22.5	18.3	24.2	21.1	24.2	21.1	22.2	
23.8	18.9	24.4	23.3	21.2	24.7	24.4	20.0	
15.9	18.4	13.2	20.2	16.1	24.9	18.8	24.8	

Avg : 21.2

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.40	2x4		2.4000
2	2.30	2x4		2.3000
3	2.40	2x4		2.4000
4	2.40	2x4		2.4000
5	4.50	4x4	4.50	
6	4.70	4x4	4.70	
7				
8				
9				

Combined Mass of 4 x 4s 9.2 lb
Combined Mass of 2 x 4s 9.5 lb

Total Wet Mass of Fuel Load **18.7** lb

Fuel Load Properties

Type	*Number of Pieces*	*Wet Weight, lb.*	*Dry Weight, lb.*	*Fuel Loading Density, lb/ft³* Wet Basis	*Fuel Loading Density, lb/ft³* Dry Basis	Dry Fuel Density, lb/ft³	Wet Fuel Density, lb/ft³	*Moisture, %* Dry Basis	*Moisture, %* Wet Basis
2 x 4	4	7.6	6.20	6.51	5.32	28.89	35.37	22.24	18.19
4 x 4	2	8.0	6.54						
Spacers	24	3.1	2.56						
Totals		18.7	15.30						

Compliance Checks

	Fuel Load, Wet Lb.	Load Density, lb/ft³ of FB vol	Fuel Density, lb/ft³	% of Fuel load mass which is 2x4	Fuel Load Peices Mositure, % db
Measured	18.7	6.51	28.89	51	22.5
Required	18.1 - 22.1	6.3 - 7.7	25 - 36	35 - 65	19 -25
Complies ?	Yes	Yes	Yes	Yes	Yes

Dilution Tunnel Velocity Traverse and Supplementary Data

ASTM E2515-11

Run:	1	Tracking No.:	BK30.2
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WS021E
Model:	Ashford 30.2	Test Date:	3/5/2024

Dillution Tunnel Velocity Traverse

Pitot Location

Traverse Point	*% of Diameter*	*Inches into Tunnel*	*dP in. H_2O*	*Tunnel Temp, °F*	*$dP^{1/2}$*
X1	6.7	0.5 *	0.054	76	0.232
X2	25.0	0.00	0.080	76	0.283
X3	75.0	0.00	0.090	76	0.300
X4	93.3	-0.5 *	0.050	76	0.224
Y1	6.7	0.5 *	0.054	76	0.232
Y2	25.0	0.00	0.090	75	0.300
Y3	75.0	0.00	0.082	75	0.286
Y4	93.3	-0.5 *	0.060	75	0.245
Center	50.0	0.00	0.100	76	0.316

Tunnel Static Pressure	-0.400	*in. H_2O*
Tunnel Moisture	2.00	%
Tunnel Diameter	6.00	inches
Pitot Tube C_p	0.99	inches
Tunnel Molecular Weight	29	(dry)
Tunnel Molecular Weight	28.78	(M_S, wet)
Tunnel Area	0.19634954	*ft^2*
K_p	85.49	constant
$P_s=P_{bar}$+Tunnel Static	29.9805882	in HG

** Probe location must be no closer than 0.50 in to tunnel wall*

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 17.5252$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 21.0944$$

$$F_P = V_{strav} / V_{scent} = 0.831$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 14.560\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	12:15	
Barometric Pressure, in. Hg	30.01	30.05
Room Air Velocity, fpm	16	0
Room Air Temperature, °F	71	70
Room Relative Humidity, %	25.0	29.0
Platform Scale Audit, lb.	20.0	20.0

Leak Checks

Pitot and associated tubing, (pass/fail)[1]	Pass	Pass

See sampling box worksheets for sampling boxes

Dillution Tunnel

Date last cleaned	3/5/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

1 Both sides (independantly) of the pitot system are brought under a minimum vacuum of 3 in. H_2O and then sealed. Any indiction of pressure loss is deemed a fail.

2 Create a smoking condition during start of pre-burn activites and using adequate lighting pointed upward and aroud tunnel hood, visually observe if 100% of visible smoke is being captured by the hood. If not, increase flow tunnel flow and / or re-assess chimney proximity to draft hood as required and repeat until 100% capture is observed.

3 With the appliance installed and the dillution tunnel flow turned-off, observe the flue draft gauge while turning the dulution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducemnt is occuring. Determine the cause (i.e. flue chimnet too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 1

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E
Test Date: 3/5/24
Beginning Clock Time: 11:10

Coal Bed Range (lb):	3.7 (min)	4.7 (max)

Preburn Fuel Data

10 pieces @ 16.75 inches
____ pieces @ ____ inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

22.5	21.7					
22.1	22.2					
22	24.3					
24.2	18.5					
23.8	23					

Avg Preburn Moisture (% DB): **22.43**

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
0	4.5	-0.083	714	438	364	246	564	978	465	344	75
1	4.4	-0.066	705	439	370	263	563	942	468	300	75
2	4.4	-0.064	695	441	375	266	555	910	466	253	75
3	4.3	-0.061	685	443	378	271	547	889	465	221	75
4	4.3	-0.059	675	445	379	272	537	874	462	198	75
5	4.3	-0.057	666	447	380	271	527	861	458	181	76
6	4.2	-0.056	657	448	379	269	517	850	454	168	76
7	4.2	-0.054	649	449	379	270	509	842	451	159	76
8	4.2	-0.052	642	450	377	269	499	834	447	152	75
9	4.2	-0.051	634	450	376	267	493	827	444	146	75
10	4.2	-0.051	628	451	374	268	487	820	442	142	75
11	4.1	-0.051	621	450	372	264	476	814	437	139	75
12	4.1	-0.049	615	450	370	263	471	808	434	136	75
13	4.1	-0.048	608	449	367	261	464	802	430	134	74
14	4.1	-0.046	602	448	365	259	458	796	426	132	74
15	4.1	-0.047	596	447	362	255	453	790	423	130	74
16	4	-0.046	591	446	359	253	447	786	419	128	74
17	4	-0.045	585	445	357	252	442	780	416	127	74
18	4	-0.044	579	444	354	250	437	770	413	125	74
19	4	-0.044	573	442	351	247	432	759	409	124	74
20	4	-0.043	567	441	348	247	427	748	406	122	73
21	4	-0.043	561	440	345	243	422	736	402	120	73
22	4	-0.043	554	439	342	242	417	724	399	119	73
23	4	-0.042	547	438	339	239	413	714	395	118	73
24	4	-0.041	541	437	337	238	409	704	392	117	73
25	4	-0.041	535	435	334	236	403	695	389	116	73
26	4	-0.04	528	434	331	236	399	687	386	114	73
27	4	-0.04	522	433	328	233	395	679	382	114	73
28	4	-0.04	516	432	325	229	391	671	379	113	73
29	4	-0.039	510	431	322	228	386	664	375	112	73
30	4	-0.038	505	430	320	226	382	656	373	111	73
31	4	-0.038	499	429	317	224	378	649	369	110	72
32	4	-0.038	493	428	314	225	374	642	367	109	72
33	4	-0.037	487	427	312	222	370	634	364	108	72
34	4	-0.037	482	426	309	219	366	627	360	108	72
35	4	-0.037	476	425	307	218	362	621	358	106	72
36	4	-0.036	471	424	304	217	359	614	355	106	72
37	4	-0.035	465	424	302	215	355	608	352	105	72
38	4	-0.036	460	423	299	214	351	601	349	104	72
39	4	-0.035	455	422	297	212	348	595	347	103	71
40	4	-0.035	450	421	294	210	344	589	344	102	71
41	4	-0.035	446	421	292	208	341	583	342	102	71
42	4	-0.034	441	420	290	207	337	577	339	101	71

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
43	4	-0.033	436	419	288	206	334	571	337	101	71
44	4	-0.033	432	419	286	204	331	565	334	100	71
45	4	-0.033	427	418	284	203	328	560	332	99	71
46	4	-0.033	422	417	282	201	325	555	329	98	71
47	4.1	-0.033	418	416	280	199	322	549	327	97	71
48	4.1	-0.032	414	416	278	198	318	545	325	97	71
49	4.1	-0.031	410	415	276	198	315	540	323	96	71
50	4.1	-0.032	405	414	274	194	313	536	320	96	71
51	4.1	-0.032	402	414	272	194	310	533	318	96	71
52	4.1	-0.032	398	413	270	193	308	532	316	96	71
53	4.1	-0.032	395	413	268	192	305	531	315	97	71
54	4.1	-0.032	392	412	266	188	302	532	312	98	71
55	4.1	-0.032	390	412	264	188	300	535	311	97	71
56	4.1	-0.033	388	412	263	187	297	538	309	98	71
57	4.1	-0.033	387	412	261	186	294	544	308	99	71
58	4.1	-0.034	385	412	259	186	292	551	307	101	71
59	4.1	-0.033	385	412	257	184	290	558	306	103	70
60	4.1	-0.034	384	412	256	183	288	565	305	103	71
61	4.1	-0.033	384	413	254	183	286	572	304	105	71
62	4.1	-0.034	384	414	253	182	284	578	303	105	71
63	4.1	-0.033	383	415	252	180	283	575	303	108	71
64	4.1	-0.034	381	416	251	179	281	568	302	108	71
NOTE: Weight readings are 0.2 lb. heavier than the real weight due to addition of flue gas probe											
Actual ending preburn weight = 3.9 lb.											

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.12	in. Hg
Post-Test	0.002	cfm @	17	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
Tot / Avg		18.7	**106.835**	**0.160**	**1.24**	**82.0**	**1.86**	**71.82**	**51.33**	**71.04**	**100.0**	**78.4**	**0.097**	**0.312**	**17.30**
Minimum	0.0	0.0	0.000	0.148	0.82	74	1.71	69	47	69	93.3	73	0.093	0.305	17.11
Max	18.7	0.1	106.835	0.163	1.27	84	1.88	73	56	73	102.5	96	0.102	0.319	17.93
0	18.7		0.000		0.82	74	1.71	69	56	71		96	0.100	0.316	17.93
1	18.6	0.1	0.148	0.148	1.26	74	1.88	70	49	71	93.3	90	0.099	0.315	17.75
2	18.6	0.0	0.308	0.160	1.26	74	1.88	70	48	71	100.2	80	0.100	0.316	17.62
3	18.6	0.0	0.468	0.160	1.26	74	1.88	70	48	70	99.8	78	0.099	0.315	17.52
4	18.6	0.0	0.627	0.159	1.25	74	1.86	70	48	70	99.5	77	0.098	0.313	17.41
5	18.6	0.0	0.787	0.160	1.24	74	1.85	70	48	71	100.3	76	0.099	0.315	17.40
6	18.6	0.0	0.946	0.159	1.24	74	1.86	70	48	71	99.5	76	0.099	0.315	17.43
7	18.6	0.0	1.106	0.160	1.26	74	1.88	70	48	70	100.1	76	0.098	0.313	17.39
8	18.5	0.1	1.266	0.160	1.26	74	1.88	70	47	70	100.0	76	0.101	0.318	17.48
9	18.5	0.0	1.425	0.159	1.26	74	1.87	70	47	70	99.0	76	0.099	0.315	17.52
10	18.5	0.0	1.585	0.160	1.26	74	1.87	70	47	70	99.6	76	0.100	0.316	17.48
11	18.5	0.0	1.746	0.161	1.25	74	1.87	70	47	71	100.5	76	0.098	0.313	17.43
12	18.5	0.0	1.906	0.160	1.26	74	1.86	70	47	70	100.4	76	0.097	0.311	17.30
13	18.5	0.0	2.066	0.160	1.25	74	1.86	70	47	70	100.9	76	0.097	0.311	17.25
14	18.5	0.0	2.225	0.159	1.25	75	1.86	70	47	70	100.1	77	0.099	0.315	17.35
15	18.5	0.0	2.385	0.160	1.26	75	1.85	70	47	70	100.3	77	0.098	0.313	17.40
16	18.4	0.1	2.545	0.160	1.25	75	1.86	70	47	70	99.8	77	0.102	0.319	17.54
17	18.4	0.0	2.704	0.159	1.24	75	1.86	70	47	70	98.8	77	0.098	0.313	17.54
18	18.4	0.0	2.863	0.159	1.25	75	1.86	70	47	70	99.3	77	0.098	0.313	17.36
19	18.4	0.0	3.023	0.160	1.25	75	1.86	70	48	70	100.6	77	0.097	0.311	17.32
20	18.4	0.0	3.184	0.161	1.25	75	1.86	70	48	70	101.2	77	0.099	0.315	17.36
21	18.4	0.0	3.343	0.159	1.24	76	1.86	70	48	70	99.7	77	0.097	0.311	17.36
22	18.3	0.1	3.502	0.159	1.24	76	1.86	70	48	70	99.7	77	0.098	0.313	17.32
23	18.3	0.0	3.661	0.159	1.24	76	1.87	70	48	70	99.9	77	0.097	0.311	17.32
24	18.3	0.0	3.822	0.161	1.24	76	1.86	71	48	70	100.9	78	0.100	0.316	17.41
25	18.3	0.0	3.981	0.159	1.24	76	1.86	71	48	70	99.4	78	0.098	0.313	17.46
26	18.3	0.0	4.140	0.159	1.24	76	1.85	71	48	70	99.6	78	0.097	0.311	17.33
27	18.2	0.1	4.299	0.159	1.24	76	1.85	71	48	70	100.0	78	0.098	0.313	17.33
28	18.2	0.0	4.459	0.160	1.24	77	1.86	71	48	70	100.2	78	0.099	0.315	17.42
29	18.2	0.0	4.619	0.160	1.23	77	1.85	71	48	70	100.0	78	0.097	0.311	17.38
30	18.1	0.1	4.778	0.159	1.24	77	1.86	71	48	71	99.8	79	0.097	0.311	17.29
31	18.0	0.1	4.937	0.159	1.25	77	1.86	71	48	71	99.8	79	0.100	0.316	17.44
32	17.9	0.1	5.097	0.160	1.23	77	1.87	71	48	70	99.7	80	0.100	0.316	17.58
33	17.8	0.1	5.256	0.159	1.23	77	1.87	71	48	70	99.0	80	0.098	0.313	17.50
34	17.7	0.1	5.415	0.159	1.24	77	1.86	71	48	70	99.6	80	0.097	0.311	17.36
35	17.7	0.0	5.574	0.159	1.24	77	1.86	71	48	70	100.1	80	0.097	0.311	17.32
36	17.6	0.1	5.734	0.160	1.24	78	1.86	71	48	71	100.7	81	0.098	0.313	17.37
37	17.5	0.1	5.895	0.161	1.26	78	1.88	71	49	71	101.1	81	0.097	0.311	17.38
38	17.4	0.1	6.055	0.160	1.26	78	1.88	71	49	71	100.5	81	0.098	0.313	17.38
39	17.3	0.1	6.216	0.161	1.26	78	1.88	71	49	71	101.0	81	0.098	0.313	17.42
40	17.2	0.1	6.376	0.160	1.26	78	1.88	71	49	71	100.4	81	0.097	0.311	17.38

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
41	17.1	0.1	6.537	0.161	1.26	78	1.88	71	49	71	101.6	82	0.095	0.308	17.25
42	17.0	0.1	6.699	0.162	1.26	78	1.88	71	49	70	102.5	82	0.098	0.313	17.31
43	17.0	0.0	6.859	0.160	1.26	78	1.88	71	49	71	101.0	82	0.096	0.310	17.35
44	16.9	0.1	7.019	0.160	1.25	79	1.88	71	49	71	100.8	82	0.098	0.313	17.35
45	16.8	0.1	7.180	0.161	1.26	79	1.88	72	49	71	101.0	82	0.098	0.313	17.44
46	16.7	0.1	7.341	0.161	1.26	79	1.88	72	49	71	100.9	82	0.097	0.311	17.40
47	16.6	0.1	7.502	0.161	1.25	79	1.88	72	49	71	101.0	82	0.098	0.313	17.40
48	16.5	0.1	7.663	0.161	1.26	79	1.88	72	49	71	101.0	82	0.097	0.311	17.40
49	16.5	0.0	7.824	0.161	1.25	79	1.88	72	49	71	101.2	82	0.097	0.311	17.35
50	16.4	0.1	7.985	0.161	1.25	79	1.88	72	50	71	101.3	82	0.097	0.311	17.35
51	16.3	0.1	8.145	0.160	1.26	79	1.88	72	50	71	100.5	82	0.098	0.313	17.40
52	16.3	0.0	8.306	0.161	1.26	79	1.88	72	50	71	101.0	82	0.097	0.311	17.40
53	16.2	0.1	8.468	0.162	1.25	79	1.88	72	50	71	101.5	82	0.099	0.315	17.44
54	16.1	0.1	8.629	0.161	1.25	79	1.88	72	50	71	100.6	82	0.098	0.313	17.48
55	16.1	0.0	8.789	0.160	1.25	79	1.87	72	50	71	100.2	83	0.097	0.311	17.40
56	16.0	0.1	8.950	0.161	1.25	79	1.88	72	50	71	101.2	82	0.097	0.311	17.36
57	15.9	0.1	9.111	0.161	1.26	80	1.87	72	50	71	101.2	82	0.097	0.311	17.35
58	15.9	0.0	9.273	0.162	1.26	80	1.88	72	50	71	101.6	82	0.098	0.313	17.40
59	15.8	0.1	9.434	0.161	1.26	80	1.88	72	50	71	100.6	82	0.099	0.315	17.48
60	15.7	0.1	9.595	0.161	1.25	80	1.88	72	50	71	100.5	83	0.097	0.311	17.45
61	15.6	0.1	9.755	0.160	1.26	80	1.87	72	50	71	100.7	83	0.094	0.307	17.23
62	15.6	0.0	9.916	0.161	1.26	80	1.87	72	50	71	102.1	83	0.096	0.310	17.19
63	15.5	0.1	10.077	0.161	1.26	80	1.87	72	50	71	101.8	82	0.097	0.311	17.31
64	15.4	0.1	10.239	0.162	1.25	80	1.87	72	50	71	101.9	83	0.097	0.311	17.36
65	15.3	0.1	10.400	0.161	1.26	80	1.88	72	50	71	101.4	83	0.096	0.310	17.32
66	15.3	0.0	10.561	0.161	1.25	80	1.88	72	51	71	101.7	83	0.095	0.308	17.23
67	15.2	0.1	10.722	0.161	1.26	80	1.88	72	51	71	101.9	82	0.096	0.310	17.22
68	15.1	0.1	10.883	0.161	1.26	80	1.87	72	51	71	101.5	82	0.098	0.313	17.35
69	15.1	0.0	11.044	0.161	1.26	81	1.88	72	51	71	100.9	82	0.097	0.311	17.40
70	15.0	0.1	11.206	0.162	1.26	81	1.88	72	51	71	101.4	82	0.097	0.311	17.35
71	14.9	0.1	11.367	0.161	1.25	81	1.88	72	51	71	101.0	82	0.096	0.310	17.31
72	14.9	0.0	11.528	0.161	1.25	81	1.88	72	51	71	101.3	82	0.096	0.310	17.26
73	14.8	0.1	11.689	0.161	1.25	81	1.88	72	51	71	101.4	82	0.096	0.310	17.26
74	14.8	0.0	11.850	0.161	1.26	81	1.88	72	51	71	101.6	82	0.095	0.308	17.22
75	14.7	0.1	12.012	0.162	1.26	81	1.87	73	51	71	102.1	82	0.098	0.313	17.31
76	14.7	0.0	12.174	0.162	1.26	81	1.87	73	51	71	101.5	82	0.097	0.311	17.40
77	14.6	0.1	12.335	0.161	1.26	81	1.87	73	51	71	100.9	82	0.096	0.310	17.31
78	14.5	0.1	12.496	0.161	1.25	81	1.87	73	51	71	101.3	82	0.096	0.310	17.26
79	14.5	0.0	12.657	0.161	1.25	81	1.87	72	51	71	101.4	82	0.096	0.310	17.26
80	14.4	0.1	12.818	0.161	1.26	81	1.87	73	51	71	101.0	82	0.099	0.315	17.40
81	14.4	0.0	12.980	0.162	1.26	81	1.88	73	51	71	100.9	82	0.099	0.315	17.53
82	14.3	0.1	13.142	0.162	1.26	81	1.88	73	51	71	101.0	82	0.095	0.308	17.35
83	14.3	0.0	13.304	0.162	1.26	81	1.88	72	51	71	101.7	81	0.097	0.311	17.25
84	14.2	0.1	13.465	0.161	1.25	81	1.88	72	51	71	101.1	81	0.097	0.311	17.33

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	17.12	in. Hg
Post-Test	0.002	cfm @	17	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
85	14.2	0.0	13.626	0.161	1.26	81	1.88	73	51	71	100.8	81	0.097	0.311	17.33
86	14.2	0.0	13.787	0.161	1.26	81	1.88	73	51	71	101.0	82	0.096	0.310	17.30
87	14.1	0.1	13.948	0.161	1.26	81	1.88	73	51	71	101.3	81	0.096	0.310	17.25
88	14.1	0.0	14.110	0.162	1.26	81	1.87	73	51	71	101.8	81	0.097	0.311	17.29
89	14.0	0.1	14.272	0.162	1.26	82	1.87	73	51	71	101.8	82	0.095	0.308	17.25
90	14.0	0.0	14.433	0.161	1.26	82	1.87	73	51	71	101.3	82	0.097	0.311	17.26
91	13.9	0.1	14.595	0.162	1.25	82	1.87	73	51	71	101.7	82	0.096	0.310	17.31
92	13.9	0.0	14.756	0.161	1.26	82	1.88	73	51	71	100.9	81	0.097	0.311	17.30
93	13.8	0.1	14.917	0.161	1.26	82	1.87	73	51	71	100.6	81	0.098	0.313	17.38
94	13.8	0.0	15.078	0.161	1.25	82	1.87	73	51	71	100.4	81	0.097	0.311	17.38
95	13.8	0.0	15.241	0.163	1.26	82	1.88	73	51	71	101.8	81	0.097	0.311	17.33
96	13.7	0.1	15.403	0.162	1.26	82	1.87	73	51	71	101.1	81	0.098	0.313	17.38
97	13.7	0.0	15.564	0.161	1.25	82	1.87	73	51	71	100.5	81	0.096	0.310	17.33
98	13.7	0.0	15.725	0.161	1.26	82	1.88	73	51	71	100.6	81	0.098	0.313	17.33
99	13.6	0.1	15.886	0.161	1.26	82	1.87	73	51	71	100.5	81	0.097	0.311	17.38
100	13.6	0.0	16.048	0.162	1.26	82	1.87	73	51	72	101.1	81	0.097	0.311	17.33
101	13.5	0.1	16.209	0.161	1.25	82	1.88	73	51	71	100.8	81	0.096	0.310	17.29
102	13.5	0.0	16.372	0.163	1.25	82	1.87	73	51	72	102.3	81	0.096	0.310	17.25
103	13.5	0.0	16.533	0.161	1.26	82	1.88	73	51	72	101.0	81	0.097	0.311	17.29
104	13.4	0.1	16.695	0.162	1.25	82	1.87	73	51	72	101.7	81	0.095	0.308	17.25
105	13.4	0.0	16.856	0.161	1.26	82	1.88	73	51	72	101.0	81	0.098	0.313	17.29
106	13.3	0.1	17.017	0.161	1.26	82	1.88	73	51	72	100.5	81	0.098	0.313	17.42
107	13.3	0.0	17.179	0.162	1.26	82	1.88	73	51	72	101.0	81	0.096	0.310	17.33
108	13.3	0.0	17.341	0.162	1.26	82	1.88	73	51	72	101.4	81	0.097	0.311	17.29
109	13.2	0.1	17.503	0.162	1.25	82	1.87	73	51	72	101.5	81	0.096	0.310	17.29
110	13.2	0.0	17.664	0.161	1.25	82	1.88	73	51	72	101.2	81	0.095	0.308	17.20
111	13.2	0.0	17.826	0.162	1.26	82	1.87	73	51	72	101.8	81	0.098	0.313	17.29
112	13.1	0.1	17.987	0.161	1.25	82	1.88	73	51	72	100.8	81	0.096	0.310	17.33
113	13.1	0.0	18.148	0.161	1.26	82	1.88	73	51	72	100.8	81	0.097	0.311	17.29
114	13.1	0.0	18.310	0.162	1.26	82	1.88	73	51	72	101.5	81	0.096	0.310	17.29
115	13.0	0.1	18.472	0.162	1.25	82	1.87	73	51	72	101.5	81	0.097	0.311	17.29
116	13.0	0.0	18.634	0.162	1.26	82	1.87	73	51	72	101.3	81	0.098	0.313	17.38
117	12.9	0.1	18.795	0.161	1.25	82	1.87	73	51	72	100.5	81	0.096	0.310	17.33
118	12.9	0.0	18.956	0.161	1.26	82	1.88	73	51	72	100.9	81	0.096	0.310	17.25
119	12.9	0.0	19.118	0.162	1.26	82	1.87	73	51	72	101.8	81	0.096	0.310	17.25
120	12.8	0.1	19.279	0.161	1.26	82	1.88	73	51	72	101.0	81	0.097	0.311	17.29
121	12.8	0.0	19.441	0.162	1.26	82	1.87	73	51	72	101.4	81	0.097	0.311	17.33
122	12.8	0.0	19.603	0.162	1.26	82	1.88	73	51	72	101.4	81	0.096	0.310	17.29
123	12.7	0.1	19.765	0.162	1.26	82	1.88	73	51	72	101.5	81	0.097	0.311	17.29
124	12.7	0.0	19.926	0.161	1.25	83	1.88	73	51	72	100.5	81	0.098	0.313	17.38
125	12.6	0.1	20.088	0.162	1.26	83	1.88	73	51	72	100.9	81	0.096	0.310	17.33
126	12.6	0.0	20.249	0.161	1.26	83	1.88	73	51	72	100.6	81	0.097	0.311	17.29
127	12.6	0.0	20.411	0.162	1.25	83	1.87	73	51	72	101.2	81	0.097	0.311	17.33
128	12.5	0.1	20.572	0.161	1.26	82	1.88	73	51	72	100.8	81	0.095	0.308	17.25

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
129	12.5	0.0	20.735	0.163	1.26	83	1.87	73	51	72	102.5	81	0.096	0.310	17.20
130	12.5	0.0	20.896	0.161	1.26	83	1.88	73	51	72	101.1	81	0.096	0.310	17.25
131	12.4	0.1	21.058	0.162	1.25	83	1.87	73	51	72	101.3	80	0.098	0.313	17.33
132	12.4	0.0	21.219	0.161	1.25	83	1.88	73	51	72	100.2	80	0.097	0.311	17.36
133	12.3	0.1	21.380	0.161	1.26	83	1.87	73	51	72	100.2	80	0.097	0.311	17.32
134	12.3	0.0	21.542	0.162	1.26	83	1.88	73	51	72	101.0	80	0.097	0.311	17.32
135	12.3	0.0	21.704	0.162	1.26	83	1.88	73	51	72	100.7	80	0.099	0.315	17.41
136	12.2	0.1	21.867	0.163	1.25	83	1.87	73	51	72	101.1	80	0.097	0.311	17.41
137	12.2	0.0	22.028	0.161	1.26	83	1.88	73	51	72	100.2	80	0.096	0.310	17.27
138	12.2	0.0	22.190	0.162	1.25	83	1.88	73	51	72	101.3	79	0.096	0.310	17.22
139	12.1	0.1	22.351	0.161	1.26	83	1.88	73	51	72	100.5	79	0.098	0.313	17.30
140	12.1	0.0	22.512	0.161	1.26	83	1.87	73	51	72	100.1	79	0.097	0.311	17.35
141	12.0	0.1	22.674	0.162	1.26	83	1.87	73	51	72	101.0	79	0.095	0.308	17.21
142	12.0	0.0	22.836	0.162	1.26	83	1.88	73	51	72	101.1	79	0.099	0.315	17.30
143	12.0	0.0	22.999	0.163	1.26	83	1.88	73	51	72	101.1	79	0.098	0.313	17.44
144	11.9	0.1	23.160	0.161	1.26	83	1.88	73	51	72	99.7	78	0.097	0.311	17.34
145	11.9	0.0	23.322	0.162	1.25	83	1.88	73	51	72	100.6	78	0.097	0.311	17.29
146	11.8	0.1	23.483	0.161	1.26	83	1.87	72	51	72	100.2	78	0.097	0.311	17.29
147	11.8	0.0	23.645	0.162	1.26	83	1.88	72	51	72	100.7	78	0.098	0.313	17.33
148	11.7	0.1	23.806	0.161	1.26	83	1.88	72	51	72	99.8	77	0.097	0.311	17.32
149	11.7	0.0	23.969	0.163	1.26	83	1.88	72	51	72	101.2	77	0.097	0.311	17.27
150	11.7	0.0	24.131	0.162	1.26	83	1.88	72	51	72	100.3	77	0.100	0.316	17.40
151	11.6	0.1	24.293	0.162	1.26	83	1.87	72	51	72	99.9	78	0.098	0.313	17.46
152	11.6	0.0	24.454	0.161	1.25	83	1.88	72	51	72	99.4	78	0.098	0.313	17.38
153	11.5	0.1	24.616	0.162	1.26	83	1.88	72	51	71	100.3	77	0.097	0.311	17.32
154	11.5	0.0	24.777	0.161	1.26	83	1.88	72	51	71	99.7	78	0.099	0.315	17.37
155	11.4	0.1	24.939	0.162	1.26	83	1.88	72	51	71	100.2	78	0.098	0.313	17.42
156	11.4	0.0	25.101	0.162	1.27	83	1.88	72	51	71	100.0	77	0.099	0.315	17.41
157	11.4	0.0	25.263	0.162	1.26	83	1.88	72	51	71	100.1	76	0.096	0.310	17.31
158	11.3	0.1	25.425	0.162	1.26	83	1.87	72	51	71	100.4	77	0.099	0.315	17.31
159	11.3	0.0	25.587	0.162	1.26	83	1.87	72	51	71	100.1	77	0.099	0.315	17.45
160	11.2	0.1	25.748	0.161	1.26	83	1.87	72	51	71	99.2	77	0.098	0.313	17.40
161	11.2	0.0	25.910	0.162	1.26	83	1.87	72	51	71	100.2	77	0.097	0.311	17.32
162	11.1	0.1	26.072	0.162	1.26	83	1.87	72	51	71	100.2	77	0.100	0.316	17.40
163	11.1	0.0	26.234	0.162	1.26	83	1.87	72	51	71	99.9	77	0.097	0.311	17.40
164	11.0	0.1	26.396	0.162	1.26	83	1.87	72	51	71	100.1	77	0.099	0.315	17.36
165	11.0	0.0	26.558	0.162	1.25	83	1.88	72	51	71	100.1	77	0.098	0.313	17.40
166	10.9	0.1	26.720	0.162	1.26	83	1.87	72	51	71	99.9	77	0.099	0.315	17.40
167	10.9	0.0	26.881	0.161	1.26	83	1.88	71	51	71	99.2	77	0.099	0.315	17.45
168	10.9	0.0	27.043	0.162	1.26	83	1.87	71	51	71	99.9	77	0.097	0.311	17.36
169	10.8	0.1	27.203	0.160	1.24	83	1.86	71	52	71	99.2	77	0.097	0.311	17.27
170	10.8	0.0	27.364	0.161	1.24	83	1.85	71	52	71	100.0	77	0.098	0.313	17.32
171	10.7	0.1	27.525	0.161	1.24	83	1.86	71	51	71	100.0	77	0.096	0.310	17.27
172	10.7	0.0	27.685	0.160	1.24	83	1.85	71	52	71	99.5	76	0.097	0.311	17.22

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
173	10.6	0.1	27.844	0.159	1.24	83	1.85	71	52	71	98.8	76	0.097	0.311	17.25
174	10.6	0.0	28.005	0.161	1.24	83	1.86	71	52	71	99.9	76	0.098	0.313	17.30
175	10.5	0.1	28.166	0.161	1.23	82	1.85	71	51	71	99.6	76	0.099	0.315	17.39
176	10.5	0.0	28.326	0.160	1.24	82	1.85	71	52	71	98.9	76	0.097	0.311	17.34
177	10.5	0.0	28.486	0.160	1.23	82	1.85	71	52	71	99.4	77	0.097	0.311	17.26
178	10.4	0.1	28.646	0.160	1.24	82	1.85	71	52	71	99.3	77	0.100	0.316	17.40
179	10.4	0.0	28.806	0.160	1.23	82	1.85	71	51	71	98.9	77	0.097	0.311	17.40
180	10.3	0.1	28.968	0.162	1.23	82	1.85	71	52	71	100.5	77	0.097	0.311	17.27
181	10.3	0.0	29.128	0.160	1.23	82	1.85	71	52	70	99.6	77	0.097	0.311	17.27
182	10.2	0.1	29.287	0.159	1.24	82	1.86	71	52	70	98.9	77	0.098	0.313	17.32
183	10.2	0.0	29.447	0.160	1.24	82	1.85	71	52	71	99.3	77	0.098	0.313	17.36
184	10.2	0.0	29.608	0.161	1.24	82	1.85	71	52	70	99.5	77	0.100	0.316	17.45
185	10.1	0.1	29.769	0.161	1.24	82	1.85	71	52	70	99.2	76	0.098	0.313	17.44
186	10.1	0.0	29.929	0.160	1.23	82	1.85	71	52	70	98.8	76	0.098	0.313	17.34
187	10.0	0.1	30.089	0.160	1.23	82	1.85	71	52	70	99.2	77	0.097	0.311	17.31
188	10.0	0.0	30.249	0.160	1.24	82	1.85	71	52	71	99.3	76	0.098	0.313	17.31
189	10.0	0.0	30.409	0.160	1.24	82	1.85	71	52	70	99.1	76	0.098	0.313	17.34
190	9.9	0.1	30.570	0.161	1.23	82	1.85	71	52	70	99.7	76	0.098	0.313	17.34
191	9.9	0.0	30.730	0.160	1.24	82	1.85	71	52	70	98.9	76	0.099	0.315	17.39
192	9.9	0.0	30.890	0.160	1.23	82	1.85	71	51	70	98.8	76	0.098	0.313	17.39
193	9.8	0.1	31.050	0.160	1.24	82	1.85	71	52	70	99.0	76	0.097	0.311	17.30
194	9.8	0.0	31.211	0.161	1.24	82	1.86	71	52	70	99.8	76	0.099	0.315	17.34
195	9.8	0.0	31.371	0.160	1.23	82	1.85	70	52	70	98.8	76	0.099	0.315	17.43
196	9.7	0.1	31.531	0.160	1.23	82	1.85	70	52	70	98.4	76	0.100	0.316	17.48
197	9.7	0.0	31.691	0.160	1.24	82	1.85	70	52	70	98.4	76	0.098	0.313	17.43
198	9.7	0.0	31.851	0.160	1.24	82	1.85	70	52	70	98.8	76	0.098	0.313	17.34
199	9.6	0.1	32.012	0.161	1.24	82	1.85	70	52	70	99.7	76	0.098	0.313	17.34
200	9.6	0.0	32.173	0.161	1.24	82	1.85	70	52	70	99.4	76	0.100	0.316	17.43
201	9.6	0.0	32.333	0.160	1.23	82	1.85	70	51	70	98.4	76	0.099	0.315	17.48
202	9.5	0.1	32.493	0.160	1.23	82	1.85	70	52	70	98.5	76	0.098	0.313	17.39
203	9.5	0.0	32.653	0.160	1.24	82	1.85	70	51	70	98.9	76	0.098	0.313	17.34
204	9.5	0.0	32.814	0.161	1.23	82	1.85	70	51	70	99.8	76	0.097	0.311	17.30
205	9.4	0.1	32.974	0.160	1.24	82	1.85	70	51	70	99.3	76	0.098	0.313	17.30
206	9.4	0.0	33.134	0.160	1.23	82	1.85	70	51	70	99.0	76	0.099	0.315	17.39
207	9.4	0.0	33.294	0.160	1.24	82	1.85	70	51	70	98.7	76	0.099	0.315	17.43
208	9.3	0.1	33.454	0.160	1.24	82	1.85	70	51	70	98.7	76	0.098	0.313	17.39
209	9.3	0.0	33.615	0.161	1.24	82	1.86	70	51	70	99.4	76	0.099	0.315	17.39
210	9.3	0.0	33.776	0.161	1.23	82	1.85	70	51	70	99.6	75	0.096	0.310	17.29
211	9.2	0.1	33.935	0.159	1.23	81	1.85	70	51	70	98.5	75	0.100	0.316	17.33
212	9.2	0.0	34.095	0.160	1.23	81	1.85	70	51	70	99.0	75	0.097	0.311	17.37
213	9.1	0.1	34.255	0.160	1.24	81	1.85	70	51	70	99.1	75	0.098	0.313	17.28
214	9.1	0.0	34.417	0.162	1.23	81	1.85	70	51	69	100.4	75	0.099	0.315	17.37
215	9.1	0.0	34.577	0.160	1.24	81	1.85	70	51	69	98.9	75	0.098	0.313	17.37
216	9.0	0.1	34.736	0.159	1.24	81	1.85	70	51	69	98.3	75	0.099	0.315	17.37

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
217	9.0	0.0	34.896	0.160	1.24	81	1.85	70	51	69	99.0	75	0.097	0.311	17.33
218	9.0	0.0	35.057	0.161	1.24	81	1.85	70	51	69	99.9	75	0.098	0.313	17.28
219	8.9	0.1	35.218	0.161	1.23	81	1.85	70	51	69	99.7	75	0.099	0.315	17.37
220	8.9	0.0	35.378	0.160	1.23	81	1.85	70	51	69	98.8	75	0.099	0.315	17.42
221	8.8	0.1	35.538	0.160	1.24	81	1.85	70	51	69	98.6	75	0.099	0.315	17.42
222	8.8	0.0	35.698	0.160	1.24	81	1.85	70	51	69	98.6	75	0.099	0.315	17.42
223	8.8	0.0	35.858	0.160	1.24	81	1.85	70	51	69	98.8	76	0.098	0.313	17.38
224	8.7	0.1	36.019	0.161	1.24	81	1.85	70	51	69	99.7	75	0.098	0.313	17.34
225	8.7	0.0	36.179	0.160	1.23	81	1.85	70	51	69	99.0	75	0.099	0.315	17.37
226	8.7	0.0	36.339	0.160	1.23	81	1.85	70	51	69	98.9	75	0.098	0.313	17.37
227	8.6	0.1	36.499	0.160	1.24	81	1.85	70	51	69	98.9	75	0.099	0.315	17.37
228	8.6	0.0	36.660	0.161	1.24	81	1.85	70	51	69	99.4	75	0.099	0.315	17.42
229	8.6	0.0	36.820	0.160	1.24	81	1.85	70	51	69	98.9	75	0.097	0.311	17.33
230	8.5	0.1	36.980	0.160	1.23	81	1.85	70	51	69	99.4	75	0.097	0.311	17.24
231	8.5	0.0	37.140	0.160	1.24	81	1.85	70	51	69	99.5	75	0.098	0.313	17.28
232	8.5	0.0	37.300	0.160	1.24	81	1.85	70	51	69	99.1	75	0.099	0.315	17.37
233	8.4	0.1	37.461	0.161	1.24	81	1.85	70	51	69	99.2	75	0.100	0.316	17.46
234	8.4	0.0	37.621	0.160	1.24	81	1.85	70	51	69	98.7	74	0.096	0.310	17.32
235	8.4	0.0	37.781	0.160	1.24	81	1.85	70	51	69	99.5	75	0.097	0.311	17.19
236	8.3	0.1	37.940	0.159	1.24	81	1.85	70	51	69	99.2	75	0.097	0.311	17.24
237	8.3	0.0	38.101	0.161	1.24	81	1.85	70	51	69	100.1	75	0.098	0.313	17.28
238	8.3	0.0	38.262	0.161	1.23	81	1.85	70	51	69	99.9	75	0.098	0.313	17.33
239	8.2	0.1	38.422	0.160	1.24	81	1.85	69	51	69	99.1	74	0.098	0.313	17.32
240	8.2	0.0	38.582	0.160	1.24	81	1.85	69	51	69	99.4	74	0.095	0.308	17.18
241	8.2	0.0	38.742	0.160	1.24	81	1.85	69	51	69	99.9	74	0.097	0.311	17.13
242	8.1	0.1	38.902	0.160	1.24	81	1.85	69	51	69	99.7	74	0.098	0.313	17.27
243	8.1	0.0	39.063	0.161	1.24	81	1.85	69	51	69	99.9	75	0.098	0.313	17.32
244	8.1	0.0	39.223	0.160	1.23	81	1.85	69	51	69	99.0	75	0.099	0.315	17.37
245	8.1	0.0	39.383	0.160	1.24	81	1.85	69	51	70	98.8	75	0.099	0.315	17.42
246	8.1	0.0	39.542	0.159	1.24	81	1.85	69	51	70	98.5	76	0.096	0.310	17.29
247	8.0	0.1	39.703	0.161	1.24	81	1.84	70	51	70	100.3	76	0.098	0.313	17.25
248	8.0	0.0	39.864	0.161	1.24	81	1.85	70	51	70	100.1	76	0.098	0.313	17.34
249	8.0	0.0	40.024	0.160	1.23	81	1.85	70	51	70	99.3	77	0.098	0.313	17.35
250	8.0	0.0	40.183	0.159	1.24	81	1.85	70	51	70	98.8	77	0.097	0.311	17.32
251	7.9	0.1	40.343	0.160	1.24	81	1.84	70	51	70	99.7	77	0.097	0.311	17.27
252	7.9	0.0	40.504	0.161	1.24	81	1.85	70	51	70	100.3	77	0.098	0.313	17.32
253	7.9	0.0	40.664	0.160	1.24	81	1.85	70	51	70	99.6	77	0.097	0.311	17.32
254	7.9	0.0	40.824	0.160	1.24	81	1.85	70	51	70	99.6	77	0.098	0.313	17.32
255	7.8	0.1	40.984	0.160	1.24	81	1.85	70	51	70	99.5	78	0.098	0.313	17.37
256	7.8	0.0	41.144	0.160	1.24	81	1.85	70	51	70	99.6	77	0.096	0.310	17.28
257	7.8	0.0	41.305	0.161	1.23	81	1.85	70	51	70	100.6	78	0.097	0.311	17.23
258	7.8	0.0	41.465	0.160	1.23	81	1.85	70	51	70	100.1	77	0.096	0.310	17.23
259	7.8	0.0	41.624	0.159	1.24	81	1.85	70	51	70	99.5	78	0.097	0.311	17.23
260	7.7	0.1	41.784	0.160	1.24	81	1.84	70	51	70	100.2	78	0.096	0.310	17.24

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
261	7.7	0.0	41.944	0.160	1.24	81	1.85	70	51	70	100.0	78	0.098	0.313	17.29
262	7.7	0.0	42.105	0.161	1.24	81	1.85	70	51	70	100.3	78	0.098	0.313	17.38
263	7.7	0.0	42.265	0.160	1.23	81	1.84	70	51	70	99.5	78	0.097	0.311	17.33
264	7.7	0.0	42.425	0.160	1.23	81	1.85	70	51	70	99.9	78	0.096	0.310	17.24
265	7.6	0.1	42.584	0.159	1.24	81	1.85	70	51	70	99.6	78	0.097	0.311	17.24
266	7.6	0.0	42.745	0.161	1.24	81	1.85	71	51	70	100.5	78	0.098	0.313	17.33
267	7.6	0.0	42.905	0.160	1.23	81	1.85	71	51	70	99.5	78	0.098	0.313	17.38
268	7.6	0.0	43.065	0.160	1.23	81	1.85	71	51	70	99.8	78	0.095	0.308	17.24
269	7.6	0.0	43.224	0.159	1.23	81	1.85	71	51	71	99.6	78	0.098	0.313	17.24
270	7.5	0.1	43.384	0.160	1.23	81	1.85	71	51	70	99.5	77	0.100	0.316	17.46
271	7.5	0.0	43.545	0.161	1.23	81	1.85	71	51	70	99.3	77	0.099	0.315	17.49
272	7.5	0.0	43.705	0.160	1.23	81	1.84	71	51	70	98.8	78	0.099	0.315	17.46
273	7.5	0.0	43.865	0.160	1.23	81	1.85	71	51	70	99.2	78	0.097	0.311	17.38
274	7.5	0.0	44.024	0.159	1.24	81	1.85	71	51	70	99.2	78	0.096	0.310	17.24
275	7.5	0.0	44.185	0.161	1.23	81	1.85	71	51	70	100.9	78	0.096	0.310	17.20
276	7.4	0.1	44.345	0.160	1.24	81	1.85	71	51	70	100.3	78	0.097	0.311	17.24
277	7.4	0.0	44.505	0.160	1.23	81	1.85	71	51	70	100.2	78	0.096	0.310	17.24
278	7.4	0.0	44.664	0.159	1.23	81	1.85	71	51	71	99.3	78	0.099	0.315	17.33
279	7.4	0.0	44.824	0.160	1.23	81	1.85	71	51	70	99.5	79	0.098	0.313	17.43
280	7.4	0.0	44.985	0.161	1.22	81	1.85	71	51	71	99.8	78	0.099	0.315	17.43
281	7.3	0.1	45.145	0.160	1.22	81	1.85	71	51	70	99.3	78	0.097	0.311	17.38
282	7.3	0.0	45.305	0.160	1.23	81	1.84	71	51	70	99.8	78	0.096	0.310	17.24
283	7.3	0.0	45.464	0.159	1.24	81	1.84	71	51	71	99.6	78	0.097	0.311	17.24
284	7.3	0.0	45.625	0.161	1.24	81	1.85	71	51	71	100.7	78	0.097	0.311	17.29
285	7.3	0.0	45.785	0.160	1.23	81	1.85	71	51	71	99.9	78	0.097	0.311	17.29
286	7.2	0.1	45.945	0.160	1.23	81	1.85	71	51	71	99.9	78	0.097	0.311	17.29
287	7.2	0.0	46.105	0.160	1.23	81	1.85	71	51	71	99.9	78	0.097	0.311	17.29
288	7.2	0.0	46.265	0.160	1.24	81	1.85	71	51	71	99.9	78	0.097	0.311	17.29
289	7.2	0.0	46.425	0.160	1.24	81	1.85	71	51	71	99.9	78	0.097	0.311	17.29
290	7.2	0.0	46.585	0.160	1.23	81	1.85	71	51	71	99.9	78	0.097	0.311	17.29
291	7.1	0.1	46.745	0.160	1.23	81	1.85	71	51	71	100.0	79	0.097	0.311	17.29
292	7.1	0.0	46.904	0.159	1.23	81	1.86	71	51	71	99.5	79	0.096	0.310	17.26
293	7.1	0.0	47.064	0.160	1.24	82	1.85	71	51	71	100.2	79	0.097	0.311	17.26
294	7.1	0.0	47.226	0.162	1.23	82	1.85	71	51	71	101.3	78	0.096	0.310	17.25
295	7.0	0.1	47.385	0.159	1.23	82	1.85	71	51	71	99.3	78	0.097	0.311	17.24
296	7.0	0.0	47.545	0.160	1.23	82	1.85	72	51	71	100.0	78	0.096	0.310	17.24
297	7.0	0.0	47.705	0.160	1.24	82	1.85	72	51	71	100.1	79	0.097	0.311	17.25
298	7.0	0.0	47.865	0.160	1.23	82	1.85	72	51	71	100.1	79	0.096	0.310	17.26
299	6.9	0.1	48.026	0.161	1.23	82	1.85	72	51	71	100.8	79	0.096	0.310	17.21
300	6.9	0.0	48.185	0.159	1.23	82	1.85	72	51	71	99.6	79	0.097	0.311	17.26
301	6.9	0.0	48.345	0.160	1.23	82	1.85	72	51	71	99.8	79	0.098	0.313	17.35
302	6.9	0.0	48.505	0.160	1.24	82	1.85	72	51	71	99.6	79	0.097	0.311	17.35
303	6.9	0.0	48.666	0.161	1.23	82	1.85	72	51	71	100.1	79	0.099	0.315	17.39
304	6.8	0.1	48.826	0.160	1.23	82	1.85	72	51	71	99.3	79	0.097	0.311	17.39

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.12	in. Hg
Post-Test	0.002	cfm @	17	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
305	6.8	0.0	48.985	0.159	1.23	82	1.85	72	51	71	98.8	79	0.098	0.313	17.35
306	6.8	0.0	49.145	0.160	1.23	82	1.85	72	51	71	100.0	79	0.094	0.307	17.21
307	6.7	0.1	49.305	0.160	1.23	82	1.85	72	51	71	100.3	79	0.098	0.313	17.21
308	6.7	0.0	49.466	0.161	1.23	82	1.85	72	51	71	100.6	79	0.097	0.311	17.35
309	6.7	0.0	49.625	0.159	1.23	82	1.85	72	51	71	99.1	79	0.097	0.311	17.30
310	6.7	0.0	49.785	0.160	1.23	82	1.85	72	51	71	99.7	79	0.098	0.313	17.35
311	6.6	0.1	49.945	0.160	1.23	82	1.85	72	51	71	99.6	79	0.097	0.311	17.35
312	6.6	0.0	50.105	0.160	1.23	82	1.85	72	51	71	99.8	79	0.096	0.310	17.26
313	6.6	0.0	50.266	0.161	1.23	82	1.85	72	51	71	100.7	79	0.097	0.311	17.26
314	6.6	0.0	50.425	0.159	1.23	82	1.86	72	51	71	99.2	79	0.098	0.313	17.35
315	6.5	0.1	50.585	0.160	1.23	82	1.85	72	51	71	99.4	79	0.098	0.313	17.39
316	6.5	0.0	50.745	0.160	1.23	82	1.85	72	51	71	99.4	79	0.097	0.311	17.35
317	6.5	0.0	50.906	0.161	1.24	82	1.86	72	51	71	100.5	79	0.096	0.310	17.26
318	6.5	0.0	51.066	0.160	1.22	82	1.85	72	51	71	100.2	79	0.096	0.310	17.21
319	6.4	0.1	51.225	0.159	1.23	82	1.85	72	51	71	99.8	79	0.095	0.308	17.17
320	6.4	0.0	51.385	0.160	1.24	82	1.86	72	51	71	100.6	79	0.096	0.310	17.17
321	6.4	0.0	51.545	0.160	1.24	82	1.85	72	51	71	100.3	79	0.097	0.311	17.26
322	6.4	0.0	51.706	0.161	1.23	82	1.85	72	51	71	100.7	79	0.096	0.310	17.26
323	6.3	0.1	51.866	0.160	1.23	82	1.85	72	51	71	100.0	79	0.098	0.313	17.30
324	6.3	0.0	52.026	0.160	1.24	82	1.85	72	51	71	99.7	79	0.097	0.311	17.35
325	6.3	0.0	52.186	0.160	1.24	82	1.85	72	51	71	99.7	79	0.097	0.311	17.30
326	6.3	0.0	52.346	0.160	1.23	82	1.85	72	51	71	99.9	80	0.097	0.311	17.31
327	6.2	0.1	52.506	0.160	1.23	82	1.85	72	51	71	99.9	80	0.097	0.311	17.32
328	6.2	0.0	52.666	0.160	1.23	82	1.85	72	51	71	100.0	80	0.096	0.310	17.27
329	6.2	0.0	52.826	0.160	1.23	82	1.85	72	51	71	100.2	79	0.096	0.310	17.22
330	6.2	0.0	52.986	0.160	1.23	82	1.85	72	51	71	100.5	80	0.095	0.308	17.18
331	6.2	0.0	53.147	0.161	1.23	82	1.85	72	51	71	101.4	80	0.096	0.310	17.18
332	6.1	0.1	53.307	0.160	1.23	82	1.85	72	51	71	100.6	80	0.096	0.310	17.23
333	6.1	0.0	53.466	0.159	1.23	82	1.85	72	51	71	99.9	80	0.095	0.308	17.18
334	6.1	0.0	53.626	0.160	1.23	82	1.85	72	51	71	100.6	80	0.097	0.311	17.23
335	6.1	0.0	53.786	0.160	1.24	83	1.85	72	51	71	100.3	80	0.095	0.308	17.23
336	6.0	0.1	53.947	0.161	1.23	83	1.85	73	51	72	101.1	79	0.095	0.308	17.13
337	6.0	0.0	54.107	0.160	1.23	83	1.85	72	51	72	100.4	79	0.097	0.311	17.21
338	6.0	0.0	54.266	0.159	1.23	83	1.85	72	51	72	99.5	80	0.096	0.310	17.27
339	6.0	0.0	54.426	0.160	1.23	83	1.86	73	52	72	100.1	80	0.096	0.310	17.23
340	6.0	0.0	54.587	0.161	1.23	83	1.86	73	51	72	101.0	80	0.095	0.308	17.18
341	5.9	0.1	54.747	0.160	1.23	83	1.85	73	51	72	100.4	80	0.097	0.311	17.23
342	5.9	0.0	54.907	0.160	1.23	83	1.86	73	52	72	99.9	79	0.097	0.311	17.31
343	5.9	0.0	55.066	0.159	1.23	83	1.86	73	52	72	98.9	79	0.098	0.313	17.35
344	5.9	0.0	55.227	0.161	1.23	83	1.85	73	52	72	99.9	79	0.098	0.313	17.39
345	5.9	0.0	55.388	0.161	1.23	83	1.85	73	52	72	100.0	79	0.096	0.310	17.30
346	5.9	0.0	55.547	0.159	1.22	83	1.86	73	52	72	99.1	79	0.097	0.311	17.26
347	5.8	0.1	55.707	0.160	1.23	83	1.85	73	52	72	99.6	80	0.099	0.315	17.40
348	5.8	0.0	55.867	0.160	1.23	83	1.86	73	52	72	99.2	80	0.097	0.311	17.41

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.12	in. Hg
Post-Test	0.002	cfm @	17	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
349	5.8	0.0	56.027	0.160	1.23	83	1.85	73	52	72	99.2	80	0.099	0.315	17.41
350	5.8	0.0	56.188	0.161	1.23	83	1.86	73	52	72	99.8	79	0.097	0.311	17.40
351	5.7	0.1	56.348	0.160	1.23	83	1.85	73	52	72	99.4	79	0.097	0.311	17.30
352	5.7	0.0	56.507	0.159	1.23	83	1.85	73	52	72	99.3	80	0.095	0.308	17.22
353	5.7	0.0	56.667	0.160	1.23	83	1.85	73	52	72	100.4	80	0.096	0.310	17.18
354	5.7	0.0	56.828	0.161	1.24	83	1.85	73	52	72	100.9	80	0.097	0.311	17.27
355	5.7	0.0	56.988	0.160	1.23	83	1.85	73	52	72	99.9	80	0.097	0.311	17.32
356	5.7	0.0	57.148	0.160	1.23	83	1.86	73	52	72	100.1	79	0.094	0.307	17.18
357	5.6	0.1	57.308	0.160	1.23	83	1.85	73	52	72	100.3	79	0.098	0.313	17.21
358	5.6	0.0	57.468	0.160	1.23	83	1.85	73	52	72	99.6	79	0.098	0.313	17.39
359	5.6	0.0	57.629	0.161	1.22	83	1.85	73	52	72	100.1	80	0.096	0.310	17.31
360	5.6	0.0	57.789	0.160	1.23	83	1.85	73	52	72	99.8	79	0.097	0.311	17.27
361	5.6	0.0	57.948	0.159	1.23	83	1.85	73	52	72	99.2	80	0.097	0.311	17.31
362	5.6	0.0	58.108	0.160	1.23	83	1.86	73	52	72	99.6	79	0.098	0.313	17.36
363	5.6	0.0	58.269	0.161	1.24	83	1.85	73	52	72	99.7	79	0.099	0.315	17.44
364	5.5	0.1	58.430	0.161	1.23	83	1.85	73	52	72	99.8	80	0.096	0.310	17.36
365	5.5	0.0	58.590	0.160	1.22	83	1.85	73	52	72	99.8	79	0.096	0.310	17.22
366	5.5	0.0	58.749	0.159	1.23	83	1.86	73	52	72	99.5	79	0.096	0.310	17.21
367	5.5	0.0	58.909	0.160	1.23	83	1.86	73	52	72	99.9	79	0.098	0.313	17.30
368	5.5	0.0	59.069	0.160	1.23	83	1.85	73	52	72	99.4	79	0.098	0.313	17.39
369	5.5	0.0	59.230	0.161	1.23	83	1.86	73	52	72	100.0	79	0.096	0.310	17.30
370	5.4	0.1	59.390	0.160	1.23	83	1.85	73	52	72	99.6	79	0.098	0.313	17.30
371	5.4	0.0	59.550	0.160	1.23	83	1.86	73	52	72	99.8	79	0.095	0.308	17.26
372	5.4	0.0	59.710	0.160	1.24	83	1.86	73	52	72	100.0	79	0.097	0.311	17.21
373	5.4	0.0	59.871	0.161	1.24	83	1.85	73	52	72	100.7	79	0.096	0.310	17.26
374	5.4	0.0	60.031	0.160	1.23	83	1.85	73	52	72	99.7	78	0.098	0.313	17.29
375	5.4	0.0	60.191	0.160	1.23	83	1.86	73	52	72	99.3	78	0.098	0.313	17.38
376	5.4	0.0	60.350	0.159	1.23	83	1.85	73	52	72	98.7	78	0.096	0.310	17.29
377	5.3	0.1	60.511	0.161	1.23	83	1.85	73	52	72	100.3	78	0.097	0.311	17.24
378	5.3	0.0	60.672	0.161	1.22	83	1.86	73	52	72	100.4	77	0.096	0.310	17.23
379	5.3	0.0	60.832	0.160	1.23	83	1.85	73	52	72	99.8	77	0.096	0.310	17.18
380	5.3	0.0	60.992	0.160	1.23	83	1.86	73	52	72	99.9	76	0.096	0.310	17.17
381	5.2	0.1	61.151	0.159	1.23	83	1.85	73	52	72	98.8	76	0.099	0.315	17.30
382	5.2	0.0	61.312	0.161	1.24	83	1.85	73	52	72	99.3	76	0.099	0.315	17.43
383	5.2	0.0	61.473	0.161	1.23	83	1.86	72	52	71	99.2	76	0.097	0.311	17.34
384	5.2	0.0	61.633	0.160	1.23	83	1.85	72	52	72	99.1	76	0.097	0.311	17.25
385	5.2	0.0	61.793	0.160	1.23	83	1.85	72	52	72	99.4	76	0.097	0.311	17.25
386	5.2	0.0	61.953	0.160	1.23	83	1.85	72	52	72	99.4	76	0.097	0.311	17.25
387	5.1	0.1	62.113	0.160	1.23	83	1.85	72	52	72	99.1	76	0.099	0.315	17.34
388	5.1	0.0	62.274	0.161	1.24	83	1.86	72	52	72	99.6	76	0.096	0.310	17.30
389	5.1	0.0	62.434	0.160	1.23	83	1.85	72	52	72	99.5	76	0.096	0.310	17.17
390	5.1	0.0	62.594	0.160	1.23	83	1.85	72	52	72	99.5	76	0.099	0.315	17.30
391	5.1	0.0	62.754	0.160	1.23	83	1.86	72	52	72	99.0	76	0.097	0.311	17.34
392	5.1	0.0	62.915	0.161	1.24	83	1.86	72	52	72	100.0	75	0.094	0.307	17.11

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
393	5.0	0.1	63.076	0.161	1.23	83	1.85	72	52	72	100.5	75	0.098	0.313	17.15
394	5.0	0.0	63.236	0.160	1.23	83	1.85	72	52	73	99.3	76	0.098	0.313	17.34
395	5.0	0.0	63.396	0.160	1.24	83	1.85	72	52	72	99.1	75	0.096	0.310	17.25
396	5.0	0.0	63.556	0.160	1.24	83	1.85	72	52	72	99.5	75	0.096	0.310	17.15
397	5.0	0.0	63.717	0.161	1.24	83	1.85	71	52	72	100.2	75	0.098	0.313	17.24
398	5.0	0.0	63.877	0.160	1.23	83	1.86	71	52	72	99.1	75	0.097	0.311	17.28
399	4.9	0.1	64.038	0.161	1.23	83	1.86	71	52	72	99.7	74	0.097	0.311	17.23
400	4.9	0.0	64.198	0.160	1.24	83	1.85	71	52	71	99.5	75	0.095	0.308	17.14
401	4.9	0.0	64.358	0.160	1.24	83	1.85	71	52	71	99.7	74	0.097	0.311	17.14
402	4.9	0.0	64.519	0.161	1.24	83	1.85	71	52	72	100.2	75	0.096	0.310	17.19
403	4.9	0.0	64.680	0.161	1.24	83	1.85	71	52	71	100.1	74	0.097	0.311	17.19
404	4.9	0.0	64.840	0.160	1.23	83	1.86	71	52	71	99.3	74	0.097	0.311	17.22
405	4.9	0.0	65.000	0.160	1.23	83	1.85	71	52	71	99.2	74	0.097	0.311	17.22
406	4.8	0.1	65.160	0.160	1.24	83	1.85	71	52	71	99.2	73	0.096	0.310	17.17
407	4.8	0.0	65.321	0.161	1.24	83	1.85	71	52	72	100.1	74	0.096	0.310	17.13
408	4.8	0.0	65.482	0.161	1.24	83	1.85	70	52	71	100.1	73	0.097	0.311	17.17
409	4.8	0.0	65.642	0.160	1.23	83	1.85	70	52	71	99.3	73	0.096	0.310	17.16
410	4.8	0.0	65.802	0.160	1.24	83	1.86	70	52	71	99.5	74	0.096	0.310	17.13
411	4.8	0.0	65.962	0.160	1.24	83	1.85	70	52	71	99.6	74	0.097	0.311	17.18
412	4.7	0.1	66.123	0.161	1.23	83	1.85	70	52	71	99.9	74	0.097	0.311	17.22
413	4.7	0.0	66.284	0.161	1.24	82	1.86	70	52	71	99.6	74	0.099	0.315	17.31
414	4.7	0.0	66.444	0.160	1.23	82	1.85	70	52	71	98.9	74	0.097	0.311	17.31
415	4.7	0.0	66.604	0.160	1.24	82	1.85	70	52	71	99.1	75	0.098	0.313	17.27
416	4.7	0.0	66.764	0.160	1.24	82	1.85	70	52	71	99.5	75	0.095	0.308	17.19
417	4.7	0.0	66.925	0.161	1.24	82	1.85	70	52	71	100.5	75	0.097	0.311	17.15
418	4.7	0.0	67.085	0.160	1.23	82	1.86	70	52	71	99.9	76	0.096	0.310	17.20
419	4.6	0.1	67.246	0.161	1.24	82	1.86	70	52	71	100.3	76	0.098	0.313	17.25
420	4.6	0.0	67.406	0.160	1.24	82	1.85	70	52	71	99.4	76	0.097	0.311	17.30
421	4.6	0.0	67.566	0.160	1.24	82	1.86	70	52	71	99.5	76	0.096	0.310	17.21
422	4.6	0.0	67.726	0.160	1.24	82	1.85	70	52	71	99.9	76	0.096	0.310	17.17
423	4.6	0.0	67.887	0.161	1.24	82	1.85	71	52	71	100.6	77	0.097	0.311	17.22
424	4.6	0.0	68.047	0.160	1.23	82	1.86	71	52	71	100.0	76	0.095	0.308	17.17
425	4.6	0.0	68.207	0.160	1.23	82	1.85	71	52	71	100.2	77	0.096	0.310	17.13
426	4.5	0.1	68.367	0.160	1.23	82	1.85	71	52	71	100.2	77	0.097	0.311	17.23
427	4.5	0.0	68.528	0.161	1.23	82	1.85	71	52	71	100.4	77	0.097	0.311	17.27
428	4.5	0.0	68.688	0.160	1.24	82	1.86	71	52	71	99.6	77	0.097	0.311	17.27
429	4.5	0.0	68.848	0.160	1.23	82	1.85	71	52	71	99.6	77	0.097	0.311	17.27
430	4.5	0.0	69.008	0.160	1.23	82	1.85	71	52	71	99.5	77	0.098	0.313	17.32
431	4.5	0.0	69.168	0.160	1.24	82	1.85	71	52	71	99.5	77	0.096	0.310	17.27
432	4.5	0.0	69.329	0.161	1.24	82	1.85	71	52	71	100.5	77	0.096	0.310	17.18
433	4.4	0.1	69.490	0.161	1.23	82	1.86	71	52	71	100.8	77	0.096	0.310	17.18
434	4.4	0.0	69.649	0.159	1.23	82	1.85	71	52	71	99.4	77	0.097	0.311	17.23
435	4.4	0.0	69.809	0.160	1.24	82	1.86	71	52	71	99.5	77	0.099	0.315	17.36
436	4.4	0.0	69.969	0.160	1.24	82	1.86	71	52	71	99.3	77	0.096	0.310	17.32

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
437	4.4	0.0	70.131	0.162	1.23	82	1.85	71	52	71	101.0	77	0.096	0.310	17.18
438	4.4	0.0	70.291	0.160	1.23	82	1.85	71	52	71	100.2	77	0.096	0.310	17.18
439	4.4	0.0	70.450	0.159	1.23	82	1.86	71	52	71	99.3	78	0.098	0.313	17.28
440	4.3	0.1	70.610	0.160	1.24	82	1.85	72	52	71	99.6	77	0.097	0.311	17.32
441	4.3	0.0	70.770	0.160	1.24	82	1.85	72	52	71	99.6	77	0.096	0.310	17.23
442	4.3	0.0	70.931	0.161	1.23	82	1.86	72	52	71	100.8	77	0.095	0.308	17.14
443	4.3	0.0	71.091	0.160	1.23	82	1.85	72	52	71	100.2	77	0.098	0.313	17.23
444	4.3	0.0	71.251	0.160	1.23	82	1.85	72	52	71	99.8	78	0.096	0.310	17.28
445	4.3	0.0	71.411	0.160	1.23	82	1.85	72	52	71	99.8	77	0.097	0.311	17.23
446	4.3	0.0	71.572	0.161	1.24	82	1.86	72	52	71	100.6	78	0.096	0.310	17.23
447	4.3	0.0	71.732	0.160	1.24	82	1.85	72	52	71	100.1	78	0.096	0.310	17.20
448	4.2	0.1	71.892	0.160	1.23	82	1.85	72	52	71	100.0	78	0.098	0.313	17.29
449	4.2	0.0	72.052	0.160	1.23	82	1.85	72	52	71	99.7	78	0.096	0.310	17.29
450	4.2	0.0	72.212	0.160	1.23	82	1.85	72	52	71	99.7	78	0.098	0.313	17.29
451	4.2	0.0	72.373	0.161	1.23	82	1.86	72	52	71	100.2	78	0.097	0.311	17.33
452	4.2	0.0	72.533	0.160	1.23	82	1.85	72	52	71	99.6	78	0.097	0.311	17.29
453	4.2	0.0	72.693	0.160	1.24	82	1.85	72	52	71	99.7	78	0.097	0.311	17.29
454	4.1	0.1	72.852	0.159	1.24	82	1.85	72	52	71	99.2	78	0.096	0.310	17.24
455	4.1	0.0	73.013	0.161	1.24	82	1.86	72	52	71	100.7	78	0.096	0.310	17.20
456	4.1	0.0	73.174	0.161	1.24	82	1.85	72	52	71	100.7	78	0.097	0.311	17.24
457	4.1	0.0	73.334	0.160	1.23	83	1.85	72	52	71	99.9	78	0.096	0.310	17.24
458	4.1	0.0	73.493	0.159	1.23	83	1.86	72	52	71	99.2	78	0.097	0.311	17.24
459	4.1	0.0	73.653	0.160	1.24	83	1.85	72	52	71	99.8	78	0.096	0.310	17.24
460	4.1	0.0	73.814	0.161	1.24	83	1.85	72	52	71	100.7	78	0.095	0.308	17.15
461	4.1	0.0	73.975	0.161	1.23	83	1.86	72	52	71	100.7	78	0.098	0.313	17.24
462	4.0	0.1	74.135	0.160	1.23	83	1.85	72	52	71	99.7	78	0.096	0.310	17.29
463	4.0	0.0	74.295	0.160	1.23	83	1.85	72	52	71	99.7	78	0.097	0.311	17.24
464	4.0	0.0	74.455	0.160	1.24	83	1.85	72	52	71	99.8	78	0.096	0.310	17.24
465	4.0	0.0	74.615	0.160	1.23	83	1.85	72	52	71	99.8	78	0.097	0.311	17.24
466	4.0	0.0	74.776	0.161	1.24	83	1.86	72	52	71	100.3	78	0.097	0.311	17.29
467	4.0	0.0	74.936	0.160	1.23	83	1.86	72	52	71	99.8	78	0.095	0.308	17.20
468	4.0	0.0	75.096	0.160	1.23	83	1.85	72	52	71	100.2	78	0.096	0.310	17.15
469	3.9	0.1	75.256	0.160	1.24	83	1.86	72	52	71	100.2	78	0.096	0.310	17.20
470	3.9	0.0	75.416	0.160	1.23	83	1.85	72	52	71	99.8	78	0.098	0.313	17.29
471	3.9	0.0	75.577	0.161	1.24	83	1.86	72	52	71	100.2	78	0.096	0.310	17.29
472	3.9	0.0	75.737	0.160	1.23	83	1.85	72	52	71	99.7	78	0.097	0.311	17.24
473	3.9	0.0	75.897	0.160	1.24	83	1.85	72	52	71	99.6	78	0.098	0.313	17.33
474	3.9	0.0	76.057	0.160	1.23	83	1.85	72	52	71	99.6	78	0.095	0.308	17.24
475	3.9	0.0	76.218	0.161	1.24	83	1.86	72	52	71	100.6	78	0.097	0.311	17.20
476	3.9	0.0	76.378	0.160	1.23	83	1.85	72	52	71	99.9	78	0.096	0.310	17.24
477	3.9	0.0	76.538	0.160	1.23	83	1.86	72	52	71	100.1	78	0.095	0.308	17.15
478	3.8	0.1	76.698	0.160	1.24	83	1.86	72	52	71	100.2	78	0.097	0.311	17.20
479	3.8	0.0	76.858	0.160	1.23	83	1.86	72	52	71	99.9	78	0.096	0.310	17.24
480	3.8	0.0	77.019	0.161	1.23	83	1.85	72	52	71	100.6	78	0.096	0.310	17.20

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
481	3.8	0.0	77.179	0.160	1.24	83	1.85	72	52	71	99.9	78	0.097	0.311	17.24
482	3.8	0.0	77.339	0.160	1.23	83	1.86	72	52	71	99.8	78	0.096	0.310	17.24
483	3.8	0.0	77.499	0.160	1.23	83	1.85	72	52	71	99.9	78	0.096	0.310	17.20
484	3.8	0.0	77.659	0.160	1.24	83	1.85	72	52	71	99.9	78	0.097	0.311	17.24
485	3.7	0.1	77.821	0.162	1.23	83	1.85	72	52	71	101.2	78	0.095	0.308	17.20
486	3.7	0.0	77.981	0.160	1.23	83	1.85	72	52	71	100.1	78	0.097	0.311	17.20
487	3.7	0.0	78.140	0.159	1.24	83	1.85	72	52	71	99.4	78	0.095	0.308	17.20
488	3.7	0.0	78.300	0.160	1.23	83	1.86	72	52	71	100.1	78	0.097	0.311	17.20
489	3.7	0.0	78.460	0.160	1.24	83	1.86	72	52	71	99.7	78	0.098	0.313	17.33
490	3.7	0.0	78.622	0.162	1.24	83	1.86	72	52	71	100.5	78	0.097	0.311	17.33
491	3.6	0.1	78.782	0.160	1.23	83	1.85	72	52	71	99.4	78	0.097	0.311	17.29
492	3.6	0.0	78.942	0.160	1.23	83	1.86	72	52	71	99.7	78	0.096	0.310	17.24
493	3.6	0.0	79.101	0.159	1.24	83	1.86	72	52	71	99.1	78	0.098	0.313	17.29
494	3.6	0.0	79.262	0.161	1.24	83	1.85	72	52	71	100.2	78	0.096	0.310	17.29
495	3.6	0.0	79.423	0.161	1.24	83	1.85	72	52	71	100.6	78	0.095	0.308	17.15
496	3.6	0.0	79.583	0.160	1.23	83	1.85	72	52	71	100.2	78	0.097	0.311	17.20
497	3.6	0.0	79.743	0.160	1.23	83	1.85	72	52	71	99.7	78	0.098	0.313	17.33
498	3.5	0.1	79.903	0.160	1.24	83	1.85	72	52	71	99.4	78	0.096	0.310	17.29
499	3.5	0.0	80.063	0.160	1.24	83	1.85	72	52	71	99.8	78	0.096	0.310	17.20
500	3.5	0.0	80.224	0.161	1.23	83	1.85	72	52	71	100.6	78	0.097	0.311	17.24
501	3.5	0.0	80.384	0.160	1.23	83	1.86	72	52	71	99.8	78	0.096	0.310	17.24
502	3.5	0.0	80.544	0.160	1.23	83	1.85	72	52	71	99.9	78	0.096	0.310	17.20
503	3.5	0.0	80.704	0.160	1.24	83	1.85	72	52	71	99.8	78	0.098	0.313	17.29
504	3.5	0.0	80.865	0.161	1.24	83	1.85	72	52	71	100.0	78	0.097	0.311	17.33
505	3.4	0.1	81.026	0.161	1.24	83	1.85	72	52	71	100.3	78	0.095	0.308	17.20
506	3.4	0.0	81.186	0.160	1.23	83	1.85	72	52	71	99.9	78	0.098	0.313	17.24
507	3.4	0.0	81.345	0.159	1.23	83	1.85	72	52	71	99.1	78	0.096	0.310	17.29
508	3.4	0.0	81.506	0.161	1.23	83	1.85	72	52	71	100.3	78	0.097	0.311	17.24
509	3.4	0.0	81.667	0.161	1.23	83	1.85	72	52	71	100.3	78	0.097	0.311	17.29
510	3.4	0.0	81.827	0.160	1.23	83	1.85	72	52	71	99.6	78	0.097	0.311	17.29
511	3.4	0.0	81.987	0.160	1.23	83	1.85	72	52	71	99.4	78	0.098	0.313	17.33
512	3.4	0.0	82.147	0.160	1.24	83	1.85	72	52	71	99.4	78	0.096	0.310	17.29
513	3.3	0.1	82.307	0.160	1.24	83	1.86	72	52	71	99.7	78	0.097	0.311	17.24
514	3.3	0.0	82.468	0.161	1.23	83	1.85	72	52	71	100.8	78	0.093	0.305	17.11
515	3.3	0.0	82.628	0.160	1.23	83	1.86	72	52	71	100.5	78	0.098	0.313	17.15
516	3.3	0.0	82.788	0.160	1.23	83	1.86	72	52	71	99.9	78	0.096	0.310	17.29
517	3.3	0.0	82.948	0.160	1.23	83	1.85	72	52	71	99.7	78	0.097	0.311	17.24
518	3.3	0.0	83.108	0.160	1.23	83	1.85	72	52	71	99.7	78	0.097	0.311	17.29
519	3.3	0.0	83.270	0.162	1.23	83	1.86	72	52	71	100.7	78	0.098	0.313	17.33
520	3.3	0.0	83.430	0.160	1.23	83	1.86	72	52	71	99.6	78	0.095	0.308	17.24
521	3.3	0.0	83.589	0.159	1.23	83	1.86	72	52	71	99.2	78	0.098	0.313	17.24
522	3.2	0.1	83.749	0.160	1.23	83	1.85	72	52	71	99.4	78	0.098	0.313	17.38
523	3.2	0.0	83.909	0.160	1.24	83	1.85	72	52	71	99.2	78	0.097	0.311	17.33
524	3.2	0.0	84.071	0.162	1.23	83	1.85	72	52	71	100.7	78	0.097	0.311	17.29

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
525	3.2	0.0	84.231	0.160	1.23	83	1.85	72	52	71	99.6	78	0.097	0.311	17.29
526	3.2	0.0	84.390	0.159	1.23	83	1.85	72	52	71	99.1	78	0.096	0.310	17.24
527	3.2	0.0	84.550	0.160	1.23	83	1.85	72	52	71	99.9	78	0.096	0.310	17.20
528	3.2	0.0	84.711	0.161	1.24	83	1.85	72	52	71	100.6	78	0.097	0.311	17.24
529	3.2	0.0	84.872	0.161	1.24	83	1.86	72	52	71	100.4	78	0.096	0.310	17.24
530	3.2	0.0	85.032	0.160	1.23	83	1.85	72	52	71	100.1	78	0.095	0.308	17.15
531	3.2	0.0	85.192	0.160	1.23	83	1.85	72	52	71	100.2	78	0.097	0.311	17.20
532	3.2	0.0	85.352	0.160	1.24	83	1.86	72	52	71	100.1	78	0.095	0.308	17.20
533	3.1	0.1	85.512	0.160	1.22	83	1.86	72	52	71	100.2	78	0.096	0.310	17.15
534	3.1	0.0	85.673	0.161	1.24	83	1.86	72	52	71	100.6	78	0.098	0.313	17.29
535	3.1	0.0	85.833	0.160	1.24	83	1.85	72	52	71	99.6	78	0.096	0.310	17.29
536	3.1	0.0	85.993	0.160	1.23	83	1.85	72	52	71	99.7	78	0.097	0.311	17.24
537	3.1	0.0	86.153	0.160	1.24	83	1.85	72	52	71	99.7	78	0.097	0.311	17.29
538	3.1	0.0	86.314	0.161	1.24	83	1.86	72	52	71	100.2	78	0.097	0.311	17.29
539	3.1	0.0	86.474	0.160	1.24	83	1.85	72	52	71	99.8	78	0.095	0.308	17.20
540	3.0	0.1	86.634	0.160	1.23	83	1.85	72	52	71	99.8	78	0.099	0.315	17.29
541	3.0	0.0	86.794	0.160	1.24	83	1.86	72	52	71	99.3	78	0.097	0.311	17.38
542	3.0	0.0	86.955	0.161	1.23	83	1.85	72	52	71	100.2	78	0.095	0.308	17.20
543	3.0	0.0	87.116	0.161	1.24	83	1.86	72	52	71	100.8	78	0.096	0.310	17.15
544	3.0	0.0	87.276	0.160	1.24	83	1.85	72	52	71	100.1	78	0.097	0.311	17.24
545	3.0	0.0	87.436	0.160	1.23	83	1.85	72	52	71	99.7	78	0.097	0.311	17.29
546	3.0	0.0	87.596	0.160	1.24	83	1.85	72	52	71	99.6	78	0.097	0.311	17.29
547	3.0	0.0	87.756	0.160	1.24	83	1.86	72	52	71	99.7	78	0.096	0.310	17.24
548	3.0	0.0	87.917	0.161	1.23	83	1.86	72	52	71	100.6	78	0.096	0.310	17.20
549	3.0	0.0	88.078	0.161	1.23	83	1.86	72	52	71	100.7	78	0.096	0.310	17.20
550	2.9	0.1	88.237	0.159	1.23	83	1.86	73	52	71	100.4	88	0.094	0.307	17.19
551	2.9	0.0	88.397	0.160	1.24	83	1.85	73	52	71	101.1	80	0.097	0.311	17.25
552	2.9	0.0	88.558	0.161	1.24	83	1.86	73	52	71	100.6	79	0.096	0.310	17.27
553	2.9	0.0	88.719	0.161	1.23	83	1.86	73	52	71	100.5	79	0.097	0.311	17.26
554	2.8	0.1	88.879	0.160	1.23	83	1.86	73	52	71	99.8	78	0.096	0.310	17.25
555	2.8	0.0	89.039	0.160	1.23	83	1.86	73	52	71	99.9	78	0.096	0.310	17.20
556	2.8	0.0	89.199	0.160	1.24	83	1.85	73	52	71	100.0	79	0.097	0.311	17.25
557	2.8	0.0	89.359	0.160	1.23	83	1.86	73	52	71	99.9	78	0.096	0.310	17.25
558	2.8	0.0	89.520	0.161	1.23	83	1.85	73	52	71	100.4	78	0.097	0.311	17.24
559	2.7	0.1	89.680	0.160	1.23	83	1.86	73	52	71	99.7	79	0.097	0.311	17.29
560	2.7	0.0	89.840	0.160	1.23	83	1.85	73	52	71	99.9	78	0.095	0.308	17.21
561	2.7	0.0	90.000	0.160	1.24	83	1.85	73	52	71	99.9	78	0.098	0.313	17.24
562	2.7	0.0	90.161	0.161	1.24	83	1.86	73	52	71	100.3	78	0.096	0.310	17.29
563	2.7	0.0	90.322	0.161	1.23	83	1.86	73	52	71	100.3	78	0.097	0.311	17.24
564	2.6	0.1	90.482	0.160	1.23	83	1.85	73	52	71	99.6	78	0.098	0.313	17.33
565	2.6	0.0	90.642	0.160	1.24	83	1.85	73	52	71	99.2	78	0.098	0.313	17.38
566	2.6	0.0	90.802	0.160	1.23	83	1.86	73	52	71	98.9	78	0.099	0.315	17.42
567	2.6	0.0	90.962	0.160	1.23	83	1.85	73	52	71	99.0	78	0.096	0.310	17.33
568	2.6	0.0	91.123	0.161	1.24	84	1.85	73	52	71	100.2	79	0.097	0.311	17.25

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	17.12	in. Hg
Post-Test	0.002	cfm @	17	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
569	2.5	0.1	91.283	0.160	1.22	83	1.86	73	52	71	99.7	79	0.097	0.311	17.30
570	2.5	0.0	91.443	0.160	1.23	84	1.85	73	52	71	99.6	78	0.096	0.310	17.25
571	2.5	0.0	91.603	0.160	1.23	83	1.86	73	52	71	99.9	79	0.096	0.310	17.21
572	2.5	0.0	91.764	0.161	1.23	83	1.85	73	52	71	100.7	79	0.097	0.311	17.26
573	2.4	0.1	91.924	0.160	1.24	84	1.86	73	52	71	99.6	79	0.098	0.313	17.35
574	2.4	0.0	92.084	0.160	1.23	84	1.86	73	52	71	99.3	79	0.096	0.310	17.30
575	2.4	0.0	92.244	0.160	1.23	84	1.86	73	52	71	99.7	79	0.096	0.310	17.21
576	2.3	0.1	92.404	0.160	1.23	83	1.86	73	52	71	99.7	79	0.099	0.315	17.35
577	2.3	0.0	92.565	0.161	1.24	83	1.86	73	52	71	99.9	79	0.097	0.311	17.39
578	2.3	0.0	92.726	0.161	1.23	83	1.85	73	52	72	100.0	79	0.097	0.311	17.30
579	2.3	0.0	92.886	0.160	1.23	84	1.85	73	52	72	99.7	79	0.096	0.310	17.26
580	2.2	0.1	93.046	0.160	1.24	83	1.85	73	52	72	100.1	79	0.095	0.308	17.17
581	2.2	0.0	93.206	0.160	1.24	84	1.86	73	52	71	100.3	79	0.096	0.310	17.17
582	2.2	0.0	93.367	0.161	1.24	84	1.86	73	52	72	100.6	79	0.097	0.311	17.26
583	2.1	0.1	93.527	0.160	1.23	84	1.86	73	52	71	99.6	79	0.097	0.311	17.30
584	2.1	0.0	93.687	0.160	1.24	84	1.86	73	52	72	99.6	79	0.096	0.310	17.26
585	2.1	0.0	93.847	0.160	1.24	84	1.86	73	52	72	99.7	79	0.097	0.311	17.26
586	2.1	0.0	94.007	0.160	1.24	83	1.86	73	52	72	99.4	79	0.099	0.315	17.39
587	2.0	0.1	94.168	0.161	1.23	83	1.86	73	52	72	99.8	79	0.097	0.311	17.39
588	2.0	0.0	94.329	0.161	1.24	84	1.86	73	52	72	99.9	79	0.097	0.311	17.30
589	2.0	0.0	94.488	0.159	1.23	84	1.86	73	52	72	99.1	79	0.095	0.308	17.21
590	1.9	0.1	94.648	0.160	1.24	84	1.85	73	52	72	99.8	79	0.098	0.313	17.26
591	1.9	0.0	94.809	0.161	1.24	84	1.86	73	52	72	100.1	79	0.097	0.311	17.35
592	1.9	0.0	94.970	0.161	1.23	84	1.86	73	52	71	100.0	79	0.097	0.311	17.30
593	1.9	0.0	95.130	0.160	1.23	84	1.86	73	52	72	99.6	79	0.096	0.310	17.26
594	1.8	0.1	95.290	0.160	1.23	84	1.85	73	52	72	99.8	79	0.096	0.310	17.21
595	1.8	0.0	95.450	0.160	1.24	84	1.86	73	52	72	100.0	79	0.096	0.310	17.21
596	1.8	0.0	95.610	0.160	1.24	84	1.86	73	52	72	99.7	79	0.098	0.313	17.30
597	1.8	0.0	95.771	0.161	1.23	84	1.85	73	52	72	100.0	79	0.097	0.311	17.35
598	1.7	0.1	95.932	0.161	1.23	84	1.85	73	52	72	100.0	79	0.097	0.311	17.30
599	1.7	0.0	96.091	0.159	1.23	84	1.85	73	52	72	99.1	79	0.095	0.308	17.21
600	1.7	0.0	96.251	0.160	1.24	84	1.85	73	52	72	99.8	79	0.098	0.313	17.26
601	1.7	0.0	96.412	0.161	1.23	84	1.86	73	52	72	100.2	79	0.096	0.310	17.30
602	1.6	0.1	96.573	0.161	1.23	84	1.86	73	52	72	100.2	79	0.097	0.311	17.26
603	1.6	0.0	96.733	0.160	1.23	84	1.86	73	52	72	99.5	79	0.098	0.313	17.35
604	1.6	0.0	96.893	0.160	1.23	84	1.85	73	52	72	99.2	79	0.097	0.311	17.35
605	1.6	0.0	97.053	0.160	1.23	84	1.85	73	52	72	99.5	79	0.096	0.310	17.26
606	1.5	0.1	97.213	0.160	1.24	84	1.86	73	52	72	99.8	80	0.097	0.311	17.27
607	1.5	0.0	97.375	0.162	1.23	84	1.86	73	52	72	100.9	79	0.097	0.311	17.31
608	1.5	0.0	97.535	0.160	1.23	84	1.85	73	52	72	99.4	79	0.097	0.311	17.30
609	1.5	0.0	97.695	0.160	1.24	84	1.86	73	52	72	99.2	79	0.099	0.315	17.39
610	1.4	0.1	97.855	0.160	1.24	84	1.85	73	52	72	99.0	79	0.097	0.311	17.39
611	1.4	0.0	98.015	0.160	1.24	84	1.85	73	52	72	99.2	79	0.097	0.311	17.30
612	1.4	0.0	98.176	0.161	1.23	84	1.86	73	52	72	100.0	79	0.098	0.313	17.35

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Test Date: 3/5/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
613	1.4	0.0	98.336	0.160	1.23	84	1.86	73	52	72	99.2	79	0.097	0.311	17.35
614	1.4	0.0	98.496	0.160	1.24	83	1.86	73	52	72	99.4	79	0.097	0.311	17.30
615	1.3	0.1	98.656	0.160	1.24	84	1.86	73	52	72	99.6	79	0.097	0.311	17.30
616	1.3	0.0	98.817	0.161	1.24	84	1.86	73	52	72	100.0	80	0.098	0.313	17.36
617	1.3	0.0	98.978	0.161	1.24	84	1.86	73	52	71	99.9	79	0.097	0.311	17.36
618	1.3	0.0	99.138	0.160	1.23	84	1.86	73	52	72	99.4	79	0.096	0.310	17.26
619	1.2	0.1	99.298	0.160	1.23	84	1.86	73	52	72	99.8	80	0.097	0.311	17.27
620	1.2	0.0	99.458	0.160	1.23	84	1.86	73	52	72	99.8	80	0.096	0.310	17.27
621	1.2	0.0	99.619	0.161	1.24	84	1.86	73	52	72	100.3	80	0.098	0.313	17.32
622	1.2	0.0	99.779	0.160	1.23	84	1.85	73	52	71	99.6	80	0.096	0.310	17.32
623	1.2	0.0	99.939	0.160	1.24	84	1.86	73	52	72	99.6	79	0.097	0.311	17.27
624	1.2	0.0	100.100	0.161	1.24	84	1.86	73	52	72	100.2	79	0.097	0.311	17.30
625	1.1	0.1	100.259	0.159	1.24	84	1.85	73	52	72	99.0	79	0.096	0.310	17.26
626	1.1	0.0	100.420	0.161	1.23	84	1.85	73	52	72	100.7	80	0.095	0.308	17.18
627	1.1	0.0	100.581	0.161	1.24	84	1.86	73	52	72	100.7	80	0.098	0.313	17.27
628	1.1	0.0	100.741	0.160	1.24	84	1.85	73	52	71	99.5	79	0.097	0.311	17.36
629	1.0	0.1	100.901	0.160	1.24	84	1.86	73	52	72	99.3	79	0.097	0.311	17.30
630	1.0	0.0	101.061	0.160	1.23	84	1.85	73	52	72	99.5	80	0.097	0.311	17.31
631	0.9	0.1	101.222	0.161	1.24	84	1.86	73	52	72	100.3	79	0.096	0.310	17.27
632	0.9	0.0	101.383	0.161	1.23	84	1.86	73	52	72	100.3	79	0.097	0.311	17.26
633	0.8	0.1	101.542	0.159	1.23	84	1.86	73	52	72	98.9	80	0.098	0.313	17.36
634	0.8	0.0	101.702	0.160	1.23	84	1.85	73	52	72	99.3	80	0.097	0.311	17.36
635	0.8	0.0	101.862	0.160	1.23	84	1.86	73	52	72	99.6	80	0.096	0.310	17.27
636	0.7	0.1	102.024	0.162	1.23	84	1.86	73	52	72	101.2	80	0.096	0.310	17.23
637	0.7	0.0	102.184	0.160	1.24	84	1.86	73	52	72	100.1	80	0.096	0.310	17.23
638	0.7	0.0	102.344	0.160	1.24	84	1.86	73	52	72	100.1	80	0.096	0.310	17.23
639	0.6	0.1	102.504	0.160	1.24	84	1.85	73	52	72	100.1	80	0.096	0.310	17.23
640	0.6	0.0	102.664	0.160	1.24	84	1.86	73	52	72	99.9	80	0.097	0.311	17.27
641	0.5	0.1	102.825	0.161	1.23	84	1.85	73	52	72	100.6	80	0.095	0.308	17.23
642	0.5	0.0	102.986	0.161	1.23	84	1.86	73	52	72	100.8	80	0.096	0.310	17.18
643	0.5	0.0	103.145	0.159	1.23	84	1.85	73	52	72	99.4	80	0.097	0.311	17.27
644	0.5	0.0	103.305	0.160	1.23	84	1.86	73	52	72	99.8	80	0.096	0.310	17.27
645	0.4	0.1	103.466	0.161	1.23	84	1.86	73	52	72	100.6	80	0.096	0.310	17.23
646	0.4	0.0	103.627	0.161	1.23	84	1.86	73	52	72	100.6	80	0.097	0.311	17.27
647	0.4	0.0	103.787	0.160	1.23	84	1.86	73	52	72	99.8	80	0.096	0.310	17.27
648	0.4	0.0	103.947	0.160	1.23	84	1.86	73	52	72	99.9	80	0.096	0.310	17.23
649	0.3	0.1	104.107	0.160	1.24	84	1.85	73	53	71	100.0	79	0.096	0.310	17.22
650	0.3	0.0	104.268	0.161	1.24	84	1.85	73	53	71	100.8	80	0.095	0.308	17.18
651	0.3	0.0	104.429	0.161	1.23	83	1.86	72	53	71	101.0	79	0.096	0.310	17.18
652	0.3	0.0	104.589	0.160	1.23	83	1.85	72	53	71	100.4	79	0.095	0.308	17.17
653	0.3	0.0	104.749	0.160	1.24	83	1.85	72	53	71	100.3	79	0.097	0.311	17.21
654	0.3	0.0	104.909	0.160	1.24	83	1.86	72	53	71	99.9	79	0.097	0.311	17.30
655	0.3	0.0	105.070	0.161	1.24	83	1.86	72	53	71	100.3	79	0.097	0.311	17.30
656	0.2	0.1	105.231	0.161	1.24	83	1.86	72	53	71	100.3	79	0.097	0.311	17.30

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Test Length: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.12 in. Hg
Post-Test 0.002 cfm @ 17 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H (" H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP (" H_2O)*	$\sqrt{dP}$	*vs*
657	0.2	0.0	105.392	0.161	1.23	83	1.86	72	53	71	100.4	79	0.096	0.310	17.26
658	0.2	0.0	105.552	0.160	1.24	83	1.86	72	53	71	99.9	79	0.097	0.311	17.26
659	0.2	0.0	105.712	0.160	1.24	83	1.86	72	53	71	99.8	79	0.097	0.311	17.30
660	0.2	0.0	105.872	0.160	1.24	83	1.86	72	52	71	99.5	79	0.098	0.313	17.35
661	0.2	0.0	106.033	0.161	1.24	83	1.86	72	53	71	99.9	78	0.097	0.311	17.34
662	0.2	0.0	106.194	0.161	1.23	83	1.86	72	53	71	100.0	78	0.097	0.311	17.29
663	0.1	0.1	106.354	0.160	1.24	83	1.86	72	53	71	99.6	78	0.097	0.311	17.29
664	0.1	0.0	106.514	0.160	1.23	83	1.86	72	53	71	99.6	78	0.097	0.311	17.29
665	0.1	0.0	106.674	0.160	1.23	83	1.86	72	53	71	99.5	77	0.097	0.311	17.28
666	0.0	0.1	106.835	0.161	1.24	83	1.86	72	53	71	100.1	77	0.097	0.311	17.27

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	**Train B Sampling System**								**Appliance Temperatures, °F**						
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*	*Top*	*Bottom*	*Back*	*Left*	*Right*	*Catalyst Exit*	*Average Stove Surface (Tot = Δ T)*
Tot / Avg	**107.063**	**0.161**	**0.94**	**81.7**	**2.10**	**71.19**	**53.64**	**100.0**	**457.4**	**371.0**	**252.4**	**178.4**	**262.3**	**574.8**	**18.0**
Minimum	0.000	0.145	-0.01	74	1.80	69	50	91.1	342	335	187	142	205	347	253
Max	107.063	0.163	0.95	83	2.10	72	55	102.1	568	426	291	196	301	865	334
0	0.000		-0.01	74	2.00	69	57		382	418	250	179	279	415	302
1	0.145	0.145	0.96	74	2.10	69	52	91.1	376	419	248	180	275	404	300
2	0.307	0.162	0.96	74	2.10	69	52	101.2	369	420	244	179	272	397	297
3	0.466	0.159	0.96	74	2.10	69	52	98.9	363	419	240	177	269	389	294
4	0.626	0.160	0.95	74	2.10	69	51	99.8	358	419	237	175	265	379	291
5	0.787	0.161	0.94	74	2.00	69	51	100.6	354	418	234	174	262	371	288
6	0.945	0.158	0.94	74	2.10	69	51	98.6	352	417	230	172	258	364	286
7	1.105	0.160	0.94	74	2.00	70	51	99.9	350	415	227	170	255	362	283
8	1.265	0.160	0.94	74	2.00	69	51	99.8	348	413	225	168	252	361	281
9	1.423	0.158	0.94	74	2.00	70	51	98.1	347	412	222	166	248	358	279
10	1.582	0.159	0.93	74	2.00	70	51	98.8	346	410	219	165	245	356	277
11	1.742	0.160	0.93	74	2.00	70	51	99.6	345	408	217	164	242	355	275
12	1.900	0.158	0.94	75	2.00	70	51	98.8	345	406	214	162	239	353	273
13	2.060	0.160	0.94	75	2.00	70	50	100.5	344	404	212	160	236	353	271
14	2.219	0.159	0.92	75	2.10	70	50	99.8	344	402	210	158	233	350	269
15	2.377	0.158	0.92	75	2.10	70	50	98.8	343	400	208	157	231	349	268
16	2.536	0.159	0.92	75	2.10	70	50	98.9	343	398	206	156	228	348	266
17	2.694	0.158	0.93	75	2.00	70	50	97.9	342	395	204	155	226	347	264
18	2.853	0.159	0.93	75	2.00	70	50	99.0	342	394	203	153	223	347	263
19	3.011	0.158	0.92	75	2.10	70	50	99.0	342	392	201	152	221	347	262
20	3.169	0.158	0.92	76	2.00	70	50	98.9	342	390	199	151	219	348	260
21	3.329	0.160	0.92	76	2.10	70	51	100.0	342	388	198	150	217	348	259
22	3.487	0.158	0.93	76	2.00	70	51	98.9	342	386	196	148	215	350	257
23	3.645	0.158	0.93	76	2.00	70	51	99.0	343	384	195	149	213	351	257
24	3.805	0.160	0.92	76	2.00	70	51	100.0	344	383	193	147	211	354	256
25	3.963	0.158	0.93	76	2.00	70	51	98.5	345	381	192	146	210	357	255
26	4.123	0.160	0.93	76	2.00	70	51	99.9	347	379	190	145	208	361	254
27	4.282	0.159	0.93	76	2.00	70	51	99.7	350	377	189	145	207	365	254
28	4.440	0.158	0.93	77	2.00	70	51	98.7	353	376	188	143	206	374	253
29	4.600	0.160	0.93	77	2.00	70	51	99.8	357	374	187	142	205	668	253
30	4.758	0.158	0.93	77	2.00	70	51	99.0	363	372	187	143	205	667	254
31	4.917	0.159	0.92	77	2.00	70	51	99.5	372	371	188	142	205	651	256
32	5.077	0.160	0.92	77	2.00	71	51	99.4	382	370	188	143	205	663	258
33	5.235	0.158	0.93	77	2.00	70	51	98.1	391	368	189	144	206	657	260
34	5.394	0.159	0.93	77	2.00	71	51	99.3	400	367	190	144	206	667	261
35	5.553	0.159	0.92	77	2.00	71	51	99.8	408	365	191	144	207	660	263
36	5.712	0.159	0.93	78	2.00	71	51	99.8	415	364	192	144	208	625	265
37	5.865	0.153	0.75	78	1.80	71	51	95.9	422	363	192	145	209	628	266
38	6.023	0.158	0.95	78	2.10	71	51	99.0	428	362	193	145	210	638	268
39	6.184	0.161	0.95	78	2.10	71	51	100.7	433	361	194	145	212	666	269
40	6.345	0.161	0.94	78	2.10	71	51	100.7	438	360	195	146	213	668	270

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
41	6.505	0.160	0.95	78	2.10	71	51	100.7	444	359	196	146	215	666	272
42	6.666	0.161	0.95	78	2.10	71	52	101.6	449	358	197	146	216	659	273
43	6.827	0.161	0.95	78	2.10	71	52	101.3	453	358	198	147	218	656	275
44	6.988	0.161	0.95	78	2.10	71	52	101.2	456	357	199	148	220	666	276
45	7.148	0.160	0.95	79	2.10	71	52	100.2	459	356	200	149	221	666	277
46	7.310	0.162	0.95	79	2.10	71	52	101.3	463	356	201	150	223	657	279
47	7.470	0.160	0.94	79	2.10	71	52	100.1	466	356	203	151	224	652	280
48	7.631	0.161	0.95	79	2.10	71	52	100.8	468	356	203	153	225	642	281
49	7.792	0.161	0.95	79	2.10	71	52	100.9	471	356	204	153	227	634	282
50	7.953	0.161	0.94	79	2.10	71	52	101.0	473	356	205	153	228	628	283
51	8.113	0.160	0.95	79	2.10	71	52	100.3	475	356	206	153	229	624	284
52	8.274	0.161	0.95	79	2.10	71	52	100.8	477	356	206	155	230	625	285
53	8.435	0.161	0.95	79	2.10	71	52	100.6	478	356	206	155	231	627	285
54	8.595	0.160	0.95	79	2.10	71	52	99.8	479	356	207	156	232	622	286
55	8.756	0.161	0.95	79	2.10	71	52	100.6	479	356	207	156	233	629	286
56	8.918	0.162	0.95	79	2.10	71	52	101.6	480	356	208	158	234	636	287
57	9.078	0.160	0.94	80	2.10	71	52	100.3	481	356	208	157	235	641	287
58	9.238	0.160	0.95	80	2.10	72	52	100.1	483	356	209	158	236	644	288
59	9.399	0.161	0.95	80	2.10	72	53	100.3	486	356	210	158	237	658	289
60	9.561	0.162	0.94	80	2.10	72	53	100.9	489	356	210	159	238	654	290
61	9.721	0.160	0.95	80	2.10	72	53	100.5	492	356	211	159	239	662	291
62	9.882	0.161	0.95	80	2.10	72	53	101.9	496	356	212	160	240	665	293
63	10.044	0.162	0.95	80	2.10	72	53	102.1	500	357	212	160	241	628	294
64	10.204	0.160	0.94	80	2.10	72	53	100.4	505	357	213	160	242	672	295
65	10.364	0.160	0.95	80	2.10	72	53	100.5	509	357	214	162	243	670	297
66	10.526	0.162	0.95	80	2.10	72	53	102.1	513	357	215	163	244	631	298
67	10.687	0.161	0.94	80	2.10	72	53	101.6	517	357	216	163	245	628	300
68	10.847	0.160	0.95	80	2.10	72	53	100.6	523	357	216	164	246	629	301
69	11.008	0.161	0.95	80	2.10	72	53	100.7	528	357	217	164	247	638	303
70	11.169	0.161	0.95	80	2.10	72	53	100.7	531	357	217	165	247	621	303
71	11.330	0.161	0.95	80	2.10	72	53	101.0	534	358	218	164	248	615	304
72	11.491	0.161	0.95	81	2.10	72	53	101.1	536	357	218	166	248	615	305
73	11.652	0.161	0.95	81	2.10	72	53	101.2	538	357	218	165	249	616	305
74	11.813	0.161	0.94	81	2.10	72	53	101.3	540	357	218	166	249	612	306
75	11.973	0.160	0.94	81	2.10	72	53	100.5	541	357	218	165	249	614	306
76	12.134	0.161	0.95	81	2.10	72	53	100.6	542	357	219	166	249	617	307
77	12.296	0.162	0.94	81	2.10	72	53	101.3	542	357	219	167	250	618	307
78	12.456	0.160	0.95	81	2.10	72	53	100.4	543	357	219	166	250	618	307
79	12.617	0.161	0.95	81	2.10	72	53	101.2	543	357	219	166	250	620	307
80	12.779	0.162	0.95	81	2.10	72	53	101.4	543	357	219	166	250	619	307
81	12.940	0.161	0.94	81	2.10	72	53	100.0	544	357	219	167	251	619	308
82	13.101	0.161	0.94	81	2.10	72	53	100.1	543	357	219	167	251	619	307
83	13.262	0.161	0.95	81	2.10	72	53	100.8	543	357	219	167	251	621	307
84	13.424	0.162	0.95	81	2.10	72	53	101.4	543	356	219	167	251	620	307

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
85	13.584	0.160	0.95	81	2.10	72	53	99.9	542	356	219	167	251	619	307
86	13.745	0.161	0.95	81	2.10	72	53	100.8	542	356	219	167	251	617	307
87	13.907	0.162	0.95	81	2.10	72	53	101.6	541	356	219	168	251	616	307
88	14.068	0.161	0.94	81	2.10	72	53	100.9	539	356	219	166	251	613	306
89	14.228	0.160	0.95	81	2.10	72	53	100.4	538	355	218	168	252	614	306
90	14.389	0.161	0.95	81	2.10	72	53	101.2	537	355	218	168	251	613	306
91	14.551	0.162	0.95	81	2.10	72	53	101.7	535	355	218	168	252	610	306
92	14.712	0.161	0.94	81	2.10	72	53	100.8	534	354	218	168	251	609	305
93	14.873	0.161	0.95	81	2.10	72	53	100.5	532	354	218	168	251	607	305
94	15.034	0.161	0.95	81	2.10	72	53	100.3	531	354	218	167	252	605	304
95	15.196	0.162	0.94	81	2.10	72	53	101.1	529	353	218	169	252	604	304
96	15.356	0.160	0.95	81	2.10	72	53	99.8	527	353	217	168	252	603	303
97	15.518	0.162	0.95	81	2.10	72	53	101.1	526	353	217	168	252	601	303
98	15.680	0.162	0.95	81	2.10	72	53	101.2	525	353	217	167	252	599	303
99	15.840	0.160	0.94	81	2.10	72	53	99.8	523	352	217	167	252	599	302
100	16.001	0.161	0.95	82	2.10	72	53	100.3	522	352	217	168	252	597	302
101	16.162	0.161	0.95	82	2.10	72	54	100.5	520	352	216	167	252	596	301
102	16.324	0.162	0.95	82	2.10	72	54	101.4	519	351	216	167	252	596	301
103	16.485	0.161	0.95	82	2.10	72	53	100.8	517	351	216	167	252	594	301
104	16.646	0.161	0.95	82	2.10	72	53	100.8	517	351	216	167	252	594	301
105	16.808	0.162	0.95	82	2.10	72	54	101.4	515	350	216	166	252	593	300
106	16.969	0.161	0.94	82	2.10	72	54	100.2	514	350	216	167	252	592	300
107	17.130	0.161	0.94	82	2.10	72	54	100.1	513	350	216	166	252	590	299
108	17.291	0.161	0.95	82	2.10	72	54	100.5	512	349	215	167	252	590	299
109	17.453	0.162	0.95	82	2.10	72	54	101.3	511	349	215	166	252	589	299
110	17.614	0.161	0.94	82	2.10	72	54	100.9	510	349	215	167	252	588	299
111	17.775	0.161	0.95	82	2.10	72	54	100.9	510	349	215	167	252	587	299
112	17.936	0.161	0.95	82	2.10	72	54	100.5	509	348	215	167	252	588	298
113	18.098	0.162	0.94	82	2.10	72	54	101.1	509	348	215	167	252	585	298
114	18.259	0.161	0.95	82	2.10	72	54	100.6	508	348	215	167	252	583	298
115	18.420	0.161	0.95	82	2.10	72	54	100.6	507	347	215	167	252	583	298
116	18.582	0.162	0.95	82	2.10	72	54	101.0	506	347	215	166	252	583	297
117	18.743	0.161	0.94	82	2.10	72	54	100.2	506	347	215	167	252	581	297
118	18.904	0.161	0.95	82	2.10	72	54	100.6	506	346	215	167	252	581	297
119	19.065	0.161	0.95	82	2.10	72	54	100.9	506	346	215	167	252	581	297
120	19.227	0.162	0.94	82	2.10	72	54	101.4	505	346	215	168	252	581	297
121	19.388	0.161	0.95	82	2.10	72	54	100.5	505	346	214	167	252	582	297
122	19.549	0.161	0.95	82	2.10	72	54	100.5	505	346	214	166	252	580	297
123	19.711	0.162	0.95	82	2.10	72	54	101.3	504	345	214	167	252	580	296
124	19.872	0.161	0.94	82	2.10	72	54	100.4	505	345	214	166	252	580	296
125	20.033	0.161	0.95	82	2.10	72	54	100.2	504	345	214	166	251	581	296
126	20.195	0.162	0.95	82	2.10	72	54	101.1	504	345	214	166	252	581	296
127	20.357	0.162	0.95	82	2.10	72	54	101.1	504	345	214	167	252	580	296
128	20.518	0.161	0.94	82	2.10	72	54	100.6	504	344	214	168	252	580	296

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
129	20.679	0.161	0.95	82	2.10	72	54	101.0	504	344	214	166	252	582	296
130	20.840	0.161	0.95	82	2.10	72	54	101.0	504	344	214	167	252	582	296
131	21.002	0.162	0.95	82	2.10	72	54	101.2	504	343	214	166	251	582	296
132	21.163	0.161	0.95	82	2.10	72	54	100.1	504	343	214	167	251	581	296
133	21.324	0.161	0.95	82	2.10	72	54	100.1	505	343	214	167	252	582	296
134	21.485	0.161	0.95	82	2.10	72	54	100.3	505	343	214	167	251	584	296
135	21.647	0.162	0.95	82	2.10	72	54	100.6	506	342	214	167	252	586	296
136	21.808	0.161	0.95	82	2.10	72	54	99.8	506	342	214	167	252	587	296
137	21.969	0.161	0.95	82	2.10	72	54	100.2	507	342	214	167	251	588	296
138	22.132	0.163	0.95	82	2.10	72	54	101.8	508	342	214	167	252	588	297
139	22.293	0.161	0.94	82	2.10	72	54	100.4	508	342	214	168	252	591	297
140	22.454	0.161	0.95	82	2.10	72	54	100.1	509	342	214	167	252	592	297
141	22.615	0.161	0.95	82	2.10	72	54	100.3	511	341	215	167	252	593	297
142	22.777	0.162	0.95	82	2.10	72	54	101.1	512	341	215	166	252	596	297
143	22.938	0.161	0.95	82	2.10	72	54	99.8	513	341	215	168	252	600	298
144	23.099	0.161	0.95	82	2.10	72	54	99.6	515	341	215	167	252	600	298
145	23.261	0.162	0.95	82	2.10	72	54	100.6	516	341	215	168	252	603	298
146	23.423	0.162	0.95	82	2.10	72	54	100.7	517	340	215	168	252	608	298
147	23.584	0.161	0.95	82	2.10	72	54	100.0	519	340	216	167	253	608	299
148	23.745	0.161	0.95	82	2.10	72	54	99.8	521	341	216	167	253	611	300
149	23.907	0.162	0.95	82	2.10	72	54	100.5	523	341	216	169	253	615	300
150	24.069	0.162	0.95	82	2.10	72	54	100.2	524	341	216	168	253	618	300
151	24.230	0.161	0.95	83	2.10	72	54	99.1	527	340	217	169	254	620	301
152	24.391	0.161	0.95	82	2.10	72	54	99.3	529	340	217	168	254	622	302
153	24.553	0.162	0.95	82	2.10	72	54	100.3	529	340	217	169	254	625	302
154	24.715	0.162	0.94	82	2.10	71	54	100.3	532	340	218	169	255	626	303
155	24.876	0.161	0.95	82	2.10	71	54	99.5	534	341	218	169	255	629	303
156	25.037	0.161	0.95	82	2.10	71	54	99.3	537	340	218	170	256	634	304
157	25.199	0.162	0.95	82	2.10	71	54	100.0	538	341	219	170	256	636	305
158	25.360	0.161	0.95	82	2.10	71	54	99.7	541	341	219	169	257	639	305
159	25.521	0.161	0.95	82	2.10	71	54	99.4	543	341	220	169	257	641	306
160	25.683	0.162	0.95	82	2.10	71	54	99.7	544	341	220	170	257	642	306
161	25.845	0.162	0.95	82	2.10	71	54	100.1	546	341	221	171	258	645	307
162	26.006	0.161	0.94	82	2.10	71	54	99.5	549	341	221	171	259	646	308
163	26.168	0.162	0.95	82	2.10	71	54	99.9	551	341	221	171	259	651	309
164	26.329	0.161	0.95	82	2.10	71	54	99.4	552	341	222	172	260	652	309
165	26.491	0.162	0.94	82	2.10	71	54	100.0	555	342	222	171	260	653	310
166	26.652	0.161	0.95	82	2.10	71	54	99.2	556	342	223	172	261	657	311
167	26.814	0.162	0.95	82	2.10	71	54	99.7	558	342	224	172	261	658	311
168	26.976	0.162	0.95	82	2.10	71	54	99.9	560	342	224	172	262	658	312
169	27.137	0.161	0.94	82	2.10	71	54	99.7	562	342	224	172	262	661	312
170	27.298	0.161	0.94	82	2.10	71	54	99.9	563	342	225	173	263	663	313
171	27.459	0.161	0.94	82	2.10	71	54	99.9	564	343	226	173	264	662	314
172	27.621	0.162	0.94	82	2.10	71	54	100.7	565	343	226	173	264	662	314

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
173	27.781	0.160	0.94	82	2.10	71	54	99.4	566	343	227	173	264	663	315
174	27.942	0.161	0.95	82	2.10	71	54	99.8	567	343	227	174	265	664	315
175	28.103	0.161	0.94	82	2.10	71	54	99.4	568	343	228	175	265	662	316
176	28.265	0.162	0.94	82	2.10	71	54	99.9	568	344	229	175	266	666	316
177	28.425	0.160	0.94	82	2.10	71	54	99.1	568	344	229	175	266	663	316
178	28.586	0.161	0.94	82	2.10	71	54	99.6	568	344	230	175	267	664	317
179	28.748	0.162	0.94	82	2.10	71	54	99.9	568	344	230	175	267	663	317
180	28.909	0.161	0.94	82	2.10	71	54	99.6	567	344	231	176	268	661	317
181	29.069	0.160	0.94	82	2.10	71	54	99.4	567	344	231	175	269	660	317
182	29.231	0.162	0.94	82	2.10	71	54	100.5	566	345	232	177	269	658	318
183	29.392	0.161	0.93	82	2.10	71	54	99.6	565	345	232	176	270	659	318
184	29.553	0.161	0.94	82	2.10	70	54	99.2	564	345	233	175	270	656	317
185	29.714	0.161	0.94	82	2.10	70	54	98.9	563	345	233	177	270	654	318
186	29.876	0.162	0.94	82	2.10	70	54	99.7	561	345	234	177	271	652	318
187	30.036	0.160	0.94	82	2.10	70	54	99.0	560	345	234	177	271	650	317
188	30.197	0.161	0.94	82	2.10	70	54	99.7	558	345	235	177	272	647	317
189	30.358	0.161	0.94	82	2.10	70	54	99.5	556	345	235	177	272	645	317
190	30.519	0.161	0.94	82	2.10	70	54	99.4	554	345	236	177	272	644	317
191	30.680	0.161	0.94	82	2.10	70	54	99.3	552	345	236	178	272	642	317
192	30.841	0.161	0.94	82	2.10	70	54	99.1	550	345	236	178	273	638	316
193	31.003	0.162	0.94	82	2.10	70	54	100.0	548	345	237	178	273	638	316
194	31.163	0.160	0.94	82	2.10	70	54	98.9	546	345	237	179	273	636	316
195	31.324	0.161	0.94	82	2.10	70	54	99.1	544	346	238	177	273	632	316
196	31.485	0.161	0.94	82	2.10	70	54	98.8	542	346	238	178	273	633	315
197	31.647	0.162	0.94	82	2.10	70	54	99.4	541	346	238	177	274	632	315
198	31.808	0.161	0.94	82	2.10	70	54	99.1	540	346	238	177	274	631	315
199	31.969	0.161	0.94	82	2.10	70	54	99.4	538	347	239	178	274	632	315
200	32.131	0.162	0.94	82	2.10	70	54	99.8	537	347	239	177	274	631	315
201	32.291	0.160	0.94	82	2.10	70	54	98.2	536	347	239	177	274	631	315
202	32.452	0.161	0.95	82	2.10	70	54	98.9	535	347	239	177	274	633	314
203	32.613	0.161	0.94	81	2.10	70	54	99.4	534	348	240	177	274	633	315
204	32.775	0.162	0.94	82	2.10	70	54	100.2	533	348	240	177	274	634	314
205	32.935	0.160	0.94	81	2.10	70	54	99.1	533	348	241	177	274	636	315
206	33.096	0.161	0.94	81	2.10	70	54	99.6	533	349	241	178	274	636	315
207	33.258	0.162	0.94	81	2.10	70	54	99.8	532	349	242	178	274	638	315
208	33.419	0.161	0.94	81	2.10	70	54	99.2	532	349	242	179	274	640	315
209	33.579	0.160	0.94	81	2.10	70	54	98.7	533	350	242	177	274	640	315
210	33.740	0.161	0.94	81	2.10	70	54	99.5	533	350	243	178	275	644	316
211	33.901	0.161	0.93	81	2.10	70	54	99.6	534	350	243	177	274	646	316
212	34.062	0.161	0.94	81	2.10	70	54	99.4	535	351	244	178	275	650	317
213	34.223	0.161	0.94	81	2.10	70	54	99.5	537	351	244	178	275	654	317
214	34.384	0.161	0.93	81	2.10	70	54	99.5	539	352	245	178	275	659	318
215	34.545	0.161	0.94	81	2.10	70	54	99.2	540	352	245	177	275	660	318
216	34.705	0.160	0.94	81	2.10	70	54	98.6	543	353	246	178	275	662	319

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	**Train B Sampling System**								**Appliance Temperatures, °F**						
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter Δ H*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*	*Top*	*Bottom*	*Back*	*Left*	*Right*	*Catalyst Exit*	*Average Stove Surface (Tot = Δ T)*
217	34.866	0.161	0.94	81	2.10	69	54	99.4	545	353	246	178	276	664	320
218	35.027	0.161	0.93	81	2.10	69	54	99.6	546	354	247	178	276	666	320
219	35.188	0.161	0.94	81	2.10	69	54	99.5	548	354	247	178	276	667	321
220	35.349	0.161	0.94	81	2.10	69	54	99.1	549	355	248	178	276	668	321
221	35.510	0.161	0.94	81	2.10	69	54	99.0	550	356	249	178	277	670	322
222	35.670	0.160	0.94	81	2.10	69	54	98.4	551	356	249	180	277	669	323
223	35.831	0.161	0.94	81	2.10	69	54	99.2	552	357	250	180	277	670	323
224	35.993	0.162	0.94	81	2.10	69	54	100.0	552	357	251	178	277	671	323
225	36.154	0.161	0.94	81	2.10	69	53	99.3	553	358	251	179	278	673	324
226	36.314	0.160	0.94	81	2.10	69	54	98.6	554	358	252	179	278	673	324
227	36.475	0.161	0.94	81	2.10	69	53	99.2	554	359	253	179	278	672	325
228	36.636	0.161	0.94	81	2.10	69	54	99.1	555	359	253	179	278	671	325
229	36.796	0.160	0.94	81	2.10	69	53	98.6	554	359	254	180	279	673	325
230	36.957	0.161	0.94	81	2.10	69	53	99.7	553	360	254	179	279	673	325
231	37.119	0.162	0.94	81	2.10	69	54	100.5	553	360	255	180	279	673	325
232	37.279	0.160	0.93	81	2.10	69	53	98.9	552	360	255	180	280	671	325
233	37.440	0.161	0.94	81	2.10	69	53	99.0	552	361	256	181	280	668	326
234	37.601	0.161	0.94	81	2.10	69	54	99.0	551	361	256	181	280	667	326
235	37.762	0.161	0.93	81	2.10	69	53	99.8	551	361	257	181	280	668	326
236	37.922	0.160	0.94	81	2.10	69	53	99.5	550	361	257	181	281	666	326
237	38.083	0.161	0.94	81	2.10	69	53	99.9	549	361	258	181	281	659	326
238	38.245	0.162	0.94	81	2.10	69	53	100.2	547	361	258	182	281	659	326
239	38.405	0.160	0.94	81	2.10	69	53	98.8	546	361	259	183	281	656	326
240	38.565	0.160	0.94	81	2.10	69	53	99.1	545	361	260	182	281	653	326
241	38.726	0.161	0.94	81	2.10	69	53	100.3	542	361	260	183	282	648	326
242	38.887	0.161	0.94	81	2.10	69	53	100.0	541	362	261	183	282	644	326
243	39.048	0.161	0.94	81	2.10	69	53	99.6	539	362	261	184	282	642	326
244	39.208	0.160	0.94	81	2.10	69	53	98.8	537	362	261	183	282	638	325
245	39.370	0.162	0.94	81	2.10	69	53	99.7	535	362	262	185	282	638	325
246	39.530	0.160	0.94	81	2.10	69	53	98.8	533	362	262	185	282	632	325
247	39.691	0.161	0.94	81	2.10	69	53	100.0	531	362	262	184	282	630	324
248	39.852	0.161	0.93	81	2.10	69	53	99.8	528	362	262	185	282	626	324
249	40.012	0.160	0.93	80	2.10	69	53	99.1	526	362	263	186	282	622	324
250	40.173	0.161	0.94	81	2.10	69	53	99.9	523	362	263	186	281	621	323
251	40.334	0.161	0.94	81	2.10	69	53	100.1	520	362	263	185	281	616	322
252	40.495	0.161	0.94	81	2.10	69	53	100.1	518	362	263	185	281	613	322
253	40.655	0.160	0.94	81	2.10	69	53	99.3	515	362	263	186	281	609	321
254	40.815	0.160	0.94	81	2.10	69	53	99.3	512	362	263	185	281	605	321
255	40.977	0.162	0.94	80	2.10	69	53	100.6	509	362	263	186	281	604	320
256	41.137	0.160	0.94	80	2.10	69	53	99.5	506	362	263	186	280	600	319
257	41.298	0.161	0.94	81	2.10	70	53	100.5	503	362	263	186	280	597	319
258	41.459	0.161	0.94	81	2.10	70	53	100.5	501	362	263	185	279	592	318
259	41.619	0.160	0.93	81	2.10	70	53	99.9	498	361	263	185	279	591	317
260	41.779	0.160	0.94	81	2.10	70	53	99.9	495	361	263	185	279	588	317

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
261	41.940	0.161	0.93	81	2.10	70	53	100.4	492	361	263	185	278	587	316
262	42.101	0.161	0.93	81	2.10	70	53	100.0	489	361	263	186	278	584	315
263	42.261	0.160	0.94	81	2.10	70	53	99.3	486	361	263	185	278	581	315
264	42.422	0.161	0.94	81	2.10	70	53	100.3	483	361	262	184	277	579	313
265	42.583	0.161	0.94	81	2.10	70	53	100.5	481	360	262	185	277	577	313
266	42.743	0.160	0.94	81	2.10	70	53	99.7	478	360	262	184	276	575	312
267	42.904	0.161	0.94	81	2.10	70	53	99.9	476	360	262	185	276	574	312
268	43.065	0.161	0.94	81	2.10	70	53	100.1	474	359	262	185	276	571	311
269	43.225	0.160	0.93	81	2.10	70	53	99.9	472	359	261	185	275	571	310
270	43.385	0.160	0.94	81	2.10	70	53	99.2	470	358	261	185	275	571	310
271	43.547	0.162	0.94	81	2.10	70	53	99.6	468	358	261	185	275	570	309
272	43.707	0.160	0.93	81	2.10	70	53	98.5	467	358	261	185	274	567	309
273	43.867	0.160	0.94	81	2.10	70	53	98.9	465	357	261	183	274	566	308
274	44.028	0.161	0.94	81	2.10	70	53	100.1	464	357	261	183	273	565	308
275	44.189	0.161	0.94	81	2.10	70	53	100.7	462	356	261	183	273	565	307
276	44.349	0.160	0.94	81	2.10	70	53	100.0	461	356	260	183	272	565	306
277	44.510	0.161	0.94	81	2.10	70	53	100.5	460	355	260	183	272	564	306
278	44.671	0.161	0.93	81	2.10	70	53	100.3	459	355	260	182	272	564	306
279	44.831	0.160	0.94	81	2.10	71	53	99.2	459	354	260	183	272	563	306
280	44.991	0.160	0.94	81	2.10	71	53	98.9	457	354	260	183	271	564	305
281	45.152	0.161	0.93	81	2.10	71	53	99.6	457	353	260	182	271	564	305
282	45.313	0.161	0.93	81	2.10	71	53	100.1	457	353	260	183	271	566	305
283	45.473	0.160	0.94	81	2.10	71	53	99.9	457	352	260	181	270	567	304
284	45.634	0.161	0.94	81	2.10	71	53	100.4	456	352	260	181	270	569	304
285	45.795	0.161	0.94	81	2.10	71	53	100.3	457	351	260	181	270	569	304
286	45.955	0.160	0.94	81	2.10	71	53	99.7	457	351	260	181	270	571	304
287	46.116	0.161	0.94	81	2.10	71	53	100.3	457	350	260	183	270	572	304
288	46.277	0.161	0.93	81	2.10	71	53	100.3	458	350	260	180	269	573	303
289	46.437	0.160	0.94	81	2.10	71	53	99.7	458	349	260	182	269	575	304
290	46.597	0.160	0.94	81	2.10	71	53	99.7	459	349	260	182	269	575	304
291	46.759	0.162	0.93	81	2.10	71	53	101.0	460	349	260	181	269	575	304
292	46.919	0.160	0.93	81	2.10	71	53	99.9	460	348	261	181	269	577	304
293	47.079	0.160	0.94	81	2.10	71	53	100.0	461	348	261	182	269	577	304
294	47.240	0.161	0.94	81	2.10	71	53	100.6	462	347	261	181	269	579	304
295	47.401	0.161	0.94	81	2.10	71	53	100.5	462	347	261	183	269	580	304
296	47.561	0.160	0.94	81	2.10	71	53	99.9	463	347	261	181	269	580	304
297	47.722	0.161	0.94	81	2.10	71	53	100.6	464	346	261	180	269	581	304
298	47.883	0.161	0.94	81	2.10	71	53	100.7	464	346	261	181	269	583	304
299	48.043	0.160	0.94	81	2.10	71	53	100.1	465	345	262	180	269	583	304
300	48.204	0.161	0.94	81	2.10	71	53	100.8	466	345	262	182	269	584	305
301	48.365	0.161	0.93	81	2.10	71	53	100.4	467	344	262	181	269	585	305
302	48.525	0.160	0.93	81	2.10	71	53	99.5	468	344	262	180	269	587	305
303	48.685	0.160	0.94	81	2.10	71	53	99.4	469	343	263	182	269	588	305
304	48.846	0.161	0.94	81	2.10	71	53	99.9	470	343	263	182	269	590	305

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
305	49.007	0.161	0.94	82	2.10	71	53	99.9	471	343	263	181	269	590	305
306	49.167	0.160	0.94	82	2.10	71	53	99.7	472	342	264	181	269	589	306
307	49.328	0.161	0.94	82	2.10	71	53	100.7	473	342	264	182	269	591	306
308	49.489	0.161	0.94	82	2.10	71	53	100.3	474	342	264	181	269	592	306
309	49.649	0.160	0.94	82	2.10	71	53	99.4	475	341	265	181	269	593	306
310	49.810	0.161	0.94	82	2.10	71	53	100.1	476	341	265	180	269	594	306
311	49.971	0.161	0.93	82	2.10	71	53	99.9	477	341	265	181	269	595	307
312	50.131	0.160	0.93	82	2.10	71	53	99.6	478	340	265	181	269	596	307
313	50.291	0.160	0.94	82	2.10	71	53	99.8	479	340	265	182	270	598	307
314	50.453	0.162	0.94	82	2.10	71	53	100.8	480	340	266	182	270	598	308
315	50.613	0.160	0.93	82	2.10	71	53	99.2	481	339	266	182	269	599	307
316	50.773	0.160	0.94	82	2.10	71	53	99.2	482	339	266	183	270	599	308
317	50.934	0.161	0.94	82	2.10	72	54	100.2	483	339	267	180	270	599	308
318	51.095	0.161	0.94	82	2.10	71	54	100.6	483	339	267	181	270	601	308
319	51.256	0.161	0.94	82	2.10	72	53	100.8	483	338	267	182	270	599	308
320	51.416	0.160	0.94	82	2.10	72	54	100.3	484	338	267	182	270	599	308
321	51.578	0.162	0.93	82	2.10	72	54	101.3	484	338	267	181	270	600	308
322	51.737	0.159	0.93	82	2.10	72	54	99.2	484	337	268	182	271	599	308
323	51.898	0.161	0.94	82	2.10	72	54	100.3	484	337	268	182	271	598	308
324	52.059	0.161	0.93	82	2.10	72	54	100.1	484	337	268	182	271	598	308
325	52.220	0.161	0.93	82	2.10	72	54	100.1	484	337	268	183	271	598	309
326	52.380	0.160	0.94	82	2.10	72	54	99.6	484	337	268	182	271	597	308
327	52.541	0.161	0.94	82	2.10	72	54	100.3	484	337	268	183	271	595	309
328	52.702	0.161	0.94	82	2.10	72	54	100.4	483	337	268	181	271	595	308
329	52.862	0.160	0.94	82	2.10	72	54	100.0	483	336	268	183	271	594	308
330	53.022	0.160	0.94	82	2.10	72	54	100.3	483	336	268	182	271	592	308
331	53.184	0.162	0.93	82	2.10	72	54	101.7	482	336	268	182	272	591	308
332	53.344	0.160	0.94	82	2.10	72	54	100.3	481	336	268	182	272	590	308
333	53.504	0.160	0.93	82	2.10	72	54	100.3	480	336	268	182	272	589	308
334	53.666	0.162	0.93	82	2.10	72	54	101.6	479	336	268	182	272	588	307
335	53.826	0.160	0.93	82	2.10	72	54	100.2	478	335	268	183	272	586	307
336	53.986	0.160	0.94	82	2.10	72	54	100.4	477	335	268	182	272	586	307
337	54.147	0.161	0.94	82	2.10	72	54	100.9	476	335	268	184	272	586	307
338	54.308	0.161	0.93	82	2.10	72	54	100.6	474	335	268	184	272	585	307
339	54.468	0.160	0.94	82	2.10	72	54	100.1	473	335	268	183	272	585	306
340	54.629	0.161	0.94	82	2.10	72	54	100.9	472	335	268	183	272	584	306
341	54.790	0.161	0.94	82	2.10	72	54	100.9	472	335	268	182	272	583	306
342	54.950	0.160	0.94	82	2.10	72	54	99.8	470	335	268	183	272	582	306
343	55.111	0.161	0.94	82	2.10	72	54	100.0	469	335	269	183	272	579	306
344	55.272	0.161	0.93	82	2.10	72	54	99.8	468	335	269	182	272	580	305
345	55.432	0.160	0.93	83	2.10	72	54	99.2	467	335	269	183	272	584	305
346	55.592	0.160	0.94	82	2.10	72	54	99.6	465	335	270	182	272	575	305
347	55.753	0.161	0.94	83	2.10	72	54	100.0	462	336	270	183	272	572	305
348	55.914	0.161	0.93	83	2.10	72	54	99.6	459	336	271	182	272	566	304

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
349	56.074	0.160	0.94	83	2.10	72	54	99.0	456	337	271	184	272	568	304
350	56.235	0.161	0.94	83	2.10	72	54	99.5	453	338	271	183	273	564	304
351	56.396	0.161	0.93	83	2.10	72	54	99.7	450	339	271	183	273	563	303
352	56.556	0.160	0.94	83	2.10	72	54	99.7	447	340	271	182	273	559	303
353	56.717	0.161	0.94	83	2.10	72	54	100.8	444	340	272	183	273	561	302
354	56.878	0.161	0.93	83	2.10	72	54	100.6	441	341	272	183	273	561	302
355	57.039	0.161	0.93	83	2.10	72	54	100.2	439	342	272	183	273	554	302
356	57.199	0.160	0.94	83	2.10	72	54	99.8	436	343	272	184	273	554	302
357	57.360	0.161	0.94	83	2.10	72	54	100.6	434	344	272	182	273	553	301
358	57.521	0.161	0.94	83	2.10	72	54	100.0	432	345	272	183	274	553	301
359	57.681	0.160	0.94	83	2.10	72	54	99.2	430	346	272	184	273	550	301
360	57.841	0.160	0.94	83	2.10	72	54	99.6	427	347	272	184	274	551	301
361	58.003	0.162	0.94	83	2.10	72	54	100.8	425	348	272	183	273	544	300
362	58.163	0.160	0.94	83	2.10	72	54	99.3	423	349	272	182	274	549	300
363	58.324	0.161	0.94	83	2.10	72	54	99.5	422	350	272	182	274	544	300
364	58.485	0.161	0.94	83	2.10	72	54	99.6	420	352	271	183	273	545	300
365	58.645	0.160	0.93	83	2.10	72	54	99.6	418	353	272	183	273	549	300
366	58.805	0.160	0.94	83	2.10	72	54	99.9	416	354	272	181	273	545	299
367	58.967	0.162	0.93	83	2.10	72	54	100.9	415	355	272	181	273	547	299
368	59.128	0.161	0.93	83	2.10	72	54	99.7	414	356	272	183	273	548	300
369	59.288	0.160	0.93	83	2.10	72	54	99.1	412	357	272	183	272	548	299
370	59.448	0.160	0.94	83	2.10	72	54	99.4	411	358	272	182	273	549	299
371	59.610	0.162	0.93	83	2.10	72	54	100.8	410	359	272	182	272	550	299
372	59.770	0.160	0.94	83	2.10	72	54	99.8	409	359	272	182	272	549	299
373	59.931	0.161	0.94	83	2.10	72	54	100.4	407	360	272	181	272	552	298
374	60.092	0.161	0.94	83	2.10	72	54	100.1	406	361	272	182	272	548	299
375	60.253	0.161	0.93	83	2.10	72	54	99.6	405	362	272	183	272	546	299
376	60.413	0.160	0.94	83	2.10	72	54	99.0	404	363	272	181	272	547	298
377	60.574	0.161	0.94	83	2.10	72	54	100.0	403	363	272	180	272	544	298
378	60.735	0.161	0.93	83	2.10	72	54	100.1	402	364	272	181	271	544	298
379	60.895	0.160	0.93	83	2.10	72	54	99.6	401	365	272	183	271	544	298
380	61.056	0.161	0.94	83	2.10	72	54	100.3	400	366	272	182	271	548	298
381	61.218	0.162	0.94	83	2.10	72	54	100.4	400	366	272	182	271	561	298
382	61.377	0.159	0.94	83	2.10	72	54	97.9	400	367	272	181	272	532	298
383	61.538	0.161	0.94	83	2.10	72	54	99.0	400	368	271	181	272	542	298
384	61.699	0.161	0.94	83	2.10	72	54	99.5	402	369	271	182	272	548	299
385	61.860	0.161	0.94	83	2.10	72	54	99.7	405	371	270	181	272	553	300
386	62.021	0.161	0.94	83	2.10	72	54	99.7	408	373	270	180	272	558	301
387	62.181	0.160	0.94	83	2.10	72	54	98.8	412	375	269	180	271	560	301
388	62.343	0.162	0.94	83	2.10	72	54	100.0	415	377	268	180	271	560	302
389	62.503	0.160	0.94	83	2.10	72	54	99.2	418	379	268	180	271	562	303
390	62.664	0.161	0.94	83	2.10	72	54	99.9	420	382	267	179	271	561	304
391	62.826	0.162	0.94	83	2.10	72	54	100.0	423	384	267	180	270	562	305
392	62.986	0.160	0.93	83	2.10	72	54	99.2	424	386	266	179	270	561	305

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
393	63.146	0.160	0.94	83	2.10	71	54	99.6	426	388	266	178	270	561	306
394	63.308	0.162	0.94	83	2.10	71	54	100.3	428	390	265	177	270	563	306
395	63.469	0.161	0.93	83	2.10	71	54	99.4	429	392	265	178	269	561	307
396	63.630	0.161	0.94	83	2.10	71	54	99.9	430	393	265	177	269	561	307
397	63.790	0.160	0.94	83	2.10	71	54	99.3	431	395	264	178	269	562	307
398	63.952	0.162	0.93	83	2.10	71	54	100.1	432	396	264	178	269	561	308
399	64.113	0.161	0.94	83	2.10	71	54	99.4	433	398	264	176	268	561	308
400	64.273	0.160	0.94	83	2.10	71	54	99.2	433	399	263	177	268	561	308
401	64.434	0.161	0.94	83	2.10	71	54	100.1	434	400	263	177	268	562	308
402	64.596	0.162	0.94	83	2.10	71	54	100.6	434	401	263	177	268	562	309
403	64.756	0.160	0.94	83	2.10	71	54	99.2	435	402	263	175	268	561	309
404	64.917	0.161	0.94	83	2.10	71	54	99.6	435	403	263	175	267	562	309
405	65.079	0.162	0.94	83	2.10	71	54	100.2	435	403	262	175	267	561	308
406	65.239	0.160	0.94	83	2.10	71	54	99.0	436	404	262	176	267	561	309
407	65.400	0.161	0.94	83	2.10	71	54	99.9	436	404	262	175	267	561	309
408	65.561	0.161	0.94	83	2.10	70	54	99.9	436	405	262	176	267	560	309
409	65.723	0.162	0.94	83	2.10	70	54	100.3	436	405	262	176	267	561	309
410	65.883	0.160	0.94	83	2.10	70	54	99.3	436	405	262	175	266	560	309
411	66.044	0.161	0.94	83	2.10	70	54	99.9	437	406	262	175	266	561	309
412	66.206	0.162	0.94	82	2.10	70	54	100.4	437	406	262	176	266	560	309
413	66.367	0.161	0.94	82	2.10	70	54	99.5	437	406	262	176	266	559	309
414	66.527	0.160	0.94	82	2.10	70	54	98.6	437	406	262	177	266	561	310
415	66.688	0.161	0.94	82	2.10	70	54	99.4	437	406	263	176	266	560	310
416	66.850	0.162	0.94	82	2.10	70	54	100.5	437	406	263	176	266	560	310
417	67.010	0.160	0.94	82	2.10	70	54	99.6	437	405	263	177	265	558	309
418	67.171	0.161	0.94	82	2.10	70	54	100.3	438	405	263	176	265	558	309
419	67.333	0.162	0.94	82	2.10	70	54	100.7	438	405	263	176	265	559	309
420	67.493	0.160	0.94	82	2.10	70	54	99.2	437	404	264	176	265	560	309
421	67.654	0.161	0.94	82	2.10	70	54	99.9	438	404	264	176	265	560	309
422	67.815	0.161	0.94	82	2.10	70	54	100.3	438	404	264	177	265	559	310
423	67.976	0.161	0.93	82	2.10	70	54	100.4	437	403	264	177	265	558	309
424	68.137	0.161	0.94	82	2.10	70	54	100.3	437	403	264	176	264	558	309
425	68.297	0.160	0.94	82	2.10	70	54	100.0	437	403	264	177	265	558	309
426	68.459	0.162	0.94	82	2.10	70	54	101.2	437	402	264	177	265	558	309
427	68.619	0.160	0.94	82	2.10	70	54	99.5	437	402	264	176	264	558	309
428	68.780	0.161	0.94	82	2.10	70	54	100.0	437	402	264	177	264	557	309
429	68.941	0.161	0.93	82	2.10	70	54	100.0	437	401	264	177	264	557	309
430	69.102	0.161	0.94	82	2.10	70	54	99.9	437	401	264	177	264	556	309
431	69.263	0.161	0.94	82	2.10	71	54	99.9	436	400	264	178	264	555	308
432	69.423	0.160	0.94	82	2.10	71	54	99.6	436	400	264	176	264	555	308
433	69.585	0.162	0.94	82	2.10	71	54	101.1	436	399	264	177	264	555	308
434	69.745	0.160	0.94	82	2.10	71	54	99.8	435	399	264	178	264	555	308
435	69.906	0.161	0.94	82	2.10	71	54	99.9	435	398	264	177	264	555	308
436	70.068	0.162	0.94	82	2.10	71	54	100.2	435	397	264	177	263	553	307

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
437	70.228	0.160	0.93	82	2.10	71	54	99.5	434	397	264	178	263	552	307
438	70.388	0.160	0.94	82	2.10	71	54	99.9	434	396	265	177	263	550	307
439	70.549	0.161	0.94	82	2.10	71	54	100.3	432	396	265	178	263	545	307
440	70.711	0.162	0.93	82	2.10	71	54	100.5	430	397	264	178	263	540	306
441	70.871	0.160	0.94	82	2.10	71	54	99.4	427	397	264	178	263	540	306
442	71.032	0.161	0.94	82	2.10	71	54	100.5	425	398	264	178	263	537	306
443	71.193	0.161	0.94	82	2.10	71	54	100.5	422	399	264	178	263	535	305
444	71.353	0.160	0.94	82	2.10	71	54	99.6	420	400	264	179	263	534	305
445	71.514	0.161	0.94	82	2.10	71	54	100.2	418	401	264	179	263	534	305
446	71.675	0.161	0.94	82	2.10	71	54	100.3	415	401	264	179	263	533	304
447	71.836	0.161	0.94	82	2.10	71	54	100.5	413	402	264	179	263	530	304
448	71.996	0.160	0.93	82	2.10	71	54	99.7	411	403	263	179	262	532	304
449	72.157	0.161	0.94	82	2.10	71	54	100.1	409	404	263	180	262	532	304
450	72.318	0.161	0.93	82	2.10	71	54	100.1	407	405	263	179	262	532	303
451	72.479	0.161	0.94	82	2.10	71	54	100.0	406	406	263	180	262	531	303
452	72.639	0.160	0.94	82	2.10	71	54	99.3	404	407	263	182	262	532	304
453	72.801	0.162	0.94	82	2.10	71	54	100.7	402	408	263	180	262	527	303
454	72.961	0.160	0.93	82	2.10	71	54	99.6	401	409	263	181	262	532	303
455	73.121	0.160	0.94	82	2.10	71	54	99.9	399	410	263	181	262	531	303
456	73.283	0.162	0.94	82	2.10	71	54	101.1	398	411	262	182	262	530	303
457	73.444	0.161	0.93	82	2.10	71	54	100.4	397	412	262	182	262	531	303
458	73.604	0.160	0.94	82	2.10	71	54	99.7	396	413	262	182	262	528	303
459	73.765	0.161	0.94	82	2.10	71	54	100.4	395	414	262	183	262	531	303
460	73.927	0.162	0.94	82	2.10	71	54	101.2	394	414	262	182	262	532	303
461	74.086	0.159	0.94	82	2.10	71	54	99.4	394	415	262	182	261	529	303
462	74.247	0.161	0.94	82	2.10	71	54	100.2	393	416	262	183	262	534	303
463	74.409	0.162	0.94	82	2.10	71	54	100.8	392	416	262	182	261	528	303
464	74.569	0.160	0.94	82	2.10	71	54	99.7	391	417	262	183	261	526	303
465	74.730	0.161	0.94	82	2.10	71	54	100.4	391	417	261	182	261	525	302
466	74.891	0.161	0.94	82	2.10	71	54	100.2	391	418	261	182	261	524	303
467	75.052	0.161	0.94	82	2.10	71	54	100.4	390	418	261	182	261	524	302
468	75.212	0.160	0.94	82	2.10	71	54	100.1	390	418	261	182	260	524	302
469	75.373	0.161	0.94	82	2.10	71	54	100.7	389	418	260	182	260	525	302
470	75.535	0.162	0.94	82	2.10	71	54	101.0	388	418	260	183	260	521	302
471	75.695	0.160	0.93	83	2.10	71	54	99.4	388	418	260	182	260	521	302
472	75.855	0.160	0.94	83	2.10	71	54	99.4	387	418	260	182	260	521	301
473	76.017	0.162	0.94	82	2.10	71	54	100.6	386	418	260	183	259	518	301
474	76.178	0.161	0.93	83	2.10	71	54	100.0	386	418	260	183	259	517	301
475	76.338	0.160	0.94	83	2.10	71	54	99.7	385	418	260	184	259	518	301
476	76.499	0.161	0.94	82	2.10	71	54	100.4	384	418	260	183	259	515	301
477	76.661	0.162	0.94	83	2.10	71	54	101.1	384	417	260	184	259	513	301
478	76.821	0.160	0.94	83	2.10	71	54	99.9	383	417	260	182	258	514	300
479	76.982	0.161	0.94	83	2.10	71	54	100.3	382	416	260	184	258	516	300
480	77.143	0.161	0.94	83	2.10	71	54	100.3	382	416	261	184	258	513	300

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
481	77.304	0.161	0.94	83	2.10	71	54	100.3	382	415	262	184	258	516	300
482	77.464	0.160	0.94	83	2.10	71	54	99.5	382	414	263	185	257	512	300
483	77.625	0.161	0.94	83	2.10	71	54	100.3	382	413	263	184	257	515	300
484	77.787	0.162	0.94	83	2.10	71	54	100.9	382	413	264	186	256	516	300
485	77.947	0.160	0.94	83	2.10	71	54	99.7	382	412	265	184	256	513	300
486	78.107	0.160	0.94	83	2.10	71	54	99.8	382	411	266	185	256	513	300
487	78.269	0.162	0.94	83	2.10	71	54	101.1	382	410	267	186	255	515	300
488	78.430	0.161	0.93	83	2.10	71	54	100.4	382	409	268	186	255	514	300
489	78.590	0.160	0.94	83	2.10	71	54	99.4	382	408	269	187	255	515	300
490	78.751	0.161	0.94	83	2.10	71	54	99.7	382	407	270	187	255	516	300
491	78.912	0.161	0.93	83	2.10	71	54	99.8	382	406	271	186	254	517	300
492	79.072	0.160	0.94	83	2.10	71	54	99.4	382	405	272	187	254	516	300
493	79.233	0.161	0.94	83	2.10	71	54	100.0	382	404	273	188	254	514	300
494	79.395	0.162	0.93	83	2.10	71	54	100.5	382	402	274	187	254	515	300
495	79.555	0.160	0.94	83	2.10	71	54	99.7	382	401	275	187	254	516	300
496	79.715	0.160	0.94	83	2.10	71	54	99.9	382	400	276	187	254	516	300
497	79.877	0.162	0.94	83	2.10	71	54	100.7	382	399	277	187	254	513	300
498	80.038	0.161	0.94	83	2.10	71	54	99.8	381	398	278	187	253	515	299
499	80.198	0.160	0.94	83	2.10	71	54	99.5	381	398	279	187	253	512	300
500	80.359	0.161	0.94	83	2.10	71	54	100.3	381	397	280	187	253	515	300
501	80.521	0.162	0.94	83	2.10	71	54	100.8	381	396	281	187	253	513	300
502	80.681	0.160	0.94	83	2.10	71	54	99.7	380	395	282	187	253	514	299
503	80.842	0.161	0.94	83	2.10	71	54	100.2	380	395	282	187	253	517	299
504	81.003	0.161	0.94	83	2.10	71	54	99.8	380	394	283	187	253	511	299
505	81.164	0.161	0.93	83	2.10	71	54	100.0	380	394	283	187	252	511	299
506	81.325	0.161	0.94	83	2.10	72	54	100.3	380	393	284	188	252	513	299
507	81.485	0.160	0.94	83	2.10	71	54	99.4	380	392	285	187	252	514	299
508	81.647	0.162	0.94	83	2.10	71	54	100.7	380	392	285	187	252	511	299
509	81.807	0.160	0.94	83	2.10	71	54	99.4	380	391	286	187	252	511	299
510	81.968	0.161	0.94	83	2.10	72	54	99.9	380	389	286	188	252	514	299
511	82.130	0.162	0.93	83	2.10	72	54	100.4	380	388	287	188	252	518	299
512	82.290	0.160	0.94	83	2.10	72	54	99.2	380	387	287	188	252	515	299
513	82.450	0.160	0.94	83	2.10	72	54	99.4	380	387	288	187	252	514	299
514	82.611	0.161	0.94	83	2.10	72	54	100.6	380	386	288	188	252	515	299
515	82.773	0.162	0.94	83	2.10	72	54	101.4	379	385	289	188	252	516	299
516	82.933	0.160	0.94	83	2.10	72	54	99.7	380	384	289	188	252	512	299
517	83.094	0.161	0.94	83	2.10	72	54	100.0	379	383	290	187	251	515	298
518	83.255	0.161	0.94	83	2.10	72	54	100.0	379	382	290	188	251	513	298
519	83.415	0.160	0.94	83	2.10	72	54	99.2	379	380	290	187	252	512	298
520	83.576	0.161	0.94	83	2.10	72	54	99.9	379	379	290	187	251	510	297
521	83.738	0.162	0.93	83	2.10	72	54	100.8	378	378	290	187	251	508	297
522	83.898	0.160	0.93	83	2.10	72	54	99.2	378	377	291	187	251	506	297
523	84.059	0.161	0.94	83	2.10	72	54	99.5	378	376	291	186	251	506	296
524	84.219	0.160	0.94	83	2.10	72	54	99.2	378	375	291	188	250	504	296

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	**Train B Sampling System**								**Appliance Temperatures, °F**						
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*	*Top*	*Bottom*	*Back*	*Left*	*Right*	*Catalyst Exit*	*Average Stove Surface (Tot = Δ T)*
525	84.381	0.162	0.94	83	2.10	72	54	100.5	378	373	291	187	251	502	296
526	84.541	0.160	0.94	83	2.10	72	54	99.4	378	372	291	187	250	501	296
527	84.702	0.161	0.94	83	2.10	72	54	100.3	377	371	291	188	250	502	295
528	84.864	0.162	0.93	83	2.10	72	54	100.9	377	369	291	189	250	499	295
529	85.024	0.160	0.94	83	2.10	72	54	99.5	376	368	291	189	250	497	295
530	85.184	0.160	0.94	83	2.10	72	54	99.8	377	367	291	188	249	494	294
531	85.346	0.162	0.94	83	2.10	72	54	101.2	376	365	291	189	249	494	294
532	85.507	0.161	0.94	83	2.10	72	54	100.4	376	364	291	188	249	492	294
533	85.667	0.160	0.94	83	2.10	72	54	99.9	376	363	291	188	249	491	293
534	85.828	0.161	0.94	83	2.10	72	54	100.3	375	361	291	189	248	495	293
535	85.990	0.162	0.94	83	2.10	72	54	100.5	375	360	290	189	248	501	292
536	86.150	0.160	0.94	83	2.10	72	54	99.4	375	359	290	188	248	502	292
537	86.310	0.160	0.94	83	2.10	72	54	99.4	375	358	290	188	248	500	292
538	86.472	0.162	0.94	83	2.10	72	54	100.5	374	357	289	188	248	503	291
539	86.633	0.161	0.93	83	2.10	72	54	100.2	374	356	289	187	248	497	291
540	86.793	0.160	0.94	83	2.10	72	54	99.5	374	355	289	188	248	502	291
541	86.954	0.161	0.94	83	2.10	72	54	99.7	373	353	289	187	247	498	290
542	87.115	0.161	0.94	83	2.10	72	54	99.9	373	353	288	188	247	500	290
543	87.275	0.160	0.94	83	2.10	72	54	99.9	374	351	288	188	247	500	290
544	87.436	0.161	0.94	83	2.10	72	54	100.4	373	350	287	187	247	499	289
545	87.598	0.162	0.93	83	2.10	72	54	100.7	373	349	287	186	247	498	288
546	87.759	0.161	0.94	83	2.10	72	54	99.9	373	348	286	188	247	500	288
547	87.919	0.160	0.94	83	2.10	72	54	99.4	374	347	286	187	246	498	288
548	88.080	0.161	0.94	83	2.10	72	54	100.3	374	346	285	186	246	495	287
549	88.241	0.161	0.94	83	2.10	72	54	100.4	374	345	286	188	246	494	288
550	88.401	0.160	0.94	83	2.10	72	54	100.8	375	344	286	187	246	402	288
551	88.562	0.161	0.94	83	2.10	72	54	101.4	373	343	286	187	246	504	287
552	88.724	0.162	0.94	83	2.10	72	54	101.0	371	344	287	187	246	496	287
553	88.884	0.160	0.94	83	2.10	72	54	99.6	370	345	288	187	246	500	287
554	89.045	0.161	0.94	83	2.10	72	54	100.2	371	346	288	188	247	502	288
555	89.206	0.161	0.94	83	2.10	72	54	100.3	372	347	288	187	247	502	288
556	89.367	0.161	0.94	83	2.10	72	54	100.4	373	349	288	187	247	502	289
557	89.527	0.160	0.94	83	2.10	72	54	99.6	374	351	288	187	247	509	289
558	89.688	0.161	0.94	83	2.10	72	54	100.1	375	353	288	188	247	509	290
559	89.850	0.162	0.93	83	2.10	72	54	100.7	377	356	288	188	247	515	291
560	90.010	0.160	0.94	83	2.10	72	54	99.6	378	358	287	187	248	520	292
561	90.171	0.161	0.94	83	2.10	72	54	100.3	379	360	287	187	248	520	292
562	90.332	0.161	0.94	83	2.10	72	54	100.0	380	363	286	185	249	515	293
563	90.493	0.161	0.93	83	2.10	72	54	100.0	382	365	286	188	249	524	294
564	90.653	0.160	0.94	83	2.10	72	54	99.3	383	367	285	187	249	536	294
565	90.814	0.161	0.94	83	2.10	72	54	99.5	385	370	284	186	250	532	295
566	90.976	0.162	0.94	83	2.10	72	54	99.9	386	372	284	186	251	539	296
567	91.136	0.160	0.94	83	2.10	72	54	98.8	388	374	283	185	251	536	296
568	91.297	0.161	0.94	83	2.10	72	54	100.0	390	376	283	184	252	536	297

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
569	91.458	0.161	0.94	83	2.10	72	54	100.2	392	377	283	187	253	545	298
570	91.619	0.161	0.94	83	2.10	72	54	100.1	395	379	282	186	253	544	299
571	91.779	0.160	0.94	83	2.10	72	54	99.7	397	381	282	184	254	540	300
572	91.940	0.161	0.94	83	2.10	72	54	100.4	399	383	283	186	255	548	301
573	92.101	0.161	0.94	83	2.10	72	54	100.0	402	385	283	186	256	552	302
574	92.262	0.161	0.94	83	2.10	72	54	99.9	405	387	283	186	257	554	304
575	92.422	0.160	0.94	83	2.10	72	54	99.6	408	388	283	187	258	557	305
576	92.584	0.162	0.93	83	2.10	72	54	100.8	411	389	282	187	259	556	306
577	92.744	0.160	0.94	83	2.10	72	54	99.0	414	390	282	188	259	559	307
578	92.905	0.161	0.94	83	2.10	72	54	99.7	417	391	282	186	261	560	307
579	93.066	0.161	0.94	83	2.10	72	54	100.1	419	391	281	188	261	560	308
580	93.227	0.161	0.93	83	2.10	72	54	100.5	421	392	281	188	262	562	309
581	93.387	0.160	0.94	83	2.10	72	54	100.2	423	392	280	187	263	563	309
582	93.548	0.161	0.94	83	2.10	72	54	100.5	426	392	280	188	264	569	310
583	93.709	0.161	0.94	83	2.10	72	54	100.1	427	392	279	188	265	568	310
584	93.870	0.161	0.94	83	2.10	72	54	100.1	429	392	279	189	266	567	311
585	94.031	0.161	0.94	83	2.10	72	54	100.3	431	392	278	189	266	570	311
586	94.192	0.161	0.94	83	2.10	72	54	99.9	433	392	278	188	267	573	312
587	94.353	0.161	0.94	83	2.10	72	54	99.5	435	392	278	187	268	579	312
588	94.513	0.160	0.94	83	2.10	72	54	99.1	437	392	277	189	268	583	313
589	94.674	0.161	0.94	83	2.10	72	54	100.3	439	392	277	191	269	585	314
590	94.836	0.162	0.94	83	2.10	72	54	101.0	440	392	277	189	270	585	314
591	94.996	0.160	0.94	83	2.10	72	54	99.4	442	392	276	189	270	583	314
592	95.157	0.161	0.94	83	2.10	72	54	99.9	444	392	276	189	271	585	314
593	95.318	0.161	0.93	83	2.10	72	54	100.1	445	392	276	190	271	584	315
594	95.478	0.160	0.93	83	2.10	72	54	99.8	446	392	275	190	272	582	315
595	95.639	0.161	0.94	83	2.10	72	54	100.5	446	393	275	190	272	579	315
596	95.800	0.161	0.94	83	2.10	72	54	100.3	447	393	275	192	273	579	316
597	95.961	0.161	0.93	83	2.10	72	54	99.9	447	393	275	192	273	575	316
598	96.122	0.161	0.94	83	2.10	72	54	99.9	448	393	274	191	273	576	316
599	96.282	0.160	0.94	83	2.10	72	54	99.6	448	393	274	192	274	575	316
600	96.444	0.162	0.94	83	2.10	72	54	101.0	448	394	274	192	274	575	316
601	96.604	0.160	0.94	83	2.10	72	54	99.5	448	394	274	193	274	574	317
602	96.765	0.161	0.94	83	2.10	72	54	100.1	448	395	273	193	275	575	317
603	96.926	0.161	0.94	83	2.10	72	54	100.0	448	395	273	193	275	572	317
604	97.087	0.161	0.94	83	2.10	72	54	99.7	448	395	272	193	276	577	317
605	97.248	0.161	0.94	83	2.10	72	54	100.0	448	396	272	193	276	575	317
606	97.408	0.160	0.94	83	2.10	72	54	99.7	448	396	272	193	276	575	317
607	97.570	0.162	0.94	83	2.10	72	54	100.8	448	397	271	193	277	573	317
608	97.730	0.160	0.94	83	2.10	72	54	99.4	448	397	271	193	277	572	317
609	97.891	0.161	0.94	83	2.10	72	55	99.7	448	398	271	193	277	573	317
610	98.053	0.162	0.94	83	2.10	72	54	100.1	448	398	270	192	277	572	317
611	98.213	0.160	0.93	83	2.10	72	55	99.1	448	399	270	193	278	574	318
612	98.374	0.161	0.94	83	2.10	72	54	99.9	447	399	270	191	278	574	317

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
613	98.535	0.161	0.94	83	2.10	72	54	99.7	447	399	269	193	278	573	317
614	98.696	0.161	0.93	83	2.10	72	54	99.9	446	400	269	193	279	572	317
615	98.857	0.161	0.94	83	2.10	72	54	100.0	446	400	269	193	279	573	317
616	99.017	0.160	0.94	83	2.10	72	54	99.3	446	401	269	193	279	570	318
617	99.179	0.162	0.94	83	2.10	72	55	100.4	446	401	268	192	279	572	317
618	99.339	0.160	0.94	83	2.10	72	55	99.4	446	401	268	193	279	572	317
619	99.500	0.161	0.94	83	2.10	72	55	100.3	446	402	268	195	279	572	318
620	99.661	0.161	0.94	83	2.10	72	55	100.4	446	402	267	193	279	573	317
621	99.822	0.161	0.94	83	2.10	72	55	100.2	445	402	267	193	280	573	317
622	99.983	0.161	0.93	83	2.10	72	55	100.1	445	402	267	194	279	572	317
623	100.143	0.160	0.94	83	2.10	72	55	99.5	444	402	266	194	280	572	317
624	100.305	0.162	0.94	83	2.10	72	55	100.7	444	402	266	194	280	573	317
625	100.465	0.160	0.94	83	2.10	72	55	99.5	444	403	266	194	280	572	317
626	100.626	0.161	0.94	83	2.10	72	55	100.6	444	403	265	194	280	569	317
627	100.787	0.161	0.94	83	2.10	72	55	100.6	444	403	265	194	280	570	317
628	100.948	0.161	0.93	83	2.10	72	55	100.0	444	403	266	194	280	617	317
629	101.108	0.160	0.94	83	2.10	72	55	99.2	446	403	267	196	281	644	319
630	101.269	0.161	0.94	83	2.10	72	55	100.1	450	403	268	194	282	639	319
631	101.431	0.162	0.94	83	2.10	72	55	100.8	456	403	268	194	283	694	321
632	101.591	0.160	0.94	83	2.10	72	55	99.6	462	403	269	195	284	663	323
633	101.752	0.161	0.94	83	2.10	72	55	100.1	469	403	269	195	285	841	324
634	101.913	0.161	0.93	83	2.10	72	55	99.9	476	403	270	196	286	809	326
635	102.074	0.161	0.93	83	2.10	72	55	100.1	483	402	270	195	287	865	327
636	102.234	0.160	0.94	83	2.10	72	55	99.9	490	402	270	194	288	805	329
637	102.395	0.161	0.94	83	2.10	72	55	100.6	496	402	270	195	289	703	330
638	102.557	0.162	0.94	83	2.10	72	55	101.2	502	402	269	196	290	713	332
639	102.717	0.160	0.94	83	2.10	72	55	100.0	508	402	269	196	290	770	333
640	102.878	0.161	0.94	83	2.10	72	55	100.5	511	402	268	196	291	724	334
641	103.039	0.161	0.94	83	2.10	72	55	100.5	512	402	268	196	292	691	334
642	103.200	0.161	0.94	83	2.10	72	55	100.7	512	403	267	195	292	658	334
643	103.360	0.160	0.94	83	2.10	72	55	100.0	511	403	267	195	292	646	334
644	103.522	0.162	0.94	83	2.10	72	55	101.0	508	404	266	194	293	637	333
645	103.683	0.161	0.94	83	2.10	72	55	100.5	505	405	265	195	293	630	333
646	103.843	0.160	0.93	83	2.10	72	55	99.9	502	406	265	195	294	623	332
647	104.003	0.160	0.94	83	2.10	72	55	99.7	498	407	264	195	294	615	332
648	104.165	0.162	0.94	83	2.10	72	55	101.1	494	408	264	192	295	615	331
649	104.326	0.161	0.94	83	2.10	72	55	100.5	490	408	263	193	295	609	330
650	104.487	0.161	0.94	83	2.10	72	55	100.7	486	409	263	192	296	601	329
651	104.648	0.161	0.94	83	2.10	72	55	100.8	481	410	262	192	296	599	328
652	104.810	0.162	0.94	83	2.10	72	55	101.4	477	411	262	193	297	595	328
653	104.970	0.160	0.94	83	2.10	72	55	100.0	473	412	261	193	297	593	327
654	105.131	0.161	0.94	83	2.10	72	55	100.3	469	413	261	192	298	591	327
655	105.293	0.162	0.94	83	2.10	72	55	100.6	465	414	260	192	298	584	326
656	105.453	0.160	0.94	83	2.10	72	55	99.4	461	416	259	190	299	582	325

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 12:15
Total Sampling Time: 666 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.17 in. Hg
Post-Test 0.002 cfm @ 18 in. Hg

Elapsed Time (min)	**Train B Sampling System**								**Appliance Temperatures, °F**						
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*	*Top*	*Bottom*	*Back*	*Left*	*Right*	*Catalyst Exit*	*Average Stove Surface (Tot = ΔT)*
657	105.614	0.161	0.94	83	2.10	72	55	100.1	458	417	259	191	299	579	325
658	105.776	0.162	0.94	83	2.10	72	55	100.9	454	418	258	191	299	576	324
659	105.937	0.161	0.94	83	2.10	72	55	100.1	451	419	258	191	300	570	324
660	106.098	0.161	0.94	83	2.10	72	55	99.9	447	420	257	190	300	567	323
661	106.258	0.160	0.94	83	2.10	72	55	99.1	444	422	256	190	300	565	322
662	106.420	0.162	0.94	83	2.10	72	55	100.4	440	422	256	191	300	563	322
663	106.580	0.160	0.94	83	2.10	72	55	99.3	437	424	255	190	301	561	321
664	106.741	0.161	0.94	83	2.10	72	55	99.9	434	424	254	189	301	557	320
665	106.902	0.161	0.94	83	2.10	72	55	99.8	432	425	254	188	301	554	320
666	107.063	0.161	0.94	83	2.10	71	55	99.8	429	426	253	189	301	547	320

Train C - First Hour Particulate Sampling

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 12:15
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 23.8 in. Hg
Post-Test 0 cfm @ 5.96 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
Tot / Avg	**9.568**	**0.159**	**2.15**	**70.1**	**-2.10**	**69.7**	**59.3**	**99.4**
Minimum	0.000	0.134	1.36	70	-2.36	68	58	84.0
Max	9.568	0.162	2.23	71	-1.81	71	63	100.9
0	0.000		1.36	70	-1.94	68	63	
1	0.134	0.134	2.15	70	-2.26	69	61	84.0
2	0.295	0.161	2.23	70	-2.35	69	60	100.4
3	0.457	0.162	2.21	70	-2.22	69	60	100.5
4	0.618	0.161	2.20	70	-1.97	69	60	100.2
5	0.778	0.160	2.19	70	-2.16	69	59	99.7
6	0.939	0.161	2.15	70	-2.02	69	59	100.1
7	1.099	0.160	2.18	70	-1.83	69	59	99.5
8	1.260	0.161	2.21	70	-1.97	69	59	100.0
9	1.422	0.162	2.21	70	-2.14	69	59	100.2
10	1.584	0.162	2.21	70	-2.10	69	59	100.1
11	1.745	0.161	2.20	70	-2.35	69	59	99.7
12	1.906	0.161	2.20	70	-2.04	69	58	100.2
13	2.067	0.161	2.20	70	-2.18	69	58	100.7
14	2.228	0.161	2.18	70	-2.36	69	58	100.6
15	2.390	0.162	2.17	70	-2.32	69	58	100.9
16	2.550	0.160	2.18	70	-2.12	69	58	99.1
17	2.710	0.160	2.18	70	-2.27	69	58	98.7
18	2.870	0.160	2.18	70	-2.24	69	58	99.2
19	3.030	0.160	2.18	70	-2.22	69	58	99.8
20	3.191	0.161	2.16	70	-1.82	69	58	100.4
21	3.351	0.160	2.18	70	-2.10	69	58	99.6
22	3.511	0.160	2.16	70	-1.85	69	58	99.7
23	3.671	0.160	2.16	70	-1.86	69	58	99.8
24	3.832	0.161	2.15	70	-1.82	69	59	100.3
25	3.991	0.159	2.16	70	-2.25	69	59	98.7
26	4.151	0.160	2.14	70	-1.87	69	59	99.5
27	4.310	0.159	2.16	70	-2.34	69	59	99.2
28	4.470	0.160	2.16	70	-2.29	69	59	99.6
29	4.630	0.160	2.15	70	-1.91	70	59	99.4
30	4.789	0.159	2.15	70	-1.84	70	59	99.2
31	4.949	0.160	2.15	70	-2.33	70	59	99.8
32	5.108	0.159	2.15	70	-2.27	70	59	98.4

Train C - First Hour Particulate Sampling

Run: 1 **Test Date:** 3/5/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 12:15
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 23.8 in. Hg
Post-Test 0 cfm @ 5.96 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
33	5.267	0.159	2.15	70	-2.34	70	59	98.3
34	5.426	0.159	2.15	70	-1.97	70	59	98.9
35	5.586	0.160	2.14	70	-1.91	70	59	100.0
36	5.744	0.158	2.15	70	-1.84	70	59	98.8
37	5.904	0.160	2.15	70	-2.25	70	59	100.0
38	6.063	0.159	2.15	70	-1.88	70	59	99.4
39	6.222	0.159	2.15	70	-2.35	70	59	99.2
40	6.381	0.159	2.15	70	-2.33	70	59	99.2
41	6.541	0.160	2.13	70	-1.82	70	59	100.4
42	6.699	0.158	2.15	70	-2.17	70	59	99.5
43	6.859	0.160	2.14	70	-1.84	70	59	100.4
44	7.018	0.159	2.15	70	-2.09	70	59	99.7
45	7.178	0.160	2.12	70	-2.28	70	59	100.0
46	7.337	0.159	2.15	70	-1.86	70	60	99.3
47	7.496	0.159	2.14	70	-2.34	70	60	99.4
48	7.655	0.159	2.15	70	-1.82	70	60	99.4
49	7.814	0.159	2.13	70	-2.32	71	60	99.5
50	7.973	0.159	2.14	70	-2.31	71	60	99.7
51	8.133	0.160	2.12	70	-1.82	71	60	100.1
52	8.291	0.158	2.14	71	-2.01	71	60	98.7
53	8.451	0.160	2.14	71	-1.81	71	60	99.7
54	8.609	0.158	2.14	71	-2.07	71	60	98.2
55	8.769	0.160	2.11	71	-2.19	71	60	99.6
56	8.927	0.158	2.13	71	-2.31	71	61	98.7
57	9.086	0.159	2.13	71	-2.14	71	61	99.4
58	9.245	0.159	2.14	71	-1.98	71	61	99.3
59	9.406	0.161	2.22	71	-2.16	71	61	100.2
60	9.568	0.162	2.22	71	-1.98	71	61	100.7

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
Tot / Avg	**106.130**	**0.159**	**1.67**	**71.9**	**-2.22**	**142.50**	**-0.043**	**144.2**	**0.02**	**11.91**
Minimum	0.000	0.155	1.59	70	-2.40	108.00	-0.070	4.2	0.00	0.21
Max	106.130	0.161	1.70	73	-2.00	226.00	-0.033	1040.0	0.58	16.77
0	0.000		0.90	70	-2.10	156	-0.055	1040.0	0.15	0.96
1	0.158	0.158	1.67	70	-2.40	164	-0.042	1011.9	0.10	0.28
2	0.319	0.161	1.70	70	-2.30	146	-0.041	1040.0	0.58	1.68
3	0.479	0.160	1.68	70	-2.40	134	-0.041	1040.0	0.50	2.96
4	0.638	0.159	1.67	70	-2.10	128	-0.042	1040.0	0.23	3.59
5	0.798	0.160	1.67	70	-2.30	125	-0.042	709.5	0.05	3.92
6	0.957	0.159	1.65	70	-2.20	125	-0.042	53.4	0.00	4.12
7	1.115	0.158	1.64	70	-2.20	126	-0.042	56.9	0.00	4.26
8	1.273	0.158	1.65	70	-2.10	127	-0.042	59.9	0.00	4.18
9	1.431	0.158	1.63	70	-2.10	128	-0.042	66.6	0.00	4.51
10	1.588	0.157	1.64	70	-2.00	130	-0.043	70.6	0.00	4.71
11	1.746	0.158	1.62	70	-2.20	130	-0.043	69.9	0.00	4.71
12	1.903	0.157	1.63	70	-2.30	132	-0.043	69.6	0.00	4.73
13	2.060	0.157	1.63	70	-2.00	133	-0.044	67.0	0.00	4.73
14	2.217	0.157	1.63	70	-2.30	134	-0.044	69.3	0.00	4.87
15	2.375	0.158	1.63	70	-2.30	136	-0.044	72.5	0.00	4.97
16	2.532	0.157	1.62	70	-2.10	136	-0.044	75.4	0.00	4.97
17	2.688	0.156	1.62	70	-2.10	136	-0.045	77.3	0.00	5.09
18	2.845	0.157	1.61	70	-2.00	140	-0.045	76.7	0.00	5.00
19	3.002	0.157	1.62	70	-2.00	141	-0.045	80.6	0.00	5.12
20	3.158	0.156	1.62	70	-2.30	142	-0.045	86.7	0.01	5.29
21	3.314	0.156	1.62	70	-2.20	146	-0.046	91.9	0.01	5.48
22	3.471	0.157	1.62	70	-2.10	149	-0.046	94.5	0.01	5.61
23	3.628	0.157	1.61	70	-2.10	150	-0.047	103.6	0.01	5.78
24	3.784	0.156	1.62	70	-2.00	152	-0.047	111.7	0.01	6.00
25	3.940	0.156	1.61	70	-2.20	154	-0.048	115.2	0.01	6.21
26	4.097	0.157	1.61	70	-2.20	155	-0.048	118.5	0.01	6.55
27	4.253	0.156	1.61	70	-2.10	158	-0.049	118.5	0.01	6.62
28	4.409	0.156	1.61	70	-2.30	161	-0.050	121.1	0.01	6.92
29	4.565	0.156	1.61	70	-2.30	170	-0.052	101.3	0.01	8.38
30	4.721	0.156	1.61	70	-2.10	177	-0.055	200.0	0.01	14.87
31	4.878	0.157	1.59	70	-2.30	187	-0.057	60.5	0.00	13.52
32	5.033	0.155	1.61	70	-2.20	193	-0.058	61.2	0.00	12.87

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
33	5.190	0.157	1.61	70	-2.30	198	-0.059	51.8	0.00	12.61
34	5.345	0.155	1.60	70	-2.20	205	-0.060	49.2	0.00	12.76
35	5.502	0.157	1.61	70	-2.10	210	-0.061	48.5	0.00	12.79
36	5.657	0.155	1.61	70	-2.10	214	-0.063	43.4	0.00	12.01
37	5.813	0.156	1.61	70	-2.20	217	-0.063	47.6	0.00	11.67
38	5.973	0.160	1.66	70	-2.10	219	-0.063	47.2	0.00	12.15
39	6.131	0.158	1.66	70	-2.10	222	-0.064	48.2	0.00	12.40
40	6.291	0.160	1.67	70	-2.10	222	-0.064	49.9	0.00	12.96
41	6.450	0.159	1.66	70	-2.10	224	-0.064	45.9	0.00	12.43
42	6.609	0.159	1.67	70	-2.10	224	-0.064	43.4	0.00	12.13
43	6.769	0.160	1.67	70	-2.00	223	-0.064	42.7	0.00	12.04
44	6.928	0.159	1.67	70	-2.20	224	-0.064	42.1	0.00	11.94
45	7.088	0.160	1.67	70	-2.40	224	-0.064	40.8	0.00	12.29
46	7.247	0.159	1.68	70	-2.20	226	-0.064	42.7	0.00	11.91
47	7.407	0.160	1.67	70	-2.10	224	-0.064	43.7	0.00	11.52
48	7.566	0.159	1.68	70	-2.20	222	-0.063	46.6	0.00	11.26
49	7.725	0.159	1.68	70	-2.10	220	-0.064	47.9	0.00	11.21
50	7.885	0.160	1.67	70	-2.10	220	-0.063	49.2	0.00	10.99
51	8.044	0.159	1.67	70	-2.10	219	-0.063	50.8	0.00	10.82
52	8.203	0.159	1.68	70	-2.10	217	-0.062	53.4	0.00	10.92
53	8.363	0.160	1.67	70	-2.40	214	-0.062	53.1	0.00	10.56
54	8.522	0.159	1.67	70	-2.10	213	-0.061	51.8	0.00	10.75
55	8.681	0.159	1.67	70	-2.30	212	-0.062	54.7	0.00	10.56
56	8.841	0.160	1.66	70	-2.30	211	-0.062	56.3	0.00	11.25
57	9.000	0.159	1.67	71	-2.30	210	-0.061	57.6	0.00	11.28
58	9.159	0.159	1.67	71	-2.40	211	-0.061	65.0	0.00	11.45
59	9.318	0.159	1.66	71	-2.10	211	-0.061	63.4	0.00	11.71
60	9.477	0.159	1.66	71	-2.10	209	-0.062	61.5	0.00	11.89
61	9.637	0.160	1.66	71	-2.20	210	-0.061	63.4	0.00	12.04
62	9.796	0.159	1.66	71	-2.20	209	-0.061	70.9	0.00	12.26
63	9.954	0.158	1.67	71	-2.10	207	-0.061	70.9	0.00	12.47
64	10.114	0.160	1.66	71	-2.10	207	-0.061	72.8	0.00	12.60
65	10.273	0.159	1.66	71	-2.20	208	-0.062	87.7	0.01	12.46
66	10.432	0.159	1.67	71	-2.10	205	-0.061	85.1	0.00	12.98
67	10.591	0.159	1.67	71	-2.40	205	-0.061	91.9	0.01	12.91
68	10.750	0.159	1.66	71	-2.10	203	-0.061	96.5	0.01	12.69

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
69	10.909	0.159	1.67	71	-2.40	202	-0.059	87.7	0.00	12.02
70	11.069	0.160	1.66	71	-2.30	202	-0.060	86.1	0.00	12.19
71	11.227	0.158	1.66	71	-2.30	199	-0.059	85.5	0.01	12.05
72	11.387	0.160	1.67	71	-2.10	197	-0.059	85.5	0.00	11.61
73	11.546	0.159	1.66	71	-2.20	195	-0.059	86.4	0.00	11.59
74	11.705	0.159	1.66	71	-2.20	192	-0.058	87.7	0.01	11.76
75	11.864	0.159	1.67	71	-2.30	189	-0.057	87.7	0.01	11.91
76	12.023	0.159	1.66	71	-2.30	189	-0.057	84.5	0.00	11.90
77	12.182	0.159	1.66	71	-2.10	187	-0.056	86.1	0.00	11.86
78	12.341	0.159	1.67	71	-2.30	185	-0.056	85.5	0.01	12.23
79	12.501	0.160	1.66	71	-2.10	183	-0.055	86.1	0.00	12.33
80	12.660	0.159	1.66	71	-2.10	181	-0.055	82.9	0.00	11.90
81	12.819	0.159	1.67	71	-2.30	180	-0.055	82.5	0.00	12.11
82	12.978	0.159	1.66	71	-2.40	179	-0.055	83.6	0.00	11.69
83	13.137	0.159	1.66	71	-2.40	178	-0.054	91.9	0.01	11.96
84	13.296	0.159	1.67	71	-2.30	176	-0.054	92.9	0.01	11.76
85	13.455	0.159	1.66	71	-2.20	174	-0.053	94.2	0.01	11.30
86	13.614	0.159	1.66	71	-2.30	173	-0.053	89.7	0.01	11.48
87	13.774	0.160	1.66	71	-2.40	172	-0.053	87.4	0.00	11.22
88	13.933	0.159	1.65	71	-2.20	171	-0.052	91.9	0.01	11.51
89	14.092	0.159	1.67	71	-2.20	170	-0.052	96.8	0.01	11.47
90	14.251	0.159	1.67	71	-2.10	170	-0.052	97.7	0.01	11.34
91	14.410	0.159	1.65	71	-2.30	171	-0.052	92.9	0.01	11.21
92	14.569	0.159	1.66	71	-2.30	169	-0.052	91.9	0.01	10.92
93	14.729	0.160	1.67	71	-2.20	168	-0.051	94.9	0.01	11.07
94	14.888	0.159	1.66	71	-2.30	167	-0.051	96.2	0.01	11.48
95	15.047	0.159	1.67	71	-2.10	166	-0.050	92.6	0.01	11.14
96	15.206	0.159	1.66	71	-2.20	165	-0.050	94.5	0.01	11.11
97	15.365	0.159	1.66	71	-2.30	164	-0.051	96.5	0.01	11.52
98	15.524	0.159	1.67	71	-2.20	164	-0.050	93.5	0.01	11.06
99	15.684	0.160	1.67	71	-2.40	164	-0.050	94.2	0.01	10.81
100	15.843	0.159	1.66	71	-2.10	162	-0.050	95.5	0.01	11.27
101	16.002	0.159	1.67	71	-2.10	162	-0.050	93.5	0.01	11.00
102	16.162	0.160	1.66	71	-2.20	161	-0.050	95.8	0.01	11.06
103	16.320	0.158	1.66	71	-2.30	161	-0.049	93.9	0.01	11.19
104	16.480	0.160	1.67	71	-2.10	161	-0.050	96.1	0.01	11.28

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
105	16.640	0.160	1.66	71	-2.10	160	-0.048	95.2	0.01	11.20
106	16.798	0.158	1.66	71	-2.40	160	-0.049	93.9	0.01	11.09
107	16.958	0.160	1.67	72	-2.10	159	-0.049	92.3	0.01	11.02
108	17.117	0.159	1.66	72	-2.10	160	-0.049	91.3	0.01	10.95
109	17.276	0.159	1.66	72	-2.10	161	-0.048	90.0	0.01	10.99
110	17.435	0.159	1.67	72	-2.30	160	-0.049	90.7	0.01	11.09
111	17.594	0.159	1.67	72	-2.40	159	-0.048	93.5	0.01	11.10
112	17.753	0.159	1.66	72	-2.10	159	-0.048	94.2	0.01	11.33
113	17.913	0.160	1.67	72	-2.30	159	-0.048	93.2	0.01	11.15
114	18.072	0.159	1.66	72	-2.40	161	-0.048	91.6	0.01	10.71
115	18.231	0.159	1.66	72	-2.30	159	-0.048	90.7	0.01	10.84
116	18.391	0.160	1.67	72	-2.10	158	-0.048	93.2	0.01	11.35
117	18.550	0.159	1.67	72	-2.30	159	-0.048	90.7	0.01	10.98
118	18.709	0.159	1.66	72	-2.40	158	-0.048	90.3	0.01	10.89
119	18.869	0.160	1.67	72	-2.40	159	-0.048	92.9	0.01	11.21
120	19.028	0.159	1.66	72	-2.30	159	-0.048	90.0	0.01	10.79
121	19.187	0.159	1.66	72	-2.40	159	-0.048	91.3	0.01	10.98
122	19.346	0.159	1.67	72	-2.40	159	-0.048	92.9	0.01	11.08
123	19.506	0.160	1.67	72	-2.10	159	-0.048	94.2	0.01	11.27
124	19.665	0.159	1.67	72	-2.10	158	-0.048	94.2	0.01	11.04
125	19.825	0.160	1.67	72	-2.40	159	-0.048	94.2	0.01	11.23
126	19.984	0.159	1.67	72	-2.30	159	-0.048	93.2	0.01	10.96
127	20.143	0.159	1.66	72	-2.40	159	-0.048	91.6	0.01	11.06
128	20.302	0.159	1.67	72	-2.10	158	-0.048	92.3	0.01	11.07
129	20.462	0.160	1.66	72	-2.20	157	-0.048	95.5	0.01	11.48
130	20.621	0.159	1.66	72	-2.10	157	-0.048	94.5	0.01	11.20
131	20.780	0.159	1.67	72	-2.10	157	-0.048	93.2	0.01	10.97
132	20.940	0.160	1.67	72	-2.30	159	-0.048	95.8	0.01	10.98
133	21.099	0.159	1.65	72	-2.30	158	-0.048	99.1	0.01	11.35
134	21.259	0.160	1.67	72	-2.20	158	-0.048	96.5	0.01	11.47
135	21.418	0.159	1.67	72	-2.20	159	-0.048	97.7	0.01	11.30
136	21.577	0.159	1.66	72	-2.20	159	-0.048	100.0	0.01	11.70
137	21.737	0.160	1.67	72	-2.20	160	-0.048	99.7	0.01	11.56
138	21.896	0.159	1.67	72	-2.10	161	-0.049	102.9	0.01	11.70
139	22.055	0.159	1.66	72	-2.30	160	-0.049	101.4	0.01	11.62
140	22.215	0.160	1.67	72	-2.10	161	-0.049	104.2	0.01	11.93

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
141	22.375	0.160	1.67	72	-2.10	161	-0.049	104.2	0.01	11.99
142	22.534	0.159	1.67	72	-2.30	160	-0.049	107.2	0.01	12.38
143	22.693	0.159	1.67	72	-2.30	160	-0.049	105.9	0.01	12.26
144	22.853	0.160	1.67	72	-2.40	161	-0.049	108.5	0.01	12.28
145	23.012	0.159	1.66	72	-2.30	162	-0.049	107.2	0.01	12.12
146	23.172	0.160	1.67	72	-2.30	159	-0.049	110.7	0.01	12.50
147	23.332	0.160	1.67	72	-2.20	161	-0.049	113.0	0.01	12.45
148	23.491	0.159	1.67	72	-2.20	161	-0.050	112.7	0.01	12.58
149	23.651	0.160	1.67	72	-2.10	162	-0.050	116.2	0.01	12.97
150	23.811	0.160	1.66	72	-2.30	162	-0.050	119.5	0.01	13.12
151	23.970	0.159	1.66	72	-2.30	162	-0.049	118.2	0.01	12.98
152	24.130	0.160	1.67	72	-2.40	163	-0.050	121.4	0.01	13.15
153	24.290	0.160	1.67	72	-2.30	163	-0.050	124.0	0.01	13.28
154	24.448	0.158	1.66	72	-2.10	164	-0.050	124.4	0.01	13.48
155	24.608	0.160	1.68	72	-2.40	164	-0.050	125.0	0.01	13.63
156	24.768	0.160	1.66	72	-2.40	162	-0.050	123.7	0.01	13.54
157	24.927	0.159	1.66	72	-2.10	164	-0.051	123.1	0.01	13.52
158	25.087	0.160	1.67	72	-2.20	165	-0.050	123.1	0.01	13.44
159	25.247	0.160	1.67	72	-2.20	166	-0.050	126.6	0.01	13.48
160	25.406	0.159	1.66	72	-2.40	166	-0.051	126.9	0.01	13.46
161	25.566	0.160	1.67	72	-2.20	166	-0.050	127.3	0.01	13.59
162	25.726	0.160	1.67	72	-2.30	167	-0.050	126.6	0.01	13.76
163	25.885	0.159	1.66	72	-2.10	167	-0.050	126.9	0.01	13.51
164	26.045	0.160	1.66	72	-2.20	168	-0.050	128.9	0.01	13.84
165	26.205	0.160	1.67	72	-2.10	167	-0.052	129.9	0.01	13.97
166	26.364	0.159	1.66	72	-2.10	168	-0.051	126.0	0.01	13.80
167	26.524	0.160	1.67	72	-2.30	168	-0.051	128.2	0.01	13.82
168	26.683	0.159	1.68	72	-2.30	166	-0.050	129.5	0.01	14.15
169	26.843	0.160	1.67	72	-2.30	166	-0.051	129.8	0.01	14.09
170	27.003	0.160	1.67	72	-2.10	167	-0.050	127.9	0.01	14.11
171	27.162	0.159	1.67	72	-2.30	166	-0.051	124.7	0.01	14.14
172	27.322	0.160	1.67	72	-2.10	166	-0.051	122.7	0.01	13.77
173	27.482	0.160	1.66	72	-2.30	166	-0.051	128.9	0.01	14.20
174	27.642	0.160	1.67	72	-2.20	165	-0.050	124.0	0.01	13.69
175	27.802	0.160	1.67	72	-2.10	164	-0.050	127.9	0.01	13.78
176	27.961	0.159	1.67	72	-2.10	164	-0.050	129.8	0.01	14.27

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
177	28.122	0.161	1.68	72	-2.30	163	-0.050	135.3	0.01	13.95
178	28.281	0.159	1.67	72	-2.30	165	-0.050	130.5	0.01	13.70
179	28.441	0.160	1.67	72	-2.30	164	-0.049	125.0	0.01	13.82
180	28.600	0.159	1.67	72	-2.30	163	-0.050	134.0	0.01	13.92
181	28.761	0.161	1.66	72	-2.10	161	-0.049	133.7	0.01	13.89
182	28.920	0.159	1.66	72	-2.40	159	-0.049	123.4	0.01	13.51
183	29.079	0.159	1.67	72	-2.10	160	-0.049	118.5	0.01	13.49
184	29.239	0.160	1.67	72	-2.30	160	-0.048	114.9	0.01	13.42
185	29.399	0.160	1.66	72	-2.40	159	-0.048	116.9	0.01	13.46
186	29.558	0.159	1.67	72	-2.30	158	-0.048	115.2	0.01	13.77
187	29.718	0.160	1.67	72	-2.30	156	-0.048	115.3	0.01	13.58
188	29.877	0.159	1.66	72	-2.30	156	-0.048	110.4	0.01	13.08
189	30.037	0.160	1.67	72	-2.40	154	-0.048	109.1	0.01	13.39
190	30.197	0.160	1.68	72	-2.30	154	-0.048	108.1	0.01	12.95
191	30.356	0.159	1.66	72	-2.10	153	-0.048	104.9	0.01	13.02
192	30.516	0.160	1.67	72	-2.40	152	-0.047	104.6	0.01	12.86
193	30.675	0.159	1.67	72	-2.10	153	-0.047	106.5	0.01	13.13
194	30.835	0.160	1.66	72	-2.10	151	-0.047	106.5	0.01	13.30
195	30.995	0.160	1.66	72	-2.20	151	-0.047	105.5	0.01	13.07
196	31.154	0.159	1.67	72	-2.30	150	-0.047	106.8	0.01	12.88
197	31.314	0.160	1.67	72	-2.10	150	-0.047	104.9	0.01	13.02
198	31.474	0.160	1.67	72	-2.10	149	-0.046	108.1	0.01	13.29
199	31.633	0.159	1.68	72	-2.10	149	-0.046	111.7	0.01	13.26
200	31.793	0.160	1.67	72	-2.10	147	-0.046	113.3	0.01	13.49
201	31.952	0.159	1.67	72	-2.10	147	-0.046	115.9	0.01	13.34
202	32.112	0.160	1.67	72	-2.30	148	-0.045	118.5	0.01	13.26
203	32.272	0.160	1.68	72	-2.40	148	-0.046	118.1	0.01	13.11
204	32.432	0.160	1.67	72	-2.40	148	-0.046	118.8	0.01	13.57
205	32.592	0.160	1.68	72	-2.20	147	-0.046	124.0	0.01	13.67
206	32.752	0.160	1.68	72	-2.10	147	-0.046	126.3	0.01	13.69
207	32.911	0.159	1.67	72	-2.30	148	-0.046	129.5	0.01	13.98
208	33.071	0.160	1.68	72	-2.10	148	-0.045	131.8	0.01	13.89
209	33.231	0.160	1.67	72	-2.30	148	-0.045	4.2	0.00	0.21
210	33.391	0.160	1.66	72	-2.20	148	-0.046	138.6	0.01	14.42
211	33.550	0.159	1.67	72	-2.30	148	-0.046	142.5	0.01	14.65
212	33.711	0.161	1.67	72	-2.10	148	-0.046	146.1	0.01	14.92

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
213	33.870	0.159	1.67	72	-2.10	148	-0.046	158.0	0.01	14.94
214	34.030	0.160	1.67	71	-2.10	149	-0.046	197.2	0.02	15.11
215	34.190	0.160	1.68	71	-2.10	151	-0.046	309.6	0.03	15.31
216	34.349	0.159	1.67	72	-2.10	150	-0.046	420.0	0.04	14.93
217	34.509	0.160	1.67	71	-2.10	151	-0.046	438.8	0.04	15.00
218	34.669	0.160	1.68	71	-2.10	149	-0.046	487.4	0.05	15.74
219	34.829	0.160	1.67	71	-2.10	150	-0.046	430.3	0.04	15.02
220	34.988	0.159	1.67	71	-2.40	151	-0.046	613.0	0.06	15.08
221	35.148	0.160	1.68	71	-2.20	150	-0.046	600.4	0.06	15.14
222	35.308	0.160	1.68	71	-2.30	150	-0.045	760.6	0.08	15.24
223	35.467	0.159	1.67	71	-2.40	150	-0.045	1040.0	0.12	15.68
224	35.628	0.161	1.68	71	-2.10	149	-0.045	1040.0	0.13	15.26
225	35.787	0.159	1.68	71	-2.30	149	-0.046	1040.0	0.14	15.16
226	35.947	0.160	1.68	71	-2.20	148	-0.045	1040.0	0.22	15.37
227	36.107	0.160	1.68	71	-2.10	147	-0.045	1040.0	0.27	15.30
228	36.267	0.160	1.67	71	-2.20	147	-0.045	1040.0	0.27	15.50
229	36.426	0.159	1.67	71	-2.10	147	-0.045	1040.0	0.28	15.16
230	36.585	0.159	1.68	71	-2.30	147	-0.045	1040.0	0.27	15.20
231	36.746	0.161	1.68	71	-2.30	146	-0.045	1040.0	0.33	15.26
232	36.905	0.159	1.67	71	-2.10	146	-0.045	1040.0	0.37	14.85
233	37.064	0.159	1.68	71	-2.30	145	-0.044	1040.0	0.31	15.26
234	37.224	0.160	1.67	71	-2.10	144	-0.045	1040.0	0.35	14.98
235	37.384	0.160	1.66	71	-2.10	144	-0.045	1040.0	0.31	14.70
236	37.543	0.159	1.67	71	-2.10	143	-0.044	1040.0	0.23	14.67
237	37.703	0.160	1.68	71	-2.40	142	-0.044	1040.0	0.08	14.50
238	37.863	0.160	1.67	71	-2.10	142	-0.044	868.2	0.09	15.44
239	38.022	0.159	1.68	71	-2.40	142	-0.043	880.5	0.09	15.04
240	38.182	0.160	1.68	71	-2.30	141	-0.043	667.7	0.06	15.13
241	38.342	0.160	1.67	71	-2.30	141	-0.044	480.2	0.04	14.82
242	38.501	0.159	1.67	71	-2.10	141	-0.043	354.2	0.03	14.43
243	38.660	0.159	1.68	71	-2.30	140	-0.043	280.4	0.03	14.56
244	38.821	0.161	1.68	71	-2.20	140	-0.043	232.8	0.02	14.36
245	38.980	0.159	1.67	71	-2.20	138	-0.042	166.8	0.01	14.18
246	39.139	0.159	1.68	71	-2.20	137	-0.041	149.3	0.01	14.47
247	39.299	0.160	1.67	71	-2.10	137	-0.042	143.5	0.01	14.18
248	39.459	0.160	1.67	71	-2.10	137	-0.041	135.3	0.01	13.73

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
249	39.618	0.159	1.68	71	-2.20	135	-0.041	135.7	0.01	13.84
250	39.778	0.160	1.68	71	-2.40	134	-0.041	133.4	0.01	14.02
251	39.937	0.159	1.67	71	-2.10	134	-0.040	127.3	0.01	13.74
252	40.097	0.160	1.68	71	-2.30	133	-0.040	128.5	0.01	13.70
253	40.256	0.159	1.67	71	-2.10	133	-0.040	126.6	0.01	13.60
254	40.416	0.160	1.67	71	-2.40	132	-0.040	118.8	0.01	13.00
255	40.575	0.159	1.68	71	-2.10	127	-0.039	122.4	0.01	13.20
256	40.735	0.160	1.68	71	-2.30	130	-0.039	119.1	0.01	13.26
257	40.894	0.159	1.67	71	-2.30	130	-0.039	118.5	0.01	13.16
258	41.053	0.159	1.68	71	-2.30	130	-0.039	115.3	0.01	12.87
259	41.213	0.160	1.67	71	-2.10	129	-0.039	115.6	0.01	12.84
260	41.372	0.159	1.67	71	-2.10	129	-0.038	115.2	0.01	13.09
261	41.531	0.159	1.67	71	-2.30	128	-0.038	115.2	0.01	12.65
262	41.691	0.160	1.68	71	-2.30	128	-0.038	114.9	0.01	12.88
263	41.850	0.159	1.67	71	-2.20	127	-0.038	118.1	0.01	12.80
264	42.009	0.159	1.68	71	-2.20	128	-0.038	113.0	0.01	12.70
265	42.169	0.160	1.67	71	-2.10	127	-0.038	112.3	0.01	12.41
266	42.328	0.159	1.67	71	-2.10	126	-0.038	118.1	0.01	12.82
267	42.488	0.160	1.67	71	-2.30	126	-0.038	117.2	0.01	12.78
268	42.647	0.159	1.68	71	-2.40	125	-0.038	113.6	0.01	12.39
269	42.806	0.159	1.67	71	-2.10	125	-0.038	114.6	0.01	12.32
270	42.966	0.160	1.67	71	-2.30	125	-0.038	117.5	0.01	12.26
271	43.125	0.159	1.67	71	-2.20	125	-0.037	118.8	0.01	12.66
272	43.284	0.159	1.66	71	-2.30	125	-0.037	128.5	0.01	12.78
273	43.443	0.159	1.67	71	-2.40	125	-0.037	125.3	0.01	12.80
274	43.603	0.160	1.67	71	-2.10	125	-0.037	126.3	0.01	12.67
275	43.762	0.159	1.67	71	-2.10	125	-0.037	123.7	0.01	12.78
276	43.921	0.159	1.67	71	-2.40	124	-0.037	123.0	0.01	12.66
277	44.081	0.160	1.67	71	-2.20	124	-0.037	129.5	0.01	13.01
278	44.240	0.159	1.67	71	-2.10	124	-0.037	125.6	0.01	12.48
279	44.399	0.159	1.68	71	-2.30	124	-0.037	129.5	0.01	12.96
280	44.559	0.160	1.67	71	-2.20	123	-0.037	128.5	0.01	12.91
281	44.718	0.159	1.67	71	-2.10	121	-0.037	136.0	0.01	13.07
282	44.878	0.160	1.67	71	-2.30	121	-0.037	138.3	0.01	13.11
283	45.037	0.159	1.67	71	-2.20	122	-0.037	45.9	0.00	9.64
284	45.196	0.159	1.67	71	-2.30	120	-0.037	140.5	0.01	13.41

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
285	45.356	0.160	1.68	71	-2.20	121	-0.038	138.6	0.01	13.19
286	45.515	0.159	1.67	71	-2.10	121	-0.037	138.9	0.01	13.00
287	45.675	0.160	1.67	71	-2.30	122	-0.037	143.2	0.01	13.52
288	45.834	0.159	1.67	71	-2.40	123	-0.037	143.1	0.01	13.60
289	45.993	0.159	1.67	71	-2.10	123	-0.038	144.4	0.01	13.52
290	46.153	0.160	1.67	71	-2.30	123	-0.037	147.0	0.01	13.71
291	46.312	0.159	1.68	71	-2.30	123	-0.037	144.8	0.01	13.78
292	46.471	0.159	1.67	71	-2.10	124	-0.038	144.4	0.01	13.44
293	46.631	0.160	1.67	71	-2.10	123	-0.037	149.0	0.01	13.67
294	46.790	0.159	1.67	71	-2.30	125	-0.038	141.8	0.01	13.65
295	46.949	0.159	1.67	71	-2.10	125	-0.038	141.5	0.01	13.45
296	47.109	0.160	1.67	71	-2.30	125	-0.038	138.9	0.01	13.63
297	47.268	0.159	1.67	71	-2.10	125	-0.038	141.5	0.01	13.84
298	47.427	0.159	1.66	71	-2.30	125	-0.038	143.5	0.01	13.63
299	47.586	0.159	1.66	71	-2.10	125	-0.038	146.1	0.01	13.98
300	47.746	0.160	1.68	71	-2.10	127	-0.038	143.2	0.01	13.81
301	47.905	0.159	1.67	71	-2.10	128	-0.039	149.6	0.01	13.70
302	48.064	0.159	1.67	71	-2.10	127	-0.039	151.9	0.01	13.87
303	48.223	0.159	1.67	71	-2.20	127	-0.039	155.4	0.01	14.38
304	48.383	0.160	1.67	71	-2.20	127	-0.038	154.8	0.01	14.32
305	48.542	0.159	1.67	71	-2.10	127	-0.039	154.5	0.01	14.31
306	48.701	0.159	1.68	71	-2.20	127	-0.038	152.9	0.01	14.22
307	48.860	0.159	1.66	71	-2.10	127	-0.039	155.1	0.01	14.20
308	49.019	0.159	1.66	71	-2.20	128	-0.039	153.2	0.01	14.10
309	49.179	0.160	1.67	71	-2.40	129	-0.039	151.9	0.01	14.28
310	49.338	0.159	1.67	71	-2.40	128	-0.039	156.4	0.01	14.25
311	49.497	0.159	1.68	72	-2.30	128	-0.039	153.5	0.01	14.11
312	49.656	0.159	1.67	72	-2.20	129	-0.039	154.8	0.01	13.97
313	49.816	0.160	1.66	72	-2.10	129	-0.039	154.5	0.01	14.02
314	49.975	0.159	1.67	72	-2.10	129	-0.039	153.8	0.01	14.14
315	50.134	0.159	1.68	72	-2.30	130	-0.040	156.4	0.01	14.13
316	50.294	0.160	1.66	72	-2.10	130	-0.039	152.5	0.01	13.85
317	50.453	0.159	1.66	72	-2.10	129	-0.039	152.2	0.01	13.91
318	50.612	0.159	1.67	72	-2.40	129	-0.039	156.7	0.01	14.50
319	50.772	0.160	1.66	72	-2.10	128	-0.039	157.7	0.01	14.39
320	50.931	0.159	1.67	72	-2.20	128	-0.039	156.4	0.01	14.07

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
321	51.091	0.160	1.68	72	-2.30	128	-0.039	154.8	0.01	14.02
322	51.250	0.159	1.66	72	-2.10	129	-0.039	149.6	0.01	13.70
323	51.409	0.159	1.66	72	-2.10	129	-0.039	150.6	0.01	13.81
324	51.569	0.160	1.67	72	-2.40	129	-0.039	149.9	0.01	14.02
325	51.728	0.159	1.66	72	-2.30	129	-0.039	150.3	0.01	13.75
326	51.888	0.160	1.67	72	-2.40	128	-0.038	150.6	0.01	13.87
327	52.047	0.159	1.68	72	-2.10	126	-0.039	148.0	0.01	13.58
328	52.207	0.160	1.66	72	-2.40	127	-0.039	143.5	0.01	13.82
329	52.366	0.159	1.66	72	-2.10	126	-0.038	142.5	0.01	13.72
330	52.525	0.159	1.67	72	-2.10	126	-0.038	135.3	0.01	13.15
331	52.685	0.160	1.66	72	-2.30	126	-0.038	129.8	0.01	13.24
332	52.844	0.159	1.67	72	-2.10	126	-0.038	135.7	0.01	13.17
333	53.004	0.160	1.68	72	-2.10	125	-0.038	132.8	0.01	13.16
334	53.163	0.159	1.67	72	-2.10	124	-0.038	132.8	0.01	13.30
335	53.323	0.160	1.66	72	-2.10	124	-0.038	129.8	0.01	13.06
336	53.482	0.159	1.67	72	-2.20	123	-0.038	131.8	0.01	12.94
337	53.641	0.159	1.67	72	-2.30	123	-0.038	133.7	0.01	13.15
338	53.801	0.160	1.67	72	-2.30	122	-0.037	136.3	0.01	13.43
339	53.960	0.159	1.67	72	-2.10	121	-0.037	136.3	0.01	13.38
340	54.120	0.160	1.66	72	-2.10	120	-0.037	136.0	0.01	13.40
341	54.279	0.159	1.66	72	-2.10	120	-0.037	137.3	0.01	13.34
342	54.438	0.159	1.67	72	-2.10	120	-0.037	137.3	0.01	13.44
343	54.598	0.160	1.67	72	-2.30	119	-0.037	137.3	0.01	13.41
344	54.757	0.159	1.67	72	-2.40	118	-0.036	140.2	0.01	13.59
345	54.916	0.159	1.67	72	-2.40	118	-0.036	136.7	0.01	13.93
346	55.076	0.160	1.66	72	-2.10	117	-0.036	81.3	0.00	13.07
347	55.235	0.159	1.66	72	-2.20	117	-0.036	85.1	0.00	13.34
348	55.395	0.160	1.67	72	-2.30	116	-0.035	74.4	0.00	13.21
349	55.554	0.159	1.67	72	-2.40	116	-0.035	75.4	0.00	13.11
350	55.713	0.159	1.67	72	-2.40	115	-0.036	79.3	0.00	12.92
351	55.873	0.160	1.67	72	-2.10	116	-0.036	77.0	0.00	12.58
352	56.032	0.159	1.66	72	-2.10	115	-0.036	74.1	0.00	12.72
353	56.192	0.160	1.66	72	-2.30	115	-0.035	77.7	0.00	12.62
354	56.351	0.159	1.67	72	-2.10	115	-0.036	81.6	0.00	12.61
355	56.510	0.159	1.66	72	-2.40	114	-0.035	80.6	0.00	12.70
356	56.670	0.160	1.66	72	-2.10	113	-0.035	81.9	0.00	12.67

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
357	56.829	0.159	1.66	72	-2.40	114	-0.035	80.9	0.00	12.60
358	56.988	0.159	1.66	72	-2.10	115	-0.036	78.0	0.00	12.41
359	57.148	0.160	1.66	72	-2.20	113	-0.035	80.6	0.00	12.31
360	57.307	0.159	1.67	72	-2.30	113	-0.035	80.0	0.00	12.35
361	57.466	0.159	1.66	72	-2.40	112	-0.034	79.6	0.00	12.61
362	57.625	0.159	1.66	73	-2.20	112	-0.035	83.5	0.00	12.28
363	57.785	0.160	1.67	73	-2.10	112	-0.034	82.5	0.00	12.21
364	57.944	0.159	1.66	73	-2.20	112	-0.034	82.2	0.00	12.39
365	58.103	0.159	1.67	73	-2.10	111	-0.035	87.1	0.00	12.45
366	58.263	0.160	1.67	73	-2.20	111	-0.035	87.1	0.00	12.13
367	58.422	0.159	1.66	73	-2.20	111	-0.034	85.8	0.00	12.32
368	58.581	0.159	1.66	73	-2.10	110	-0.035	87.1	0.00	12.47
369	58.741	0.160	1.67	73	-2.40	110	-0.033	86.1	0.00	12.28
370	58.900	0.159	1.66	73	-2.10	109	-0.034	89.4	0.00	12.50
371	59.059	0.159	1.67	73	-2.30	109	-0.034	90.3	0.00	12.40
372	59.219	0.160	1.67	73	-2.40	109	-0.034	87.1	0.00	12.34
373	59.378	0.159	1.66	73	-2.10	109	-0.034	87.4	0.00	12.43
374	59.537	0.159	1.66	73	-2.40	109	-0.035	86.4	0.00	12.31
375	59.697	0.160	1.67	73	-2.20	108	-0.034	84.8	0.00	12.23
376	59.856	0.159	1.66	73	-2.20	108	-0.034	82.5	0.00	12.18
377	60.015	0.159	1.67	73	-2.30	108	-0.034	82.2	0.00	11.96
378	60.175	0.160	1.67	73	-2.30	108	-0.035	83.5	0.00	12.26
379	60.334	0.159	1.66	73	-2.10	108	-0.035	86.8	0.00	12.33
380	60.494	0.160	1.66	73	-2.10	109	-0.036	83.5	0.00	11.73
381	60.653	0.159	1.67	73	-2.10	110	-0.035	73.3	0.00	13.28
382	60.813	0.160	1.66	73	-2.10	111	-0.035	65.0	0.00	14.40
383	60.972	0.159	1.66	73	-2.30	112	-0.035	131.2	0.01	13.71
384	61.132	0.160	1.66	73	-2.40	113	-0.036	181.7	0.01	13.46
385	61.291	0.159	1.66	73	-2.30	113	-0.036	194.3	0.02	13.49
386	61.451	0.160	1.66	73	-2.30	113	-0.036	190.7	0.02	13.52
387	61.610	0.159	1.67	73	-2.30	113	-0.036	172.9	0.01	13.22
388	61.770	0.160	1.67	73	-2.20	112	-0.036	162.2	0.01	13.19
389	61.929	0.159	1.67	73	-2.10	112	-0.036	158.0	0.01	12.86
390	62.089	0.160	1.68	73	-2.10	111	-0.036	153.8	0.01	12.79
391	62.249	0.160	1.66	73	-2.20	110	-0.035	151.9	0.01	13.01
392	62.408	0.159	1.66	73	-2.20	111	-0.035	147.0	0.01	12.69

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
393	62.568	0.160	1.67	73	-2.40	111	-0.035	144.8	0.01	12.77
394	62.728	0.160	1.67	73	-2.40	110	-0.035	142.8	0.01	12.61
395	62.887	0.159	1.67	73	-2.30	110	-0.036	141.9	0.01	12.57
396	63.048	0.161	1.68	73	-2.10	111	-0.036	140.9	0.01	12.47
397	63.208	0.160	1.67	73	-2.40	110	-0.036	138.9	0.01	12.45
398	63.367	0.159	1.67	73	-2.10	110	-0.036	138.3	0.01	12.53
399	63.527	0.160	1.68	73	-2.20	110	-0.036	136.3	0.01	12.41
400	63.687	0.160	1.66	73	-2.40	109	-0.036	139.5	0.01	12.62
401	63.846	0.159	1.66	73	-2.20	109	-0.036	136.7	0.01	12.66
402	64.006	0.160	1.67	73	-2.10	110	-0.036	137.3	0.01	12.63
403	64.167	0.161	1.66	73	-2.20	110	-0.036	137.3	0.01	12.64
404	64.326	0.159	1.67	73	-2.40	111	-0.036	135.3	0.01	12.55
405	64.486	0.160	1.68	73	-2.10	112	-0.036	136.3	0.01	12.51
406	64.646	0.160	1.68	73	-2.40	112	-0.036	137.9	0.01	12.72
407	64.806	0.160	1.67	73	-2.20	113	-0.035	134.0	0.01	12.27
408	64.966	0.160	1.67	73	-2.10	115	-0.037	134.7	0.01	12.38
409	65.125	0.159	1.68	73	-2.30	115	-0.036	137.3	0.01	12.46
410	65.285	0.160	1.67	73	-2.40	115	-0.036	140.2	0.01	12.79
411	65.445	0.160	1.67	73	-2.10	116	-0.036	135.3	0.01	12.43
412	65.605	0.160	1.68	73	-2.30	116	-0.036	136.0	0.01	12.58
413	65.765	0.160	1.68	73	-2.30	117	-0.036	134.4	0.01	12.46
414	65.925	0.160	1.67	72	-2.20	117	-0.035	135.3	0.01	12.63
415	66.085	0.160	1.68	72	-2.30	117	-0.035	137.9	0.01	12.61
416	66.245	0.160	1.68	72	-2.10	117	-0.035	135.7	0.01	12.58
417	66.404	0.159	1.67	72	-2.20	117	-0.035	136.0	0.01	12.64
418	66.564	0.160	1.68	72	-2.10	118	-0.035	137.3	0.01	12.67
419	66.724	0.160	1.67	72	-2.10	118	-0.035	138.6	0.01	12.83
420	66.883	0.159	1.66	72	-2.30	118	-0.035	135.7	0.01	12.78
421	67.043	0.160	1.67	72	-2.20	118	-0.035	137.3	0.01	12.76
422	67.203	0.160	1.68	72	-2.10	119	-0.035	136.3	0.01	12.80
423	67.362	0.159	1.67	72	-2.10	118	-0.035	135.7	0.01	12.59
424	67.522	0.160	1.68	72	-2.20	118	-0.035	136.7	0.01	12.85
425	67.681	0.159	1.68	72	-2.30	119	-0.035	136.0	0.01	12.74
426	67.841	0.160	1.67	72	-2.10	118	-0.035	135.0	0.01	12.66
427	68.001	0.160	1.66	72	-2.20	119	-0.035	133.7	0.01	12.76
428	68.160	0.159	1.68	72	-2.20	118	-0.034	135.0	0.01	12.65

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
429	68.320	0.160	1.66	72	-2.20	120	-0.035	131.8	0.01	12.65
430	68.480	0.160	1.67	72	-2.20	118	-0.034	133.1	0.01	12.60
431	68.639	0.159	1.68	72	-2.40	118	-0.035	130.2	0.01	12.47
432	68.799	0.160	1.67	72	-2.10	119	-0.034	132.4	0.01	12.50
433	68.959	0.160	1.67	72	-2.20	119	-0.034	130.5	0.01	12.48
434	69.118	0.159	1.67	72	-2.20	118	-0.034	129.8	0.01	12.48
435	69.278	0.160	1.67	72	-2.10	118	-0.034	128.2	0.01	12.20
436	69.437	0.159	1.66	72	-2.30	117	-0.035	131.2	0.01	12.46
437	69.597	0.160	1.68	72	-2.10	117	-0.034	128.5	0.01	12.48
438	69.757	0.160	1.67	72	-2.10	118	-0.035	109.4	0.01	11.93
439	69.916	0.159	1.67	72	-2.30	120	-0.035	75.1	0.00	11.51
440	70.076	0.160	1.67	72	-2.10	118	-0.035	75.7	0.00	11.36
441	70.235	0.159	1.67	72	-2.30	117	-0.035	76.4	0.00	11.25
442	70.394	0.159	1.67	72	-2.20	117	-0.035	79.0	0.00	11.14
443	70.554	0.160	1.67	72	-2.30	118	-0.035	77.0	0.00	11.08
444	70.714	0.160	1.67	72	-2.40	118	-0.035	81.3	0.00	11.28
445	70.873	0.159	1.67	72	-2.10	117	-0.035	79.3	0.00	10.91
446	71.032	0.159	1.67	72	-2.10	119	-0.035	78.6	0.00	11.02
447	71.192	0.160	1.67	72	-2.40	119	-0.035	80.6	0.00	11.00
448	71.351	0.159	1.66	72	-2.30	119	-0.035	79.6	0.00	11.34
449	71.511	0.160	1.67	72	-2.40	119	-0.035	80.3	0.00	11.39
450	71.670	0.159	1.67	72	-2.30	119	-0.035	79.3	0.00	11.28
451	71.829	0.159	1.67	72	-2.30	118	-0.035	78.0	0.00	11.02
452	71.989	0.160	1.67	72	-2.30	119	-0.035	78.0	0.00	11.11
453	72.148	0.159	1.67	72	-2.10	119	-0.035	76.0	0.00	10.89
454	72.307	0.159	1.66	72	-2.30	120	-0.035	77.3	0.00	10.94
455	72.467	0.160	1.68	72	-2.10	120	-0.035	76.7	0.00	10.89
456	72.627	0.160	1.67	72	-2.10	121	-0.035	76.0	0.00	10.75
457	72.785	0.158	1.67	72	-2.40	121	-0.035	76.7	0.00	10.45
458	72.945	0.160	1.67	72	-2.30	121	-0.035	85.1	0.00	10.50
459	73.105	0.160	1.67	72	-2.30	120	-0.036	87.1	0.00	10.62
460	73.264	0.159	1.67	72	-2.30	121	-0.036	83.5	0.00	10.63
461	73.423	0.159	1.68	72	-2.40	121	-0.035	81.3	0.00	10.65
462	73.583	0.160	1.67	72	-2.40	122	-0.035	76.7	0.00	10.57
463	73.742	0.159	1.67	72	-2.40	121	-0.036	76.7	0.00	10.62
464	73.901	0.159	1.67	72	-2.10	121	-0.036	81.3	0.00	10.23

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
465	74.061	0.160	1.67	72	-2.10	122	-0.036	83.0	0.00	10.02
466	74.220	0.159	1.66	72	-2.10	122	-0.036	80.3	0.00	10.12
467	74.380	0.160	1.68	72	-2.10	122	-0.036	79.6	0.00	10.19
468	74.539	0.159	1.66	72	-2.10	122	-0.036	78.3	0.00	10.15
469	74.698	0.159	1.67	72	-2.30	122	-0.036	77.3	0.00	10.14
470	74.858	0.160	1.67	72	-2.10	122	-0.036	76.4	0.00	10.32
471	75.017	0.159	1.67	72	-2.10	123	-0.036	73.8	0.00	10.19
472	75.176	0.159	1.67	72	-2.10	123	-0.036	72.5	0.00	10.18
473	75.336	0.160	1.68	72	-2.20	122	-0.036	73.5	0.00	10.31
474	75.495	0.159	1.66	72	-2.20	123	-0.036	72.2	0.00	10.06
475	75.654	0.159	1.67	72	-2.30	123	-0.036	69.9	0.00	9.67
476	75.814	0.160	1.68	72	-2.10	124	-0.036	70.3	0.00	9.82
477	75.974	0.160	1.67	72	-2.30	124	-0.036	71.5	0.00	9.68
478	76.133	0.159	1.67	72	-2.30	125	-0.037	75.1	0.00	9.83
479	76.293	0.160	1.68	72	-2.10	125	-0.036	82.9	0.00	10.06
480	76.453	0.160	1.66	72	-2.30	125	-0.036	82.9	0.00	10.25
481	76.611	0.158	1.66	72	-2.30	125	-0.037	80.3	0.00	10.26
482	76.771	0.160	1.68	72	-2.10	125	-0.036	83.5	0.00	10.36
483	76.931	0.160	1.67	72	-2.40	126	-0.036	82.5	0.00	10.49
484	77.090	0.159	1.67	72	-2.20	125	-0.037	82.9	0.00	10.50
485	77.249	0.159	1.68	72	-2.40	125	-0.037	83.2	0.00	10.50
486	77.409	0.160	1.66	72	-2.10	126	-0.037	81.3	0.00	10.50
487	77.568	0.159	1.66	72	-2.20	126	-0.037	80.6	0.00	10.78
488	77.727	0.159	1.68	72	-2.30	126	-0.037	80.0	0.00	10.79
489	77.887	0.160	1.67	73	-2.20	127	-0.037	79.0	0.00	10.66
490	78.046	0.159	1.67	72	-2.10	127	-0.037	80.6	0.00	10.76
491	78.206	0.160	1.68	72	-2.30	126	-0.037	78.0	0.00	10.55
492	78.366	0.160	1.66	72	-2.10	128	-0.037	76.7	0.00	10.49
493	78.525	0.159	1.66	72	-2.20	128	-0.037	75.4	0.00	10.54
494	78.684	0.159	1.68	72	-2.20	128	-0.037	75.7	0.00	10.53
495	78.844	0.160	1.67	73	-2.10	127	-0.038	76.0	0.00	10.54
496	79.003	0.159	1.67	72	-2.30	127	-0.037	74.4	0.00	10.29
497	79.162	0.159	1.68	73	-2.40	127	-0.037	70.6	0.00	10.40
498	79.322	0.160	1.67	73	-2.10	127	-0.037	71.9	0.00	10.32
499	79.481	0.159	1.67	72	-2.40	128	-0.037	75.1	0.00	10.28
500	79.640	0.159	1.68	72	-2.10	128	-0.037	74.4	0.00	10.30

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
501	79.801	0.161	1.68	72	-2.40	128	-0.037	73.8	0.00	10.33
502	79.960	0.159	1.67	72	-2.10	127	-0.037	73.1	0.00	10.07
503	80.119	0.159	1.68	72	-2.20	127	-0.037	73.1	0.00	10.15
504	80.279	0.160	1.67	72	-2.20	126	-0.037	76.7	0.00	10.34
505	80.438	0.159	1.66	73	-2.30	126	-0.037	78.3	0.00	10.13
506	80.597	0.159	1.68	73	-2.20	126	-0.037	81.3	0.00	10.14
507	80.757	0.160	1.68	73	-2.30	127	-0.037	81.9	0.00	10.17
508	80.916	0.159	1.67	73	-2.10	127	-0.037	80.3	0.00	9.95
509	81.075	0.159	1.68	73	-2.20	127	-0.037	81.6	0.00	10.11
510	81.235	0.160	1.66	73	-2.10	127	-0.037	78.0	0.00	9.92
511	81.394	0.159	1.66	73	-2.40	126	-0.037	77.0	0.00	10.32
512	81.554	0.160	1.67	73	-2.20	127	-0.037	76.7	0.00	10.17
513	81.713	0.159	1.68	73	-2.10	127	-0.037	76.0	0.00	10.07
514	81.873	0.160	1.67	73	-2.10	127	-0.037	78.3	0.00	10.08
515	82.032	0.159	1.67	73	-2.40	126	-0.037	78.0	0.00	10.08
516	82.192	0.160	1.67	73	-2.20	127	-0.037	76.0	0.00	9.82
517	82.351	0.159	1.66	73	-2.30	127	-0.037	77.3	0.00	9.85
518	82.510	0.159	1.68	73	-2.10	127	-0.037	78.0	0.00	9.95
519	82.670	0.160	1.67	73	-2.40	126	-0.037	78.0	0.00	9.79
520	82.829	0.159	1.66	73	-2.10	126	-0.037	76.7	0.00	9.61
521	82.988	0.159	1.68	73	-2.10	126	-0.037	77.3	0.00	9.54
522	83.148	0.160	1.66	73	-2.30	126	-0.037	77.7	0.00	9.41
523	83.307	0.159	1.67	73	-2.30	126	-0.037	79.0	0.00	9.40
524	83.466	0.159	1.67	73	-2.10	127	-0.037	77.7	0.00	9.31
525	83.626	0.160	1.67	73	-2.30	126	-0.037	79.6	0.00	9.43
526	83.785	0.159	1.66	73	-2.40	125	-0.037	79.0	0.00	9.28
527	83.943	0.158	1.67	73	-2.40	126	-0.037	80.0	0.00	9.24
528	84.103	0.160	1.67	73	-2.10	126	-0.037	79.0	0.00	9.19
529	84.262	0.159	1.66	73	-2.30	125	-0.037	78.0	0.00	8.99
530	84.421	0.159	1.68	73	-2.20	125	-0.038	78.3	0.00	8.96
531	84.581	0.160	1.66	73	-2.30	126	-0.038	76.4	0.00	8.75
532	84.740	0.159	1.66	73	-2.30	126	-0.037	78.0	0.00	8.86
533	84.899	0.159	1.68	73	-2.20	126	-0.037	76.0	0.00	8.75
534	85.059	0.160	1.67	73	-2.10	125	-0.037	79.3	0.00	8.83
535	85.218	0.159	1.67	73	-2.10	125	-0.037	77.3	0.00	9.57
536	85.378	0.160	1.67	73	-2.10	125	-0.036	74.8	0.00	10.36

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
537	85.537	0.159	1.66	73	-2.40	125	-0.036	74.8	0.00	10.34
538	85.696	0.159	1.66	73	-2.10	126	-0.036	77.3	0.00	10.16
539	85.856	0.160	1.68	73	-2.40	125	-0.037	77.0	0.00	10.09
540	86.016	0.160	1.67	73	-2.10	125	-0.036	77.7	0.00	9.93
541	86.174	0.158	1.67	73	-2.40	125	-0.037	78.7	0.00	9.93
542	86.334	0.160	1.67	73	-2.10	125	-0.037	81.9	0.00	9.73
543	86.494	0.160	1.67	73	-2.10	125	-0.037	82.2	0.00	9.66
544	86.652	0.158	1.66	73	-2.10	124	-0.037	84.5	0.00	9.62
545	86.812	0.160	1.68	73	-2.30	125	-0.037	83.9	0.00	9.62
546	86.971	0.159	1.66	73	-2.30	125	-0.037	83.9	0.00	9.41
547	87.130	0.159	1.66	73	-2.40	125	-0.037	86.4	0.00	9.43
548	87.290	0.160	1.67	73	-2.10	125	-0.037	85.8	0.00	9.28
549	87.449	0.159	1.67	73	-2.30	125	-0.036	73.1	0.00	10.26
550	87.608	0.159	1.67	73	-2.10	167	-0.070	70.6	0.00	10.50
551	87.768	0.160	1.68	73	-2.20	162	-0.038	23.3	0.00	9.54
552	87.927	0.159	1.66	73	-2.10	151	-0.037	56.6	0.00	13.21
553	88.086	0.159	1.66	73	-2.10	142	-0.037	88.4	0.00	12.24
554	88.246	0.160	1.67	73	-2.30	138	-0.038	83.5	0.00	12.08
555	88.406	0.160	1.67	73	-2.30	136	-0.037	92.3	0.00	11.96
556	88.564	0.158	1.67	73	-2.10	134	-0.037	107.2	0.01	12.08
557	88.724	0.160	1.68	73	-2.10	133	-0.037	101.0	0.01	11.81
558	88.884	0.160	1.66	73	-2.10	132	-0.037	96.5	0.00	12.00
559	89.043	0.159	1.66	73	-2.30	131	-0.038	102.0	0.01	11.98
560	89.202	0.159	1.67	73	-2.10	132	-0.038	98.4	0.00	11.88
561	89.362	0.160	1.67	73	-2.10	131	-0.037	96.5	0.00	11.80
562	89.521	0.159	1.67	73	-2.10	130	-0.037	95.8	0.00	11.80
563	89.681	0.160	1.68	73	-2.10	131	-0.037	101.4	0.01	11.86
564	89.841	0.160	1.66	73	-2.20	133	-0.039	93.2	0.00	11.50
565	90.000	0.159	1.66	73	-2.40	135	-0.039	88.7	0.00	11.54
566	90.159	0.159	1.67	73	-2.20	136	-0.040	96.2	0.00	11.84
567	90.319	0.160	1.67	73	-2.30	136	-0.039	95.5	0.00	11.92
568	90.478	0.159	1.67	73	-2.10	137	-0.040	99.4	0.00	12.04
569	90.638	0.160	1.67	73	-2.20	139	-0.040	101.7	0.01	12.15
570	90.798	0.160	1.67	73	-2.40	141	-0.040	106.6	0.01	12.41
571	90.957	0.159	1.66	73	-2.20	142	-0.040	107.8	0.01	12.89
572	91.116	0.159	1.67	73	-2.30	144	-0.040	104.9	0.01	12.95

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
573	91.276	0.160	1.68	73	-2.10	145	-0.041	114.3	0.01	13.32
574	91.435	0.159	1.67	73	-2.10	145	-0.041	112.7	0.01	13.43
575	91.595	0.160	1.68	73	-2.10	144	-0.042	108.5	0.01	13.17
576	91.755	0.160	1.67	73	-2.10	145	-0.042	103.3	0.01	12.84
577	91.914	0.159	1.66	73	-2.40	146	-0.042	103.6	0.01	12.77
578	92.074	0.160	1.67	73	-2.10	146	-0.042	100.4	0.00	12.86
579	92.233	0.159	1.68	73	-2.20	147	-0.043	96.8	0.00	12.61
580	92.393	0.160	1.66	73	-2.30	148	-0.042	94.9	0.00	12.58
581	92.553	0.160	1.67	73	-2.30	147	-0.043	93.2	0.00	12.78
582	92.712	0.159	1.68	73	-2.10	147	-0.043	93.2	0.00	12.57
583	92.872	0.160	1.66	73	-2.40	147	-0.043	92.6	0.00	12.60
584	93.031	0.159	1.66	73	-2.10	147	-0.043	93.6	0.00	12.74
585	93.191	0.160	1.67	73	-2.40	148	-0.043	97.1	0.00	12.99
586	93.351	0.160	1.67	73	-2.30	149	-0.043	94.9	0.01	13.05
587	93.510	0.159	1.67	73	-2.30	149	-0.043	97.1	0.00	13.21
588	93.669	0.159	1.68	73	-2.30	149	-0.044	97.4	0.00	13.37
589	93.829	0.160	1.67	73	-2.30	149	-0.043	91.6	0.00	13.19
590	93.989	0.160	1.67	73	-2.10	150	-0.044	89.4	0.00	13.22
591	94.149	0.160	1.68	73	-2.30	150	-0.044	87.1	0.00	12.95
592	94.309	0.160	1.67	73	-2.40	150	-0.044	86.7	0.00	12.88
593	94.468	0.159	1.67	73	-2.10	151	-0.043	87.4	0.00	12.73
594	94.628	0.160	1.67	73	-2.20	151	-0.043	85.8	0.00	12.39
595	94.787	0.159	1.67	73	-2.20	150	-0.043	89.4	0.00	12.45
596	94.946	0.159	1.67	73	-2.10	150	-0.043	85.8	0.00	12.05
597	95.107	0.161	1.67	73	-2.10	151	-0.043	85.1	0.00	11.89
598	95.266	0.159	1.66	73	-2.30	151	-0.043	91.9	0.00	12.07
599	95.426	0.160	1.67	73	-2.20	151	-0.043	89.0	0.00	12.05
600	95.585	0.159	1.67	73	-2.10	151	-0.043	86.8	0.00	11.91
601	95.745	0.160	1.67	73	-2.40	150	-0.042	85.1	0.00	11.92
602	95.905	0.160	1.67	73	-2.40	150	-0.043	84.5	0.00	11.93
603	96.064	0.159	1.67	73	-2.30	150	-0.043	85.1	0.00	11.91
604	96.224	0.160	1.67	73	-2.10	150	-0.044	84.2	0.00	11.98
605	96.383	0.159	1.66	73	-2.40	150	-0.043	86.4	0.00	12.18
606	96.543	0.160	1.67	73	-2.20	151	-0.043	83.2	0.00	12.08
607	96.703	0.160	1.67	73	-2.10	148	-0.043	84.5	0.00	12.02
608	96.862	0.159	1.66	73	-2.30	148	-0.043	82.2	0.00	11.95

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
609	97.022	0.160	1.68	73	-2.10	149	-0.043	83.2	0.00	11.93
610	97.182	0.160	1.68	73	-2.10	149	-0.043	83.8	0.00	11.78
611	97.341	0.159	1.67	73	-2.30	149	-0.043	84.8	0.00	11.76
612	97.501	0.160	1.67	73	-2.10	149	-0.043	84.5	0.00	12.00
613	97.661	0.160	1.67	73	-2.10	148	-0.043	83.2	0.00	11.86
614	97.821	0.160	1.67	73	-2.20	149	-0.042	80.9	0.00	11.51
615	97.980	0.159	1.66	73	-2.30	149	-0.043	83.2	0.00	11.60
616	98.140	0.160	1.68	73	-2.30	148	-0.042	89.0	0.00	11.49
617	98.300	0.160	1.67	73	-2.40	149	-0.043	92.9	0.00	11.63
618	98.459	0.159	1.67	73	-2.20	149	-0.042	92.3	0.00	11.58
619	98.619	0.160	1.67	73	-2.20	148	-0.042	92.6	0.00	11.65
620	98.779	0.160	1.67	73	-2.30	148	-0.042	91.0	0.00	11.52
621	98.938	0.159	1.67	73	-2.20	148	-0.042	91.6	0.00	11.65
622	99.098	0.160	1.68	73	-2.30	147	-0.042	90.7	0.00	11.63
623	99.258	0.160	1.67	73	-2.20	147	-0.042	92.9	0.00	11.41
624	99.417	0.159	1.67	73	-2.10	147	-0.042	89.0	0.00	11.42
625	99.577	0.160	1.68	73	-2.20	147	-0.042	90.0	0.00	11.41
626	99.737	0.160	1.67	73	-2.30	147	-0.042	89.0	0.00	11.30
627	99.896	0.159	1.67	73	-2.10	146	-0.042	88.7	0.00	11.23
628	100.056	0.160	1.68	73	-2.10	148	-0.042	91.9	0.00	12.02
629	100.216	0.160	1.67	73	-2.10	150	-0.042	98.1	0.01	16.31
630	100.376	0.160	1.66	73	-2.30	151	-0.043	1040.0	0.12	16.77
631	100.535	0.159	1.67	73	-2.20	153	-0.045	101.0	0.00	14.65
632	100.695	0.160	1.68	73	-2.10	155	-0.046	124.7	0.01	14.58
633	100.855	0.160	1.67	73	-2.40	158	-0.046	377.3	0.05	15.64
634	101.015	0.160	1.68	73	-2.30	159	-0.047	1040.0	0.43	16.68
635	101.174	0.159	1.68	73	-2.20	162	-0.047	1040.0	0.15	15.91
636	101.334	0.160	1.67	73	-2.10	163	-0.047	378.9	0.03	15.37
637	101.494	0.160	1.67	73	-2.10	163	-0.047	142.5	0.01	15.12
638	101.654	0.160	1.67	73	-2.40	162	-0.047	148.3	0.01	14.34
639	101.814	0.160	1.67	73	-2.10	163	-0.047	192.4	0.02	14.11
640	101.973	0.159	1.67	73	-2.10	162	-0.047	172.3	0.01	13.38
641	102.133	0.160	1.68	73	-2.30	161	-0.047	128.9	0.01	12.96
642	102.293	0.160	1.67	73	-2.10	161	-0.046	68.6	0.00	12.13
643	102.452	0.159	1.67	73	-2.30	160	-0.046	65.0	0.00	11.77
644	102.612	0.160	1.67	73	-2.30	159	-0.045	62.1	0.00	11.27

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 3/5/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 12:15
Total Sampling Time 666 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
645	102.772	0.160	1.66	73	-2.30	157	-0.045	62.1	0.00	11.25
646	102.931	0.159	1.67	73	-2.40	155	-0.045	58.3	0.00	10.83
647	103.091	0.160	1.68	73	-2.10	154	-0.045	58.6	0.00	10.89
648	103.251	0.160	1.68	73	-2.10	151	-0.044	55.6	0.00	10.65
649	103.411	0.160	1.68	73	-2.10	151	-0.044	53.7	0.00	10.38
650	103.571	0.160	1.69	73	-2.30	149	-0.044	52.8	0.00	10.64
651	103.732	0.161	1.69	73	-2.40	148	-0.044	52.1	0.00	10.25
652	103.892	0.160	1.68	73	-2.30	147	-0.044	50.5	0.00	10.25
653	104.052	0.160	1.68	73	-2.10	147	-0.043	50.2	0.00	10.18
654	104.212	0.160	1.68	73	-2.10	146	-0.043	48.6	0.00	9.98
655	104.372	0.160	1.68	73	-2.30	146	-0.042	50.2	0.00	10.07
656	104.532	0.160	1.68	73	-2.40	145	-0.042	49.9	0.00	10.04
657	104.692	0.160	1.68	73	-2.10	143	-0.042	49.5	0.00	9.96
658	104.852	0.160	1.67	73	-2.30	143	-0.042	50.2	0.00	9.84
659	105.012	0.160	1.68	73	-2.30	143	-0.042	48.6	0.00	9.87
660	105.172	0.160	1.68	73	-2.30	141	-0.042	49.5	0.00	9.84
661	105.332	0.160	1.66	73	-2.10	142	-0.042	47.6	0.00	9.58
662	105.491	0.159	1.67	73	-2.40	141	-0.041	47.9	0.00	9.65
663	105.651	0.160	1.68	73	-2.20	139	-0.042	48.2	0.00	9.65
664	105.811	0.160	1.68	73	-2.30	138	-0.041	50.2	0.00	9.87
665	105.971	0.160	1.67	73	-2.10	138	-0.041	49.9	0.00	9.77
666	106.130	0.159	1.68	73	-2.10	138	-0.041	48.5	0.00	10.01

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Tracking No.:	BK30.2
Project No.:	0142WS021E
Run No.:	1
Test Date:	3/5/24

OMNI Eq. ID Numbers	
Analytical Scale	
Audit Weight Set:	
Analytical Scale	
Hydrometer	
Filters are weighed	In Pairs

Train A

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/05/24 @23:35	Filter	F246	240.1	239.7	0.4	0.4
Probe catch*	3/05/24 @23:35	Probe	20	114254.5	114253.9	0.6	0.6
ilter seals catch*	3/05/24 @23:35	Seals	S674	3289.8	3289.2	0.6	0.6
				Total Particulate, mg:		**1.6**	**1.6**

Train B

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/05/24 @23:35	Filter	F247	238.9	238.4	0.5	0.5
Probe catch*	3/05/24 @23:35	Probe	69	117371.4	117370.3	1.1	1.1
ilter seals catch*	3/05/24 @23:35	Seals	S675	3401.5	3401.1	0.4	0.4
			Sub-Total	Total Particulate, mg:		**2.0**	**2.0**

Train C - *First Hour*

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/05/24 @23:35	Filter	F245	238.9	238.9	0.0	0.0
Probe catch*	3/05/24 @23:35	Probe	14	114547.2	114546.3	0.9	0.9
ilter seals catch*	3/05/24 @23:35	Seals	S670	3266.8	3266.4	0.4	0.4
				Total Particulate, mg:		**1.3**	**1.3**

Train D - *Ambient Background*

Sample Component	Date / Time in Dessicator	Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*	3/05/24 @23:35	Filter	F227	123.2	123.1	0.1
				Total Particulate, mg:		**0.1**

Final (mg) - Tare (mg) = Particulate (mg)

NOTE: The Uncorrected values are those where any negative filter weights are taken as a negative value. This can possibly occur when filter matter adheres the O-ring seals and thereby transfers some mass to the O-ring. The Corrected values reflect where any negative filter weights are taken as ZERO, thus not accounting for any transfer of mass and resultingly over-reporting. Corrected values were added to this analysis to report the "Corrected" results in this report in response to a request by the US EPA. In cases where the Final weight minus the Tare weight of the Ambient filter occurs, it is taken as a ZERO. Any negative probe weights are evaluated pursuant to clause of ASTM E25215 (or appropriatelt associated test standard as defined in the introduction of this report).

Technician Signature:_____ Reviewed By:_____

Run 1 - Run Notes

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	1
Test Date:	3/5/2024

This supplemental section of miscellaneous run notes is comprised of the following:

- Appliance Operation Notes
- Velocity Traverse / Supplementa Run Notes
- Test Fuel Notes
- Gravimetric Analysis Notes

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 1

Model: AF30.2 Tracking Number: 2254 Date: 03/05/2024

Test Crew: T. Tong K. Morgan

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

Closed 80° From Full Open

Secondary: N/A

Tertiary/Pilot: N/A

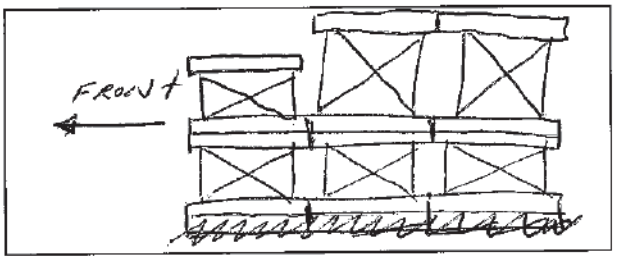
Fan: ON - Low duration of test.

Preburn Notes

Time	Notes
~~10:21~~ 11:10	@ 13.2 lbs. adding 0.2 lb due to flue gas probe installation ~~Reset~~ Recording Preburn @ 4.5 lbs (4.3 lbs on scale

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: open 45 sec

Fuel loaded by: 45 sec

Door closed at: 45 sec

Primary air: No Adjustment

Notes:

Time	Notes
12:15	Test started
13:15	First hour sampling ended
15:43	Gas analyzer impinger service

2125: Stir was conducted to prevent a seize in combustion (3.0 lbs)

2321: Test complete

Technician Signature: K. Morgan Date: 3/5/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 1

Model: AF30.2 Tracking Number: 2254 Date: 03/05/2024

Test Crew: T. Tong K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 12:15 Booth #: 1

Stop Time: 23:21

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Sample Train Leak Check:

PRE-TEST

Before A: 0.000 @ 17.12" Hg

B: 0.000 @ 18.1" Hg

A1 0.000 @ 23.8" Hg

Post-Test

After A 0.002 @ 17 "Hg

B 0.002 @ 18 "Hg

A1 0.000 @ 5.96" Hg

Calibrations: Span Gas CO_2: 16.86% CO: 4.37%, CO 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	10:11	10:12	2127	2129
CO_2 %	0.00	16.86	0	16.87
CO %	0.00	4.38	0.02	4.38
CO ppm	0.0	493	-3	493

Air Velocity (ft/min): Initial: 16 Final: 0

Scale Audit (lbs): Initial: 20 Final: 20

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 6

Induced Draft: 0.000

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 03/05/24 Initials: TT

	Initial	Middle	Ending
P_b (in/Hg)	30.01	29.99	30.05
RH (%)	25	32	29
Ambient (°F)	71	70	70

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
.027	.054	76
.040	.080	76
.045	.090	76
.025	.050	76
.027	.054	76
.045	.090	75
.041	.082	75
.030	.060	75
Center:		
.046,050	0.090,0.100	76

K K

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.40	-0.40

Background Filter Volume: _____

Technician Signature: M. Morgan Date: 3/5/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 1

Model: AF30.2 Tracking Number: 2254 Date: 03/05/2024

Test Crew: K. Morgan, T. Tang

OMNI Equipment ID numbers:

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0

Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16.75 in	22.5	7	16.75 in	22.2
2	16.75 in	22.1	8	16.75 in	24.3
3	16.75 in	22.0	9	16.75 in	18.5
4	16.75 in	24.2	10	16.75 in	23.0
5	16.75 in	23.8	11	in	
6	16.75 in	21.7	12	in	

Total Pre-Burn Fuel Weight: 19.9 Pre-Burn Fuel Average Moisture: 22.43 %DB

Time (clock): 09:05 Room Temperature (F): 71 Initials: K

Test Fuel

Firebox Volume (ft³): ~~2.944~~ 2.874 K Test Fuel Piece Length (in): 16.75

Load Weight Range (lb): ~~18.4 - 22.4~~ K Total Wet Fuel Load Weight (lb): 18.7 (3.8, 4.6)

Fuel Type & Amount: 2 x 4: 4 4 x 4: 2

Weight (with spacers): 9.5 Weight (with spacers): 9.2

Piece:	Weight (lbs):	Moisture Readings (%DB): ↓ 8 K			Fuel Type:
1	2.0 ~~+9~~ / 2.4	23.8	21.3	22.7	2x4
2	1.8 / 2.3	22.0	20.1	21.6	2x4
3	1.9 / 2.4	24.3	19.7	23.8	2x4
4	1.9 / 2.4	25.4	24.9	22.2	2x4
5	4.0 / 4.5	20.3	20.0	22.2	4x4
6	4.1 / 4.7	24.8	24.6	22.0	4x4
7					

Spacer Moisture Readings (%DB) NOT USED

22.4	22.5	18.5	24.2	21.1	~~24.2~~	24.9	18.8
23.8	18.9	24.4	23.3	21.2	~~24.6~~	21.1	22.2
15.9	18.4	13.2	20.2	16.1	24.7	24.4	20.0
24.8							

Time (clock): 10:21 Room Temperature (F): 70 Initials: K

Technician Signature: K. Morgan Date: 3/5/24

0.62@ 0.20/0.20
1.58/1.58

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 1

Model: AF30.2 Tracking Number: 2254 Date: 03/05/2024

Test Crew: T. Tang, K. Morgan

OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: Tony Tang 8:30 →

Date/Time in Dessicator: 2335 3-5-24

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/11/24	3/11/24 15:40			
R/H %:	29	33			
Temp:	65	67			
200 mg Audit:	200.0	200.0			
2 g Audit:	2000.2	2000.3			
100 g Audit:	99997.7	99997.9			
Initials:	K	K			

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	✓ Front Filter	F245/A	238.9	238.9	238.9			
	Rear Filter							
	✓ Probe	14	114546.3	114547.0	114547.2			
	✓ O-Ring Set	S670	3266.4	3266.7	3266.8			
A	✓ Front Filter	F246/A	239.7	240.2	240.1			
	Rear Filter							
	✓ Probe	20	114253.9	114254.7	114254.5			
	✓ O-Ring Set	S674	3289.2	3289.7	3289.8			
B	✓ Front Filter	F247/A	238.4	238.8	238.9			
	Rear Filter							
	✓ Probe	69	117370.3	117371.3	117371.4			
	✓ O-Ring Set	S675	3401.1	3401.4	3401.5			
BG	✓ Filter	F227	123.1	123.1	123.2			

Technician Signature: K. Morgan Date: 3/11/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	1

Sample calculations of each equation used in the refernced standards for this test run.

Summary of INPUT values necessary for calculations

	Global Input Parameters for Equations	Value	Source
FM_S	- Average moisture of test fuel spacers, % dry basis	21.21	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	3.1	Fuel Properties Work Sheet
M_{CPnwb}	- Weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis , kg	[1]Varies	Fuel Properties Work Sheet
FM_{CPn}	- Average fuel Fuel moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.441	Fuel Properties Work Sheet
V_{SCENT}	- Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse, ft/sec	0.00	Traverse Worksheet
V_{STRAV}	- Average gas velocity calculated after the multipoint Pitot traverse	14.56	Traverse Worksheet
θ	- Duration of test, min	666	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.03	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

[1] *Denotes that this pararmeter for each individual piece of fuel is calculated in the Test Fuel Properties worksheet and the input values are pulled into these sample caculations.*

	Sample Train Input Parameters for Equations	Train A	Train B	Train C	Train D
V_m	- Volume of gas sample measured at the dry gas meter, dcf	106.835	107.063	9.568	106.13
Y	Dry gas meter calibration factor	1.016	1.011	1.015	1.011
ΔH	- Average pressure differential across the orifice meter, in. H_2O	1.24	0.94	2.15	1.67
T_m	- Temperature of Dry Gas Meter, °F	82.0	81.7	70.1	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.6	1.1	0.9	n/a
m_f	- mass of particulate matter from filters, mg	0.4	0.5	0.0	0.1
m_g	- mass of particulate matter from filter seals, mg	0.6	0.4	0.4	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.6	1.1	0.9	n/a
m_f	- mass of particulate matter from filters, mg	0.4	0.5	0.0	n/a
m_g	- mass of particulate matter from filter seals, mg	0.6	0.4	0.4	n/a

M_{Sdb} – Weight of test fuel spacers, dry basis, kg - ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})\left(\frac{100}{100 + FM_S}\right)$$

Where,

FM_S = average moisture of test fuel spacers, % dry basis
M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 21.21 %, dry basis
M_{Swb} = 3.1 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((3.1 x 0.4536) (100 / (100 + 21.21))

M_{Sdb} = **1.160** kg

MCdb– Weight of test fuel crib, excluding nails and spacers, dry basis, kg - ASTM E2780 equation (2)

$$M_{Cdb} = \sum (M_{CPnwb})\left(\frac{100}{100 + FM_{CPn}}\right)$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation:

ΣM_{CPnwb} = 15.6 lb.
FM_{CPn} = 22.50 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 15.6 x 0.4536 x (100 / (100 + 22.5))

M_{Cdb} = **5.78** kg

DCdb - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft3 - ASTM E2780 equation (3)

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

Where,

V_C = Volume of Fuel Crib, ft³ (less spacers)

Sample Calculation:

M_{Cdb} = 12.73 lb
V_C = 0.441 ft³

D_{Cdb} = 12.73 / 0.441

D_{Cdb} = **28.87** lb/ft³

M_{FTAdb} - Total weight of fuel crib including spacers and nails, dry basis - ASTM E2780 equation (4)

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

Sample Calculation:

M_{Sdb} = 1.160
M_{Cdb} = 5.78

M_{FTAdb} = 1.16 + 5.78

M_{FTAdb} = **6.94** kg

BR – dry burn rate, kg/hr - ASTM E2780 equation (5)

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

Sample Calculation:

M_{FTAdb} = 6.937
θ = 666

BR = (60 x 6.937) / 666

BR = **0.62** kg / hr

***Vs* – Average gas velocity in the dilution tunnel, ft/sec -** ASTM E2515 equation (9)

$$V_S = F_P \times K_P \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where

F_P = Adjustment factor for center of tunnel pitot tube placement, where $F_P = V_{STRAV} / V_{SCENT}$

V_{SCENT} = Dilution tunnel velocity, at the center, ft/sec

V_{STRAV} = Dilution tunnel velocity, multi-point pitot traverse, ft/sec

K_P = Pitot tube constant, 85.49

C_P = Pitot tube coefficient: 0.99, unitless

$\Delta P^{1/2}_{AVG}$ = Velocity pressure in the dilution tunnel, in H_2O

$T_{S\,(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R

P_S = Absolute average gas static pressure in tunnel, = Pbar + Pg , where Pbar = Barometric Pressure, in. Hg, Pg = Static pressure in tunnel, Hg (in H_2O / 13.6)

M_S = The dilution tunnel wet molecular weight; Ms = 28.78 assuming a dry weight of 29 lb/lb-mole

(Duration of Test)

F_P = 0.8308

$\Delta P^{1/2}_{AVG}$ = 0.3115

$T_{S\,(avg)}$ = 538.3583

Pbar = 30.0300

Pg = -0.4000

Ps = 30.0006

V_S = 0.831 x 85.49 x 0.99 x 0.312 x √ [(538 / (30 x 28.78)]

V_S = **17.298** ft/sec

(First Hour of Test)

F_P = 0.8308

$\Delta P^{1/2}_{AVG}$ = 0.3131

$T_{S\,(avg)}$ = 539.8033

Pbar = 30.0100

Pg = -0.4000

Ps = 29.9806

V_S = 0.831 x 85.49 x 0.99 x 0.313 x √ [(540 / (29.98 x 28.78)]

V_S = **17.415** ft/sec

Q_{std} – Average gas flow rate in dilution tunnel, dscf/hr - ASTM E2515 equation (3)

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

Where:

3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
A = Cross sectional area of dilution tunnel, ft2
T_{std} = solute temperature, 528 °R
P_s = Absolute average gas static pressure in dilution tunnel, = Pbar + Pg , in Hg
$T_{s(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std} = Standard absolute pressure, 29.92 in Hg

(Duration of Test):

B_{ws} = 0.02
A = 0.19635
P_s = 30.00
$T_{s(avg)}$ = 538
Vs = 17.30

Qstd = 3600 x (1 - 0.02) x 17.298 x 0.19635 x (528 / 538) x (30 / 29.92)

Qstd = **11783.5** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 29.98
$T_{s(avg)}$ = 540
Vs = 17.415

Qstd = 3600 x (1 - 0.02) x 17.415 x 0.1963 x (528 / 540) x (29.98 / 29.92)

Qstd = **11823.6** dscf/hr

Vm(std) – Volume of Gas Sampled (Corrected), 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
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Train A

$$V_{m(std)} = 17.64 \times 106.835 \times 1.016 \times \frac{(30.03 + \frac{1.24}{13.6})}{(82.0 + 460)}$$

$V_{m(std)}$ = **106.417** dscf

Train B

$$V_{m(std)} = 17.64 \times 107.063 \times 1.011 \times \frac{(30.03 + \frac{0.94}{13.6})}{(82 + 460)}$$

$V_{m(std)}$ = **106.096** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.57 \times 1.015 \times \frac{(\underline{30.01} + \frac{2.15}{13.6})}{(70.1 + 460)}$$

$V_{m(std)}$ = **9.748** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 106.13 \times 1.011 \times \frac{(\underline{30.03} + \frac{1.67}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **105.882** dscf

mn – 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 Calculations (Uncorrected):

Train A

m_n = 0.6 + 0.4 + 0.6

m_n = **1.6** mg

Train B

m_n = 1.1 + 0.5 + 0.4

m_n = **2.0** mg

Train C (1st hour)

m_n = 0.9 + 0.0 + 0.4

m_n = **1.3** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

Sample Calculations (Corrected):

Train A

m_n = 0.6 + 0.4 + 0.6

m_n = **1.6** mg

Train B

m_n = 1.1 + 0.5 + 0.4

m_n = **2.0** mg

Train C (1st hour)

m_n = 0.9 + 0.0 + 0.4

m_n = **1.3** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions

g/dscf - ASTM E2515 equation (13)

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

Where:

K_2 = Constant, 0.001 g/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample Calculations (Uncorrected):

Train A

$$C_s = 0.001 \times \frac{1.6}{106.42}$$

C_s = **0.000015** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.0}{106.10}$$

C_s = **0.0000189** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.3}{9.75}$$

Cs = **0.000133** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{105.88}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{1.6}{106.42}$$

C_s = **0.000015** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.0}{106.10}$$

C_s = **0.0000189** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.3}{9.75}$$

Cs = **0.000133** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{105.88}$$

C_r = **0.000000** g/dscf

ET – Total Particulate Emissions, g - ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculations (uncorrected)

Train A

E_T = (0.000015 - 0.000000) x 11783.5 x 666 / 60

E_T = **1.97** g

Train B

E_T = (0.000019 - 0.000000) x 11783.5 x 666 / 60

E_T = **2.47** g

First Hour

E_T = (0.000133 - 0.000000) x 11823.6 x 60 / 60

E_T = 1.58 g

Trains A and B Average

E = **2.22** g

Sample calculations (Corrected)

Train A

E_T = (0.000015 - 0.000000) x 11783.5 x 666 / 60

E_T = **1.97** g

Train B

E_T = (0.000019 - 0.000000) x 11783.5 x 666 / 60

E_T = **2.47** g

First Hour

E_T = (0.000133 - 0.000000) x 11823.6 x 60 / 60

E_T = **1.58** g

Trains A and B Average

E_T = **2.22** g

PM_R – Particulate emissions for test run, g/hr - ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation (Uncorrected)

Train A

E_T = 1.97 g

θ = 666 min

$PM_R = 60 \times (1.97 / 666)$

PM_R = **0.18** g/hr

Train B

E_T = 2.47 g

θ = 666 min

$PM_R = 60 \times (2.47 / 666)$

PM_R = **0.22** g/hr

A and B Average

E_T = **0.20** g/hr

First Hour

E_T = 1.58 g

θ = 60 min

$PM_R = 60 \times (1.58 / 60)$

PM_R = **1.58** g/hr

Sample Calculation (Corrected)

Train A

E_T = 1.97 g

θ = 666 min

$PM_R = 60 \times (1.97 / 666)$

PM_R = **0.18** g/hr

Train B

E_T = 2.47 g

θ = 666 min

$PM_R = 60 \times (2.47 / 666)$

PM_R = **0.22** g/hr

A and B Average

E_T = **0.20** g

First Hour

E_T = 1.58 g

θ = 60 min

$PM_R = 60 \times (1.58 / 60)$

PM_R = **1.58** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned - ASTM E2780 equation (7)

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

Sample Calculation (Uncorrected)

Train A

E_T = 1.97 g
M_{FTAdb} = 6.94 kg
PM_F = 1.97 / 6.94
PM_F = **0.28** g/kg

Train B

E_T = 2.47 g
M_{FTAdb} = 6.94 kg
PM_F = 2.47 / 6.94
PM_F = **0.36** g/kg

Sample Calculation (Corrected)

Train A

E_T = 1.97 g
M_{FTAdb} = 6.94 kg
PM_F = 1.97 / 6.94
PM_F = **0.28** g/kg

Train B

E_T = 2.47 g
M_{FTAdb} = 6.94 kg
PM_F = 2.47 / 6.94
PM_F = **0.36** g/kg

PR - Proportional Rate Variation - ASTM E2515 equation (16)

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

Where:			Train A	Train B	Train C
θ	=	Total sampling time, min	666	666	60
θ_i	=	Length of recording interval, min	1	1	1
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.16	0.162	0.161
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	106.835	107.063	9.568
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	17.686	17.686	17.686
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	17.298	17.298	17.414
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	534.0	534.0	530.0
T_m	=	Absolute average dry gas meter temperature, ^oR	542.0	541.7	530.1
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	545.0	545.0	545.0
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	538.4	538.4	539.8

NOTE: These sample calculations are for the Second interval of each train)

Train A PR = $\left(\frac{666 \times 0.16 \times 17.298 \times 542 \times 545}{1 \times 106.835 \times 17.686 \times 534 \times 538}\right)$ X 100 = 100.2 %

Train B PR = $\left(\frac{666 \times 0.162 \times 17.298 \times 542 \times 545}{1 \times 107.063 \times 17.686 \times 534 \times 538}\right)$ X 100 = 101.2 %

Train B PR = $\left(\frac{60 \times 0.161 \times 17.414 \times 530 \times 545}{1 \times 9.568 \times 17.686 \times 530 \times 540}\right)$ X 100 = 100.4 %

Run 2 Test Data

Test Date:	3/6/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	Ashford 30.2

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Project No.: 0142WS021E
Tracking No.: BK30.2
Run: 2
Test Date: 03/06/24

Burn-Rate Result

1.07 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	4.15	4.15	2.31	2.31
Emission Rate, g/hr	**0.62**	0.62	**2.31**	2.31
Emissions Factor, g/kg	0.58	0.58	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		84.2	79.7
Average Tunnel Gas Velocity (vs), feet/second		18.176	18.091
Average Tunnel Gas Flow Rate(Qsd),	DSCF/hr	12264.5	12319.9
	DSCF/min	204.4	205.3
Average Delta p, in. H2O		0.098	0.098
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	401

Particulate Sample Measurement Parameters

	Uncorrected				*Corrected*			
	AMBIENT	Train A	Train B	First Hour	AMBIENT	Train A	Train B	First Hour
Total Sample Volume (V_m), ft^3	64.143	65.689	65.275	9.856	64.143	65.689	65.275	9.856
Average Gas Meter Temperature, °F	79	79	79	69	79	79	79	69
Total Sample Volume (V_{mstd}), DSCF	64.135	65.959	65.175	10.093	64.135	65.959	65.175	10.093
Total Particulates (mn), mg - m_n	0.0	3.1	3.5	1.9	0.0	3.1	3.5	1.9
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00005	0.00005	0.00019	0.00000	0.00005	0.00005	0.00019
Total Particulate Emissions (ET), grams	n/a	3.87	4.42	2.31	n/a	3.87	4.42	2.31
Particulate Emission Rate, g/hr	n/a	0.58	0.66	2.31	n/a	0.58	0.66	2.31
Emissions Factor, g/kg	n/a	0.54	0.62	n/a	n/a	0.54	0.62	n/a
Difference, ET from from Average ET, grams	n/a	-0.28	0.28	n/a	n/a	-0.28	0.28	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	70	69	69	✓
Filter Face Velocity, fpm	< 30	9.11	8.84	8.84	✓
Dryer Exit Temperature, °F	< 80	64	59	60	✓
Tunnel Velocity, fpm	>800	1,091	1,085		✓
First Hour Leakage	0.007	0.000			✓
Train A Leakage Rate	0.007		0.000		✓
Train B Leakage Rate	0.007			0.000	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.9	0.4	0.9	✓
Pro-Rate Variation	< 90 for < 10% of θ	1.67%	0.00%	0.00%	✓
	> 110 for < 10% of θ	0.00%	0.000%	0.00%	✓
	# Readings < 80%	0	0	0	✓
	# Readings > 120%	0	0	0	✓
Ambient Temp, °F	> 55		67		✓
Ambient Temp, °F	< 90		72		✓
Trains A and B Precision	(*A*) < 7.5%		6.66%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.08		✓
Stove Surface ΔT	<= 125 °F		23		✓
Room Air Velocity	< 50 fpm		10		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	2
Test Date:	3/6/2024

Efficiency results reported herein are based on a stack-loss method in accordance with CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". OMNI uses the spreadsheet provided by CSA that is to be used in conjunction with the current version of the test standard. The most recent version of the software is version 2.4, dated April 15, 2010. OMNI received confirmation from CSA on October 18, 2023 that this is the current version of the software.

Stack Loss Efficiency

Manufacturer: Valley Comfort
Model: AF30.2
Date: 03/06/24
Run: 2
Control #: 2254
Test Duration: 401
Output Category: II

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	83.6%	90.4%
Combustion Efficiency	98.8%	98.8%
Heat Transfer Efficiency	85%	91.5%

Output Rate (kJ/h)	17,649	16,742	**(Btu/h)**
Burn Rate (kg/h)	1.07	2.35	**(lb/h)**
Input (kJ/h)	21,099	20,015	**(Btu/h)**

Test Load Weight (dry kg)	7.12	15.69	**dry lb**
MC wet (%)	16.99		
MC dry (%)	20.47		
Particulate (g)	4.15		
CO (g)	128		
Test Duration (h)	6.68		

Emissions	**Particulate**	**CO**
g/MJ Output	0.04	1.09
g/kg Dry Fuel	0.58	18.04
g/h	0.62	19.22
lb/MM Btu Output	0.08	2.53

Air/Fuel Ratio (A/F)	8.73

VERSION: **2.4** **4/15/2010**

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	AF30.2				
Date:	3/6/2024		**Temp. Units**	F	(F or C)
Run:	2		**Weight Units**	lb	(kg or lb)
Control #:	2254				
Test Duration:	401				
Output Category:	II		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	16.99		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	18.90		**%C**	48.73	
Burn Rate (dry kg/h):	1.06		**%H**	6.87	
Total Particulate Emissions:	4.15 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.23**	**12.85**	**#DIV/0!**	**213.25**	**69.75**
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	18.90	0.07	2.49		302.0	70.0
1	18.90	0.15	1.05		282.0	70.0
2	18.80	0.11	6.45		251.0	70.0
3	18.80	0.01	6.68		232.0	70.0
4	18.70	0.00	6.36		224.0	70.0
5	18.70	0.01	6.22		220.0	70.0
6	18.70	0.01	5.58		218.0	70.0
7	18.60	0.01	5.90		218.0	70.0
8	18.50	0.00	12.59		221.0	70.0
9	18.50	0.00	10.28		224.0	70.0
10	18.40	0.00	11.08		228.0	70.0
11	18.30	0.00	11.24		232.0	70.0
12	18.20	0.00	10.01		233.0	71.0
13	18.20	0.00	9.92		234.0	70.0
14	18.10	0.00	9.89		236.0	70.0
15	18.00	0.00	10.25		237.0	71.0
16	17.90	0.00	10.19		238.0	71.0
17	17.90	0.00	9.74		241.0	70.0
18	17.80	0.00	9.56		241.0	70.0
19	17.70	0.00	9.80		242.0	71.0
20	17.60	0.00	9.88		244.0	70.0
21	17.60	0.00	9.86		245.0	71.0
22	17.50	0.00	9.65		246.0	71.0
23	17.40	0.00	9.36		248.0	71.0
24	17.30	0.00	9.33		248.0	70.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	17.20	0.00	9.51		247.0	71.0
26	17.20	0.00	9.69		248.0	71.0
27	17.10	0.00	10.57		250.0	71.0
28	17.00	0.00	10.74		251.0	71.0
29	16.90	0.00	10.26		252.0	71.0
30	16.80	0.00	10.02		252.0	71.0
31	16.70	0.00	9.89		253.0	71.0
32	16.70	0.00	10.05		254.0	71.0
33	16.60	0.00	10.20		254.0	71.0
34	16.50	0.00	10.54		254.0	71.0
35	16.40	0.01	10.82		257.0	71.0
36	16.30	0.01	11.29		258.0	72.0
37	16.20	0.01	11.58		261.0	71.0
38	16.10	0.01	11.98		262.0	71.0
39	16.00	0.01	12.96		264.0	71.0
40	15.90	0.01	13.28		266.0	71.0
41	15.80	0.00	14.62		271.0	71.0
42	15.70	3.75	16.64		277.0	72.0
43	15.50	2.70	17.14		281.0	71.0
44	15.40	0.62	16.90		285.0	71.0
45	15.30	0.03	15.14		285.0	71.0
46	15.20	0.00	13.05		282.0	71.0
47	15.10	0.00	12.07		277.0	71.0
48	15.00	0.00	11.35		272.0	71.0
49	15.00	0.00372	11.05		269	71
50	14.90	0.00323	12.33		267	71
51	14.80	0.00333	12.83		267	71
52	14.70	0.00336	12.94		267	71
53	14.60	0.00378	12.03		268	71
54	14.50	0.00404	12.14		264	72
55	14.50	0.0042	11.01		263	71
56	14.40	0.01	10.43		263	72
57	14.30	0.01	10.34		260	72
58	14.30	0.00433	10.35		260	71
59	14.20	0.0043	10.68		257	71
60	14.10	0.01	10.86		256	71
61	14.10	0.01	10.86		256	71
62	14.00	0.01	11.39		255	71
63	13.90	0.01	11.87		254	71
64	13.80	0.01	12.28		256	71
65	13.80	0.01	12.42		257	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	13.70	0.01	12.91		257	72
67	13.60	0.01	12.58		259	72
68	13.50	0.01	12.94		257	72
69	13.50	0.01	13.42		259	72
70	13.40	0.01	13.9		261	72
71	13.30	0.01	14.61		262	72
72	13.20	0.04	14.99		265	71
73	13.10	0.07	14.68		266	71
74	13.00	0.09	14.64		267	71
75	12.90	0.08	14.81		270	71
76	12.80	0.05	14.11		267	71
77	12.70	0.04	14.83		267	71
78	12.60	0.02	14.43		267	71
79	12.60	0.02	13.75		265	71
80	12.50	0.01	13.49		262	70
81	12.40	0.01	13.17		262	70
82	12.30	0.01	12.91		261	70
83	12.30	0.01	13		259	69
84	12.20	0.01	12.13		258	69
85	12.10	0.01	11.95		256	70
86	12.10	0.01	11.42		254	70
87	12.00	0.01	11.85		252	70
88	12.00	0.01	11.74		252	70
89	11.90	0.01	11.87		251	69
90	11.80	0.01	11.81		247	69
91	11.80	0.01	11.88		247	69
92	11.70	0.01	12.32		246	70
93	11.60	0.01	12.59		246	70
94	11.60	0.01	12.72		247	69
95	11.50	0.01	12.94		248	70
96	11.40	0.01	13.12		250	69
97	11.40	0.01	13.36		251	70
98	11.30	0.01	13.53		251	70
99	11.30	0.01	13.59		250	70
100	11.20	0.01	13.78		253	69
101	11.10	0.01	13.79		254	69
102	11.00	0.01	13.97		255	69
103	11.00	0.01	13.88		255	70
104	10.90	0.01	14.05		255	69
105	10.80	0.01	13.66		255	69
106	10.80	0.03	13.8		254	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	10.70	0.04	13.8		254	70
108	10.60	0.04	13.77		251	70
109	10.60	0.02	13.95		250	70
110	10.50	0.03	13.68		249	70
111	10.40	0.07	14.07		245	70
112	10.40	0.02	13.72		246	70
113	10.30	0.02	13.74		243	70
114	10.30	0.03	13.66		244	71
115	10.20	0.03	13.82		242	71
116	10.10	0.05	14.53		242	71
117	10.10	0.04	14.4		241	71
118	10.00	0.06	14.45		241	71
119	9.90	0.06	14.47		239	71
120	9.90	0.1	14.88		237	71
121	9.80	0.14	14.49		237	71
122	9.70	0.21	14.86		239	71
123	9.70	0.21	14.25		239	70
124	9.60	0.27	14.41		237	71
125	9.50	0.34	14.97		236	71
126	9.50	0.36	14.98		235	71
127	9.40	0.46	15.06		234	71
128	9.30	0.55	14.91		236	71
129	9.30	0.59	15.18		235	71
130	9.20	0.55	14.85		238	71
131	9.10	0.63	15.36		235	71
132	9.00	0.62	15.53		234	71
133	9.00	0.7	15.71		233	71
134	8.90	0.78	15.29		232	71
135	8.80	0.83	15.03		230	71
136	8.80	0.89	15.25		229	71
137	8.70	0.88	15.46		228	71
138	8.60	0.95	15.44		228	71
139	8.60	0.81	15.2		225	71
140	8.50	0.8	15.14		224	71
141	8.40	0.81	15.2		222	71
142	8.40	0.78	15.18		219	71
143	8.30	0.76	15.36		216	71
144	8.20	0.68	15.22		214	71
145	8.20	0.66	15.36		212	71
146	8.10	0.71	15.13		210	71
147	8.10	0.69	15.12		211	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	8.00	0.6	14.78		209	71
149	8.00	0.64	15.29		206	70
150	7.90	0.64	15.2		203	71
151	7.90	0.66	15.2		200	71
152	7.80	0.73	15.06		202	70
153	7.70	0.57	13.12		203	70
154	7.70	0.52	14.82		201	70
155	7.60	0.65	14.85		199	70
156	7.60	0.58	14.77		199	70
157	7.50	0.53	14.53		200	70
158	7.50	0.57	14.89		198	70
159	7.40	0.71	14.83		197	70
160	7.40	0.73	15.27		196	70
161	7.30	0.81	15.13		195	70
162	7.30	0.96	15.21		196	70
163	7.20	1.14	15.47		195	70
164	7.20	1.18	15.2		197	70
165	7.10	1.26	15.23		196	70
166	7.00	1.44	14.9		195	71
167	7.00	1.37	15.14		196	70
168	6.90	1.47	14.65		197	70
169	6.90	1.56	15.11		196	70
170	6.80	1.35	14.4		196	70
171	6.80	1.47	15.16		194	70
172	6.70	1.5	14.83		194	70
173	6.70	1.65	15.08		192	70
174	6.60	2.1	15.18		193	70
175	6.50	2.64	15.34		192	70
176	6.50	2.53	15.32		192	70
177	6.40	2.37	14.83		193	70
178	6.40	2.13	14.75		193	70
179	6.30	2	15.16		193	70
180	6.30	1.89	14.78		192	70
181	6.20	2	14.37		191	70
182	6.20	1.64	14.58		192	70
183	6.10	1.22	14.53		191	70
184	6.10	1.08	14.55		190	70
185	6.10	0.88	14.01		189	70
186	6.00	0.83	14.33		188	70
187	6.00	0.73	14.29		188	70
188	6.00	0.59	14.5		186	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	5.90	0.49	14.23		189	70
190	5.90	0.45	14.54		189	70
191	5.80	0.42	14.46		190	70
192	5.80	0.48	14.28		191	70
193	5.80	0.42	14.19		190	70
194	5.70	0.4	14.27		191	70
195	5.70	0.4	14.29		192	70
196	5.70	0.33	13.83		193	70
197	5.60	0.29	14.35		194	70
198	5.60	0.24	14.04		193	70
199	5.50	0.23	13.74		197	70
200	5.50	0.21	14.16		197	70
201	5.50	0.21	13.71		199	70
202	5.50	0.2	13.79		199	70
203	5.40	0.21	13.34		198	70
204	5.40	0.21	13.71		201	70
205	5.30	0.2	14.16		200	70
206	5.30	0.2	13.68		199	70
207	5.30	0.17	13.98		201	70
208	5.20	0.2	13.43		202	70
209	5.20	0.2	13.56		203	70
210	5.10	0.22	13.67		204	70
211	5.10	0.22	13.75		204	70
212	5.10	0.26	13.81		206	70
213	5.00	0.25	13.75		205	70
214	5.00	0.28	14.14		205	70
215	4.90	0.24	14.18		207	70
216	4.90	0.29	14		207	70
217	4.90	0.31	14.22		207	70
218	4.80	0.35	14.01		210	70
219	4.80	0.45	14.35		210	70
220	4.70	0.48	14.42		209	70
221	4.70	0.51	14.44		211	70
222	4.60	0.54	14.3		210	70
223	4.60	0.57	14.44		211	70
224	4.60	0.57	13.98		214	70
225	4.50	0.37	15.14		214	70
226	4.50	0.44	14.83		216	70
227	4.40	0.07	14.47		217	70
228	4.30	0.09	14.96		215	70
229	4.30	0.12	14.46		213	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	4.30	0.08	14.66		212	70
231	4.20	0.09	14.7		212	70
232	4.20	0.09	14.89		213	70
233	4.10	0.09	14.68		214	70
234	4.10	0.09	14.96		212	70
235	4.00	0.12	14.76		212	70
236	4.00	0.13	14.51		212	70
237	4.00	0.13	13.68		213	70
238	3.90	0.18	14.61		211	70
239	3.90	0.13	14.8		208	70
240	3.80	0.2	14.37		206	70
241	3.80	0.28	14.82		206	70
242	3.80	0.29	14.53		204	70
243	3.70	0.22	14.57		203	71
244	3.70	0.13	14.34		202	70
245	3.70	0.06	14.16		199	70
246	3.60	0.03	13.68		198	70
247	3.60	0.02	13.27		197	70
248	3.60	0.01	12.83		196	70
249	3.50	0.01	12.71		194	70
250	3.50	0.01	12.68		193	70
251	3.50	0.01	12.44		191	70
252	3.50	0.01	12.53		190	70
253	3.40	0.01	12.14		189	70
254	3.40	0.01	12.43		189	70
255	3.40	0.01	12.09		187	70
256	3.40	0.01	12.16		186	70
257	3.40	0.01	11.94		185	70
258	3.30	0.01	12.49		182	70
259	3.30	0.01	11.78		181	69
260	3.30	0.01	11.77		182	69
261	3.30	0.01	11.96		180	69
262	3.30	0.01	11.92		182	69
263	3.20	0.01	11.96		182	69
264	3.20	0.01	11.68		182	69
265	3.20	0.01	11.7		183	68
266	3.20	0.01	11.72		183	68
267	3.10	0.01	11.6		182	68
268	3.10	0.01	11.38		182	68
269	3.10	0.01	11.66		182	68
270	3.10	0.01	11.73		183	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	3.10	0.01	11.74		184	68
272	3.00	0.01	11.55		185	68
273	3.00	0.01	11.48		185	68
274	3.00	0.01	11.98		185	68
275	3.00	0.01	11.69		185	68
276	2.90	0.01	11.55		185	68
277	2.90	0.01	11.57		186	68
278	2.90	0.01	11.8		186	68
279	2.90	0.01	11.75		186	68
280	2.90	0.01	11.56		188	68
281	2.80	0.01	11.96		185	68
282	2.80	0.01	11.74		186	69
283	2.80	0.01	11.57		187	69
284	2.80	0.01	11.76		186	69
285	2.70	0.01	12.03		186	68
286	2.70	0.01	11.84		185	68
287	2.70	0.01	11.94		184	68
288	2.70	0.01	11.67		186	69
289	2.70	0.01	12.02		185	68
290	2.60	0.01	12.01		186	69
291	2.60	0.01	12.11		186	69
292	2.60	0.01	11.61		187	69
293	2.60	0.01	11.86		186	69
294	2.50	0.01	11.76		186	69
295	2.50	0.01	11.83		188	69
296	2.50	0.01	11.74		187	68
297	2.50	0.01	11.81		187	69
298	2.40	0.01	11.45		186	69
299	2.40	0.01	11.68		184	69
300	2.40	0.01	11.79		185	68
301	2.40	0.01	11.77		185	68
302	2.40	0.01	11.75		185	68
303	2.30	0.01	11.93		184	67
304	2.30	0.01	11.64		186	67
305	2.30	0.01	11.74		187	67
306	2.30	0.01	11.87		185	68
307	2.20	0.01	11.83		186	68
308	2.20	0.01	11.86		185	68
309	2.20	0.01	11.53		187	68
310	2.20	0.01	12.03		186	68
311	2.10	0.01	12.03		186	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	2.10	0.01	12		186	68
313	2.10	0.01	12.09		186	68
314	2.10	0.01	11.89		186	69
315	2.10	0.01	11.78		188	69
316	2.00	0.01	12.21		186	69
317	2.00	0.01	12.17		187	69
318	2.00	0.01	12.64		187	69
319	2.00	0.01	12.53		187	69
320	1.90	0.01	12.1		188	69
321	1.90	0.01	12.11		188	69
322	1.90	0.01	12.29		188	69
323	1.90	0.01	12.19		189	69
324	1.80	0.01	12.23		189	69
325	1.80	0.01	12.03		187	69
326	1.80	0.01	11.94		187	69
327	1.80	0.01	12.26		189	69
328	1.80	0.01	12.63		189	69
329	1.70	0.01	12.53		188	69
330	1.70	0.01	12.52		190	69
331	1.70	0.01	12.33		189	69
332	1.70	0.01	12.12		190	69
333	1.60	0.01	12.42		189	69
334	1.60	0.01	12.59		189	69
335	1.60	0.01	12.38		188	69
336	1.60	0.01	12.47		189	69
337	1.50	0.01	12.46		188	69
338	1.50	0.01	12.53		188	69
339	1.50	0.01	12.11		189	69
340	1.50	0.01	12.34		188	69
341	1.40	0.01	12.37		187	69
342	1.40	0.01	12.55		189	70
343	1.40	0.01	12.03		189	70
344	1.40	0.01	12.28		189	69
345	1.40	0.01	12.31		188	69
346	1.30	0.01	12.32		189	69
347	1.30	0.01	12.21		189	69
348	1.30	0.01	12.11		191	69
349	1.30	0.01	12.38		190	69
350	1.20	0.01	12.01		189	69
351	1.20	0.01	12.23		190	69
352	1.20	0.01	12.35		191	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	1.20	0.01	12.24		189	69
354	1.10	0.01	12.26		190	69
355	1.10	0.01	12.42		189	69
356	1.10	0.01	12.14		188	69
357	1.10	0.01	12.48		188	69
358	1.10	0.01	12.29		188	69
359	1.00	0.01	12.52		189	69
360	1.00	0.01	11.92		190	69
361	1.00	0.01	11.92		190	69
362	1.00	0.01	12.48		190	69
363	0.90	0.01	12.38		188	69
364	0.90	0.01	12.51		189	69
365	0.90	0.01	12.38		188	69
366	0.90	0.01	12.44		189	69
367	0.90	0.01	12.54		189	69
368	0.80	0.01	12.22		189	69
369	0.80	0.01	12.18		190	68
370	0.80	0.01	12.51		188	69
371	0.80	0.01	12.11		190	68
372	0.70	0.01	12.19		189	68
373	0.70	0.01	12.16		189	68
374	0.70	0.01	12.63		188	68
375	0.70	0.01	12.47		188	68
376	0.70	0.01	12.48		189	68
377	0.60	0.01	12.58		188	68
378	0.60	0.01	12.15		189	68
379	0.60	0.01	12.08		189	68
380	0.60	0.01	12.08		188	68
381	0.50	0.01	12.12		188	68
382	0.50	0.01	12.08		188	68
383	0.50	0.01	11.78		187	68
384	0.50	0.01	12.83		187	68
385	0.40	0.01	12.9		188	68
386	0.40	0.01	12.79		188	68
387	0.40	0.01	12.59		187	69
388	0.40	0.01	12.55		187	69
389	0.30	0.01	12.4		188	69
390	0.30	0.01	12.4		189	69
391	0.30	0.01	12.57		188	69
392	0.30	0.01	12.46		188	69
393	0.20	0.01	12.48		189	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
394	0.20	0.01	12.32		188	69
395	0.20	0.01	12.43		188	69
396	0.20	0.01	12.29		188	69
397	0.10	0.01	12.06		187	68
398	0.10	0.01	12.16		186	68
399	0.10	0.01	12.53		185	68
400	0.00	0.01	12.08		186	69
401	0.00	0.01	12.26		185	68

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : Ashford 30.2
Tracking No. : BK30.2
Project No. : 0142WS021E
Test Date : 3/6/2024
Run No. : 2

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.874** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 20.118 lb.
Minimum Fuel Weight : 18.11 lb.
Maximum Fuel Weight : 22.13 lb.

Fuel Piece Data

PC #	Weight, lb	Size	Length, In	Moisture Readings, Dry Basis %			Average MC, % db	Dry Weight, lb.	Volume, ft3	Wet Weights, lb 4 x 4	Wet Weights, lb 2 x 4	Dry Weights, lb 4 x 4	Dry Weights, lb 2 x 4
1	2.00	2x4	16.75	20.3	20.6	20.2	20.4	1.66	0.0509		2.0		1.66
2	2.20	2x4	16.75	19.4	19.0	19.5	19.3	1.84	0.0509		2.2		1.84
3	2.20	2x4	16.75	20.5	22.1	22.2	21.6	1.81	0.0509		2.2		1.81
4	2.30	2x4	16.75	21.2	20.5	21.5	21.1	1.90	0.0509		2.3		1.90
5	4.30	4x4	16.75	19.3	22.1	19.8	20.4	3.57	0.1187	4.3		3.57	
6	4.30	4x4	16.75	22.2	22.1	19.0	21.1	3.55	0.1187	4.3		3.55	
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
15.5	15.9	22.0	19.8	20.6	22.0			
18.4	20.6	13.1	21.3	15.1	19.8			
22.0	15.5	15.0	17.8	21.4	22.0			
17.9	15.0	18.5	17.1	12.6	21.2			

Avg : 18.3

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.50	2x4		2.5000
2	2.30	2x4		2.3000
3	2.20	2x4		2.2000
4	2.30	2x4		2.3000
5	4.80	4x4	4.80	
6	4.80	4x4	4.80	
7				
8				
9				

Combined Mass of 4 x 4s 9.6 lb
Combined Mass of 2 x 4s 9.3 lb

Total Wet Mass of Fuel Load **18.9** lb

Fuel Load Properties

Type	*Number of Pieces*	*Wet Weight, lb.*	*Dry Weight, lb.*	*Fuel Loading Density, lb/ft³* Wet Basis	*Fuel Loading Density, lb/ft³* Dry Basis	Dry Fuel Density, lb/ft³	Wet Fuel Density, lb/ft³	*Moisture, %* Dry Basis	*Moisture, %* Wet Basis
2 x 4	4	8.7	7.21	6.58	5.46	32.51	39.23	20.47	16.99
4 x 4	2	8.6	7.12						
Spacers	24	1.6	1.35						
Totals		18.9	15.69						

Compliance Checks

	Fuel Load, Wet Lb.	Load Density, lb/ft³ of FB vol	Fuel Density, lb/ft³	% of Fuel load mass which is 2x4	Fuel Load Peices Mositure, % db
Measured	18.9	6.58	32.51	49	20.6
Required	18.1 - 22.1	6.3 - 7.7	25 - 36	35 - 65	19 -25
Complies ?	Yes	Yes	Yes	Yes	Yes

Dilution Tunnel Velocity Traverse and Supplementary Data

ASTM E2515-11

Run:	2	Tracking No.:	BK30.2
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WS021E
Model:	Ashford 30.2	Test Date:	3/6/2024

Dillution Tunnel Velocity Traverse

Pitot Location

Traverse Point	*% of Diameter*	*Inches into Tunnel*	*dP in. H_2O*	*Tunnel Temp, °F*	*$dP^{1/2}$*
X1	6.7	0.5 *	0.050	91	0.224
X2	25.0	0.00	0.088	91	0.297
X3	75.0	0.00	0.086	91	0.293
X4	93.3	-0.5 *	0.040	91	0.200
Y1	6.7	0.5 *	0.070	90	0.265
Y2	25.0	0.00	0.090	90	0.300
Y3	75.0	0.00	0.086	89	0.293
Y4	93.3	-0.5 *	0.060	89	0.245
Center	50.0	0.00	0.094	88	0.307

Tunnel Static Pressure	-0.400	*in. H_2O*
Tunnel Moisture	2.00	%
Tunnel Diameter	6.00	inches
Pitot Tube C_p	0.99	inches
Tunnel Molecular Weight	29	(dry)
Tunnel Molecular Weight	28.78	(M_S, wet)
Tunnel Area	0.19634954	*ft^2*
K_p	85.49	constant
$P_s=P_{bar}$+Tunnel Static	30.0405882	in HG

** Probe location must be no closer than 0.50 in to tunnel wall*

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 17.8615$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 20.6588$$

$$F_P = V_{strav} / V_{scent} = 0.865$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 15.443\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	2:23	
Barometric Pressure, in. Hg	30.07	30.12
Room Air Velocity, fpm	0	10
Room Air Temperature, °F	70	68
Room Relative Humidity, %	29.0	31.0
Platform Scale Audit, lb.	20.0	20.0

Leak Checks

Pitot and associated tubing, (pass/fail)[1]	Pass	Pass

See sampling box worksheets for sampling boxes

Dillution Tunnel

Date last cleaned	3/5/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

1 Both sides (independantly) of the pitot system are brought under a minimum vacuum of 3 in. H_2O and then sealed. Any indiction of pressure loss is deemed a fail.

2 Create a smoking condition during start of pre-burn activites and using adequate lighting pointed upward and aroud tunnel hood, visually observe if 100% of visible smoke is being captured by the hood. If not, increase flow tunnel flow and / or re-assess chimney proximity to draft hood as required and repeat until 100% capture is observed.

3 With the appliance installed and the dillution tunnel flow turned-off, observe the flue draft gauge while turning the dulution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducemnt is occuring. Determine the cause (i.e. flue chimnet too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 2

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E
Test Date: 3/6/24
Beginning Clock Time: 1:23

Coal Bed Range (lb):	3.8 (min)	4.7 (max)

Preburn Fuel Data

10 pieces @ 16.75 inches
____ pieces @ ____ inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

21.5	23.8					
19.3	20					
19.1	23.8					
19.5	24.4					
24.2	20.3					

Avg Preburn Moisture (% DB): **21.59**

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
0	5.2	-0.091	803	493	366	238	622	1108	504	417	73
1	5	-0.075	793	495	377	260	625	1047	510	319	73
2	4.9	-0.071	779	497	382	264	615	995	507	261	73
3	4.9	-0.066	765	499	386	265	605	959	504	227	73
4	4.8	-0.062	751	501	387	267	594	931	500	204	73
5	4.8	-0.06	738	502	388	269	583	913	496	187	73
6	4.8	-0.058	725	503	388	268	571	900	491	175	73
7	4.8	-0.056	713	503	388	269	560	889	487	166	73
8	4.7	-0.055	701	503	388	268	550	877	482	158	73
9	4.7	-0.053	690	502	386	270	540	867	478	154	73
10	4.7	-0.051	681	502	385	266	531	857	473	149	73
11	4.7	-0.051	671	500	383	266	521	847	468	145	73
12	4.6	-0.05	662	499	381	262	513	838	463	143	73
13	4.6	-0.048	653	497	379	262	505	829	459	140	72
14	4.6	-0.046	644	496	376	260	498	819	455	136	72
15	4.6	-0.045	636	494	374	258	491	810	451	133	72
16	4.6	-0.045	628	492	371	257	483	806	446	130	72
17	4.6	-0.044	622	490	368	252	477	816	442	128	72
18	4.6	-0.042	615	488	365	250	469	813	437	126	72
19	4.6	-0.042	607	486	362	252	463	793	434	123	72
20	4.6	-0.041	600	484	359	248	457	775	430	121	72
21	4.6	-0.041	592	482	356	245	451	759	425	120	72
22	4.6	-0.04	584	479	353	245	445	744	421	118	71
23	4.6	-0.04	577	477	350	242	439	729	417	117	72
24	4.6	-0.04	569	474	346	240	433	716	412	116	71
25	4.6	-0.04	561	472	343	238	428	704	408	116	71
26	4.6	-0.039	554	470	340	237	422	694	405	116	72
27	4.6	-0.04	546	467	337	235	417	685	400	117	72
28	4.6	-0.04	539	465	334	234	412	678	397	118	72
29	4.6	-0.042	533	462	330	235	407	672	393	122	72
30	4.6	-0.042	527	460	327	230	402	668	389	126	72
31	4.6	-0.043	520	458	324	227	397	663	385	130	71
32	4.6	-0.044	515	455	320	225	392	659	381	134	71
33	4.6	-0.045	510	453	317	223	388	656	378	138	71
34	4.7	-0.045	505	451	313	222	384	655	375	141	71
35	4.7	-0.045	500	449	310	221	380	654	372	141	71
36	4.7	-0.046	496	447	307	217	375	656	368	144	71
37	4.7	-0.047	492	445	305	217	371	660	366	147	71
38	4.7	-0.047	489	443	302	217	368	666	364	152	71
39	4.7	-0.047	487	441	300	215	364	675	361	155	71
40	4.7	-0.047	485	439	297	213	361	687	359	157	70
41	4.7	-0.048	484	438	296	212	358	701	358	161	70
42	4.7	-0.048	485	436	294	212	355	716	356	162	71

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
43	4.7	-0.048	485	435	293	211	351	733	355	165	71
44	4.7	-0.049	487	433	291	208	349	752	354	169	71
45	4.7	-0.049	491	432	290	208	347	774	354	172	71
46	4.7	-0.05	494	431	290	208	344	796	353	176	71
47	4.7	-0.05	500	430	290	208	343	817	354	181	70
48	4.6	-0.05	503	429	290	206	342	798	354	184	71
49	4.6	-0.051	502	428	292	207	341	760	354	186	70
50	4.6	-0.05	500	429	293	208	341	736	354	188	70
51	4.6	-0.05	497	429	295	209	342	721	354	187	70
52	4.6	-0.05	495	429	298	209	342	711	355	187	70
53	4.5	-0.05	492	430	300	210	344	706	355	187	70
54	4.5	-0.05	490	431	302	212	344	703	356	186	70
55	4.5	-0.05	488	432	304	212	346	702	356	189	71
56	4.5	-0.051	487	433	306	214	347	704	357	188	70
57	4.5	-0.05	486	434	307	215	349	706	358	188	70
58	4.5	-0.05	485	436	309	214	350	709	359	187	70
59	4.5	-0.051	485	437	310	216	352	712	360	188	70
60	4.4	-0.05	485	439	312	217	353	716	361	188	70
	NOTE: 0.1 pound was added to the scale weight due to addition of flue probe										
	Actual coal bed = 4.3 lb.										

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0.002	cfm @	17	in. Hg
Post-Test	0	cfm @	9.77	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
Tot / Avg		18.9	**65.689**	**0.164**	**1.30**	**78.9**	**1.91**	**68.97**	**58.99**	**69.75**	**100.0**	**79.7**	**0.098**	**0.313**	**18.09**
Minimum	0.0	0.0	0.000	0.154	0.30	72	0.02	67	54	67	97.6	73	0.093	0.305	17.88
Max	18.9	0.2	65.689	0.165	1.32	81	1.94	70	61	72	104.1	135	0.101	0.318	18.94
0	18.9		0.000		0.30	72	0.02	68	59	70		116	0.097	0.311	18.94
1	18.9	0.0	0.154	0.154	1.30	72	1.91	69	55	70	99.7	135	0.093	0.305	18.55
2	18.8	0.1	0.316	0.162	1.29	72	1.89	69	54	70	104.1	95	0.100	0.316	18.53
3	18.8	0.0	0.477	0.161	1.29	73	1.89	69	54	70	99.7	87	0.097	0.311	18.33
4	18.7	0.1	0.638	0.161	1.29	73	1.88	69	54	70	99.5	84	0.099	0.315	18.19
5	18.7	0.0	0.799	0.161	1.28	73	1.87	69	54	70	99.2	82	0.100	0.316	18.28
6	18.7	0.0	0.960	0.161	1.27	73	1.87	69	54	70	98.9	82	0.098	0.313	18.22
7	18.6	0.1	1.121	0.161	1.27	73	1.86	69	54	70	99.3	81	0.098	0.313	18.12
8	18.5	0.1	1.281	0.160	1.26	73	1.86	69	54	70	98.7	81	0.099	0.315	18.16
9	18.5	0.0	1.440	0.159	1.26	73	1.86	69	54	70	97.6	81	0.101	0.318	18.30
10	18.4	0.1	1.600	0.160	1.26	73	1.86	69	54	70	97.8	81	0.100	0.316	18.34
11	18.3	0.1	1.761	0.161	1.26	73	1.86	69	54	70	98.5	81	0.099	0.315	18.25
12	18.2	0.1	1.920	0.159	1.24	73	1.86	70	54	71	97.8	82	0.098	0.313	18.17
13	18.2	0.0	2.079	0.159	1.25	73	1.85	70	54	70	98.4	82	0.097	0.311	18.08
14	18.1	0.1	2.238	0.159	1.25	73	1.85	70	54	70	98.8	81	0.096	0.310	17.98
15	18.0	0.1	2.399	0.161	1.26	74	1.85	70	54	71	100.0	82	0.099	0.315	18.08
16	17.9	0.1	2.558	0.159	1.25	74	1.85	70	54	71	98.1	82	0.099	0.315	18.22
17	17.9	0.0	2.717	0.159	1.25	74	1.85	70	54	70	97.7	82	0.099	0.315	18.22
18	17.8	0.1	2.876	0.159	1.26	74	1.84	70	54	70	97.9	82	0.097	0.311	18.13
19	17.7	0.1	3.036	0.160	1.26	74	1.84	70	54	71	98.9	82	0.098	0.313	18.08
20	17.6	0.1	3.196	0.160	1.25	74	1.85	70	54	70	98.8	81	0.098	0.313	18.12
21	17.6	0.0	3.356	0.160	1.31	74	1.90	70	54	71	98.9	82	0.097	0.311	18.08
22	17.5	0.1	3.519	0.163	1.32	75	1.90	70	55	71	100.7	82	0.099	0.315	18.13
23	17.4	0.1	3.681	0.162	1.31	75	1.90	70	55	71	99.8	82	0.097	0.311	18.13
24	17.3	0.1	3.845	0.164	1.31	75	1.90	70	55	70	101.1	82	0.099	0.315	18.13
25	17.2	0.1	4.008	0.163	1.31	75	1.90	70	55	71	100.4	82	0.097	0.311	18.13
26	17.2	0.0	4.171	0.163	1.31	75	1.91	70	55	71	100.6	82	0.098	0.313	18.08
27	17.1	0.1	4.335	0.164	1.31	75	1.90	70	55	71	101.2	82	0.098	0.313	18.13
28	17.0	0.1	4.499	0.164	1.31	75	1.90	70	55	71	101.1	82	0.098	0.313	18.13
29	16.9	0.1	4.662	0.163	1.31	76	1.91	70	55	71	100.2	82	0.099	0.315	18.18
30	16.8	0.1	4.825	0.163	1.31	76	1.91	70	55	71	100.0	82	0.098	0.313	18.18
31	16.7	0.1	4.989	0.164	1.30	76	1.92	70	55	71	100.6	82	0.099	0.315	18.18
32	16.7	0.0	5.152	0.163	1.30	76	1.92	70	55	71	99.6	82	0.101	0.318	18.31
33	16.6	0.1	5.315	0.163	1.30	76	1.92	70	56	71	99.4	82	0.098	0.313	18.27
34	16.5	0.1	5.478	0.163	1.30	76	1.92	70	56	71	99.9	82	0.098	0.313	18.13
35	16.4	0.1	5.642	0.164	1.31	76	1.92	70	56	71	100.9	82	0.098	0.313	18.13
36	16.3	0.1	5.805	0.163	1.31	77	1.91	70	56	72	100.1	83	0.099	0.315	18.18
37	16.2	0.1	5.968	0.163	1.31	77	1.92	70	56	71	100.0	82	0.097	0.311	18.14
38	16.1	0.1	6.132	0.164	1.30	77	1.92	70	56	71	100.6	83	0.100	0.316	18.18
39	16.0	0.1	6.296	0.164	1.31	77	1.92	70	56	71	100.3	83	0.099	0.315	18.28
40	15.9	0.1	6.459	0.163	1.31	77	1.92	70	56	71	99.4	83	0.100	0.316	18.28

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
41	15.8	0.1	6.624	0.165	1.31	77	1.93	70	56	71	100.9	84	0.097	0.311	18.20
42	15.7	0.1	6.788	0.164	1.30	77	1.93	70	56	72	101.0	84	0.097	0.311	18.07
43	15.5	0.2	6.952	0.164	1.30	77	1.93	70	56	71	101.3	85	0.098	0.313	18.13
44	15.4	0.1	7.115	0.163	1.31	77	1.93	70	57	71	100.3	84	0.099	0.315	18.22
45	15.3	0.1	7.278	0.163	1.31	78	1.92	70	57	71	100.1	84	0.096	0.310	18.12
46	15.2	0.1	7.441	0.163	1.30	78	1.93	70	57	71	100.6	84	0.097	0.311	18.02
47	15.1	0.1	7.604	0.163	1.30	78	1.93	70	57	71	100.7	84	0.097	0.311	18.07
48	15.0	0.1	7.767	0.163	1.30	78	1.93	70	57	71	100.5	84	0.098	0.313	18.12
49	15.0	0.0	7.931	0.164	1.30	78	1.93	70	57	71	100.9	84	0.097	0.311	18.12
50	14.9	0.1	8.095	0.164	1.31	78	1.93	70	57	71	101.1	83	0.096	0.310	18.02
51	14.8	0.1	8.258	0.163	1.30	78	1.93	70	57	71	100.5	84	0.099	0.315	18.11
52	14.7	0.1	8.421	0.163	1.31	78	1.93	70	57	71	100.1	83	0.097	0.311	18.15
53	14.6	0.1	8.585	0.164	1.31	78	1.93	70	57	71	100.7	83	0.098	0.313	18.10
54	14.5	0.1	8.748	0.163	1.31	78	1.93	70	57	72	100.2	83	0.097	0.311	18.10
55	14.5	0.0	8.912	0.164	1.31	78	1.93	70	57	71	100.9	84	0.098	0.313	18.11
56	14.4	0.1	9.076	0.164	1.30	78	1.93	70	57	72	100.8	83	0.098	0.313	18.15
57	14.3	0.1	9.240	0.164	1.31	78	1.93	70	57	72	100.7	83	0.097	0.311	18.10
58	14.3	0.0	9.404	0.164	1.30	79	1.93	70	58	71	101.0	83	0.096	0.310	18.01
59	14.2	0.1	9.568	0.164	1.30	79	1.93	70	58	71	100.9	83	0.099	0.315	18.10
60	14.1	0.1	9.731	0.163	1.30	79	1.93	70	58	71	99.9	83	0.097	0.311	18.15
61	14.1	0.0	9.895	0.164	1.30	79	1.92	70	58	71	100.5	83	0.098	0.313	18.10
62	14.0	0.1	10.059	0.164	1.30	79	1.93	70	58	71	100.8	83	0.096	0.310	18.05
63	13.9	0.1	10.222	0.163	1.30	79	1.92	70	58	71	100.3	83	0.098	0.313	18.05
64	13.8	0.1	10.386	0.164	1.30	79	1.93	70	58	71	101.0	83	0.095	0.308	18.01
65	13.8	0.0	10.550	0.164	1.31	79	1.93	70	58	72	101.1	82	0.098	0.313	18.00
66	13.7	0.1	10.713	0.163	1.30	79	1.92	70	58	72	100.1	82	0.098	0.313	18.13
67	13.6	0.1	10.877	0.164	1.31	79	1.93	70	58	72	100.4	82	0.097	0.311	18.08
68	13.5	0.1	11.041	0.164	1.31	79	1.93	70	58	72	100.8	82	0.096	0.310	17.99
69	13.5	0.0	11.205	0.164	1.31	79	1.92	70	58	72	101.2	83	0.097	0.311	18.00
70	13.4	0.1	11.369	0.164	1.30	79	1.93	70	58	72	101.1	82	0.096	0.310	18.00
71	13.3	0.1	11.532	0.163	1.30	79	1.93	70	58	72	100.7	82	0.095	0.308	17.90
72	13.2	0.1	11.696	0.164	1.30	79	1.93	70	58	71	101.3	82	0.098	0.313	17.99
73	13.1	0.1	11.860	0.164	1.31	79	1.92	70	58	71	101.0	82	0.096	0.310	18.04
74	13.0	0.1	12.025	0.165	1.31	79	1.93	70	58	71	101.4	82	0.098	0.313	18.04
75	12.9	0.1	12.189	0.164	1.30	79	1.93	70	58	71	100.5	81	0.098	0.313	18.12
76	12.8	0.1	12.353	0.164	1.30	79	1.93	69	58	71	100.3	82	0.098	0.313	18.12
77	12.7	0.1	12.517	0.164	1.30	79	1.93	69	58	71	100.4	81	0.097	0.311	18.08
78	12.6	0.1	12.681	0.164	1.31	79	1.93	69	58	71	100.4	81	0.098	0.313	18.07
79	12.6	0.0	12.845	0.164	1.31	79	1.93	69	58	71	100.1	80	0.099	0.315	18.15
80	12.5	0.1	13.009	0.164	1.30	79	1.93	69	58	70	100.0	80	0.097	0.311	18.10
81	12.4	0.1	13.173	0.164	1.30	79	1.93	69	58	70	100.3	81	0.098	0.313	18.06
82	12.3	0.1	13.337	0.164	1.30	79	1.93	69	58	70	100.4	80	0.097	0.311	18.06
83	12.3	0.0	13.501	0.164	1.30	79	1.93	69	58	69	100.6	81	0.097	0.311	18.01
84	12.2	0.1	13.665	0.164	1.30	79	1.93	69	58	69	100.9	81	0.096	0.310	17.97

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
85	12.1	0.1	13.829	0.164	1.30	79	1.93	69	59	70	100.8	80	0.098	0.313	18.01
86	12.1	0.0	13.994	0.165	1.31	79	1.93	68	59	70	101.1	80	0.097	0.311	18.05
87	12.0	0.1	14.158	0.164	1.31	79	1.92	68	59	70	100.4	79	0.097	0.311	18.00
88	12.0	0.0	14.322	0.164	1.31	79	1.92	68	59	70	100.6	80	0.097	0.311	18.00
89	11.9	0.1	14.486	0.164	1.31	79	1.92	68	59	69	100.5	80	0.098	0.313	18.05
90	11.8	0.1	14.650	0.164	1.32	79	1.93	68	59	69	100.1	78	0.098	0.313	18.08
91	11.8	0.0	14.815	0.165	1.31	79	1.93	68	59	69	100.5	78	0.098	0.313	18.06
92	11.7	0.1	14.979	0.164	1.31	79	1.92	68	59	70	100.1	78	0.097	0.311	18.02
93	11.6	0.1	15.143	0.164	1.31	79	1.92	68	59	70	99.9	78	0.100	0.316	18.11
94	11.6	0.0	15.308	0.165	1.31	79	1.93	68	59	69	100.1	79	0.099	0.315	18.21
95	11.5	0.1	15.472	0.164	1.31	79	1.93	68	59	70	99.6	80	0.098	0.313	18.13
96	11.4	0.1	15.636	0.164	1.31	79	1.92	68	59	69	99.9	80	0.099	0.315	18.14
97	11.4	0.0	15.800	0.164	1.31	79	1.93	68	59	70	99.9	80	0.098	0.313	18.14
98	11.3	0.1	15.965	0.165	1.31	79	1.92	68	59	70	100.6	80	0.098	0.313	18.10
99	11.3	0.0	16.129	0.164	1.30	79	1.93	68	59	70	100.4	80	0.096	0.310	18.00
100	11.2	0.1	16.293	0.164	1.30	79	1.93	68	59	69	101.0	81	0.096	0.310	17.92
101	11.1	0.1	16.458	0.165	1.31	79	1.93	68	59	69	101.5	81	0.099	0.315	18.07
102	11.0	0.1	16.622	0.164	1.31	79	1.93	68	59	69	100.5	81	0.096	0.310	18.07
103	11.0	0.0	16.786	0.164	1.31	79	1.93	68	59	70	100.7	81	0.097	0.311	17.97
104	10.9	0.1	16.950	0.164	1.31	79	1.93	68	58	69	101.0	81	0.096	0.310	17.97
105	10.8	0.1	17.114	0.164	1.31	79	1.93	68	58	69	100.9	82	0.098	0.313	18.03
106	10.8	0.0	17.278	0.164	1.30	78	1.93	68	58	69	100.6	81	0.098	0.313	18.12
107	10.7	0.1	17.442	0.164	1.31	79	1.92	68	59	70	100.5	82	0.097	0.311	18.08
108	10.6	0.1	17.606	0.164	1.30	79	1.93	68	59	70	100.8	82	0.096	0.310	17.99
109	10.6	0.0	17.770	0.164	1.31	79	1.93	68	59	70	101.2	82	0.096	0.310	17.94
110	10.5	0.1	17.934	0.164	1.31	79	1.93	68	59	70	101.2	82	0.097	0.311	17.99
111	10.4	0.1	18.098	0.164	1.31	79	1.93	69	59	70	100.8	81	0.098	0.313	18.08
112	10.4	0.0	18.262	0.164	1.31	79	1.93	69	59	70	100.3	82	0.099	0.315	18.17
113	10.3	0.1	18.425	0.163	1.31	79	1.92	69	59	70	99.8	81	0.095	0.308	18.03
114	10.3	0.0	18.589	0.164	1.31	79	1.93	69	59	71	101.0	81	0.097	0.311	17.93
115	10.2	0.1	18.753	0.164	1.31	79	1.93	69	59	71	101.3	81	0.095	0.308	17.93
116	10.1	0.1	18.917	0.164	1.31	79	1.93	69	59	71	101.4	81	0.096	0.310	17.88
117	10.1	0.0	19.081	0.164	1.30	79	1.93	69	59	71	101.3	81	0.097	0.311	17.97
118	10.0	0.1	19.245	0.164	1.31	79	1.93	69	59	71	101.1	81	0.095	0.308	17.93
119	9.9	0.1	19.409	0.164	1.31	79	1.93	69	59	71	101.4	81	0.096	0.310	17.88
120	9.9	0.0	19.574	0.165	1.31	79	1.93	69	59	71	101.6	81	0.099	0.315	18.07
121	9.8	0.1	19.738	0.164	1.31	79	1.93	69	59	71	100.5	81	0.096	0.310	18.07
122	9.7	0.1	19.902	0.164	1.30	79	1.92	69	59	71	100.6	81	0.098	0.313	18.02
123	9.7	0.0	20.066	0.164	1.30	79	1.93	69	59	70	100.6	81	0.097	0.311	18.07
124	9.6	0.1	20.230	0.164	1.31	79	1.93	69	59	71	100.5	81	0.098	0.313	18.07
125	9.5	0.1	20.394	0.164	1.30	79	1.93	69	59	71	100.3	81	0.098	0.313	18.11
126	9.5	0.0	20.558	0.164	1.30	79	1.93	69	59	71	100.5	81	0.096	0.310	18.02
127	9.4	0.1	20.722	0.164	1.30	79	1.93	69	59	71	100.7	81	0.098	0.313	18.02
128	9.3	0.1	20.885	0.163	1.30	79	1.93	69	59	71	100.1	81	0.096	0.310	18.02

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
129	9.3	0.0	21.049	0.164	1.30	79	1.93	69	59	71	100.9	81	0.097	0.311	17.97
130	9.2	0.1	21.213	0.164	1.30	79	1.93	69	59	71	101.0	81	0.096	0.310	17.97
131	9.1	0.1	21.377	0.164	1.30	79	1.93	69	59	71	100.9	81	0.098	0.313	18.02
132	9.0	0.1	21.541	0.164	1.31	79	1.93	69	59	71	100.6	81	0.097	0.311	18.07
133	9.0	0.0	21.704	0.163	1.31	79	1.93	69	59	71	100.0	81	0.097	0.311	18.02
134	8.9	0.1	21.868	0.164	1.31	79	1.94	69	59	71	100.7	81	0.097	0.311	18.02
135	8.8	0.1	22.032	0.164	1.31	79	1.93	69	59	71	100.9	81	0.096	0.310	17.97
136	8.8	0.0	22.196	0.164	1.31	79	1.93	69	59	71	101.0	81	0.097	0.311	17.97
137	8.7	0.1	22.360	0.164	1.30	79	1.93	69	59	71	100.6	81	0.099	0.315	18.11
138	8.6	0.1	22.524	0.164	1.31	79	1.93	69	59	71	100.1	81	0.098	0.313	18.16
139	8.6	0.0	22.688	0.164	1.31	79	1.94	69	59	71	100.2	81	0.097	0.311	18.07
140	8.5	0.1	22.852	0.164	1.31	79	1.93	69	59	71	100.6	81	0.097	0.311	18.02
141	8.4	0.1	23.016	0.164	1.31	79	1.92	69	59	71	100.6	81	0.098	0.313	18.07
142	8.4	0.0	23.181	0.165	1.30	79	1.93	69	59	71	100.8	80	0.099	0.315	18.15
143	8.3	0.1	23.344	0.163	1.30	79	1.93	69	59	71	99.2	80	0.098	0.313	18.14
144	8.2	0.1	23.508	0.164	1.30	79	1.93	69	59	71	100.1	81	0.098	0.313	18.10
145	8.2	0.0	23.672	0.164	1.30	79	1.93	69	59	71	100.3	80	0.097	0.311	18.06
146	8.1	0.1	23.836	0.164	1.30	79	1.93	69	59	71	100.4	81	0.098	0.313	18.06
147	8.1	0.0	24.000	0.164	1.30	79	1.94	69	59	71	100.3	80	0.098	0.313	18.10
148	8.0	0.1	24.164	0.164	1.30	79	1.93	69	59	71	100.2	80	0.097	0.311	18.05
149	8.0	0.0	24.328	0.164	1.30	79	1.92	69	59	70	100.4	80	0.098	0.313	18.05
150	7.9	0.1	24.492	0.164	1.30	79	1.93	69	59	71	100.3	80	0.098	0.313	18.10
151	7.9	0.0	24.656	0.164	1.30	79	1.93	69	59	71	100.1	80	0.098	0.313	18.10
152	7.8	0.1	24.820	0.164	1.31	79	1.93	69	59	70	100.3	81	0.097	0.311	18.06
153	7.7	0.1	24.984	0.164	1.31	79	1.93	69	59	70	100.6	80	0.097	0.311	18.01
154	7.7	0.0	25.147	0.163	1.30	79	1.93	69	59	70	100.0	80	0.097	0.311	18.00
155	7.6	0.1	25.311	0.164	1.31	79	1.93	69	59	70	100.6	80	0.097	0.311	18.00
156	7.6	0.0	25.475	0.164	1.31	79	1.93	69	59	70	100.6	80	0.097	0.311	18.00
157	7.5	0.1	25.639	0.164	1.31	79	1.93	69	59	70	100.6	80	0.097	0.311	18.00
158	7.5	0.0	25.803	0.164	1.31	79	1.92	69	59	70	100.8	80	0.096	0.310	17.96
159	7.4	0.1	25.967	0.164	1.31	80	1.93	69	59	70	100.7	80	0.098	0.313	18.00
160	7.4	0.0	26.132	0.165	1.31	80	1.93	69	59	70	100.9	80	0.097	0.311	18.05
161	7.3	0.1	26.296	0.164	1.31	80	1.93	69	59	70	100.5	80	0.096	0.310	17.96
162	7.3	0.0	26.460	0.164	1.31	80	1.93	69	59	70	100.6	80	0.098	0.313	18.00
163	7.2	0.1	26.625	0.165	1.31	80	1.92	69	59	70	101.1	80	0.096	0.310	18.00
164	7.2	0.0	26.789	0.164	1.30	80	1.92	69	59	70	100.6	80	0.097	0.311	17.96
165	7.1	0.1	26.952	0.163	1.31	80	1.92	69	59	70	100.0	80	0.097	0.311	18.00
166	7.0	0.1	27.116	0.164	1.31	80	1.93	69	59	71	100.2	80	0.099	0.315	18.10
167	7.0	0.0	27.281	0.165	1.30	80	1.93	69	59	70	100.4	80	0.098	0.313	18.14
168	6.9	0.1	27.445	0.164	1.30	80	1.93	69	59	70	99.7	80	0.099	0.315	18.14
169	6.9	0.0	27.609	0.164	1.30	80	1.92	69	59	70	99.8	80	0.097	0.311	18.10
170	6.8	0.1	27.773	0.164	1.31	80	1.92	69	59	70	99.9	80	0.099	0.315	18.10
171	6.8	0.0	27.936	0.163	1.31	80	1.93	69	59	70	99.2	80	0.098	0.313	18.14
172	6.7	0.1	28.101	0.165	1.30	80	1.92	69	59	70	100.3	80	0.099	0.315	18.14

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Test Date: 3/6/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
173	6.7	0.0	28.265	0.164	1.31	80	1.92	69	60	70	99.8	80	0.097	0.311	18.10
174	6.6	0.1	28.429	0.164	1.31	80	1.92	70	59	70	100.3	80	0.096	0.310	17.96
175	6.5	0.1	28.593	0.164	1.30	80	1.92	69	60	70	100.6	80	0.098	0.313	18.00
176	6.5	0.0	28.757	0.164	1.32	80	1.92	69	59	70	100.2	80	0.098	0.313	18.10
177	6.4	0.1	28.921	0.164	1.31	80	1.92	69	59	70	99.8	80	0.099	0.315	18.14
178	6.4	0.0	29.085	0.164	1.31	80	1.92	70	60	70	99.7	80	0.098	0.313	18.14
179	6.3	0.1	29.250	0.165	1.31	80	1.93	70	60	70	100.4	80	0.098	0.313	18.10
180	6.3	0.0	29.414	0.164	1.31	80	1.92	70	60	70	99.7	80	0.100	0.316	18.19
181	6.2	0.1	29.578	0.164	1.31	80	1.92	70	60	70	99.3	80	0.099	0.315	18.23
182	6.2	0.0	29.742	0.164	1.31	80	1.92	70	60	70	99.4	80	0.098	0.313	18.14
183	6.1	0.1	29.906	0.164	1.31	80	1.92	70	60	70	99.9	80	0.097	0.311	18.05
184	6.1	0.0	30.071	0.165	1.31	80	1.92	70	60	70	100.7	80	0.099	0.315	18.10
185	6.1	0.0	30.235	0.164	1.31	80	1.92	70	60	70	99.8	80	0.098	0.313	18.14
186	6.0	0.1	30.400	0.165	1.31	80	1.92	70	60	70	100.2	79	0.099	0.315	18.13
187	6.0	0.0	30.564	0.164	1.31	80	1.92	70	60	70	99.8	80	0.097	0.311	18.09
188	6.0	0.0	30.729	0.165	1.31	80	1.92	70	60	70	100.7	80	0.098	0.313	18.05
189	5.9	0.1	30.893	0.164	1.31	80	1.92	70	60	70	100.1	80	0.098	0.313	18.10
190	5.9	0.0	31.057	0.164	1.31	80	1.92	70	60	70	99.9	80	0.098	0.313	18.10
191	5.8	0.1	31.221	0.164	1.31	80	1.93	70	60	70	99.9	80	0.098	0.313	18.10
192	5.8	0.0	31.385	0.164	1.31	80	1.92	70	60	70	99.9	80	0.098	0.313	18.10
193	5.8	0.0	31.550	0.165	1.31	80	1.92	70	60	70	100.7	80	0.097	0.311	18.05
194	5.7	0.1	31.714	0.164	1.30	80	1.92	70	60	70	100.2	80	0.098	0.313	18.05
195	5.7	0.0	31.878	0.164	1.31	80	1.92	70	60	70	100.1	80	0.098	0.313	18.10
196	5.7	0.0	32.042	0.164	1.31	80	1.93	70	60	70	99.9	80	0.098	0.313	18.10
197	5.6	0.1	32.206	0.164	1.31	80	1.92	70	60	70	99.9	80	0.098	0.313	18.10
198	5.6	0.0	32.371	0.165	1.31	80	1.92	70	60	70	100.7	80	0.097	0.311	18.05
199	5.5	0.1	32.535	0.164	1.31	80	1.92	70	60	70	100.2	80	0.098	0.313	18.05
200	5.5	0.0	32.699	0.164	1.31	80	1.92	70	60	70	99.9	80	0.099	0.315	18.14
201	5.5	0.0	32.863	0.164	1.31	80	1.92	70	60	70	99.7	80	0.098	0.313	18.14
202	5.5	0.0	33.027	0.164	1.31	80	1.92	70	60	70	99.9	80	0.097	0.311	18.05
203	5.4	0.1	33.192	0.165	1.31	80	1.92	70	60	70	100.7	80	0.099	0.315	18.10
204	5.4	0.0	33.356	0.164	1.31	80	1.92	70	60	70	99.8	80	0.098	0.313	18.14
205	5.3	0.1	33.520	0.164	1.31	80	1.92	70	60	70	99.8	80	0.098	0.313	18.10
206	5.3	0.0	33.684	0.164	1.31	80	1.92	70	60	70	99.9	80	0.098	0.313	18.10
207	5.3	0.0	33.849	0.165	1.31	80	1.92	70	60	70	100.5	80	0.098	0.313	18.10
208	5.2	0.1	34.013	0.164	1.31	80	1.92	70	60	70	99.9	80	0.098	0.313	18.10
209	5.2	0.0	34.177	0.164	1.31	80	1.92	70	60	70	100.1	80	0.097	0.311	18.05
210	5.1	0.1	34.342	0.165	1.31	80	1.93	70	60	70	100.8	80	0.098	0.313	18.05
211	5.1	0.0	34.506	0.164	1.31	80	1.92	70	60	70	99.9	80	0.099	0.315	18.14
212	5.1	0.0	34.670	0.164	1.31	80	1.92	70	60	70	99.7	80	0.098	0.313	18.14
213	5.0	0.1	34.835	0.165	1.31	80	1.92	70	60	70	100.3	80	0.099	0.315	18.14
214	5.0	0.0	34.999	0.164	1.31	80	1.92	70	60	70	99.8	81	0.098	0.313	18.15
215	4.9	0.1	35.164	0.165	1.31	80	1.93	70	60	70	100.6	80	0.097	0.311	18.06
216	4.9	0.0	35.328	0.164	1.31	80	1.92	70	60	70	100.2	80	0.098	0.313	18.05

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
217	4.9	0.0	35.492	0.164	1.31	80	1.92	70	60	70	100.2	80	0.097	0.311	18.05
218	4.8	0.1	35.656	0.164	1.31	80	1.92	70	60	70	100.1	81	0.099	0.315	18.10
219	4.8	0.0	35.821	0.165	1.31	80	1.92	70	60	70	100.4	81	0.099	0.315	18.21
220	4.7	0.1	35.985	0.164	1.31	81	1.92	70	60	70	99.7	81	0.097	0.311	18.11
221	4.7	0.0	36.149	0.164	1.30	81	1.92	70	60	70	100.1	81	0.097	0.311	18.02
222	4.6	0.1	36.313	0.164	1.31	81	1.93	70	60	70	100.4	81	0.097	0.311	18.02
223	4.6	0.0	36.477	0.164	1.31	81	1.93	70	60	70	100.1	81	0.099	0.315	18.11
224	4.6	0.0	36.642	0.165	1.31	81	1.93	70	60	70	100.3	81	0.098	0.313	18.16
225	4.5	0.1	36.806	0.164	1.31	81	1.93	70	60	70	99.7	81	0.098	0.313	18.11
226	4.5	0.0	36.970	0.164	1.31	81	1.92	70	60	70	99.7	81	0.099	0.315	18.16
227	4.4	0.1	37.134	0.164	1.30	81	1.92	70	60	70	99.7	81	0.097	0.311	18.11
228	4.3	0.1	37.298	0.164	1.31	81	1.92	70	60	70	99.8	81	0.099	0.315	18.11
229	4.3	0.0	37.463	0.165	1.31	81	1.93	70	60	70	100.2	81	0.099	0.315	18.21
230	4.3	0.0	37.627	0.164	1.31	81	1.92	70	60	70	99.3	81	0.099	0.315	18.21
231	4.2	0.1	37.791	0.164	1.31	81	1.92	70	60	70	99.6	81	0.097	0.311	18.11
232	4.2	0.0	37.955	0.164	1.31	81	1.92	70	60	70	100.0	81	0.098	0.313	18.07
233	4.1	0.1	38.120	0.165	1.31	81	1.92	70	60	70	100.5	81	0.099	0.315	18.16
234	4.1	0.0	38.284	0.164	1.31	81	1.92	70	60	70	99.6	80	0.097	0.311	18.10
235	4.0	0.1	38.448	0.164	1.31	81	1.93	70	60	70	99.9	81	0.098	0.313	18.06
236	4.0	0.0	38.612	0.164	1.31	81	1.92	70	60	70	99.9	80	0.098	0.313	18.10
237	4.0	0.0	38.777	0.165	1.30	81	1.93	70	60	70	100.3	80	0.098	0.313	18.10
238	3.9	0.1	38.941	0.164	1.31	81	1.92	70	60	70	99.4	79	0.100	0.316	18.18
239	3.9	0.0	39.106	0.165	1.31	81	1.92	70	60	70	99.7	79	0.098	0.313	18.17
240	3.8	0.1	39.270	0.164	1.31	81	1.92	70	60	70	99.7	79	0.096	0.310	17.99
241	3.8	0.0	39.435	0.165	1.30	81	1.92	70	60	70	100.7	78	0.098	0.313	17.98
242	3.8	0.0	39.599	0.164	1.30	81	1.93	70	60	70	99.7	79	0.099	0.315	18.12
243	3.7	0.1	39.764	0.165	1.30	81	1.93	70	60	71	100.0	79	0.098	0.313	18.13
244	3.7	0.0	39.929	0.165	1.30	81	1.92	70	60	70	100.4	79	0.096	0.310	17.99
245	3.7	0.0	40.093	0.164	1.30	81	1.93	70	60	70	100.0	78	0.099	0.315	18.03
246	3.6	0.1	40.257	0.164	1.31	81	1.92	69	60	70	99.4	78	0.099	0.315	18.15
247	3.6	0.0	40.421	0.164	1.31	81	1.92	69	60	70	98.9	78	0.100	0.316	18.20
248	3.6	0.0	40.586	0.165	1.31	81	1.92	69	60	70	99.7	78	0.097	0.311	18.11
249	3.5	0.1	40.750	0.164	1.31	80	1.93	69	60	70	99.5	77	0.099	0.315	18.05
250	3.5	0.0	40.915	0.165	1.32	80	1.92	69	60	70	100.1	77	0.098	0.313	18.09
251	3.5	0.0	41.080	0.165	1.32	80	1.92	69	60	70	99.9	77	0.100	0.316	18.14
252	3.5	0.0	41.244	0.164	1.31	80	1.92	69	60	70	99.0	76	0.099	0.315	18.18
253	3.4	0.1	41.409	0.165	1.31	80	1.92	69	60	70	99.5	76	0.099	0.315	18.12
254	3.4	0.0	41.573	0.164	1.31	80	1.92	69	60	70	99.2	76	0.098	0.313	18.08
255	3.4	0.0	41.738	0.165	1.31	80	1.92	69	60	70	99.9	76	0.099	0.315	18.08
256	3.4	0.0	41.902	0.164	1.31	80	1.92	69	60	70	99.4	76	0.097	0.311	18.03
257	3.4	0.0	42.067	0.165	1.31	80	1.92	69	60	70	100.4	76	0.097	0.311	17.94
258	3.3	0.1	42.231	0.164	1.31	80	1.92	69	60	70	100.0	76	0.098	0.313	17.98
259	3.3	0.0	42.396	0.165	1.31	80	1.93	68	60	69	100.1	75	0.099	0.315	18.07
260	3.3	0.0	42.561	0.165	1.31	80	1.92	68	60	69	99.8	75	0.098	0.313	18.06

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
261	3.3	0.0	42.725	0.164	1.31	80	1.92	68	60	69	99.6	75	0.096	0.310	17.92
262	3.3	0.0	42.890	0.165	1.32	80	1.92	68	60	69	100.5	75	0.099	0.315	17.97
263	3.2	0.1	43.055	0.165	1.32	80	1.92	68	60	69	100.0	75	0.099	0.315	18.10
264	3.2	0.0	43.219	0.164	1.32	80	1.92	68	60	69	99.1	75	0.098	0.313	18.06
265	3.2	0.0	43.384	0.165	1.32	80	1.92	68	60	68	99.8	74	0.099	0.315	18.05
266	3.2	0.0	43.549	0.165	1.32	80	1.92	68	60	68	99.8	75	0.098	0.313	18.05
267	3.1	0.1	43.713	0.164	1.32	80	1.92	68	60	68	99.5	75	0.097	0.311	17.97
268	3.1	0.0	43.878	0.165	1.31	80	1.92	68	60	68	100.3	74	0.098	0.313	17.96
269	3.1	0.0	44.043	0.165	1.32	80	1.92	68	60	68	100.0	74	0.099	0.315	18.04
270	3.1	0.0	44.207	0.164	1.32	80	1.92	68	60	68	99.1	74	0.098	0.313	18.04
271	3.1	0.0	44.372	0.165	1.32	80	1.92	68	60	68	99.9	73	0.097	0.311	17.94
272	3.0	0.1	44.537	0.165	1.32	79	1.92	67	60	68	100.0	73	0.100	0.316	18.02
273	3.0	0.0	44.701	0.164	1.32	79	1.92	67	60	68	99.3	74	0.097	0.311	18.03
274	3.0	0.0	44.866	0.165	1.32	79	1.92	67	60	68	100.3	74	0.097	0.311	17.90
275	3.0	0.0	45.031	0.165	1.32	79	1.91	67	60	68	100.6	74	0.098	0.313	17.95
276	2.9	0.1	45.195	0.164	1.32	79	1.92	67	60	68	99.8	74	0.097	0.311	17.95
277	2.9	0.0	45.360	0.165	1.32	79	1.92	67	60	68	100.2	74	0.100	0.316	18.04
278	2.9	0.0	45.525	0.165	1.32	79	1.92	67	60	68	99.9	75	0.098	0.313	18.10
279	2.9	0.0	45.689	0.164	1.32	79	1.92	67	60	68	99.5	74	0.097	0.311	17.96
280	2.9	0.0	45.854	0.165	1.32	79	1.92	67	60	68	100.3	75	0.099	0.315	18.00
281	2.8	0.1	46.018	0.164	1.32	79	1.92	67	60	68	99.6	75	0.098	0.313	18.06
282	2.8	0.0	46.183	0.165	1.32	79	1.91	67	60	69	100.1	76	0.099	0.315	18.07
283	2.8	0.0	46.348	0.165	1.32	79	1.92	67	60	69	100.3	76	0.097	0.311	18.03
284	2.8	0.0	46.512	0.164	1.32	79	1.92	67	60	69	100.0	76	0.097	0.311	17.94
285	2.7	0.1	46.677	0.165	1.32	79	1.92	67	60	68	100.7	76	0.098	0.313	17.98
286	2.7	0.0	46.842	0.165	1.32	79	1.92	67	60	68	100.4	77	0.099	0.315	18.08
287	2.7	0.0	47.006	0.164	1.31	79	1.92	67	60	68	99.6	77	0.098	0.313	18.09
288	2.7	0.0	47.171	0.165	1.31	79	1.92	67	60	69	100.2	77	0.099	0.315	18.09
289	2.7	0.0	47.336	0.165	1.30	79	1.92	67	60	68	100.1	77	0.099	0.315	18.14
290	2.6	0.1	47.500	0.164	1.31	79	1.92	67	60	69	99.3	77	0.099	0.315	18.14
291	2.6	0.0	47.664	0.164	1.32	79	1.92	67	60	69	99.5	77	0.098	0.313	18.09
292	2.6	0.0	47.829	0.165	1.32	79	1.92	68	60	69	100.2	77	0.099	0.315	18.09
293	2.6	0.0	47.993	0.164	1.32	79	1.92	68	60	69	99.3	77	0.100	0.316	18.18
294	2.5	0.1	48.157	0.164	1.32	79	1.92	68	60	69	99.0	78	0.100	0.316	18.24
295	2.5	0.0	48.322	0.165	1.31	79	1.92	68	60	69	99.9	78	0.097	0.311	18.11
296	2.5	0.0	48.486	0.164	1.31	79	1.92	68	60	68	99.7	78	0.100	0.316	18.11
297	2.5	0.0	48.650	0.164	1.31	79	1.92	68	60	69	99.4	78	0.099	0.315	18.20
298	2.4	0.1	48.815	0.165	1.32	79	1.92	68	60	69	99.7	78	0.101	0.318	18.25
299	2.4	0.0	48.979	0.164	1.32	79	1.92	68	60	69	98.9	77	0.099	0.315	18.24
300	2.4	0.0	49.143	0.164	1.32	79	1.92	68	60	68	99.3	78	0.098	0.313	18.10
301	2.4	0.0	49.308	0.165	1.32	79	1.91	68	60	68	100.4	78	0.098	0.313	18.06
302	2.4	0.0	49.472	0.164	1.32	79	1.92	68	60	68	99.9	77	0.098	0.313	18.05
303	2.3	0.1	49.637	0.165	1.32	79	1.91	68	60	67	100.3	77	0.099	0.315	18.09
304	2.3	0.0	49.801	0.164	1.32	79	1.91	68	60	67	99.7	77	0.097	0.311	18.05

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
305	2.3	0.0	49.966	0.165	1.32	79	1.92	68	60	67	100.6	77	0.098	0.313	18.00
306	2.3	0.0	50.130	0.164	1.31	79	1.92	68	60	68	99.8	77	0.099	0.315	18.09
307	2.2	0.1	50.295	0.165	1.32	79	1.92	68	60	68	100.0	78	0.100	0.316	18.19
308	2.2	0.0	50.459	0.164	1.32	79	1.91	68	60	68	99.2	78	0.099	0.315	18.20
309	2.2	0.0	50.624	0.165	1.32	79	1.91	68	60	68	99.9	78	0.099	0.315	18.15
310	2.2	0.0	50.788	0.164	1.32	79	1.92	68	60	68	99.4	78	0.099	0.315	18.15
311	2.1	0.1	50.953	0.165	1.32	79	1.92	68	60	68	100.3	78	0.097	0.311	18.06
312	2.1	0.0	51.117	0.164	1.32	79	1.92	68	60	68	100.1	78	0.098	0.313	18.02
313	2.1	0.0	51.282	0.165	1.31	79	1.92	68	60	68	100.7	78	0.098	0.313	18.06
314	2.1	0.0	51.446	0.164	1.31	79	1.91	68	60	69	99.8	78	0.099	0.315	18.11
315	2.1	0.0	51.611	0.165	1.32	79	1.92	68	60	69	100.2	78	0.099	0.315	18.15
316	2.0	0.1	51.775	0.164	1.31	79	1.92	68	60	69	99.6	78	0.098	0.313	18.11
317	2.0	0.0	51.939	0.164	1.32	79	1.92	68	60	69	99.8	79	0.099	0.315	18.12
318	2.0	0.0	52.104	0.165	1.32	79	1.92	68	60	69	100.4	79	0.098	0.313	18.13
319	2.0	0.0	52.268	0.164	1.32	79	1.92	68	60	69	100.0	79	0.097	0.311	18.03
320	1.9	0.1	52.433	0.165	1.32	79	1.92	68	60	69	101.0	78	0.097	0.311	17.98
321	1.9	0.0	52.597	0.164	1.32	79	1.92	68	60	69	100.2	78	0.099	0.315	18.06
322	1.9	0.0	52.762	0.165	1.32	79	1.92	68	60	69	100.3	78	0.099	0.315	18.15
323	1.9	0.0	52.926	0.164	1.31	79	1.92	68	60	69	99.8	79	0.097	0.311	18.07
324	1.8	0.1	53.091	0.165	1.32	79	1.92	68	60	69	100.8	79	0.098	0.313	18.03
325	1.8	0.0	53.255	0.164	1.32	79	1.92	68	60	69	100.0	79	0.099	0.315	18.13
326	1.8	0.0	53.419	0.164	1.31	79	1.92	68	60	69	99.7	79	0.099	0.315	18.17
327	1.8	0.0	53.583	0.164	1.32	79	1.91	69	60	69	99.5	79	0.099	0.315	18.17
328	1.8	0.0	53.748	0.165	1.32	79	1.92	69	60	69	100.3	79	0.098	0.313	18.13
329	1.7	0.1	53.912	0.164	1.31	79	1.92	69	60	69	100.1	80	0.097	0.311	18.04
330	1.7	0.0	54.076	0.164	1.31	79	1.92	69	60	69	100.3	79	0.098	0.313	18.04
331	1.7	0.0	54.241	0.165	1.31	79	1.92	69	60	69	100.6	79	0.099	0.315	18.13
332	1.7	0.0	54.404	0.163	1.31	79	1.93	69	60	69	99.2	79	0.098	0.313	18.13
333	1.6	0.1	54.569	0.165	1.31	79	1.93	69	60	69	100.4	79	0.099	0.315	18.13
334	1.6	0.0	54.733	0.164	1.32	79	1.92	69	60	69	99.9	79	0.097	0.311	18.08
335	1.6	0.0	54.897	0.164	1.31	79	1.93	69	60	69	100.0	79	0.099	0.315	18.08
336	1.6	0.0	55.061	0.164	1.32	79	1.92	69	60	69	100.0	79	0.097	0.311	18.08
337	1.5	0.1	55.226	0.165	1.31	79	1.92	69	60	69	100.8	79	0.098	0.313	18.03
338	1.5	0.0	55.390	0.164	1.32	79	1.92	69	60	69	100.2	79	0.098	0.313	18.08
339	1.5	0.0	55.554	0.164	1.32	79	1.92	69	60	69	100.3	79	0.096	0.310	17.99
340	1.5	0.0	55.718	0.164	1.32	79	1.92	69	60	69	100.4	79	0.099	0.315	18.03
341	1.4	0.1	55.883	0.165	1.31	79	1.93	69	60	69	100.5	79	0.099	0.315	18.17
342	1.4	0.0	56.047	0.164	1.31	79	1.93	69	60	70	99.7	79	0.098	0.313	18.13
343	1.4	0.0	56.211	0.164	1.32	79	1.92	69	60	70	100.0	79	0.097	0.311	18.03
344	1.4	0.0	56.375	0.164	1.31	79	1.92	69	60	69	100.0	79	0.100	0.316	18.13
345	1.4	0.0	56.540	0.165	1.31	79	1.92	69	60	69	100.1	79	0.099	0.315	18.22
346	1.3	0.1	56.704	0.164	1.31	79	1.92	69	60	69	99.7	79	0.097	0.311	18.08
347	1.3	0.0	56.868	0.164	1.31	79	1.92	69	60	69	100.0	80	0.100	0.316	18.13
348	1.3	0.0	57.033	0.165	1.32	79	1.92	69	60	69	100.3	79	0.098	0.313	18.18

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Test Date: 3/6/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
349	1.3	0.0	57.197	0.164	1.31	79	1.92	69	60	69	99.6	79	0.099	0.315	18.13
350	1.2	0.1	57.362	0.165	1.31	79	1.92	69	60	69	100.6	79	0.096	0.310	18.03
351	1.2	0.0	57.526	0.164	1.31	79	1.92	69	60	69	100.2	78	0.099	0.315	18.03
352	1.2	0.0	57.691	0.165	1.31	79	1.92	69	60	69	100.6	79	0.098	0.313	18.12
353	1.2	0.0	57.855	0.164	1.31	79	1.93	69	60	69	99.7	78	0.099	0.315	18.12
354	1.1	0.1	58.018	0.163	1.29	80	1.91	69	60	69	98.6	78	0.101	0.318	18.25
355	1.1	0.0	58.181	0.163	1.29	80	1.91	69	60	69	98.4	78	0.097	0.311	18.15
356	1.1	0.0	58.343	0.162	1.29	80	1.91	69	60	69	98.3	77	0.098	0.313	18.01
357	1.1	0.0	58.506	0.163	1.29	80	1.91	69	60	69	99.0	77	0.099	0.315	18.09
358	1.1	0.0	58.669	0.163	1.29	80	1.90	69	60	69	98.8	77	0.098	0.313	18.09
359	1.0	0.1	58.832	0.163	1.30	80	1.90	69	60	69	98.9	77	0.098	0.313	18.05
360	1.0	0.0	58.995	0.163	1.30	80	1.91	69	60	69	98.9	77	0.099	0.315	18.09
361	1.0	0.0	59.158	0.163	1.29	80	1.91	69	60	69	98.7	77	0.099	0.315	18.14
362	1.0	0.0	59.322	0.164	1.29	80	1.90	69	60	69	99.2	77	0.099	0.315	18.14
363	0.9	0.1	59.485	0.163	1.29	80	1.90	69	60	69	98.3	77	0.101	0.318	18.23
364	0.9	0.0	59.649	0.164	1.29	80	1.91	69	60	69	98.4	77	0.101	0.318	18.32
365	0.9	0.0	59.812	0.163	1.29	80	1.91	69	60	69	97.7	76	0.099	0.315	18.22
366	0.9	0.0	59.975	0.163	1.30	80	1.90	69	60	69	98.1	76	0.100	0.316	18.17
367	0.9	0.0	60.138	0.163	1.29	80	1.90	69	60	69	98.3	76	0.098	0.313	18.12
368	0.8	0.1	60.301	0.163	1.29	80	1.90	69	60	69	98.6	76	0.099	0.315	18.08
369	0.8	0.0	60.464	0.163	1.29	80	1.90	68	60	68	98.6	76	0.099	0.315	18.12
370	0.8	0.0	60.627	0.163	1.30	79	1.90	68	60	69	98.4	76	0.100	0.316	18.17
371	0.8	0.0	60.790	0.163	1.30	79	1.91	68	60	68	98.6	76	0.097	0.311	18.08
372	0.7	0.1	60.954	0.164	1.30	80	1.90	68	60	68	99.2	75	0.101	0.318	18.11
373	0.7	0.0	61.117	0.163	1.29	79	1.90	68	60	68	98.2	75	0.099	0.315	18.20
374	0.7	0.0	61.280	0.163	1.30	79	1.90	68	60	68	98.4	75	0.098	0.313	18.06
375	0.7	0.0	61.444	0.164	1.30	79	1.90	68	60	68	99.4	75	0.099	0.315	18.06
376	0.7	0.0	61.608	0.164	1.29	79	1.91	68	60	68	99.4	75	0.098	0.313	18.06
377	0.6	0.1	61.771	0.163	1.30	79	1.90	68	60	68	98.8	75	0.099	0.315	18.06
378	0.6	0.0	61.934	0.163	1.30	79	1.90	68	60	68	98.7	75	0.099	0.315	18.10
379	0.6	0.0	62.098	0.164	1.30	79	1.91	68	60	68	99.2	75	0.099	0.315	18.10
380	0.6	0.0	62.261	0.163	1.29	79	1.90	68	60	68	98.6	76	0.099	0.315	18.11
381	0.5	0.1	62.424	0.163	1.29	79	1.91	68	60	68	98.7	77	0.099	0.315	18.13
382	0.5	0.0	62.587	0.163	1.29	79	1.90	68	60	68	98.6	77	0.100	0.316	18.18
383	0.5	0.0	62.750	0.163	1.30	79	1.90	68	60	68	98.6	77	0.098	0.313	18.14
384	0.5	0.0	62.913	0.163	1.30	79	1.90	68	60	68	98.9	77	0.099	0.315	18.09
385	0.4	0.1	63.077	0.164	1.30	79	1.91	68	60	68	99.7	78	0.098	0.313	18.10
386	0.4	0.0	63.240	0.163	1.30	79	1.91	68	60	68	99.0	77	0.099	0.315	18.10
387	0.4	0.0	63.403	0.163	1.30	79	1.90	68	60	69	98.8	77	0.099	0.315	18.14
388	0.4	0.0	63.567	0.164	1.30	79	1.91	68	60	69	99.7	78	0.097	0.311	18.05
389	0.3	0.1	63.731	0.164	1.29	79	1.91	68	60	69	100.1	78	0.098	0.313	18.02
390	0.3	0.0	63.894	0.163	1.29	79	1.90	68	60	69	99.4	77	0.098	0.313	18.05
391	0.3	0.0	64.057	0.163	1.30	79	1.91	68	60	69	99.2	77	0.098	0.313	18.05
392	0.3	0.0	64.220	0.163	1.30	79	1.90	68	60	69	99.0	77	0.100	0.316	18.14

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 2:23
Test Length: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 17 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
393	0.2	0.1	64.383	0.163	1.29	79	1.91	68	60	69	98.7	77	0.098	0.313	18.14
394	0.2	0.0	64.546	0.163	1.29	79	1.91	68	61	69	98.9	77	0.099	0.315	18.09
395	0.2	0.0	64.709	0.163	1.29	79	1.90	68	61	69	98.7	77	0.100	0.316	18.18
396	0.2	0.0	64.872	0.163	1.30	79	1.90	68	61	69	98.4	77	0.100	0.316	18.23
397	0.1	0.1	65.035	0.163	1.30	79	1.90	68	61	68	98.5	77	0.098	0.313	18.14
398	0.1	0.0	65.198	0.163	1.29	79	1.90	68	61	68	99.1	77	0.097	0.311	18.00
399	0.1	0.0	65.361	0.163	1.29	79	1.91	68	61	68	99.7	76	0.096	0.310	17.90
400	0.0	0.1	65.525	0.164	1.30	79	1.90	68	61	69	100.2	77	0.100	0.316	18.04
401	0.0	0.0	65.689	0.164	1.30	79	1.90	68	61	68	99.4	76	0.099	0.315	18.18

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
Tot / Avg	**65.275**	**0.163**	**0.97**	**78.8**	**2.01**	**69.02**	**60.09**	**100.0**	**579.0**	**404.1**	**285.3**	**202.8**	**358.2**	**760.8**	**22.6**
Minimum	0.000	0.145	0.16	73	0.10	67	56	94.3	462	365	230	169	274	484	321
Max	65.275	0.165	0.99	81	2.10	70	61	103.9	678	479	347	225	390	1239	386
0	0.000		0.16	73	0.10	68	60		485	441	312	220	353	501	362
1	0.145	0.145	0.95	73	2.00	69	57	94.3	475	443	311	219	351	502	360
2	0.306	0.161	0.95	73	2.00	69	57	103.9	466	444	307	215	346	511	356
3	0.465	0.159	0.95	73	2.00	69	56	99.0	463	445	302	214	341	507	353
4	0.624	0.159	0.94	73	2.00	69	56	98.9	463	445	297	211	336	499	350
5	0.784	0.160	0.93	73	2.00	69	56	99.2	462	446	291	208	330	492	347
6	0.942	0.158	0.93	73	2.00	69	56	97.7	462	446	286	208	325	484	345
7	1.101	0.159	0.93	73	2.00	69	56	98.6	462	447	282	205	319	678	343
8	1.259	0.158	0.93	73	2.00	69	56	98.1	462	447	278	200	315	671	340
9	1.417	0.158	0.93	73	2.00	69	56	97.6	466	446	274	197	311	650	339
10	1.576	0.159	0.92	73	2.00	69	56	97.8	469	446	271	195	307	756	338
11	1.733	0.157	0.92	73	2.00	69	56	96.6	473	445	268	195	303	675	337
12	1.892	0.159	0.93	74	2.00	69	56	98.3	477	444	265	190	300	668	335
13	2.049	0.157	0.92	74	2.00	69	56	97.6	479	443	263	188	297	663	334
14	2.207	0.158	0.92	74	2.00	69	56	98.6	481	442	260	186	295	651	333
15	2.365	0.158	0.92	74	2.00	69	56	98.6	482	441	258	185	293	656	332
16	2.522	0.157	0.92	74	2.00	70	56	97.4	484	440	256	184	290	642	331
17	2.680	0.158	0.92	74	2.00	70	56	97.7	485	439	255	182	289	637	330
18	2.837	0.157	0.92	74	2.00	70	56	97.3	486	437	253	183	287	631	329
19	2.996	0.159	0.92	74	2.00	70	56	98.9	486	436	252	180	285	639	328
20	3.153	0.157	0.92	75	2.00	70	56	97.5	486	434	250	180	284	636	327
21	3.311	0.158	0.97	75	2.00	70	56	98.0	487	433	249	179	283	622	326
22	3.474	0.163	0.97	75	2.00	70	56	101.2	488	432	248	177	282	623	325
23	3.635	0.161	0.97	75	2.00	70	56	99.8	489	431	247	177	281	619	325
24	3.796	0.161	0.97	75	2.00	70	57	99.8	489	429	246	176	280	620	324
25	3.958	0.162	0.97	75	2.00	70	57	100.4	490	427	245	175	279	611	323
26	4.121	0.163	0.97	76	2.00	70	57	101.1	490	426	244	174	278	626	322
27	4.282	0.161	0.97	76	2.00	70	57	99.8	492	425	243	174	277	793	322
28	4.444	0.162	0.97	76	2.00	70	57	100.3	494	424	243	173	276	690	322
29	4.606	0.162	0.97	76	2.00	70	57	100.1	497	422	243	174	276	659	322
30	4.769	0.163	0.97	76	2.00	70	57	100.6	499	421	242	173	276	645	322
31	4.930	0.161	0.97	76	2.00	70	57	99.4	501	420	242	171	275	641	322
32	5.092	0.162	0.97	76	2.00	70	57	99.6	503	419	241	172	274	640	322
33	5.254	0.162	0.97	76	2.00	70	57	99.4	505	418	241	170	274	646	322
34	5.417	0.163	0.97	77	2.00	70	57	100.4	506	417	240	169	274	647	321
35	5.579	0.162	0.97	77	2.00	70	57	100.1	509	416	240	172	274	665	322
36	5.740	0.161	0.97	77	2.00	70	57	99.4	512	415	239	170	274	683	322
37	5.902	0.162	0.97	77	2.00	70	58	100.0	516	414	239	170	274	707	323
38	6.065	0.163	0.97	77	2.00	70	58	100.6	521	413	240	170	274	751	324
39	6.227	0.162	0.97	77	2.00	70	58	99.7	525	412	240	170	275	813	324
40	6.389	0.162	0.97	77	2.00	70	58	99.4	531	411	241	171	276	889	326

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
41	6.551	0.162	0.97	77	2.00	70	58	99.7	537	410	243	171	277	1103	328
42	6.713	0.162	0.97	77	2.00	70	58	100.4	547	409	244	171	280	1190	330
43	6.876	0.163	0.97	78	2.10	70	58	101.2	558	409	244	172	282	1201	333
44	7.037	0.161	0.97	78	2.00	70	58	99.5	569	408	245	172	285	1239	336
45	7.199	0.162	0.97	78	2.10	70	58	100.0	580	407	245	173	288	1156	339
46	7.361	0.162	0.97	78	2.10	70	58	100.6	587	406	244	174	291	1105	340
47	7.524	0.163	0.97	78	2.10	70	58	101.3	592	405	243	173	294	996	341
48	7.685	0.161	0.97	78	2.10	70	58	99.8	594	405	242	174	297	941	342
49	7.848	0.163	0.97	78	2.00	70	58	100.9	595	404	242	174	299	921	343
50	8.010	0.162	0.97	78	2.00	70	58	100.5	595	404	241	175	301	928	343
51	8.173	0.163	0.97	78	2.10	70	58	101.2	596	403	241	176	303	987	344
52	8.335	0.162	0.97	78	2.00	70	59	100.2	598	402	240	176	305	956	344
53	8.497	0.162	0.97	78	2.00	70	59	100.1	600	402	239	178	308	949	345
54	8.659	0.162	0.97	78	2.00	70	59	100.2	601	401	238	175	310	955	345
55	8.822	0.163	0.97	79	2.00	70	59	100.8	602	401	237	179	311	934	346
56	8.985	0.163	0.97	79	2.10	70	59	100.6	602	400	236	177	313	885	346
57	9.147	0.162	0.97	79	2.10	70	59	99.9	601	400	236	178	314	859	346
58	9.309	0.162	0.97	79	2.00	70	59	100.3	600	399	235	178	315	857	345
59	9.472	0.163	0.97	79	2.10	70	59	100.9	599	398	234	178	316	831	345
60	9.635	0.163	0.97	79	2.00	70	59	100.5	598	398	234	178	316	836	345
61	9.797	0.162	0.97	79	2.00	70	59	99.9	598	397	233	178	317	832	345
62	9.959	0.162	0.97	79	2.00	70	59	100.2	598	396	233	177	318	855	344
63	10.122	0.163	0.97	79	2.10	70	59	100.9	598	396	232	177	318	891	344
64	10.285	0.163	0.97	79	2.10	70	59	101.1	600	395	232	178	319	922	345
65	10.448	0.163	0.97	79	2.00	70	59	101.1	602	394	231	178	319	956	345
66	10.610	0.162	0.97	79	2.10	70	59	100.1	604	394	231	178	320	930	345
67	10.773	0.163	0.97	79	2.00	70	59	100.4	606	393	231	176	321	917	345
68	10.935	0.162	0.98	79	2.10	70	59	100.2	610	392	231	178	322	869	347
69	11.099	0.164	0.97	79	2.10	70	59	101.8	612	391	230	177	323	866	347
70	11.261	0.162	0.97	79	2.00	70	59	100.5	616	390	230	177	324	876	347
71	11.424	0.163	0.97	79	2.10	70	59	101.3	619	390	231	177	325	891	348
72	11.586	0.162	0.97	79	2.00	70	59	100.7	623	389	231	178	327	906	350
73	11.750	0.164	0.97	79	2.10	70	59	101.6	628	388	231	177	328	902	350
74	11.913	0.163	0.97	79	2.00	70	60	100.8	632	388	231	179	330	881	352
75	12.075	0.162	0.97	79	2.10	70	60	99.9	636	387	232	178	333	864	353
76	12.238	0.163	0.98	79	2.10	70	60	100.3	640	386	232	179	334	851	354
77	12.400	0.162	0.97	79	2.00	70	60	99.8	643	386	232	179	337	845	355
78	12.564	0.164	0.97	79	2.00	70	60	101.1	646	385	233	180	339	838	357
79	12.727	0.163	0.97	79	2.00	70	60	100.2	647	384	233	180	341	825	357
80	12.889	0.162	0.98	79	2.10	70	60	99.4	648	384	234	180	344	818	358
81	13.052	0.163	0.98	79	2.10	70	60	100.3	648	383	234	181	345	815	358
82	13.215	0.163	0.98	79	2.00	70	60	100.4	648	383	235	184	346	815	359
83	13.379	0.164	0.98	79	2.00	70	60	101.2	648	382	235	183	347	820	359
84	13.542	0.163	0.97	79	2.00	70	60	100.9	647	381	235	185	348	795	359

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
85	13.704	0.162	0.98	79	2.00	70	60	100.2	647	381	236	183	349	790	359
86	13.867	0.163	0.98	79	2.00	69	60	100.5	646	380	236	186	349	784	359
87	14.030	0.163	0.98	79	2.00	69	60	100.4	646	379	236	186	348	793	359
88	14.194	0.164	0.97	79	2.10	69	60	101.2	644	379	236	184	348	782	358
89	14.357	0.163	0.97	79	2.00	69	60	100.5	643	378	236	184	347	778	358
90	14.520	0.163	0.98	79	2.00	69	60	100.1	643	377	237	185	346	781	358
91	14.682	0.162	0.98	79	2.00	69	60	99.3	643	376	237	185	345	783	357
92	14.846	0.164	0.98	79	2.00	69	60	100.7	643	376	237	185	344	785	357
93	15.010	0.164	0.97	79	2.00	69	60	100.6	644	375	237	184	344	790	357
94	15.173	0.163	0.97	79	2.00	69	60	99.5	644	375	238	186	343	792	357
95	15.335	0.162	0.98	79	2.00	69	60	99.0	646	374	238	187	343	792	358
96	15.498	0.163	0.98	79	2.00	69	60	99.9	647	374	239	188	342	797	358
97	15.661	0.163	0.98	79	2.00	69	60	99.9	648	373	240	188	342	798	358
98	15.825	0.164	0.97	79	2.00	69	60	100.6	650	373	240	188	341	800	358
99	15.988	0.163	0.97	79	2.10	69	60	100.4	652	372	241	188	341	799	359
100	16.150	0.162	0.97	79	2.00	69	60	100.4	654	372	242	190	342	803	360
101	16.313	0.163	0.98	79	2.00	69	60	100.9	656	371	243	188	341	809	360
102	16.476	0.163	0.98	79	2.10	69	60	100.5	658	371	244	189	342	833	361
103	16.640	0.164	0.97	79	2.10	69	60	101.4	660	371	244	190	342	862	361
104	16.802	0.162	0.97	79	2.00	69	60	100.4	662	370	245	190	343	815	362
105	16.965	0.163	0.98	79	2.10	69	60	100.9	664	370	246	190	343	839	363
106	17.128	0.163	0.98	79	2.10	69	60	100.5	666	370	247	191	344	811	364
107	17.291	0.163	0.97	79	2.10	69	60	100.4	667	370	248	192	346	807	365
108	17.454	0.163	0.97	79	2.00	69	60	100.9	668	369	249	192	347	819	365
109	17.617	0.163	0.97	79	2.00	69	60	101.2	669	369	250	194	348	841	366
110	17.779	0.162	0.98	79	2.10	69	60	100.6	669	369	250	192	349	817	366
111	17.942	0.163	0.98	79	2.10	69	60	100.8	669	368	251	193	350	808	366
112	18.105	0.163	0.98	79	2.00	69	60	100.3	668	368	252	193	351	804	366
113	18.268	0.163	0.97	79	2.00	69	60	100.4	668	368	252	193	353	799	367
114	18.431	0.163	0.97	79	2.00	69	60	101.0	667	368	253	193	354	804	367
115	18.594	0.163	0.97	79	2.10	69	60	101.3	666	367	254	194	355	805	367
116	18.756	0.162	0.97	79	2.00	69	60	100.8	666	367	254	194	355	817	367
117	18.919	0.163	0.97	79	2.00	69	60	101.3	668	367	255	194	356	816	368
118	19.082	0.163	0.97	79	2.10	69	60	101.1	668	366	255	195	357	839	368
119	19.245	0.163	0.97	79	2.00	69	60	101.4	669	366	256	194	357	813	368
120	19.408	0.163	0.97	79	2.10	69	60	101.0	670	366	256	194	357	811	369
121	19.571	0.163	0.97	79	2.00	69	60	100.5	671	366	257	195	358	820	369
122	19.734	0.163	0.97	79	2.00	69	60	100.6	671	366	258	195	359	819	370
123	19.897	0.163	0.97	79	2.00	69	60	100.6	672	365	259	196	359	811	370
124	20.059	0.162	0.97	79	2.00	69	60	99.9	672	365	260	198	360	811	371
125	20.222	0.163	0.97	79	2.00	69	60	100.4	673	365	261	196	361	808	371
126	20.385	0.163	0.97	79	2.10	69	60	100.5	674	365	262	198	362	821	372
127	20.549	0.164	0.97	79	2.10	69	60	101.4	675	365	263	198	363	812	373
128	20.711	0.162	0.97	79	2.00	69	60	100.1	675	365	264	198	364	809	373

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
129	20.873	0.162	0.97	79	2.10	69	60	100.3	675	365	265	199	365	812	374
130	21.036	0.163	0.97	79	2.10	69	60	101.0	675	365	267	199	366	812	374
131	21.199	0.163	0.98	79	2.10	69	60	100.9	676	365	268	200	368	811	375
132	21.363	0.164	0.97	79	2.10	69	60	101.2	676	365	270	201	369	813	376
133	21.525	0.162	0.97	79	2.00	69	60	100.0	677	365	271	202	370	813	377
134	21.688	0.163	0.97	79	2.00	69	60	100.7	677	365	272	200	372	808	377
135	21.850	0.162	0.97	79	2.10	69	60	100.3	678	365	274	202	373	809	378
136	22.013	0.163	0.97	79	2.00	69	60	101.0	677	365	275	204	374	810	379
137	22.177	0.164	0.97	79	2.00	69	60	101.2	677	365	276	203	375	807	379
138	22.339	0.162	0.97	79	2.00	69	60	99.5	677	366	277	203	376	807	380
139	22.502	0.163	0.97	79	2.10	69	60	100.2	677	366	279	204	377	810	381
140	22.665	0.163	0.97	79	2.00	69	60	100.6	676	366	280	205	378	809	381
141	22.828	0.163	0.98	79	2.00	69	60	100.6	676	366	281	206	379	807	382
142	22.991	0.163	0.97	79	2.00	69	60	100.2	675	366	282	205	379	809	381
143	23.153	0.162	0.97	79	2.10	69	60	99.2	675	366	282	206	380	807	382
144	23.316	0.163	0.97	79	2.10	69	60	100.1	674	366	283	206	380	812	382
145	23.479	0.163	0.97	79	2.10	69	60	100.3	672	367	283	206	381	810	382
146	23.643	0.164	0.97	79	2.00	69	60	101.1	671	367	283	207	380	804	382
147	23.805	0.162	0.97	79	2.00	69	60	99.7	670	367	284	207	381	957	382
148	23.968	0.163	0.97	80	2.00	69	60	100.1	668	368	284	205	381	864	381
149	24.130	0.162	0.98	79	2.00	69	60	99.7	667	368	284	205	381	809	381
150	24.293	0.163	0.97	80	2.00	69	60	100.2	665	368	284	207	381	806	381
151	24.457	0.164	0.97	80	2.00	69	60	100.6	663	368	284	206	381	810	380
152	24.620	0.163	0.97	80	2.00	69	60	100.1	662	369	284	205	380	804	380
153	24.783	0.163	0.98	80	2.10	69	60	100.4	661	369	283	207	381	946	380
154	24.945	0.162	0.98	80	2.00	69	60	99.8	659	369	283	206	380	798	379
155	25.108	0.163	0.97	80	2.00	69	60	100.5	658	369	283	205	380	802	379
156	25.272	0.164	0.97	80	2.00	69	60	101.1	656	369	283	205	379	791	378
157	25.435	0.163	0.97	80	2.10	69	60	100.5	655	369	283	206	379	888	378
158	25.597	0.162	0.97	80	2.00	69	60	100.0	653	369	283	206	379	817	378
159	25.760	0.163	0.97	80	2.00	69	60	100.6	652	370	283	206	379	868	378
160	25.923	0.163	0.97	80	2.00	69	60	100.3	651	370	282	206	379	794	378
161	26.087	0.164	0.97	80	2.10	69	60	101.1	650	370	282	207	379	799	378
162	26.249	0.162	0.97	80	2.00	69	60	100.0	649	370	282	205	379	806	377
163	26.412	0.163	0.97	80	2.00	69	60	100.5	648	370	283	206	379	807	377
164	26.575	0.163	0.97	80	2.10	69	60	100.6	648	370	283	208	380	925	378
165	26.738	0.163	0.98	80	2.00	69	60	100.6	647	370	284	209	380	843	378
166	26.901	0.163	0.97	80	2.00	69	60	100.2	645	370	284	207	380	863	377
167	27.064	0.163	0.97	80	2.00	69	60	99.8	644	370	284	208	382	843	378
168	27.227	0.163	0.97	80	2.00	69	60	99.7	643	370	284	207	382	866	377
169	27.390	0.163	0.97	80	2.00	69	61	99.8	642	370	284	206	383	855	377
170	27.553	0.163	0.98	80	2.00	69	61	99.9	640	371	284	206	384	841	377
171	27.716	0.163	0.97	80	2.00	69	61	99.8	639	371	284	207	385	898	377
172	27.879	0.163	0.97	80	2.00	69	61	99.7	638	371	284	205	386	838	377

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
173	28.042	0.163	0.97	80	2.00	69	61	99.8	637	371	284	207	387	822	377
174	28.205	0.163	0.98	80	2.00	69	61	100.3	636	371	284	206	387	819	377
175	28.368	0.163	0.98	80	2.00	69	61	100.6	640	371	283	206	387	823	377
176	28.531	0.163	0.98	80	2.00	69	61	100.2	644	371	282	208	386	827	378
177	28.694	0.163	0.97	80	2.00	69	61	99.8	648	371	282	206	385	827	378
178	28.857	0.163	0.97	80	2.00	69	61	99.7	652	372	281	207	384	825	379
179	29.020	0.163	0.98	80	2.00	69	61	99.8	655	372	280	204	383	824	379
180	29.184	0.164	0.98	80	2.00	69	61	100.3	657	372	279	206	382	823	379
181	29.347	0.163	0.97	80	2.00	69	61	99.3	659	372	279	204	381	821	379
182	29.510	0.163	0.98	80	2.00	69	61	99.4	660	372	278	206	380	816	379
183	29.673	0.163	0.98	80	2.00	69	61	99.9	661	372	277	203	380	811	379
184	29.836	0.163	0.98	80	2.00	69	61	100.1	661	372	277	204	378	806	378
185	29.999	0.163	0.98	80	2.00	69	61	99.8	659	372	276	204	378	801	378
186	30.163	0.164	0.98	80	2.00	69	61	100.2	658	372	276	204	378	798	378
187	30.326	0.163	0.97	80	2.00	69	61	99.8	656	372	275	203	377	794	377
188	30.489	0.163	0.98	80	2.00	69	61	100.1	654	372	275	202	376	793	376
189	30.652	0.163	0.98	80	2.00	69	61	100.1	653	373	274	203	375	790	376
190	30.815	0.163	0.98	80	2.00	69	61	99.9	651	373	274	203	375	789	375
191	30.979	0.164	0.98	80	2.00	70	61	100.6	650	373	273	202	374	788	374
192	31.142	0.163	0.97	80	2.00	69	61	99.9	648	373	273	202	374	788	374
193	31.305	0.163	0.97	80	2.00	70	61	100.1	647	373	272	202	374	786	374
194	31.468	0.163	0.98	80	2.00	70	61	100.2	646	373	272	202	373	783	373
195	31.631	0.163	0.98	80	2.00	70	61	100.1	645	373	272	203	373	782	373
196	31.795	0.164	0.97	80	2.00	70	61	100.6	643	373	271	203	373	780	373
197	31.958	0.163	0.97	80	2.00	70	61	99.9	642	373	271	202	372	779	372
198	32.121	0.163	0.98	80	2.00	70	61	100.1	641	373	271	203	372	779	372
199	32.284	0.163	0.98	80	2.00	70	61	100.2	640	373	271	203	371	779	372
200	32.447	0.163	0.98	80	2.00	70	61	99.9	640	373	270	202	372	778	371
201	32.611	0.164	0.98	80	2.00	70	61	100.3	639	373	270	201	371	777	371
202	32.774	0.163	0.97	80	2.00	70	61	99.9	638	373	270	203	371	776	371
203	32.937	0.163	0.98	80	2.00	70	61	100.1	638	373	270	202	371	776	371
204	33.100	0.163	0.98	80	2.00	70	61	99.8	637	373	270	201	371	776	370
205	33.263	0.163	0.98	80	2.00	70	61	99.8	637	373	269	202	371	776	370
206	33.427	0.164	0.98	80	2.00	70	61	100.6	637	373	269	201	371	776	370
207	33.590	0.163	0.97	80	2.00	70	61	99.9	636	373	269	202	371	777	370
208	33.753	0.163	0.97	80	2.00	70	61	99.9	637	373	269	203	370	777	370
209	33.916	0.163	0.98	80	2.00	70	61	100.1	637	373	269	202	371	778	370
210	34.079	0.163	0.98	80	2.00	70	61	100.2	637	374	269	203	371	779	371
211	34.243	0.164	0.98	80	2.00	70	61	100.6	638	374	269	202	370	779	371
212	34.406	0.163	0.98	80	2.00	70	61	99.7	638	374	270	202	371	782	371
213	34.569	0.163	0.97	80	2.00	70	61	99.7	639	374	270	203	371	783	371
214	34.732	0.163	0.98	80	2.00	70	61	99.8	640	374	270	202	371	784	371
215	34.895	0.163	0.98	80	2.00	70	61	100.0	641	374	270	202	371	787	372
216	35.059	0.164	0.98	80	2.00	70	61	100.8	642	374	270	203	371	789	372

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
217	35.222	0.163	0.98	80	2.00	70	61	100.2	644	374	270	201	371	792	372
218	35.385	0.163	0.97	80	2.00	70	61	100.1	645	374	271	202	371	794	373
219	35.548	0.163	0.98	80	2.00	70	61	99.8	647	374	271	204	371	795	373
220	35.711	0.163	0.98	80	2.00	70	61	99.8	648	374	272	201	372	796	373
221	35.875	0.164	0.98	80	2.00	70	61	100.9	650	374	272	203	372	797	374
222	36.038	0.163	0.97	80	2.00	70	61	100.6	651	374	272	202	372	797	374
223	36.201	0.163	0.97	80	2.00	70	61	100.3	652	374	273	203	372	799	375
224	36.364	0.163	0.97	80	2.00	70	61	99.9	653	374	273	205	372	801	375
225	36.527	0.163	0.98	80	2.00	70	61	99.9	656	374	274	204	372	812	376
226	36.690	0.163	0.98	80	2.00	70	61	99.9	658	374	275	205	373	812	377
227	36.855	0.165	0.98	80	2.00	70	61	101.1	659	374	276	204	373	810	377
228	37.017	0.162	0.97	80	2.00	70	61	99.4	657	374	277	205	374	800	377
229	37.180	0.163	0.98	80	2.00	70	61	99.8	654	375	279	205	375	788	378
230	37.343	0.163	0.98	80	2.00	70	61	99.5	651	375	281	206	376	787	378
231	37.506	0.163	0.97	80	2.00	70	61	99.8	648	375	283	207	377	782	378
232	37.671	0.165	0.97	80	2.00	70	61	101.4	646	376	285	207	378	783	378
233	37.834	0.163	0.98	80	2.00	70	61	100.0	643	376	287	206	379	780	378
234	37.996	0.162	0.97	80	2.00	70	61	99.2	641	377	289	210	380	778	379
235	38.159	0.163	0.97	80	2.00	70	61	100.1	640	378	291	211	381	783	380
236	38.323	0.164	0.97	80	2.10	70	61	100.7	638	379	293	211	382	778	381
237	38.487	0.164	0.97	80	2.00	70	61	100.5	637	380	294	213	382	775	381
238	38.650	0.163	0.97	80	2.00	70	61	99.6	636	381	296	213	383	772	382
239	38.813	0.163	0.98	80	2.00	70	61	99.3	635	382	298	214	382	774	382
240	38.976	0.163	0.98	80	2.00	70	61	99.9	635	382	298	214	382	785	382
241	39.139	0.163	0.98	80	2.10	70	61	100.3	638	383	299	216	382	798	384
242	39.303	0.164	0.98	81	2.00	70	61	100.5	642	384	299	214	382	806	384
243	39.466	0.163	0.97	80	2.00	70	61	99.5	645	385	299	215	381	807	385
244	39.630	0.164	0.97	80	2.00	70	61	100.6	648	385	298	216	380	803	385
245	39.793	0.163	0.98	80	2.00	70	61	100.2	649	386	299	214	380	797	386
246	39.956	0.163	0.98	80	2.00	70	61	99.6	648	386	298	215	379	787	385
247	40.119	0.163	0.98	80	2.00	70	61	99.1	647	387	298	214	378	779	385
248	40.283	0.164	0.98	80	2.00	69	61	99.9	644	387	299	214	377	772	384
249	40.447	0.164	0.97	80	2.00	69	61	100.2	640	387	299	213	376	764	383
250	40.609	0.162	0.98	80	2.00	69	61	98.9	637	388	299	216	376	757	383
251	40.773	0.164	0.98	80	2.00	69	61	99.9	632	388	299	214	375	752	382
252	40.936	0.163	0.98	80	2.00	69	61	99.0	628	389	299	214	374	747	381
253	41.100	0.164	0.98	80	2.00	69	61	99.5	623	389	299	213	373	743	379
254	41.264	0.164	0.97	80	2.00	69	61	99.8	619	389	299	212	373	742	378
255	41.427	0.163	0.98	80	2.00	69	61	99.3	615	389	299	213	372	738	378
256	41.590	0.163	0.98	80	2.00	69	61	99.4	611	390	299	212	371	736	377
257	41.754	0.164	0.98	80	2.00	69	61	100.4	607	390	299	212	369	731	375
258	41.917	0.163	0.98	80	2.00	69	61	100.0	603	390	300	212	369	729	375
259	42.082	0.165	0.98	80	2.00	69	61	100.7	599	391	300	211	368	726	374
260	42.245	0.163	0.98	80	2.00	69	61	99.2	596	391	300	213	368	725	374

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
261	42.408	0.163	0.98	80	2.00	68	61	99.6	593	391	300	213	367	723	373
262	42.571	0.163	0.98	80	2.00	68	61	99.9	590	391	300	212	366	721	372
263	42.735	0.164	0.98	80	2.00	68	61	100.0	587	391	300	211	365	719	371
264	42.899	0.164	0.98	80	2.00	68	61	99.7	585	392	300	211	364	721	370
265	43.063	0.164	0.98	80	2.00	68	61	99.8	582	392	300	212	363	715	370
266	43.226	0.163	0.98	80	2.00	68	61	99.2	577	392	302	211	363	706	369
267	43.389	0.163	0.98	80	2.00	68	61	99.5	572	392	303	211	362	704	368
268	43.553	0.164	0.98	80	2.00	68	61	100.3	567	393	304	211	362	699	367
269	43.717	0.164	0.98	79	2.00	68	61	100.1	563	393	306	211	362	697	367
270	43.881	0.164	0.98	79	2.00	68	61	99.9	558	393	308	212	362	694	367
271	44.044	0.163	0.98	79	2.00	68	61	99.5	554	393	309	210	361	693	365
272	44.207	0.163	0.98	79	2.00	68	61	99.5	550	394	311	210	361	691	365
273	44.371	0.164	0.98	79	2.00	68	61	99.9	547	394	313	212	361	691	365
274	44.534	0.163	0.97	79	2.00	67	61	99.7	544	394	315	212	361	693	365
275	44.698	0.164	0.98	79	2.00	67	61	100.6	541	395	317	210	361	689	365
276	44.862	0.164	0.98	79	2.00	67	61	100.4	539	395	319	212	361	687	365
277	45.025	0.163	0.98	79	2.00	67	61	99.6	536	395	321	211	361	693	365
278	45.189	0.164	0.98	79	2.00	67	61	99.9	534	395	322	211	361	691	365
279	45.352	0.163	0.98	79	2.00	67	61	99.5	532	396	324	211	361	694	365
280	45.515	0.163	0.98	79	2.00	67	61	99.7	530	396	326	212	361	690	365
281	45.680	0.165	0.98	79	2.00	67	61	100.8	528	396	328	215	361	692	366
282	45.843	0.163	0.97	79	2.00	67	61	99.5	526	397	329	214	361	685	365
283	46.006	0.163	0.98	79	2.00	67	61	99.7	525	397	331	213	361	685	365
284	46.169	0.163	0.98	79	2.00	67	61	100.0	524	398	332	215	361	682	366
285	46.332	0.163	0.98	79	2.00	67	61	100.1	523	398	334	214	362	682	366
286	46.497	0.165	0.98	79	2.00	67	61	101.1	523	398	335	216	362	683	367
287	46.660	0.163	0.98	79	2.00	67	61	99.6	522	399	336	215	361	679	367
288	46.823	0.163	0.97	79	2.00	67	61	99.6	521	399	337	213	361	677	366
289	46.986	0.163	0.98	79	2.00	68	61	99.5	520	399	338	214	362	688	367
290	47.149	0.163	0.98	79	2.00	68	61	99.3	519	400	338	215	362	692	367
291	47.313	0.164	0.98	79	2.00	68	61	100.1	517	401	337	214	362	690	366
292	47.477	0.164	0.98	79	2.00	68	61	100.2	515	402	336	214	361	688	366
293	47.640	0.163	0.98	79	2.00	68	61	99.3	514	403	334	215	362	689	366
294	47.803	0.163	0.98	79	2.00	68	61	99.0	513	404	332	214	362	692	365
295	47.966	0.163	0.98	79	2.00	68	61	99.3	511	406	331	215	362	689	365
296	48.129	0.163	0.98	79	2.00	68	61	99.7	510	407	329	215	362	693	365
297	48.294	0.165	0.98	79	2.00	68	61	100.7	509	409	328	214	362	690	364
298	48.456	0.162	0.98	79	2.00	68	61	98.5	508	410	326	215	362	691	364
299	48.619	0.163	0.98	79	2.00	68	61	98.9	507	411	325	214	362	689	364
300	48.782	0.163	0.98	79	2.00	68	61	99.3	506	412	324	213	362	694	363
301	48.946	0.164	0.98	79	2.00	68	61	100.5	505	414	322	214	362	694	363
302	49.110	0.164	0.99	79	2.00	68	61	100.5	504	415	321	213	362	694	363
303	49.274	0.164	0.98	79	2.00	68	61	100.3	504	416	320	212	362	701	363
304	49.437	0.163	0.98	79	2.00	68	61	99.7	503	417	319	212	363	699	363

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
305	49.601	0.164	0.98	79	2.00	68	61	100.6	502	418	319	214	363	698	363
306	49.764	0.163	0.99	79	2.00	68	61	99.9	501	419	318	214	363	700	363
307	49.928	0.164	0.98	79	2.00	68	61	100.0	500	420	318	216	364	699	364
308	50.092	0.164	0.98	79	2.00	68	61	99.8	500	421	317	214	364	699	363
309	50.255	0.163	0.98	79	2.00	68	61	99.3	499	422	317	216	365	696	364
310	50.418	0.163	0.98	79	2.00	68	61	99.4	498	423	316	217	365	695	364
311	50.581	0.163	0.98	78	2.00	68	60	99.8	497	424	316	214	366	698	363
312	50.745	0.164	0.98	79	2.00	68	61	100.8	497	425	316	215	366	693	364
313	50.909	0.164	0.98	79	2.00	68	61	100.7	496	426	316	214	367	694	364
314	51.072	0.163	0.98	79	2.00	68	60	99.8	495	426	315	215	368	699	364
315	51.235	0.163	0.97	78	2.00	68	60	99.7	495	427	315	217	368	699	364
316	51.398	0.163	0.98	78	2.00	68	60	99.8	494	428	315	218	368	703	365
317	51.562	0.164	0.98	78	2.00	68	61	100.6	494	428	315	216	369	703	364
318	51.725	0.163	0.98	79	2.00	68	60	99.9	493	429	315	216	370	704	365
319	51.889	0.164	0.98	78	2.00	68	60	100.7	492	430	315	217	371	702	365
320	52.052	0.163	0.98	78	2.00	68	60	100.5	493	430	315	218	371	699	365
321	52.215	0.163	0.98	79	2.00	68	60	100.3	492	431	315	216	371	705	365
322	52.378	0.163	0.98	79	2.00	68	60	99.7	492	431	315	216	373	699	365
323	52.541	0.163	0.98	79	2.00	68	60	99.8	492	432	316	216	373	700	366
324	52.706	0.165	0.98	79	2.00	68	60	101.4	491	432	316	216	374	699	366
325	52.868	0.162	0.98	79	2.00	68	60	99.4	491	433	317	215	374	699	366
326	53.031	0.163	0.98	79	2.00	68	61	99.7	491	433	317	217	374	684	366
327	53.194	0.163	0.98	79	2.00	68	60	99.5	491	434	318	218	375	682	367
328	53.357	0.163	0.98	79	2.00	69	60	99.7	491	434	318	216	376	689	367
329	53.522	0.165	0.97	79	2.00	69	61	101.3	491	435	319	216	376	690	367
330	53.684	0.162	0.97	79	2.00	69	61	99.7	491	436	320	218	377	689	368
331	53.847	0.163	0.98	79	2.00	69	60	100.0	492	437	320	219	378	693	369
332	54.010	0.163	0.98	79	2.00	69	61	99.8	492	437	321	217	378	691	369
333	54.173	0.163	0.98	79	2.00	69	61	99.8	492	438	321	217	378	693	369
334	54.337	0.164	0.98	79	2.00	69	60	100.5	492	439	322	216	379	696	370
335	54.500	0.163	0.97	79	2.00	69	61	100.0	492	439	323	216	379	694	370
336	54.663	0.163	0.98	79	2.00	69	61	100.0	493	440	324	218	380	694	371
337	54.826	0.163	0.98	79	2.00	69	60	100.2	492	441	324	217	380	700	371
338	54.989	0.163	0.98	79	2.00	69	61	100.2	492	441	325	217	380	697	371
339	55.153	0.164	0.98	79	2.00	69	61	100.9	492	442	326	216	380	693	371
340	55.316	0.163	0.98	79	2.00	69	61	100.4	492	442	326	217	381	697	372
341	55.479	0.163	0.97	79	2.00	69	61	99.9	492	443	327	219	380	695	372
342	55.642	0.163	0.98	79	2.00	69	61	99.7	492	444	327	217	381	694	372
343	55.805	0.163	0.98	79	2.00	69	61	100.0	492	445	327	219	381	691	373
344	55.969	0.164	0.98	79	2.00	69	61	100.7	492	446	327	218	381	693	373
345	56.132	0.163	0.98	79	2.00	69	61	99.5	492	447	328	218	382	692	373
346	56.295	0.163	0.98	79	2.00	69	61	99.7	492	449	327	218	381	694	373
347	56.458	0.163	0.98	79	2.00	69	61	100.0	492	450	328	217	382	693	374
348	56.621	0.163	0.98	79	2.00	69	61	99.7	493	451	328	218	382	694	374

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
349	56.785	0.164	0.98	79	2.00	69	61	100.2	493	452	327	219	382	697	375
350	56.948	0.163	0.98	79	2.00	69	61	100.0	493	453	327	218	382	695	375
351	57.111	0.163	0.98	79	2.00	69	61	100.2	493	455	327	218	383	689	375
352	57.274	0.163	0.98	79	2.00	69	61	100.0	493	456	327	218	383	695	375
353	57.437	0.163	0.98	79	2.00	69	61	99.7	493	457	327	219	383	693	376
354	57.600	0.163	0.97	79	2.00	69	61	99.3	493	458	327	220	383	692	376
355	57.764	0.164	0.98	79	2.00	69	61	99.8	493	460	327	220	383	694	377
356	57.927	0.163	0.97	79	2.00	69	61	99.8	493	461	326	219	384	691	377
357	58.090	0.163	0.98	79	2.00	69	61	99.8	494	462	326	220	384	693	377
358	58.253	0.163	0.98	79	2.00	69	61	99.6	493	463	326	218	384	690	377
359	58.416	0.163	0.98	79	2.00	69	61	99.7	494	464	326	219	384	692	377
360	58.580	0.164	0.98	79	2.00	69	61	100.3	494	465	326	218	384	691	377
361	58.743	0.163	0.98	79	2.00	69	61	99.5	494	466	325	219	384	690	378
362	58.906	0.163	0.98	79	2.00	69	61	99.3	494	466	325	219	385	689	378
363	59.069	0.163	0.98	79	2.00	69	61	99.1	494	467	325	217	385	692	378
364	59.232	0.163	0.98	79	2.00	69	61	98.6	494	468	325	217	385	688	378
365	59.396	0.164	0.98	79	2.00	69	61	99.1	494	468	324	217	385	694	378
366	59.559	0.163	0.97	79	2.00	69	61	98.9	494	469	324	217	386	694	378
367	59.722	0.163	0.98	79	2.00	69	61	99.1	494	470	324	218	386	692	378
368	59.885	0.163	0.98	79	2.00	69	61	99.4	494	470	324	217	386	692	378
369	60.049	0.164	0.98	79	2.00	68	61	100.0	494	471	324	217	386	693	378
370	60.213	0.164	0.98	79	2.00	68	61	99.7	494	472	324	219	387	693	379
371	60.376	0.163	0.98	79	2.00	68	61	99.3	493	473	324	218	387	692	379
372	60.539	0.163	0.98	79	2.00	68	61	99.3	493	473	324	217	388	694	379
373	60.702	0.163	0.98	79	2.00	68	61	98.9	493	474	324	218	387	697	379
374	60.866	0.164	0.98	79	2.00	68	61	99.6	493	475	324	217	388	692	379
375	61.029	0.163	0.98	79	2.00	68	61	99.4	493	475	324	218	388	696	380
376	61.193	0.164	0.98	79	2.00	68	61	100.0	493	476	324	218	388	698	380
377	61.356	0.163	0.97	79	2.00	68	61	99.4	494	477	324	217	388	692	380
378	61.519	0.163	0.98	79	2.00	68	61	99.3	494	477	324	219	389	686	381
379	61.683	0.164	0.98	79	2.00	68	61	99.8	494	478	324	217	389	683	380
380	61.846	0.163	0.98	79	2.00	68	61	99.2	494	478	323	219	389	682	381
381	62.010	0.164	0.98	79	2.00	68	61	100.0	494	479	323	220	389	679	381
382	62.173	0.163	0.98	79	2.00	68	61	99.2	494	479	323	218	389	677	381
383	62.336	0.163	0.98	79	2.00	68	61	99.2	493	479	324	220	389	687	381
384	62.499	0.163	0.98	79	2.00	68	61	99.5	493	479	325	219	389	688	381
385	62.663	0.164	0.98	79	2.00	68	61	100.3	493	479	327	221	389	689	382
386	62.827	0.164	0.98	79	2.00	68	61	100.3	492	479	329	220	389	690	382
387	62.990	0.163	0.97	79	2.00	68	61	99.5	492	479	331	220	389	688	382
388	63.153	0.163	0.98	79	2.00	68	61	99.7	491	478	333	221	389	689	382
389	63.316	0.163	0.98	79	2.00	68	61	100.1	491	478	334	221	389	687	383
390	63.480	0.164	0.98	79	2.00	68	61	100.6	491	478	336	222	390	687	383
391	63.643	0.163	0.98	79	2.00	68	61	99.8	490	477	338	222	389	690	383
392	63.807	0.164	0.98	79	2.00	68	61	100.2	490	477	339	222	390	691	384

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 02:23
Total Sampling Time: 401 min
Recording Interval: 1 min

Test Date: 3/6/24

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18.5 in. Hg
Post-Test 0 cfm @ 9.69 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = ΔT)
393	63.970	0.163	0.98	79	2.00	68	61	99.3	490	476	340	222	390	690	384
394	64.133	0.163	0.98	79	2.00	68	61	99.5	490	476	341	223	389	689	384
395	64.296	0.163	0.98	79	2.00	68	61	99.3	490	475	343	224	390	691	384
396	64.459	0.163	0.98	79	2.00	68	61	99.0	490	475	343	223	390	691	384
397	64.623	0.164	0.98	79	2.00	68	61	99.7	490	475	344	224	389	688	384
398	64.786	0.163	0.98	79	2.00	68	61	99.7	490	474	345	224	390	688	385
399	64.949	0.163	0.98	79	2.00	68	61	100.3	490	474	346	223	389	688	384
400	65.112	0.163	0.98	79	2.00	68	61	100.2	490	474	346	223	389	688	384
401	65.275	0.163	0.98	79	2.00	68	61	99.4	490	473	347	225	389	689	385

Train C - First Hour Particulate Sampling

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 2:23
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0.002 cfm @ 23 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
Tot / Avg	**9.856**	**0.164**	**2.26**	**68.7**	**-2.15**	**69.6**	**63.9**	**99.9**
Minimum	0.000	0.133	-0.03	68	-2.43	67	63	84.6
Max	9.856	0.170	2.43	70	-1.80	70	64	107.4
0	0.000		-0.03	68	-1.80	67	64	
1	0.133	0.133	2.32	68	-2.37	69	63	84.6
2	0.303	0.170	2.43	68	-1.98	69	63	107.4
3	0.472	0.169	2.42	68	-2.15	69	63	103.0
4	0.641	0.169	2.41	68	-2.41	69	63	102.9
5	0.810	0.169	2.40	68	-2.39	69	63	102.6
6	0.978	0.168	2.40	68	-2.43	69	64	101.7
7	1.146	0.168	2.38	68	-1.97	69	64	102.0
8	1.313	0.167	2.36	68	-1.93	69	64	101.5
9	1.480	0.167	2.36	68	-1.90	69	64	101.0
10	1.647	0.167	2.33	68	-2.07	69	64	100.4
11	1.813	0.166	2.35	68	-2.06	69	64	99.9
12	1.979	0.166	2.34	68	-2.00	69	64	100.5
13	2.145	0.166	2.33	68	-1.88	69	64	101.0
14	2.310	0.165	2.32	68	-1.92	69	64	100.8
15	2.476	0.166	2.32	68	-2.32	69	64	101.4
16	2.641	0.165	2.31	68	-2.34	69	64	100.3
17	2.806	0.165	2.31	68	-2.01	69	64	99.9
18	2.971	0.165	2.31	68	-2.39	69	64	100.1
19	3.136	0.165	2.31	68	-2.40	69	64	100.5
20	3.300	0.164	2.30	68	-2.20	69	64	99.8
21	3.465	0.165	2.30	68	-2.11	69	64	100.4
22	3.630	0.165	2.29	68	-2.24	70	64	100.5
23	3.794	0.164	2.29	68	-2.36	70	64	99.7
24	3.958	0.164	2.29	68	-2.11	70	64	99.7
25	4.123	0.165	2.28	69	-1.96	70	64	100.2
26	4.287	0.164	2.29	69	-1.95	70	64	99.7
27	4.451	0.164	2.29	69	-2.39	70	64	99.7
28	4.616	0.165	2.29	69	-2.06	70	64	100.1
29	4.780	0.164	2.27	69	-2.18	70	64	99.4
30	4.944	0.164	2.28	69	-2.20	70	64	99.3
31	5.108	0.164	2.29	69	-2.34	70	64	99.3
32	5.273	0.165	2.28	69	-1.99	70	64	99.5

Train C - First Hour Particulate Sampling

Run: 2 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 2:23
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0.002 cfm @ 23 in. Hg
Post-Test 0 cfm @ 9.77 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
33	5.436	0.163	2.28	69	-1.93	70	64	98.1
34	5.600	0.164	2.28	69	-2.25	70	64	99.1
35	5.765	0.165	2.28	69	-2.26	70	64	100.1
36	5.928	0.163	2.28	69	-1.91	70	64	98.9
37	6.092	0.164	2.28	69	-2.26	70	64	99.5
38	6.256	0.164	2.28	69	-1.86	70	64	99.5
39	6.421	0.165	2.28	69	-2.01	70	64	99.8
40	6.584	0.163	2.27	69	-2.32	70	64	98.3
41	6.748	0.164	2.28	69	-1.88	70	64	99.2
42	6.912	0.164	2.27	69	-2.26	70	64	99.8
43	7.076	0.164	2.27	69	-2.24	70	64	100.1
44	7.239	0.163	2.26	69	-2.02	70	64	99.1
45	7.403	0.164	2.25	69	-2.22	70	64	99.7
46	7.566	0.163	2.26	69	-2.24	70	64	99.6
47	7.729	0.163	2.25	69	-2.04	70	64	99.7
48	7.894	0.165	2.25	69	-2.28	70	64	100.7
49	8.057	0.163	2.25	69	-2.39	70	64	99.3
50	8.220	0.163	2.27	69	-2.40	70	64	99.5
51	8.384	0.164	2.26	69	-2.40	70	64	100.1
52	8.547	0.163	2.24	69	-1.88	70	64	99.2
53	8.711	0.164	2.25	69	-2.14	70	64	99.7
54	8.874	0.163	2.26	69	-2.08	70	64	99.2
55	9.038	0.164	2.26	69	-2.40	70	64	99.9
56	9.201	0.163	2.26	69	-2.39	70	64	99.1
57	9.365	0.164	2.27	70	-2.19	70	64	99.6
58	9.529	0.164	2.26	70	-2.04	70	64	99.9
59	9.692	0.163	2.27	70	-1.86	70	64	99.3
60	9.856	0.164	2.27	70	-2.39	70	64	99.5

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
Tot / Avg	**64.143**	**0.162**	**1.69**	**68.8**	**-2.20**	**213.25**	**-0.060**	**395.0**	**0.23**	**12.85**
Minimum	0.000	0.158	1.68	68	-2.40	180.00	-0.080	29.4	0.00	1.05
Max	64.143	0.319	1.80	70	-2.00	302.00	-0.051	1040.0	3.75	17.14
0	0.000		0.18	68	-2.40	302	-0.080	640.7	0.07	2.49
1	0.164	0.164	1.80	68	-2.40	282	-0.064	1040.0	0.15	1.05
2	0.329	0.165	1.80	68	-2.30	251	-0.061	1040.0	0.11	6.45
3	0.494	0.165	1.79	68	-2.40	232	-0.063	47.2	0.01	6.68
4	0.658	0.164	1.78	68	-2.30	224	-0.063	42.4	0.00	6.36
5	0.822	0.164	1.77	68	-2.20	220	-0.064	51.1	0.01	6.22
6	0.985	0.163	1.76	68	-2.10	218	-0.063	53.4	0.01	5.58
7	1.148	0.163	1.74	68	-2.30	218	-0.064	52.7	0.01	5.90
8	1.310	0.162	1.74	68	-2.10	221	-0.065	39.5	0.00	12.59
9	1.472	0.162	1.74	68	-2.20	224	-0.066	32.3	0.00	10.28
10	1.634	0.162	1.72	68	-2.10	228	-0.067	33.6	0.00	11.08
11	1.795	0.161	1.72	68	-2.10	232	-0.067	31.4	0.00	11.24
12	1.957	0.162	1.72	68	-2.30	233	-0.067	32.6	0.00	10.01
13	2.118	0.161	1.72	68	-2.30	234	-0.068	29.4	0.00	9.92
14	2.279	0.161	1.72	68	-2.10	236	-0.068	29.7	0.00	9.89
15	2.439	0.160	1.71	68	-2.10	237	-0.068	32.0	0.00	10.25
16	2.600	0.161	1.71	68	-2.30	238	-0.068	32.3	0.00	10.19
17	2.760	0.160	1.71	68	-2.20	241	-0.068	31.7	0.00	9.74
18	2.921	0.161	1.71	68	-2.30	241	-0.069	31.7	0.00	9.56
19	3.081	0.160	1.70	68	-2.30	242	-0.069	32.0	0.00	9.80
20	3.242	0.161	1.71	68	-2.20	244	-0.069	32.0	0.00	9.88
21	3.402	0.160	1.70	68	-2.30	245	-0.070	33.6	0.00	9.86
22	3.561	0.159	1.70	68	-2.30	246	-0.070	34.9	0.00	9.65
23	3.721	0.160	1.70	68	-2.10	248	-0.070	35.5	0.00	9.36
24	3.881	0.160	1.69	68	-2.00	248	-0.070	36.5	0.00	9.33
25	4.040	0.159	1.69	68	-2.20	247	-0.070	37.5	0.00	9.51
26	4.200	0.160	1.70	68	-2.20	248	-0.070	38.8	0.00	9.69
27	4.360	0.160	1.70	68	-2.10	250	-0.071	37.2	0.00	10.57
28	4.520	0.160	1.69	68	-2.30	251	-0.071	35.9	0.00	10.74
29	4.679	0.159	1.70	68	-2.10	252	-0.071	39.5	0.00	10.26
30	4.839	0.160	1.70	68	-2.30	252	-0.071	41.1	0.00	10.02
31	4.999	0.160	1.69	68	-2.00	253	-0.070	41.7	0.00	9.89
32	5.158	0.159	1.68	68	-2.30	254	-0.070	42.0	0.00	10.05

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
33	5.318	0.160	1.70	69	-2.30	254	-0.070	43.3	0.00	10.20
34	5.478	0.160	1.69	69	-2.30	254	-0.071	44.6	0.00	10.54
35	5.637	0.159	1.69	69	-2.20	257	-0.071	45.9	0.01	10.82
36	5.796	0.159	1.70	69	-2.30	258	-0.072	47.5	0.01	11.29
37	5.956	0.160	1.68	69	-2.00	261	-0.072	49.2	0.01	11.58
38	6.116	0.160	1.68	69	-2.30	262	-0.072	48.2	0.01	11.98
39	6.275	0.159	1.69	69	-2.00	264	-0.072	47.5	0.01	12.96
40	6.435	0.160	1.69	69	-2.20	266	-0.073	46.9	0.01	13.28
41	6.594	0.159	1.68	69	-2.20	271	-0.073	43.3	0.00	14.62
42	6.754	0.160	1.69	69	-2.30	277	-0.076	1040.0	3.75	16.64
43	6.914	0.160	1.69	69	-2.10	281	-0.076	1040.0	2.70	17.14
44	7.073	0.159	1.69	69	-2.30	285	-0.075	1040.0	0.62	16.90
45	7.232	0.159	1.69	69	-2.10	285	-0.075	635.6	0.03	15.14
46	7.392	0.160	1.69	69	-2.00	282	-0.074	41.7	0.00	13.05
47	7.551	0.159	1.69	69	-2.30	277	-0.073	37.8	0.00	12.07
48	7.711	0.160	1.69	69	-2.30	272	-0.073	37.2	0.00	11.35
49	7.871	0.160	1.69	69	-2.20	269	-0.072	37.2	0.00	11.05
50	8.030	0.159	1.69	69	-2.30	267	-0.071	32.3	0.00	12.33
51	8.190	0.160	1.69	69	-2.30	267	-0.072	33.3	0.00	12.83
52	8.350	0.160	1.69	69	-2.10	267	-0.073	33.6	0.00	12.94
53	8.508	0.158	1.68	69	-2.10	268	-0.072	37.8	0.00	12.03
54	8.668	0.160	1.69	69	-2.30	264	-0.072	40.4	0.00	12.14
55	8.828	0.160	1.69	69	-2.30	263	-0.071	42.0	0.00	11.01
56	8.987	0.159	1.68	69	-2.20	263	-0.071	45.6	0.01	10.43
57	9.147	0.160	1.69	69	-2.10	260	-0.071	44.0	0.01	10.34
58	9.307	0.160	1.68	69	-2.30	260	-0.069	43.3	0.00	10.35
59	9.466	0.159	1.68	69	-2.10	257	-0.070	43.0	0.00	10.68
60	9.625	0.159	1.69	69	-2.20	256	-0.070	43.7	0.01	10.86
61	9.785	0.160	1.69	69	-2.10	256	-0.069	46.2	0.01	10.86
62	9.945	0.160	1.68	69	-2.30	255	-0.069	48.5	0.01	11.39
63	10.104	0.159	1.69	69	-2.30	254	-0.069	49.5	0.01	11.87
64	10.264	0.160	1.69	69	-2.30	256	-0.070	49.2	0.01	12.28
65	10.424	0.160	1.68	69	-2.30	257	-0.071	51.4	0.01	12.42
66	10.583	0.159	1.69	69	-2.30	257	-0.070	57.6	0.01	12.91
67	10.743	0.160	1.70	69	-2.30	259	-0.070	58.9	0.01	12.58
68	10.903	0.160	1.68	69	-2.30	257	-0.071	60.5	0.01	12.94

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
69	11.063	0.160	1.69	69	-2.10	259	-0.071	59.9	0.01	13.42
70	11.222	0.159	1.70	69	-2.00	261	-0.071	61.5	0.01	13.90
71	11.383	0.161	1.69	69	-2.00	262	-0.071	91.9	0.01	14.61
72	11.543	0.160	1.69	69	-2.00	265	-0.072	385.6	0.04	14.99
73	11.703	0.160	1.70	69	-2.10	266	-0.073	637.0	0.07	14.68
74	11.863	0.160	1.69	69	-2.30	267	-0.072	806.9	0.09	14.64
75	12.023	0.160	1.70	69	-2.30	270	-0.072	722.7	0.08	14.81
76	12.183	0.160	1.70	69	-2.30	267	-0.071	664.1	0.05	14.11
77	12.344	0.161	1.69	69	-2.30	267	-0.072	411.0	0.04	14.83
78	12.504	0.160	1.69	69	-2.30	267	-0.072	224.7	0.02	14.43
79	12.664	0.160	1.70	69	-2.30	265	-0.072	155.7	0.02	13.75
80	12.824	0.160	1.70	69	-2.20	262	-0.071	102.6	0.01	13.49
81	12.985	0.161	1.69	69	-2.30	262	-0.071	141.5	0.01	13.17
82	13.145	0.160	1.70	69	-2.10	261	-0.070	100.0	0.01	12.91
83	13.305	0.160	1.71	69	-2.00	259	-0.070	77.6	0.01	13.00
84	13.466	0.161	1.70	69	-2.10	258	-0.070	66.0	0.01	12.13
85	13.626	0.160	1.70	69	-2.30	256	-0.069	62.0	0.01	11.95
86	13.786	0.160	1.70	69	-2.10	254	-0.070	55.3	0.01	11.42
87	13.947	0.161	1.71	69	-2.20	252	-0.070	53.7	0.01	11.85
88	14.107	0.160	1.70	69	-2.30	252	-0.069	50.8	0.01	11.74
89	14.268	0.161	1.70	69	-2.10	251	-0.069	53.4	0.01	11.87
90	14.429	0.161	1.71	69	-2.30	247	-0.069	60.5	0.01	11.81
91	14.589	0.160	1.70	69	-2.10	247	-0.069	61.1	0.01	11.88
92	14.749	0.160	1.70	69	-2.30	246	-0.070	62.8	0.01	12.32
93	14.909	0.160	1.70	69	-2.00	246	-0.069	65.0	0.01	12.59
94	15.070	0.161	1.68	69	-2.30	247	-0.069	65.3	0.01	12.72
95	15.230	0.160	1.69	69	-2.30	248	-0.069	66.9	0.01	12.94
96	15.390	0.160	1.70	69	-2.30	250	-0.071	70.6	0.01	13.12
97	15.550	0.160	1.70	69	-2.10	251	-0.068	67.6	0.01	13.36
98	15.710	0.160	1.69	69	-2.20	251	-0.068	71.8	0.01	13.53
99	15.870	0.160	1.70	69	-2.30	250	-0.072	76.3	0.01	13.59
100	16.030	0.160	1.70	69	-2.30	253	-0.068	74.4	0.01	13.78
101	16.190	0.160	1.69	69	-2.30	254	-0.068	86.3	0.01	13.79
102	16.350	0.160	1.69	69	-2.30	255	-0.068	83.5	0.01	13.97
103	16.510	0.160	1.70	69	-2.30	255	-0.070	90.6	0.01	13.88
104	16.670	0.160	1.68	69	-2.00	255	-0.070	113.3	0.01	14.05

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
105	16.829	0.159	1.68	69	-2.20	255	-0.070	121.1	0.01	13.66
106	16.989	0.160	1.70	69	-2.10	254	-0.068	187.1	0.03	13.80
107	17.149	0.160	1.70	69	-2.00	254	-0.068	353.2	0.04	13.80
108	17.309	0.160	1.69	69	-2.30	251	-0.069	387.5	0.04	13.77
109	17.468	0.159	1.70	69	-2.10	250	-0.069	200.4	0.02	13.95
110	17.628	0.160	1.70	68	-2.30	249	-0.067	267.7	0.03	13.68
111	17.788	0.160	1.69	69	-2.30	245	-0.067	388.8	0.07	14.07
112	17.948	0.160	1.69	69	-2.30	246	-0.067	187.1	0.02	13.72
113	18.108	0.160	1.70	69	-2.30	243	-0.066	203.0	0.02	13.74
114	18.268	0.160	1.68	69	-2.20	244	-0.067	313.1	0.03	13.66
115	18.427	0.159	1.68	69	-2.30	242	-0.067	284.2	0.03	13.82
116	18.587	0.160	1.70	69	-2.20	242	-0.066	536.3	0.05	14.53
117	18.747	0.160	1.69	69	-2.20	241	-0.066	417.3	0.04	14.40
118	18.907	0.160	1.69	69	-2.30	241	-0.072	520.0	0.06	14.45
119	19.067	0.160	1.69	69	-2.00	239	-0.066	585.8	0.06	14.47
120	19.227	0.160	1.68	69	-2.30	237	-0.066	781.6	0.10	14.88
121	19.386	0.159	1.69	69	-2.20	237	-0.066	1040.0	0.14	14.49
122	19.546	0.160	1.70	69	-2.00	239	-0.065	1040.0	0.21	14.86
123	19.706	0.160	1.69	69	-2.10	239	-0.066	1040.0	0.21	14.25
124	19.865	0.159	1.69	69	-2.00	237	-0.067	1040.0	0.27	14.41
125	20.025	0.160	1.70	69	-2.10	236	-0.066	1040.0	0.34	14.97
126	20.185	0.160	1.69	69	-2.10	235	-0.067	1040.0	0.36	14.98
127	20.344	0.159	1.69	69	-2.30	234	-0.066	1040.0	0.46	15.06
128	20.504	0.160	1.70	69	-2.20	236	-0.066	1040.0	0.55	14.91
129	20.664	0.160	1.69	69	-2.30	235	-0.066	1040.0	0.59	15.18
130	20.823	0.159	1.68	69	-2.10	238	-0.068	1040.0	0.55	14.85
131	20.983	0.160	1.69	69	-2.20	235	-0.064	1040.0	0.63	15.36
132	21.143	0.160	1.70	69	-2.20	234	-0.066	1040.0	0.62	15.53
133	21.303	0.160	1.69	69	-2.20	233	-0.065	1040.0	0.70	15.71
134	21.462	0.159	1.70	69	-2.30	232	-0.069	1040.0	0.78	15.29
135	21.622	0.160	1.70	69	-2.00	230	-0.066	1040.0	0.83	15.03
136	21.782	0.160	1.69	69	-2.20	229	-0.065	1040.0	0.89	15.25
137	21.941	0.159	1.69	69	-2.30	228	-0.065	1040.0	0.88	15.46
138	22.101	0.160	1.69	69	-2.20	228	-0.063	1040.0	0.95	15.44
139	22.261	0.160	1.69	69	-2.00	225	-0.064	1040.0	0.81	15.20
140	22.420	0.159	1.69	69	-2.00	224	-0.063	1040.0	0.80	15.14

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
141	22.580	0.160	1.70	69	-2.20	222	-0.063	1040.0	0.81	15.20
142	22.740	0.160	1.69	69	-2.30	219	-0.063	1040.0	0.78	15.18
143	22.899	0.159	1.69	69	-2.30	216	-0.062	1040.0	0.76	15.36
144	23.060	0.161	1.69	69	-2.30	214	-0.062	1040.0	0.68	15.22
145	23.220	0.160	1.69	69	-2.10	212	-0.062	1040.0	0.66	15.36
146	23.379	0.159	1.69	69	-2.20	210	-0.061	1040.0	0.71	15.13
147	23.539	0.160	1.70	69	-2.10	211	-0.060	1040.0	0.69	15.12
148	23.699	0.160	1.69	69	-2.20	209	-0.059	1040.0	0.60	14.78
149	23.858	0.159	1.69	69	-2.20	206	-0.061	1040.0	0.64	15.29
150	24.017	0.159	1.69	69	-2.10	203	-0.060	1040.0	0.64	15.20
151	24.178	0.161	1.69	69	-2.00	200	-0.059	1040.0	0.66	15.20
152	24.337	0.159	1.69	69	-2.30	202	-0.059	1040.0	0.73	15.06
153	24.497	0.160	1.69	69	-2.20	203	-0.061	1040.0	0.57	13.12
154	24.657	0.160	1.69	69	-2.30	201	-0.059	1040.0	0.52	14.82
155	24.817	0.160	1.68	69	-2.20	199	-0.058	1040.0	0.65	14.85
156	24.976	0.159	1.69	69	-2.10	199	-0.059	1040.0	0.58	14.77
157	25.136	0.160	1.70	69	-2.20	200	-0.063	1040.0	0.53	14.53
158	25.296	0.160	1.69	69	-2.10	198	-0.058	1040.0	0.57	14.89
159	25.456	0.160	1.69	69	-2.00	197	-0.057	1040.0	0.71	14.83
160	25.615	0.159	1.70	69	-2.20	196	-0.058	1040.0	0.73	15.27
161	25.775	0.160	1.68	69	-2.30	195	-0.058	1040.0	0.81	15.13
162	25.934	0.159	1.68	69	-2.00	196	-0.058	1040.0	0.96	15.21
163	26.094	0.160	1.69	69	-2.00	195	-0.060	1040.0	1.14	15.47
164	26.254	0.160	1.69	69	-2.10	197	-0.062	1040.0	1.18	15.20
165	26.414	0.160	1.69	69	-2.30	196	-0.061	1040.0	1.26	15.23
166	26.574	0.160	1.70	69	-2.30	195	-0.058	1040.0	1.44	14.90
167	26.734	0.160	1.69	69	-2.30	196	-0.058	1040.0	1.37	15.14
168	26.893	0.159	1.69	69	-2.20	197	-0.057	1040.0	1.47	14.65
169	27.053	0.160	1.69	69	-2.10	196	-0.058	1040.0	1.56	15.11
170	27.213	0.160	1.68	69	-2.20	196	-0.058	1040.0	1.35	14.40
171	27.372	0.159	1.69	69	-2.30	194	-0.058	1040.0	1.47	15.16
172	27.532	0.160	1.70	69	-2.30	194	-0.057	1040.0	1.50	14.83
173	27.692	0.160	1.70	69	-2.30	192	-0.057	1040.0	1.65	15.08
174	27.852	0.160	1.69	69	-2.10	193	-0.058	1040.0	2.10	15.18
175	28.011	0.159	1.70	69	-2.30	192	-0.058	1040.0	2.64	15.34
176	28.171	0.160	1.70	69	-2.10	192	-0.057	1040.0	2.53	15.32

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
177	28.331	0.160	1.69	69	-2.10	193	-0.057	1040.0	2.37	14.83
178	28.491	0.160	1.69	69	-2.30	193	-0.057	1040.0	2.13	14.75
179	28.651	0.160	1.70	69	-2.10	193	-0.057	1040.0	2.00	15.16
180	28.811	0.160	1.70	69	-2.10	192	-0.057	1040.0	1.89	14.78
181	28.971	0.160	1.69	69	-2.20	191	-0.057	1040.0	2.00	14.37
182	29.131	0.160	1.70	69	-2.10	192	-0.056	1040.0	1.64	14.58
183	29.291	0.160	1.70	69	-2.10	191	-0.056	1040.0	1.22	14.53
184	29.450	0.159	1.69	69	-2.20	190	-0.056	1040.0	1.08	14.55
185	29.610	0.160	1.70	69	-2.00	189	-0.055	1040.0	0.88	14.01
186	29.770	0.160	1.69	69	-2.20	188	-0.055	1040.0	0.83	14.33
187	29.930	0.160	1.69	69	-2.30	188	-0.055	1040.0	0.73	14.29
188	30.089	0.159	1.69	69	-2.20	186	-0.055	1040.0	0.59	14.50
189	30.250	0.161	1.68	69	-2.10	189	-0.055	1040.0	0.49	14.23
190	30.409	0.159	1.68	69	-2.30	189	-0.055	1040.0	0.45	14.54
191	30.569	0.160	1.70	69	-2.20	190	-0.055	1040.0	0.42	14.46
192	30.729	0.160	1.70	69	-2.10	191	-0.055	1040.0	0.48	14.28
193	30.888	0.159	1.68	69	-2.30	190	-0.055	1040.0	0.42	14.19
194	31.048	0.160	1.70	69	-2.10	191	-0.055	1040.0	0.40	14.27
195	31.208	0.160	1.70	69	-2.20	192	-0.056	1040.0	0.40	14.29
196	31.367	0.159	1.69	69	-2.30	193	-0.056	1040.0	0.33	13.83
197	31.527	0.160	1.68	69	-2.10	194	-0.056	1040.0	0.29	14.35
198	31.687	0.160	1.69	69	-2.30	193	-0.056	1040.0	0.24	14.04
199	31.847	0.160	1.70	69	-2.10	197	-0.056	1040.0	0.23	13.74
200	32.007	0.160	1.69	69	-2.20	197	-0.056	1040.0	0.21	14.16
201	32.167	0.160	1.69	69	-2.30	199	-0.056	1040.0	0.21	13.71
202	32.326	0.159	1.69	69	-2.20	199	-0.057	1040.0	0.20	13.79
203	32.486	0.160	1.69	69	-2.00	198	-0.056	1040.0	0.21	13.34
204	32.646	0.160	1.69	69	-2.00	201	-0.057	1040.0	0.21	13.71
205	32.806	0.160	1.68	69	-2.20	200	-0.057	1040.0	0.20	14.16
206	32.965	0.159	1.69	69	-2.20	199	-0.057	1040.0	0.20	13.68
207	33.125	0.160	1.70	69	-2.30	201	-0.057	1040.0	0.17	13.98
208	33.285	0.160	1.70	69	-2.10	202	-0.057	1040.0	0.20	13.43
209	33.445	0.160	1.68	69	-2.10	203	-0.057	1040.0	0.20	13.56
210	33.604	0.159	1.70	69	-2.10	204	-0.057	1040.0	0.22	13.67
211	33.765	0.161	1.70	69	-2.30	204	-0.058	1040.0	0.22	13.75
212	33.924	0.159	1.69	69	-2.30	206	-0.058	1040.0	0.26	13.81

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
213	34.084	0.160	1.68	69	-2.30	205	-0.058	1040.0	0.25	13.75
214	34.244	0.160	1.69	69	-2.30	205	-0.058	1040.0	0.28	14.14
215	34.404	0.160	1.69	69	-2.10	207	-0.058	1040.0	0.24	14.18
216	34.563	0.159	1.68	69	-2.30	207	-0.058	1040.0	0.29	14.00
217	34.723	0.160	1.69	69	-2.30	207	-0.059	1040.0	0.31	14.22
218	34.883	0.160	1.69	69	-2.30	210	-0.059	1040.0	0.35	14.01
219	35.043	0.160	1.69	69	-2.30	210	-0.059	1040.0	0.45	14.35
220	35.202	0.159	1.69	69	-2.30	209	-0.059	1040.0	0.48	14.42
221	35.362	0.160	1.69	69	-2.30	211	-0.059	1040.0	0.51	14.44
222	35.522	0.160	1.69	69	-2.20	210	-0.059	1040.0	0.54	14.30
223	35.682	0.160	1.70	69	-2.30	211	-0.059	1040.0	0.57	14.44
224	35.842	0.160	1.69	69	-2.30	214	-0.059	1040.0	0.57	13.98
225	36.001	0.159	1.69	69	-2.20	214	-0.059	1040.0	0.37	15.14
226	36.161	0.160	1.70	69	-2.10	216	-0.059	1040.0	0.44	14.83
227	36.321	0.160	1.69	69	-2.30	217	-0.059	718.3	0.07	14.47
228	36.481	0.160	1.69	69	-2.10	215	-0.061	922.2	0.09	14.96
229	36.640	0.159	1.70	69	-2.20	213	-0.058	1040.0	0.12	14.46
230	36.800	0.160	1.69	69	-2.10	212	-0.058	903.7	0.08	14.66
231	36.960	0.160	1.68	70	-2.30	212	-0.058	828.6	0.09	14.70
232	37.119	0.159	1.69	70	-2.10	213	-0.059	892.7	0.09	14.89
233	37.279	0.160	1.70	70	-2.30	214	-0.060	892.0	0.09	14.68
234	37.439	0.160	1.68	70	-2.00	212	-0.059	894.3	0.09	14.96
235	37.599	0.160	1.69	70	-2.30	212	-0.061	976.3	0.12	14.76
236	37.758	0.159	1.70	69	-2.20	212	-0.063	1040.0	0.13	14.51
237	37.918	0.160	1.69	69	-2.30	213	-0.059	1040.0	0.13	13.68
238	38.078	0.160	1.69	70	-2.30	211	-0.058	1040.0	0.18	14.61
239	38.237	0.159	1.70	70	-2.20	208	-0.058	1040.0	0.13	14.80
240	38.398	0.161	1.69	70	-2.10	206	-0.059	1040.0	0.20	14.37
241	38.557	0.159	1.68	69	-2.20	206	-0.058	1040.0	0.28	14.82
242	38.718	0.161	1.69	70	-2.30	204	-0.058	1040.0	0.29	14.53
243	38.878	0.160	1.69	70	-2.30	203	-0.057	1040.0	0.22	14.57
244	39.037	0.159	1.69	70	-2.30	202	-0.057	1040.0	0.13	14.34
245	39.197	0.160	1.70	70	-2.20	199	-0.056	742.9	0.06	14.16
246	39.358	0.161	1.70	69	-2.00	198	-0.056	296.9	0.03	13.68
247	39.517	0.159	1.69	70	-2.10	197	-0.056	157.7	0.02	13.27
248	39.677	0.160	1.70	70	-2.30	196	-0.056	116.5	0.01	12.83

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
249	39.837	0.160	1.70	70	-2.00	194	-0.055	110.1	0.01	12.71
250	39.998	0.161	1.69	69	-2.30	193	-0.056	103.2	0.01	12.68
251	40.158	0.160	1.69	69	-2.20	191	-0.055	97.4	0.01	12.44
252	40.318	0.160	1.70	69	-2.10	190	-0.054	96.7	0.01	12.53
253	40.478	0.160	1.70	69	-2.30	189	-0.055	96.1	0.01	12.14
254	40.638	0.160	1.70	69	-2.20	189	-0.055	99.0	0.01	12.43
255	40.799	0.161	1.70	69	-2.00	187	-0.054	98.0	0.01	12.09
256	40.959	0.160	1.69	69	-2.30	186	-0.053	97.4	0.01	12.16
257	41.119	0.160	1.69	69	-2.30	185	-0.054	99.0	0.01	11.94
258	41.280	0.161	1.70	69	-2.30	182	-0.053	100.7	0.01	12.49
259	41.440	0.160	1.71	69	-2.30	181	-0.054	98.0	0.01	11.78
260	41.600	0.160	1.70	69	-2.30	182	-0.053	99.7	0.01	11.77
261	41.761	0.161	1.70	69	-2.30	180	-0.053	102.0	0.01	11.96
262	41.922	0.161	1.71	69	-2.30	182	-0.053	102.3	0.01	11.92
263	42.082	0.160	1.70	69	-2.30	182	-0.054	105.5	0.01	11.96
264	42.242	0.160	1.70	69	-2.00	182	-0.053	102.6	0.01	11.68
265	42.402	0.160	1.71	69	-2.30	183	-0.054	64.0	0.01	11.70
266	42.563	0.161	1.71	69	-2.00	183	-0.053	62.1	0.01	11.72
267	42.724	0.161	1.70	69	-2.30	182	-0.053	63.4	0.01	11.60
268	42.884	0.160	1.70	69	-2.20	182	-0.053	61.4	0.01	11.38
269	43.045	0.161	1.71	69	-2.20	182	-0.053	63.1	0.01	11.66
270	43.206	0.161	1.70	69	-2.10	183	-0.053	64.4	0.01	11.73
271	43.365	0.159	1.70	69	-2.10	184	-0.054	64.4	0.01	11.74
272	43.526	0.161	1.71	69	-2.30	185	-0.054	63.1	0.01	11.55
273	43.686	0.160	1.71	69	-2.10	185	-0.053	64.4	0.01	11.48
274	43.847	0.161	1.70	69	-2.30	185	-0.054	66.6	0.01	11.98
275	44.007	0.160	1.70	69	-2.00	185	-0.054	65.0	0.01	11.69
276	44.167	0.160	1.71	69	-2.30	185	-0.054	65.0	0.01	11.55
277	44.328	0.161	1.71	69	-2.30	186	-0.053	64.7	0.01	11.57
278	44.488	0.160	1.70	69	-2.30	186	-0.054	64.4	0.01	11.80
279	44.648	0.160	1.71	69	-2.10	186	-0.054	66.0	0.01	11.75
280	44.808	0.160	1.71	69	-2.30	188	-0.054	64.7	0.01	11.56
281	44.968	0.160	1.70	69	-2.10	185	-0.053	66.3	0.01	11.96
282	45.129	0.161	1.71	69	-2.00	186	-0.053	68.6	0.01	11.74
283	45.288	0.159	1.71	69	-2.20	187	-0.053	71.2	0.01	11.57
284	45.449	0.161	1.70	68	-2.30	186	-0.053	72.4	0.01	11.76

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
285	45.609	0.160	1.70	68	-2.30	186	-0.052	72.8	0.01	12.03
286	45.769	0.160	1.70	68	-2.10	185	-0.052	74.7	0.01	11.84
287	45.929	0.160	1.70	68	-2.10	184	-0.053	76.3	0.01	11.94
288	46.089	0.160	1.70	68	-2.30	186	-0.052	76.0	0.01	11.67
289	46.249	0.160	1.70	68	-2.30	185	-0.052	59.5	0.01	12.02
290	46.409	0.160	1.69	68	-2.10	186	-0.053	54.3	0.01	12.01
291	46.568	0.159	1.69	68	-2.30	186	-0.053	55.3	0.01	12.11
292	46.728	0.160	1.70	68	-2.10	187	-0.054	58.9	0.01	11.61
293	46.889	0.161	1.71	68	-2.20	186	-0.053	60.5	0.01	11.86
294	47.048	0.159	1.69	68	-2.20	186	-0.052	56.9	0.01	11.76
295	47.208	0.160	1.70	68	-2.20	188	-0.053	57.9	0.01	11.83
296	47.368	0.160	1.70	68	-2.30	187	-0.053	55.6	0.01	11.74
297	47.527	0.159	1.69	68	-2.00	187	-0.053	56.6	0.01	11.81
298	47.687	0.160	1.69	68	-2.00	186	-0.053	55.0	0.01	11.45
299	47.847	0.160	1.70	68	-2.10	184	-0.053	56.3	0.01	11.68
300	48.007	0.160	1.70	68	-2.30	185	-0.052	56.3	0.01	11.79
301	48.168	0.161	1.70	68	-2.00	185	-0.053	55.3	0.01	11.77
302	48.329	0.161	1.72	68	-2.00	185	-0.053	55.6	0.01	11.75
303	48.489	0.160	1.70	68	-2.20	184	-0.053	55.3	0.01	11.93
304	48.650	0.161	1.71	68	-2.20	186	-0.053	51.4	0.01	11.64
305	48.811	0.161	1.71	68	-2.30	187	-0.054	50.1	0.01	11.74
306	48.971	0.160	1.72	68	-2.30	185	-0.053	51.1	0.01	11.87
307	49.132	0.161	1.71	68	-2.30	186	-0.054	51.1	0.01	11.83
308	49.292	0.160	1.71	68	-2.10	185	-0.052	50.1	0.01	11.86
309	49.453	0.161	1.71	68	-2.00	187	-0.053	47.5	0.01	11.53
310	49.613	0.160	1.70	68	-2.30	186	-0.053	49.5	0.01	12.03
311	49.773	0.160	1.70	68	-2.30	186	-0.053	48.2	0.01	12.03
312	49.933	0.160	1.70	68	-2.20	186	-0.053	47.8	0.01	12.00
313	50.093	0.160	1.71	68	-2.10	186	-0.052	48.5	0.01	12.09
314	50.253	0.160	1.70	68	-2.20	186	-0.052	49.2	0.01	11.89
315	50.413	0.160	1.70	68	-2.30	188	-0.052	47.9	0.01	11.78
316	50.573	0.160	1.71	68	-2.20	186	-0.052	48.2	0.01	12.21
317	50.733	0.160	1.70	68	-2.20	187	-0.052	45.6	0.01	12.17
318	50.892	0.159	1.70	68	-2.10	187	-0.052	45.3	0.01	12.64
319	51.052	0.160	1.70	68	-2.30	187	-0.052	44.3	0.01	12.53
320	51.212	0.160	1.70	68	-2.30	188	-0.052	43.3	0.01	12.10

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
321	51.371	0.159	1.70	68	-2.30	188	-0.052	43.0	0.01	12.11
322	51.532	0.161	1.70	68	-2.00	188	-0.052	43.7	0.01	12.29
323	51.691	0.159	1.70	68	-2.10	189	-0.053	43.3	0.01	12.19
324	51.850	0.159	1.69	68	-2.30	189	-0.051	44.6	0.01	12.23
325	52.010	0.160	1.70	68	-2.10	187	-0.052	44.0	0.01	12.03
326	52.170	0.160	1.69	68	-2.20	187	-0.052	45.3	0.01	11.94
327	52.329	0.159	1.70	68	-2.10	189	-0.052	47.2	0.01	12.26
328	52.489	0.160	1.70	68	-2.00	189	-0.052	47.9	0.01	12.63
329	52.649	0.160	1.69	68	-2.20	188	-0.052	49.5	0.01	12.53
330	52.808	0.159	1.69	68	-2.20	190	-0.053	50.5	0.01	12.52
331	52.968	0.160	1.70	68	-2.00	189	-0.052	49.5	0.01	12.33
332	53.128	0.160	1.70	68	-2.10	190	-0.052	49.8	0.01	12.12
333	53.287	0.159	1.69	68	-2.20	189	-0.052	50.4	0.01	12.42
334	53.446	0.159	1.70	68	-2.30	189	-0.053	50.1	0.01	12.59
335	53.606	0.160	1.69	68	-2.20	188	-0.053	51.1	0.01	12.38
336	53.765	0.159	1.69	68	-2.30	189	-0.053	49.8	0.01	12.47
337	53.925	0.160	1.70	68	-2.30	188	-0.052	50.8	0.01	12.46
338	54.085	0.160	1.70	68	-2.20	188	-0.052	48.8	0.01	12.53
339	54.244	0.159	1.69	68	-2.30	189	-0.052	48.5	0.01	12.11
340	54.404	0.160	1.70	68	-2.30	188	-0.052	49.2	0.01	12.34
341	54.723	0.319	1.69	68	-2.30	187	-0.052	49.5	0.01	12.37
342	55.042	0.319	1.70	68	-2.30	189	-0.053	50.4	0.01	12.55
343	55.361	0.319	1.69	68	-2.30	189	-0.052	49.8	0.01	12.03
344	55.680	0.319	1.68	68	-2.20	189	-0.051	52.4	0.01	12.28
345	55.999	0.319	1.70	69	-2.10	188	-0.052	51.1	0.01	12.31
346	56.158	0.159	1.69	69	-2.30	189	-0.052	52.4	0.01	12.32
347	56.318	0.160	1.69	69	-2.10	189	-0.052	52.4	0.01	12.21
348	56.477	0.159	1.70	69	-2.30	191	-0.052	51.7	0.01	12.11
349	56.637	0.160	1.69	69	-2.20	190	-0.053	52.7	0.01	12.38
350	56.796	0.159	1.69	69	-2.10	189	-0.053	51.4	0.01	12.01
351	56.955	0.159	1.70	69	-2.20	190	-0.052	52.7	0.01	12.23
352	57.115	0.160	1.69	69	-2.00	191	-0.053	53.4	0.01	12.35
353	57.275	0.160	1.69	69	-2.00	189	-0.052	53.4	0.01	12.24
354	57.434	0.159	1.70	69	-2.30	190	-0.052	52.7	0.01	12.26
355	57.594	0.160	1.69	69	-2.10	189	-0.053	53.7	0.01	12.42
356	57.754	0.160	1.69	69	-2.10	188	-0.053	53.0	0.01	12.14

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
357	57.913	0.159	1.70	69	-2.00	188	-0.053	55.3	0.01	12.48
358	58.073	0.160	1.70	69	-2.30	188	-0.053	54.3	0.01	12.29
359	58.232	0.159	1.69	69	-2.10	189	-0.053	52.7	0.01	12.52
360	58.393	0.161	1.70	69	-2.30	190	-0.052	51.7	0.01	11.92
361	58.552	0.159	1.68	69	-2.00	190	-0.053	50.8	0.01	11.92
362	58.711	0.159	1.70	69	-2.30	190	-0.053	53.0	0.01	12.48
363	58.871	0.160	1.70	69	-2.20	188	-0.053	51.7	0.01	12.38
364	59.031	0.160	1.70	69	-2.10	189	-0.053	51.1	0.01	12.51
365	59.190	0.159	1.69	69	-2.00	188	-0.053	52.1	0.01	12.38
366	59.350	0.160	1.70	69	-2.20	189	-0.052	50.8	0.01	12.44
367	59.510	0.160	1.70	69	-2.30	189	-0.053	49.8	0.01	12.54
368	59.670	0.160	1.69	69	-2.00	189	-0.053	49.8	0.01	12.22
369	59.829	0.159	1.71	69	-2.20	190	-0.052	49.2	0.01	12.18
370	59.989	0.160	1.70	69	-2.10	188	-0.053	51.1	0.01	12.51
371	60.149	0.160	1.69	69	-2.30	190	-0.053	49.8	0.01	12.11
372	60.309	0.160	1.70	69	-2.10	189	-0.053	50.1	0.01	12.19
373	60.469	0.160	1.70	69	-2.30	189	-0.053	49.5	0.01	12.16
374	60.628	0.159	1.70	69	-2.30	188	-0.053	53.4	0.01	12.63
375	60.788	0.160	1.70	69	-2.20	188	-0.054	52.4	0.01	12.47
376	60.948	0.160	1.71	69	-2.30	189	-0.053	52.4	0.01	12.48
377	61.108	0.160	1.69	69	-2.30	188	-0.053	53.7	0.01	12.58
378	61.268	0.160	1.70	69	-2.00	189	-0.053	52.1	0.01	12.15
379	61.428	0.160	1.70	69	-2.10	189	-0.053	49.5	0.01	12.08
380	61.588	0.160	1.70	69	-2.00	188	-0.053	50.4	0.01	12.08
381	61.747	0.159	1.69	69	-2.30	188	-0.052	49.8	0.01	12.12
382	61.907	0.160	1.70	69	-2.10	188	-0.052	51.4	0.01	12.08
383	62.067	0.160	1.70	69	-2.30	187	-0.052	52.1	0.01	11.78
384	62.226	0.159	1.69	69	-2.00	187	-0.052	50.1	0.01	12.83
385	62.386	0.160	1.70	69	-2.30	188	-0.052	48.5	0.01	12.90
386	62.546	0.160	1.70	69	-2.00	188	-0.053	46.5	0.01	12.79
387	62.706	0.160	1.69	69	-2.10	187	-0.053	46.5	0.01	12.59
388	62.865	0.159	1.70	69	-2.30	187	-0.053	47.9	0.01	12.55
389	63.025	0.160	1.69	69	-2.30	188	-0.052	46.9	0.01	12.40
390	63.185	0.160	1.69	69	-2.20	189	-0.053	48.9	0.01	12.40
391	63.344	0.159	1.70	69	-2.30	188	-0.053	49.8	0.01	12.57
392	63.504	0.160	1.70	69	-2.30	188	-0.053	48.8	0.01	12.46

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 2:23
Total Sampling Time 396 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
393	63.664	0.160	1.69	69	-2.30	189	-0.053	49.2	0.01	12.48
394	63.824	0.160	1.69	69	-2.10	188	-0.053	49.2	0.01	12.32
395	63.983	0.159	1.70	69	-2.10	188	-0.053	50.1	0.01	12.43
396	64.143	0.160	1.69	69	-2.10	188	-0.053	50.5	0.01	12.29

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Tracking No.:	BK30.2
Project No.:	0142WS021E
Run No.:	2
Test Date:	3/6/24

OMNI Eq. ID Numbers	
Analytical Scale	
Audit Weight Set:	
Analytical Scale	
Hydrometer	
Filters are weighed	In Pairs

Train A

Sample Component / Date / Time in Dessicator		Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs		Filter	F249	240.1	238.3	1.8	1.8
Probe catch*		Probe	35	114327.8	114327.4	0.4	0.4
ilter seals catch*		Seals	S673	3411.4	3410.5	0.9	0.9
				Total Particulate, mg:		**3.1**	**3.1**

Train B

Sample Component / Date / Time in Dessicator		Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs		Filter	F250	240.2	238.1	2.1	2.1
Probe catch*		Probe	18	114399.9	114399.0	0.9	0.9
ilter seals catch*		Seals	S672	3354.5	3354.0	0.5	0.5
			Sub-Total	Total Particulate, mg:		**3.5**	**3.5**

Train C - *First Hour*

Sample Component / Date / Time in Dessicator		Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs		Filter	F248	240.0	239.3	0.7	0.7
Probe catch*		Probe	77	116182.5	116181.6	0.9	0.9
ilter seals catch*		Seals	S671	3431.7	3431.4	0.3	0.3
				Total Particulate, mg:		**1.9**	**1.9**

Train D - *Ambient Background*

Sample Component / Date / Time in Dessicator		Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*		Filter	F228	122.4	122.4	0.0
				Total Particulate, mg:		**0.0**

Final (mg) - Tare (mg) = Particulate (mg)

NOTE: The Uncorrected values are those where any negative filter weights are taken as a negative value. This can possibly occur when filter matter adheres the O-ring seals and thereby transfers some mass to the O-ring. The Corrected values reflect where any negative filter weights are taken as ZERO, thus not accounting for any transfer of mass and resultingly over-reporting. Corrected values were added to this analysis to report the "Corrected" results in this report in response to a request by the US EPA. In cases where the Final weight minus the Tare weight of the Ambient filter occurs, it is taken as a ZERO. Any negative probe weights are evaluated pursuant to clause of ASTM E25215 (or appropriatelt associated test standard as defined in the introduction of this report).

Technician Signature:_____ Reviewed By:_____

Run 2 - Run Notes

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	2
Test Date:	3/6/2024

This supplemental section of miscellaneous run notes is comprised of the following:

- Appliance Operation Notes
- Velocity Traverse / Supplementa Run Notes
- Test Fuel Notes
- Gravimetric Analysis Notes

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 2
Model: AF30.2 Tracking Number: 2254 Date: 03/05/2024
Test Crew: K. Morgan, R. Tiggs
OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary: 60° from full open

Secondary: N/A

Tertiary/Pilot: N/A

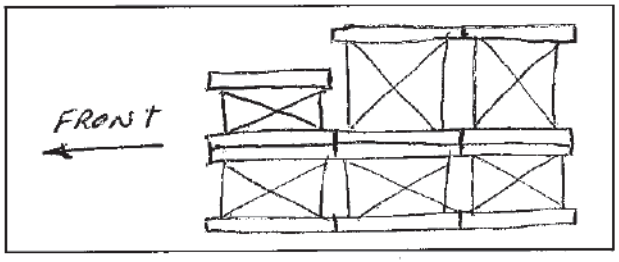
Fan: Medium low

Preburn Notes

Time	Notes
0123	At 5.0 lbs preburn, air setting set to test setting
0158	Probe installed (+0.1 lbs)
0223	Preburn stopped (4.4 lbs scale) 4.3 actual

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Used
Fuel loaded by: 1min
Door closed at: 65sec
Primary air: at test setting
Notes:

Time	Notes
0224	Test start
0324	first hour sampling stopped
03/06/24 09:05	Test completed

Technician Signature: K. J. Morgan Date: 3/5/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 2

Model: AF30.2 Tracking Number: 2254 Date: 03/05/2024

Test Crew: R. Tiggs K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Bias check ppm 490/14.98 CO_2

03/06/24 Start Time: 0223

03/06/24 Stop Time: 09:05

Booth #: 1

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Sample Train Leak Check:

1st hour A: 0.002 @ 23 "Hg

B: 0.001 @ 185 "Hg

A train 0.002 @ 17

Post

1st hour 0.003 @ 23.5

A: 0.000 @ 9.72 "Hg

B: 0.000 @ 9.69 "Hg

Calibrations: Span Gas CO_2: 16.86 CO: 4.37 CO ppm 500

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	0013	0015	9:13	9:15
CO_2	0	16.87	0.00	16.88
CO	0	4.38	0.00	~~4.34~~ 4.40
ppm	0	499	2	501

Air Velocity (ft/min): Initial: 0 Final: 10

Scale Audit (lbs): Initial: 20 Final: 20

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 6

Induced Draft: NONE

% Smoke Capture: 100%

Flue Pipe Cleaned Prior to First Test in Series:

Date: See Run 1 Initials: RT

	Initial	Middle	Ending
P_b (in/Hg)	30.07	30.07	30.12
RH (%)	29	29	31
Ambient (°F)	70	69	68

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
.025	.050	91
.044	.088	93 91
.043	.086	91
.020	.040	91
.035	.070	90
.045	.090	90
.043	.086	89
.030	.060	89
Center:		
.047	.094	88

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-.40	-0.4

Background Filter Volume:

Technician Signature: K. J. Morgan Date: 3/5/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 2

Model: AF30.2 Tracking Number: 7254 Date: 03/05/2024

Test Crew: ZT, K. Meyer

OMNI Equipment ID numbers:

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0

Cal Value (2) = 22% Actual Reading 22.6

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16.75 in	21.5	7	16.75 in	20.0
2	16.75 in	19.3	8	16.75 in	23.8
3	16.75 in	19.1	9	16.75 in	24.4
4	16.75 in	15.5	10	16.75 in	20.5
5	16.75 in	24.2	11	in	
6	16.75 in	23.8	12	in	

Total Pre-Burn Fuel Weight: 17.7 Pre-Burn Fuel Average Moisture: 21.6 % db

Time (clock): 0200 Room Temperature (F): 71 Initials: RT

Test Fuel

Firebox Volume (ft³): ~~2.944~~ 2.874 ft³ Test Fuel Piece Length (in): 16.75

Load Weight Range (lb): ~~18.4 - 22.4~~ ft³ Total Wet Fuel Load Weight (lb): 18.9

3.8 - 4.7

Fuel Type & Amount: 2 x 4: 4 4 x 4: 2

Weight (with spacers): 9.2 Weight (with spacers): 9.7

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	2.5/~~2.0~~ 2.0	20.3	20.6	20.2	2x4
2	2.3/1.7	19.4	19.0	19.5	2x4
3	2.2/1.7	20.5	22.1	22.2	2x4
2 3/4 1.8	~~4.0/4.4~~	21.2	20.5	21.5	2x4
5	4.8/4.3	19.3	22.1	19.8	4x4
6	4.8/4.3	22.2	22.1	19.0	4x4
7					

Spacer Moisture Readings (%DB)

15.5	15.9	22.0	19.8	20.6	22.0		
18.4	20.6	13.1	21.3	15.1	19.8		
22	15.5	15.0	17.8	21.4	22.0		
12.9	15.0	18.5	17.1	12.6	21.2		

Time (clock): 0100 Room Temperature (F): 70 Initials: RT

Technician Signature: Kyle Meyer Date: 3/5/24

1.07 @ ~~0.54+0.77~~ 0.64 / 2.31
~~2.31 / 2.731~~

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 2
Model: AF30.2 Tracking Number: 2254 Date: 03/05/2024
Test Crew: R. Tiegs, K. Morgan
OMNI Equipment ID numbers: ______

ASTM E2515 Lab Sheet

Assembled By: R Tieg T

Date/Time in Dessicator: 0333 3-6-24 (first hour)

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	8:40 → 3/11/24	3/11/24 15:45			
R/H %:	29	33			
Temp:	65	67			
200 mg Audit:	200.0	200.0			
2 g Audit:	2000.2	2000.3			
100 g Audit:	99997.7	99997.9			
Initials:	K	K			

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	✓ Front Filter	F248	239.3	239.9	240.0 —			
	Rear Filter	F248A	/	/	/			
	✓ Probe	77	116181.6	116182.7	116182.5 —			
	✓ O-Ring Set	5671	3431.4	3431.7	3431.7 —			
A	✓ Front Filter	F249	238.3	240.0	240.1 —			
	Rear Filter	F249A	/	/	/			
	✓ Probe	35	114327.4	114327.8	114327.8 —			
	✓ O-Ring Set	5673	3410.5	3411.3	3411.4 —			
B	✓ Front Filter	F250	238.1	240.2	240.2 —			
	Rear Filter	F250A	/	/	/			
	✓ Probe	18	114399.0	114400.1	114399.9 —			
	✓ O-Ring Set	5672	3354.0	3354.4	3354.5 —			
BG	✓ Filter	F228	122.4	122.5	122.4 —			

Technician Signature: K. A. Morgan Date: 3/11/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	2

Sample calculations of each equation used in the refernced standards for this test run.

Summary of INPUT values necessary for calculations

	Global Input Parameters for Equations	Value	Source
FM_S	- Average moisture of test fuel spacers, % dry basis	18.34	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	1.6	Fuel Properties Work Sheet
M_{CPnwb}	- Weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis , kg	[1]Varies	Fuel Properties Work Sheet
FM_{CPn}	- Average fuel Fuel moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.441	Fuel Properties Work Sheet
V_{SCENT}	- Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse, ft/sec	0.00	Traverse Worksheet
V_{STRAV}	- Average gas velocity calculated after the multipoint Pitot traverse	15.44	Traverse Worksheet
θ	- Duration of test, min	401	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.10	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

[1] *Denotes that this pararmeter for each individual piece of fuel is calculated in the Test Fuel Properties worksheet and the input values are pulled into these sample caculations.*

	Sample Train Input Parameters for Equations	Train A	Train B	Train C	Train D
V_m	- Volume of gas sample measured at the dry gas meter, dcf	65.689	65.275	9.856	64.143
Y	Dry gas meter calibration factor	1.016	1.011	1.015	1.011
ΔH	- Average pressure differential across the orifice meter, in. H_2O	1.30	0.97	2.26	1.69
T_m	- Temperature of Dry Gas Meter, °F	78.9	78.8	68.7	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.4	0.9	0.9	n/a
m_f	- mass of particulate matter from filters, mg	1.8	2.1	0.7	0.0
m_g	- mass of particulate matter from filter seals, mg	0.9	0.5	0.3	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.4	0.9	0.9	n/a
m_f	- mass of particulate matter from filters, mg	1.8	2.1	0.7	n/a
m_g	- mass of particulate matter from filter seals, mg	0.9	0.5	0.3	n/a

M_{Sdb} – Weight of test fuel spacers, dry basis, kg - ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})\left(\frac{100}{100 + FM_S}\right)$$

Where,

FM_S = average moisture of test fuel spacers, % dry basis
M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 18.34 %, dry basis
M_{Swb} = 1.6 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((1.6 x 0.4536) (100 / (100 + 18.34))

M_{Sdb} = **0.613** kg

MCdb– Weight of test fuel crib, excluding nails and spacers, dry basis, kg - ASTM E2780 equation (2)

$$M_{Cdb} = \sum (M_{CPnwb})\left(\frac{100}{100 + FM_{CPn}}\right)$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation:

ΣM_{CPnwb} = 17.3 lb.
FM_{CPn} = 20.64 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 17.3 x 0.4536 x (100 / (100 + 20.6388888888889))

M_{Cdb} = **6.50** kg

DCdb - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft3 - ASTM E2780 equation (3)

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

Where,

V_C = Volume of Fuel Crib, ft³ (less spacers)

Sample Calculation:

M_{Cdb} = 14.34 lb
V_C = 0.441 ft³

D_{Cdb} = 14.34 / 0.441

D_{Cdb} = **32.51** lb/ft³

M_{FTAdb} - Total weight of fuel crib including spacers and nails, dry basis - ASTM E2780 equation (4)

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

Sample Calculation:

M_{Sdb} = 0.613
M_{Cdb} = 6.50

M_{FTAdb} = 0.613 + 6.5

M_{FTAdb} = **7.12** kg

BR – dry burn rate, kg/hr - ASTM E2780 equation (5)

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

Sample Calculation:

M_{FTAdb} = 7.118
θ = 401

BR = (60 x 7.118) / 401

BR = **1.07** kg / hr

***Vs* – Average gas velocity in the dilution tunnel, ft/sec -** ASTM E2515 equation (9)

$$V_S = F_P \times K_P \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where

F_P = Adjustment factor for center of tunnel pitot tube placement, where $F_P = V_{STRAV} / V_{SCENT}$

V_{SCENT} = Dilution tunnel velocity, at the center, ft/sec

V_{STRAV} = Dilution tunnel velocity, multi-point pitot traverse, ft/sec

K_P = Pitot tube constant, 85.49

C_P = Pitot tube coefficient: 0.99, unitless

$\Delta P^{1/2}_{AVG}$ = Velocity pressure in the dilution tunnel, in H_2O

$T_{S\,(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R

P_S = Absolute average gas static pressure in tunnel, = Pbar + Pg , where Pbar = Barometric Pressure, in. Hg, Pg = Static pressure in tunnel, Hg (in H_2O / 13.6)

M_S = The dilution tunnel wet molecular weight; Ms = 28.78 assuming a dry weight of 29 lb/lb-mole

(Duration of Test)

F_P = 0.8646

$\Delta P^{1/2}_{AVG}$ = 0.3130

$T_{S\,(avg)}$ = 539.6965

Pbar = 30.0950

Pg = -0.4000

Ps = 30.0656

V_S = 0.865 x 85.49 x 0.99 x 0.313 x √ [(540 / (30.07 x 28.78)]

V_S = **18.091** ft/sec

(First Hour of Test)

F_P = 0.8646

$\Delta P^{1/2}_{AVG}$ = 0.3131

$T_{S\,(avg)}$ = 544.2295

Pbar = 30.0700

Pg = -0.4000

Ps = 30.0406

V_S = 0.865 x 85.49 x 0.99 x 0.313 x √ [(544 / (30.04 x 28.78)]

V_S = **18.176** ft/sec

Q_{std} – Average gas flow rate in dilution tunnel, dscf/hr - ASTM E2515 equation (3)

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

Where:

3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
A = Cross sectional area of dilution tunnel, ft2
T_{std} = solute temperature, 528 °R
P_s = Absolute average gas static pressure in dilution tunnel, = Pbar + Pg , in Hg
$T_{s(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std} = Standard absolute pressure, 29.92 in Hg

(Duration of Test):

B_{ws} = 0.02
A = 0.19635
P_s = 30.07
$T_{s(avg)}$ = 540
Vs = 18.09

Qstd = 3600 x (1 - 0.02) x 18.091 x 0.19635 x (528 / 540) x (30.07 / 29.92)

Qstd = **12319.9** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 30.04
$T_{s(avg)}$ = 544
Vs = 18.176

Qstd = 3600 x (1 - 0.02) x 18.176 x 0.1963 x (528 / 544) x (30.04 / 29.92)

Qstd = **12264.5** dscf/hr

Vm(std) – Volume of Gas Sampled (Corrected), 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
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Train A

$$V_{m(std)} = 17.64 \times 65.689 \times 1.016 \times \frac{(30.10 + \frac{1.30}{13.6})}{(78.9 + 460)}$$

$V_{m(std)}$ = **65.959** dscf

Train B

$$V_{m(std)} = 17.64 \times 65.275 \times 1.011 \times \frac{(30.10 + \frac{0.97}{13.6})}{(79 + 460)}$$

$V_{m(std)}$ = **65.175** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.86 \times 1.015 \times \frac{(\underline{30.07} + \frac{2.26}{13.6})}{(68.7 + 460)}$$

$V_{m(std)}$ = **10.093** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 64.14 \times 1.011 \times \frac{(\underline{30.10} + \frac{1.69}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **64.135** dscf

mn – 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 Calculations (Uncorrected):

Train A

m_n = 0.4 + 1.8 + 0.9

m_n = **3.1** mg

Train B

m_n = 0.9 + 2.1 + 0.5

m_n = **3.5** mg

Train C (1st hour)

m_n = 0.9 + 0.7 + 0.3

m_n = **1.9** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 0.4 + 1.8 + 0.9

m_n = **3.1** mg

Train B

m_n = 0.9 + 2.1 + 0.5

m_n = **3.5** mg

Train C (1st hour)

m_n = 0.9 + 0.7 + 0.3

m_n = **1.9** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions

g/dscf - ASTM E2515 equation (13)

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

Where:

K_2 = Constant, 0.001 g/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample Calculations (Uncorrected):

Train A

$$C_s = 0.001 \times \frac{3.1}{65.96}$$

C_s = **0.000047** g/dscf

Train B

$$C_s = 0.001 \times \frac{3.5}{65.18}$$

C_s = **0.0000537** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.9}{10.09}$$

Cs = **0.000188** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{64.14}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{3.1}{65.96}$$

C_s = **0.000047** g/dscf

Train B

$$C_s = 0.001 \times \frac{3.5}{65.18}$$

C_s = **0.0000537** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.9}{10.09}$$

Cs = **0.000188** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{64.14}$$

C_r = **0.000000** g/dscf

ET – Total Particulate Emissions, g - ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculations (uncorrected)

Train A

E_T = (0.000047 - 0.000000) x 12319.9 x 401 / 60

E_T = **3.87** g

Train B

E_T = (0.000054 - 0.000000) x 12319.9 x 401 / 60

E_T = **4.42** g

First Hour

E_T = (0.000188 - 0.000000) x 12264.5 x 60 / 60

E_T = 2.31 g

Trains A and B Average

E = **4.15** g

Sample calculations (Corrected)

Train A

E_T = (0.000047 - 0.000000) x 12319.9 x 401 / 60

E_T = **3.87** g

Train B

E_T = (0.000054 - 0.000000) x 12319.9 x 401 / 60

E_T = **4.42** g

First Hour

E_T = (0.000188 - 0.000000) x 12264.5 x 60 / 60

E_T = **2.31** g

Trains A and B Average

E_T = **4.15** g

PM_R – Particulate emissions for test run, g/hr - ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation (Uncorrected)

Train A

E_T = 3.87 g

θ = 401 min

$PM_R = 60 \times (3.87 / 401)$

PM_R = **0.58** g/hr

Train B

E_T = 4.42 g

θ = 401 min

$PM_R = 60 \times (4.42 / 401)$

PM_R = **0.66** g/hr

A and B Average

E_T = **0.62** g/hr

First Hour

E_T = 2.31 g

θ = 60 min

$PM_R = 60 \times (2.31 / 60)$

PM_R = **2.31** g/hr

Sample Calculation (Corrected)

Train A

E_T = 3.87 g

θ = 401 min

$PM_R = 60 \times (3.87 / 401)$

PM_R = **0.58** g/hr

Train B

E_T = 4.42 g

θ = 401 min

$PM_R = 60 \times (4.42 / 401)$

PM_R = **0.66** g/hr

A and B Average

E_T = **0.62** g

First Hour

E_T = 2.31 g

θ = 60 min

$PM_R = 60 \times (2.31 / 60)$

PM_R = **2.31** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned - ASTM E2780 equation (7)

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

Sample Calculation (Uncorrected)

Train A

E_T = 3.87 g
M_{FTAdb} = 7.12 kg
PM_F = 3.87 / 7.12
PM_F = **0.54** g/kg

Train B

E_T = 4.42 g
M_{FTAdb} = 7.12 kg
PM_F = 4.42 / 7.12
PM_F = **0.62** g/kg

Sample Calculation (Corrected)

Train A

E_T = 3.87 g
M_{FTAdb} = 7.12 kg
PM_F = 3.87 / 7.12
PM_F = **0.54** g/kg

Train B

E_T = 4.42 g
M_{FTAdb} = 7.12 kg
PM_F = 4.42 / 7.12
PM_F = **0.62** g/kg

PR - Proportional Rate Variation - ASTM E2515 equation (16)

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

Where:			Train A	Train B	Train C
θ	=	Total sampling time, min	401	401	60
θ_i	=	Length of recording interval, min	1	1	1
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.162	0.161	0.17
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	65.689	65.275	9.856
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	18.541	18.541	18.541
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	18.092	18.092	18.178
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	532.0	533.0	528.0
T_m	=	Absolute average dry gas meter temperature, ^oR	538.9	538.8	528.7
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	575.0	575.0	575.0
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	539.7	539.7	544.2

NOTE: These sample calculations are for the Second interval of each train)

Train A PR = $\left(\frac{401 \text{ x } 0.162 \text{ x } 18.092 \text{ x } 539 \text{ x } 575}{1 \text{ x } 65.689 \text{ x } 18.541 \text{ x } 532 \text{ x } 540}\right)$ X 100 = 104.1 %

Train B PR = $\left(\frac{401 \text{ x } 0.161 \text{ x } 18.092 \text{ x } 539 \text{ x } 575}{1 \text{ x } 65.275 \text{ x } 18.541 \text{ x } 533 \text{ x } 540}\right)$ X 100 = 103.9 %

Train B PR = $\left(\frac{60 \text{ x } 0.17 \text{ x } 18.178 \text{ x } 529 \text{ x } 575}{1 \text{ x } 9.856 \text{ x } 18.541 \text{ x } 528 \text{ x } 544}\right)$ X 100 = 107.3 %

Run 3 Test Data

Test Date:	3/26/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	Ashford 30.2

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Project No.: 0142WS021E
Tracking No.: BK30.2
Run: 3
Test Date: 03/26/24

Burn-Rate Result

2.48 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	9.90	9.90	8.52	8.52
Emission Rate, g/hr	**3.56**	3.56	**8.52**	8.52
Emissions Factor, g/kg	1.43	1.43	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		104.2	97.3
Average Tunnel Gas Velocity (vs), feet/second		18.519	18.408
Average Tunnel Gas Flow Rate(Qsd)	DSCF/hr	12069.4	12141.4
	DSCF/min	201.2	202.4
Average Delta p, in. H2O		0.121	0.121
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	167

Particulate Sample Measurement Parameters

	Uncorrected				*Corrected*			
	AMBIENT	Train A	Train B	First Hour	AMBIENT	Train A	Train B	First Hour
Total Sample Volume (V_m), ft^3	26.587	20.617	22.909	9.516	26.587	20.617	22.909	9.516
Average Gas Meter Temperature, °F	79	78	78	68	79	78	78	68
Total Sample Volume (V_{mstd}), DSCF	26.588	20.728	22.877	9.775	26.588	20.728	22.877	9.775
Total Particulates (mn), mg - m_n	0.1	6.8	5.9	6.9	0.1	6.8	5.9	6.9
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00033	0.00026	0.00071	0.00000	0.00033	0.00026	0.00071
Total Particulate Emissions (ET), grams	n/a	11.09	8.72	8.52	n/a	11.09	8.72	8.52
Particulate Emission Rate, g/hr	n/a	3.98	3.13	8.52	n/a	3.98	3.13	8.52
Emissions Factor, g/kg	n/a	1.61	1.26	n/a	n/a	1.61	1.26	n/a
Difference, ET from from Average ET, grams	n/a	1.19	-1.19	n/a	n/a	1.19	-1.19	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	73	71	72	✓
Filter Face Velocity, fpm	< 30	9.75	8.62	8.68	✓
Dryer Exit Temperature, °F	< 80	63	45	46	✓
Tunnel Velocity, fpm	>800	1,111	1,104		✓
First Hour Leakage	0.006	0.000			✓
Train A Leakage Rate	0.005		0.000		✓
Train B Leakage Rate	0.005			0.000	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	1.4	0.9	0.5	✓
Pro-Rate Variation	< 90 for < 10% of θ	8.33%	42.51%	18.56%	✗
	> 110 for < 10% of θ	3.33%	4800.000%	26.35%	✗
	# Readings < 80%	3	1	0	✗
	# Readings > 120%	0	47	2	✗
Ambient Temp, °F	> 55		70		✓
Ambient Temp, °F	< 90		73		✓
Trains A and B Precision	(*A*) < 7.5%		11.97%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.34		✓
Stove Surface ΔT	<= 125 °F		92		✓
Room Air Velocity	< 50 fpm		23		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	3
Test Date:	3/26/2024

Efficiency results reported herein are based on a stack-loss method in accordance with CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". OMNI uses the spreadsheet provided by CSA that is to be used in conjunction with the current version of the test standard. The most recent version of the software is version 2.4, dated April 15, 2010. OMNI received confirmation from CSA on October 18, 2023 that this is the current version of the software.

Stack Loss Efficiency

Manufacturer: Valley Comfort
Model: AF30.2
Date: 03/06/24
Run: 3
Control #: 2254
Test Duration: 167
Output Category: IV

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	76.8%	83.0%
Combustion Efficiency	97.5%	97.5%
Heat Transfer Efficiency	79%	85.1%

Output Rate (kJ/h)	37,742	35,802	**(Btu/h)**
Burn Rate (kg/h)	2.48	5.47	**(lb/h)**
Input (kJ/h)	49,163	46,637	**(Btu/h)**

Test Load Weight (dry kg)	6.91	15.22	**dry lb**
MC wet (%)	18.15		
MC dry (%)	22.17		
Particulate (g)	9.9		
CO (g)	245		
Test Duration (h)	2.78		

Emissions	**Particulate**	**CO**
g/MJ Output	0.09	2.33
g/kg Dry Fuel	1.43	35.51
g/h	3.56	88.12
lb/MM Btu Output	0.22	5.43

Air/Fuel Ratio (A/F)	8.50

VERSION: **2.4** **4/15/2010**

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	AF30.2				
Date:	3/6/2024		**Temp. Units**	F	(F or C)
Run:	3		**Weight Units**	lb	(kg or lb)
Control #:	2254				
Test Duration:	167				
Output Category:	IV		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	18.15		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	18.60		**%C**	48.73	
Burn Rate (dry kg/h):	2.48		**%H**	6.87	
Total Particulate Emissions:	9.9 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.33**	**13.12**	**#DIV/0!**	**388.19**	**71.58**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	18.60	0.00	12.65		401.0	73.0
1	18.30	0.18	2.17		396.0	73.0
2	18.10	0.46	13.13		396.0	73.0
3	17.90	0.32	12.98		404.0	73.0
4	17.70	0.41	10.03		411.0	73.0
5	17.60	0.65	13.94		412.0	73.0
6	17.40	0.61	14.10		417.0	72.0
7	17.20	0.60	14.29		421.0	72.0
8	17.00	0.60	14.47		424.0	73.0
9	16.80	0.55	14.71		426.0	72.0
10	16.60	0.56	14.89		430.0	72.0
11	16.40	0.51	15.23		432.0	72.0
12	16.20	0.50	15.41		434.0	72.0
13	16.00	0.57	15.71		435.0	72.0
14	15.80	0.71	16.01		438.0	72.0
15	15.60	0.72	16.06		440.0	72.0
16	15.40	0.71	16.12		441.0	72.0
17	15.20	0.63	16.13		442.0	72.0
18	14.90	0.63	16.29		444.0	72.0
19	14.70	0.50	16.12		441.0	72.0
20	14.50	0.44	16.07		441.0	72.0
21	14.30	0.44	16.02		439.0	72.0
22	14.10	0.47	16.14		439.0	72.0
23	13.90	0.55	16.16		438.0	72.0
24	13.70	1.12	17.04		440.0	72.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	13.50	1.20	17.35		443.0	72.0
26	13.30	1.33	17.44		444.0	72.0
27	13.10	1.41	17.60		445.0	72.0
28	12.80	1.47	17.60		444.0	72.0
29	12.60	1.45	17.68		445.0	72.0
30	12.40	1.42	17.78		445.0	72.0
31	12.20	1.42	18.03		444.0	72.0
32	11.90	1.52	18.23		443.0	72.0
33	11.70	1.58	18.21		443.0	72.0
34	11.50	1.78	18.32		444.0	72.0
35	11.30	2.04	18.41		442.0	72.0
36	11.00	1.98	18.29		440.0	72.0
37	10.80	1.90	18.15		439.0	72.0
38	10.60	1.65	17.84		439.0	72.0
39	10.40	1.56	17.47		437.0	72.0
40	10.20	1.28	17.13		433.0	72.0
41	10.00	1.15	16.10		428.0	72.0
42	9.80	1.03	15.71		424.0	72.0
43	9.70	0.89	15.59		420.0	72.0
44	9.50	0.80	15.47		417.0	72.0
45	9.40	0.73	15.44		414.0	72.0
46	9.20	0.80	15.69		411.0	72.0
47	9.10	0.77	15.88		411.0	72.0
48	8.90	0.59	15.14		409.0	72.0
49	8.80	0.51	15.08		408	72
50	8.60	0.38	14.83		407	72
51	8.50	0.29	14.59		406	72
52	8.40	0.21	14.51		404	72
53	8.30	0.26	14.22		401	72
54	8.20	0.25	13.9		399	72
55	8.10	0.24	13.61		397	72
56	8.00	0.23	13.62		396	72
57	7.80	0.24	13.64		395	72
58	7.70	0.2	13.64		394	72
59	7.60	0.23	13.81		392	72
60	7.50	0.33	13.81		392	72
61	7.40	0.41	13.9		393	72
62	7.30	0.42	14.08		392	72
63	7.20	0.44	14.15		391	72
64	7.10	0.41	14.27		392	72
65	6.90	0.38	13.94		392	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	6.80	0.18	13.81		392	72
67	6.70	0.14	13.72		391	72
68	6.60	0.09	13.57		391	72
69	6.50	0.13	13.53		391	72
70	6.40	0.15	13.68		391	72
71	6.30	0.28	13.78		390	72
72	6.10	0.39	13.78		390	72
73	6.00	0.48	13.86		390	73
74	5.90	0.45	14.06		390	72
75	5.80	0.35	14.31		388	72
76	5.70	0.23	14.48		387	72
77	5.60	0.25	14.47		389	72
78	5.50	0.33	14.53		392	72
79	5.30	0.36	14.6		390	72
80	5.20	0.3	14.58		390	72
81	5.10	0.21	14.59		391	72
82	5.00	0.01	14.82		392	72
83	4.90	0.01	14.73		395	72
84	4.80	0.01	14.59		394	72
85	4.70	0.01	14.18		393	72
86	4.60	0.00628	13.9		392	72
87	4.50	0.00553	13.48		389	72
88	4.40	0.00553	13.14		387	72
89	4.30	0.00472	12.91		385	72
90	4.20	0.0053	12.51		380	72
91	4.20	0.00605	12.13		381	72
92	4.10	0.00585	12.07		382	72
93	4.00	0.00624	12.18		381	72
94	3.90	0.00637	12.38		381	72
95	3.80	0.00627	12.66		380	71
96	3.70	0.00582	12.96		379	72
97	3.70	0.00521	13.13		379	72
98	3.60	0.00472	13.27		378	71
99	3.50	0.00414	13.45		379	71
100	3.40	0.00391	13.37		377	72
101	3.30	0.0042	13.35		377	72
102	3.20	0.00443	12.48		378	71
103	3.20	0.00433	12.01		377	71
104	3.10	0.00469	11.71		376	71
105	3.00	0.00437	11.55		374	71
106	2.90	0.00407	11.46		375	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	2.90	0.00411	11.2		372	71
108	2.80	0.00395	11.08		370	71
109	2.70	0.00388	11.01		368	71
110	2.70	0.00381	11.05		367	71
111	2.60	0.00395	10.97		367	71
112	2.60	0.00401	10.87		367	71
113	2.50	0.00378	10.75		365	71
114	2.50	0.0033	10.65		366	71
115	2.40	0.00317	10.34		364	71
116	2.40	0.00313	10.3		363	71
117	2.30	0.00288	10.5		361	71
118	2.30	0.00271	10.75		361	71
119	2.20	0.00233	10.96		361	71
120	2.10	0.00223	11.08		361	71
121	2.10	0.00207	11.12		362	71
122	2.00	0.00178	11.57		359	71
123	2.00	0.00181	11.75		358	71
124	1.90	0.00138	12.01		359	71
125	1.80	0.00126	12.18		356	71
126	1.80	0.00126	12.29		358	71
127	1.70	0.00119	12.38		358	71
128	1.60	0.00106	12.41		358	71
129	1.60	0.00087	12.5		358	71
130	1.50	0.0009	12.27		357	71
131	1.50	0.00135	11.52		359	71
132	1.40	0.00171	11.27		358	71
133	1.30	0.00184	11.24		359	71
134	1.30	0.00236	11.2		357	71
135	1.30	0.00262	11.13		357	71
136	1.20	0.00258	10.91		358	71
137	1.20	0.00271	10.48		355	71
138	1.10	0.00268	10.36		353	71
139	1.10	0.00288	10.37		351	71
140	1.00	0.00285	10.4		349	71
141	1.00	0.00291	10.09		349	71
142	1.00	0.00307	10		350	71
143	0.90	0.00314	10		349	71
144	0.90	0.00313	9.97		350	71
145	0.80	0.0033	9.89		349	71
146	0.80	0.00326	9.94		349	71
147	0.80	0.00326	9.92		349	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	0.70	0.00339	9.84		347	71
149	0.70	0.0032	9.94		347	71
150	0.60	0.00333	9.85		346	71
151	0.60	0.00349	9.78		345	71
152	0.60	0.00346	9.56		345	71
153	0.50	0.00355	9.56		346	71
154	0.50	0.00352	9.5		344	71
155	0.50	0.00365	9.54		344	71
156	0.40	0.00368	9.5		346	71
157	0.40	0.00372	9.6		343	71
158	0.30	0.00365	9.52		344	70
159	0.30	0.00372	9.56		343	70
160	0.30	0.00372	9.51		343	71
161	0.20	0.00372	9.54		343	70
162	0.20	0.00375	9.54		344	70
163	0.20	0.00381	9.68		343	70
164	0.10	0.00372	9.53		343	70
165	0.00	0.00375	9.52		342	70
166	0.00	0.00368	9.52		340	70
167	0.00	0.00346	9.46		340	70

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : Ashford 30.2
Tracking No. : BK30.2
Project No. : 0142WS021E
Test Date : 3/26/2024
Run No. : 3

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.874** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 20.118 lb.
Minimum Fuel Weight : 18.11 lb.
Maximum Fuel Weight : 22.13 lb.

Fuel Piece Data

PC #	Weight, lb	Size	Length, In	Moisture Readings, Dry Basis %			Average MC, % db	Dry Weight, lb.	Volume, ft3	Wet Weights, lb 4 x 4	Wet Weights, lb 2 x 4	Dry Weights, lb 4 x 4	Dry Weights, lb 2 x 4
1	2.00	2x4	16.75	20.8	22.0	23.1	22.0	1.64	0.0509		2.0		1.64
2	1.70	2x4	16.75	24.3	23.1	22.0	23.1	1.38	0.0509		1.7		1.38
3	2.00	2x4	16.75	24.2	23.4	21.7	23.1	1.62	0.0509		2.0		1.62
4	2.10	2x4	16.75	22.3	22.3	20.2	21.6	1.73	0.0509		2.1		1.73
5	3.70	4x4	16.75	23.3	18.8	24.4	22.2	3.03	0.1187	3.7		3.03	
6	4.40	4x4	16.75	23.8	18.7	24.2	22.2	3.60	0.1187	4.4		3.60	
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
21.9	22.1	24.3	23.8	21.5	20.0	19.9	22.7	
22.1	19.0	24.8	20.5	20.9	20.9	24.2	18.9	
19.3	23.1	23.8	22.0	19.4	19.4	19.6	20.6	

Avg : 21.4

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.50	2x4		2.5000
2	2.20	2x4		2.2000
3	2.40	2x4		2.4000
4	2.50	2x4		2.5000
5	4.10	4x4	4.10	
6	4.90	4x4	4.90	
7				
8				
9				

Combined Mass of 4 x 4s 9.0 lb
Combined Mass of 2 x 4s 9.6 lb

Total Wet Mass of Fuel Load **18.6** lb

Fuel Load Properties

Type	*Number of Pieces*	*Wet Weight, lb.*	*Dry Weight, lb.*	*Fuel Loading Density, lb/ft³* Wet Basis	*Fuel Loading Density, lb/ft³* Dry Basis	Dry Fuel Density, lb/ft^3	Wet Fuel Density, lb/ft^3	*Moisture, %* Dry Basis	*Moisture, %* Wet Basis
2 x 4	4	7.8	6.37	6.47	5.30	29.48	36.05	22.18	18.15
4 x 4	2	8.1	6.63						
Spacers	24	2.7	2.22						
Totals		18.6	15.22						

Compliance Checks

	Fuel Load, Wet Lb.	Load Density, lb/ft^3 of FB vol	Fuel Density, lb/ft^3	% of Fuel load mass which is 2x4	Fuel Load Peices Mositure, % db
Measured	18.6	6.47	29.48	52	22.4
Required	18.1 - 22.1	6.3 - 7.7	25 - 36	35 - 65	19 -25
Complies ?	Yes	Yes	Yes	Yes	Yes

Dilution Tunnel Velocity Traverse and Supplementary Data

ASTM E2515-11

Run:	3	Tracking No.:	BK30.2
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WS021E
Model:	Ashford 30.2	Test Date:	3/26/2024

Dillution Tunnel Velocity Traverse

Pitot Location

Traverse Point	*% of Diameter*	*Inches into Tunnel*	*dP in. H_2O*	*Tunnel Temp, °F*	*$dP^{1/2}$*
X1	6.7	0.5 *	0.050	104	0.224
X2	25.0	0.00	0.072	104	0.268
X3	75.0	0.00	0.100	104	0.316
X4	93.3	-0.5 *	0.052	104	0.228
Y1	6.7	0.5 *	0.070	103	0.265
Y2	25.0	0.00	0.106	103	0.326
Y3	75.0	0.00	0.092	103	0.303
Y4	93.3	-0.5 *	0.064	102	0.253
Center	50.0	0.00	0.122	104	0.349

Tunnel Static Pressure	-0.400	*in. H_2O*
Tunnel Moisture	2.00	%
Tunnel Diameter	6.00	inches
Pitot Tube C_p	0.99	inches
Tunnel Molecular Weight	29	(dry)
Tunnel Molecular Weight	28.78	(M_S, wet)
Tunnel Area	0.19634954	*ft^2*
K_p	85.49	constant
$P_s=P_{bar}$+Tunnel Static	30.0805882	in HG

** Probe location must be no closer than 0.50 in to tunnel wall*

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 18.6275$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 23.8606$$

$$F_P = V_{strav} / V_{scent} = 0.781$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 14.542\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	11:43	14:30
Barometric Pressure, in. Hg	30.11	30.09
Room Air Velocity, fpm	23	16
Room Air Temperature, °F	73	68
Room Relative Humidity, %	30.0	30.0
Platform Scale Audit, lb.	20.0	20.0

Leak Checks

Pitot and associated tubing, (pass/fail)[1]	Pass	Pass

See sampling box worksheets for sampling boxes

Dillution Tunnel

Date last cleaned	3/5/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

1 Both sides (independantly) of the pitot system are brought under a minimum vacuum of 3 in. H_2O and then sealed. Any indiction of pressure loss is deemed a fail.

2 Create a smoking condition during start of pre-burn activites and using adequate lighting pointed upward and aroud tunnel hood, visually observe if 100% of visible smoke is being captured by the hood. If not, increase flow tunnel flow and / or re-assess chimney proximity to draft hood as required and repeat until 100% capture is observed.

3 With the appliance installed and the dillution tunnel flow turned-off, observe the flue draft gauge while turning the dulution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducemnt is occuring. Determine the cause (i.e. flue chimnet too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 3

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E
Test Date: 3/26/24
Beginning Clock Time: 10:07

Coal Bed Range (lb):	3.7 (min)	4.7 (max)

Preburn Fuel Data

10 pieces @ 16.75 inches
____ pieces @ ____ inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

24.9	22					
23.8	19					
23.8	19.5					
23	24.3					
23.8	23.8					

Avg Preburn Moisture (% DB): **22.79**

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
0	19.4	-0.086	592	537	340	214	513	614	439	401	71
1	19.2	-0.086	579	542	331	210	498	684	432	367	71
2	19	-0.09	579	545	323	207	483	821	427	369	71
3	18.8	-0.092	587	546	316	203	472	935	425	383	71
4	18.5	-0.096	604	547	312	201	463	1021	425	405	71
5	18.2	-0.097	628	548	309	193	455	1106	427	427	70
6	17.9	-0.099	650	548	308	190	450	1121	429	442	70
7	17.5	-0.099	668	547	306	190	446	1128	431	452	71
8	17.2	-0.1	684	546	304	187	442	1137	433	457	70
9	16.9	-0.1	700	544	303	188	441	1151	435	460	70
10	16.5	-0.1	711	542	303	187	441	1142	437	466	70
11	16.2	-0.1	722	541	303	182	442	1146	438	468	70
12	15.9	-0.101	732	540	303	186	444	1149	441	470	70
13	15.5	-0.101	741	538	304	191	447	1154	444	472	70
14	15.2	-0.101	749	536	305	185	450	1159	445	471	70
15	14.9	-0.101	756	534	306	188	453	1160	447	470	70
16	14.6	-0.101	762	533	307	187	456	1159	449	470	70
17	14.4	-0.101	768	531	309	193	460	1161	452	467	70
18	14.1	-0.102	771	530	310	189	462	1151	452	462	71
19	13.8	-0.101	775	528	312	195	466	1149	455	460	71
20	13.5	-0.1	778	526	313	193	470	1154	456	460	70
21	13.2	-0.101	782	525	315	194	474	1161	458	459	71
22	12.9	-0.101	787	523	318	197	478	1168	461	457	70
23	12.6	-0.1	790	520	320	195	481	1168	461	454	69
24	12.3	-0.101	793	517	322	200	485	1170	463	452	69
25	12	-0.1	795	515	324	198	489	1165	464	450	69
26	11.7	-0.099	797	514	326	196	493	1157	465	448	69
27	11.5	-0.099	797	513	329	202	497	1151	468	447	69
28	11.2	-0.098	797	512	332	205	500	1139	469	445	69
29	10.9	-0.097	796	512	335	205	505	1134	471	443	69
30	10.6	-0.097	795	512	338	207	509	1128	472	442	70
31	10.4	-0.098	794	512	340	212	513	1128	474	438	70
32	10.1	-0.096	794	512	342	215	517	1125	476	435	70
33	9.9	-0.096	794	512	344	217	521	1122	478	434	70
34	9.6	-0.095	794	512	346	210	525	1120	477	432	71
35	9.4	-0.095	795	512	347	215	529	1128	480	430	71
36	9.2	-0.095	798	513	347	218	534	1150	482	430	71
37	9	-0.095	800	514	347	219	540	1153	484	429	72
38	8.8	-0.095	803	515	348	220	543	1154	486	429	72
39	8.6	-0.094	805	515	350	221	547	1143	488	429	72
40	8.4	-0.094	805	516	351	223	550	1124	489	426	72
41	8.2	-0.095	803	516	352	229	552	1106	490	423	72
42	8	-0.094	801	517	353	228	555	1101	491	421	72

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
43	7.8	-0.093	799	517	354	224	558	1098	490	418	73
44	7.7	-0.093	797	518	355	231	562	1083	493	416	73
45	7.5	-0.092	794	519	357	234	565	1070	494	413	73
46	7.4	-0.092	791	519	358	232	566	1064	493	411	73
47	7.2	-0.091	789	520	360	235	567	1069	494	407	73
48	7.1	-0.092	787	521	362	237	568	1080	495	405	73
49	6.9	-0.091	786	522	364	235	569	1086	495	406	73
50	6.8	-0.091	786	523	366	241	570	1093	497	405	73
51	6.6	-0.091	785	523	369	235	571	1098	497	402	73
52	6.5	-0.091	785	524	371	244	571	1102	499	403	74
53	6.4	-0.091	784	525	374	239	573	1105	499	403	74
54	6.2	-0.091	784	526	377	246	574	1111	501	403	74
55	6.1	-0.091	785	527	381	245	575	1109	503	404	74
56	5.9	-0.091	785	528	384	248	577	1105	504	403	73
57	5.8	-0.091	785	529	387	252	579	1105	506	402	73
58	5.7	-0.091	785	530	390	252	581	1103	508	402	73
59	5.5	-0.09	785	532	393	251	583	1101	509	402	74
60	5.4	-0.091	784	533	394	250	585	1095	509	400	74
61	5.3	-0.09	783	534	395	256	590	1081	512	400	74
62	5.1	-0.091	783	535	395	253	596	1089	512	399	74
63	5	-0.09	783	536	395	255	602	1094	514	397	73
64	4.9	-0.09	783	537	396	254	608	1098	516	395	74
65	4.7	-0.09	783	538	397	256	613	1094	517	395	74
66	4.6	-0.089	782	538	398	254	615	1097	517	393	74
67	4.5	-0.089	779	540	400	256	617	1053	518	391	73
68	4.4	-0.088	774	541	401	256	618	1028	518	391	73
69	4.4	-0.088	768	542	401	255	618	1015	517	388	73
70	4.3	-0.087	762	543	401	264	617	1007	517	384	73
71	4.2	-0.087	755	544	399	261	614	994	515	379	73
72	4.2	-0.086	747	544	398	256	610	971	511	377	73
	NOTE: 0.1 lb. was added when the flue gas probe was installed.										
	Actual ending coal bed = 4.1 lb.										

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3 **Test Date:** 3/26/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 11:43
Test Length: 167 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.59	in. Hg
Post-Test	0	cfm @	18.14	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
Tot / Avg		0.1	**20.617**	**0.123**	**0.76**	**77.6**	**6.59**	**70.70**	**45.32**	**71.58**	**100.1**	**97.3**	**0.121**	**0.347**	**18.41**
Minimum	0.0	-18.2	0.000	0.099	0.47	72	1.61	67	41	70	79.6	90	0.116	0.341	18.17
Max	18.3	0.3	20.617	0.161	1.28	79	8.97	74	46	73	136.0	166	0.123	0.351	19.51
0	0.1		0.000		0.74	72	1.61	67	44	73		166	0.118	0.344	19.51
1	18.3	-18.2	0.152	0.152	1.26	72	1.88	70	42	73	132.1	157	0.116	0.341	19.15
2	18.1	0.2	0.312	0.160	1.25	72	1.87	71	41	73	136.0	116	0.119	0.345	18.80
3	17.9	0.2	0.470	0.158	1.25	72	1.88	71	41	73	130.7	107	0.120	0.346	18.56
4	17.7	0.2	0.628	0.158	1.25	72	1.88	71	41	73	130.3	105	0.121	0.348	18.55
5	17.6	0.1	0.787	0.159	1.25	72	1.88	71	41	73	130.7	103	0.121	0.348	18.55
6	17.4	0.2	0.946	0.159	1.24	73	1.88	71	41	72	130.2	102	0.122	0.349	18.57
7	17.2	0.2	1.103	0.157	1.23	73	1.87	71	42	72	128.4	102	0.120	0.346	18.52
8	17.0	0.2	1.261	0.158	1.23	73	1.86	71	42	73	129.4	102	0.122	0.349	18.52
9	16.8	0.2	1.419	0.158	1.23	73	1.87	72	42	72	129.4	102	0.120	0.346	18.52
10	16.6	0.2	1.575	0.156	1.22	73	1.87	72	42	72	128.0	102	0.120	0.346	18.44
11	16.4	0.2	1.734	0.159	1.28	73	1.92	72	42	72	130.6	102	0.121	0.348	18.48
12	16.2	0.2	1.894	0.160	1.27	73	1.91	72	42	72	130.9	102	0.123	0.351	18.60
13	16.0	0.2	2.055	0.161	1.27	73	1.91	72	42	72	131.4	103	0.121	0.348	18.61
14	15.8	0.2	2.215	0.160	1.27	73	1.92	72	42	72	131.0	103	0.120	0.346	18.50
15	15.6	0.2	2.374	0.159	1.27	73	1.92	72	42	72	130.9	103	0.119	0.345	18.42
16	15.4	0.2	2.534	0.160	1.26	74	1.92	73	42	72	131.8	104	0.121	0.348	18.47
17	15.2	0.2	2.695	0.161	1.25	74	1.93	73	43	72	132.3	104	0.120	0.346	18.52
18	14.9	0.3	2.854	0.159	1.26	74	1.93	73	43	72	130.6	104	0.120	0.346	18.48
19	14.7	0.2	3.013	0.159	1.26	74	1.93	73	43	72	130.7	104	0.120	0.346	18.48
20	14.5	0.2	3.172	0.159	1.26	74	1.93	73	43	72	130.7	103	0.120	0.346	18.47
21	14.3	0.2	3.332	0.160	1.25	74	1.92	73	43	72	131.3	103	0.121	0.348	18.50
22	14.1	0.2	3.492	0.160	1.25	74	1.93	73	43	72	131.1	104	0.121	0.348	18.55
23	13.9	0.2	3.651	0.159	1.25	75	1.94	73	43	72	130.2	103	0.120	0.346	18.51
24	13.7	0.2	3.810	0.159	1.25	75	1.94	73	44	72	130.4	104	0.119	0.345	18.43
25	13.5	0.2	3.970	0.160	1.25	75	1.94	73	44	72	131.5	104	0.121	0.348	18.48
26	13.3	0.2	4.129	0.159	1.25	75	1.95	73	44	72	130.2	104	0.121	0.348	18.55
27	13.1	0.2	4.288	0.159	1.25	75	1.95	73	44	72	129.8	104	0.122	0.349	18.59
28	12.8	0.3	4.446	0.158	1.25	75	1.94	73	44	72	129.0	104	0.120	0.346	18.55
29	12.6	0.2	4.606	0.160	1.25	75	1.94	73	44	72	131.0	104	0.120	0.346	18.48
30	12.4	0.2	4.765	0.159	1.24	75	1.95	73	44	72	130.5	104	0.120	0.346	18.48
31	12.2	0.2	4.924	0.159	1.24	76	1.96	73	45	72	130.2	104	0.121	0.348	18.52
32	11.9	0.3	5.083	0.159	1.25	76	1.95	73	45	72	129.8	104	0.121	0.348	18.55
33	11.7	0.2	5.242	0.159	1.24	76	1.96	73	45	72	129.8	104	0.120	0.346	18.52
34	11.5	0.2	5.401	0.159	1.24	76	1.96	73	45	72	130.1	104	0.120	0.346	18.48
35	11.3	0.2	5.559	0.158	1.24	76	1.96	73	45	72	129.4	104	0.120	0.346	18.48
36	11.0	0.3	5.718	0.159	1.24	76	1.97	73	45	72	130.1	104	0.121	0.348	18.52
37	10.8	0.2	5.877	0.159	1.23	76	1.98	73	45	72	129.8	104	0.121	0.348	18.55
38	10.6	0.2	6.034	0.157	1.21	76	2.02	73	45	72	128.1	104	0.121	0.348	18.55
39	10.4	0.2	6.190	0.156	1.19	77	2.06	74	45	72	127.3	104	0.120	0.346	18.52
40	10.2	0.2	6.346	0.156	1.16	77	2.12	74	46	72	127.1	103	0.122	0.349	18.55

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Date: 3/26/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Test Start Time: 11:43
Test Length: 167 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	17.59	in. Hg
Post-Test	0	cfm @	18.14	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
41	10.0	0.2	6.499	0.153	1.15	77	2.16	73	46	72	124.3	103	0.121	0.348	18.58
42	9.8	0.2	6.659	0.160	1.27	77	2.41	73	46	72	130.1	102	0.120	0.346	18.49
43	9.7	0.1	6.819	0.160	1.23	77	2.52	74	46	72	130.1	101	0.122	0.349	18.51
44	9.5	0.2	6.976	0.157	1.24	77	2.83	74	46	72	127.5	101	0.120	0.346	18.50
45	9.4	0.1	7.135	0.159	1.24	77	3.31	74	46	72	129.3	100	0.120	0.346	18.42
46	9.2	0.2	7.295	0.160	1.17	77	3.88	73	46	72	130.2	100	0.121	0.348	18.45
47	9.1	0.1	7.443	0.148	1.00	77	4.60	73	46	72	120.1	100	0.122	0.349	18.53
48	8.9	0.2	7.590	0.147	0.95	77	5.88	73	46	72	119.1	100	0.120	0.346	18.49
49	8.8	0.1	7.723	0.133	0.81	77	6.81	73	46	72	107.8	100	0.123	0.351	18.53
50	8.6	0.2	7.849	0.126	0.72	78	7.41	72	46	72	101.5	99	0.123	0.351	18.63
51	8.5	0.1	7.972	0.123	0.70	78	7.52	72	46	72	99.1	99	0.119	0.345	18.47
52	8.4	0.1	8.092	0.120	0.68	78	7.73	72	46	72	97.4	99	0.120	0.346	18.36
53	8.3	0.1	8.209	0.117	0.64	78	7.97	72	46	72	95.1	99	0.121	0.348	18.43
54	8.2	0.1	8.323	0.114	0.61	78	8.13	72	46	72	92.5	99	0.119	0.345	18.40
55	8.1	0.1	8.435	0.112	0.59	78	8.25	72	46	72	90.9	98	0.121	0.348	18.39
56	8.0	0.1	8.547	0.112	0.59	78	8.28	72	46	72	90.6	97	0.122	0.349	18.48
57	7.8	0.2	8.659	0.112	0.59	78	8.22	72	46	72	90.3	97	0.120	0.346	18.44
58	7.7	0.1	8.772	0.113	0.61	78	8.17	72	46	72	91.3	97	0.122	0.349	18.44
59	7.6	0.1	8.884	0.112	0.61	78	8.14	72	46	72	90.4	97	0.121	0.348	18.48
60	7.5	0.1	8.998	0.114	0.61	78	8.12	71	46	72	92.1	97	0.120	0.346	18.40
61	7.4	0.1	9.112	0.114	0.62	78	8.10	71	46	72	92.3	97	0.121	0.348	18.40
62	7.3	0.1	9.227	0.115	0.62	78	8.07	71	46	72	93.1	97	0.120	0.346	18.40
63	7.2	0.1	9.342	0.115	0.63	78	8.04	71	46	72	93.1	97	0.121	0.348	18.40
64	7.1	0.1	9.457	0.115	0.63	78	7.99	71	46	72	93.2	97	0.119	0.345	18.36
65	6.9	0.2	9.572	0.115	0.64	78	7.94	71	46	72	93.3	97	0.121	0.348	18.36
66	6.8	0.1	9.689	0.117	0.65	78	7.92	71	46	72	94.7	96	0.120	0.346	18.39
67	6.7	0.1	9.806	0.117	0.65	78	7.91	71	46	72	94.6	96	0.121	0.348	18.38
68	6.6	0.1	9.922	0.116	0.65	78	7.91	71	46	72	93.6	96	0.122	0.349	18.46
69	6.5	0.1	10.039	0.117	0.65	78	7.92	71	46	72	94.2	96	0.121	0.348	18.46
70	6.4	0.1	10.156	0.117	0.65	78	7.94	71	46	72	94.3	96	0.121	0.348	18.42
71	6.3	0.1	10.272	0.116	0.64	78	7.96	71	46	72	93.6	96	0.121	0.348	18.42
72	6.1	0.2	10.388	0.116	0.64	78	7.99	71	46	72	93.4	95	0.123	0.351	18.49
73	6.0	0.1	10.504	0.116	0.64	78	8.02	71	46	73	93.2	96	0.121	0.348	18.49
74	5.9	0.1	10.620	0.116	0.62	78	8.06	71	46	72	93.5	96	0.120	0.346	18.38
75	5.8	0.1	10.734	0.114	0.62	79	8.10	71	46	72	92.1	96	0.121	0.348	18.38
76	5.7	0.1	10.848	0.114	0.61	79	8.13	71	46	72	92.1	96	0.119	0.345	18.35
77	5.6	0.1	10.961	0.113	0.60	79	8.21	71	46	72	91.3	97	0.123	0.351	18.43
78	5.5	0.1	11.072	0.111	0.59	79	8.27	71	46	72	89.2	97	0.122	0.349	18.55
79	5.3	0.2	11.185	0.113	0.58	79	8.32	71	46	72	90.8	96	0.120	0.346	18.43
80	5.2	0.1	11.295	0.110	0.58	79	8.35	70	46	72	89.0	96	0.118	0.344	18.27
81	5.1	0.1	11.405	0.110	0.57	79	8.38	70	46	72	89.2	96	0.121	0.348	18.31
82	5.0	0.1	11.516	0.111	0.56	79	8.41	70	46	72	89.8	96	0.120	0.346	18.38
83	4.9	0.1	11.624	0.108	0.56	79	8.45	70	46	72	87.4	96	0.118	0.344	18.27
84	4.8	0.1	11.733	0.109	0.55	79	8.49	70	46	72	88.5	96	0.120	0.346	18.27

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 11:43
Test Length: 167 min
Recording Interval: 1 min

Test Date: 3/26/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.59 in. Hg
Post-Test 0 cfm @ 18.14 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
85	4.7	0.1	11.842	0.109	0.55	79	8.54	70	46	72	88.3	96	0.120	0.346	18.35
86	4.6	0.1	11.948	0.106	0.55	79	8.56	70	46	72	85.6	96	0.121	0.348	18.38
87	4.5	0.1	12.056	0.108	0.54	79	8.56	70	46	72	87.1	96	0.121	0.348	18.42
88	4.4	0.1	12.162	0.106	0.54	79	8.57	70	46	72	85.4	95	0.120	0.346	18.38
89	4.3	0.1	12.271	0.109	0.54	79	8.57	70	46	72	88.0	95	0.120	0.346	18.33
90	4.2	0.1	12.377	0.106	0.54	79	8.57	70	46	72	85.7	95	0.120	0.346	18.33
91	4.2	0.0	12.485	0.108	0.55	79	8.58	70	46	72	87.2	95	0.121	0.348	18.37
92	4.1	0.1	12.591	0.106	0.54	79	8.58	70	46	72	85.4	95	0.121	0.348	18.41
93	4.0	0.1	12.698	0.107	0.54	79	8.60	70	46	72	86.0	94	0.121	0.348	18.40
94	3.9	0.1	12.804	0.106	0.53	79	8.65	70	46	72	85.3	95	0.121	0.348	18.40
95	3.8	0.1	12.910	0.106	0.51	79	8.75	70	46	71	85.3	95	0.121	0.348	18.41
96	3.7	0.1	13.013	0.103	0.50	79	8.83	70	46	72	83.0	95	0.120	0.346	18.37
97	3.7	0.0	13.116	0.103	0.49	79	8.87	70	46	72	83.1	95	0.121	0.348	18.37
98	3.6	0.1	13.217	0.101	0.49	79	8.90	70	46	71	81.4	95	0.121	0.348	18.41
99	3.5	0.1	13.318	0.101	0.48	79	8.93	70	46	71	81.2	94	0.121	0.348	18.40
100	3.4	0.1	13.420	0.102	0.47	79	8.95	70	46	72	82.1	95	0.120	0.346	18.36
101	3.3	0.1	13.521	0.101	0.47	79	8.97	70	46	72	81.4	95	0.122	0.349	18.41
102	3.2	0.1	13.620	0.099	0.47	79	8.97	70	46	71	79.6	94	0.120	0.346	18.40
103	3.2	0.0	13.721	0.101	0.47	79	8.96	70	46	71	81.4	94	0.120	0.346	18.31
104	3.1	0.1	13.823	0.102	0.47	79	8.95	70	46	71	82.3	94	0.121	0.348	18.35
105	3.0	0.1	13.924	0.101	0.48	79	8.93	70	46	71	81.3	94	0.121	0.348	18.39
106	2.9	0.1	14.024	0.100	0.48	79	8.93	70	46	71	80.3	93	0.122	0.349	18.42
107	2.9	0.0	14.125	0.101	0.48	79	8.92	70	46	71	81.0	94	0.121	0.348	18.42
108	2.8	0.1	14.227	0.102	0.48	79	8.92	70	46	71	81.9	93	0.121	0.348	18.38
109	2.7	0.1	14.328	0.101	0.48	79	8.91	70	46	71	81.2	93	0.120	0.346	18.33
110	2.7	0.0	14.430	0.102	0.48	79	8.91	70	46	71	82.1	93	0.121	0.348	18.33
111	2.6	0.1	14.532	0.102	0.49	79	8.91	70	46	71	82.0	93	0.121	0.348	18.37
112	2.6	0.0	14.633	0.101	0.48	79	8.91	70	46	71	81.2	93	0.120	0.346	18.33
113	2.5	0.1	14.734	0.101	0.48	79	8.91	70	46	71	81.3	93	0.121	0.348	18.33
114	2.5	0.0	14.837	0.103	0.49	79	8.90	70	46	71	82.8	93	0.121	0.348	18.37
115	2.4	0.1	14.938	0.101	0.49	79	8.89	70	46	71	81.1	93	0.121	0.348	18.37
116	2.4	0.0	15.040	0.102	0.49	79	8.87	70	46	71	81.9	92	0.121	0.348	18.36
117	2.3	0.1	15.143	0.103	0.49	79	8.87	70	46	71	82.8	92	0.119	0.345	18.28
118	2.3	0.0	15.245	0.102	0.49	79	8.86	69	46	71	82.3	93	0.120	0.346	18.25
119	2.2	0.1	15.346	0.101	0.49	79	8.87	69	46	71	81.6	92	0.119	0.345	18.25
120	2.1	0.1	15.450	0.104	0.49	79	8.87	69	46	71	84.0	93	0.120	0.346	18.25
121	2.1	0.0	15.552	0.102	0.49	79	8.87	69	46	71	82.4	93	0.120	0.346	18.30
122	2.0	0.1	15.653	0.101	0.48	79	8.92	69	46	71	81.4	93	0.121	0.348	18.33
123	2.0	0.0	15.755	0.102	0.48	79	8.93	69	46	71	82.2	93	0.119	0.345	18.30
124	1.9	0.1	15.856	0.101	0.48	79	8.93	69	46	71	81.5	93	0.121	0.348	18.30
125	1.8	0.1	15.957	0.101	0.48	79	8.92	69	46	71	81.2	92	0.121	0.348	18.36
126	1.8	0.0	16.058	0.101	0.48	79	8.92	69	46	71	81.2	92	0.119	0.345	18.28
127	1.7	0.1	16.160	0.102	0.49	79	8.90	69	46	71	82.1	92	0.122	0.349	18.32
128	1.6	0.1	16.261	0.101	0.49	79	8.88	69	46	71	81.2	93	0.120	0.346	18.36

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3 **Test Date:** 3/26/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 11:43
Test Length: 167 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.59	in. Hg
Post-Test	0	cfm @	18.14	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
129	1.6	0.0	16.364	0.103	0.49	79	8.86	69	46	71	82.7	92	0.122	0.349	18.36
130	1.5	0.1	16.467	0.103	0.50	79	8.83	69	46	71	82.5	92	0.122	0.349	18.43
131	1.5	0.0	16.569	0.102	0.50	79	8.82	69	46	71	81.9	92	0.118	0.344	18.28
132	1.4	0.1	16.672	0.103	0.50	79	8.80	69	46	71	83.3	92	0.119	0.345	18.17
133	1.3	0.1	16.777	0.105	0.51	79	8.78	69	46	71	85.0	92	0.120	0.346	18.24
134	1.3	0.0	16.880	0.103	0.51	79	8.75	69	46	71	83.1	92	0.120	0.346	18.28
135	1.3	0.0	16.985	0.105	0.52	79	8.72	69	46	71	84.7	92	0.119	0.345	18.24
136	1.2	0.1	17.090	0.105	0.52	79	8.70	69	46	71	84.8	92	0.120	0.346	18.24
137	1.2	0.0	17.195	0.105	0.52	79	8.68	69	46	71	84.6	92	0.121	0.348	18.32
138	1.1	0.1	17.300	0.105	0.53	79	8.65	69	46	71	84.4	92	0.120	0.346	18.32
139	1.1	0.0	17.407	0.107	0.53	79	8.62	69	46	71	86.1	92	0.121	0.348	18.32
140	1.0	0.1	17.513	0.106	0.54	79	8.59	69	46	71	84.9	91	0.123	0.351	18.42
141	1.0	0.0	17.621	0.108	0.54	79	8.57	69	46	71	86.4	91	0.119	0.345	18.34
142	1.0	0.0	17.728	0.107	0.55	79	8.52	69	46	71	86.1	91	0.120	0.346	18.22
143	0.9	0.1	17.837	0.109	0.55	79	8.49	69	46	71	87.9	91	0.120	0.346	18.26
144	0.9	0.0	17.945	0.108	0.56	79	8.44	69	46	71	87.0	91	0.119	0.345	18.22
145	0.8	0.1	18.055	0.110	0.57	79	8.40	69	46	71	88.8	91	0.120	0.346	18.22
146	0.8	0.0	18.166	0.111	0.58	79	8.36	69	46	71	89.4	91	0.121	0.348	18.30
147	0.8	0.0	18.276	0.110	0.58	79	8.32	69	46	71	88.4	91	0.120	0.346	18.30
148	0.7	0.1	18.388	0.112	0.59	79	8.28	69	46	71	90.0	91	0.121	0.348	18.30
149	0.7	0.0	18.500	0.112	0.60	79	8.24	69	46	71	89.9	91	0.121	0.348	18.34
150	0.6	0.1	18.613	0.113	0.61	79	8.20	69	46	71	90.6	91	0.121	0.348	18.34
151	0.6	0.0	18.726	0.113	0.61	79	8.16	70	46	71	90.6	91	0.121	0.348	18.34
152	0.6	0.0	18.840	0.114	0.62	79	8.12	70	46	71	91.6	91	0.119	0.345	18.26
153	0.5	0.1	18.954	0.114	0.62	79	8.08	69	46	71	91.9	91	0.120	0.346	18.22
154	0.5	0.0	19.069	0.115	0.63	79	8.05	69	46	71	92.6	91	0.121	0.348	18.30
155	0.5	0.0	19.185	0.116	0.64	79	8.01	69	46	71	93.0	91	0.122	0.349	18.38
156	0.4	0.1	19.302	0.117	0.65	79	7.97	69	46	71	93.8	91	0.119	0.345	18.30
157	0.4	0.0	19.419	0.117	0.65	79	7.93	69	46	71	94.2	91	0.120	0.346	18.22
158	0.3	0.1	19.536	0.117	0.65	79	7.89	69	46	70	94.4	91	0.119	0.345	18.22
159	0.3	0.0	19.654	0.118	0.67	79	7.85	69	46	70	95.0	91	0.122	0.349	18.30
160	0.3	0.0	19.773	0.119	0.67	79	7.81	69	46	71	95.3	91	0.122	0.349	18.41
161	0.2	0.1	19.892	0.119	0.68	79	7.77	69	46	70	95.0	91	0.122	0.349	18.41
162	0.2	0.0	20.011	0.119	0.69	79	7.73	69	46	70	95.3	90	0.119	0.345	18.29
163	0.2	0.0	20.131	0.120	0.69	79	7.69	69	46	70	96.6	91	0.120	0.346	18.22
164	0.1	0.1	20.252	0.121	0.69	79	7.66	69	46	70	97.4	91	0.121	0.348	18.30
165	0.0	0.1	20.373	0.121	0.70	79	7.63	69	46	70	97.2	90	0.120	0.346	18.29
166	0.0	0.0	20.495	0.122	0.70	79	7.59	69	46	70	97.9	90	0.121	0.348	18.28
167	0.0	0.0	20.617	0.122	0.71	79	7.54	69	46	70	97.7	90	0.122	0.349	18.36

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 3/26/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 11:43
Total Sampling Time: 167 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.13 in. Hg
Post-Test 0 cfm @ 18.92 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
Tot / Avg	**22.909**	**0.137**	**0.66**	**78.4**	**6.49**	**71.55**	**45.87**	**100.1**	**712.3**	**502.9**	**322.1**	**210.7**	**507.2**	**1042.2**	**91.8**
Minimum	0.000	0.121	0.17	73	2.00	68	43	87.5	559	482	269	167	446	790	418
Max	22.909	0.162	0.75	80	8.60	71	47	121.6	818	546	395	260	606	1331	510
0	0.000		0.17	73	2.00	68	45		742	545	395	260	606	893	510
1	0.151	0.151	0.95	73	2.10	72	43	118.1	727	546	383	256	589	1184	500
2	0.310	0.159	0.94	73	2.10	72	43	121.6	723	545	366	239	568	1012	488
3	0.472	0.162	0.98	73	2.20	72	43	120.6	729	545	350	237	548	1045	482
4	0.633	0.161	0.97	73	2.20	72	43	119.5	734	546	336	224	530	1116	474
5	0.794	0.161	0.97	73	2.20	72	43	119.1	739	546	324	218	515	1115	468
6	0.954	0.160	0.97	73	2.20	72	43	118.0	743	546	314	214	502	1110	464
7	1.115	0.161	0.96	73	2.20	72	43	118.7	746	546	306	209	490	1097	459
8	1.274	0.159	0.96	73	2.20	72	43	117.4	750	545	299	203	481	1116	456
9	1.434	0.160	0.96	74	2.20	73	43	118.0	753	545	292	200	473	1129	453
10	1.594	0.160	0.95	74	2.20	73	43	118.1	755	544	287	194	467	1080	449
11	1.754	0.160	0.95	74	2.20	73	43	118.3	759	543	283	190	461	1136	447
12	1.913	0.159	0.95	74	2.20	73	43	117.0	763	542	280	190	457	1120	446
13	2.073	0.160	0.95	74	2.20	73	43	117.5	766	541	277	183	453	1136	444
14	2.232	0.159	0.95	74	2.20	73	43	117.2	770	540	274	179	450	1176	443
15	2.392	0.160	0.95	74	2.20	73	43	118.5	774	538	273	184	449	1182	444
16	2.551	0.159	0.94	74	2.20	73	43	117.9	777	536	271	178	447	1201	442
17	2.710	0.159	0.95	74	2.20	73	43	117.7	781	535	270	174	446	1180	441
18	2.870	0.160	0.93	75	2.20	74	44	118.4	784	533	269	173	446	1187	441
19	3.028	0.158	0.94	75	2.20	74	44	116.9	787	532	269	173	447	1147	442
20	3.187	0.159	0.94	75	2.20	74	44	117.5	788	530	269	176	448	1135	442
21	3.347	0.160	0.94	75	2.20	74	44	118.1	788	529	270	173	449	1136	442
22	3.505	0.158	0.94	75	2.20	74	44	116.5	788	527	270	167	452	1147	441
23	3.664	0.159	0.94	75	2.20	74	44	117.2	788	526	271	172	453	1174	442
24	3.823	0.159	0.93	75	2.20	74	44	117.6	788	524	273	167	455	1224	441
25	3.982	0.159	0.94	76	2.20	74	44	117.7	790	522	274	168	459	1243	443
26	4.142	0.160	0.94	76	2.20	74	44	117.9	793	521	275	168	462	1270	444
27	4.300	0.158	0.93	76	2.20	74	44	116.1	795	519	276	173	466	1271	446
28	4.459	0.159	0.93	76	2.20	74	44	116.8	798	518	277	172	470	1276	447
29	4.618	0.159	0.93	76	2.20	74	45	117.2	801	516	278	171	474	1268	448
30	4.777	0.159	0.93	76	2.20	74	45	117.4	803	514	279	170	479	1284	449
31	4.935	0.158	0.94	76	2.20	74	45	116.5	805	512	281	171	485	1291	451
32	5.095	0.160	0.93	76	2.20	74	45	117.8	806	511	283	167	492	1303	452
33	5.253	0.158	0.93	77	2.20	74	45	116.2	809	510	285	173	499	1299	455
34	5.412	0.159	0.92	77	2.20	74	45	117.1	811	509	288	170	507	1299	457
35	5.570	0.158	0.93	77	2.20	74	45	116.4	813	507	292	172	515	1310	460
36	5.728	0.158	0.92	77	2.30	74	45	116.3	815	506	295	174	525	1327	463
37	5.886	0.158	0.90	77	2.30	74	45	116.1	817	505	298	174	533	1310	465
38	6.042	0.156	0.88	77	2.30	74	45	114.5	818	504	301	177	541	1326	468
39	6.196	0.154	0.84	77	2.50	74	45	113.1	818	503	304	179	548	1331	470
40	6.347	0.151	0.80	77	2.60	74	45	110.9	817	502	307	177	553	1326	471

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 3/26/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 11:43
Total Sampling Time: 167 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.13 in. Hg
Post-Test 0 cfm @ 18.92 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
41	6.493	0.146	0.75	77	2.70	73	46	106.9	814	501	308	181	557	1319	472
42	6.635	0.142	0.82	78	3.30	73	46	104.0	809	500	310	181	559	1314	472
43	6.793	0.158	0.87	78	3.90	73	46	115.6	805	499	311	182	560	1300	471
44	6.948	0.155	0.91	78	5.00	73	46	113.2	800	499	313	187	560	1299	472
45	7.106	0.158	0.92	78	6.00	73	46	115.6	797	498	314	185	560	1259	471
46	7.261	0.155	0.84	78	6.50	73	46	113.5	794	497	315	189	559	1234	471
47	7.411	0.150	0.77	78	6.90	73	46	109.5	791	496	316	184	559	1250	469
48	7.555	0.144	0.70	78	7.30	73	46	105.0	788	495	317	183	559	1265	468
49	7.693	0.138	0.65	78	7.60	73	46	100.6	788	495	318	190	557	1247	470
50	7.828	0.135	0.60	78	7.80	72	46	98.0	789	494	319	193	554	1242	470
51	7.959	0.131	0.60	78	7.90	72	46	95.1	788	494	320	187	551	1223	468
52	8.092	0.133	0.59	78	7.90	72	46	97.3	787	493	321	193	549	1202	469
53	8.221	0.129	0.58	78	8.00	72	46	94.5	785	492	321	194	544	1192	467
54	8.351	0.130	0.57	78	8.00	72	46	95.1	783	492	321	195	541	1151	466
55	8.481	0.130	0.56	79	8.10	72	46	95.1	780	492	322	196	537	1120	465
56	8.608	0.127	0.55	79	8.10	72	46	92.4	776	491	321	197	534	1094	464
57	8.736	0.128	0.55	79	8.10	72	46	92.9	773	490	322	204	531	1072	464
58	8.865	0.129	0.55	79	8.10	72	46	93.7	771	490	322	197	528	1062	462
59	8.992	0.127	0.56	79	8.10	72	46	92.2	771	490	323	201	526	1056	462
60	9.121	0.129	0.56	79	8.10	72	46	93.7	771	490	324	200	523	1040	462
61	9.250	0.129	0.57	79	8.10	72	46	93.9	771	490	325	202	521	1059	462
62	9.377	0.127	0.56	79	8.10	72	46	92.5	770	490	326	203	518	1085	461
63	9.507	0.130	0.56	79	8.10	72	46	94.7	768	489	327	207	517	1091	462
64	9.635	0.128	0.56	79	8.10	72	46	93.3	766	490	329	209	515	1095	462
65	9.763	0.128	0.57	79	8.00	72	46	93.4	765	489	330	205	515	1136	461
66	9.893	0.130	0.57	79	8.00	72	46	94.7	765	489	330	210	515	1119	462
67	10.022	0.129	0.57	79	8.00	71	46	93.8	766	488	330	211	514	1066	462
68	10.151	0.129	0.57	79	8.00	71	46	93.7	768	488	330	209	515	1043	462
69	10.281	0.130	0.57	79	8.00	71	46	94.2	769	487	330	215	515	1026	463
70	10.410	0.129	0.57	79	8.00	71	46	93.6	768	486	330	216	516	1016	463
71	10.539	0.129	0.57	79	8.00	71	46	93.7	767	485	330	211	518	1029	462
72	10.668	0.129	0.57	79	8.00	71	46	93.4	764	484	329	213	519	1029	462
73	10.797	0.129	0.56	79	8.00	71	46	93.2	762	484	329	217	520	1038	462
74	10.927	0.130	0.57	79	8.10	71	46	94.3	760	485	329	209	522	1031	461
75	11.055	0.128	0.56	79	8.10	71	46	93.1	759	485	328	211	524	1062	461
76	11.184	0.129	0.56	79	8.10	71	46	94.0	757	485	327	212	527	1076	462
77	11.312	0.128	0.56	79	8.10	71	46	93.2	757	485	327	215	527	1086	462
78	11.439	0.127	0.55	79	8.10	71	46	92.0	758	485	326	214	529	1118	462
79	11.568	0.129	0.55	79	8.10	71	46	93.4	756	485	326	215	530	1121	462
80	11.695	0.127	0.55	79	8.10	71	46	92.6	755	485	326	216	532	1108	463
81	11.822	0.127	0.55	79	8.20	71	46	92.9	755	484	326	226	533	1148	465
82	11.949	0.127	0.54	80	8.20	71	46	92.5	753	484	325	215	533	1166	462
83	12.077	0.128	0.54	80	8.20	71	46	93.2	751	484	324	219	532	1158	462
84	12.203	0.126	0.54	79	8.20	71	46	92.2	750	484	324	221	530	1136	462

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 3/26/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 11:43
Total Sampling Time: 167 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.13 in. Hg
Post-Test 0 cfm @ 18.92 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
85	12.330	0.127	0.54	80	8.20	71	46	92.7	749	483	324	220	528	1128	461
86	12.457	0.127	0.54	80	8.20	71	46	92.3	747	483	324	227	525	1102	461
87	12.584	0.127	0.54	80	8.20	71	46	92.1	745	483	324	218	524	1080	459
88	12.710	0.126	0.54	80	8.20	71	46	91.3	742	483	324	224	522	1054	459
89	12.837	0.127	0.54	80	8.20	71	46	92.2	738	482	324	219	519	1016	456
90	12.965	0.128	0.54	80	8.20	71	46	93.1	734	482	324	224	518	993	456
91	13.091	0.126	0.54	80	8.20	71	46	91.5	731	482	323	227	517	972	456
92	13.218	0.127	0.54	80	8.20	71	46	92.0	727	483	323	220	516	960	454
93	13.345	0.127	0.54	80	8.20	71	46	91.9	724	483	322	224	514	952	453
94	13.471	0.126	0.54	80	8.20	71	46	91.2	723	483	322	225	513	950	453
95	13.597	0.126	0.53	80	8.30	71	46	91.2	721	483	324	223	512	952	453
96	13.721	0.124	0.51	80	8.40	71	46	89.9	719	483	325	228	512	951	453
97	13.845	0.124	0.50	80	8.40	71	46	90.0	717	483	327	229	514	950	454
98	13.968	0.123	0.50	80	8.50	71	46	89.1	714	483	330	222	516	945	453
99	14.091	0.123	0.49	80	8.50	71	46	89.0	711	484	332	221	520	955	454
100	14.213	0.122	0.49	80	8.60	71	46	88.4	708	484	335	223	524	949	455
101	14.334	0.121	0.48	80	8.60	71	46	87.7	705	484	338	221	527	951	455
102	14.455	0.121	0.49	80	8.60	71	46	87.5	703	485	341	220	529	956	456
103	14.576	0.121	0.48	80	8.60	71	46	87.7	700	485	343	229	530	945	457
104	14.697	0.121	0.49	80	8.60	71	47	87.8	698	485	343	222	531	946	456
105	14.819	0.122	0.49	80	8.50	71	47	88.3	695	486	343	224	528	936	455
106	14.941	0.122	0.49	80	8.50	71	47	88.1	692	486	343	224	527	937	454
107	15.063	0.122	0.49	80	8.50	71	47	88.0	689	486	342	222	526	935	453
108	15.185	0.122	0.50	80	8.50	71	47	88.1	685	487	341	225	524	928	452
109	15.308	0.123	0.49	80	8.50	71	47	89.0	681	487	340	216	521	927	449
110	15.431	0.123	0.50	80	8.50	71	47	89.1	677	488	339	225	520	922	450
111	15.554	0.123	0.50	80	8.50	71	47	89.0	674	488	338	225	517	916	448
112	15.676	0.122	0.50	80	8.50	71	47	88.3	671	489	336	224	516	911	447
113	15.799	0.123	0.50	80	8.50	71	47	89.1	668	489	334	224	514	905	446
114	15.922	0.123	0.50	80	8.50	71	47	89.0	665	490	332	225	511	900	445
115	16.045	0.123	0.50	80	8.40	70	47	88.9	661	490	329	226	510	895	443
116	16.168	0.123	0.51	80	8.40	70	47	88.8	656	490	327	220	508	889	440
117	16.293	0.125	0.51	80	8.40	70	47	90.4	653	490	324	222	506	889	439
118	16.416	0.123	0.51	80	8.40	70	47	89.3	650	491	322	221	506	886	438
119	16.540	0.124	0.51	80	8.40	70	47	90.1	647	491	321	221	506	878	437
120	16.663	0.123	0.51	80	8.40	70	47	89.4	645	491	320	217	507	874	436
121	16.787	0.124	0.51	80	8.40	70	47	90.1	642	491	320	221	507	899	436
122	16.911	0.124	0.50	80	8.40	70	47	89.9	640	491	323	224	508	928	437
123	17.034	0.123	0.50	80	8.50	70	47	89.2	637	492	327	226	510	951	438
124	17.157	0.123	0.50	80	8.50	70	47	89.3	636	492	331	224	511	993	439
125	17.280	0.123	0.50	80	8.50	70	47	89.0	635	493	334	224	511	1010	439
126	17.403	0.123	0.51	80	8.50	70	47	89.0	634	493	336	225	512	1038	440
127	17.526	0.123	0.51	80	8.40	70	47	89.1	634	494	339	230	511	1041	442
128	17.650	0.124	0.51	80	8.40	70	47	89.7	634	495	341	228	511	1057	442

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 3/26/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 11:43
Total Sampling Time: 167 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.13 in. Hg
Post-Test 0 cfm @ 18.92 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = ΔT)
129	17.774	0.124	0.51	80	8.30	70	47	89.6	635	496	344	231	510	1051	443
130	17.899	0.125	0.52	80	8.30	70	47	90.1	635	497	346	230	509	1067	443
131	18.024	0.125	0.52	80	8.30	70	47	90.3	636	497	348	230	508	1040	444
132	18.149	0.125	0.53	80	8.30	70	47	90.9	636	498	350	237	507	1026	446
133	18.275	0.126	0.53	80	8.20	70	47	91.7	636	499	350	241	506	1003	446
134	18.402	0.127	0.54	80	8.20	70	47	92.2	636	500	350	246	504	963	447
135	18.529	0.127	0.55	80	8.20	70	47	92.2	634	502	349	242	504	954	446
136	18.656	0.127	0.55	80	8.10	70	47	92.3	633	503	348	237	503	923	445
137	18.784	0.128	0.55	80	8.10	70	47	92.8	630	504	346	241	501	908	444
138	18.913	0.129	0.56	80	8.10	70	47	93.3	627	505	344	238	500	896	443
139	19.041	0.128	0.57	80	8.00	70	47	92.6	624	506	343	241	498	896	442
140	19.171	0.130	0.57	80	8.00	70	47	93.7	621	507	342	240	497	890	441
141	19.301	0.130	0.58	80	8.00	70	47	93.6	617	508	341	235	495	873	439
142	19.432	0.131	0.58	80	7.90	70	47	94.8	614	508	340	239	493	866	439
143	19.563	0.131	0.59	80	7.90	70	47	95.0	612	509	340	234	492	865	437
144	19.695	0.132	0.60	80	7.80	70	47	95.7	609	510	340	233	490	863	436
145	19.827	0.132	0.61	80	7.80	70	47	95.8	607	510	339	234	489	853	436
146	19.962	0.135	0.61	80	7.70	70	47	97.8	604	511	339	230	487	852	434
147	20.095	0.133	0.62	80	7.70	70	47	96.1	602	512	339	231	485	852	434
148	20.231	0.136	0.63	80	7.60	70	47	98.3	600	512	338	233	483	849	433
149	20.366	0.135	0.64	80	7.60	70	47	97.5	597	512	338	229	483	846	432
150	20.502	0.136	0.65	80	7.60	71	47	98.1	595	513	338	231	481	844	432
151	20.640	0.138	0.65	80	7.50	71	47	99.6	592	513	338	231	479	838	431
152	20.777	0.137	0.65	80	7.50	71	47	99.0	591	513	338	227	478	835	429
153	20.915	0.138	0.67	80	7.40	71	47	100.1	588	513	337	223	476	831	427
154	21.053	0.138	0.67	80	7.40	71	47	100.0	586	513	337	226	474	831	427
155	21.193	0.140	0.68	80	7.40	71	47	101.0	583	513	337	223	473	825	426
156	21.333	0.140	0.69	80	7.30	71	47	101.0	581	513	336	223	472	826	425
157	21.473	0.140	0.69	80	7.30	71	47	101.4	579	513	336	225	471	819	425
158	21.614	0.141	0.70	80	7.30	71	47	102.4	576	514	336	219	469	820	423
159	21.756	0.142	0.71	80	7.20	71	47	102.9	574	514	336	220	468	816	422
160	21.898	0.142	0.71	80	7.20	71	47	102.3	572	514	335	220	467	815	422
161	22.041	0.143	0.72	80	7.20	71	47	102.7	570	514	335	222	466	810	421
162	22.184	0.143	0.73	80	7.10	71	47	103.0	568	514	335	218	465	807	420
163	22.328	0.144	0.73	80	7.10	71	47	104.3	566	514	335	216	464	807	419
164	22.473	0.145	0.74	80	7.10	71	47	105.1	564	514	335	223	462	799	420
165	22.618	0.145	0.74	80	7.00	71	47	104.8	562	514	336	219	462	795	419
166	22.763	0.145	0.75	80	7.00	71	47	104.7	560	514	337	218	461	790	418
167	22.909	0.146	0.75	80	7.00	71	47	105.2	559	513	338	219	460	791	418

Train C - First Hour Particulate Sampling

Run: 3 **Test Date:** 3/26/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 11:43
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 23.24 in. Hg
Post-Test 0 cfm @ 22.77 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
Tot / Avg	**9.516**	**0.159**	**2.16**	**67.6**	**-4.70**	**72.2**	**63.3**	**100.5**
Minimum	0.000	0.099	0.82	67	-13.50	67	62	62.6
Max	9.516	0.182	2.60	68	-2.02	73	64	114.8
0	0.000		2.32	67	-2.10	67	63	
1	0.144	0.144	2.45	67	-2.51	71	63	96.0
2	0.314	0.170	2.44	67	-2.47	71	63	110.9
3	0.485	0.171	2.52	67	-2.55	71	63	108.7
4	0.656	0.171	2.46	67	-2.19	71	63	108.4
5	0.826	0.170	2.46	67	-2.11	71	63	107.4
6	0.995	0.169	2.44	67	-2.34	71	63	106.5
7	1.164	0.169	2.43	67	-2.57	71	63	106.5
8	1.330	0.166	2.35	67	-2.31	71	63	104.7
9	1.496	0.166	2.34	67	-2.02	72	63	104.7
10	1.663	0.167	2.34	67	-2.02	72	63	105.6
11	1.828	0.165	2.32	67	-2.06	72	63	104.4
12	1.993	0.165	2.32	67	-2.38	72	63	104.0
13	2.157	0.164	2.31	67	-2.25	72	63	103.2
14	2.323	0.166	2.29	67	-2.10	72	63	104.8
15	2.486	0.163	2.27	67	-2.36	72	63	103.4
16	2.650	0.164	2.27	67	-2.53	73	63	104.2
17	2.813	0.163	2.27	67	-2.03	73	63	103.4
18	2.976	0.163	2.26	67	-2.28	73	63	103.4
19	3.139	0.163	2.25	67	-2.42	73	63	103.6
20	3.302	0.163	2.24	67	-2.03	73	63	103.5
21	3.464	0.162	2.24	67	-2.06	73	63	102.7
22	3.626	0.162	2.24	67	-2.53	73	63	102.6
23	3.788	0.162	2.22	67	-2.40	73	63	102.6
24	3.950	0.162	2.23	68	-2.04	73	63	102.8
25	4.113	0.163	2.23	68	-2.39	73	63	103.5
26	4.274	0.161	2.23	68	-2.55	73	63	101.9
27	4.435	0.161	2.22	68	-2.07	73	63	101.6
28	4.597	0.162	2.20	68	-2.09	73	63	102.3
29	4.757	0.160	2.21	68	-2.34	73	63	101.4
30	4.920	0.163	2.21	68	-2.06	73	62	103.5
31	5.081	0.161	2.23	68	-2.05	73	63	102.1
32	5.243	0.162	2.22	68	-2.16	73	63	102.5

Train C - First Hour Particulate Sampling

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Start Time: 11:43
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/26/24

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Sample Train Leak Checks
Pre-test 0 cfm @ 23.24 in. Hg
Post-Test 0 cfm @ 22.77 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
33	5.405	0.162	2.21	68	-2.52	73	63	102.6
34	5.566	0.161	2.21	68	-2.55	73	64	102.2
35	5.729	0.163	2.25	68	-2.18	73	64	103.6
36	5.891	0.162	2.22	68	-2.33	73	63	102.8
37	6.052	0.161	2.18	68	-2.47	73	64	102.0
38	6.210	0.158	2.06	68	-2.75	73	64	100.0
39	6.364	0.154	1.91	68	-2.90	73	63	97.6
40	6.510	0.146	1.72	68	-2.88	73	63	92.5
41	6.647	0.137	1.53	68	-2.82	73	64	86.6
42	6.775	0.128	1.30	68	-3.49	72	64	80.9
43	6.893	0.118	1.09	68	-3.38	72	64	74.6
44	7.001	0.108	0.94	68	-3.63	72	63	68.2
45	7.100	0.099	0.82	68	-3.78	72	64	62.6
46	7.253	0.153	2.50	68	-7.28	72	64	96.9
47	7.418	0.165	2.14	68	-8.24	72	64	104.2
48	7.600	0.182	2.60	68	-10.63	73	64	114.8
49	7.761	0.161	2.05	68	-10.68	72	63	101.6
50	7.913	0.152	1.92	68	-10.99	72	63	95.4
51	8.063	0.150	1.90	68	-11.03	72	63	94.2
52	8.212	0.149	1.86	68	-10.88	72	63	94.3
53	8.370	0.158	2.28	68	-12.74	72	64	100.1
54	8.532	0.162	2.19	68	-12.87	72	63	102.6
55	8.694	0.162	2.25	68	-13.49	72	64	102.6
56	8.858	0.164	2.28	68	-13.50	72	64	103.5
57	9.023	0.165	2.31	68	-13.32	72	64	103.9
58	9.187	0.164	2.30	68	-12.96	72	64	103.4
59	9.351	0.164	2.29	68	-13.05	72	64	103.3
60	9.516	0.165	2.29	68	-13.11	72	64	104.0

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 3/26/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 11:43
Total Sampling Time 167 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
Tot / Avg	**26.587**	**0.159**	**1.69**	**68.0**	**-2.18**	**388.19**	**-0.090**	**520.4**	**0.33**	**13.12**
Minimum	0.000	0.156	1.64	67	-2.40	340.00	-0.098	8.7	0.00	2.17
Max	26.587	0.164	1.80	69	-2.00	445.00	-0.082	1040.0	2.04	18.41
0	0.000		1.58	67	-2.40	401	-0.092	21.0	0.00	12.65
1	0.164	0.164	1.80	67	-2.20	396	-0.091	1040.0	0.18	2.17
2	0.327	0.163	1.68	67	-2.20	396	-0.094	1040.0	0.46	13.13
3	0.487	0.160	1.69	67	-2.00	404	-0.095	1040.0	0.32	12.98
4	0.645	0.158	1.68	67	-2.30	411	-0.095	1040.0	0.41	10.03
5	0.803	0.158	1.67	67	-2.10	412	-0.095	1040.0	0.65	13.94
6	0.961	0.158	1.68	67	-2.20	417	-0.096	1040.0	0.61	14.10
7	1.119	0.158	1.68	67	-2.30	421	-0.097	1040.0	0.60	14.29
8	1.277	0.158	1.68	67	-2.10	424	-0.096	1040.0	0.60	14.47
9	1.435	0.158	1.68	67	-2.20	426	-0.097	1040.0	0.55	14.71
10	1.593	0.158	1.67	67	-2.10	430	-0.097	1040.0	0.56	14.89
11	1.751	0.158	1.67	67	-2.00	432	-0.097	1040.0	0.51	15.23
12	1.909	0.158	1.67	67	-2.10	434	-0.097	1040.0	0.50	15.41
13	2.066	0.157	1.65	67	-2.10	435	-0.098	1040.0	0.57	15.71
14	2.223	0.157	1.67	67	-2.10	438	-0.098	1040.0	0.71	16.01
15	2.380	0.157	1.65	67	-2.20	440	-0.098	1040.0	0.72	16.06
16	2.537	0.157	1.65	67	-2.00	441	-0.098	1040.0	0.71	16.12
17	2.694	0.157	1.64	67	-2.00	442	-0.098	1040.0	0.63	16.13
18	2.850	0.156	1.66	67	-2.10	444	-0.098	1040.0	0.63	16.29
19	3.007	0.157	1.65	67	-2.00	441	-0.098	1040.0	0.50	16.12
20	3.165	0.158	1.66	67	-2.20	441	-0.098	1040.0	0.44	16.07
21	3.325	0.160	1.70	67	-2.30	439	-0.097	1040.0	0.44	16.02
22	3.484	0.159	1.70	67	-2.40	439	-0.096	1040.0	0.47	16.14
23	3.643	0.159	1.70	67	-2.30	438	-0.097	1040.0	0.55	16.16
24	3.803	0.160	1.70	67	-2.30	440	-0.098	1040.0	1.12	17.04
25	3.962	0.159	1.69	67	-2.30	443	-0.097	1040.0	1.20	17.35
26	4.121	0.159	1.69	68	-2.30	444	-0.098	1040.0	1.33	17.44
27	4.280	0.159	1.70	68	-2.00	445	-0.097	1040.0	1.41	17.60
28	4.439	0.159	1.69	68	-2.20	444	-0.097	1040.0	1.47	17.60
29	4.599	0.160	1.69	68	-2.10	445	-0.097	1040.0	1.45	17.68
30	4.757	0.158	1.70	68	-2.30	445	-0.097	1040.0	1.42	17.78
31	4.917	0.160	1.68	68	-2.30	444	-0.098	1040.0	1.42	18.03
32	5.076	0.159	1.70	68	-2.20	443	-0.098	1040.0	1.52	18.23

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 3/26/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 11:43
Total Sampling Time 167 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
33	5.235	0.159	1.70	68	-2.30	443	-0.097	1040.0	1.58	18.21
34	5.394	0.159	1.68	68	-2.20	444	-0.098	1040.0	1.78	18.32
35	5.553	0.159	1.69	68	-2.30	442	-0.097	1040.0	2.04	18.41
36	5.712	0.159	1.70	68	-2.30	440	-0.097	1040.0	1.98	18.29
37	5.871	0.159	1.69	68	-2.20	439	-0.096	1040.0	1.90	18.15
38	6.031	0.160	1.70	68	-2.20	439	-0.096	1040.0	1.65	17.84
39	6.190	0.159	1.68	68	-2.20	437	-0.096	1040.0	1.56	17.47
40	6.349	0.159	1.68	68	-2.10	433	-0.096	1040.0	1.28	17.13
41	6.508	0.159	1.69	68	-2.30	428	-0.096	1040.0	1.15	16.10
42	6.667	0.159	1.69	68	-2.00	424	-0.095	1040.0	1.03	15.71
43	6.826	0.159	1.68	68	-2.20	420	-0.095	1040.0	0.89	15.59
44	6.985	0.159	1.69	68	-2.30	417	-0.095	1040.0	0.80	15.47
45	7.145	0.160	1.69	68	-2.20	414	-0.094	1040.0	0.73	15.44
46	7.303	0.158	1.69	68	-2.30	411	-0.094	1040.0	0.80	15.69
47	7.463	0.160	1.69	68	-2.30	411	-0.094	1040.0	0.77	15.88
48	7.622	0.159	1.69	68	-2.10	409	-0.093	1040.0	0.59	15.14
49	7.780	0.158	1.68	68	-2.30	408	-0.093	1040.0	0.51	15.08
50	7.940	0.160	1.69	68	-2.10	407	-0.093	1040.0	0.38	14.83
51	8.099	0.159	1.69	68	-2.30	406	-0.094	1040.0	0.29	14.59
52	8.258	0.159	1.69	68	-2.10	404	-0.092	1040.0	0.21	14.51
53	8.417	0.159	1.69	68	-2.30	401	-0.092	1040.0	0.26	14.22
54	8.576	0.159	1.69	68	-2.10	399	-0.092	1040.0	0.25	13.90
55	8.735	0.159	1.69	68	-2.00	397	-0.091	1040.0	0.24	13.61
56	8.894	0.159	1.69	68	-2.00	396	-0.091	1040.0	0.23	13.62
57	9.054	0.160	1.69	68	-2.10	395	-0.091	1040.0	0.24	13.64
58	9.213	0.159	1.68	68	-2.30	394	-0.091	1040.0	0.20	13.64
59	9.372	0.159	1.70	68	-2.10	392	-0.091	1040.0	0.23	13.81
60	9.532	0.160	1.69	68	-2.40	392	-0.090	1040.0	0.33	13.81
61	9.691	0.159	1.69	68	-2.10	393	-0.091	1040.0	0.41	13.90
62	9.850	0.159	1.69	68	-2.10	392	-0.091	1040.0	0.42	14.08
63	10.010	0.160	1.69	68	-2.10	391	-0.091	1040.0	0.44	14.15
64	10.169	0.159	1.69	68	-2.20	392	-0.091	1040.0	0.41	14.27
65	10.328	0.159	1.70	68	-2.30	392	-0.092	1040.0	0.38	13.94
66	10.487	0.159	1.68	68	-2.20	392	-0.091	1040.0	0.18	13.81
67	10.646	0.159	1.68	68	-2.40	391	-0.091	1040.0	0.14	13.72
68	10.806	0.160	1.70	68	-2.20	391	-0.092	847.7	0.09	13.57

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 3/26/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 11:43
Total Sampling Time 167 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
69	10.965	0.159	1.69	68	-2.00	391	-0.092	1040.0	0.13	13.53
70	11.125	0.160	1.70	68	-2.10	391	-0.092	1040.0	0.15	13.68
71	11.284	0.159	1.70	68	-2.30	390	-0.091	1040.0	0.28	13.78
72	11.444	0.160	1.69	68	-2.10	390	-0.091	1040.0	0.39	13.78
73	11.603	0.159	1.69	68	-2.20	390	-0.091	1040.0	0.48	13.86
74	11.763	0.160	1.70	68	-2.20	390	-0.091	1040.0	0.45	14.06
75	11.922	0.159	1.69	68	-2.00	388	-0.090	1040.0	0.35	14.31
76	12.082	0.160	1.69	68	-2.30	387	-0.090	1040.0	0.23	14.48
77	12.241	0.159	1.70	68	-2.30	389	-0.090	1040.0	0.25	14.47
78	12.401	0.160	1.69	68	-2.10	392	-0.090	1040.0	0.33	14.53
79	12.560	0.159	1.68	68	-2.20	390	-0.090	1040.0	0.36	14.60
80	12.719	0.159	1.69	68	-2.10	390	-0.090	1040.0	0.30	14.58
81	12.879	0.160	1.69	68	-2.20	391	-0.089	1040.0	0.21	14.59
82	13.038	0.159	1.69	68	-2.30	392	-0.090	133.9	0.01	14.82
83	13.197	0.159	1.69	68	-2.20	395	-0.091	138.9	0.01	14.73
84	13.357	0.160	1.68	68	-2.20	394	-0.090	155.7	0.01	14.59
85	13.516	0.159	1.69	68	-2.10	393	-0.090	73.4	0.01	14.18
86	13.675	0.159	1.70	68	-2.30	392	-0.090	62.8	0.00	13.90
87	13.834	0.159	1.68	68	-2.30	389	-0.090	55.3	0.00	13.48
88	13.993	0.159	1.68	68	-2.30	387	-0.089	55.3	0.00	13.14
89	14.152	0.159	1.69	68	-2.10	385	-0.089	47.2	0.00	12.91
90	14.312	0.160	1.68	68	-2.30	380	-0.088	53.0	0.00	12.51
91	14.471	0.159	1.69	68	-2.00	381	-0.089	60.5	0.00	12.13
92	14.630	0.159	1.69	68	-2.20	382	-0.088	58.5	0.00	12.07
93	14.790	0.160	1.68	68	-2.30	381	-0.088	62.4	0.00	12.18
94	14.949	0.159	1.69	68	-2.30	381	-0.088	63.7	0.00	12.38
95	15.108	0.159	1.70	68	-2.10	380	-0.088	62.7	0.00	12.66
96	15.267	0.159	1.68	68	-2.30	379	-0.088	58.2	0.00	12.96
97	15.427	0.160	1.70	68	-2.10	379	-0.088	52.1	0.00	13.13
98	15.586	0.159	1.69	68	-2.20	378	-0.087	47.2	0.00	13.27
99	15.745	0.159	1.68	68	-2.10	379	-0.088	41.4	0.00	13.45
100	15.905	0.160	1.69	68	-2.10	377	-0.088	39.1	0.00	13.37
101	16.064	0.159	1.70	68	-2.00	377	-0.087	42.0	0.00	13.35
102	16.223	0.159	1.69	68	-2.20	378	-0.088	44.3	0.00	12.48
103	16.383	0.160	1.68	68	-2.30	377	-0.088	43.3	0.00	12.01
104	16.542	0.159	1.69	68	-2.10	376	-0.088	46.9	0.00	11.71

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 3/26/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 11:43
Total Sampling Time 167 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
105	16.702	0.160	1.68	68	-2.20	374	-0.087	43.7	0.00	11.55
106	16.861	0.159	1.69	68	-2.10	375	-0.087	40.7	0.00	11.46
107	17.021	0.160	1.70	68	-2.10	372	-0.087	41.1	0.00	11.20
108	17.180	0.159	1.69	68	-2.30	370	-0.087	39.5	0.00	11.08
109	17.339	0.159	1.68	68	-2.30	368	-0.087	38.8	0.00	11.01
110	17.499	0.160	1.69	68	-2.10	367	-0.086	38.1	0.00	11.05
111	17.658	0.159	1.68	68	-2.10	367	-0.086	39.5	0.00	10.97
112	17.818	0.160	1.69	68	-2.30	367	-0.086	40.1	0.00	10.87
113	17.977	0.159	1.70	68	-2.30	365	-0.086	37.8	0.00	10.75
114	18.137	0.160	1.68	68	-2.10	366	-0.085	33.0	0.00	10.65
115	18.296	0.159	1.68	68	-2.30	364	-0.086	31.7	0.00	10.34
116	18.455	0.159	1.69	68	-2.20	363	-0.086	31.3	0.00	10.30
117	18.615	0.160	1.68	68	-2.20	361	-0.085	28.8	0.00	10.50
118	18.774	0.159	1.70	68	-2.30	361	-0.085	27.1	0.00	10.75
119	18.933	0.159	1.70	68	-2.10	361	-0.085	23.3	0.00	10.96
120	19.093	0.160	1.69	68	-2.10	361	-0.085	22.3	0.00	11.08
121	19.253	0.160	1.68	68	-2.30	362	-0.085	20.7	0.00	11.12
122	19.412	0.159	1.70	68	-2.30	359	-0.085	17.8	0.00	11.57
123	19.571	0.159	1.68	68	-2.40	358	-0.086	18.1	0.00	11.75
124	19.731	0.160	1.70	68	-2.30	359	-0.085	13.8	0.00	12.01
125	19.890	0.159	1.70	68	-2.10	356	-0.085	12.6	0.00	12.18
126	20.050	0.160	1.69	68	-2.00	358	-0.086	12.6	0.00	12.29
127	20.209	0.159	1.68	68	-2.00	358	-0.084	11.9	0.00	12.38
128	20.368	0.159	1.69	68	-2.10	358	-0.085	10.6	0.00	12.41
129	20.528	0.160	1.69	68	-2.20	358	-0.084	8.7	0.00	12.50
130	20.687	0.159	1.69	68	-2.00	357	-0.084	9.0	0.00	12.27
131	20.846	0.159	1.70	68	-2.30	359	-0.085	13.5	0.00	11.52
132	21.006	0.160	1.69	68	-2.10	358	-0.084	17.1	0.00	11.27
133	21.166	0.160	1.68	68	-2.30	359	-0.086	18.4	0.00	11.24
134	21.325	0.159	1.70	68	-2.10	357	-0.084	23.6	0.00	11.20
135	21.484	0.159	1.69	68	-2.20	357	-0.084	26.2	0.00	11.13
136	21.644	0.160	1.69	68	-2.10	358	-0.084	25.8	0.00	10.91
137	21.803	0.159	1.70	68	-2.30	355	-0.084	27.1	0.00	10.48
138	21.963	0.160	1.69	68	-2.30	353	-0.083	26.8	0.00	10.36
139	22.122	0.159	1.68	68	-2.10	351	-0.083	28.8	0.00	10.37
140	22.281	0.159	1.69	68	-2.10	349	-0.084	28.5	0.00	10.40

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 3/26/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 11:43
Total Sampling Time 167 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
141	22.441	0.160	1.69	68	-2.30	349	-0.083	29.1	0.00	10.09
142	22.600	0.159	1.69	69	-2.30	350	-0.083	30.7	0.00	10.00
143	22.759	0.159	1.70	68	-2.30	349	-0.083	31.4	0.00	10.00
144	22.919	0.160	1.68	69	-2.30	350	-0.084	31.3	0.00	9.97
145	23.079	0.160	1.68	69	-2.20	349	-0.084	33.0	0.00	9.89
146	23.238	0.159	1.70	69	-2.10	349	-0.083	32.6	0.00	9.94
147	23.397	0.159	1.69	69	-2.10	349	-0.083	32.6	0.00	9.92
148	23.557	0.160	1.69	69	-2.10	347	-0.083	33.9	0.00	9.84
149	23.716	0.159	1.69	69	-2.20	347	-0.082	32.0	0.00	9.94
150	23.876	0.160	1.68	69	-2.10	346	-0.083	33.3	0.00	9.85
151	24.035	0.159	1.68	69	-2.40	345	-0.083	34.9	0.00	9.78
152	24.194	0.159	1.69	69	-2.00	345	-0.083	34.6	0.00	9.56
153	24.354	0.160	1.69	69	-2.10	346	-0.083	35.5	0.00	9.56
154	24.513	0.159	1.69	69	-2.10	344	-0.082	35.2	0.00	9.50
155	24.673	0.160	1.70	69	-2.10	344	-0.082	36.5	0.00	9.54
156	24.832	0.159	1.69	69	-2.10	346	-0.082	36.8	0.00	9.50
157	24.992	0.160	1.68	69	-2.10	343	-0.082	37.2	0.00	9.60
158	25.151	0.159	1.70	69	-2.10	344	-0.082	36.5	0.00	9.52
159	25.311	0.160	1.69	69	-2.30	343	-0.082	37.2	0.00	9.56
160	25.470	0.159	1.69	69	-2.20	343	-0.082	37.2	0.00	9.51
161	25.630	0.160	1.70	69	-2.10	343	-0.082	37.2	0.00	9.54
162	25.789	0.159	1.69	69	-2.10	344	-0.082	37.5	0.00	9.54
163	25.949	0.160	1.69	69	-2.20	343	-0.082	38.1	0.00	9.68
164	26.109	0.160	1.69	69	-2.30	343	-0.082	37.2	0.00	9.53
165	26.268	0.159	1.69	69	-2.20	342	-0.082	37.5	0.00	9.52
166	26.427	0.159	1.69	69	-2.30	340	-0.082	36.8	0.00	9.52
167	26.587	0.160	1.69	69	-2.00	340	-0.082	34.6	0.00	9.46

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Tracking No.:	BK30.2
Project No.:	0142WS021E
Run No.:	3
Test Date:	3/26/24

OMNI Eq. ID Numbers	
Analytical Scale	
Audit Weight Set:	
Analytical Scale	
Hydrometer	
Filters are weighed	In Pairs

Train A

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/06/24 @ 14:40	Filter	F252	240.1	238.1	2.0	2.0
Probe catch*	3/06/24 @ 14:40	Probe	65	117081.5	117080.6	0.9	0.9
ilter seals catch*	3/06/24 @ 14:40	Seals	S678	3317.9	3314.0	3.9	3.9
				Total Particulate, mg:		**6.8**	**6.8**

Train B

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/06/24 @ 14:40	Filter	F253	241.6	238.8	2.8	2.8
Probe catch*	3/06/24 @ 14:40	Probe	84	117637.5	117637.0	0.5	0.5
ilter seals catch*	3/06/24 @ 14:40	Seals	S689	3338.1	3335.5	2.6	2.6
			Sub-Total	Total Particulate, mg:		**5.9**	**5.9**

Train C - *First Hour*

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/06/24 @ 14:40	Filter	F254	244.1	240.3	3.8	3.8
Probe catch*	3/06/24 @ 14:40	Probe	11	114187.4	114186.0	1.4	1.4
ilter seals catch*	3/06/24 @ 14:40	Seals	S676	3227.4	3225.7	1.7	1.7
				Total Particulate, mg:		**6.9**	**6.9**

Train D - *Ambient Background*

Sample Component	Date / Time in Dessicator	Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*	3/06/24 @ 14:40	Filter	F229	120.6	120.5	0.1
				Total Particulate, mg:		**0.1**

Final (mg) - Tare (mg) = Particulate (mg)

NOTE: The Uncorrected values are those where any negative filter weights are taken as a negative value. This can possibly occur when filter matter adheres the O-ring seals and thereby transfers some mass to the O-ring. The Corrected values reflect where any negative filter weights are taken as ZERO, thus not accounting for any transfer of mass and resultingly over-reporting. Corrected values were added to this analysis to report the "Corrected" results in this report in response to a request by the US EPA. In cases where the Final weight minus the Tare weight of the Ambient filter occurs, it is taken as a ZERO. Any negative probe weights are evaluated pursuant to clause of ASTM E25215 (or appropriatelt associated test standard as defined in the introduction of this report).

Technician Signature:_____ Reviewed By:_____

Run 3 - Run Notes

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	3
Test Date:	3/26/2024

This supplemental section of miscellaneous run notes is comprised of the following:

- Appliance Operation Notes
- Velocity Traverse / Supplementa Run Notes
- Test Fuel Notes
- Gravimetric Analysis Notes

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 3

Model: AF30.2 Tracking Number: 2254 Date: 03/06/2024

Test Crew: T. Tang, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

Fully open (0°)

Secondary: N/A

Tertiary/Pilot: N/A

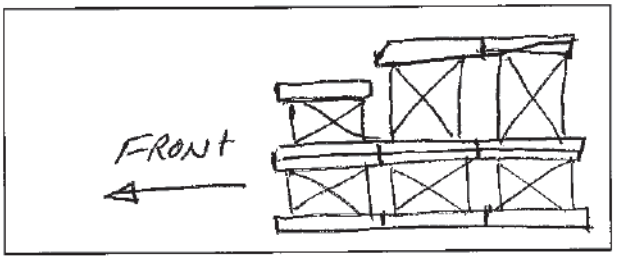
Fan: On high

Preburn Notes

Time	Notes
10:29	preburn started @ 19.4 lb
10:48	Flue gas probe installed (0.1 lb)

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: OPEN 40 sec

Fuel loaded by: 35 sec

Door closed at: 40 sec

Primary air: No Adjustment

Notes:

Time	Notes
11:43	TEST loaded / started

Technician Signature: K. L. Morgan Date: 3/6/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 3

Model: AF30.2 Tracking Number: 2254 Date: 03/06/2024

Test Crew: T. Tong, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 11:43 Booth #: 1

Stop Time: 14:30

Stack Gas Leak Check: **Sample Train Leak Check:**

Initial: ✓ Final:

A: 0.000 @ 17.59 "Hg
B: 0.000 @ 18.15 "Hg
A_1: 0.000 @ 23.24 "Hg

post
A: 0.000 @ 18.14 "Hg
B: 0.000 @ 18.92 "Hg
A_1: 0.000 @ 22.77 "Hg

Calibrations: Span Gas CO_2: 16.86% CO: 4.37% CO: 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	10:36	10:37	14:35	14:38
CO_2 %	0.00	16.86	0.00	16.83
CO %	0.00	4.38	0.00	4.37
CO ppm	0.0	498	0.0	491

Air Velocity (ft/min): Initial: 23 Final: 16

Scale Audit (lbs): Initial: 20 Final: 20.0

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 6

Induced Draft: 0.000

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 03/05/24 Initials: TT

	Initial	Middle	Ending
P_b (in/Hg)	30.11		30.09
RH (%)	30		30
Ambient (°F)	73		68

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
.025	.050	104
.036	.072	104
.050	.100	104
.026	.052	104
.035	.070	103
.053	.106	103
.046	.092	103
.032	.064	102
Center:		
0.122	~~.098~~ 0.127	104

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
−0.4	−0.4

Background Filter Volume:

Technician Signature: K. Morgan Date: 3/6/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 3

Model: AF30.2 Tracking Number: 2254 Date: 03/06/2024

Test Crew: T. Tong, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0

Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16.75 in	24.9	7	16.75 in	19.0
2	16.75 in	23.8	8	16.75 in	19.5
3	16.75 in	23.8	9	16.75 in	24.3
4	16.75 in	23.0	10	16.75 in	23.8
5	16.75 in	23.9	11	in	
6	16.75 in	22.0	12	in	

Total Pre-Burn Fuel Weight: ~~18.0~~ 16. Pre-Burn Fuel Average Moisture: 22.8 %db

Time (clock): 10:15 Room Temperature (F): 67 Initials: K

Test Fuel

Firebox Volume (ft³): ~~2.91~~ 2.874 K Test Fuel Piece Length (in): 16.75

Load Weight Range (lb): ~~18.4 – 22.4~~ K Total Wet Fuel Load Weight (lb): 18.6

CBR: 3.8 – 4.6

Fuel Type & Amount: 2 x 4: 4 4 x 4: 2

Weight (with spacers): 9.0 Weight (with spacers): 9.6

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	2.0 / 2.5	20.8	22.0	23.1	2x4
2	1.7 / 2.2	24.3	23.1	22.0	2x4
3	2.0 / 2.4	24.2	23.4	21.7	2x4
4	2.1 / 2.5	22.3	22.3	20.2	2x4
5	3.7 / 4.1	23.3	18.8	24.4	4x4
6	4.4 / 4.9	23.8	18.7	24.2	4x4
7					

Spacer Moisture Readings (%DB)

21.9	22.1	24.3	23.8	21.5	20.0	19.9	22.7
22.1	19.0	24.8	20.5	20.9	20.0	24.2	18.9
19.3	23.1	23.8	22.0	19.4	19.6	19.6	20.6

Time (clock): 11:04 Room Temperature (F): 68 Initials: K

Technician Signature: K. Morgan Date: 3/6/24

LOST PRO-MATE 2.48 @ 3.56 / 3.56 8.52 / 8.52

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 3

Model: AF30.2 Tracking Number: 2254 Date: 03/06/2024

Test Crew: T. Tong K. Morgan

OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: T. Tong

Date/Time in Dessicator: 03/06/24 14:40

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/11/24 8:45	3/11/24 15:55			
R/H %:	29	33			
Temp:	65	67			
200 mg Audit:	200.0	200.0			
2 g Audit:	2000.2	2000.3			
100 g Audit:	99997.7	99997.9			
Initials:	K	K			

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	✓ Front Filter	~~F254~~ F253/A	~~240.3~~ 238.1	244.1	244.1			
	Rear Filter							
	✓ Probe	11	114186.0	114187.5	114187.4			
	✓ O-Ring Set	S676	3225.7	3227.3	3227.4			
A	✓ Front Filter	F252/A	238.1	240.0	240.1			
	Rear Filter							
	✓ Probe	65	117080.6	117081.5	117081.5			
	✓ O-Ring Set	S678	3314.0	3317.8	3317.9			
B	✓ Front Filter	F253/A	238.8	241.6	241.6			
	Rear Filter							
	✓ Probe	84	117637.0	117637.4	117637.5			
	✓ O-Ring Set	S689	3335.5	3338.1	3338.1			
BG	✓ Filter	F229	120.5	120.6	120.6			

Technician Signature: K. Morgan Date: 3/11/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	3

Sample calculations of each equation used in the refernced standards for this test run.

Summary of INPUT values necessary for calculations

	Global Input Parameters for Equations	Value	Source
FM_S	- Average moisture of test fuel spacers, % dry basis	21.45	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	2.7	Fuel Properties Work Sheet
M_{CPnwb}	- Weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis , kg	[1]Varies	Fuel Properties Work Sheet
FM_{CPn}	- Average fuel Fuel moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.441	Fuel Properties Work Sheet
V_{SCENT}	- Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse, ft/sec	0.00	Traverse Worksheet
V_{STRAV}	- Average gas velocity calculated after the multipoint Pitot traverse	14.54	Traverse Worksheet
θ	- Duration of test, min	167	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.10	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

[1] *Denotes that this pararmeter for each individual piece of fuel is calculated in the Test Fuel Properties worksheet and the input values are pulled into these sample caculations.*

	Sample Train Input Parameters for Equations	Train A	Train B	Train C	Train D
V_m	- Volume of gas sample measured at the dry gas meter, dcf	20.617	22.909	9.516	26.587
Y	Dry gas meter calibration factor	1.016	1.011	1.015	1.011
ΔH	- Average pressure differential across the orifice meter, in. H_2O	0.76	0.66	2.16	1.69
T_m	- Temperature of Dry Gas Meter, °F	77.6	78.4	67.6	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.9	0.5	1.4	n/a
m_f	- mass of particulate matter from filters, mg	2.0	2.8	3.8	0.1
m_g	- mass of particulate matter from filter seals, mg	3.9	2.6	1.7	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.9	0.5	1.4	n/a
m_f	- mass of particulate matter from filters, mg	2.0	2.8	3.8	n/a
m_g	- mass of particulate matter from filter seals, mg	3.9	2.6	1.7	n/a

M_{Sdb} – Weight of test fuel spacers, dry basis, kg - ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})\left(\frac{100}{100 + FM_S}\right)$$

Where,

FM_S = average moisture of test fuel spacers, % dry basis
M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 21.45 %, dry basis
M_{Swb} = 2.7 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((2.7 x 0.4536) (100 / (100 + 21.45))

M_{Sdb} = **1.008** kg

MCdb– Weight of test fuel crib, excluding nails and spacers, dry basis, kg - ASTM E2780 equation (2)

$$M_{Cdb} = \sum (M_{CPnwb})\left(\frac{100}{100 + FM_{CPn}}\right)$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation:

ΣM_{CPnwb} = 15.9 lb.
FM_{CPn} = 22.37 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 15.9 x 0.4536 x (100 / (100 + 22.3666666666667))

M_{Cdb} = **5.89** kg

DCdb - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft3 - ASTM E2780 equation (3)

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

Where,

V_C = Volume of Fuel Crib, ft^3 (less spacers)

Sample Calculation:

M_{Cdb} = 12.99 lb
V_C = 0.441 ft^3

D_{Cdb} = 12.99 / 0.441

D_{Cdb} = **29.46** lb/ft^3

M_{FTAdb} - Total weight of fuel crib including spacers and nails, dry basis - ASTM E2780 equation (4)

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

Sample Calculation:

M_{Sdb} = 1.008
M_{Cdb} = 5.89

M_{FTAdb} = 1.008 + 5.89

M_{FTAdb} = **6.90** kg

BR – dry burn rate, kg/hr - ASTM E2780 equation (5)

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

Sample Calculation:

M_{FTAdb} = 6.902
θ = 167

BR = (60 x 6.902) / 167

BR = **2.48** kg / hr

***Vs* – Average gas velocity in the dilution tunnel, ft/sec -** ASTM E2515 equation (9)

$$V_S = F_P \times K_P \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where

F_P = Adjustment factor for center of tunnel pitot tube placement, where $F_P = V_{STRAV} / V_{SCENT}$

V_{SCENT} = Dilution tunnel velocity, at the center, ft/sec

V_{STRAV} = Dilution tunnel velocity, multi-point pitot traverse, ft/sec

K_P = Pitot tube constant, 85.49

C_P = Pitot tube coefficient: 0.99, unitless

$\Delta P^{1/2}_{AVG}$ = Velocity pressure in the dilution tunnel, in H_2O

$T_{S\,(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R

P_S = Absolute average gas static pressure in tunnel, = Pbar + Pg , where Pbar = Barometric Pressure, in. Hg, Pg = Static pressure in tunnel, Hg (in H_2O / 13.6)

M_S = The dilution tunnel wet molecular weight; Ms = 28.78 assuming a dry weight of 29 lb/lb-mole

(Duration of Test)

F_P = 0.7807

$\Delta P^{1/2}_{AVG}$ = 0.3472

$T_{S\,(avg)}$ = 557.3214

Pbar = 30.1000

Pg = -0.4000

Ps = 30.0706

V_S = 0.781 x 85.49 x 0.99 x 0.347 x √ [(557 / (30.07 x 28.78)]

V_S = **18.408** ft/sec

(First Hour of Test)

F_P = 0.7807

$\Delta P^{1/2}_{AVG}$ = 0.3472

$T_{S\,(avg)}$ = 564.2295

Pbar = 30.1100

Pg = -0.4000

Ps = 30.0806

V_S = 0.781 x 85.49 x 0.99 x 0.347 x √ [(564 / (30.08 x 28.78)]

V_S = **18.519** ft/sec

Q_{std} – Average gas flow rate in dilution tunnel, dscf/hr - ASTM E2515 equation (3)

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

Where:

3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
A = Cross sectional area of dilution tunnel, ft2
T_{std} = solute temperature, 528 °R
P_s = Absolute average gas static pressure in dilution tunnel, = Pbar + Pg , in Hg
$T_{s(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std} = Standard absolute pressure, 29.92 in Hg

(Duration of Test):

B_{ws} = 0.02
A = 0.19635
P_s = 30.07
$T_{s(avg)}$ = 557
Vs = 18.41

Qstd = 3600 x (1 - 0.02) x 18.408 x 0.19635 x (528 / 557) x (30.07 / 29.92)

Qstd = **12141.4** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 30.08
$T_{s(avg)}$ = 564
Vs = 18.519

Qstd = 3600 x (1 - 0.02) x 18.519 x 0.1963 x (528 / 564) x (30.08 / 29.92)

Qstd = **12069.4** dscf/hr

Vm(std) – Volume of Gas Sampled (Corrected), 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
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Train A

$$V_{m(std)} = 17.64 \times 20.617 \times 1.016 \times \frac{(30.10 + \frac{0.76}{13.6})}{(77.6 + 460)}$$

$V_{m(std)}$ = **20.728** dscf

Train B

$$V_{m(std)} = 17.64 \times 22.909 \times 1.011 \times \frac{(30.10 + \frac{0.66}{13.6})}{(78 + 460)}$$

$V_{m(std)}$ = **22.877** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.52 \times 1.015 \times \frac{(\underline{30.11} + \frac{2.16}{13.6})}{(67.6 + 460)}$$

$V_{m(std)}$ = **9.775** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 26.59 \times 1.011 \times \frac{(\underline{30.10} + \frac{1.69}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **26.588** dscf

mn – 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 Calculations (Uncorrected):

Train A

m_n = 0.9 + 2.0 + 3.9

m_n = **6.8** mg

Train B

m_n = 0.5 + 2.8 + 2.6

m_n = **5.9** mg

Train C (1st hour)

m_n = 1.4 + 3.8 + 1.7

m_n = **6.9** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

Sample Calculations (Corrected):

Train A

m_n = 0.9 + 2.0 + 3.9

m_n = **6.8** mg

Train B

m_n = 0.5 + 2.8 + 2.6

m_n = **5.9** mg

Train C (1st hour)

m_n = 1.4 + 3.8 + 1.7

m_n = **6.9** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions

g/dscf - ASTM E2515 equation (13)

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

Where:

K_2 = Constant, 0.001 g/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample Calculations (Uncorrected):

Train A

$$C_s = 0.001 \times \frac{6.8}{20.73}$$

C_s = **0.000328** g/dscf

Train B

$$C_s = 0.001 \times \frac{5.9}{22.88}$$

C_s = **0.0002579** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{6.9}{9.77}$$

Cs = **0.000706** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{26.59}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{6.8}{20.73}$$

C_s = **0.000328** g/dscf

Train B

$$C_s = 0.001 \times \frac{5.9}{22.88}$$

C_s = **0.0002579** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{6.9}{9.77}$$

Cs = **0.000706** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{26.59}$$

C_r = **0.000000** g/dscf

ET – Total Particulate Emissions, g - ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculations (uncorrected)

Train A

E_T = (0.000328 - 0.000000) x 12141.4 x 167 / 60

E_T = **11.09** g

Train B

E_T = (0.000258 - 0.000000) x 12141.4 x 167 / 60

E_T = **8.72** g

First Hour

E_T = (0.000706 - 0.000000) x 12069.4 x 60 / 60

E_T = 8.52 g

Trains A and B Average

E = **9.90** g

Sample calculations (Corrected)

Train A

E_T = (0.000328 - 0.000000) x 12141.4 x 167 / 60

E_T = **11.09** g

Train B

E_T = (0.000258 - 0.000000) x 12141.4 x 167 / 60

E_T = **8.72** g

First Hour

E_T = (0.000706 - 0.000000) x 12069.4 x 60 / 60

E_T = **8.52** g

Trains A and B Average

E_T = **9.90** g

PM_R – Particulate emissions for test run, g/hr - ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation (Uncorrected)

Train A

E_T = 11.09 g

θ = 167 min

PM_R = 60 x (11.09 / 167)

PM_R = **3.98** g/hr

Train B

E_T = 8.72 g

θ = 167 min

PM_R = 60 x (8.72 / 167)

PM_R = **3.13** g/hr

A and B Average

E_T = **3.56** g/hr

First Hour

E_T = 8.52 g

θ = 60 min

PM_R = 60 x (8.52 / 60)

PM_R = **8.52** g/hr

Sample Calculation (Corrected)

Train A

E_T = 11.09 g

θ = 167 min

PM_R = 60 x (11.09 / 167)

PM_R = **3.98** g/hr

Train B

E_T = 8.72 g

θ = 167 min

PM_R = 60 x (8.72 / 167)

PM_R = **3.13** g/hr

A and B Average

E_T = **3.56** g

First Hour

E_T = 8.52 g

θ = 60 min

PM_R = 60 x (8.52 / 60)

PM_R = **8.52** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned - ASTM E2780 equation (7)

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

Sample Calculation (Uncorrected)

Train A

E_T = 11.09 g
M_{FTAdb} = 6.90 kg
PM_F = 11.09 / 6.90
PM_F = **1.61** g/kg

Train B

E_T = 8.72 g
M_{FTAdb} = 6.90 kg
PM_F = 8.72 / 6.90
PM_F = **1.26** g/kg

Sample Calculation (Corrected)

Train A

E_T = 11.09 g
M_{FTAdb} = 6.90 kg
PM_F = 11.09 / 6.90
PM_F = **1.61** g/kg

Train B

E_T = 8.72 g
M_{FTAdb} = 6.90 kg
PM_F = 8.72 / 6.90
PM_F = **1.26** g/kg

PR - Proportional Rate Variation - ASTM E2515 equation (16)

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

Where:			Train A	Train B	Train C
θ	=	Total sampling time, min	167	167	60
θ_i	=	Length of recording interval, min	1	1	1
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.16	0.159	0.17
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	20.617	22.909	9.516
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	18.978	18.978	18.978
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	18.411	18.411	18.532
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	532.0	533.0	527.0
T_m	=	Absolute average dry gas meter temperature, ^oR	537.6	538.4	527.6
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	596.5	596.5	596.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	557.3	557.3	564.2

NOTE: These sample calculations are for the Second interval of each train)

Train A PR = $\left(\frac{167 \text{ x } 0.16 \text{ x } 18.411 \text{ x } 538 \text{ x } 597}{1 \text{ x } 20.617 \text{ x } 18.978 \text{ x } 532 \text{ x } 557}\right)$ X 100 = 136.0 %

Train B PR = $\left(\frac{167 \text{ x } 0.159 \text{ x } 18.411 \text{ x } 538 \text{ x } 597}{1 \text{ x } 22.909 \text{ x } 18.978 \text{ x } 533 \text{ x } 557}\right)$ X 100 = 121.6 %

Train B PR = $\left(\frac{60 \text{ x } 0.17 \text{ x } 18.532 \text{ x } 528 \text{ x } 597}{1 \text{ x } 9.516 \text{ x } 18.978 \text{ x } 527 \text{ x } 564}\right)$ X 100 = 110.8 %

Run 4 Test Data

Test Date:	3/6/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	Ashford 30.2

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Project No.: 0142WS021E
Tracking No.: BK30.2
Run: 4
Test Date: 03/06/24

Burn-Rate Result

1.81 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	4.84	4.84	2.75	2.75
Emission Rate, g/hr	**1.23**	1.23	**2.75**	2.75
Emissions Factor, g/kg	0.68	0.68	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		86.9	83.1
Average Tunnel Gas Velocity (vs), feet/second		22.191	22.101
Average Tunnel Gas Flow Rate(Qsd),	DSCF/hr	14907.2	14955.9
	DSCF/min	248.5	249.3
Average Delta p, in. H2O		0.156	0.155
Tunnel Static Pressure, in. H2O		-0.500	-0.500
Total Time of Test, Min		60	236

Particulate Sample Measurement Parameters

	Uncorrected				*Corrected*			
	AMBIENT	Train A	Train B	First Hour	AMBIENT	Train A	Train B	First Hour
Total Sample Volume (V_m), ft^3	34.019	32.914	33.746	8.451	34.019	32.914	33.746	8.451
Average Gas Meter Temperature, °F	79	77	77	68	79	77	77	68
Total Sample Volume (V_{mstd}), DSCF	33.997	33.157	33.784	8.666	33.997	33.157	33.784	8.666
Total Particulates (mn), mg - m_n	0.1	2.9	2.6	1.6	0.1	2.9	2.6	1.6
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00009	0.00008	0.00018	0.00000	0.00009	0.00008	0.00018
Total Particulate Emissions (ET), grams	n/a	5.15	4.53	2.75	n/a	5.15	4.53	2.75
Particulate Emission Rate, g/hr	n/a	1.31	1.15	2.75	n/a	1.31	1.15	2.75
Emissions Factor, g/kg	n/a	0.72	0.64	n/a	n/a	0.72	0.64	n/a
Difference, ET from from Average ET, grams	n/a	0.31	-0.31	n/a	n/a	0.31	-0.31	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	68	68	68	✓
Filter Face Velocity, fpm	< 30	7.71	7.55	7.71	✓
Dryer Exit Temperature, °F	< 80	60	48	50	✓
Tunnel Velocity, fpm	>800	1,331	1,326		✓
First Hour Leakage	0.006	0.000			✓
Train A Leakage Rate	0.006		0.000		✓
Train B Leakage Rate	0.006			0.000	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.4	0.6	0	✓
Pro-Rate Variation	< 90 for < 10% of θ	1.67%	0.00%	0.00%	✓
	> 110 for < 10% of θ	0.00%	0.000%	0.00%	✓
	# Readings < 80%	0	0	0	✓
	# Readings > 120%	0	0	0	✓
Ambient Temp, °F	> 55		68		✓
Ambient Temp, °F	< 90		71		✓
Trains A and B Precision	(*A*) < 7.5%		6.39%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.09		✓
Stove Surface ΔT	<= 125 °F		2		✓
Room Air Velocity	< 50 fpm		35		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	4
Test Date:	3/6/2024

Efficiency results reported herein are based on a stack-loss method in accordance with CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". OMNI uses the spreadsheet provided by CSA that is to be used in conjunction with the current version of the test standard. The most recent version of the software is version 2.4, dated April 15, 2010. OMNI received confirmation from CSA on October 18, 2023 that this is the current version of the software.

Stack Loss Efficiency

Manufacturer: Valley Comfort
Model: AF30.2
Date: 03/06/24
Run: 4
Control #: 2254
Test Duration: 236
Output Category: III

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	80.2%	86.7%
Combustion Efficiency	98.2%	98.2%
Heat Transfer Efficiency	82%	88.3%

Output Rate (kJ/h)	28,844	27,362	**(Btu/h)**
Burn Rate (kg/h)	1.82	4.00	**(lb/h)**
Input (kJ/h)	35,956	34,108	**(Btu/h)**

Test Load Weight (dry kg)	7.14	15.73	**dry lb**
MC wet (%)	17.62		
MC dry (%)	21.39		
Particulate (g)	4.84		
CO (g)	191		
Test Duration (h)	3.93		

Emissions	**Particulate**	**CO**
g/MJ Output	0.04	1.69
g/kg Dry Fuel	0.68	26.82
g/h	1.23	48.68
lb/MM Btu Output	0.10	3.92

Air/Fuel Ratio (A/F)	8.40

VERSION: **2.4** **4/15/2010**

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	AF30.2				
Date:	3/6/2024		**Temp. Units**	F	(F or C)
Run:	4		**Weight Units**	lb	(kg or lb)
Control #:	2254				
Test Duration:	236				
Output Category:	III		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.62		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	19.10		**%C**	48.73	
Burn Rate (dry kg/h):	1.81		**%H**	6.87	
Total Particulate Emissions:	4.84 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.26**	**13.36**	**#DIV/0!**	**292.11**	**69.28**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	19.10	0.37	3.67		292.0	69.0
1	18.90	0.19	1.08		287.0	69.0
2	18.70	0.00	7.92		281.0	69.0
3	18.70	0.00	7.98		286.0	69.0
4	18.60	0.00	6.88		291.0	69.0
5	18.50	0.00	6.62		291.0	69.0
6	18.40	0.00	7.03		291.0	69.0
7	18.40	0.00	7.19		293.0	69.0
8	18.30	0.00	7.00		294.0	69.0
9	18.20	0.00	7.41		294.0	69.0
10	18.10	0.00	7.42		296.0	69.0
11	18.00	0.01	11.04		301.0	68.0
12	17.90	0.04	12.70		308.0	68.0
13	17.70	0.13	14.42		321.0	68.0
14	17.60	0.05	13.45		328.0	68.0
15	17.50	0.01	11.03		332.0	68.0
16	17.30	0.01	11.81		333.0	68.0
17	17.20	0.02	12.16		335.0	68.0
18	17.00	0.02	11.96		338.0	69.0
19	16.90	0.01	11.22		337.0	69.0
20	16.80	0.01	11.00		337.0	68.0
21	16.60	0.01	11.40		337.0	68.0
22	16.50	0.01	12.83		337.0	68.0
23	16.30	0.26	15.19		340.0	68.0
24	16.20	0.65	15.67		347.0	69.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	16.00	0.67	15.12		352.0	69.0
26	15.80	0.33	14.96		353.0	69.0
27	15.70	0.25	15.30		351.0	69.0
28	15.50	0.28	15.43		350.0	69.0
29	15.30	0.28	15.49		350.0	69.0
30	15.20	0.25	15.79		349.0	69.0
31	15.00	0.36	15.82		350.0	69.0
32	14.90	0.38	15.95		348.0	69.0
33	14.70	0.41	15.99		347.0	69.0
34	14.60	0.48	16.10		347.0	69.0
35	14.40	0.68	16.33		346.0	69.0
36	14.30	0.96	17.01		345.0	69.0
37	14.10	1.28	17.15		346.0	69.0
38	13.90	1.34	17.27		346.0	69.0
39	13.80	1.11	17.25		344.0	69.0
40	13.60	0.87	17.00		343.0	69.0
41	13.50	0.77	16.88		341.0	69.0
42	13.30	0.72	16.70		338.0	69.0
43	13.20	0.56	16.67		336.0	69.0
44	13.00	0.53	16.69		336.0	69.0
45	12.90	0.50	16.78		332.0	69.0
46	12.80	0.55	16.86		329.0	69.0
47	12.60	0.60	16.78		327.0	69.0
48	12.50	0.56	16.82		325.0	69.0
49	12.40	0.52	16.45		326	69
50	12.30	0.63	16.12		324	69
51	12.10	0.79	15.73		322	70
52	12.00	0.86	15.62		319	70
53	11.90	0.89	15.62		318	69
54	11.80	0.87	15.5		316	69
55	11.60	0.76	15.42		313	70
56	11.50	0.59	15.37		312	69
57	11.40	0.38	15.16		311	69
58	11.30	0.36	15.19		309	69
59	11.20	0.34	14.99		308	69
60	11.10	0.31	14.92		308	69
61	11.00	0.22	14.93		306	69
62	10.90	0.23	14.98		304	69
63	10.80	0.31	15.08		304	69
64	10.70	0.29	15.24		303	69
65	10.60	0.35	15.21		301	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	10.50	0.35	16.03		302	69
67	10.40	0.17	15.73		301	69
68	10.30	0.11	15.36		301	69
69	10.20	0.06	14.87		298	69
70	10.10	0.04	14.8		296	69
71	10.00	0.03	14.66		295	69
72	10.00	0.02	14.5		295	69
73	9.90	0.02	14.32		294	69
74	9.80	0.02	14.45		294	69
75	9.70	0.03	14.42		293	69
76	9.60	0.04	14.58		294	69
77	9.50	0.07	14.68		294	69
78	9.40	0.1	14.84		294	69
79	9.30	0.15	14.85		294	69
80	9.30	0.19	14.94		293	69
81	9.20	0.24	15.1		295	69
82	9.10	0.22	15.34		296	69
83	9.00	0.37	15.41		295	69
84	8.90	0.44	15.76		296	69
85	8.80	0.53	15.87		297	69
86	8.70	0.65	15.47		299	69
87	8.60	0.69	15.36		299	69
88	8.50	0.68	15.4		299	69
89	8.40	0.69	15.41		298	69
90	8.30	0.69	15.35		299	69
91	8.20	0.77	15.43		301	69
92	8.10	0.79	15.57		301	69
93	7.90	0.81	15.66		305	69
94	7.80	0.84	15.6		305	69
95	7.70	0.91	15.7		306	69
96	7.60	1.07	15.91		305	69
97	7.50	0.97	15.91		306	69
98	7.40	1.01	15.86		305	69
99	7.30	1.03	15.83		304	69
100	7.20	1.02	16.34		306	69
101	7.10	1.13	16.57		307	69
102	7.00	1.15	16.58		308	69
103	6.80	1.21	16.45		307	69
104	6.70	1.2	16.36		306	69
105	6.60	1.2	16.21		304	69
106	6.50	1.2	16.01		300	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	6.40	1.13	15.91		302	69
108	6.30	1.05	15.78		299	69
109	6.20	0.99	15.73		297	69
110	6.10	1.06	15.73		299	69
111	6.00	0.91	15.62		297	69
112	5.90	0.87	15.61		294	69
113	5.90	0.85	15.64		295	69
114	5.80	0.82	15.51		294	69
115	5.70	0.76	15.49		294	69
116	5.60	0.71	15.37		294	69
117	5.50	0.62	15.3		290	69
118	5.40	0.53	15.09		289	69
119	5.40	0.41	14.88		286	68
120	5.30	0.26	14.96		285	69
121	5.20	0.24	14.91		284	68
122	5.10	0.26	14.87		283	69
123	5.10	0.21	14.86		283	69
124	5.00	0.14	14.64		281	69
125	4.90	0.11	14.58		281	69
126	4.90	0.12	14.51		279	69
127	4.80	0.1	14.49		278	69
128	4.70	0.09	14.6		277	69
129	4.60	0.07	14.62		277	68
130	4.60	0.07	14.57		277	68
131	4.50	0.05	14.29		277	68
132	4.50	0.03	14.21		276	68
133	4.40	0.01	14.03		271	68
134	4.40	0.01	13.95		272	68
135	4.30	0.01	14.09		270	68
136	4.20	0.00546	14.52		272	68
137	4.20	0.00517	14.32		270	69
138	4.10	0.00504	14.13		269	68
139	4.10	0.00492	13.93		267	68
140	4.00	0.00482	13.86		267	68
141	4.00	0.00488	13.82		269	68
142	3.90	0.0052	13.71		269	68
143	3.90	0.0054	13.57		268	68
144	3.80	0.01	13.55		266	68
145	3.70	0.01	13.31		265	68
146	3.70	0.01	13.15		264	68
147	3.70	0.01	12.96		264	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	3.60	0.01	12.55		264	68
149	3.60	0.01	12.22		263	68
150	3.50	0.01	12.14		264	69
151	3.50	0.01	12.19		264	69
152	3.50	0.01	12.16		264	68
153	3.40	0.01	12.18		267	68
154	3.40	0.01	12.26		267	68
155	3.30	0.01	12.31		267	69
156	3.30	0.01	12.38		269	70
157	3.20	0.01	12.46		270	69
158	3.20	0.01	12.51		275	69
159	3.10	0.01	12.55		277	70
160	3.10	0.01	12.62		278	69
161	3.00	0.01	12.75		278	69
162	2.90	0.01	12.96		280	69
163	2.90	0.01	13.19		282	69
164	2.80	0.01	13.62		283	69
165	2.80	0.01	13.52		284	69
166	2.70	0.01	13.51		284	69
167	2.70	0.01	13.92		286	69
168	2.60	0.01	13.74		289	69
169	2.60	0.01	13.46		290	69
170	2.50	0.01	13.07		287	69
171	2.40	0.01	12.79		287	70
172	2.40	0.00455	13.02		285	70
173	2.40	0.00508	12.66		283	70
174	2.30	0.0053	12.52		283	70
175	2.30	0.01	12.4		280	70
176	2.20	0.01	12.36		280	70
177	2.20	0.01	12.29		277	70
178	2.10	0.01	12.33		277	70
179	2.10	0.01	12.39		276	70
180	2.00	0.00511	12.4		275	70
181	2.00	0.00488	12.36		272	70
182	2.00	0.00462	12.36		271	70
183	1.90	0.00437	12.09		271	70
184	1.90	0.00433	12.2		271	70
185	1.80	0.00443	12.24		268	70
186	1.80	0.00449	12.21		269	70
187	1.80	0.0044	12.25		269	70
188	1.70	0.0042	12.23		271	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	1.70	0.00423	12.23		267	70
190	1.60	0.00423	11.64		268	70
191	1.60	0.00485	11.52		268	70
192	1.60	0.00482	11.45		268	70
193	1.50	0.00504	11.38		267	70
194	1.50	0.00504	11.36		266	70
195	1.50	0.00478	11.32		267	70
196	1.40	0.00478	11.36		267	70
197	1.40	0.00479	11.28		266	70
198	1.30	0.00482	11.33		268	70
199	1.30	0.00482	11.33		267	70
200	1.30	0.00478	11.26		266	70
201	1.20	0.00475	11.31		267	71
202	1.20	0.00478	11.31		267	70
203	1.20	0.00478	11.09		265	70
204	1.10	0.00475	11.03		267	70
205	1.10	0.00482	11.02		267	71
206	1.00	0.00485	10.97		267	71
207	1.00	0.00485	10.99		267	70
208	1.00	0.00485	11.07		267	71
209	0.90	0.00492	11.06		267	71
210	0.90	0.00504	11.03		266	71
211	0.90	0.00469	10.95		266	71
212	0.80	0.00462	10.83		267	71
213	0.80	0.00462	10.84		268	71
214	0.80	0.00459	10.83		268	71
215	0.70	0.00459	10.7		267	71
216	0.70	0.00472	10.71		268	71
217	0.70	0.00479	10.79		266	71
218	0.60	0.00475	10.72		265	71
219	0.60	0.00475	10.85		266	71
220	0.60	0.00479	10.96		267	71
221	0.50	0.00478	10.91		268	71
222	0.50	0.00465	10.61		268	71
223	0.40	0.00492	9.84		267	71
224	0.40	0.00511	9.84		266	71
225	0.40	0.00492	9.63		268	71
226	0.40	0.00489	9.57		268	71
227	0.40	0.00479	9.59		266	71
228	0.30	0.00482	9.66		265	71
229	0.30	0.00547	10.1		265	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	0.30	0.00534	10.03		264	71
231	0.20	0.00524	10.01		264	71
232	0.20	0.00524	9.98		266	71
233	0.20	0.0054	9.88		266	71
234	0.10	0.00524	9.96		265	71
235	0.10	0.0053	10.02		264	71
236	0.00	0.00527	10.05		264	71

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : Ashford 30.2
Tracking No. : BK30.2
Project No. : 0142WS021E
Test Date : 3/6/2024
Run No. : 4

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.874** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 20.118 lb.
Minimum Fuel Weight : 18.11 lb.
Maximum Fuel Weight : 22.13 lb.

Fuel Piece Data

PC #	Weight, lb	Size	Length, In	Moisture Readings, Dry Basis %			Average MC, % db	Dry Weight, lb.	Volume, ft3	Wet Weights, lb 4 x 4	Wet Weights, lb 2 x 4	Dry Weights, lb 4 x 4	Dry Weights, lb 2 x 4
1	1.90	2x4	16.75	20.8	24.4	24.2	23.1	1.54	0.0509		1.9		1.54
2	1.90	2x4	16.75	21.3	24.7	24.6	23.5	1.54	0.0509		1.9		1.54
3	1.80	2x4	16.75	19.3	22.5	23.0	21.6	1.48	0.0509		1.8		1.48
4	1.80	2x4	16.75	22.3	22.8	18.9	21.3	1.48	0.0509		1.8		1.48
5	4.20	4x4	16.75	19.6	22.3	20.0	20.6	3.48	0.1187	4.2		3.48	
6	4.20	4x4	16.75	21.9	21.7	23.8	22.5	3.43	0.1187	4.2		3.43	
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
18.1	24.2	18.0	12.7	23.3	25.8	20.3	19.7	16.6
20.1	12.5	23.1	15.1	23.8	19.2	12.0	18.7	15.0
18.8	19.4	23.8	14.3	25.0	10.6			

Avg : 18.8

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.40	2x4		2.4000
2	2.50	2x4		2.5000
3	2.40	2x4		2.4000
4	2.40	2x4		2.4000
5	4.70	4x4	4.70	
6	4.70	4x4	4.70	
7				
8				
9				

Combined Mass of 4 x 4s 9.4 lb
Combined Mass of 2 x 4s 9.7 lb

Total Wet Mass of Fuel Load **19.1** lb

Fuel Load Properties

Type	*Number of Pieces*	*Wet Weight, lb.*	*Dry Weight, lb.*	*Fuel Loading Density, lb/ft³* Wet Basis	*Fuel Loading Density, lb/ft³* Dry Basis	Dry Fuel Density, lb/ft³	Wet Fuel Density, lb/ft³	*Moisture, %* Dry Basis	*Moisture, %* Wet Basis
2 x 4	4	7.4	6.04	6.65	5.47	29.38	35.82	21.39	17.62
4 x 4	2	8.4	6.91						
Spacers	24	3.3	2.78						
Totals		19.1	15.73						

Compliance Checks

	Fuel Load, Wet Lb.	Load Density, lb/ft³ of FB vol	Fuel Density, lb/ft³	% of Fuel load mass which is 2x4	Fuel Load Peices Mositure, % db
Measured	19.1	6.65	29.38	51	22.1
Required	18.1 - 22.1	6.3 - 7.7	25 - 36	35 - 65	19 -25
Complies ?	Yes	Yes	Yes	Yes	Yes

Dilution Tunnel Velocity Traverse and Supplementary Data

ASTM E2515-11

Run:	4	Tracking No.:	BK30.2
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WS021E
Model:	Ashford 30.2	Test Date:	3/6/2024

Dillution Tunnel Velocity Traverse

Pitot Location

Traverse Point	*% of Diameter*	*Inches into Tunnel*	*dP in. H_2O*	*Tunnel Temp, °F*	*$dP^{1/2}$*
X1	6.7	0.5 *	0.096	80	0.310
X2	25.0	0.00	0.130	80	0.361
X3	75.0	0.00	0.132	80	0.363
X4	93.3	-0.5 *	0.082	80	0.286
Y1	6.7	0.5 *	0.080	80	0.283
Y2	25.0	0.00	0.128	80	0.358
Y3	75.0	0.00	0.130	80	0.361
Y4	93.3	-0.5 *	0.092	80	0.303
Center	50.0	0.00	0.154	80	0.392

Tunnel Static Pressure	-0.500	*in. H_2O*
Tunnel Moisture	2.00	%
Tunnel Diameter	6.00	inches
Pitot Tube C_p	0.99	inches
Tunnel Molecular Weight	29	(dry)
Tunnel Molecular Weight	28.78	(M_S, wet)
Tunnel Area	0.19634954	*ft^2*
K_p	85.49	constant
$P_s=P_{bar}$+Tunnel Static	30.0532353	in HG

** Probe location must be no closer than 0.50 in to tunnel wall*

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 21.9392$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 26.2432$$

$$F_P = V_{strav} / V_{scent} = 0.836$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 18.341\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	17:45	21:40
Barometric Pressure, in. Hg	30.09	30.11
Room Air Velocity, fpm	35	12
Room Air Temperature, °F	69	69
Room Relative Humidity, %	29.0	29.0
Platform Scale Audit, lb.	20.0	20.0

Leak Checks

Pitot and associated tubing, (pass/fail)[1]	Pass	Pass

See sampling box worksheets for sampling boxes

Dillution Tunnel

Date last cleaned	3/5/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.500	-0.500

1 Both sides (independantly) of the pitot system are brought under a minimum vacuum of 3 in. H_2O and then sealed. Any indiction of pressure loss is deemed a fail.

2 Create a smoking condition during start of pre-burn activites and using adequate lighting pointed upward and aroud tunnel hood, visually observe if 100% of visible smoke is being captured by the hood. If not, increase flow tunnel flow and / or re-assess chimney proximity to draft hood as required and repeat until 100% capture is observed.

3 With the appliance installed and the dillution tunnel flow turned-off, observe the flue draft gauge while turning the dulution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducemnt is occuring. Determine the cause (i.e. flue chimnet too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 4

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E
Test Date: 3/6/24
Beginning Clock Time: 16:45

Coal Bed Range (lb):	3.8 (min)	4.8 (max)

Preburn Fuel Data

10 pieces @ 16.75 inches
____ pieces @ ____ inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

22.5	23.8	22.5	22.6	19.9	23.2	19.9
22.2	19.7	19.3				

Avg Preburn Moisture (% DB): **21.56**

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
0	7.2	-0.084	773	507	342	212	603	1060	487	385	72
1	7.1	-0.079	768	507	345	225	601	1044	489	351	72
2	7	-0.077	764	507	348	223	596	1046	488	329	72
3	6.9	-0.077	761	507	349	224	589	1040	486	311	72
4	6.8	-0.076	758	508	349	225	583	1037	485	300	72
5	6.7	-0.076	755	508	349	228	575	1049	483	292	72
6	6.6	-0.076	755	508	349	224	566	1060	480	285	72
7	6.6	-0.074	754	507	348	226	559	1063	479	280	72
8	6.5	-0.074	752	507	347	226	552	1056	477	278	72
9	6.4	-0.072	748	506	347	223	544	1047	474	273	72
10	6.3	-0.072	745	505	345	221	536	1048	470	269	72
11	6.3	-0.071	744	504	344	220	528	1060	468	267	72
12	6.2	-0.069	742	503	343	222	522	1062	466	263	72
13	6.1	-0.071	739	501	342	218	515	1058	463	262	72
14	6.1	-0.07	736	500	340	221	509	1054	461	261	72
15	6	-0.071	733	499	339	217	503	1049	458	258	72
16	6	-0.069	730	498	337	218	498	1047	456	258	72
17	5.9	-0.071	726	497	336	222	492	1047	455	257	72
18	5.9	-0.068	723	496	335	219	487	1045	452	256	72
19	5.8	-0.069	720	495	333	221	483	1043	450	256	71
20	5.7	-0.069	716	494	332	216	478	1036	447	256	71
21	5.7	-0.07	712	493	331	214	473	1027	445	255	71
22	5.7	-0.069	707	493	329	214	469	1011	442	255	71
23	5.6	-0.069	701	492	327	215	465	998	440	255	71
24	5.5	-0.069	696	491	325	212	461	991	437	255	71
25	5.5	-0.069	690	490	323	212	458	983	435	257	71
26	5.5	-0.068	685	490	321	219	455	975	434	255	71
27	5.4	-0.069	679	489	319	215	451	967	431	254	71
28	5.4	-0.069	674	488	317	213	448	960	428	255	71
29	5.3	-0.068	668	488	315	213	445	955	426	255	71
30	5.3	-0.069	663	488	312	210	442	952	423	257	71
31	5.3	-0.068	658	488	310	205	440	939	420	256	70
32	5.2	-0.069	653	488	308	209	437	929	419	259	70
33	5.2	-0.07	647	488	306	205	434	912	416	259	70
34	5.2	-0.069	640	487	304	207	432	892	414	258	70
35	5.1	-0.069	634	487	302	201	430	887	411	257	70
36	5.1	-0.068	628	487	300	204	427	886	409	257	70
37	5.1	-0.069	623	486	297	206	425	884	407	259	70
38	5	-0.069	619	486	295	204	423	884	405	260	70
39	5	-0.069	615	486	293	202	422	883	404	260	70
40	5	-0.069	611	485	292	200	420	885	402	261	70
41	4.9	-0.069	608	485	290	201	419	887	401	262	70
42	4.9	-0.069	605	485	289	199	417	886	399	263	70

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
43	4.9	-0.069	602	484	288	200	416	882	398	263	70
44	4.8	-0.069	599	484	287	198	415	877	397	262	70
45	4.8	-0.069	597	484	286	193	413	873	395	263	70
46	4.8	-0.07	594	484	285	195	412	869	394	264	70
47	4.7	-0.068	590	484	284	193	411	863	392	266	70
48	4.7	-0.069	587	484	283	193	411	860	392	270	70
49	4.7	-0.07	585	484	283	194	410	858	391	269	70
50	4.6	-0.069	582	484	282	191	410	855	390	268	70
51	4.6	-0.069	580	485	282	193	410	852	390	268	70
52	4.6	-0.069	577	486	282	192	410	849	389	268	69
53	4.6	-0.069	574	486	281	191	409	846	388	267	69
54	4.5	-0.069	572	487	281	192	409	842	388	268	69
55	4.5	-0.069	569	488	281	188	408	838	387	267	70
56	4.5	-0.069	567	489	281	190	408	835	387	268	69
57	4.4	-0.069	564	490	281	192	408	833	387	268	70
58	4.4	-0.069	562	491	281	187	408	832	386	268	69
59	4.4	-0.069	560	492	281	188	409	828	386	269	69
60	4.3	-0.068	558	493	282	188	410	824	386	267	69
	NOTE: 0.2 lb. was added after logging began due to the addition of the flue gas probe.										
	Actual final coal bed weight = 4.1 lb.										

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Test Length: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.25	in. Hg
Post-Test	0	cfm @	6.14	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
Tot / Avg		6.1	**32.914**	**0.139**	**0.94**	**76.7**	**1.58**	**68.46**	**47.83**	**69.28**	**100.0**	**83.1**	**0.155**	**0.394**	**22.10**
Minimum	0.0	-12.8	0.000	0.128	0.77	72	1.54	66	44	68	96.0	78	0.152	0.390	21.92
Max	18.9	0.2	32.914	0.141	0.97	80	1.59	71	51	71	102.6	122	0.159	0.399	22.91
0	6.1		0.000		0.77	72	1.55	66	51	69		121	0.153	0.391	22.91
1	18.9	-12.8	0.128	0.128	0.97	72	1.59	68	45	69	96.0	122	0.154	0.392	22.73
2	18.7	0.2	0.267	0.139	0.94	72	1.57	68	44	69	102.6	92	0.155	0.394	22.51
3	18.7	0.0	0.405	0.138	0.94	72	1.57	68	44	69	99.5	87	0.159	0.399	22.34
4	18.6	0.1	0.544	0.139	0.94	72	1.56	68	44	69	100.1	85	0.156	0.395	22.31
5	18.5	0.1	0.681	0.137	0.94	72	1.56	68	44	69	98.9	84	0.154	0.392	22.10
6	18.4	0.1	0.819	0.138	0.93	72	1.56	68	44	69	100.0	84	0.157	0.396	22.12
7	18.4	0.0	0.956	0.137	0.93	72	1.55	68	44	69	98.9	83	0.157	0.396	22.22
8	18.3	0.1	1.092	0.136	0.93	72	1.54	68	44	69	97.9	83	0.157	0.396	22.21
9	18.2	0.1	1.229	0.137	0.92	72	1.54	68	44	69	98.5	83	0.158	0.397	22.24
10	18.1	0.1	1.367	0.138	0.92	72	1.54	68	44	69	99.1	82	0.157	0.396	22.23
11	18.0	0.1	1.505	0.138	0.92	72	1.55	68	44	68	99.2	83	0.157	0.396	22.20
12	17.9	0.1	1.642	0.137	0.97	72	1.59	68	44	68	98.8	85	0.157	0.396	22.23
13	17.7	0.2	1.780	0.138	0.94	72	1.57	68	44	68	99.7	85	0.155	0.394	22.18
14	17.6	0.1	1.918	0.138	0.94	72	1.56	68	44	68	100.0	85	0.155	0.394	22.11
15	17.5	0.1	2.056	0.138	0.95	72	1.57	68	44	68	100.1	85	0.156	0.395	22.14
16	17.3	0.2	2.196	0.140	0.95	72	1.57	69	44	68	101.5	86	0.155	0.394	22.15
17	17.2	0.1	2.335	0.139	0.95	72	1.57	69	44	68	100.9	86	0.155	0.394	22.13
18	17.0	0.2	2.474	0.139	0.95	73	1.57	69	44	69	100.7	86	0.157	0.396	22.20
19	16.9	0.1	2.613	0.139	0.94	73	1.57	69	45	69	100.5	86	0.155	0.394	22.20
20	16.8	0.1	2.751	0.138	0.95	73	1.57	69	45	68	100.1	86	0.153	0.391	22.06
21	16.6	0.2	2.890	0.139	0.95	73	1.57	69	45	68	101.1	86	0.155	0.394	22.06
22	16.5	0.1	3.029	0.139	0.95	73	1.57	69	45	68	101.1	87	0.154	0.392	22.10
23	16.3	0.2	3.168	0.139	0.94	73	1.56	69	45	68	100.8	87	0.158	0.397	22.22
24	16.2	0.1	3.306	0.138	0.95	73	1.57	69	45	69	99.7	88	0.157	0.396	22.34
25	16.0	0.2	3.446	0.140	0.95	73	1.57	69	45	69	101.1	88	0.156	0.395	22.28
26	15.8	0.2	3.585	0.139	0.95	73	1.57	69	45	69	100.6	88	0.155	0.394	22.20
27	15.7	0.1	3.724	0.139	0.95	74	1.57	69	45	69	100.8	88	0.155	0.394	22.17
28	15.5	0.2	3.862	0.138	0.94	74	1.57	69	45	69	100.1	88	0.155	0.394	22.17
29	15.3	0.2	4.001	0.139	0.94	74	1.57	69	46	69	100.8	88	0.155	0.394	22.17
30	15.2	0.1	4.140	0.139	0.95	74	1.57	69	46	69	100.8	88	0.155	0.394	22.17
31	15.0	0.2	4.278	0.138	0.95	74	1.58	69	46	69	100.2	88	0.153	0.391	22.10
32	14.9	0.1	4.417	0.139	0.94	74	1.57	69	46	69	101.2	88	0.154	0.392	22.06
33	14.7	0.2	4.556	0.139	0.94	74	1.58	69	46	69	101.0	87	0.155	0.394	22.12
34	14.6	0.1	4.696	0.140	0.94	74	1.58	69	46	69	101.5	88	0.155	0.394	22.16
35	14.4	0.2	4.835	0.139	0.94	74	1.58	69	46	69	100.8	88	0.155	0.394	22.17
36	14.3	0.1	4.974	0.139	0.95	75	1.58	69	46	69	100.8	88	0.154	0.392	22.13
37	14.1	0.2	5.112	0.138	0.94	75	1.59	69	46	69	100.0	88	0.155	0.394	22.13
38	13.9	0.2	5.251	0.139	0.94	75	1.59	69	47	69	100.6	87	0.155	0.394	22.16
39	13.8	0.1	5.390	0.139	0.94	75	1.59	69	47	69	100.3	87	0.157	0.396	22.22
40	13.6	0.2	5.529	0.139	0.95	75	1.59	69	47	69	100.0	87	0.157	0.396	22.29

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Test Length: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.25	in. Hg
Post-Test	0	cfm @	6.14	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
41	13.5	0.1	5.668	0.139	0.95	75	1.59	69	47	69	100.0	86	0.155	0.394	22.21
42	13.3	0.2	5.807	0.139	0.94	75	1.59	69	47	69	100.3	86	0.154	0.392	22.09
43	13.2	0.1	5.947	0.140	0.94	75	1.59	69	47	69	101.3	86	0.155	0.394	22.09
44	13.0	0.2	6.086	0.139	0.94	75	1.59	69	47	69	100.5	86	0.155	0.394	22.13
45	12.9	0.1	6.225	0.139	0.94	75	1.59	69	47	69	100.3	86	0.156	0.395	22.16
46	12.8	0.1	6.364	0.139	0.94	76	1.58	69	47	69	100.0	85	0.156	0.395	22.19
47	12.6	0.2	6.503	0.139	0.94	76	1.59	69	47	69	99.6	85	0.158	0.397	22.25
48	12.5	0.1	6.642	0.139	0.95	76	1.59	69	47	69	99.4	85	0.157	0.396	22.29
49	12.4	0.1	6.781	0.139	0.94	76	1.59	69	47	69	99.6	85	0.155	0.394	22.18
50	12.3	0.1	6.920	0.139	0.95	76	1.58	69	47	69	99.9	84	0.155	0.394	22.10
51	12.1	0.2	7.059	0.139	0.94	76	1.59	69	48	70	99.9	84	0.156	0.395	22.12
52	12.0	0.1	7.198	0.139	0.95	76	1.59	69	48	70	99.8	84	0.156	0.395	22.16
53	11.9	0.1	7.338	0.140	0.94	76	1.58	69	48	69	100.5	84	0.155	0.394	22.12
54	11.8	0.1	7.478	0.140	0.94	76	1.58	69	48	69	100.6	84	0.156	0.395	22.12
55	11.6	0.2	7.617	0.139	0.94	76	1.59	69	48	70	99.9	84	0.155	0.394	22.12
56	11.5	0.1	7.756	0.139	0.94	76	1.58	69	48	69	99.9	84	0.156	0.395	22.12
57	11.4	0.1	7.895	0.139	0.94	76	1.58	69	48	69	99.8	83	0.155	0.394	22.11
58	11.3	0.1	8.034	0.139	0.94	76	1.58	69	48	69	99.8	83	0.156	0.395	22.10
59	11.2	0.1	8.173	0.139	0.94	76	1.59	69	48	69	99.6	83	0.157	0.396	22.17
60	11.1	0.1	8.312	0.139	0.95	76	1.59	68	48	69	99.5	83	0.155	0.394	22.14
61	11.0	0.1	8.452	0.140	0.95	76	1.59	68	48	69	100.3	83	0.157	0.396	22.14
62	10.9	0.1	8.591	0.139	0.94	76	1.59	68	48	69	99.5	83	0.156	0.395	22.17
63	10.8	0.1	8.731	0.140	0.95	77	1.59	68	48	69	100.3	83	0.155	0.394	22.10
64	10.7	0.1	8.871	0.140	0.94	77	1.58	68	48	69	100.3	83	0.156	0.395	22.10
65	10.6	0.1	9.011	0.140	0.94	77	1.59	68	48	69	100.4	82	0.153	0.391	22.02
66	10.5	0.1	9.150	0.139	0.95	77	1.58	68	48	69	99.9	82	0.155	0.394	21.98
67	10.4	0.1	9.289	0.139	0.94	77	1.58	68	48	69	99.8	82	0.155	0.394	22.05
68	10.3	0.1	9.428	0.139	0.94	77	1.59	68	48	69	99.8	82	0.153	0.391	21.98
69	10.2	0.1	9.568	0.140	0.95	77	1.59	68	48	69	100.7	82	0.155	0.394	21.98
70	10.1	0.1	9.707	0.139	0.94	77	1.58	68	48	69	99.6	81	0.157	0.396	22.11
71	10.0	0.1	9.846	0.139	0.95	77	1.58	68	48	69	99.2	81	0.155	0.394	22.10
72	10.0	0.0	9.986	0.140	0.95	77	1.58	68	48	69	100.1	81	0.156	0.395	22.06
73	9.9	0.1	10.125	0.139	0.94	77	1.58	68	48	69	99.4	81	0.155	0.394	22.06
74	9.8	0.1	10.265	0.140	0.95	77	1.59	68	48	69	100.1	81	0.157	0.396	22.10
75	9.7	0.1	10.405	0.140	0.95	77	1.58	68	48	69	100.0	81	0.155	0.394	22.10
76	9.6	0.1	10.545	0.140	0.94	77	1.58	68	48	69	100.1	81	0.156	0.395	22.06
77	9.5	0.1	10.685	0.140	0.94	77	1.58	68	48	69	100.0	81	0.157	0.396	22.13
78	9.4	0.1	10.824	0.139	0.95	77	1.58	68	48	69	99.2	82	0.156	0.395	22.14
79	9.3	0.1	10.964	0.140	0.94	77	1.58	68	48	69	99.9	81	0.157	0.396	22.14
80	9.3	0.0	11.103	0.139	0.94	77	1.58	68	48	69	99.1	81	0.156	0.395	22.13
81	9.2	0.1	11.242	0.139	0.95	77	1.59	68	48	69	99.3	81	0.155	0.394	22.06
82	9.1	0.1	11.382	0.140	0.94	77	1.58	68	48	69	100.1	81	0.156	0.395	22.06
83	9.0	0.1	11.521	0.139	0.95	77	1.59	68	48	69	99.5	82	0.155	0.394	22.07
84	8.9	0.1	11.661	0.140	0.95	77	1.59	68	48	69	100.2	81	0.156	0.395	22.07

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Test Length: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.25	in. Hg
Post-Test	0	cfm @	6.14	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
85	8.8	0.1	11.801	0.140	0.94	77	1.58	68	48	69	100.0	81	0.156	0.395	22.10
86	8.7	0.1	11.940	0.139	0.94	77	1.59	68	49	69	99.4	82	0.155	0.394	22.07
87	8.6	0.1	12.080	0.140	0.95	77	1.59	68	49	69	100.2	82	0.156	0.395	22.08
88	8.5	0.1	12.220	0.140	0.94	77	1.58	68	49	69	100.2	82	0.155	0.394	22.08
89	8.4	0.1	12.360	0.140	0.94	77	1.58	68	49	69	100.2	82	0.156	0.395	22.08
90	8.3	0.1	12.499	0.139	0.95	77	1.59	68	49	69	99.3	82	0.157	0.396	22.15
91	8.2	0.1	12.639	0.140	0.94	77	1.58	68	49	69	100.1	81	0.153	0.391	22.04
92	8.1	0.1	12.779	0.140	0.94	77	1.59	68	49	69	100.4	81	0.155	0.394	21.96
93	7.9	0.2	12.918	0.139	0.94	77	1.59	68	49	69	99.7	81	0.156	0.395	22.06
94	7.8	0.1	13.058	0.140	0.94	77	1.58	68	49	69	100.1	81	0.156	0.395	22.10
95	7.7	0.1	13.197	0.139	0.95	77	1.58	68	49	69	99.3	81	0.156	0.395	22.10
96	7.6	0.1	13.337	0.140	0.94	77	1.59	68	49	69	100.1	82	0.155	0.394	22.07
97	7.5	0.1	13.476	0.139	0.94	77	1.58	68	49	69	99.6	82	0.155	0.394	22.05
98	7.4	0.1	13.616	0.140	0.95	77	1.59	68	49	69	100.5	82	0.154	0.392	22.01
99	7.3	0.1	13.756	0.140	0.95	77	1.58	68	49	69	100.4	82	0.157	0.396	22.08
100	7.2	0.1	13.896	0.140	0.95	77	1.58	68	49	69	100.0	82	0.157	0.396	22.19
101	7.1	0.1	14.036	0.140	0.95	77	1.59	68	49	69	99.8	81	0.156	0.395	22.14
102	7.0	0.1	14.176	0.140	0.95	77	1.59	68	49	69	100.2	82	0.153	0.391	22.00
103	6.8	0.2	14.315	0.139	0.95	77	1.58	68	49	69	99.8	82	0.157	0.396	22.05
104	6.7	0.1	14.455	0.140	0.94	77	1.58	68	49	69	100.1	82	0.157	0.396	22.19
105	6.6	0.1	14.595	0.140	0.94	77	1.59	67	49	69	99.8	81	0.156	0.395	22.14
106	6.5	0.1	14.734	0.139	0.94	77	1.58	67	49	69	99.2	81	0.155	0.394	22.06
107	6.4	0.1	14.874	0.140	0.94	77	1.58	67	49	69	100.2	81	0.155	0.394	22.03
108	6.3	0.1	15.014	0.140	0.95	77	1.58	67	49	69	100.2	81	0.156	0.395	22.06
109	6.2	0.1	15.153	0.139	0.95	77	1.58	67	49	69	99.3	81	0.156	0.395	22.10
110	6.1	0.1	15.293	0.140	0.95	77	1.58	67	49	69	100.0	81	0.156	0.395	22.10
111	6.0	0.1	15.433	0.140	0.95	77	1.58	67	49	69	99.9	81	0.157	0.396	22.13
112	5.9	0.1	15.573	0.140	0.94	77	1.59	67	49	69	99.8	81	0.156	0.395	22.13
113	5.9	0.0	15.713	0.140	0.95	77	1.58	67	49	69	99.7	81	0.158	0.397	22.17
114	5.8	0.1	15.853	0.140	0.94	77	1.59	67	49	69	99.6	81	0.157	0.396	22.20
115	5.7	0.1	15.993	0.140	0.95	77	1.58	67	49	69	99.7	81	0.156	0.395	22.13
116	5.6	0.1	16.133	0.140	0.95	77	1.58	67	49	69	99.7	80	0.157	0.396	22.12
117	5.5	0.1	16.273	0.140	0.95	77	1.58	67	49	69	99.9	80	0.154	0.392	22.04
118	5.4	0.1	16.413	0.140	0.95	77	1.58	67	49	69	100.0	80	0.157	0.396	22.04
119	5.4	0.0	16.552	0.139	0.94	77	1.58	67	49	68	99.3	80	0.154	0.392	22.04
120	5.3	0.1	16.692	0.140	0.95	77	1.58	67	49	69	100.2	80	0.155	0.394	21.97
121	5.2	0.1	16.832	0.140	0.95	77	1.58	67	49	68	100.3	80	0.155	0.394	22.01
122	5.1	0.1	16.972	0.140	0.95	77	1.58	67	49	69	100.2	80	0.155	0.394	22.01
123	5.1	0.0	17.111	0.139	0.95	77	1.58	67	49	69	99.4	80	0.156	0.395	22.04
124	5.0	0.1	17.251	0.140	0.95	77	1.58	67	49	69	99.9	79	0.156	0.395	22.07
125	4.9	0.1	17.391	0.140	0.95	77	1.58	67	49	69	99.8	79	0.155	0.394	22.02
126	4.9	0.0	17.531	0.140	0.95	77	1.58	67	49	69	99.7	79	0.159	0.399	22.13
127	4.8	0.1	17.671	0.140	0.95	77	1.58	67	49	69	99.5	80	0.155	0.394	22.14
128	4.7	0.1	17.812	0.141	0.95	77	1.58	67	49	69	100.5	79	0.156	0.395	22.03

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Test Length: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.25 in. Hg
Post-Test 0 cfm @ 6.14 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
129	4.6	0.1	17.952	0.140	0.94	77	1.58	67	49	68	99.8	79	0.156	0.395	22.06
130	4.6	0.0	18.092	0.140	0.95	77	1.58	67	49	68	99.8	79	0.156	0.395	22.06
131	4.5	0.1	18.231	0.139	0.95	77	1.58	67	49	68	99.0	79	0.157	0.396	22.09
132	4.5	0.0	18.371	0.140	0.95	77	1.58	67	49	68	99.5	79	0.158	0.397	22.16
133	4.4	0.1	18.511	0.140	0.94	77	1.58	67	49	68	99.5	79	0.155	0.394	22.09
134	4.4	0.0	18.651	0.140	0.95	77	1.58	67	49	68	99.7	79	0.157	0.396	22.06
135	4.3	0.1	18.790	0.139	0.95	77	1.58	67	49	68	98.8	78	0.157	0.396	22.12
136	4.2	0.1	18.931	0.141	0.94	77	1.58	67	49	68	100.2	79	0.156	0.395	22.08
137	4.2	0.0	19.070	0.139	0.95	77	1.58	67	49	69	99.0	79	0.156	0.395	22.06
138	4.1	0.1	19.210	0.140	0.95	77	1.58	67	49	68	99.7	78	0.156	0.395	22.05
139	4.1	0.0	19.350	0.140	0.95	77	1.58	67	49	68	99.6	78	0.157	0.396	22.07
140	4.0	0.1	19.490	0.140	0.95	77	1.58	67	49	68	99.5	78	0.156	0.395	22.07
141	4.0	0.0	19.630	0.140	0.95	77	1.58	67	49	68	99.6	78	0.156	0.395	22.04
142	3.9	0.1	19.770	0.140	0.95	77	1.58	67	49	68	99.7	78	0.156	0.395	22.04
143	3.9	0.0	19.910	0.140	0.95	77	1.57	67	49	68	99.6	78	0.157	0.396	22.07
144	3.8	0.1	20.050	0.140	0.94	77	1.58	67	49	68	99.5	78	0.156	0.395	22.07
145	3.7	0.1	20.190	0.140	0.95	77	1.58	67	49	68	99.6	78	0.156	0.395	22.04
146	3.7	0.0	20.330	0.140	0.95	77	1.58	67	49	68	99.9	78	0.154	0.392	21.97
147	3.7	0.0	20.470	0.140	0.94	77	1.58	67	49	68	100.1	78	0.155	0.394	21.93
148	3.6	0.1	20.610	0.140	0.94	77	1.58	67	49	68	99.9	78	0.157	0.396	22.04
149	3.6	0.0	20.749	0.139	0.95	77	1.58	67	49	68	98.8	78	0.157	0.396	22.11
150	3.5	0.1	20.889	0.140	0.95	77	1.58	67	49	69	99.5	78	0.156	0.395	22.07
151	3.5	0.0	21.029	0.140	0.95	77	1.58	67	49	69	99.5	78	0.158	0.397	22.11
152	3.5	0.0	21.169	0.140	0.95	77	1.58	67	49	68	99.5	78	0.155	0.394	22.07
153	3.4	0.1	21.309	0.140	0.95	77	1.58	67	49	68	99.8	78	0.155	0.394	21.97
154	3.4	0.0	21.449	0.140	0.95	77	1.58	67	49	68	99.9	79	0.157	0.396	22.05
155	3.3	0.1	21.589	0.140	0.95	77	1.58	67	49	69	99.7	79	0.157	0.396	22.13
156	3.3	0.0	21.729	0.140	0.95	77	1.58	67	49	70	99.5	80	0.158	0.397	22.17
157	3.2	0.1	21.869	0.140	0.95	77	1.58	67	49	69	99.4	80	0.157	0.396	22.18
158	3.2	0.0	22.010	0.141	0.95	77	1.58	67	49	69	100.2	81	0.158	0.397	22.19
159	3.1	0.1	22.149	0.139	0.95	77	1.58	67	49	70	99.0	81	0.155	0.394	22.13
160	3.1	0.0	22.289	0.140	0.95	77	1.58	67	49	69	100.1	82	0.155	0.394	22.04
161	3.0	0.1	22.429	0.140	0.95	77	1.58	67	49	69	100.4	82	0.155	0.394	22.05
162	2.9	0.1	22.569	0.140	0.94	77	1.58	67	49	69	100.1	82	0.158	0.397	22.15
163	2.9	0.0	22.708	0.139	0.95	77	1.58	67	49	69	99.1	82	0.156	0.395	22.19
164	2.8	0.1	22.848	0.140	0.95	77	1.59	68	49	69	99.9	83	0.157	0.396	22.16
165	2.8	0.0	22.988	0.140	0.94	77	1.58	68	49	69	100.0	83	0.156	0.395	22.17
166	2.7	0.1	23.127	0.139	0.95	77	1.58	68	49	69	99.5	83	0.154	0.392	22.07
167	2.7	0.0	23.267	0.140	0.95	77	1.58	68	49	69	100.5	83	0.156	0.395	22.07
168	2.6	0.1	23.407	0.140	0.94	77	1.58	68	49	69	100.4	83	0.155	0.394	22.10
169	2.6	0.0	23.546	0.139	0.94	77	1.58	68	49	69	99.7	83	0.155	0.394	22.07
170	2.5	0.1	23.686	0.140	0.94	78	1.58	68	49	69	100.4	83	0.155	0.394	22.07
171	2.4	0.1	23.827	0.141	0.95	78	1.58	68	48	70	101.0	83	0.155	0.394	22.07
172	2.4	0.0	23.966	0.139	0.94	78	1.58	68	49	70	99.5	83	0.156	0.395	22.10

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Test Length: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.25 in. Hg
Post-Test 0 cfm @ 6.14 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
173	2.4	0.0	24.106	0.140	0.95	78	1.59	68	49	70	100.1	83	0.155	0.394	22.10
174	2.3	0.1	24.246	0.140	0.94	78	1.58	68	48	70	100.4	83	0.153	0.391	22.00
175	2.3	0.0	24.385	0.139	0.94	78	1.58	69	48	70	99.9	83	0.155	0.394	22.00
176	2.2	0.1	24.525	0.140	0.94	78	1.58	69	48	70	100.5	83	0.154	0.392	22.03
177	2.2	0.0	24.664	0.139	0.94	78	1.58	69	49	70	99.7	83	0.156	0.395	22.07
178	2.1	0.1	24.804	0.140	0.94	78	1.58	69	49	70	100.3	83	0.154	0.392	22.07
179	2.1	0.0	24.944	0.140	0.95	78	1.58	69	48	70	100.4	83	0.155	0.394	22.03
180	2.0	0.1	25.083	0.139	0.94	78	1.58	69	48	70	99.8	83	0.153	0.391	22.00
181	2.0	0.0	25.223	0.140	0.94	78	1.58	69	48	70	100.8	83	0.153	0.391	21.92
182	2.0	0.0	25.363	0.140	0.94	78	1.58	69	48	70	100.9	83	0.154	0.392	21.96
183	1.9	0.1	25.503	0.140	0.95	78	1.58	69	48	70	100.7	83	0.154	0.392	22.00
184	1.9	0.0	25.643	0.140	0.94	78	1.58	69	48	70	100.5	83	0.155	0.394	22.03
185	1.8	0.1	25.783	0.140	0.94	78	1.58	69	48	70	100.5	83	0.154	0.392	22.03
186	1.8	0.0	25.923	0.140	0.95	78	1.58	69	48	70	100.5	83	0.155	0.394	22.03
187	1.8	0.0	26.062	0.139	0.94	78	1.58	69	48	70	99.6	83	0.156	0.395	22.10
188	1.7	0.1	26.202	0.140	0.94	78	1.58	69	48	70	100.1	83	0.155	0.394	22.10
189	1.7	0.0	26.342	0.140	0.94	78	1.58	69	48	70	100.2	83	0.155	0.394	22.07
190	1.6	0.1	26.481	0.139	0.94	78	1.58	69	48	70	99.7	83	0.154	0.392	22.03
191	1.6	0.0	26.621	0.140	0.94	78	1.58	70	48	70	100.5	83	0.154	0.392	22.00
192	1.6	0.0	26.760	0.139	0.95	78	1.59	70	48	70	99.8	84	0.156	0.395	22.08
193	1.5	0.1	26.900	0.140	0.95	79	1.58	70	48	70	100.2	83	0.154	0.392	22.08
194	1.5	0.0	27.040	0.140	0.94	79	1.58	70	48	70	100.2	83	0.154	0.392	22.00
195	1.5	0.0	27.180	0.140	0.95	79	1.58	70	48	70	100.5	84	0.154	0.392	22.01
196	1.4	0.1	27.320	0.140	0.94	79	1.58	70	48	70	100.5	84	0.155	0.394	22.05
197	1.4	0.0	27.460	0.140	0.94	79	1.58	70	48	70	100.3	84	0.155	0.394	22.09
198	1.3	0.1	27.600	0.140	0.94	79	1.58	70	48	70	100.3	84	0.154	0.392	22.05
199	1.3	0.0	27.740	0.140	0.94	79	1.58	70	48	70	100.4	84	0.154	0.392	22.02
200	1.3	0.0	27.879	0.139	0.94	79	1.58	70	48	70	99.7	84	0.155	0.394	22.05
201	1.2	0.1	28.019	0.140	0.94	79	1.58	70	48	71	100.3	84	0.155	0.394	22.09
202	1.2	0.0	28.159	0.140	0.94	79	1.58	70	48	70	100.1	84	0.156	0.395	22.12
203	1.2	0.0	28.298	0.139	0.94	79	1.58	70	48	70	99.3	84	0.155	0.394	22.12
204	1.1	0.1	28.438	0.140	0.94	79	1.58	70	48	70	100.1	84	0.155	0.394	22.09
205	1.1	0.0	28.578	0.140	0.94	79	1.58	70	48	71	100.3	84	0.154	0.392	22.05
206	1.0	0.1	28.717	0.139	0.95	79	1.58	70	48	71	99.6	84	0.155	0.394	22.05
207	1.0	0.0	28.857	0.140	0.95	79	1.58	70	48	70	100.3	84	0.155	0.394	22.09
208	1.0	0.0	28.997	0.140	0.94	79	1.58	70	48	71	100.2	84	0.155	0.394	22.09
209	0.9	0.1	29.137	0.140	0.94	79	1.58	70	48	71	100.2	84	0.155	0.394	22.09
210	0.9	0.0	29.277	0.140	0.94	79	1.59	70	48	71	100.3	84	0.154	0.392	22.05
211	0.9	0.0	29.417	0.140	0.94	79	1.58	70	48	71	100.4	84	0.154	0.392	22.02
212	0.8	0.1	29.557	0.140	0.94	79	1.58	70	48	71	100.5	84	0.154	0.392	22.02
213	0.8	0.0	29.697	0.140	0.94	79	1.59	70	48	71	100.5	84	0.154	0.392	22.02
214	0.8	0.0	29.837	0.140	0.94	79	1.59	70	48	71	100.5	84	0.154	0.392	22.02
215	0.7	0.1	29.977	0.140	0.94	79	1.58	70	48	71	100.5	84	0.154	0.392	22.02
216	0.7	0.0	30.116	0.139	0.94	79	1.58	70	48	71	99.6	84	0.156	0.395	22.09

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Test Length: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.25 in. Hg
Post-Test 0 cfm @ 6.14 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H (" H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP (" H_2O)*	$\sqrt{dP}$	*vs*
217	0.7	0.0	30.256	0.140	0.94	79	1.58	70	48	71	100.2	84	0.154	0.392	22.09
218	0.6	0.1	30.396	0.140	0.94	79	1.58	70	48	71	100.3	84	0.155	0.394	22.05
219	0.6	0.0	30.536	0.140	0.94	79	1.59	70	48	71	100.3	84	0.155	0.394	22.09
220	0.6	0.0	30.675	0.139	0.95	80	1.59	71	48	71	99.4	84	0.155	0.394	22.09
221	0.5	0.1	30.815	0.140	0.94	80	1.58	71	48	71	100.3	84	0.152	0.390	21.98
222	0.5	0.0	30.955	0.140	0.95	80	1.58	71	48	71	100.4	84	0.156	0.395	22.02
223	0.4	0.1	31.095	0.140	0.95	80	1.58	71	48	71	100.1	85	0.156	0.395	22.17
224	0.4	0.0	31.235	0.140	0.95	80	1.59	71	48	71	99.8	84	0.155	0.394	22.13
225	0.4	0.0	31.375	0.140	0.95	80	1.58	71	48	71	100.1	84	0.153	0.391	22.02
226	0.4	0.0	31.516	0.141	0.94	80	1.58	71	48	71	101.1	84	0.155	0.394	22.02
227	0.4	0.0	31.655	0.139	0.94	80	1.59	71	48	71	99.5	84	0.154	0.392	22.05
228	0.3	0.1	31.795	0.140	0.94	80	1.58	71	48	71	100.2	84	0.155	0.394	22.05
229	0.3	0.0	31.935	0.140	0.94	80	1.58	71	48	71	100.1	84	0.155	0.394	22.09
230	0.3	0.0	32.075	0.140	0.94	80	1.59	71	48	71	100.0	84	0.155	0.394	22.09
231	0.2	0.1	32.215	0.140	0.94	80	1.58	71	48	71	100.0	84	0.155	0.394	22.09
232	0.2	0.0	32.354	0.139	0.94	80	1.59	71	48	71	99.3	84	0.155	0.394	22.09
233	0.2	0.0	32.494	0.140	0.94	80	1.58	71	48	71	100.1	85	0.155	0.394	22.10
234	0.1	0.1	32.634	0.140	0.94	80	1.58	71	48	71	100.1	85	0.155	0.394	22.11
235	0.1	0.0	32.774	0.140	0.94	80	1.58	71	48	71	100.1	84	0.154	0.392	22.06
236	0.0	0.1	32.914	0.140	0.95	80	1.59	71	48	71	100.3	85	0.154	0.392	22.03

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Total Sampling Time: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.38 in. Hg
Post-Test 0 cfm @ 6.84 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
Tot / Avg	**33.746**	**0.143**	**0.72**	**77.2**	**1.80**	**68.05**	**50.04**	**100.0**	**639.3**	**459.2**	**285.5**	**189.4**	**418.9**	**907.0**	**2.4**
Minimum	0.000	0.130	0.55	72	1.70	67	46	95.2	519	431	214	144	321	551	345
Max	33.746	0.144	0.73	80	1.80	70	51	103.0	723	505	322	215	473	1238	427
0	0.000		0.55	72	1.70	67	51		558	494	282	188	408	670	386
1	0.130	0.130	0.74	72	1.80	68	47	95.2	548	494	279	188	402	586	382
2	0.273	0.143	0.74	72	1.80	68	47	103.0	539	494	272	185	394	591	377
3	0.415	0.142	0.73	72	1.80	68	47	100.0	538	494	266	184	386	583	374
4	0.558	0.143	0.73	72	1.80	68	47	100.5	537	493	259	179	378	649	369
5	0.700	0.142	0.73	72	1.80	68	47	100.1	534	493	252	176	370	578	365
6	0.843	0.143	0.72	72	1.80	68	47	101.1	531	493	246	173	362	563	361
7	0.985	0.142	0.72	72	1.80	68	46	100.0	528	493	241	169	355	551	357
8	1.127	0.142	0.72	72	1.80	68	46	99.7	524	492	236	168	348	581	354
9	1.269	0.142	0.72	72	1.80	68	46	99.7	521	492	232	163	343	568	350
10	1.411	0.142	0.72	72	1.80	68	46	99.5	519	491	227	160	337	566	347
11	1.553	0.142	0.71	72	1.80	68	46	99.6	520	491	224	161	333	856	346
12	1.694	0.141	0.71	72	1.80	68	46	99.2	526	490	221	158	330	1019	345
13	1.836	0.142	0.72	73	1.80	68	46	100.1	538	488	219	153	327	1023	345
14	1.978	0.142	0.72	73	1.80	68	46	100.2	550	487	218	152	326	891	347
15	2.120	0.142	0.72	73	1.80	68	46	100.3	558	486	217	153	324	819	348
16	2.263	0.143	0.72	73	1.80	68	47	101.0	562	484	216	153	323	803	348
17	2.405	0.142	0.72	73	1.80	68	47	100.4	567	483	216	149	322	797	347
18	2.547	0.142	0.72	73	1.80	68	47	100.3	572	482	215	148	321	798	348
19	2.689	0.142	0.72	73	1.80	68	47	100.2	576	480	215	145	322	794	348
20	2.831	0.142	0.72	73	1.80	68	47	100.5	577	479	214	148	322	793	348
21	2.974	0.143	0.72	73	1.80	68	47	101.5	578	477	214	146	322	837	347
22	3.117	0.143	0.72	73	1.80	68	47	101.5	579	476	215	145	323	948	348
23	3.259	0.142	0.71	74	1.80	68	47	100.4	585	475	217	147	324	1042	350
24	3.401	0.142	0.72	74	1.80	68	47	99.9	598	473	218	147	326	1064	352
25	3.543	0.142	0.72	74	1.80	68	47	99.9	608	472	218	148	328	949	355
26	3.685	0.142	0.72	74	1.80	68	47	100.2	615	471	219	144	331	915	356
27	3.827	0.142	0.72	74	1.80	68	47	100.4	620	469	220	146	334	1005	358
28	3.969	0.142	0.72	74	1.80	68	47	100.5	626	468	221	146	338	1046	360
29	4.111	0.142	0.72	74	1.80	68	47	100.5	634	467	223	147	342	1067	363
30	4.253	0.142	0.72	74	1.80	68	48	100.5	641	465	224	146	345	1077	364
31	4.395	0.142	0.72	75	1.80	68	48	100.6	648	464	225	147	348	1105	366
32	4.538	0.143	0.72	75	1.80	68	48	101.4	654	463	227	147	351	1095	368
33	4.680	0.142	0.72	75	1.80	68	48	100.6	659	462	228	148	354	1091	370
34	4.822	0.142	0.72	75	1.80	68	48	100.3	664	462	229	151	357	1112	373
35	4.965	0.143	0.72	75	1.80	69	48	101.0	669	461	231	151	360	1126	374
36	5.107	0.142	0.72	75	1.80	68	48	100.4	674	460	233	150	364	1187	376
37	5.250	0.143	0.71	75	1.80	69	48	101.2	679	459	235	148	367	1189	378
38	5.392	0.142	0.71	75	1.80	69	48	100.3	685	458	238	149	371	1226	380
39	5.534	0.142	0.72	75	1.80	69	48	100.0	690	457	240	151	376	1215	383
40	5.676	0.142	0.72	75	1.80	68	48	99.7	694	457	242	153	381	1195	385

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 17:45
Total Sampling Time: 236 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.38 in. Hg
Post-Test 0 cfm @ 6.84 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
41	5.819	0.143	0.71	76	1.80	69	48	100.3	697	456	244	154	386	1213	387
42	5.961	0.142	0.71	76	1.80	68	49	99.8	700	455	245	154	391	1217	389
43	6.103	0.142	0.72	76	1.80	68	49	100.1	702	455	247	155	396	1217	391
44	6.245	0.142	0.71	76	1.80	68	49	100.0	704	454	248	159	400	1198	393
45	6.388	0.143	0.72	76	1.80	68	49	100.6	706	453	249	157	404	1200	394
46	6.530	0.142	0.72	76	1.80	68	49	99.6	708	453	250	158	408	1214	395
47	6.673	0.143	0.72	76	1.80	68	49	100.0	710	452	250	162	412	1222	397
48	6.815	0.142	0.72	76	1.80	68	49	99.1	712	451	251	160	415	1238	398
49	6.958	0.143	0.72	76	1.80	68	49	100.0	712	451	251	161	419	1217	399
50	7.100	0.142	0.72	76	1.80	68	49	99.6	712	450	252	162	421	1209	399
51	7.243	0.143	0.72	76	1.80	68	49	100.4	711	449	254	165	423	1229	400
52	7.386	0.143	0.72	76	1.80	68	49	100.2	711	448	256	166	425	1233	401
53	7.528	0.142	0.72	76	1.80	68	49	99.5	710	448	258	167	427	1212	402
54	7.671	0.143	0.72	76	1.80	68	49	100.3	710	448	260	167	428	1202	403
55	7.814	0.143	0.72	77	1.80	68	49	100.2	709	447	262	168	429	1209	403
56	7.956	0.142	0.72	77	1.80	68	49	99.4	709	446	263	170	430	1204	404
57	8.099	0.143	0.72	77	1.80	68	49	100.0	710	446	265	169	431	1144	404
58	8.241	0.142	0.71	77	1.80	68	49	99.3	712	446	267	171	431	1154	405
59	8.384	0.143	0.72	77	1.80	68	49	99.9	714	445	269	172	431	1118	406
60	8.526	0.142	0.72	77	1.80	68	50	99.1	715	445	271	172	430	1070	407
61	8.668	0.142	0.72	77	1.80	68	50	99.2	716	444	272	172	429	1079	407
62	8.811	0.143	0.72	77	1.80	68	50	99.8	717	444	273	174	429	1047	407
63	8.954	0.143	0.72	77	1.80	68	50	99.9	718	443	274	172	428	1039	407
64	9.097	0.143	0.72	77	1.80	68	50	100.0	718	443	276	175	426	1026	408
65	9.240	0.143	0.72	77	1.80	68	50	100.1	718	443	277	180	427	1046	409
66	9.383	0.143	0.72	77	1.80	68	50	100.3	717	442	278	176	427	1077	408
67	9.526	0.143	0.72	77	1.80	68	50	100.2	715	442	279	175	426	1069	407
68	9.669	0.143	0.72	77	1.80	68	50	100.2	713	441	280	173	426	1062	407
69	9.811	0.142	0.73	77	1.80	68	50	99.7	712	441	280	180	425	1058	408
70	9.954	0.143	0.72	77	1.80	68	50	100.0	713	440	280	179	425	1036	407
71	10.097	0.143	0.72	77	1.80	68	50	99.7	714	440	279	178	424	991	407
72	10.240	0.143	0.73	77	1.80	68	50	99.8	715	439	279	179	423	964	407
73	10.384	0.144	0.72	77	1.80	68	50	100.5	716	439	278	180	422	948	407
74	10.527	0.143	0.72	77	1.80	68	50	99.8	717	439	277	179	421	949	407
75	10.670	0.143	0.73	77	1.80	68	50	99.7	717	438	277	181	419	949	406
76	10.813	0.143	0.72	77	1.80	68	50	99.8	717	438	276	179	418	941	406
77	10.956	0.143	0.72	77	1.80	68	50	99.7	717	438	276	182	417	943	406
78	11.099	0.143	0.72	77	1.80	68	50	99.6	717	437	275	182	415	946	405
79	11.242	0.143	0.72	77	1.80	68	50	99.6	716	437	275	184	414	950	405
80	11.385	0.143	0.72	77	1.80	68	50	99.5	717	437	275	180	413	954	404
81	11.528	0.143	0.72	77	1.80	68	50	99.7	717	437	276	180	413	947	405
82	11.671	0.143	0.72	77	1.80	68	50	99.8	717	436	276	185	413	935	405
83	11.814	0.143	0.72	77	1.80	68	50	99.9	719	436	277	184	413	950	406
84	11.957	0.143	0.72	77	1.80	68	50	99.9	720	436	278	180	413	954	405

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 17:45
Total Sampling Time: 236 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.38 in. Hg
Post-Test 0 cfm @ 6.84 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
85	12.100	0.143	0.72	77	1.80	68	50	99.7	723	436	279	189	414	938	408
86	12.243	0.143	0.72	78	1.80	68	51	99.7	723	436	280	183	416	932	408
87	12.386	0.143	0.72	78	1.80	68	51	99.8	722	436	281	183	418	928	408
88	12.529	0.143	0.72	78	1.80	68	51	99.7	720	436	281	184	421	926	408
89	12.672	0.143	0.72	78	1.80	68	51	99.7	719	436	282	184	424	919	409
90	12.815	0.143	0.72	77	1.80	68	51	99.7	718	436	282	186	427	914	410
91	12.959	0.144	0.72	78	1.80	68	51	100.4	717	436	283	188	431	923	411
92	13.102	0.143	0.72	77	1.80	68	51	100.0	717	436	283	186	434	925	411
93	13.244	0.142	0.72	78	1.80	68	51	99.3	717	436	284	192	437	927	413
94	13.388	0.144	0.72	78	1.80	68	51	100.3	717	436	285	185	439	923	412
95	13.531	0.143	0.73	78	1.80	68	51	99.5	717	436	286	186	442	935	413
96	13.674	0.143	0.73	78	1.80	68	51	99.6	717	436	287	192	444	942	415
97	13.817	0.143	0.72	78	1.80	68	51	99.8	717	436	289	188	448	942	416
98	13.960	0.143	0.72	78	1.80	68	51	100.0	717	436	290	193	450	943	417
99	14.103	0.143	0.72	78	1.80	68	51	99.9	718	436	291	194	453	933	418
100	14.247	0.144	0.72	78	1.80	68	51	100.2	718	435	293	190	455	955	418
101	14.390	0.143	0.72	78	1.80	68	51	99.3	718	435	294	192	458	1010	419
102	14.533	0.143	0.72	78	1.80	68	51	99.7	717	435	295	192	460	1040	420
103	14.677	0.144	0.72	78	1.80	68	51	100.7	715	435	297	195	462	1041	421
104	14.820	0.143	0.73	78	1.80	68	51	99.6	715	435	298	192	464	1017	421
105	14.963	0.143	0.73	78	1.80	67	51	99.3	714	435	299	198	465	1026	422
106	15.107	0.144	0.72	78	1.80	68	51	100.2	714	434	300	197	466	1018	422
107	15.250	0.143	0.72	78	1.80	67	51	99.7	715	434	301	198	467	1002	423
108	15.394	0.144	0.72	78	1.80	68	51	100.4	715	434	302	196	468	1006	423
109	15.537	0.143	0.73	78	1.80	67	51	99.6	715	434	303	199	469	989	424
110	15.681	0.144	0.73	78	1.80	67	51	100.2	715	434	304	198	470	974	424
111	15.824	0.143	0.72	78	1.80	67	51	99.4	716	433	305	201	470	976	425
112	15.967	0.143	0.72	78	1.80	67	51	99.3	717	433	306	203	471	960	426
113	16.110	0.143	0.72	78	1.80	67	51	99.2	717	433	306	201	471	939	426
114	16.253	0.143	0.72	78	1.80	67	51	99.1	717	433	307	202	472	933	426
115	16.397	0.144	0.72	78	1.80	67	51	99.9	717	432	309	200	472	933	426
116	16.540	0.143	0.72	78	1.80	67	51	99.3	717	432	309	200	473	923	426
117	16.684	0.144	0.72	78	1.80	67	51	100.1	716	432	310	203	473	918	427
118	16.827	0.143	0.72	78	1.80	67	51	99.6	715	432	311	203	472	910	427
119	16.970	0.143	0.72	78	1.80	67	51	99.6	714	432	311	202	472	907	426
120	17.114	0.144	0.72	78	1.80	67	51	100.4	712	432	312	200	471	908	425
121	17.257	0.143	0.72	78	1.80	67	51	99.8	710	432	313	206	470	904	426
122	17.400	0.143	0.72	78	1.80	67	51	99.7	708	432	314	206	469	906	426
123	17.544	0.144	0.72	78	1.80	67	51	100.3	706	432	315	206	467	901	425
124	17.687	0.143	0.73	78	1.80	67	51	99.4	704	432	316	201	466	893	424
125	17.830	0.143	0.73	78	1.80	67	51	99.4	702	431	316	203	464	892	423
126	17.974	0.144	0.73	78	1.80	67	51	99.9	699	431	317	204	462	891	423
127	18.117	0.143	0.73	78	1.80	67	51	99.1	696	431	318	207	460	895	422
128	18.261	0.144	0.73	78	1.80	67	51	100.0	694	431	319	208	458	894	422

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Total Sampling Time: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.38 in. Hg
Post-Test 0 cfm @ 6.84 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
129	18.404	0.143	0.73	78	1.80	67	51	99.4	691	431	319	208	457	898	421
130	18.547	0.143	0.73	78	1.80	67	51	99.3	689	431	320	204	455	889	420
131	18.691	0.144	0.73	78	1.80	67	51	99.9	686	431	320	208	454	889	420
132	18.834	0.143	0.73	78	1.80	67	51	99.0	683	431	321	204	453	883	418
133	18.978	0.144	0.73	78	1.80	67	51	99.7	679	431	322	206	452	877	418
134	19.121	0.143	0.73	78	1.80	67	51	99.2	676	431	322	207	451	881	417
135	19.264	0.143	0.73	78	1.80	67	51	99.1	673	431	322	211	450	884	417
136	19.407	0.143	0.73	78	1.80	67	51	99.0	669	431	322	208	449	904	416
137	19.551	0.144	0.73	78	1.80	67	51	99.9	667	431	322	208	449	904	415
138	19.694	0.143	0.73	78	1.80	67	51	99.2	665	431	321	211	448	905	415
139	19.838	0.144	0.73	78	1.80	67	51	99.8	663	431	320	207	448	906	414
140	19.982	0.144	0.73	78	1.80	67	51	99.7	662	431	319	208	448	899	414
141	20.125	0.143	0.73	78	1.80	67	51	99.1	661	432	317	206	448	890	413
142	20.268	0.143	0.73	78	1.80	67	51	99.2	659	432	316	203	448	888	412
143	20.412	0.144	0.73	78	1.80	67	51	99.8	658	431	314	203	447	881	411
144	20.555	0.143	0.73	78	1.80	67	51	99.1	657	432	313	202	447	884	410
145	20.699	0.144	0.73	78	1.80	67	51	99.8	655	432	311	205	447	883	410
146	20.842	0.143	0.73	78	1.80	67	51	99.4	654	432	310	206	446	875	410
147	20.985	0.143	0.73	78	1.80	67	51	99.6	652	433	309	205	444	869	409
148	21.129	0.144	0.73	78	1.80	67	51	100.1	650	433	308	206	442	859	408
149	21.272	0.143	0.73	78	1.80	67	51	99.1	648	433	306	205	440	854	406
150	21.416	0.144	0.73	78	1.80	67	51	99.7	644	434	305	206	438	854	405
151	21.559	0.143	0.73	78	1.80	67	51	99.0	642	434	304	211	436	852	405
152	21.703	0.144	0.73	77	1.80	67	51	99.8	639	434	302	201	435	844	402
153	21.847	0.144	0.73	77	1.80	67	51	100.2	636	434	302	205	432	845	402
154	21.990	0.143	0.73	78	1.80	67	51	99.5	634	434	301	206	431	843	401
155	22.134	0.144	0.73	77	1.80	67	51	100.0	632	435	300	203	429	843	400
156	22.277	0.143	0.73	77	1.80	67	51	99.2	630	436	300	203	427	840	399
157	22.421	0.144	0.73	77	1.80	67	51	99.8	629	437	299	205	426	838	399
158	22.565	0.144	0.73	77	1.80	67	51	99.9	627	438	299	209	425	835	400
159	22.708	0.143	0.72	78	1.80	67	51	99.3	626	439	300	205	424	836	399
160	22.852	0.144	0.72	78	1.80	67	51	100.3	625	440	300	201	423	829	398
161	22.995	0.143	0.72	77	1.80	67	51	100.0	624	440	301	207	423	827	399
162	23.138	0.143	0.72	78	1.80	67	51	99.8	624	441	302	202	423	826	398
163	23.282	0.144	0.72	77	1.80	67	51	100.1	624	442	303	200	422	824	398
164	23.425	0.143	0.73	78	1.80	67	51	99.5	625	443	304	206	422	831	400
165	23.568	0.143	0.73	78	1.80	67	51	99.5	626	444	304	206	422	831	400
166	23.711	0.143	0.73	78	1.80	67	51	99.8	628	445	305	202	422	834	400
167	23.855	0.144	0.73	78	1.80	67	51	100.7	630	446	306	204	423	832	402
168	23.998	0.143	0.72	78	1.80	67	51	99.9	632	447	308	204	424	838	403
169	24.141	0.143	0.72	78	1.80	67	51	99.9	634	448	309	203	425	839	404
170	24.284	0.143	0.72	78	1.80	68	51	100.0	634	450	310	205	426	846	405
171	24.428	0.144	0.72	78	1.80	68	51	100.7	633	451	310	210	427	845	406
172	24.571	0.143	0.72	78	1.80	68	51	99.9	631	453	310	206	428	889	406

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 17:45
Total Sampling Time: 236 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.38 in. Hg
Post-Test 0 cfm @ 6.84 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
173	24.714	0.143	0.72	78	1.80	68	51	99.8	630	455	310	210	430	884	407
174	24.857	0.143	0.72	78	1.80	68	51	100.1	630	457	309	207	432	882	407
175	25.000	0.143	0.72	78	1.80	68	51	100.3	628	458	309	207	434	877	407
176	25.144	0.144	0.72	78	1.80	68	51	100.9	626	460	308	206	435	872	407
177	25.287	0.143	0.72	78	1.80	68	51	100.1	623	462	308	207	437	863	407
178	25.431	0.144	0.72	78	1.80	68	51	100.7	621	464	308	206	437	864	407
179	25.574	0.143	0.72	78	1.80	68	51	100.1	618	466	308	204	438	861	407
180	25.717	0.143	0.72	78	1.80	68	51	100.2	615	468	307	207	438	863	407
181	25.861	0.144	0.72	78	1.80	68	51	101.2	610	470	307	208	439	862	407
182	26.004	0.143	0.72	78	1.80	68	51	100.6	607	473	308	207	439	856	407
183	26.147	0.143	0.72	78	1.80	68	51	100.4	603	475	308	209	439	863	407
184	26.290	0.143	0.72	78	1.80	68	51	100.2	599	477	308	208	438	858	406
185	26.433	0.143	0.72	78	1.80	68	51	100.2	595	479	308	211	438	866	406
186	26.577	0.144	0.73	78	1.80	68	51	100.9	592	481	308	208	437	865	405
187	26.720	0.143	0.73	78	1.80	68	51	100.0	590	483	308	210	437	868	406
188	26.864	0.144	0.73	78	1.80	69	51	100.5	587	485	308	211	437	871	406
189	27.007	0.143	0.73	78	1.80	69	51	99.9	585	487	309	211	436	880	406
190	27.150	0.143	0.73	78	1.80	69	51	100.1	583	489	309	211	435	831	405
191	27.294	0.144	0.72	78	1.80	69	51	100.9	580	490	309	209	434	827	404
192	27.437	0.143	0.72	78	1.80	69	51	100.2	578	492	309	211	434	819	405
193	27.580	0.143	0.73	79	1.80	69	51	99.9	575	492	308	213	433	811	404
194	27.724	0.144	0.72	79	1.80	69	51	100.6	573	493	308	212	432	812	404
195	27.867	0.143	0.73	79	1.80	69	51	100.2	571	494	308	215	431	808	404
196	28.010	0.143	0.73	79	1.80	69	51	100.2	569	494	308	211	430	805	402
197	28.154	0.144	0.72	79	1.80	69	50	100.7	567	494	308	213	429	800	402
198	28.297	0.143	0.73	79	1.80	69	51	100.0	565	494	307	212	429	799	401
199	28.441	0.144	0.73	79	1.80	69	51	100.8	563	494	307	215	428	793	401
200	28.584	0.143	0.72	79	1.80	69	50	100.1	562	494	307	212	428	795	401
201	28.728	0.144	0.72	79	1.80	69	51	100.7	560	493	307	208	428	794	399
202	28.871	0.143	0.72	79	1.80	69	51	99.8	558	494	307	211	428	794	400
203	29.015	0.144	0.72	79	1.80	69	51	100.4	556	493	307	208	427	790	398
204	29.158	0.143	0.72	79	1.80	69	51	99.8	554	493	307	212	427	792	399
205	29.301	0.143	0.72	79	1.80	69	51	100.0	553	493	307	209	427	787	398
206	29.445	0.144	0.72	79	1.80	69	51	100.8	551	493	306	208	426	783	397
207	29.588	0.143	0.72	79	1.80	69	51	100.0	550	494	306	207	426	783	397
208	29.731	0.143	0.73	79	1.80	69	50	99.9	548	494	306	207	425	779	396
209	29.874	0.143	0.72	79	1.80	69	51	99.9	546	494	306	207	424	780	395
210	30.018	0.144	0.72	79	1.80	69	51	100.7	545	494	306	210	424	780	396
211	30.161	0.143	0.72	79	1.80	69	51	100.1	544	495	306	206	424	776	395
212	30.304	0.143	0.72	79	1.80	69	51	100.2	543	495	306	208	424	773	395
213	30.448	0.144	0.72	79	1.80	69	51	100.9	541	496	306	205	423	775	394
214	30.591	0.143	0.72	79	1.80	69	50	100.2	539	496	306	209	423	772	395
215	30.735	0.144	0.72	79	1.80	69	51	100.9	538	496	306	205	423	771	394
216	30.878	0.143	0.72	79	1.80	70	51	100.1	537	497	306	205	422	771	393

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 17:45
Total Sampling Time: 236 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.38 in. Hg
Post-Test 0 cfm @ 6.84 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
217	31.021	0.143	0.72	79	1.80	70	51	99.9	537	498	306	209	422	772	394
218	31.165	0.144	0.72	79	1.80	70	51	100.7	536	499	305	206	421	772	393
219	31.308	0.143	0.72	79	1.80	70	51	100.0	535	499	305	207	422	766	394
220	31.451	0.143	0.72	79	1.80	70	51	99.9	535	500	305	207	421	771	394
221	31.594	0.143	0.72	79	1.80	70	51	100.1	534	501	305	205	421	775	393
222	31.738	0.144	0.73	79	1.80	70	51	101.0	533	502	305	205	421	756	393
223	31.881	0.143	0.73	80	1.80	70	51	99.9	532	502	305	208	420	752	393
224	32.025	0.144	0.73	80	1.80	70	51	100.2	531	503	305	205	419	745	393
225	32.168	0.143	0.72	80	1.80	70	51	99.8	530	503	305	205	418	744	392
226	32.312	0.144	0.72	80	1.80	70	51	100.7	529	504	305	198	417	740	391
227	32.455	0.143	0.72	80	1.80	70	51	100.0	528	504	304	202	417	743	391
228	32.598	0.143	0.72	80	1.80	70	51	99.9	527	504	304	205	415	743	391
229	32.742	0.144	0.72	80	1.80	70	51	100.5	526	504	304	205	415	741	391
230	32.885	0.143	0.72	80	1.80	70	51	99.7	526	505	303	200	414	745	390
231	33.028	0.143	0.72	80	1.80	70	51	99.7	525	505	303	200	413	747	389
232	33.172	0.144	0.72	80	1.80	70	51	100.4	525	505	303	199	413	743	389
233	33.315	0.143	0.72	80	1.80	70	51	99.8	524	505	303	202	412	742	389
234	33.459	0.144	0.72	80	1.80	70	51	100.5	524	505	303	198	411	745	388
235	33.602	0.143	0.72	80	1.80	70	51	99.8	523	504	303	203	411	740	389
236	33.746	0.144	0.72	80	1.80	70	51	100.7	522	504	304	201	411	741	388

Train C - First Hour Particulate Sampling

Run: 4 **Test Date:** 3/6/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 17:45
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 23.16 in. Hg
Post-Test 0 cfm @ 4.46 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
Tot / Avg	**8.451**	**0.141**	**1.67**	**67.5**	**-1.80**	**67.7**	**59.9**	**100.2**
Minimum	0.000	0.115	1.47	67	-2.07	65	59	84.5
Max	8.451	0.144	1.76	68	-1.39	68	62	102.9
0	0.000		1.47	67	-1.39	65	62	
1	0.115	0.115	1.65	67	-1.74	67	61	84.5
2	0.254	0.139	1.64	67	-2.00	67	61	100.6
3	0.394	0.140	1.62	67	-1.96	67	61	99.1
4	0.533	0.139	1.62	67	-1.48	67	60	98.2
5	0.671	0.138	1.60	67	-1.48	67	60	97.7
6	0.810	0.139	1.60	67	-1.44	67	60	98.7
7	0.948	0.138	1.59	67	-1.45	67	60	97.7
8	1.085	0.137	1.59	67	-1.56	67	60	96.7
9	1.223	0.138	1.57	67	-1.44	67	60	97.3
10	1.359	0.136	1.58	67	-1.90	67	60	95.8
11	1.494	0.135	1.48	67	-1.85	67	60	95.2
12	1.634	0.140	1.64	67	-1.99	67	61	99.0
13	1.774	0.140	1.66	67	-1.94	67	59	99.2
14	1.914	0.140	1.62	67	-1.64	67	59	99.4
15	2.056	0.142	1.69	67	-1.96	67	59	101.0
16	2.198	0.142	1.69	67	-1.64	68	59	101.0
17	2.340	0.142	1.69	67	-1.90	68	59	101.1
18	2.481	0.141	1.69	67	-1.99	68	59	100.3
19	2.624	0.143	1.76	67	-1.73	68	59	101.6
20	2.767	0.143	1.71	67	-1.78	68	59	101.9
21	2.910	0.143	1.71	67	-2.05	68	59	102.2
22	3.052	0.142	1.71	67	-2.06	68	59	101.5
23	3.195	0.143	1.70	67	-2.01	68	59	102.0
24	3.337	0.142	1.71	67	-1.53	68	59	100.8
25	3.480	0.143	1.69	67	-2.06	68	59	101.5
26	3.623	0.143	1.70	67	-1.85	68	59	101.8
27	3.765	0.142	1.70	67	-1.91	68	59	101.4
28	3.908	0.143	1.69	67	-1.54	68	59	102.2
29	4.050	0.142	1.70	68	-1.80	68	59	101.4
30	4.192	0.142	1.70	68	-2.00	68	59	101.3
31	4.336	0.144	1.70	68	-1.55	68	59	102.9
32	4.478	0.142	1.69	68	-1.53	68	60	101.7

Train C - First Hour Particulate Sampling

Run: 4
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Start Time: 17:45
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/6/24

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Sample Train Leak Checks
Pre-test 0 cfm @ 23.16 in. Hg
Post-Test 0 cfm @ 4.46 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
33	4.620	0.142	1.70	68	-2.05	68	60	101.6
34	4.762	0.142	1.70	68	-1.58	68	60	101.4
35	4.905	0.143	1.70	68	-1.94	68	60	102.1
36	5.047	0.142	1.71	68	-2.07	68	60	101.5
37	5.190	0.143	1.69	68	-1.84	68	60	102.3
38	5.332	0.142	1.70	68	-1.70	68	60	101.4
39	5.474	0.142	1.69	68	-2.06	68	60	101.1
40	5.616	0.142	1.70	68	-1.77	68	60	100.8
41	5.758	0.142	1.70	68	-1.83	68	60	100.8
42	5.901	0.143	1.69	68	-1.93	68	60	101.9
43	6.043	0.142	1.67	68	-1.53	68	60	101.4
44	6.185	0.142	1.70	68	-1.75	68	60	101.3
45	6.327	0.142	1.69	68	-2.03	68	60	101.2
46	6.468	0.141	1.69	68	-1.80	68	60	100.3
47	6.612	0.144	1.70	68	-2.07	68	60	102.1
48	6.752	0.140	1.63	68	-1.79	68	60	99.1
49	6.893	0.141	1.68	68	-2.03	68	60	99.9
50	7.035	0.142	1.69	68	-1.91	68	60	101.0
51	7.176	0.141	1.68	68	-1.72	68	60	100.3
52	7.318	0.142	1.68	68	-1.52	68	60	100.9
53	7.460	0.142	1.69	68	-2.00	68	60	100.9
54	7.602	0.142	1.68	68	-1.93	68	61	101.0
55	7.743	0.141	1.68	68	-1.88	68	61	100.3
56	7.885	0.142	1.68	68	-2.04	68	61	101.0
57	8.027	0.142	1.68	68	-1.52	68	61	101.0
58	8.168	0.141	1.68	68	-2.06	68	61	100.2
59	8.310	0.142	1.68	68	-1.51	68	61	100.8
60	8.451	0.141	1.68	68	-1.66	68	61	100.0

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 17:45
Total Sampling Time 236 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
Tot / Avg	**34.019**	**0.144**	**1.40**	**67.1**	**-1.94**	**292.11**	**-0.074**	**494.7**	**0.26**	**13.36**
Minimum	0.000	0.141	1.37	66	-2.10	263.00	-0.085	37.5	0.00	1.08
Max	34.019	0.146	1.44	68	-1.80	353.00	-0.067	1040.0	1.34	17.27
0	0.000		0.43	67	-2.10	292	-0.074	1040.0	0.37	3.67
1	0.145	0.145	1.43	67	-1.90	287	-0.070	1040.0	0.19	1.08
2	0.289	0.144	1.42	67	-1.80	281	-0.075	42.0	0.00	7.92
3	0.434	0.145	1.41	67	-1.80	286	-0.076	44.3	0.00	7.98
4	0.578	0.144	1.40	67	-1.90	291	-0.076	40.1	0.00	6.88
5	0.721	0.143	1.39	67	-1.90	291	-0.076	37.5	0.00	6.62
6	0.864	0.143	1.39	67	-1.80	291	-0.076	40.4	0.00	7.03
7	1.007	0.143	1.38	67	-1.80	293	-0.076	44.0	0.00	7.19
8	1.149	0.142	1.38	67	-2.00	294	-0.076	39.5	0.00	7.00
9	1.292	0.143	1.37	67	-2.00	294	-0.076	40.4	0.00	7.41
10	1.433	0.141	1.37	67	-2.00	296	-0.076	44.9	0.00	7.42
11	1.575	0.142	1.39	67	-1.80	301	-0.078	48.2	0.01	11.04
12	1.717	0.142	1.38	67	-1.90	308	-0.079	276.3	0.04	12.70
13	1.861	0.144	1.44	67	-2.10	321	-0.081	1024.5	0.13	14.42
14	2.005	0.144	1.43	67	-2.00	328	-0.082	653.3	0.05	13.45
15	2.151	0.146	1.42	67	-2.10	332	-0.082	152.1	0.01	11.03
16	2.296	0.145	1.42	67	-2.00	333	-0.082	104.5	0.01	11.81
17	2.440	0.144	1.42	67	-1.80	335	-0.082	227.3	0.02	12.16
18	2.585	0.145	1.42	67	-2.10	338	-0.083	236.5	0.02	11.96
19	2.729	0.144	1.42	67	-2.00	337	-0.082	112.3	0.01	11.22
20	2.874	0.145	1.41	67	-1.90	337	-0.082	61.8	0.00	11.00
21	3.018	0.144	1.41	67	-1.90	337	-0.081	63.4	0.00	11.40
22	3.163	0.145	1.41	67	-2.00	337	-0.083	75.0	0.01	12.83
23	3.307	0.144	1.41	67	-2.10	340	-0.083	1040.0	0.26	15.19
24	3.451	0.144	1.41	67	-1.90	347	-0.085	1040.0	0.65	15.67
25	3.595	0.144	1.41	67	-1.80	352	-0.085	1040.0	0.67	15.12
26	3.740	0.145	1.40	67	-1.80	353	-0.084	1040.0	0.33	14.96
27	3.884	0.144	1.40	67	-2.10	351	-0.085	1040.0	0.25	15.30
28	4.029	0.145	1.40	67	-2.00	350	-0.085	1040.0	0.28	15.43
29	4.173	0.144	1.41	67	-1.80	350	-0.084	1040.0	0.28	15.49
30	4.317	0.144	1.40	67	-2.10	349	-0.084	1040.0	0.25	15.79
31	4.461	0.144	1.40	67	-1.80	350	-0.084	1040.0	0.36	15.82
32	4.605	0.144	1.41	67	-2.00	348	-0.085	1040.0	0.38	15.95

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 17:45
Total Sampling Time 236 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
33	4.749	0.144	1.41	67	-2.10	347	-0.083	1040.0	0.41	15.99
34	4.894	0.145	1.40	67	-2.10	347	-0.084	1040.0	0.48	16.10
35	5.038	0.144	1.41	67	-2.10	346	-0.084	1040.0	0.68	16.33
36	5.182	0.144	1.41	67	-1.80	345	-0.084	1040.0	0.96	17.01
37	5.326	0.144	1.39	67	-2.00	346	-0.084	1040.0	1.28	17.15
38	5.470	0.144	1.41	67	-2.00	346	-0.084	1040.0	1.34	17.27
39	5.614	0.144	1.41	67	-2.10	344	-0.083	1040.0	1.11	17.25
40	5.758	0.144	1.41	67	-1.80	343	-0.082	1040.0	0.87	17.00
41	5.902	0.144	1.41	67	-1.80	341	-0.083	1040.0	0.77	16.88
42	6.046	0.144	1.41	67	-1.80	338	-0.083	1040.0	0.72	16.70
43	6.190	0.144	1.41	67	-1.80	336	-0.083	1040.0	0.56	16.67
44	6.334	0.144	1.41	67	-1.90	336	-0.083	1040.0	0.53	16.69
45	6.478	0.144	1.41	67	-1.90	332	-0.082	1040.0	0.50	16.78
46	6.622	0.144	1.41	67	-1.80	329	-0.082	1040.0	0.55	16.86
47	6.766	0.144	1.41	67	-2.00	327	-0.082	1040.0	0.60	16.78
48	6.910	0.144	1.41	67	-2.10	325	-0.082	1040.0	0.56	16.82
49	7.054	0.144	1.41	67	-1.90	326	-0.081	1040.0	0.52	16.45
50	7.198	0.144	1.41	67	-1.80	324	-0.080	1040.0	0.63	16.12
51	7.342	0.144	1.41	67	-2.10	322	-0.080	1040.0	0.79	15.73
52	7.486	0.144	1.41	67	-1.90	319	-0.081	1040.0	0.86	15.62
53	7.631	0.145	1.40	67	-2.00	318	-0.079	1040.0	0.89	15.62
54	7.775	0.144	1.40	67	-2.00	316	-0.079	1040.0	0.87	15.50
55	7.919	0.144	1.41	67	-1.80	313	-0.078	1040.0	0.76	15.42
56	8.063	0.144	1.40	67	-2.10	312	-0.080	1040.0	0.59	15.37
57	8.207	0.144	1.40	67	-2.00	311	-0.079	1040.0	0.38	15.16
58	8.351	0.144	1.40	67	-1.90	309	-0.078	1040.0	0.36	15.19
59	8.495	0.144	1.40	67	-1.80	308	-0.079	1040.0	0.34	14.99
60	8.638	0.143	1.40	67	-2.00	308	-0.079	1040.0	0.31	14.92
61	8.783	0.145	1.40	67	-2.10	306	-0.078	1040.0	0.22	14.93
62	8.927	0.144	1.40	67	-2.00	304	-0.078	1040.0	0.23	14.98
63	9.071	0.144	1.40	67	-1.90	304	-0.078	1040.0	0.31	15.08
64	9.215	0.144	1.40	67	-1.80	303	-0.078	1040.0	0.29	15.24
65	9.359	0.144	1.40	67	-2.00	301	-0.077	1040.0	0.35	15.21
66	9.504	0.145	1.40	67	-2.00	302	-0.078	1040.0	0.35	16.03
67	9.648	0.144	1.41	67	-2.10	301	-0.076	1040.0	0.17	15.73
68	9.792	0.144	1.41	67	-1.80	301	-0.077	1040.0	0.11	15.36

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 17:45
Total Sampling Time 236 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
69	9.936	0.144	1.40	67	-1.80	298	-0.077	596.7	0.06	14.87
70	10.081	0.145	1.41	67	-1.80	296	-0.080	352.9	0.04	14.80
71	10.225	0.144	1.41	67	-1.90	295	-0.075	303.0	0.03	14.66
72	10.369	0.144	1.40	67	-2.10	295	-0.076	241.8	0.02	14.50
73	10.513	0.144	1.40	67	-2.10	294	-0.076	217.6	0.02	14.32
74	10.657	0.144	1.41	67	-1.80	294	-0.076	192.6	0.02	14.45
75	10.801	0.144	1.42	67	-1.80	293	-0.076	290.7	0.03	14.42
76	10.945	0.144	1.41	67	-1.80	294	-0.076	343.8	0.04	14.58
77	11.089	0.144	1.41	67	-1.80	294	-0.075	625.8	0.07	14.68
78	11.233	0.144	1.41	67	-1.90	294	-0.075	1040.0	0.10	14.84
79	11.377	0.144	1.41	67	-1.90	294	-0.077	1040.0	0.15	14.85
80	11.522	0.145	1.41	67	-2.00	293	-0.076	1040.0	0.19	14.94
81	11.666	0.144	1.42	67	-2.00	295	-0.076	1040.0	0.24	15.10
82	11.811	0.145	1.41	67	-1.80	296	-0.077	1040.0	0.22	15.34
83	11.955	0.144	1.41	67	-2.10	295	-0.077	1040.0	0.37	15.41
84	12.099	0.144	1.42	67	-2.10	296	-0.078	1040.0	0.44	15.76
85	12.243	0.144	1.42	67	-1.90	297	-0.077	1040.0	0.53	15.87
86	12.388	0.145	1.41	67	-1.80	299	-0.078	1040.0	0.65	15.47
87	12.532	0.144	1.40	67	-2.00	299	-0.076	1040.0	0.69	15.36
88	12.676	0.144	1.41	67	-1.90	299	-0.077	1040.0	0.68	15.40
89	12.821	0.145	1.40	67	-1.90	298	-0.078	1040.0	0.69	15.41
90	12.965	0.144	1.41	67	-2.10	299	-0.076	1040.0	0.69	15.35
91	13.109	0.144	1.41	67	-2.10	301	-0.078	1040.0	0.77	15.43
92	13.254	0.145	1.41	67	-2.00	301	-0.078	1040.0	0.79	15.57
93	13.398	0.144	1.40	67	-1.80	305	-0.078	1040.0	0.81	15.66
94	13.542	0.144	1.41	67	-2.00	305	-0.077	1040.0	0.84	15.60
95	13.687	0.145	1.41	67	-2.00	306	-0.077	1040.0	0.91	15.70
96	13.831	0.144	1.40	67	-1.90	305	-0.077	1040.0	1.07	15.91
97	13.975	0.144	1.40	67	-1.90	306	-0.077	1040.0	0.97	15.91
98	14.120	0.145	1.41	67	-2.10	305	-0.078	1040.0	1.01	15.86
99	14.265	0.145	1.41	67	-2.10	304	-0.078	1040.0	1.03	15.83
100	14.409	0.144	1.40	67	-2.00	306	-0.078	1040.0	1.02	16.34
101	14.553	0.144	1.41	67	-2.10	307	-0.077	1040.0	1.13	16.57
102	14.697	0.144	1.42	67	-2.00	308	-0.078	1040.0	1.15	16.58
103	14.841	0.144	1.41	67	-1.80	307	-0.077	1040.0	1.21	16.45
104	14.986	0.145	1.41	67	-1.80	306	-0.076	1040.0	1.20	16.36

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 17:45
Total Sampling Time 236 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
105	15.130	0.144	1.42	67	-2.00	304	-0.077	1040.0	1.20	16.21
106	15.274	0.144	1.41	67	-1.90	300	-0.078	1040.0	1.20	16.01
107	15.418	0.144	1.42	67	-2.10	302	-0.077	1040.0	1.13	15.91
108	15.563	0.145	1.42	67	-1.90	299	-0.077	1040.0	1.05	15.78
109	15.708	0.145	1.42	67	-1.80	297	-0.076	1040.0	0.99	15.73
110	15.852	0.144	1.42	67	-1.90	299	-0.076	1040.0	1.06	15.73
111	15.996	0.144	1.41	67	-2.00	297	-0.075	1040.0	0.91	15.62
112	16.141	0.145	1.41	67	-1.80	294	-0.076	1040.0	0.87	15.61
113	16.285	0.144	1.41	67	-1.90	295	-0.076	1040.0	0.85	15.64
114	16.429	0.144	1.41	67	-1.90	294	-0.076	1040.0	0.82	15.51
115	16.574	0.145	1.41	67	-2.00	294	-0.076	1040.0	0.76	15.49
116	16.718	0.144	1.41	67	-1.90	294	-0.076	1040.0	0.71	15.37
117	16.862	0.144	1.41	67	-1.90	290	-0.076	1040.0	0.62	15.30
118	17.006	0.144	1.41	67	-2.00	289	-0.076	1040.0	0.53	15.09
119	17.151	0.145	1.40	67	-1.80	286	-0.075	1040.0	0.41	14.88
120	17.295	0.144	1.40	67	-1.80	285	-0.075	1040.0	0.26	14.96
121	17.440	0.145	1.41	67	-1.90	284	-0.075	1040.0	0.24	14.91
122	17.584	0.144	1.40	67	-2.10	283	-0.075	1040.0	0.26	14.87
123	17.728	0.144	1.41	67	-2.00	283	-0.074	1040.0	0.21	14.86
124	17.873	0.145	1.41	67	-2.10	281	-0.074	1040.0	0.14	14.64
125	18.017	0.144	1.41	67	-2.00	281	-0.075	1040.0	0.11	14.58
126	18.162	0.145	1.41	67	-2.10	279	-0.074	1040.0	0.12	14.51
127	18.306	0.144	1.41	67	-2.00	278	-0.073	945.1	0.10	14.49
128	18.451	0.145	1.42	67	-1.80	277	-0.074	807.5	0.09	14.60
129	18.595	0.144	1.41	67	-2.10	277	-0.073	672.1	0.07	14.62
130	18.739	0.144	1.42	67	-2.00	277	-0.074	754.3	0.07	14.57
131	18.883	0.144	1.42	67	-1.90	277	-0.073	503.8	0.05	14.29
132	19.028	0.145	1.41	67	-1.80	276	-0.073	299.8	0.03	14.21
133	19.172	0.144	1.42	67	-1.90	271	-0.073	128.1	0.01	14.03
134	19.317	0.145	1.42	67	-2.10	272	-0.072	106.4	0.01	13.95
135	19.461	0.144	1.42	67	-1.80	270	-0.072	59.2	0.01	14.09
136	19.605	0.144	1.42	67	-1.80	272	-0.072	54.6	0.00	14.52
137	19.749	0.144	1.42	67	-2.00	270	-0.073	51.7	0.00	14.32
138	19.894	0.145	1.42	67	-2.10	269	-0.072	50.4	0.00	14.13
139	20.038	0.144	1.40	67	-2.00	267	-0.072	49.2	0.00	13.93
140	20.183	0.145	1.41	67	-1.90	267	-0.072	48.2	0.00	13.86

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 17:45
Total Sampling Time 236 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
141	20.327	0.144	1.41	67	-1.80	269	-0.072	48.8	0.00	13.82
142	20.471	0.144	1.41	67	-1.90	269	-0.071	52.0	0.00	13.71
143	20.615	0.144	1.41	67	-2.10	268	-0.071	54.0	0.00	13.57
144	20.760	0.145	1.41	67	-1.80	266	-0.071	55.0	0.01	13.55
145	20.904	0.144	1.41	67	-2.00	265	-0.071	56.6	0.01	13.31
146	21.049	0.145	1.40	67	-2.00	264	-0.071	60.5	0.01	13.15
147	21.193	0.144	1.41	67	-2.10	264	-0.071	62.7	0.01	12.96
148	21.337	0.144	1.41	67	-2.10	264	-0.071	64.7	0.01	12.55
149	21.482	0.145	1.41	67	-2.00	263	-0.071	62.1	0.01	12.22
150	21.626	0.144	1.41	67	-2.10	264	-0.071	61.1	0.01	12.14
151	21.771	0.145	1.41	67	-2.10	264	-0.071	60.8	0.01	12.19
152	21.915	0.144	1.41	67	-2.10	264	-0.071	60.8	0.01	12.16
153	22.059	0.144	1.41	66	-1.80	267	-0.071	60.2	0.01	12.18
154	22.204	0.145	1.41	66	-1.80	267	-0.071	60.8	0.01	12.26
155	22.348	0.144	1.42	67	-2.10	267	-0.071	60.5	0.01	12.31
156	22.492	0.144	1.41	67	-1.80	269	-0.071	61.7	0.01	12.38
157	22.636	0.144	1.42	66	-1.80	270	-0.070	62.1	0.01	12.46
158	22.780	0.144	1.41	67	-2.00	275	-0.071	63.4	0.01	12.51
159	22.924	0.144	1.41	67	-2.00	277	-0.072	63.7	0.01	12.55
160	23.068	0.144	1.41	67	-1.80	278	-0.072	64.7	0.01	12.62
161	23.213	0.145	1.41	67	-1.90	278	-0.071	66.3	0.01	12.75
162	23.357	0.144	1.41	67	-1.90	280	-0.071	66.6	0.01	12.96
163	23.501	0.144	1.41	67	-1.80	282	-0.071	68.2	0.01	13.19
164	23.645	0.144	1.41	67	-1.90	283	-0.073	75.0	0.01	13.62
165	23.789	0.144	1.41	67	-2.10	284	-0.072	78.6	0.01	13.52
166	23.932	0.143	1.41	67	-1.80	284	-0.072	83.5	0.01	13.51
167	24.076	0.144	1.41	67	-1.90	286	-0.072	96.7	0.01	13.92
168	24.221	0.145	1.40	67	-2.00	289	-0.073	97.4	0.01	13.74
169	24.365	0.144	1.41	67	-2.00	290	-0.072	94.8	0.01	13.46
170	24.509	0.144	1.41	67	-2.10	287	-0.072	82.2	0.01	13.07
171	24.653	0.144	1.40	67	-1.80	287	-0.072	71.8	0.01	12.79
172	24.797	0.144	1.40	67	-2.10	285	-0.071	45.5	0.00	13.02
173	24.941	0.144	1.41	67	-1.80	283	-0.072	50.8	0.00	12.66
174	25.085	0.144	1.41	67	-2.00	283	-0.072	53.0	0.00	12.52
175	25.228	0.143	1.40	67	-1.80	280	-0.071	55.0	0.01	12.40
176	25.373	0.145	1.41	67	-2.00	280	-0.071	55.0	0.01	12.36

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 17:45
Total Sampling Time 236 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
177	25.517	0.144	1.40	67	-1.80	277	-0.071	55.3	0.01	12.29
178	25.661	0.144	1.40	67	-2.00	277	-0.070	55.9	0.01	12.33
179	25.805	0.144	1.40	67	-2.10	276	-0.070	55.9	0.01	12.39
180	25.949	0.144	1.40	67	-2.00	275	-0.069	51.1	0.00	12.40
181	26.093	0.144	1.40	67	-1.90	272	-0.068	48.8	0.00	12.36
182	26.237	0.144	1.40	67	-1.90	271	-0.069	46.2	0.00	12.36
183	26.381	0.144	1.40	67	-2.00	271	-0.069	43.7	0.00	12.09
184	26.525	0.144	1.40	67	-1.90	271	-0.069	43.3	0.00	12.20
185	26.669	0.144	1.40	67	-2.10	268	-0.068	44.3	0.00	12.24
186	26.813	0.144	1.41	67	-2.00	269	-0.069	44.9	0.00	12.21
187	26.958	0.145	1.41	67	-1.80	269	-0.068	44.0	0.00	12.25
188	27.101	0.143	1.40	67	-1.80	271	-0.068	42.0	0.00	12.23
189	27.246	0.145	1.41	67	-1.90	267	-0.068	42.3	0.00	12.23
190	27.390	0.144	1.41	67	-1.90	268	-0.068	42.3	0.00	11.64
191	27.534	0.144	1.40	67	-1.80	268	-0.068	48.5	0.00	11.52
192	27.678	0.144	1.40	67	-1.80	268	-0.069	48.2	0.00	11.45
193	27.822	0.144	1.41	67	-1.80	267	-0.068	50.4	0.00	11.38
194	27.966	0.144	1.41	67	-2.10	266	-0.068	50.4	0.00	11.36
195	28.110	0.144	1.41	67	-1.80	267	-0.069	47.8	0.00	11.32
196	28.254	0.144	1.41	67	-1.80	267	-0.068	47.8	0.00	11.36
197	28.397	0.143	1.41	67	-1.90	266	-0.067	47.9	0.00	11.28
198	28.542	0.145	1.41	67	-1.80	268	-0.068	48.2	0.00	11.33
199	28.685	0.143	1.41	67	-1.80	267	-0.068	48.2	0.00	11.33
200	28.829	0.144	1.41	68	-1.80	266	-0.068	47.8	0.00	11.26
201	28.974	0.145	1.41	67	-1.90	267	-0.068	47.5	0.00	11.31
202	29.118	0.144	1.41	68	-2.10	267	-0.068	47.8	0.00	11.31
203	29.262	0.144	1.41	68	-2.00	265	-0.067	47.8	0.00	11.09
204	29.406	0.144	1.41	68	-2.00	267	-0.068	47.5	0.00	11.03
205	29.550	0.144	1.41	68	-1.80	267	-0.067	48.2	0.00	11.02
206	29.694	0.144	1.41	68	-2.00	267	-0.068	48.5	0.00	10.97
207	29.838	0.144	1.40	68	-1.90	267	-0.067	48.5	0.00	10.99
208	29.982	0.144	1.40	68	-1.80	267	-0.067	48.5	0.00	11.07
209	30.126	0.144	1.41	68	-2.00	267	-0.067	49.2	0.00	11.06
210	30.271	0.145	1.40	68	-1.80	266	-0.068	50.4	0.00	11.03
211	30.415	0.144	1.40	68	-2.00	266	-0.067	46.9	0.00	10.95
212	30.559	0.144	1.41	68	-1.80	267	-0.067	46.2	0.00	10.83

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/6/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 17:45
Total Sampling Time 236 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
213	30.703	0.144	1.40	68	-1.90	268	-0.068	46.2	0.00	10.84
214	30.847	0.144	1.40	68	-1.90	268	-0.068	45.9	0.00	10.83
215	30.991	0.144	1.41	68	-2.00	267	-0.068	45.9	0.00	10.70
216	31.135	0.144	1.40	68	-1.80	268	-0.068	47.2	0.00	10.71
217	31.280	0.145	1.40	68	-2.00	266	-0.068	47.9	0.00	10.79
218	31.423	0.143	1.40	68	-1.90	265	-0.067	47.5	0.00	10.72
219	31.568	0.145	1.40	68	-1.80	266	-0.068	47.5	0.00	10.85
220	31.712	0.144	1.40	68	-1.80	267	-0.067	47.9	0.00	10.96
221	31.856	0.144	1.41	68	-1.80	268	-0.068	47.8	0.00	10.91
222	32.000	0.144	1.40	68	-1.90	268	-0.068	46.5	0.00	10.61
223	32.145	0.145	1.40	68	-2.10	267	-0.068	49.2	0.00	9.84
224	32.289	0.144	1.40	68	-1.80	266	-0.068	51.1	0.00	9.84
225	32.433	0.144	1.41	68	-1.80	268	-0.068	49.2	0.00	9.63
226	32.577	0.144	1.39	68	-2.10	268	-0.068	48.9	0.00	9.57
227	32.722	0.145	1.41	68	-2.10	266	-0.067	47.9	0.00	9.59
228	32.866	0.144	1.41	68	-2.10	265	-0.067	48.2	0.00	9.66
229	33.010	0.144	1.40	68	-1.90	265	-0.067	54.7	0.00	10.10
230	33.154	0.144	1.41	68	-2.00	264	-0.067	53.4	0.00	10.03
231	33.298	0.144	1.41	68	-1.90	264	-0.067	52.4	0.00	10.01
232	33.442	0.144	1.41	68	-1.90	266	-0.067	52.4	0.00	9.98
233	33.586	0.144	1.41	68	-2.00	266	-0.067	54.0	0.00	9.88
234	33.731	0.145	1.41	68	-2.00	265	-0.067	52.4	0.00	9.96
235	33.875	0.144	1.41	68	-2.00	264	-0.067	53.0	0.00	10.02
236	34.019	0.144	1.41	68	-2.00	264	-0.068	52.7	0.00	10.05

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Tracking No.:	BK30.2
Project No.:	0142WS021E
Run No.:	4
Test Date:	3/6/24

OMNI Eq. ID Numbers	
Analytical Scale	
Audit Weight Set:	
Analytical Scale	
Hydrometer	
Filters are weighed	In Pairs

Train A

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs		Filter	F256	241.4	239.6	1.8	1.8
Probe catch*		Probe	61	118128.7	118128.1	0.6	0.6
ilter seals catch*		Seals	S681	3279.3	3278.8	0.5	0.5
				Total Particulate, mg:		**2.9**	**2.9**

Train B

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs		Filter	F257	240.6	239.2	1.4	1.4
Probe catch*		Probe	75	117641.0	117641.0	0.0	0.0
ilter seals catch*		Seals	S692	3436.6	3435.4	1.2	1.2
			Sub-Total	Total Particulate, mg:		**2.6**	**2.6**

Train C - *First Hour*

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs		Filter	F258	239.9	239.2	0.7	0.7
Probe catch*		Probe	38	114149.9	114149.5	0.4	0.4
ilter seals catch*		Seals	S677	3296.5	3296.0	0.5	0.5
				Total Particulate, mg:		**1.6**	**1.6**

Train D - *Ambient Background*

Sample Component	Date / Time in Dessicator	Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*		Filter	F230	120.7	120.6	0.1
				Total Particulate, mg:		**0.1**

Final (mg) - Tare (mg) = Particulate (mg)

NOTE: The Uncorrected values are those where any negative filter weights are taken as a negative value. This can possibly occur when filter matter adheres the O-ring seals and thereby transfers some mass to the O-ring. The Corrected values reflect where any negative filter weights are taken as ZERO, thus not accounting for any transfer of mass and resultingly over-reporting. Corrected values were added to this analysis to report the "Corrected" results in this report in response to a request by the US EPA. In cases where the Final weight minus the Tare weight of the Ambient filter occurs, it is taken as a ZERO. Any negative probe weights are evaluated pursuant to clause of ASTM E25215 (or appropriatelt associated test standard as defined in the introduction of this report).

Technician Signature:_____ Reviewed By:_____

Run 4 - Run Notes

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	4
Test Date:	3/6/2024

This supplemental section of miscellaneous run notes is comprised of the following:

- Appliance Operation Notes
- Velocity Traverse / Supplementa Run Notes
- Test Fuel Notes
- Gravimetric Analysis Notes

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 4

Model: AF30.2 Tracking Number: 2254 Date: 03/06/2024

Test Crew: T. Tong, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

OPEN 45° From Full open

Secondary: N/A

Tertiary/Pilot: N/A

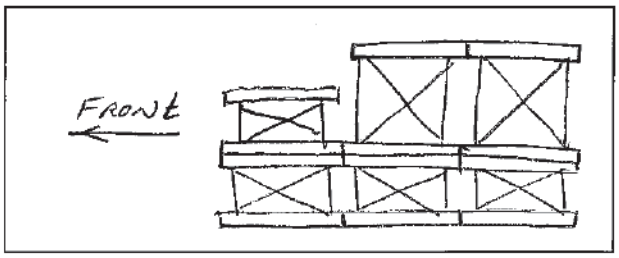
Fan: ON - Med High duration of test.

Preburn Notes

Time	Notes
	0.2 lb. Added to scale when Adding Flue gas probe.

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: open 1st 50 Sec

Fuel loaded by: 45 Sec

Door closed at: 50 Sec

Primary air: Medium high setting

Notes:

Time	Notes
17:45	Test started
18:45	1st hr Probe ended
21:40	Test completed

Technician Signature: K. Morgan Date: 3/6/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 4

Model: AF30.2 Tracking Number: 2254 Date: 03/06/2024

Test Crew: T. Tony, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 17:45 Booth #: 1

Stop Time: 21:40

Stack Gas Leak Check: **Sample Train Leak Check:** (PRE-Test)

Initial: ✓ Final: ✓

A: 0.000 @ 17.35 "Hg

B: 0.000 @ 18.38 "Hg

A 0.000 @ 23.16 "Hg

(Post-Test)

A Ø @ 6.14

B Ø @ 6.84

1st hr Ø @ 4.46

Calibrations: Span Gas CO_2: 16.86 % CO: 4.37 % CO 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	15:46	15:47	21:49	21:52
CO_2 %	0.00	16.86	0.00	16.88
CO %	0.00	4.39	0.00	4.39
CO ppm	0.0	498.0	0.0	499.3

Air Velocity (ft/min): Initial: 35 Final: 12

Scale Audit (lbs): Initial: 20 Final: 20.0

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 6

Induced Draft: 0.000

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 03/05/24 Initials: TT

	Initial	Middle	Ending
P_b (in/Hg)	30.09		30.11
RH (%)	29		29
Ambient (°F)	69		69

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
~~.077~~ .048	.096	80
.065	.130	80
.066	.132	80
.041	.082	80
.040	.080	80
.064	.128	80
~~.080~~ .065	~~.160~~ .130	80
.046	.092	80
Center:		
.077	0.154	80

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.50	-0.50

Background Filter Volume:

Technician Signature: K. Morgan Date: 3/6/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 4

Model: AF30.2 Tracking Number: 22554 Date: 03/06/2024

Test Crew: K. Morgan, T. Tong

OMNI Equipment ID numbers:

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0

Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16.75 in	22.5	7	16.75 in	19.9
2	16.75 in	23.8	8	16.75 in	22.2
3	16.75 in	22.5	9	16.75 in	~~19.9~~ 19.7 K
4	16.75 in	22.6	10	16.75 in	19.3
5	16.75 in	19.9	11	in	
6	16.75 in	23.2	12	in	

Total Pre-Burn Fuel Weight: 18.3 Pre-Burn Fuel Average Moisture: 21.56 % db

Time (clock): 15:44 Room Temperature (F): 67 Initials: K

Test Fuel

Firebox Volume (ft³): ~~2.91~~ 2.874 K Test Fuel Piece Length (in): 16.75

Load Weight Range (lb): ~~18.4 - 22.4~~ K Total Wet Fuel Load Weight (lb): 19.1

3.8 - 4.7

17.62% wb

7.13 dry Kg

3.8 - 5.7 lbs

3.93 lbs = 1.81 kg/hr

Fuel Type & Amount: 2 x 4: 4 4 x 4: 2

Weight (with spacers): 9.7 Weight (with spacers): 9.4

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	1.9 / 2.4	20.8	24.4	24.2	2x4
2	1.9 / 2.5	21.3	24.7	24.6	2x4
3	1.8 / ~~2.3~~ 2.4	19.3	22.5	23.0	2x4
4	1.8 / 2.4	22.3	22.8	18.9	2x4
5	4.2 / ~~4.7~~ 4.6	19.6	22.3	20.0	4x4
6	4.2 / ~~4.6~~ 4.7	21.9	21.7	23.8	4x4
7					

Spacer Moisture Readings (%DB)

strakers 3.3

18.1	24.2	18.0	12.7	23.3	25.8	20.3	19.7
16.6	20.1	12.5	23.1	15.1	23.8	19.2	12.0
18.7	15.0	18.8	19.4	23.8	14.3	25.0	10.6

Time (clock): 17:10 Room Temperature (F): 67 Initials: K

Technician Signature: K. Morgan Date: 3/6/24

1.81 @ ~~[illegible]~~ 2.25/2.25

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 4
Model: AF30.2 Tracking Number: 2254 Date: 03/06/2024
Test Crew: T. Tong K. Morgan
OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

1st hr Filter in 3/06/24 @ 18:55
A + B + Amb in at 3/06/24 @ 22:00

Assembled By: T. Tong

Date/Time in Dessicator: 3/06/24 22:00

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/06/24 18:55	3/11/24 9:16	3/11/24 16:15		
R/H %:		29	33		
Temp:		65	67		
200 mg Audit:		200.0	200.0		
2 g Audit:		2000.2	2000.3		
100 g Audit:		99997.7	99997.9		
Initials:		KL	KL		

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	✓ Front Filter	F258/A	239.2	240.0	239.8	239.9	—	
	Rear Filter							
	✓ Probe	38	114149.5	114149.5	114150.0	114149.9	—	
	✓ O-Ring Set	S677	3296.0	3297.1	3296.4	3296.5	—	
A	✓ Front Filter	F256/A	239.6	241.3	241.3	241.4	—	
	Rear Filter							
	✓ Probe	61	118128.1	118128.1	118128.7	118128.7	—	
	✓ O-Ring Set	S681	3278.8	3280.5	3279.3	3279.3	—	
B	✓ Front Filter	F257/A	239.2	240.4	240.7	240.6	—	
	Rear Filter							
	✓ Probe	75	117641.0	117640.9	117641.0	117640.8 →	117641.0 KL	—
	✓ O-Ring Set	S692	3435.4	3437.6	3436.5	3436.6	—	
BG	✓ Filter	F230	120.6	120.5	120.7	120.7	—	

Technician Signature: K. L. Morgan Date: 3/11/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	4

Sample calculations of each equation used in the refernced standards for this test run.

Summary of INPUT values necessary for calculations

	Global Input Parameters for Equations	Value	Source
FM_S	- Average moisture of test fuel spacers, % dry basis	18.75	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	3.3	Fuel Properties Work Sheet
M_{CPnwb}	- Weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis , kg	[1]Varies	Fuel Properties Work Sheet
FM_{CPn}	- Average fuel Fuel moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.441	Fuel Properties Work Sheet
V_{SCENT}	- Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse, ft/sec	0.00	Traverse Worksheet
V_{STRAV}	- Average gas velocity calculated after the multipoint Pitot traverse	18.34	Traverse Worksheet
θ	- Duration of test, min	236	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.10	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.5	*Traverse Worksheet*

[1] *Denotes that this pararmeter for each individual piece of fuel is calculated in the Test Fuel Properties worksheet and the input values are pulled into these sample caculations.*

	Sample Train Input Parameters for Equations	Train A	Train B	Train C	Train D
V_m	- Volume of gas sample measured at the dry gas meter, dcf	32.914	33.746	8.451	34.019
Y	Dry gas meter calibration factor	1.016	1.011	1.015	1.011
ΔH	- Average pressure differential across the orifice meter, in. H_2O	0.94	0.72	1.67	1.40
T_m	- Temperature of Dry Gas Meter, °F	76.7	77.2	67.5	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.6	0.0	0.4	n/a
m_f	- mass of particulate matter from filters, mg	1.8	1.4	0.7	0.1
m_g	- mass of particulate matter from filter seals, mg	0.5	1.2	0.5	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.6	0.0	0.4	n/a
m_f	- mass of particulate matter from filters, mg	1.8	1.4	0.7	n/a
m_g	- mass of particulate matter from filter seals, mg	0.5	1.2	0.5	n/a

M_{Sdb} – Weight of test fuel spacers, dry basis, kg - ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})\left(\frac{100}{100 + FM_S}\right)$$

Where,

FM_S = average moisture of test fuel spacers, % dry basis
M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 18.75 %, dry basis
M_{Swb} = 3.3 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((3.3 x 0.4536) (100 / (100 + 18.75))

M_{Sdb} = **1.260** kg

MCdb– Weight of test fuel crib, excluding nails and spacers, dry basis, kg - ASTM E2780 equation (2)

$$M_{Cdb} = \sum (M_{CPnwb})\left(\frac{100}{100 + FM_{CPn}}\right)$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation:

ΣM_{CPnwb} = 15.8 lb.
FM_{CPn} = 22.12 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 15.8 x 0.4536 x (100 / (100 + 22.1166666666667))

M_{Cdb} = **5.87** kg

DCdb - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft3 - ASTM E2780 equation (3)

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

Where,

V_C = Volume of Fuel Crib, ft^3 (less spacers)

Sample Calculation:

M_{Cdb} = 12.94 lb
V_C = 0.441 ft^3

D_{Cdb} = 12.94 / 0.441

D_{Cdb} = **29.34** lb/ft^3

M_{FTAdb} - Total weight of fuel crib including spacers and nails, dry basis - ASTM E2780 equation (4)

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

Sample Calculation:

M_{Sdb} = 1.260
M_{Cdb} = 5.87

M_{FTAdb} = 1.26 + 5.87

M_{FTAdb} = **7.13** kg

BR – dry burn rate, kg/hr - ASTM E2780 equation (5)

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

Sample Calculation:

M_{FTAdb} = 7.129
θ = 236

BR = (60 x 7.129) / 236

BR = **1.81** kg / hr

***Vs* – Average gas velocity in the dilution tunnel, ft/sec -** ASTM E2515 equation (9)

$$V_S = F_P \times K_P \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where

F_P = Adjustment factor for center of tunnel pitot tube placement, where $F_P = V_{STRAV} / V_{SCENT}$

V_{SCENT} = Dilution tunnel velocity, at the center, ft/sec

V_{STRAV} = Dilution tunnel velocity, multi-point pitot traverse, ft/sec

K_P = Pitot tube constant, 85.49

C_P = Pitot tube coefficient: 0.99, unitless

$\Delta P^{1/2}_{AVG}$ = Velocity pressure in the dilution tunnel, in H_2O

$T_{S\,(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R

P_S = Absolute average gas static pressure in tunnel, = Pbar + Pg , where Pbar = Barometric Pressure, in. Hg, Pg = Static pressure in tunnel, Hg (in H_2O / 13.6)

M_S = The dilution tunnel wet molecular weight; Ms = 28.78 assuming a dry weight of 29 lb/lb-mole

(Duration of Test)

F_P = 0.8360

$\Delta P^{1/2}_{AVG}$ = 0.3943

$T_{S\,(avg)}$ = 543.0886

Pbar = 30.1000

Pg = -0.5000

Ps = 30.0632

V_S = 0.836 x 85.49 x 0.99 x 0.394 x √ [(543 / (30.06 x 28.78)]

V_S = **22.101** ft/sec

(First Hour of Test)

F_P = 0.8360

$\Delta P^{1/2}_{AVG}$ = 0.3944

$T_{S\,(avg)}$ = 546.9016

Pbar = 30.0900

Pg = -0.5000

Ps = 30.0532

V_S = 0.836 x 85.49 x 0.99 x 0.394 x √ [(547 / (30.05 x 28.78)]

V_S = **22.191** ft/sec

Q_{std} – Average gas flow rate in dilution tunnel, dscf/hr - ASTM E2515 equation (3)

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

Where:

3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
A = Cross sectional area of dilution tunnel, ft2
T_{std} = solute temperature, 528 °R
P_s = Absolute average gas static pressure in dilution tunnel, = Pbar + Pg , in Hg
$T_{s(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std} = Standard absolute pressure, 29.92 in Hg

(Duration of Test):

B_{ws} = 0.02
A = 0.19635
P_s = 30.06
$T_{s(avg)}$ = 543
Vs = 22.10

Qstd = 3600 x (1 - 0.02) x 22.101 x 0.19635 x (528 / 543) x (30.06 / 29.92)

Qstd = **14955.9** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 30.05
$T_{s(avg)}$ = 547
Vs = 22.191

Qstd = 3600 x (1 - 0.02) x 22.191 x 0.1963 x (528 / 547) x (30.05 / 29.92)

Qstd = **14907.2** dscf/hr

Vm(std) – Volume of Gas Sampled (Corrected), 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
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Train A

$$V_{m(std)} = 17.64 \times 32.914 \times 1.016 \times \frac{(30.10 + \frac{0.94}{13.6})}{(76.7 + 460)}$$

$V_{m(std)}$ = **33.157** dscf

Train B

$$V_{m(std)} = 17.64 \times 33.746 \times 1.011 \times \frac{(30.10 + \frac{0.72}{13.6})}{(77 + 460)}$$

$V_{m(std)}$ = **33.784** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 8.45 \times 1.015 \times \frac{(\underline{30.09} + \frac{1.67}{13.6})}{(67.5 + 460)}$$

$V_{m(std)}$ = **8.666** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 34.02 \times 1.011 \times \frac{(\underline{30.10} + \frac{1.40}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **33.997** dscf

mn – 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 Calculations (Uncorrected):

Train A

m_n = 0.6 + 1.8 + 0.5

m_n = **2.9** mg

Train B

m_n = 0.0 + 1.4 + 1.2

m_n = **2.6** mg

Train C (1st hour)

m_n = 0.4 + 0.7 + 0.5

m_n = **1.6** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

Sample Calculations (Corrected):

Train A

m_n = 0.6 + 1.8 + 0.5

m_n = **2.9** mg

Train B

m_n = 0.0 + 1.4 + 1.2

m_n = **2.6** mg

Train C (1st hour)

m_n = 0.4 + 0.7 + 0.5

m_n = **1.6** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions

g/dscf - ASTM E2515 equation (13)

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

Where:

K_2 = Constant, 0.001 g/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample Calculations (Uncorrected):

Train A

$$C_s = 0.001 \times \frac{2.9}{33.16}$$

C_s = **0.000087** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.6}{33.78}$$

C_s = **0.0000770** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.6}{8.67}$$

Cs = **0.000185** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{34.00}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{2.9}{33.16}$$

C_s = **0.000087** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.6}{33.78}$$

C_s = **0.0000770** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.6}{8.67}$$

Cs = **0.000185** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{34.00}$$

C_r = **0.000000** g/dscf

ET – Total Particulate Emissions, g - ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculations (uncorrected)

Train A

E_T = (0.000087 - 0.000000) x 14955.9 x 236 / 60

E_T = **5.15** g

Train B

E_T = (0.000077 - 0.000000) x 14955.9 x 236 / 60

E_T = **4.53** g

First Hour

E_T = (0.000185 - 0.000000) x 14907.2 x 60 / 60

E_T = 2.75 g

Trains A and B Average

E = **4.84** g

Sample calculations (Corrected)

Train A

E_T = (0.000087 - 0.000000) x 14955.9 x 236 / 60

E_T = **5.15** g

Train B

E_T = (0.000077 - 0.000000) x 14955.9 x 236 / 60

E_T = **4.53** g

First Hour

E_T = (0.000185 - 0.000000) x 14907.2 x 60 / 60

E_T = **2.75** g

Trains A and B Average

E_T = **4.84** g

PM_R – Particulate emissions for test run, g/hr - ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation (Uncorrected)

Train A

E_T = 5.15 g

θ = 236 min

PM_R = 60 x (5.15 / 236)

PM_R = **1.31** g/hr

Train B

E_T = 4.53 g

θ = 236 min

PM_R = 60 x (4.53 / 236)

PM_R = **1.15** g/hr

A and B Average

E_T = **1.23** g/hr

First Hour

E_T = 2.75 g

θ = 60 min

PM_R = 60 x (2.75 / 60)

PM_R = **2.75** g/hr

Sample Calculation (Corrected)

Train A

E_T = 5.15 g

θ = 236 min

PM_R = 60 x (5.15 / 236)

PM_R = **1.31** g/hr

Train B

E_T = 4.53 g

θ = 236 min

PM_R = 60 x (4.53 / 236)

PM_R = **1.15** g/hr

A and B Average

E_T = **1.23** g

First Hour

E_T = 2.75 g

θ = 60 min

PM_R = 60 x (2.75 / 60)

PM_R = **2.75** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned - ASTM E2780 equation (7)

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

Sample Calculation (Uncorrected)

Train A

E_T = 5.15 g
M_{FTAdb} = 7.13 kg
PM_F = 5.15 / 7.13
PM_F = **0.72** g/kg

Train B

E_T = 4.53 g
M_{FTAdb} = 7.13 kg
PM_F = 4.53 / 7.13
PM_F = **0.64** g/kg

Sample Calculation (Corrected)

Train A

E_T = 5.15 g
M_{FTAdb} = 7.13 kg
PM_F = 5.15 / 7.13
PM_F = **0.72** g/kg

Train B

E_T = 4.53 g
M_{FTAdb} = 7.13 kg
PM_F = 4.53 / 7.13
PM_F = **0.64** g/kg

PR - Proportional Rate Variation - ASTM E2515 equation (16)

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

Where:			Train A	Train B	Train C
θ	=	Total sampling time, min	236	236	60
θ_i	=	Length of recording interval, min	1	1	1
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.139	0.143	0.139
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	32.914	33.746	8.451
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	22.620	22.620	22.620
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	22.103	22.103	22.196
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	532.0	532.0	527.0
T_m	=	Absolute average dry gas meter temperature, ^oR	536.7	537.2	527.5
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	567.0	567.0	567.0
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	543.1	543.1	546.9

NOTE: These sample calculations are for the Second interval of each train)

Train A PR = $\left(\frac{236 \text{ x } 0.139 \text{ x } 22.103 \text{ x } 537 \text{ x } 567}{1 \text{ x } 32.914 \text{ x } 22.62 \text{ x } 532 \text{ x } 543}\right)$ X 100 = 102.6 %

Train B PR = $\left(\frac{236 \text{ x } 0.143 \text{ x } 22.103 \text{ x } 537 \text{ x } 567}{1 \text{ x } 33.746 \text{ x } 22.62 \text{ x } 532 \text{ x } 543}\right)$ X 100 = 103.0 %

Train B PR = $\left(\frac{60 \text{ x } 0.139 \text{ x } 22.196 \text{ x } 528 \text{ x } 567}{1 \text{ x } 8.451 \text{ x } 22.62 \text{ x } 527 \text{ x } 547}\right)$ X 100 = 100.5 %

Run 5 Test Data

Test Date:	3/7/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	Ashford 30.2

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Project No.: 0142WS021E
Tracking No.: BK30.2
Run: 5
Test Date: 03/07/24

Burn-Rate Result

1.31 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	2.41	2.47	2.72	2.72
Emission Rate, g/hr	**0.46**	0.47	**2.72**	2.72
Emissions Factor, g/kg	0.35	0.36	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		86.6	81.0
Average Tunnel Gas Velocity (vs), feet/second		19.273	19.259
Average Tunnel Gas Flow Rate(Qsd)	DSCF/hr	13014.2	13141.9
	DSCF/min	216.9	219.0
Average Delta p, in. H2O		0.123	0.124
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	316

Particulate Sample Measurement Parameters

	Uncorrected				*Corrected*			
	AMBIENT	Train A	Train B	First Hour	AMBIENT	Train A	Train B	First Hour
Total Sample Volume (V_m), ft^3	58.771	51.116	51.882	9.723	58.771	51.116	51.882	9.723
Average Gas Meter Temperature, °F	79	78	78	67	79	78	78	67
Total Sample Volume (V_{mstd}), DSCF	58.989	51.610	52.064	10.037	58.989	51.610	52.064	10.037
Total Particulates (mn), mg - m_n	0.1	2.1	1.5	2.1	0.1	2.1	1.6	2.1
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00004	0.00003	0.00021	0.00000	0.00004	0.00003	0.00021
Total Particulate Emissions (ET), grams	n/a	2.82	1.99	2.72	n/a	2.82	2.13	2.72
Particulate Emission Rate, g/hr	n/a	0.53	0.38	2.72	n/a	0.53	0.40	2.72
Emissions Factor, g/kg	n/a	0.41	0.29	n/a	n/a	0.41	0.31	n/a
Difference, ET from from Average ET, grams	n/a	0.41	-0.41	n/a	n/a	0.34	-0.34	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	70	69	69	✓
Filter Face Velocity, fpm	< 30	8.84	8.73	8.89	✓
Dryer Exit Temperature, °F	< 80	64	54	56	✓
Tunnel Velocity, fpm	>800	1,156	1,156		✓
First Hour Leakage	0.006	0.003			✓
Train A Leakage Rate	0.006		0.000		✓
Train B Leakage Rate	0.007			0.000	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.6	0.4	0.4	✓
Pro-Rate Variation	< 90 for < 10% of θ	0.00%	0.00%	0.00%	✓
	> 110 for < 10% of θ	0.00%	0.000%	0.00%	✓
	# Readings < 80%	0	0	0	✓
	# Readings > 120%	0	0	0	✓
Ambient Temp, °F	> 55		69		✓
Ambient Temp, °F	< 90		72		✓
Trains A and B Precision	(*A*) < 7.5%		17.09%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.12		✓
Stove Surface ΔT	<= 125 °F		34		✓
Room Air Velocity	< 50 fpm		12		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	5
Test Date:	3/7/2024

Efficiency results reported herein are based on a stack-loss method in accordance with CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". OMNI uses the spreadsheet provided by CSA that is to be used in conjunction with the current version of the test standard. The most recent version of the software is version 2.4, dated April 15, 2010. OMNI received confirmation from CSA on October 18, 2023 that this is the current version of the software.

Stack Loss Efficiency

Manufacturer: Valley Comfort
Model: AF30.2
Date: 03/07/24
Run: 5
Control #: 2254
Test Duration: 316
Output Category: III

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	83.2%	89.9%
Combustion Efficiency	98.8%	98.8%
Heat Transfer Efficiency	84%	91.0%

Output Rate (kJ/h)	21,643	20,531	**(Btu/h)**
Burn Rate (kg/h)	1.31	2.90	**(lb/h)**
Input (kJ/h)	26,025	24,688	**(Btu/h)**

Test Load Weight (dry kg)	6.92	15.25	**dry lb**
MC wet (%)	17.57		
MC dry (%)	21.32		
Particulate (g)	2.41		
CO (g)	122		
Test Duration (h)	5.27		

Emissions	**Particulate**	**CO**
g/MJ Output	0.02	1.07
g/kg Dry Fuel	0.35	17.68
g/h	0.46	23.22
lb/MM Btu Output	0.05	2.49

Air/Fuel Ratio (A/F)	8.41

VERSION: **2.4** **4/15/2010**

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	AF30.2				
Date:	3/7/2024		**Temp. Units**	F	(F or C)
Run:	5		**Weight Units**	lb	(kg or lb)
Control #:	2254				
Test Duration:	316				
Output Category:	III		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.57		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	18.50		**%C**	48.73	
Burn Rate (dry kg/h):	1.31		**%H**	6.87	
Total Particulate Emissions:	2.41 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.17**	**13.43**	**#DIV/0!**	**233.97**	**70.57**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	18.50	0.29	1.80		247.0	69.0
1	18.50	0.23	1.34		256.0	69.0
2	18.40	0.01	6.95		246.0	69.0
3	18.30	0.01	9.05		246.0	69.0
4	18.20	0.01	9.37		251.0	69.0
5	18.10	0.01	9.44		255.0	69.0
6	18.00	0.01	9.51		258.0	69.0
7	18.00	0.01	9.43		261.0	69.0
8	17.90	0.01	10.35		263.0	69.0
9	17.80	0.01	9.99		265.0	69.0
10	17.70	0.01	10.66		268.0	69.0
11	17.50	0.43	15.15		276.0	69.0
12	17.40	0.79	16.00		288.0	69.0
13	17.30	0.17	15.17		293.0	69.0
14	17.10	0.05	15.15		298.0	69.0
15	17.00	0.10	14.82		305.0	69.0
16	16.80	0.01	14.13		306.0	69.0
17	16.70	0.01	12.18		306.0	69.0
18	16.60	0.01	11.24		303.0	70.0
19	16.50	0.01	11.33		300.0	69.0
20	16.40	0.01	11.88		302.0	69.0
21	16.20	0.01	12.20		303.0	69.0
22	16.10	0.01	12.84		304.0	69.0
23	16.00	0.01	13.07		305.0	70.0
24	15.90	0.01	13.60		305.0	69.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	15.70	0.56	14.56		309.0	69.0
26	15.60	1.27	16.42		313.0	69.0
27	15.40	0.62	16.44		316.0	69.0
28	15.20	0.26	17.09		318.0	69.0
29	15.10	0.67	17.08		319.0	70.0
30	14.90	0.70	17.22		319.0	70.0
31	14.80	0.42	16.91		321.0	70.0
32	14.60	0.20	16.68		319.0	70.0
33	14.50	0.36	16.57		317.0	70.0
34	14.30	0.77	16.66		316.0	70.0
35	14.20	0.89	16.32		314.0	70.0
36	14.10	0.36	15.77		313.0	70.0
37	13.90	0.22	14.88		311.0	70.0
38	13.80	0.09	14.30		306.0	70.0
39	13.70	0.05	13.94		302.0	70.0
40	13.60	0.03	13.75		299.0	70.0
41	13.50	0.03	13.67		296.0	71.0
42	13.40	0.03	13.29		293.0	71.0
43	13.30	0.01	13.08		291.0	71.0
44	13.20	0.01	13.36		288.0	71.0
45	13.10	0.01	13.62		287.0	71.0
46	13.00	0.01	13.66		286.0	71.0
47	12.90	0.01	14.11		286.0	71.0
48	12.80	0.01	14.27		285.0	71.0
49	12.70	0.01	14.38		285	71
50	12.60	0.00763	14.23		283	71
51	12.50	0.01	13.54		282	71
52	12.40	0.01	12.86		279	71
53	12.30	0.01	13.17		276	71
54	12.20	0.08	13.31		275	71
55	12.10	0.18	13.42		275	71
56	12.10	0.17	13.55		276	71
57	12.00	0.27	13.62		275	71
58	11.90	0.22	13.86		275	71
59	11.80	0.17	13.9		273	71
60	11.70	0.11	13.99		272	70
61	11.60	0.17	14.2		271	71
62	11.50	0.28	14.61		272	71
63	11.40	0.3	14.73		270	70
64	11.30	0.32	14.69		271	70
65	11.20	0.34	15.08		273	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	11.20	0.29	15.24		273	70
67	11.10	0.23	14.79		273	71
68	11.00	0.16	14.91		270	70
69	10.90	0.18	15.23		269	71
70	10.80	0.32	15.2		270	71
71	10.70	0.43	15.16		271	71
72	10.60	0.46	14.9		271	71
73	10.50	0.46	15.34		270	71
74	10.50	0.46	15.32		268	71
75	10.40	0.41	15.23		267	71
76	10.30	0.46	15.2		266	71
77	10.20	0.47	15.02		266	71
78	10.10	0.49	15.22		267	71
79	10.00	0.47	14.8		266	71
80	10.00	0.48	14.71		264	71
81	9.90	0.44	14.36		264	72
82	9.80	0.33	14.62		262	71
83	9.70	0.41	14.79		262	71
84	9.60	0.43	14.79		261	71
85	9.60	0.12	15.32		256	71
86	9.50	0.13	15.36		258	71
87	9.40	0.18	15.84		260	71
88	9.30	0.31	16.02		260	70
89	9.20	0.49	16.3		263	70
90	9.10	0.56	16.36		262	70
91	9.00	0.61	16.27		261	70
92	8.90	0.65	16.45		260	70
93	8.80	0.57	16.28		260	71
94	8.70	0.5	16.29		258	70
95	8.70	0.62	16.41		258	70
96	8.60	0.58	16.41		257	71
97	8.50	0.58	16.4		253	70
98	8.40	0.57	16.08		251	70
99	8.30	0.52	15.73		249	70
100	8.30	0.57	15.79		249	71
101	8.20	0.68	15.9		247	71
102	8.10	0.52	15.78		245	71
103	8.00	0.5	15.47		245	71
104	8.00	0.48	14.96		242	71
105	7.90	0.49	15.38		239	71
106	7.80	0.29	14.78		238	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	7.70	0.26	15.21		237	70
108	7.70	0.19	15.56		236	70
109	7.60	0.2	15.45		235	70
110	7.50	0.39	15.5		234	70
111	7.50	0.37	15.23		235	70
112	7.40	0.41	15.82		235	70
113	7.30	0.32	15.33		235	70
114	7.30	0.29	14.99		234	70
115	7.20	0.27	15.27		233	70
116	7.10	0.36	15.75		231	70
117	7.10	0.51	15.15		226	70
118	7.00	0.94	15.49		222	70
119	7.00	0.99	15.3		219	70
120	6.90	0.85	15.49		220	71
121	6.90	0.78	15.45		217	71
122	6.80	0.75	15.44		215	71
123	6.80	0.61	15.5		213	71
124	6.70	0.51	15.61		213	71
125	6.70	0.49	15.12		212	71
126	6.60	0.6	15.2		212	71
127	6.60	0.55	14.83		211	71
128	6.50	0.63	14.55		208	70
129	6.50	0.55	14.45		208	70
130	6.40	0.55	14.78		207	71
131	6.40	0.12	14.69		207	71
132	6.30	0.01	14.68		205	71
133	6.30	0.01	13.81		205	71
134	6.30	0.01	14.03		205	71
135	6.20	0.01	13.94		205	71
136	6.20	0.01	13.94		205	70
137	6.10	0.01	13.89		205	70
138	6.10	0.01	13.88		206	71
139	6.00	0.01	14.11		205	70
140	6.00	0.01	13.86		206	70
141	5.90	0.01	13.81		211	70
142	5.90	0.01	13.97		209	71
143	5.90	0.01	14.12		212	71
144	5.80	0.01	14.58		212	71
145	5.80	0.19	14.94		213	71
146	5.70	0.27	14.57		215	71
147	5.60	0.35	15.29		215	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	5.60	0.4	15.27		216	70
149	5.60	0.37	15.32		218	70
150	5.50	0.4	15.24		218	71
151	5.40	0.38	14.68		220	71
152	5.40	0.27	15.06		220	71
153	5.30	0.22	14.69		219	71
154	5.30	0.11	14.42		219	70
155	5.20	0.06	13.71		217	71
156	5.20	0.05	13.99		218	71
157	5.20	0.02	13.3		217	71
158	5.10	0.03	13.6		216	71
159	5.10	0.02	13.72		215	71
160	5.00	0.02	13.52		215	71
161	5.00	0.02	13.68		213	71
162	5.00	0.01	13.35		213	71
163	4.90	0.01	13.12		215	71
164	4.90	0.01	13.22		213	72
165	4.80	0.01	13.53		214	71
166	4.80	0.01	13.47		214	71
167	4.80	0.02	13.55		214	72
168	4.70	0.02	13.48		213	72
169	4.70	0.01	13.55		214	71
170	4.60	0.01	13.27		215	71
171	4.60	0.01	13.42		214	71
172	4.60	0.01	12.97		215	71
173	4.50	0.00864	13.02		215	71
174	4.50	0.00874	12.9		215	72
175	4.50	0.00803	12.72		215	71
176	4.40	0.00766	12.59		215	72
177	4.40	0.00763	12.47		217	72
178	4.40	0.00757	12.45		216	71
179	4.30	0.00731	12.63		216	71
180	4.30	0.00741	12.46		217	71
181	4.20	0.00724	12.42		216	71
182	4.20	0.00718	12.47		218	71
183	4.20	0.00728	12.43		218	71
184	4.10	0.00744	12.68		219	71
185	4.10	0.0076	12.84		219	71
186	4.10	0.00741	12.68		220	70
187	4.00	0.00783	12.84		221	70
188	4.00	0.0076	13.14		220	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	3.90	0.00776	13.59		219	70
190	3.90	0.00757	13.75		220	70
191	3.80	0.00744	13.68		223	71
192	3.80	0.0076	14.03		223	70
193	3.80	0.00673	14.38		221	71
194	3.70	0.00718	14.32		223	71
195	3.70	0.00706	14.99		224	71
196	3.60	0.00724	15.42		225	71
197	3.60	0.01	15.59		225	71
198	3.50	0.01	15.66		228	71
199	3.40	0.03	15.45		229	71
200	3.40	0.07	15.99		228	71
201	3.30	0.25	15.8		230	71
202	3.30	0.49	15.84		230	71
203	3.20	0.69	15.56		230	71
204	3.20	0.91	15.57		228	71
205	3.10	0.82	14.95		229	71
206	3.10	1.14	16.1		225	71
207	3.00	0.9	15.37		224	71
208	2.90	0.84	14.8		222	71
209	2.90	0.72	14.61		219	71
210	2.80	0.48	14.51		217	71
211	2.80	0.43	14.29		215	71
212	2.80	0.28	14.1		212	71
213	2.70	0.17	13.61		208	71
214	2.70	0.08	13.27		207	72
215	2.70	0.02	13.07		206	72
216	2.60	0.01	13.17		203	72
217	2.60	0.00582	12.88		201	71
218	2.60	0.00501	12.65		199	71
219	2.60	0.00479	12.07		195	71
220	2.50	0.00492	12.43		194	71
221	2.50	0.00469	12.01		193	71
222	2.50	0.00492	11.71		192	71
223	2.50	0.00508	11.95		190	71
224	2.50	0.00527	12.14		188	71
225	2.40	0.00527	12		188	71
226	2.40	0.00527	12.1		187	71
227	2.40	0.00543	12.15		186	72
228	2.40	0.00563	12.35		188	72
229	2.30	0.00562	12.25		187	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	2.30	0.00553	11.99		189	72
231	2.30	0.00582	12.4		188	71
232	2.30	0.00569	12.38		189	72
233	2.30	0.00585	12.5		189	72
234	2.20	0.00585	12.45		191	72
235	2.20	0.00572	12.26		190	72
236	2.20	0.00553	12.38		192	72
237	2.20	0.00559	12.35		194	71
238	2.10	0.00025	2.67		197	71
239	2.10	0.00559	12.37		198	71
240	2.10	0.00547	12.11		200	71
241	2.10	0.0055	11.94		202	72
242	2.00	0.00562	12.22		200	72
243	2.00	0.00562	12.13		201	72
244	2.00	0.00543	12.11		203	72
245	2.00	0.00553	12.19		203	72
246	1.90	0.00553	11.94		204	71
247	1.90	0.00556	12.05		205	71
248	1.90	0.0055	12.07		206	71
249	1.90	0.00562	11.97		207	71
250	1.80	0.00543	11.7		208	72
251	1.80	0.00553	11.97		209	72
252	1.80	0.00572	11.82		208	72
253	1.80	0.00553	11.68		209	72
254	1.70	0.00562	11.7		209	71
255	1.70	0.00556	11.54		210	71
256	1.70	0.00566	11.72		210	72
257	1.70	0.00543	11.63		210	72
258	1.60	0.00527	11.64		212	71
259	1.60	0.00534	11.5		212	71
260	1.60	0.00527	11.36		212	71
261	1.60	0.00527	11.27		213	71
262	1.50	0.0054	11.36		212	72
263	1.50	0.0054	11.17		212	72
264	1.50	0.0054	11.36		211	71
265	1.50	0.0055	11.55		212	71
266	1.40	0.00547	11.57		213	71
267	1.40	0.00547	11.74		213	71
268	1.40	0.0054	11.61		213	71
269	1.40	0.00546	11.52		212	71
270	1.30	0.00556	11.59		212	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	1.30	0.00553	11.36		212	70
272	1.30	0.00546	11.4		213	71
273	1.30	0.00524	11.29		213	71
274	1.20	0.00517	11.02		213	71
275	1.20	0.0053	11.06		212	71
276	1.20	0.00534	11.18		214	71
277	1.20	0.0055	11.09		214	71
278	1.10	0.00562	11.29		214	71
279	1.10	0.00553	11.18		213	70
280	1.10	0.00559	11.36		212	71
281	1.00	0.0055	11.56		214	70
282	1.00	0.00527	11.73		214	70
283	1.00	0.00524	11.57		213	70
284	1.00	0.00498	11.54		213	70
285	0.90	0.00482	11.81		215	70
286	0.90	0.00485	11.78		213	70
287	0.90	0.00465	11.77		213	70
288	0.80	0.00446	11.94		213	70
289	0.80	0.00446	11.91		213	71
290	0.80	0.00446	11.88		213	69
291	0.80	0.00423	11.63		214	70
292	0.70	0.00436	11.85		212	70
293	0.70	0.00407	11.96		211	70
294	0.70	0.00398	11.82		211	70
295	0.60	0.00407	11.78		213	69
296	0.60	0.00414	11.98		210	70
297	0.60	0.00414	11.96		211	70
298	0.60	0.0043	11.72		211	70
299	0.50	0.00436	11.83		210	70
300	0.50	0.00423	11.96		209	70
301	0.50	0.00433	11.72		210	70
302	0.40	0.00433	11.97		208	70
303	0.40	0.00446	11.88		207	69
304	0.40	0.00427	11.93		209	69
305	0.40	0.0043	12.07		207	69
306	0.30	0.00433	12.01		208	70
307	0.30	0.00427	12.1		209	69
308	0.30	0.00437	12.28		208	69
309	0.30	0.00443	12.2		207	69
310	0.20	0.00449	12.12		205	69
311	0.20	0.00459	12.05		204	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	0.20	0.00456	12.04		205	69
313	0.20	0.00462	11.89		205	69
314	0.10	0.00465	11.83		204	69
315	0.10	0.00465	11.88		203	69
316	0.00	0.00482	11.76		203	69

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : Ashford 30.2
Tracking No. : BK30.2
Project No. : 0142WS021E
Test Date : 3/7/2024
Run No. : 5

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.874** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 20.118 lb.
Minimum Fuel Weight : 18.11 lb.
Maximum Fuel Weight : 22.13 lb.

Fuel Piece Data

PC #	Weight, lb	Size	Length, In	Moisture Readings, Dry Basis %			Average MC, % db	Dry Weight, lb.	Volume, ft3	Wet Weights, lb 4 x 4	Wet Weights, lb 2 x 4	Dry Weights, lb 4 x 4	Dry Weights, lb 2 x 4
1	2.00	2x4	16.75	24.3	24.3	24.7	24.4	1.61	0.0509		2.0		1.61
2	1.80	2x4	16.75	21.9	22.2	22.0	22.0	1.48	0.0509		1.8		1.48
3	1.80	2x4	16.75	22.7	23.1	23.2	23.0	1.46	0.0509		1.8		1.46
4	3.90	4x4	16.75	23.8	22.5	19.1	21.8	3.20	0.1187	3.9		3.20	
5	3.80	4x4	16.75	22.3	22.5	22.4	22.4	3.10	0.1187	3.8		3.10	
6	1.90	2x4	16.75	19.1	19.9	20.7	19.9	1.58	0.0509		1.9		1.58
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
15.2	19.9	17.9	16.3	11.2	16.3			
17.1	17.5	20.7	17.8	20.9	10.4			
13.2	14.1	18.0	23.9	17.2	15.8			
15.1	22.7	15.6	21.0	19.4	18.8			

Avg : 17.3

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.50	2x4		2.5000
2	2.40	2x4		2.4000
3	2.30	2x4		2.3000
4	4.50	2x4		4.5000
5	4.40	4x4	4.40	
6	2.40	4x4	2.40	
7				
8				
9				

Combined Mass of 4 x 4s 6.8 lb
Combined Mass of 2 x 4s 11.7 lb

Total Wet Mass of Fuel Load **18.5** lb

Fuel Load Properties

Type	*Number of Pieces*	*Wet Weight, lb.*	*Dry Weight, lb.*	*Fuel Loading Density, lb/ft³* Wet Basis	*Fuel Loading Density, lb/ft³* Dry Basis	Dry Fuel Density, lb/ft^3	Wet Fuel Density, lb/ft^3	*Moisture, %* Dry Basis	*Moisture, %* Wet Basis
2 x 4	4	7.5	6.13	6.44	5.31	28.20	34.46	21.32	17.57
4 x 4	2	7.7	6.31						
Spacers	24	3.3	2.81						
Totals		18.5	15.25						

Compliance Checks

	Fuel Load, Wet Lb.	Load Density, lb/ft^3 of FB vol	Fuel Density, lb/ft^3	% of Fuel load mass which is 2x4	Fuel Load Peices Mositure, % db
Measured	18.5	6.44	28.20	63	22.3
Required	18.1 - 22.1	6.3 - 7.7	25 - 36	35 - 65	19 -25
Complies ?	Yes	Yes	Yes	Yes	Yes

Dilution Tunnel Velocity Traverse and Supplementary Data

ASTM E2515-11

Run:	5	Tracking No.:	BK30.2
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WS021E
Model:	Ashford 30.2	Test Date:	3/7/2024

Dillution Tunnel Velocity Traverse

Pitot Location

Traverse Point	*% of Diameter*	*Inches into Tunnel*	*dP in. H_2O*	*Tunnel Temp, °F*	*$dP^{1/2}$*
X1	6.7	0.5 *	0.074	78	0.272
X2	25.0	0.00	0.106	78	0.326
X3	75.0	0.00	0.104	78	0.322
X4	93.3	-0.5 *	0.064	79	0.253
Y1	6.7	0.5 *	0.072	79	0.268
Y2	25.0	0.00	0.102	79	0.319
Y3	75.0	0.00	0.090	79	0.300
Y4	93.3	-0.5 *	0.060	79	0.245
Center	50.0	0.00	0.124	79	0.352

Tunnel Static Pressure	-0.400	*in. H_2O*
Tunnel Moisture	2.00	%
Tunnel Diameter	6.00	inches
Pitot Tube C_p	0.99	inches
Tunnel Molecular Weight	29	(dry)
Tunnel Molecular Weight	28.78	(M_s, wet)
Tunnel Area	0.19634954	*ft^2*
K_p	85.49	constant
$P_s=P_{bar}$+Tunnel Static	30.1905882	in HG

** Probe location must be no closer than 0.50 in to tunnel wall*

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 19.2057$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 23.4733$$

$$F_P = V_{strav} / V_{scent} = 0.818$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 15.714\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	14:59	20:15
Barometric Pressure, in. Hg	30.22	30.23
Room Air Velocity, fpm	12	6
Room Air Temperature, °F	69	67
Room Relative Humidity, %	27.0	27.0
Platform Scale Audit, lb.	20.0	20.0

Leak Checks

Pitot and associated tubing, (pass/fail)[1]	Pass	Pass

See sampling box worksheets for sampling boxes

Dillution Tunnel

Date last cleaned	3/5/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

1 Both sides (independantly) of the pitot system are brought under a minimum vacuum of 3 in. H_2O and then sealed. Any indiction of pressure loss is deemed a fail.

2 Create a smoking condition during start of pre-burn activites and using adequate lighting pointed upward and aroud tunnel hood, visually observe if 100% of visible smoke is being captured by the hood. If not, increase flow tunnel flow and / or re-assess chimney proximity to draft hood as required and repeat until 100% capture is observed.

3 With the appliance installed and the dillution tunnel flow turned-off, observe the flue draft gauge while turning the dulution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducemnt is occuring. Determine the cause (i.e. flue chimnet too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 5

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E
Test Date: 3/7/24
Beginning Clock Time: 14:59

Coal Bed Range (lb):	3.7 (min)	4.6 (max)

Preburn Fuel Data

10 pieces @ 16.75 inches
____ pieces @ ____ inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

21.3	20.3					
24.7	18.1					
26.5	20.6					
24.9	22.2					
23	23					

Avg Preburn Moisture (% DB): **22.46**

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
0	5.8	-0.07	844	413	443	298	578	1081	515	328	73
1	5.5	-0.068	836	413	442	295	575	1034	512	280	73
2	5.4	-0.067	826	414	440	299	569	999	510	244	73
3	5.3	-0.065	816	414	438	298	562	976	506	219	73
4	5.3	-0.062	805	415	435	298	554	959	501	200	73
5	5.2	-0.06	795	415	433	294	546	943	497	187	73
6	5.2	-0.058	785	415	430	293	537	930	492	176	73
7	5.2	-0.058	775	416	428	293	532	918	489	167	73
8	5.2	-0.056	765	416	425	292	522	907	484	160	73
9	5.1	-0.055	756	416	422	293	515	896	480	154	73
10	5.1	-0.052	747	415	419	292	510	887	477	150	72
11	5.1	-0.051	738	415	416	286	503	879	472	147	73
12	5.1	-0.051	730	414	413	287	496	871	468	144	72
13	5	-0.049	722	413	411	284	489	865	464	141	72
14	5	-0.05	714	412	408	281	484	858	460	139	72
15	5	-0.048	707	411	405	279	477	853	456	136	71
16	5	-0.048	700	410	402	275	471	848	452	134	72
17	5	-0.047	693	409	399	273	464	844	448	132	71
18	5	-0.047	687	408	396	275	460	841	445	130	71
19	5	-0.045	680	407	393	273	454	838	441	128	71
20	5	-0.045	674	406	390	270	450	834	438	127	71
21	5	-0.045	667	405	387	267	444	826	434	125	71
22	5	-0.044	661	403	384	265	439	817	430	125	71
23	5	-0.044	654	402	381	269	435	807	428	124	70
24	5	-0.043	647	401	378	263	429	797	424	123	70
25	4.9	-0.043	641	399	375	257	424	788	419	122	70
26	5	-0.042	634	398	372	259	420	778	417	120	70
27	5	-0.042	628	397	369	259	415	766	414	119	70
28	4.9	-0.041	621	396	366	257	411	753	410	117	70
29	4.9	-0.042	614	394	364	259	406	741	407	116	70
30	4.9	-0.041	607	392	361	256	403	729	404	115	70
31	5	-0.042	601	391	358	251	399	720	400	114	70
32	5	-0.042	594	390	355	247	394	711	396	115	70
33	5	-0.043	588	389	352	248	392	704	394	117	70
34	5	-0.044	582	387	350	247	388	698	391	118	70
35	5	-0.044	576	386	347	247	383	695	388	121	70
36	5	-0.046	571	384	344	241	380	696	384	124	70
37	5	-0.046	566	383	341	242	377	702	382	129	70
38	4.9	-0.048	563	382	338	241	374	713	380	134	70
39	4.9	-0.048	561	381	336	241	371	720	378	139	70
40	4.9	-0.049	558	379	334	238	368	720	375	145	70
41	4.9	-0.049	555	378	333	236	367	720	374	150	69
42	4.9	-0.05	553	378	331	238	368	723	374	156	70

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
43	4.9	-0.052	551	377	330	237	368	728	373	162	70
44	4.8	-0.053	550	376	329	236	368	733	372	168	70
45	4.8	-0.053	549	375	328	237	369	737	372	173	69
46	4.8	-0.054	548	375	328	235	370	741	371	178	69
47	4.8	-0.054	547	374	327	230	370	743	370	181	69
48	4.8	-0.055	547	374	327	233	371	746	370	186	69
49	4.7	-0.055	546	374	326	236	374	748	371	190	69
50	4.7	-0.056	546	374	326	234	376	750	371	194	69
51	4.7	-0.056	546	373	326	232	377	753	371	197	68
52	4.7	-0.057	546	374	326	235	378	756	372	199	68
53	4.7	-0.057	547	374	325	235	379	762	372	204	68
54	4.7	-0.058	548	373	325	235	381	767	372	204	69
55	4.6	-0.057	549	373	325	235	381	771	373	206	69
56	4.6	-0.058	549	373	326	232	383	772	373	210	69
57	4.6	-0.059	550	373	326	231	385	775	373	213	69
58	4.6	-0.059	551	374	326	235	387	777	375	214	69
59	4.5	-0.06	552	374	327	231	389	781	375	212	69
60	4.5	-0.059	554	373	328	236	390	782	376	213	69

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
Tot / Avg		0.0	**51.116**	**0.162**	**1.28**	**78.2**	**1.90**	**69.02**	**54.25**	**70.57**	**100.0**	**81.0**	**0.124**	**0.353**	**19.26**
Minimum	0.0	-18.7	0.000	0.158	0.69	72	1.54	66	50	69	98.4	76	0.119	0.345	19.07
Max	18.7	0.3	51.116	0.163	1.30	80	1.91	70	57	72	104.0	118	0.128	0.358	19.81
0	0.0		0.000		0.69	72	1.54	66	57	69		100	0.122	0.349	19.81
1	18.7	-18.7	0.158	0.158	1.30	72	1.88	67	52	69	102.0	118	0.119	0.345	19.45
2	18.4	0.3	0.319	0.161	1.30	72	1.87	67	51	69	104.0	91	0.124	0.352	19.45
3	18.3	0.1	0.481	0.162	1.30	72	1.87	67	51	69	101.9	86	0.124	0.352	19.37
4	18.2	0.1	0.641	0.160	1.29	72	1.86	67	50	69	100.5	84	0.123	0.351	19.27
5	18.1	0.1	0.802	0.161	1.29	72	1.87	67	50	69	101.3	83	0.123	0.351	19.21
6	18.0	0.1	0.964	0.162	1.28	72	1.86	67	50	69	101.9	83	0.124	0.352	19.24
7	18.0	0.0	1.124	0.160	1.27	72	1.85	67	50	69	100.6	83	0.123	0.351	19.24
8	17.9	0.1	1.284	0.160	1.27	72	1.86	68	50	69	100.7	83	0.123	0.351	19.20
9	17.8	0.1	1.443	0.159	1.27	72	1.85	68	50	69	100.2	83	0.122	0.349	19.16
10	17.7	0.1	1.603	0.160	1.27	72	1.85	68	50	69	100.9	83	0.124	0.352	19.20
11	17.5	0.2	1.763	0.160	1.26	72	1.85	68	50	69	100.6	84	0.124	0.352	19.28
12	17.4	0.1	1.922	0.159	1.26	72	1.85	68	50	69	100.0	84	0.123	0.351	19.25
13	17.3	0.1	2.081	0.159	1.26	72	1.85	68	50	69	100.2	85	0.123	0.351	19.22
14	17.1	0.2	2.242	0.161	1.30	72	1.88	68	50	69	101.5	85	0.124	0.352	19.27
15	17.0	0.1	2.404	0.162	1.30	72	1.87	68	50	69	102.0	85	0.123	0.351	19.27
16	16.8	0.2	2.566	0.162	1.30	72	1.88	68	50	69	102.1	85	0.123	0.351	19.23
17	16.7	0.1	2.728	0.162	1.29	73	1.87	68	50	69	102.3	86	0.122	0.349	19.20
18	16.6	0.1	2.888	0.160	1.29	73	1.87	68	50	70	101.1	86	0.123	0.351	19.21
19	16.5	0.1	3.050	0.162	1.29	73	1.88	69	50	69	102.2	86	0.123	0.351	19.25
20	16.4	0.1	3.211	0.161	1.29	73	1.87	69	50	69	101.7	86	0.121	0.348	19.17
21	16.2	0.2	3.372	0.161	1.29	73	1.87	69	50	69	101.8	86	0.124	0.352	19.21
22	16.1	0.1	3.534	0.162	1.29	73	1.88	69	50	69	102.1	86	0.123	0.351	19.29
23	16.0	0.1	3.695	0.161	1.28	73	1.88	69	50	70	101.5	86	0.122	0.349	19.21
24	15.9	0.1	3.857	0.162	1.29	73	1.88	69	50	69	102.4	87	0.123	0.351	19.22
25	15.7	0.2	4.017	0.160	1.28	73	1.88	69	50	69	101.1	87	0.123	0.351	19.27
26	15.6	0.1	4.178	0.161	1.29	74	1.89	69	51	69	101.6	88	0.123	0.351	19.28
27	15.4	0.2	4.339	0.161	1.29	74	1.89	69	51	69	101.4	87	0.123	0.351	19.28
28	15.2	0.2	4.501	0.162	1.29	74	1.88	69	51	69	102.1	87	0.122	0.349	19.23
29	15.1	0.1	4.662	0.161	1.28	74	1.89	69	51	70	101.7	88	0.123	0.351	19.24
30	14.9	0.2	4.823	0.161	1.28	74	1.89	69	51	70	101.8	88	0.121	0.348	19.21
31	14.8	0.1	4.983	0.160	1.28	74	1.89	70	51	70	101.3	88	0.123	0.351	19.21
32	14.6	0.2	5.144	0.161	1.28	74	1.89	70	51	70	101.7	88	0.123	0.351	19.29
33	14.5	0.1	5.306	0.162	1.28	74	1.90	70	51	70	102.3	88	0.121	0.348	19.21
34	14.3	0.2	5.467	0.161	1.29	75	1.90	70	51	70	101.7	88	0.124	0.352	19.25
35	14.2	0.1	5.628	0.161	1.27	75	1.90	70	51	70	101.2	88	0.124	0.352	19.36
36	14.1	0.1	5.788	0.160	1.28	75	1.90	70	51	70	100.4	88	0.123	0.351	19.32
37	13.9	0.2	5.949	0.161	1.28	75	1.90	70	51	70	101.1	87	0.123	0.351	19.28
38	13.8	0.1	6.110	0.161	1.28	75	1.90	70	52	70	101.2	87	0.123	0.351	19.27
39	13.7	0.1	6.271	0.161	1.28	75	1.90	70	52	70	101.2	87	0.123	0.351	19.27
40	13.6	0.1	6.432	0.161	1.27	75	1.90	70	52	70	101.1	86	0.123	0.351	19.26

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
41	13.5	0.1	6.593	0.161	1.28	75	1.89	70	52	71	101.0	86	0.124	0.352	19.29
42	13.4	0.1	6.754	0.161	1.28	76	1.90	70	52	71	100.9	87	0.123	0.351	19.30
43	13.3	0.1	6.914	0.160	1.28	76	1.91	70	52	71	100.2	86	0.123	0.351	19.26
44	13.2	0.1	7.076	0.162	1.28	76	1.90	70	52	71	101.6	86	0.122	0.349	19.21
45	13.1	0.1	7.238	0.162	1.28	76	1.90	70	52	71	101.8	86	0.123	0.351	19.21
46	13.0	0.1	7.398	0.160	1.27	76	1.90	70	52	71	100.5	86	0.122	0.349	19.21
47	12.9	0.1	7.559	0.161	1.28	76	1.90	70	52	71	101.0	85	0.124	0.352	19.24
48	12.8	0.1	7.720	0.161	1.28	76	1.90	70	52	71	100.7	86	0.124	0.352	19.32
49	12.7	0.1	7.881	0.161	1.27	76	1.90	70	52	71	100.4	86	0.125	0.354	19.37
50	12.6	0.1	8.042	0.161	1.28	76	1.90	70	52	71	100.1	85	0.125	0.354	19.40
51	12.5	0.1	8.204	0.162	1.27	77	1.90	70	52	71	100.7	85	0.123	0.351	19.31
52	12.4	0.1	8.365	0.161	1.27	77	1.90	70	53	71	100.3	85	0.124	0.352	19.27
53	12.3	0.1	8.526	0.161	1.28	77	1.90	70	53	71	100.3	85	0.124	0.352	19.31
54	12.2	0.1	8.687	0.161	1.28	77	1.90	70	53	71	100.2	85	0.124	0.352	19.31
55	12.1	0.1	8.848	0.161	1.28	77	1.91	70	53	71	100.2	85	0.124	0.352	19.31
56	12.1	0.0	9.010	0.162	1.28	77	1.90	70	53	71	101.0	85	0.123	0.351	19.27
57	12.0	0.1	9.172	0.162	1.27	77	1.91	70	53	71	101.0	84	0.124	0.352	19.26
58	11.9	0.1	9.333	0.161	1.28	77	1.91	70	53	71	100.0	85	0.127	0.356	19.42
59	11.8	0.1	9.494	0.161	1.28	77	1.91	70	53	71	99.7	84	0.123	0.351	19.38
60	11.7	0.1	9.655	0.161	1.27	77	1.91	70	53	70	100.0	84	0.124	0.352	19.25
61	11.6	0.1	9.816	0.161	1.28	77	1.90	70	53	71	100.1	84	0.125	0.354	19.33
62	11.5	0.1	9.977	0.161	1.28	77	1.91	70	53	71	100.1	85	0.123	0.351	19.30
63	11.4	0.1	10.140	0.163	1.28	77	1.90	70	53	70	101.4	84	0.125	0.354	19.30
64	11.3	0.1	10.301	0.161	1.28	78	1.90	70	53	70	99.9	84	0.124	0.352	19.33
65	11.2	0.1	10.462	0.161	1.28	78	1.90	70	53	70	99.9	84	0.124	0.352	19.29
66	11.2	0.0	10.623	0.161	1.27	78	1.90	70	53	70	100.1	85	0.123	0.351	19.26
67	11.1	0.1	10.785	0.162	1.28	78	1.90	70	53	71	100.9	84	0.123	0.351	19.22
68	11.0	0.1	10.946	0.161	1.28	78	1.90	70	53	70	100.3	85	0.124	0.352	19.26
69	10.9	0.1	11.108	0.162	1.28	78	1.90	70	53	71	100.7	85	0.125	0.354	19.35
70	10.8	0.1	11.270	0.162	1.28	78	1.90	70	53	71	100.6	85	0.123	0.351	19.31
71	10.7	0.1	11.432	0.162	1.27	78	1.90	70	53	71	101.0	85	0.122	0.349	19.19
72	10.6	0.1	11.593	0.161	1.28	78	1.90	70	53	71	100.7	85	0.123	0.351	19.19
73	10.5	0.1	11.754	0.161	1.28	78	1.91	70	53	71	100.6	85	0.123	0.351	19.23
74	10.5	0.0	11.915	0.161	1.28	78	1.91	70	53	71	100.5	85	0.123	0.351	19.23
75	10.4	0.1	12.077	0.162	1.28	78	1.90	70	53	71	100.9	85	0.125	0.354	19.31
76	10.3	0.1	12.239	0.162	1.28	78	1.90	70	53	71	100.7	85	0.123	0.351	19.31
77	10.2	0.1	12.401	0.162	1.28	78	1.91	70	53	71	100.8	85	0.124	0.352	19.27
78	10.1	0.1	12.562	0.161	1.27	78	1.90	70	53	71	100.2	85	0.124	0.352	19.31
79	10.0	0.1	12.723	0.161	1.27	78	1.91	70	53	71	100.3	85	0.122	0.349	19.23
80	10.0	0.0	12.884	0.161	1.28	78	1.91	70	53	71	100.6	85	0.123	0.351	19.19
81	9.9	0.1	13.046	0.162	1.28	78	1.91	70	53	72	100.9	84	0.125	0.354	19.30
82	9.8	0.1	13.208	0.162	1.28	78	1.91	70	53	71	100.5	84	0.124	0.352	19.33
83	9.7	0.1	13.370	0.162	1.27	78	1.90	70	53	71	100.7	84	0.122	0.349	19.22
84	9.6	0.1	13.532	0.162	1.27	78	1.90	70	53	71	100.9	84	0.125	0.354	19.25

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
85	9.6	0.0	13.693	0.161	1.28	79	1.90	70	53	71	99.8	85	0.125	0.354	19.38
86	9.5	0.1	13.854	0.161	1.27	79	1.90	70	53	71	99.6	85	0.124	0.352	19.35
87	9.4	0.1	14.016	0.162	1.28	79	1.90	70	53	71	100.4	85	0.124	0.352	19.31
88	9.3	0.1	14.177	0.161	1.28	79	1.90	70	53	70	99.9	85	0.124	0.352	19.31
89	9.2	0.1	14.340	0.163	1.28	79	1.90	70	53	70	101.2	85	0.123	0.351	19.27
90	9.1	0.1	14.502	0.162	1.28	79	1.90	70	53	70	100.8	85	0.123	0.351	19.23
91	9.0	0.1	14.663	0.161	1.27	79	1.90	70	53	70	100.3	84	0.122	0.349	19.18
92	8.9	0.1	14.824	0.161	1.28	79	1.91	70	53	70	100.4	84	0.123	0.351	19.18
93	8.8	0.1	14.986	0.162	1.28	79	1.91	70	53	71	101.0	85	0.123	0.351	19.22
94	8.7	0.1	15.147	0.161	1.28	79	1.90	70	53	70	100.2	85	0.124	0.352	19.27
95	8.7	0.0	15.309	0.162	1.28	79	1.90	70	53	70	100.5	84	0.124	0.352	19.30
96	8.6	0.1	15.471	0.162	1.28	79	1.91	70	53	71	100.4	84	0.124	0.352	19.29
97	8.5	0.1	15.633	0.162	1.28	79	1.90	70	53	70	100.5	84	0.123	0.351	19.25
98	8.4	0.1	15.795	0.162	1.27	79	1.90	70	53	70	100.7	84	0.123	0.351	19.22
99	8.3	0.1	15.956	0.161	1.28	79	1.91	70	53	70	100.2	84	0.123	0.351	19.22
100	8.3	0.0	16.118	0.162	1.28	79	1.91	70	53	71	100.8	84	0.123	0.351	19.22
101	8.2	0.1	16.279	0.161	1.28	79	1.91	70	53	71	100.2	84	0.123	0.351	19.22
102	8.1	0.1	16.441	0.162	1.28	79	1.90	70	53	71	100.8	84	0.123	0.351	19.22
103	8.0	0.1	16.604	0.163	1.28	79	1.90	70	53	71	101.4	83	0.123	0.351	19.21
104	8.0	0.0	16.765	0.161	1.28	79	1.90	70	53	71	100.0	83	0.124	0.352	19.24
105	7.9	0.1	16.927	0.162	1.27	79	1.90	70	53	71	100.4	84	0.125	0.354	19.32
106	7.8	0.1	17.088	0.161	1.28	79	1.90	70	53	70	99.4	83	0.125	0.354	19.36
107	7.7	0.1	17.250	0.162	1.28	79	1.90	70	53	70	100.1	83	0.123	0.351	19.28
108	7.7	0.0	17.412	0.162	1.28	79	1.90	70	53	70	100.2	83	0.126	0.355	19.31
109	7.6	0.1	17.574	0.162	1.28	79	1.90	70	54	70	99.9	83	0.125	0.354	19.39
110	7.5	0.1	17.736	0.162	1.27	79	1.90	70	54	70	99.9	82	0.123	0.351	19.27
111	7.5	0.0	17.898	0.162	1.28	79	1.90	70	54	70	100.3	82	0.124	0.352	19.22
112	7.4	0.1	18.060	0.162	1.27	79	1.90	70	54	70	100.4	82	0.123	0.351	19.22
113	7.3	0.1	18.221	0.161	1.28	79	1.91	70	54	70	99.6	82	0.126	0.355	19.30
114	7.3	0.0	18.383	0.162	1.28	79	1.90	70	54	70	99.9	83	0.125	0.354	19.38
115	7.2	0.1	18.545	0.162	1.28	79	1.90	70	54	70	99.9	83	0.124	0.352	19.31
116	7.1	0.1	18.706	0.161	1.27	79	1.90	70	54	70	99.6	82	0.123	0.351	19.23
117	7.1	0.0	18.869	0.163	1.28	79	1.90	70	54	70	100.9	82	0.125	0.354	19.26
118	7.0	0.1	19.031	0.162	1.28	79	1.91	70	54	70	100.2	82	0.123	0.351	19.26
119	7.0	0.0	19.193	0.162	1.27	79	1.91	70	54	70	100.3	82	0.124	0.352	19.22
120	6.9	0.1	19.354	0.161	1.27	79	1.90	70	54	71	99.8	82	0.123	0.351	19.22
121	6.9	0.0	19.516	0.162	1.28	79	1.90	70	54	71	100.2	81	0.125	0.354	19.25
122	6.8	0.1	19.677	0.161	1.28	79	1.90	70	54	71	99.5	81	0.123	0.351	19.24
123	6.8	0.0	19.839	0.162	1.28	79	1.90	70	54	71	100.4	81	0.122	0.349	19.12
124	6.7	0.1	20.001	0.162	1.28	79	1.91	70	54	71	100.3	80	0.126	0.355	19.23
125	6.7	0.0	20.164	0.163	1.27	79	1.90	70	54	71	100.1	80	0.127	0.356	19.41
126	6.6	0.1	20.325	0.161	1.27	79	1.90	70	54	71	98.7	81	0.124	0.352	19.35
127	6.6	0.0	20.487	0.162	1.27	79	1.90	70	54	71	99.8	81	0.124	0.352	19.24
128	6.5	0.1	20.648	0.161	1.28	79	1.90	70	54	70	99.5	81	0.124	0.352	19.24

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
129	6.5	0.0	20.810	0.162	1.28	79	1.90	70	54	70	99.9	80	0.125	0.354	19.27
130	6.4	0.1	20.972	0.162	1.27	79	1.90	70	54	71	99.9	80	0.123	0.351	19.22
131	6.4	0.0	21.134	0.162	1.28	79	1.90	70	54	71	100.0	80	0.125	0.354	19.22
132	6.3	0.1	21.297	0.163	1.28	79	1.90	70	54	71	100.4	80	0.125	0.354	19.30
133	6.3	0.0	21.458	0.161	1.28	79	1.90	70	54	71	99.2	80	0.123	0.351	19.22
134	6.3	0.0	21.620	0.162	1.27	79	1.90	70	54	71	100.1	80	0.124	0.352	19.18
135	6.2	0.1	21.781	0.161	1.28	79	1.90	70	54	71	99.4	80	0.125	0.354	19.26
136	6.2	0.0	21.943	0.162	1.28	79	1.90	70	54	70	99.7	79	0.125	0.354	19.29
137	6.1	0.1	22.104	0.161	1.28	79	1.90	69	54	70	99.1	79	0.123	0.351	19.20
138	6.1	0.0	22.266	0.162	1.28	79	1.91	70	54	71	99.7	79	0.127	0.356	19.28
139	6.0	0.1	22.429	0.163	1.27	79	1.90	70	54	70	99.9	80	0.126	0.355	19.41
140	6.0	0.0	22.591	0.162	1.28	79	1.91	69	54	70	99.3	80	0.124	0.352	19.30
141	5.9	0.1	22.752	0.161	1.27	79	1.90	70	54	70	99.1	80	0.125	0.354	19.26
142	5.9	0.0	22.914	0.162	1.27	79	1.91	70	54	71	99.7	80	0.125	0.354	19.30
143	5.9	0.0	23.075	0.161	1.28	80	1.91	70	54	71	98.9	80	0.125	0.354	19.30
144	5.8	0.1	23.237	0.162	1.28	80	1.91	70	54	71	99.5	80	0.124	0.352	19.26
145	5.8	0.0	23.399	0.162	1.28	80	1.91	70	54	71	99.6	80	0.125	0.354	19.26
146	5.7	0.1	23.562	0.163	1.28	80	1.91	70	54	71	100.2	80	0.125	0.354	19.30
147	5.6	0.1	23.723	0.161	1.28	80	1.90	70	54	70	98.8	80	0.125	0.354	19.30
148	5.6	0.0	23.885	0.162	1.27	80	1.90	70	54	70	99.4	80	0.125	0.354	19.30
149	5.6	0.0	24.047	0.162	1.27	80	1.90	70	54	70	99.7	80	0.122	0.349	19.18
150	5.5	0.1	24.208	0.161	1.28	80	1.90	70	54	71	99.7	80	0.122	0.349	19.07
151	5.4	0.1	24.370	0.162	1.28	80	1.90	70	54	71	100.4	80	0.124	0.352	19.14
152	5.4	0.0	24.532	0.162	1.28	80	1.90	70	54	71	100.1	80	0.123	0.351	19.18
153	5.3	0.1	24.695	0.163	1.28	80	1.90	70	54	71	100.8	80	0.123	0.351	19.14
154	5.3	0.0	24.856	0.161	1.27	80	1.90	70	54	70	99.5	80	0.124	0.352	19.18
155	5.2	0.1	25.018	0.162	1.28	80	1.91	70	54	71	99.9	80	0.124	0.352	19.22
156	5.2	0.0	25.180	0.162	1.28	80	1.90	70	54	71	99.6	80	0.126	0.355	19.30
157	5.2	0.0	25.341	0.161	1.28	80	1.90	70	54	71	98.7	80	0.125	0.354	19.34
158	5.1	0.1	25.503	0.162	1.28	80	1.90	70	54	71	99.5	80	0.123	0.351	19.22
159	5.1	0.0	25.665	0.162	1.28	80	1.91	70	54	71	99.8	80	0.125	0.354	19.22
160	5.0	0.1	25.827	0.162	1.28	80	1.90	70	55	71	99.8	80	0.123	0.351	19.22
161	5.0	0.0	25.990	0.163	1.28	80	1.90	70	55	71	100.6	80	0.124	0.352	19.18
162	5.0	0.0	26.152	0.162	1.27	80	1.91	70	55	71	99.8	80	0.125	0.354	19.26
163	4.9	0.1	26.313	0.161	1.28	80	1.91	69	55	71	98.9	80	0.125	0.354	19.30
164	4.9	0.0	26.475	0.162	1.28	80	1.90	69	55	72	99.5	80	0.124	0.352	19.26
165	4.8	0.1	26.637	0.162	1.28	80	1.91	69	55	71	99.5	79	0.126	0.355	19.29
166	4.8	0.0	26.799	0.162	1.28	80	1.90	69	55	71	99.4	80	0.124	0.352	19.29
167	4.8	0.0	26.961	0.162	1.28	80	1.91	69	55	72	99.5	79	0.125	0.354	19.25
168	4.7	0.1	27.124	0.163	1.28	80	1.90	69	55	72	100.2	79	0.123	0.351	19.20
169	4.7	0.0	27.285	0.161	1.28	80	1.90	69	55	71	99.2	80	0.125	0.354	19.21
170	4.6	0.1	27.448	0.163	1.27	80	1.91	69	55	71	100.4	80	0.124	0.352	19.26
171	4.6	0.0	27.609	0.161	1.28	80	1.90	69	55	71	99.0	79	0.125	0.354	19.25
172	4.6	0.0	27.771	0.162	1.28	80	1.90	69	55	71	99.5	79	0.124	0.352	19.24

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
173	4.5	0.1	27.932	0.161	1.28	80	1.91	69	55	71	98.9	79	0.125	0.354	19.24
174	4.5	0.0	28.094	0.162	1.28	80	1.90	69	55	72	99.6	80	0.124	0.352	19.25
175	4.5	0.0	28.257	0.163	1.27	80	1.91	69	55	71	100.2	79	0.125	0.354	19.25
176	4.4	0.1	28.420	0.163	1.28	80	1.90	69	55	72	100.0	79	0.125	0.354	19.28
177	4.4	0.0	28.581	0.161	1.28	80	1.91	69	55	72	98.8	79	0.124	0.352	19.24
178	4.4	0.0	28.743	0.162	1.27	80	1.91	69	55	71	99.6	79	0.124	0.352	19.20
179	4.3	0.1	28.905	0.162	1.28	80	1.90	69	55	71	99.7	80	0.125	0.354	19.25
180	4.3	0.0	29.066	0.161	1.28	80	1.90	69	55	71	98.9	80	0.125	0.354	19.30
181	4.2	0.1	29.228	0.162	1.28	80	1.90	69	55	71	99.5	80	0.124	0.352	19.26
182	4.2	0.0	29.391	0.163	1.28	80	1.90	69	55	71	100.3	80	0.125	0.354	19.26
183	4.2	0.0	29.553	0.162	1.27	80	1.90	69	55	71	99.4	80	0.126	0.355	19.34
184	4.1	0.1	29.715	0.162	1.28	80	1.91	69	55	71	99.2	80	0.125	0.354	19.34
185	4.1	0.0	29.877	0.162	1.27	80	1.90	69	55	71	99.0	79	0.128	0.358	19.41
186	4.1	0.0	30.039	0.162	1.28	80	1.90	69	55	70	98.6	79	0.126	0.355	19.44
187	4.0	0.1	30.201	0.162	1.28	80	1.91	69	55	70	98.9	80	0.125	0.354	19.33
188	4.0	0.0	30.363	0.162	1.28	80	1.91	69	55	70	99.4	79	0.124	0.352	19.25
189	3.9	0.1	30.525	0.162	1.28	80	1.90	69	55	70	99.6	80	0.125	0.354	19.25
190	3.9	0.0	30.687	0.162	1.28	80	1.90	69	55	70	99.5	80	0.126	0.355	19.34
191	3.8	0.1	30.850	0.163	1.28	80	1.90	69	55	71	99.9	80	0.125	0.354	19.34
192	3.8	0.0	31.011	0.161	1.28	80	1.91	69	55	70	98.7	80	0.125	0.354	19.30
193	3.8	0.0	31.173	0.162	1.28	80	1.90	69	55	71	99.5	80	0.124	0.352	19.26
194	3.7	0.1	31.335	0.162	1.27	80	1.90	69	55	71	99.7	80	0.124	0.352	19.22
195	3.7	0.0	31.497	0.162	1.28	80	1.90	69	55	71	99.8	80	0.124	0.352	19.22
196	3.6	0.1	31.659	0.162	1.28	80	1.90	69	55	71	99.6	80	0.126	0.355	19.30
197	3.6	0.0	31.821	0.162	1.28	80	1.90	69	55	71	99.1	80	0.127	0.356	19.41
198	3.5	0.1	31.984	0.163	1.28	80	1.91	69	55	71	99.5	80	0.126	0.355	19.41
199	3.4	0.1	32.145	0.161	1.28	80	1.90	69	55	71	98.4	80	0.125	0.354	19.34
200	3.4	0.0	32.308	0.163	1.28	80	1.90	69	55	71	100.0	80	0.125	0.354	19.30
201	3.3	0.1	32.469	0.161	1.28	80	1.91	69	55	71	98.9	80	0.124	0.352	19.26
202	3.3	0.0	32.631	0.162	1.28	80	1.90	69	55	71	99.7	79	0.124	0.352	19.21
203	3.2	0.1	32.793	0.162	1.28	80	1.91	69	56	71	99.6	79	0.125	0.354	19.24
204	3.2	0.0	32.955	0.162	1.28	80	1.91	69	56	71	99.5	79	0.124	0.352	19.24
205	3.1	0.1	33.117	0.162	1.28	80	1.91	69	56	71	99.5	79	0.125	0.354	19.24
206	3.1	0.0	33.280	0.163	1.28	80	1.90	69	56	71	100.0	79	0.126	0.355	19.32
207	3.0	0.1	33.442	0.162	1.27	80	1.91	69	56	71	99.1	79	0.125	0.354	19.32
208	2.9	0.1	33.604	0.162	1.28	80	1.91	69	56	71	99.2	79	0.125	0.354	19.28
209	2.9	0.0	33.765	0.161	1.28	80	1.90	69	56	71	98.7	79	0.125	0.354	19.28
210	2.8	0.1	33.927	0.162	1.28	80	1.91	69	56	71	99.3	79	0.125	0.354	19.28
211	2.8	0.0	34.089	0.162	1.28	80	1.90	69	56	71	99.3	79	0.125	0.354	19.28
212	2.8	0.0	34.251	0.162	1.28	80	1.90	69	56	71	99.4	79	0.124	0.352	19.24
213	2.7	0.1	34.414	0.163	1.28	80	1.91	69	56	71	100.2	79	0.125	0.354	19.24
214	2.7	0.0	34.576	0.162	1.28	80	1.91	69	56	72	99.5	78	0.124	0.352	19.23
215	2.7	0.0	34.738	0.162	1.27	80	1.90	69	56	72	99.4	78	0.125	0.354	19.22
216	2.6	0.1	34.900	0.162	1.28	80	1.91	69	56	72	99.3	78	0.126	0.355	19.30

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
217	2.6	0.0	35.062	0.162	1.28	80	1.90	69	56	71	99.0	77	0.125	0.354	19.29
218	2.6	0.0	35.224	0.162	1.28	80	1.90	69	56	71	99.2	78	0.124	0.352	19.22
219	2.6	0.0	35.386	0.162	1.28	80	1.90	69	56	71	99.5	77	0.124	0.352	19.18
220	2.5	0.1	35.548	0.162	1.28	80	1.90	69	56	71	99.3	77	0.126	0.355	19.25
221	2.5	0.0	35.711	0.163	1.28	80	1.90	69	56	71	99.7	77	0.125	0.354	19.28
222	2.5	0.0	35.874	0.163	1.28	80	1.91	69	56	71	99.8	77	0.124	0.352	19.21
223	2.5	0.0	36.036	0.162	1.28	80	1.90	69	56	71	99.5	77	0.124	0.352	19.17
224	2.5	0.0	36.198	0.162	1.28	80	1.91	68	56	71	99.5	77	0.125	0.354	19.21
225	2.4	0.1	36.360	0.162	1.28	80	1.90	69	56	71	99.4	77	0.124	0.352	19.21
226	2.4	0.0	36.522	0.162	1.28	80	1.90	68	56	71	99.4	77	0.125	0.354	19.21
227	2.4	0.0	36.684	0.162	1.28	80	1.90	68	56	72	99.5	77	0.123	0.351	19.17
228	2.4	0.0	36.846	0.162	1.29	80	1.90	68	56	72	99.6	77	0.125	0.354	19.17
229	2.3	0.1	37.009	0.163	1.28	80	1.90	68	56	71	100.0	77	0.125	0.354	19.25
230	2.3	0.0	37.171	0.162	1.28	80	1.90	68	56	72	99.0	76	0.126	0.355	19.28
231	2.3	0.0	37.333	0.162	1.27	79	1.90	68	56	71	99.1	77	0.124	0.352	19.24
232	2.3	0.0	37.495	0.162	1.28	79	1.90	68	56	72	99.5	77	0.125	0.354	19.21
233	2.3	0.0	37.657	0.162	1.28	79	1.90	68	56	72	99.5	77	0.124	0.352	19.21
234	2.2	0.1	37.819	0.162	1.29	79	1.90	68	56	72	99.5	77	0.125	0.354	19.21
235	2.2	0.0	37.981	0.162	1.28	79	1.90	68	56	72	99.5	77	0.124	0.352	19.21
236	2.2	0.0	38.143	0.162	1.28	79	1.90	68	56	72	99.6	77	0.124	0.352	19.17
237	2.2	0.0	38.306	0.163	1.29	79	1.90	68	56	71	100.4	77	0.124	0.352	19.17
238	2.1	0.1	38.469	0.163	1.28	79	1.90	68	56	71	100.4	77	0.124	0.352	19.17
239	2.1	0.0	38.631	0.162	1.28	79	1.90	68	56	71	99.6	77	0.125	0.354	19.21
240	2.1	0.0	38.793	0.162	1.28	79	1.90	68	56	71	99.3	77	0.126	0.355	19.28
241	2.1	0.0	38.955	0.162	1.28	79	1.90	68	56	72	99.1	77	0.125	0.354	19.28
242	2.0	0.1	39.117	0.162	1.28	79	1.91	68	56	72	99.3	77	0.124	0.352	19.21
243	2.0	0.0	39.279	0.162	1.28	79	1.90	68	56	72	99.7	77	0.123	0.351	19.13
244	2.0	0.0	39.441	0.162	1.29	79	1.90	68	56	72	99.7	77	0.126	0.355	19.21
245	2.0	0.0	39.604	0.163	1.28	79	1.90	68	56	72	100.0	77	0.125	0.354	19.28
246	1.9	0.1	39.766	0.162	1.28	79	1.90	68	56	71	99.3	77	0.124	0.352	19.21
247	1.9	0.0	39.929	0.163	1.28	79	1.90	68	56	71	100.2	77	0.125	0.354	19.21
248	1.9	0.0	40.090	0.161	1.28	79	1.90	68	56	71	98.8	77	0.125	0.354	19.25
249	1.9	0.0	40.252	0.162	1.28	79	1.90	68	56	71	99.2	77	0.126	0.355	19.28
250	1.8	0.1	40.414	0.162	1.28	79	1.90	68	56	72	99.1	77	0.125	0.354	19.28
251	1.8	0.0	40.576	0.162	1.29	79	1.90	68	56	72	99.4	77	0.123	0.351	19.17
252	1.8	0.0	40.738	0.162	1.28	79	1.90	68	56	72	99.7	77	0.125	0.354	19.17
253	1.8	0.0	40.901	0.163	1.29	79	1.90	68	56	72	100.2	77	0.125	0.354	19.25
254	1.7	0.1	41.064	0.163	1.28	79	1.90	68	56	71	100.0	77	0.125	0.354	19.25
255	1.7	0.0	41.226	0.162	1.28	79	1.90	68	56	71	99.3	77	0.125	0.354	19.25
256	1.7	0.0	41.388	0.162	1.27	79	1.90	68	56	72	99.2	77	0.126	0.355	19.28
257	1.7	0.0	41.550	0.162	1.28	79	1.90	68	56	72	99.0	77	0.126	0.355	19.32
258	1.6	0.1	41.712	0.162	1.29	79	1.90	68	56	71	99.1	77	0.124	0.352	19.25
259	1.6	0.0	41.874	0.162	1.28	79	1.90	68	56	71	99.5	77	0.124	0.352	19.17
260	1.6	0.0	42.036	0.162	1.28	79	1.90	68	56	71	99.5	77	0.126	0.355	19.25

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
261	1.6	0.0	42.199	0.163	1.28	79	1.90	68	56	71	99.9	77	0.125	0.354	19.28
262	1.5	0.1	42.362	0.163	1.28	79	1.90	68	56	72	100.0	77	0.124	0.352	19.21
263	1.5	0.0	42.523	0.161	1.28	79	1.90	68	56	72	99.0	77	0.124	0.352	19.17
264	1.5	0.0	42.685	0.162	1.28	79	1.91	68	56	71	99.6	77	0.125	0.354	19.21
265	1.5	0.0	42.847	0.162	1.28	79	1.90	68	56	71	99.6	77	0.123	0.351	19.17
266	1.4	0.1	43.009	0.162	1.28	79	1.90	68	56	71	99.8	77	0.124	0.352	19.13
267	1.4	0.0	43.171	0.162	1.29	79	1.90	68	56	71	99.6	77	0.126	0.355	19.25
268	1.4	0.0	43.333	0.162	1.28	79	1.89	68	56	71	99.2	77	0.125	0.354	19.28
269	1.4	0.0	43.496	0.163	1.28	79	1.90	68	56	71	99.9	77	0.125	0.354	19.25
270	1.3	0.1	43.659	0.163	1.29	79	1.90	68	56	70	99.9	77	0.126	0.355	19.28
271	1.3	0.0	43.821	0.162	1.28	79	1.90	68	56	70	98.9	77	0.128	0.358	19.40
272	1.3	0.0	43.983	0.162	1.28	79	1.90	68	56	71	98.7	77	0.125	0.354	19.36
273	1.3	0.0	44.145	0.162	1.28	79	1.90	68	56	71	98.9	77	0.126	0.355	19.28
274	1.2	0.1	44.307	0.162	1.28	79	1.90	68	56	71	99.0	77	0.126	0.355	19.32
275	1.2	0.0	44.469	0.162	1.29	79	1.90	68	56	71	98.9	77	0.126	0.355	19.32
276	1.2	0.0	44.631	0.162	1.29	79	1.90	68	56	71	99.1	77	0.124	0.352	19.25
277	1.2	0.0	44.793	0.162	1.29	79	1.90	68	56	71	99.3	77	0.126	0.355	19.25
278	1.1	0.1	44.956	0.163	1.28	79	1.90	68	56	71	100.0	77	0.124	0.352	19.25
279	1.1	0.0	45.118	0.162	1.28	79	1.89	68	56	70	99.4	77	0.125	0.354	19.21
280	1.1	0.0	45.280	0.162	1.28	79	1.90	68	56	71	99.5	77	0.124	0.352	19.21
281	1.0	0.1	45.442	0.162	1.28	79	1.90	68	56	70	99.6	77	0.124	0.352	19.17
282	1.0	0.0	45.604	0.162	1.28	79	1.90	68	56	70	99.6	77	0.125	0.354	19.21
283	1.0	0.0	45.766	0.162	1.29	79	1.90	68	56	70	99.5	77	0.124	0.352	19.21
284	1.0	0.0	45.928	0.162	1.29	79	1.90	68	56	70	99.4	77	0.126	0.355	19.25
285	0.9	0.1	46.091	0.163	1.29	79	1.90	68	56	70	100.0	77	0.124	0.352	19.25
286	0.9	0.0	46.253	0.162	1.29	79	1.90	68	56	70	99.4	77	0.125	0.354	19.21
287	0.9	0.0	46.415	0.162	1.29	79	1.90	68	56	70	99.5	77	0.124	0.352	19.21
288	0.8	0.1	46.577	0.162	1.28	79	1.90	68	56	70	99.4	77	0.126	0.355	19.25
289	0.8	0.0	46.739	0.162	1.28	78	1.91	68	56	71	99.3	77	0.125	0.354	19.28
290	0.8	0.0	46.901	0.162	1.28	78	1.90	68	56	69	99.3	77	0.126	0.355	19.28
291	0.8	0.0	47.063	0.162	1.28	79	1.90	68	56	70	99.2	77	0.125	0.354	19.28
292	0.7	0.1	47.225	0.162	1.28	78	1.90	68	56	70	99.2	77	0.126	0.355	19.28
293	0.7	0.0	47.388	0.163	1.29	78	1.90	68	56	70	100.0	76	0.124	0.352	19.24
294	0.7	0.0	47.551	0.163	1.28	78	1.90	68	56	70	100.2	77	0.125	0.354	19.20
295	0.6	0.1	47.712	0.161	1.28	78	1.91	68	57	69	99.2	77	0.123	0.351	19.17
296	0.6	0.0	47.874	0.162	1.29	78	1.90	68	56	70	99.8	77	0.126	0.355	19.21
297	0.6	0.0	48.036	0.162	1.28	78	1.90	68	57	70	99.5	77	0.125	0.354	19.28
298	0.6	0.0	48.198	0.162	1.29	78	1.90	68	57	70	99.4	77	0.125	0.354	19.25
299	0.5	0.1	48.360	0.162	1.29	78	1.90	68	57	70	99.4	77	0.126	0.355	19.28
300	0.5	0.0	48.522	0.162	1.29	78	1.90	68	57	70	99.2	77	0.126	0.355	19.32
301	0.5	0.0	48.685	0.163	1.29	78	1.89	68	57	70	100.0	77	0.123	0.351	19.21
302	0.4	0.1	48.847	0.162	1.28	78	1.90	68	57	70	99.8	77	0.125	0.354	19.17
303	0.4	0.0	49.009	0.162	1.28	78	1.90	68	57	69	99.6	77	0.126	0.355	19.28
304	0.4	0.0	49.171	0.162	1.28	78	1.90	68	57	69	99.3	77	0.125	0.354	19.28

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Test Length: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 9.68 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H (" H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP (" H_2O)*	$\sqrt{dP}$	*vs*
305	0.4	0.0	49.333	0.162	1.28	78	1.90	68	57	69	99.3	77	0.126	0.355	19.28
306	0.3	0.1	49.495	0.162	1.29	78	1.90	68	57	70	99.1	76	0.127	0.356	19.35
307	0.3	0.0	49.657	0.162	1.28	78	1.90	68	57	69	99.2	77	0.123	0.351	19.24
308	0.3	0.0	49.819	0.162	1.29	78	1.90	68	57	69	99.8	77	0.125	0.354	19.17
309	0.3	0.0	49.982	0.163	1.28	78	1.90	68	57	69	100.3	77	0.125	0.354	19.25
310	0.2	0.1	50.144	0.162	1.29	78	1.90	68	57	69	99.5	77	0.125	0.354	19.25
311	0.2	0.0	50.306	0.162	1.28	78	1.90	68	57	70	99.4	76	0.126	0.355	19.28
312	0.2	0.0	50.468	0.162	1.28	78	1.90	68	57	69	99.1	76	0.126	0.355	19.30
313	0.2	0.0	50.630	0.162	1.28	78	1.90	68	57	69	99.0	76	0.126	0.355	19.30
314	0.1	0.1	50.792	0.162	1.29	78	1.89	67	57	69	99.1	76	0.125	0.354	19.27
315	0.1	0.0	50.954	0.162	1.28	78	1.90	67	57	69	99.3	77	0.126	0.355	19.28
316	0.0	0.1	51.116	0.162	1.29	78	1.90	67	57	69	99.2	76	0.126	0.355	19.31

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
Tot / Avg	**51.882**	**0.164**	**1.00**	**78.4**	**2.09**	**68.85**	**55.65**	**100.0**	**680.1**	**361.8**	**323.1**	**228.9**	**401.4**	**883.3**	**34.0**
Minimum	0.000	0.147	0.36	72	1.30	66	52	93.5	544	342	272	198	318	542	360
Max	51.882	0.166	1.01	80	2.10	70	58	102.5	789	394	414	257	470	1280	419
0	0.000		0.36	72	1.30	66	58		555	374	327	232	390	683	376
1	0.147	0.147	0.97	72	2.00	67	54	93.5	551	374	327	233	386	572	374
2	0.307	0.160	0.97	72	2.00	67	53	101.9	544	374	323	232	380	542	371
3	0.468	0.161	0.97	72	2.00	67	53	99.8	545	375	318	227	375	585	368
4	0.629	0.161	0.96	72	2.00	67	53	99.7	552	375	313	229	368	630	367
5	0.789	0.160	0.95	72	2.00	67	53	99.2	558	376	308	227	361	647	366
6	0.949	0.160	0.95	72	2.00	67	53	99.2	564	376	304	225	355	654	365
7	1.109	0.160	0.95	72	2.00	67	53	99.1	568	376	300	224	350	691	364
8	1.268	0.159	0.95	72	2.00	67	53	98.6	573	376	296	219	345	683	362
9	1.428	0.160	0.95	72	2.00	68	53	99.4	578	376	292	217	339	694	360
10	1.588	0.160	0.95	72	2.00	68	53	99.4	583	377	289	216	334	907	360
11	1.747	0.159	0.94	72	2.00	68	52	98.6	591	377	286	215	331	1080	360
12	1.906	0.159	0.95	72	2.00	68	52	98.5	604	377	284	212	327	1022	361
13	2.065	0.159	0.94	73	2.00	68	52	98.7	618	377	281	212	324	1120	362
14	2.228	0.163	1.00	73	2.10	68	52	101.1	629	377	279	211	324	1095	364
15	2.391	0.163	1.01	73	2.10	68	52	101.0	639	377	278	206	322	1089	364
16	2.555	0.164	1.00	73	2.10	68	52	101.7	647	377	276	206	322	975	366
17	2.719	0.164	1.00	73	2.10	68	52	102.0	653	377	275	206	321	890	366
18	2.882	0.163	1.00	73	2.10	68	52	101.5	657	377	274	203	320	843	366
19	3.045	0.163	1.00	73	2.10	68	52	101.4	659	377	273	208	320	836	367
20	3.209	0.164	1.00	73	2.10	68	52	102.1	659	377	272	205	319	830	366
21	3.373	0.164	1.00	73	2.10	68	52	102.2	660	377	272	204	318	829	366
22	3.536	0.163	1.00	73	2.10	68	52	101.3	660	376	272	200	318	862	365
23	3.700	0.164	1.00	74	2.10	69	52	101.8	662	376	272	201	319	868	366
24	3.863	0.163	1.00	74	2.10	69	52	101.4	664	376	272	201	319	940	366
25	4.026	0.163	1.00	74	2.10	69	52	101.3	667	376	272	198	319	1103	366
26	4.190	0.164	1.00	74	2.10	69	53	101.9	673	376	273	202	321	1266	369
27	4.353	0.163	1.00	74	2.10	69	53	101.2	681	376	273	201	321	1270	370
28	4.518	0.165	1.00	74	2.10	69	53	102.5	688	376	273	200	323	1279	372
29	4.680	0.162	0.99	74	2.10	69	53	100.8	696	375	274	200	326	1280	374
30	4.843	0.163	1.00	74	2.10	69	53	101.6	705	375	274	202	328	1245	377
31	5.006	0.163	0.99	75	2.10	69	53	101.6	712	374	274	206	333	1226	380
32	5.170	0.164	1.00	75	2.10	69	53	101.9	719	374	275	202	336	1207	381
33	5.334	0.164	0.99	75	2.10	69	53	101.9	724	374	275	204	340	1219	383
34	5.497	0.163	0.99	75	2.10	69	53	101.4	729	374	276	202	343	1217	385
35	5.660	0.163	0.99	75	2.10	69	53	101.0	733	374	277	204	347	1171	387
36	5.823	0.163	0.99	75	2.10	70	53	100.8	736	374	278	205	351	1059	389
37	5.986	0.163	1.00	75	2.10	70	53	100.9	739	373	279	206	353	1027	390
38	6.150	0.164	0.99	75	2.10	70	53	101.6	740	373	280	206	358	1000	391
39	6.314	0.164	0.99	76	2.10	70	53	101.5	741	372	280	206	360	1012	392
40	6.477	0.163	0.99	76	2.10	70	53	100.7	741	372	281	205	363	1052	392

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Test Date: 3/7/24

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
41	6.640	0.163	0.99	76	2.10	70	53	100.6	741	371	282	208	364	1013	393
42	6.803	0.163	1.00	76	2.10	70	53	100.6	742	371	282	209	365	1003	394
43	6.967	0.164	0.99	76	2.10	70	54	101.3	742	371	282	207	365	1004	393
44	7.131	0.164	0.99	76	2.10	70	54	101.4	742	371	282	209	367	1023	394
45	7.294	0.163	0.99	76	2.10	70	54	100.9	741	371	282	207	370	1030	394
46	7.457	0.163	0.99	76	2.10	70	54	100.9	741	370	282	208	371	1063	394
47	7.621	0.164	1.00	76	2.10	70	54	101.4	740	370	282	208	372	1093	394
48	7.785	0.164	0.99	77	2.10	70	54	101.0	739	369	283	208	374	1105	395
49	7.949	0.164	1.00	77	2.10	70	54	100.7	740	369	283	210	373	1089	395
50	8.113	0.164	0.99	77	2.10	70	54	100.4	740	369	283	209	376	1040	395
51	8.276	0.163	0.99	77	2.10	70	54	99.8	740	368	283	212	377	975	396
52	8.439	0.163	1.00	77	2.10	70	54	100.1	741	368	283	211	378	935	396
53	8.603	0.164	1.00	77	2.10	70	54	100.7	741	367	283	211	379	911	396
54	8.767	0.164	1.00	77	2.10	70	54	100.6	740	366	283	211	383	910	397
55	8.931	0.164	1.00	77	2.10	70	54	100.6	739	366	283	211	381	915	396
56	9.095	0.164	0.99	77	2.10	70	54	100.7	738	365	283	212	381	952	396
57	9.259	0.164	1.00	77	2.10	70	54	100.8	737	365	284	211	380	973	395
58	9.422	0.163	0.99	77	2.10	70	54	99.8	737	365	284	213	380	944	396
59	9.586	0.164	1.00	78	2.10	70	54	100.0	738	364	284	213	381	921	396
60	9.750	0.164	1.00	78	2.10	70	54	100.2	738	363	284	213	381	919	396
61	9.915	0.165	1.00	78	2.10	70	54	101.0	740	363	285	211	380	930	396
62	10.079	0.164	1.00	78	2.10	70	55	100.3	742	362	285	211	380	953	396
63	10.243	0.164	0.99	78	2.10	70	55	100.4	745	362	285	214	380	956	397
64	10.406	0.163	1.00	78	2.10	70	55	99.6	748	361	286	216	380	966	398
65	10.570	0.164	1.00	78	2.10	70	55	100.3	750	360	286	219	380	1013	399
66	10.735	0.165	1.00	78	2.10	70	55	101.1	752	360	287	218	379	997	399
67	10.899	0.164	1.00	78	2.10	70	55	100.7	753	359	288	215	379	1008	399
68	11.064	0.165	1.00	78	2.10	70	55	101.3	755	359	288	217	378	1042	399
69	11.228	0.164	1.00	78	2.10	70	55	100.5	757	358	289	220	379	1082	401
70	11.392	0.164	1.00	78	2.10	70	55	100.4	757	358	289	218	379	1129	400
71	11.556	0.164	1.00	78	2.10	70	55	100.8	757	357	290	217	380	1127	400
72	11.720	0.164	1.00	78	2.10	70	55	101.1	757	357	291	217	381	1099	401
73	11.884	0.164	1.00	78	2.10	70	55	101.0	758	356	292	219	381	1086	401
74	12.049	0.165	0.99	78	2.10	70	55	101.5	758	356	292	220	382	1086	402
75	12.213	0.164	1.00	78	2.10	70	55	100.7	758	355	293	220	383	1075	402
76	12.377	0.164	0.99	78	2.10	70	55	100.5	759	355	294	220	384	1058	402
77	12.541	0.164	1.00	78	2.10	70	55	100.6	761	355	295	218	385	1064	403
78	12.705	0.164	1.00	78	2.10	70	55	100.6	763	354	295	219	387	1091	404
79	12.869	0.164	1.00	78	2.10	70	55	100.7	765	354	296	222	387	1097	405
80	13.033	0.164	1.00	79	2.10	70	55	100.9	765	353	296	219	388	1045	404
81	13.198	0.165	1.00	79	2.10	70	55	101.1	765	353	297	218	388	1102	404
82	13.362	0.164	1.00	79	2.10	70	55	100.1	765	352	297	219	389	1066	404
83	13.526	0.164	1.00	79	2.10	70	55	100.3	766	352	297	221	389	1071	405
84	13.690	0.164	1.00	79	2.10	70	55	100.5	766	352	297	221	391	1081	405

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
85	13.854	0.164	1.00	79	2.10	70	55	100.1	767	351	298	224	391	953	406
86	14.019	0.165	1.00	79	2.10	70	55	100.6	771	350	299	224	392	950	407
87	14.184	0.165	1.00	79	2.10	70	55	100.8	774	350	300	224	394	956	408
88	14.348	0.164	1.00	79	2.10	70	55	100.3	777	350	301	224	395	982	409
89	14.512	0.164	1.00	79	2.10	70	55	100.4	779	349	303	223	397	1080	410
90	14.676	0.164	1.00	79	2.10	70	55	100.6	781	349	304	225	398	1107	411
91	14.841	0.165	1.00	79	2.10	70	55	101.3	782	349	306	225	399	1125	412
92	15.005	0.164	1.00	79	2.10	70	55	100.8	783	348	307	226	402	1119	413
93	15.169	0.164	1.00	79	2.10	70	55	100.8	783	348	309	225	404	1166	414
94	15.334	0.165	1.00	79	2.10	70	55	101.2	783	348	310	223	406	1128	414
95	15.499	0.165	1.00	79	2.10	70	55	100.9	784	348	311	225	407	1157	415
96	15.663	0.164	0.99	79	2.10	70	55	100.2	785	348	312	224	409	1155	416
97	15.827	0.164	1.00	79	2.10	70	55	100.3	786	347	313	225	411	1153	416
98	15.991	0.164	1.00	79	2.10	70	55	100.5	786	347	313	227	412	1143	417
99	16.156	0.165	1.00	79	2.10	70	55	101.2	787	347	314	227	413	1159	418
100	16.320	0.164	1.00	79	2.10	70	55	100.6	787	347	314	227	414	1144	418
101	16.485	0.165	0.99	79	2.10	70	55	101.2	788	347	315	228	415	1138	419
102	16.650	0.165	1.00	79	2.10	70	55	101.2	788	346	315	227	415	1152	418
103	16.814	0.164	1.00	79	2.10	69	55	100.5	788	346	315	226	416	1202	418
104	16.978	0.164	1.00	79	2.10	69	55	100.4	787	346	315	226	415	1095	418
105	17.143	0.165	1.00	79	2.10	69	55	100.8	787	346	315	227	416	979	418
106	17.307	0.164	1.00	79	2.10	69	55	99.8	787	346	315	225	416	1127	418
107	17.472	0.165	1.00	79	2.10	69	55	100.5	787	346	315	227	416	971	418
108	17.637	0.165	1.00	79	2.10	69	55	100.6	787	346	315	229	416	1006	419
109	17.802	0.165	1.00	79	2.10	69	55	100.3	787	345	316	226	418	1013	418
110	17.966	0.164	1.00	79	2.10	69	55	99.7	787	345	316	225	418	948	418
111	18.130	0.164	1.00	79	2.10	69	55	100.1	788	345	317	222	417	946	418
112	18.295	0.165	1.00	79	2.10	69	55	100.8	788	345	317	223	417	1061	418
113	18.459	0.164	1.00	79	2.10	69	55	100.0	788	345	318	225	417	950	419
114	18.624	0.165	1.00	79	2.10	69	55	100.3	787	345	318	227	417	1026	419
115	18.788	0.164	1.00	79	2.10	69	55	99.7	787	345	319	223	417	988	418
116	18.954	0.166	1.00	79	2.10	69	55	101.2	785	345	319	227	418	1076	419
117	19.118	0.164	1.00	79	2.10	69	55	100.1	784	345	320	225	417	929	418
118	19.282	0.164	1.00	79	2.10	69	55	100.0	785	345	320	222	416	932	418
119	19.446	0.164	1.00	79	2.10	69	55	100.1	786	345	319	226	415	930	418
120	19.610	0.164	1.00	79	2.10	69	55	100.2	788	345	319	225	412	930	418
121	19.775	0.165	1.00	79	2.10	69	55	100.6	789	345	319	225	410	929	418
122	19.940	0.165	1.00	79	2.10	69	55	100.5	789	345	318	225	409	926	417
123	20.105	0.165	1.00	79	2.10	69	55	100.8	789	345	318	224	408	922	417
124	20.269	0.164	1.00	79	2.10	69	55	100.1	789	345	317	224	406	921	416
125	20.433	0.164	0.99	79	2.10	69	55	99.3	789	345	317	225	405	916	416
126	20.597	0.164	1.00	79	2.10	69	55	99.1	788	345	317	225	404	912	416
127	20.761	0.164	1.00	79	2.10	69	55	99.6	787	344	316	225	403	909	415
128	20.926	0.165	1.00	79	2.10	69	55	100.5	785	344	316	223	402	903	414

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
129	21.090	0.164	1.00	79	2.10	69	55	99.7	783	344	315	223	400	900	413
130	21.256	0.166	1.00	79	2.10	69	55	100.9	781	344	315	226	400	895	413
131	21.420	0.164	1.00	79	2.10	69	55	99.8	778	344	315	221	400	899	412
132	21.584	0.164	1.00	79	2.10	69	55	99.6	773	344	315	225	399	887	411
133	21.748	0.164	1.00	80	2.10	69	55	99.5	767	344	315	225	399	878	410
134	21.912	0.164	1.00	80	2.10	69	55	99.7	761	343	315	221	398	888	408
135	22.077	0.165	1.00	80	2.10	69	55	100.2	756	343	314	223	398	868	407
136	22.241	0.164	1.00	80	2.10	69	55	99.3	751	343	314	225	398	863	406
137	22.406	0.165	1.00	80	2.10	69	55	99.9	746	343	314	225	397	855	405
138	22.571	0.165	0.99	80	2.10	69	55	99.9	742	343	314	225	397	858	404
139	22.735	0.164	1.00	80	2.10	69	55	98.9	738	343	314	223	397	858	403
140	22.899	0.164	0.99	80	2.10	69	55	99.0	734	343	314	224	397	837	402
141	23.063	0.164	1.00	80	2.10	69	55	99.3	731	343	314	225	398	837	402
142	23.228	0.165	1.00	80	2.10	69	55	99.9	728	343	315	225	400	830	402
143	23.392	0.164	1.00	80	2.10	69	55	99.2	724	343	316	226	400	825	402
144	23.558	0.166	1.00	80	2.10	69	55	100.5	721	342	317	224	402	823	401
145	23.721	0.163	0.99	80	2.10	69	55	98.8	719	342	318	224	404	832	401
146	23.886	0.165	1.00	80	2.10	69	55	99.9	717	342	318	225	405	840	401
147	24.050	0.164	1.00	80	2.10	69	55	99.2	717	342	319	225	407	853	402
148	24.214	0.164	1.00	80	2.10	69	55	99.2	717	342	319	227	409	857	403
149	24.379	0.165	1.00	80	2.10	69	55	100.1	717	342	320	227	412	848	404
150	24.543	0.164	1.00	80	2.10	69	55	100.1	718	342	321	227	413	861	404
151	24.708	0.165	0.99	80	2.10	69	55	100.8	718	342	321	226	414	873	404
152	24.873	0.165	1.00	80	2.10	69	55	100.5	719	342	321	226	416	874	405
153	25.037	0.164	0.99	80	2.10	69	55	99.9	719	342	322	225	418	865	405
154	25.201	0.164	1.00	80	2.10	69	56	99.9	719	343	322	225	418	859	405
155	25.365	0.164	1.00	80	2.10	69	56	99.7	718	343	322	226	420	853	406
156	25.530	0.165	1.00	80	2.10	69	56	100.0	716	343	322	225	421	845	405
157	25.695	0.165	1.00	80	2.10	69	56	99.7	713	343	322	226	421	838	405
158	25.860	0.165	1.00	80	2.10	69	56	99.9	711	343	321	226	421	837	404
159	26.024	0.164	1.00	80	2.10	69	56	99.6	709	343	321	225	422	836	404
160	26.188	0.164	1.00	80	2.10	69	56	99.6	708	343	321	226	421	842	404
161	26.352	0.164	1.00	80	2.10	69	56	99.7	706	343	320	228	420	838	403
162	26.517	0.165	1.00	80	2.10	69	56	100.2	704	343	320	227	420	831	403
163	26.682	0.165	1.00	80	2.10	69	56	99.9	702	344	320	226	420	832	402
164	26.846	0.164	1.00	80	2.10	69	56	99.3	701	344	319	226	418	833	402
165	27.012	0.166	1.00	80	2.10	69	56	100.5	700	344	319	227	418	842	402
166	27.176	0.164	1.00	80	2.10	69	56	99.2	700	344	318	227	418	835	401
167	27.340	0.164	1.00	80	2.10	69	56	99.3	699	344	318	227	417	835	401
168	27.504	0.164	1.00	80	2.10	69	56	99.4	699	344	318	225	416	840	400
169	27.669	0.165	1.00	80	2.10	69	56	100.2	699	344	317	225	416	836	400
170	27.833	0.164	1.00	80	2.10	69	56	99.5	699	344	317	227	414	843	400
171	27.998	0.165	1.00	80	2.10	69	56	100.0	698	344	317	226	415	831	400
172	28.163	0.165	1.00	80	2.10	69	56	99.9	698	344	317	226	414	828	400

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
173	28.328	0.165	1.00	80	2.10	69	56	99.9	696	344	317	226	414	818	399
174	28.492	0.164	1.00	80	2.10	69	56	99.4	694	344	317	228	414	816	399
175	28.656	0.164	1.00	80	2.10	69	56	99.4	692	344	316	227	414	812	399
176	28.821	0.165	1.00	80	2.10	69	56	99.8	690	345	316	225	415	809	398
177	28.985	0.164	1.00	80	2.10	69	56	99.2	688	345	316	228	414	806	398
178	29.150	0.165	1.00	80	2.10	69	56	100.0	686	345	316	228	415	804	398
179	29.315	0.165	1.00	80	2.10	69	56	100.1	684	345	316	225	415	802	397
180	29.480	0.165	0.99	80	2.10	69	56	100.0	682	345	316	225	415	800	397
181	29.644	0.164	1.00	80	2.10	69	56	99.3	679	345	316	229	415	798	397
182	29.809	0.165	1.00	80	2.10	69	56	100.0	677	345	316	228	415	794	396
183	29.973	0.164	1.00	80	2.10	69	56	99.2	675	345	316	226	415	794	395
184	30.138	0.165	1.00	80	2.10	69	56	99.6	673	345	316	225	416	795	395
185	30.302	0.164	1.00	80	2.10	69	56	98.8	671	345	316	228	416	793	395
186	30.467	0.165	1.00	80	2.10	69	56	99.0	670	345	316	227	417	795	395
187	30.633	0.166	1.00	80	2.10	69	56	99.9	668	345	316	227	418	792	395
188	30.797	0.164	1.00	80	2.10	69	56	99.2	667	345	316	227	419	794	395
189	30.961	0.164	1.00	80	2.10	69	56	99.4	667	346	316	228	419	803	395
190	31.126	0.165	1.00	80	2.10	69	57	99.9	666	346	317	225	420	796	395
191	31.290	0.164	1.00	80	2.10	69	57	99.0	666	346	317	227	423	841	396
192	31.455	0.165	1.00	80	2.10	69	57	99.7	666	346	318	229	424	830	397
193	31.619	0.164	1.00	80	2.10	69	56	99.3	666	346	319	228	426	807	397
194	31.785	0.166	1.00	80	2.10	69	57	100.7	666	346	321	229	429	804	398
195	31.949	0.164	1.00	80	2.10	69	57	99.6	667	347	322	228	431	849	399
196	32.114	0.165	1.00	80	2.10	69	57	100.0	668	347	324	226	434	823	400
197	32.278	0.164	1.00	80	2.10	69	57	98.9	669	347	326	227	439	834	402
198	32.443	0.165	1.00	80	2.10	69	57	99.2	670	347	328	229	443	846	403
199	32.607	0.164	1.00	80	2.10	69	57	98.8	672	348	330	233	446	877	406
200	32.772	0.165	1.00	80	2.10	69	57	99.7	675	348	333	232	450	866	408
201	32.936	0.164	1.00	80	2.10	69	57	99.3	677	348	335	230	454	869	409
202	33.102	0.166	1.00	80	2.10	69	57	100.7	680	349	338	229	457	868	411
203	33.266	0.164	1.00	80	2.10	69	57	99.4	681	349	340	236	462	857	414
204	33.431	0.165	1.00	80	2.10	69	57	99.9	683	349	343	236	466	873	415
205	33.595	0.164	1.00	80	2.10	69	57	99.3	683	350	345	236	469	847	417
206	33.759	0.164	1.00	80	2.10	69	57	99.1	684	350	347	236	470	848	417
207	33.924	0.165	1.00	80	2.10	69	57	99.5	686	350	349	236	469	870	418
208	34.088	0.164	1.00	80	2.10	69	57	99.0	687	351	350	239	467	875	419
209	34.254	0.166	1.00	80	2.10	69	57	100.3	687	351	351	239	466	880	419
210	34.418	0.164	1.00	80	2.10	69	57	99.1	688	352	352	238	463	867	419
211	34.583	0.165	1.00	80	2.10	69	57	99.7	687	352	352	241	462	869	419
212	34.747	0.164	1.00	80	2.10	69	57	99.2	686	353	353	239	460	866	418
213	34.912	0.165	1.00	80	2.10	69	57	99.9	685	353	353	241	458	856	418
214	35.077	0.165	1.00	80	2.10	69	57	99.9	683	353	353	241	456	850	417
215	35.241	0.164	1.00	80	2.10	69	57	99.2	680	354	353	241	455	841	417
216	35.406	0.165	1.00	80	2.10	69	57	99.6	677	354	353	238	452	835	415

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
217	35.571	0.165	1.00	80	2.10	69	57	99.4	673	355	353	240	450	831	414
218	35.736	0.165	1.00	80	2.10	69	57	99.6	669	355	353	238	449	822	413
219	35.900	0.164	1.00	80	2.10	69	57	99.3	664	355	352	243	445	814	412
220	36.065	0.165	1.00	80	2.10	69	57	99.7	660	356	352	239	444	807	410
221	36.229	0.164	1.00	80	2.10	69	57	98.9	655	356	351	243	441	807	409
222	36.394	0.165	1.00	80	2.10	69	57	99.6	651	357	351	241	439	802	408
223	36.559	0.165	1.00	80	2.10	69	57	99.9	646	357	350	242	437	802	406
224	36.724	0.165	1.00	80	2.10	69	57	99.9	642	358	350	238	435	798	405
225	36.889	0.165	1.00	80	2.10	69	57	99.8	638	358	349	241	434	796	404
226	37.053	0.164	1.00	80	2.10	69	57	99.1	635	359	348	243	432	791	403
227	37.218	0.165	1.00	80	2.10	69	57	99.9	631	359	348	238	429	788	401
228	37.382	0.164	1.00	80	2.10	69	57	99.3	628	359	347	237	429	791	400
229	37.547	0.165	1.00	80	2.10	69	57	99.8	626	360	346	243	427	788	400
230	37.712	0.165	1.00	80	2.10	69	57	99.4	623	360	346	240	426	787	399
231	37.877	0.165	1.00	80	2.10	69	57	99.4	621	361	345	242	424	789	399
232	38.042	0.165	1.00	80	2.10	69	57	99.7	618	361	344	238	423	787	397
233	38.207	0.165	1.00	80	2.10	69	57	99.8	617	361	343	242	421	789	397
234	38.371	0.164	1.00	80	2.10	69	57	99.1	615	362	343	242	421	786	397
235	38.536	0.165	1.00	80	2.10	69	57	99.8	613	362	342	243	421	791	396
236	38.701	0.165	1.00	80	2.10	69	57	99.9	612	363	342	239	419	785	395
237	38.865	0.164	1.01	80	2.10	69	57	99.3	611	363	342	240	417	786	395
238	39.030	0.165	1.00	80	2.10	69	57	100.0	609	364	341	242	417	792	395
239	39.195	0.165	1.00	80	2.10	68	57	99.9	608	364	341	239	417	792	394
240	39.361	0.166	1.00	80	2.10	68	57	100.2	607	365	340	239	417	794	394
241	39.525	0.164	1.00	80	2.10	68	57	98.8	607	365	340	239	415	791	393
242	39.690	0.165	1.00	80	2.10	68	57	99.6	606	366	339	240	415	795	393
243	39.854	0.164	1.00	80	2.10	68	57	99.3	605	366	339	236	414	792	392
244	40.019	0.165	1.00	80	2.10	68	57	100.0	605	367	338	241	415	798	393
245	40.184	0.165	1.00	80	2.10	68	57	99.6	604	368	338	240	416	791	393
246	40.348	0.164	1.00	80	2.10	68	57	99.0	604	368	338	240	415	789	393
247	40.514	0.166	1.00	80	2.10	68	57	100.4	604	369	338	242	414	787	393
248	40.679	0.165	1.00	80	2.10	68	57	99.7	603	369	338	238	414	785	392
249	40.844	0.165	1.00	80	2.10	68	57	99.5	603	370	338	241	413	787	393
250	41.008	0.164	1.00	80	2.10	68	57	98.8	602	371	338	241	414	786	393
251	41.173	0.165	1.00	80	2.10	68	57	99.7	601	371	338	239	413	785	392
252	41.337	0.164	1.01	79	2.10	68	57	99.4	601	372	339	244	413	785	394
253	41.502	0.165	1.00	79	2.10	68	57	99.9	601	373	339	244	413	783	394
254	41.667	0.165	1.00	79	2.10	68	57	99.7	600	373	339	242	413	783	393
255	41.832	0.165	1.01	79	2.10	68	57	99.7	600	374	340	243	412	779	394
256	41.998	0.166	1.00	79	2.10	68	57	100.2	599	374	340	243	411	777	393
257	42.162	0.164	1.00	79	2.10	68	57	98.8	599	375	340	243	411	780	394
258	42.327	0.165	1.00	79	2.10	68	57	99.5	598	375	340	243	411	782	393
259	42.491	0.164	1.00	79	2.10	68	57	99.3	598	376	340	244	410	781	394
260	42.656	0.165	1.00	79	2.10	68	57	99.9	597	377	340	245	410	778	394

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
261	42.821	0.165	1.00	79	2.10	68	57	99.6	597	377	340	243	410	779	393
262	42.985	0.164	1.00	79	2.10	68	57	99.1	596	378	340	243	410	781	393
263	43.151	0.166	1.00	79	2.10	68	57	100.6	596	378	340	246	409	781	394
264	43.316	0.165	1.00	79	2.10	68	57	100.0	596	379	340	245	408	776	394
265	43.480	0.164	0.99	79	2.10	68	57	99.4	595	379	340	243	407	771	393
266	43.645	0.165	1.00	79	2.10	68	57	100.2	595	380	340	242	406	773	393
267	43.810	0.165	1.00	79	2.10	68	57	100.0	594	381	340	244	407	767	393
268	43.974	0.164	1.00	79	2.10	68	57	99.0	594	381	340	241	407	765	393
269	44.139	0.165	1.00	79	2.10	68	57	99.6	594	381	341	244	407	763	393
270	44.304	0.165	1.01	79	2.10	68	57	99.6	594	382	341	243	406	758	393
271	44.469	0.165	1.00	79	2.10	68	57	99.2	594	383	342	247	408	760	395
272	44.634	0.165	1.00	79	2.10	68	57	99.0	594	383	342	244	405	761	394
273	44.799	0.165	1.00	79	2.10	68	57	99.3	593	384	343	245	405	763	394
274	44.963	0.164	1.00	79	2.10	68	57	98.8	593	384	343	247	405	749	394
275	45.128	0.165	1.00	79	2.10	68	57	99.3	592	385	343	246	403	747	394
276	45.293	0.165	1.01	79	2.10	68	57	99.5	591	385	343	244	404	745	393
277	45.457	0.164	1.00	79	2.10	68	57	99.1	591	386	344	248	404	743	395
278	45.622	0.165	1.00	79	2.10	68	57	99.7	590	386	345	246	403	740	394
279	45.788	0.166	1.00	79	2.10	68	57	100.4	589	386	346	247	402	740	394
280	45.952	0.164	1.00	79	2.10	68	57	99.3	589	387	346	244	404	741	394
281	46.117	0.165	1.00	79	2.10	68	57	100.0	588	387	347	247	402	740	394
282	46.281	0.164	1.00	79	2.10	68	58	99.4	587	387	348	248	402	738	394
283	46.446	0.165	1.00	79	2.10	68	57	99.9	586	387	349	251	401	739	395
284	46.610	0.164	1.01	79	2.10	68	57	99.2	586	388	351	249	403	739	395
285	46.775	0.165	1.00	79	2.10	68	57	99.7	585	388	352	250	403	740	396
286	46.940	0.165	1.01	79	2.10	68	58	99.8	584	388	354	249	403	740	396
287	47.105	0.165	1.00	79	2.10	68	58	99.9	583	388	356	247	403	745	395
288	47.270	0.165	1.00	79	2.10	68	58	99.8	582	389	359	245	404	747	396
289	47.435	0.165	1.00	79	2.10	68	58	99.6	581	389	362	248	405	747	397
290	47.599	0.164	1.00	79	2.10	68	58	98.9	580	389	365	249	406	750	398
291	47.763	0.164	1.01	79	2.10	68	58	98.9	579	389	367	249	405	746	398
292	47.929	0.166	1.00	79	2.10	68	58	100.1	578	389	370	251	405	737	399
293	48.093	0.164	1.00	79	2.10	68	58	99.0	577	389	374	250	405	738	399
294	48.258	0.165	1.00	79	2.10	68	58	99.8	576	390	377	247	406	741	399
295	48.423	0.165	1.00	79	2.10	68	58	100.1	575	390	380	248	409	737	400
296	48.588	0.165	1.00	79	2.10	68	58	100.0	574	390	383	251	407	739	401
297	48.752	0.164	1.00	79	2.10	68	58	99.1	573	390	387	250	409	734	402
298	48.917	0.165	1.00	79	2.10	68	58	99.6	573	390	389	249	409	737	402
299	49.081	0.164	1.00	79	2.10	68	58	99.0	572	390	392	254	408	732	403
300	49.246	0.165	1.00	79	2.10	68	58	99.4	572	391	394	249	409	738	403
301	49.411	0.165	1.01	79	2.10	68	58	99.6	571	391	397	251	410	738	404
302	49.576	0.165	1.00	79	2.10	68	58	100.0	571	391	399	252	410	736	405
303	49.741	0.165	1.00	79	2.10	68	58	99.8	571	391	401	251	409	733	405
304	49.905	0.164	0.99	79	2.10	68	58	98.9	571	391	403	253	410	727	406

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 14:59
Total Sampling Time: 316 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0 cfm @ 10.14 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
305	50.070	0.165	1.00	79	2.10	68	58	99.5	570	392	404	252	411	726	406
306	50.234	0.164	1.01	79	2.10	68	58	98.7	570	392	406	248	409	729	405
307	50.399	0.165	1.00	79	2.10	68	58	99.4	570	392	407	253	415	727	407
308	50.564	0.165	1.00	79	2.10	68	58	100.0	570	392	408	252	414	735	407
309	50.729	0.165	1.01	79	2.10	68	58	99.9	570	393	410	254	411	735	408
310	50.894	0.165	1.00	79	2.10	68	58	99.7	570	393	410	249	412	731	407
311	51.059	0.165	1.00	79	2.10	68	58	99.6	570	393	411	251	411	733	407
312	51.223	0.164	1.00	79	2.10	68	58	98.7	570	393	412	253	412	727	408
313	51.388	0.165	1.00	79	2.10	68	58	99.2	570	393	413	254	413	731	409
314	51.552	0.164	1.01	79	2.10	67	58	98.7	570	394	413	254	411	734	408
315	51.717	0.165	1.00	79	2.10	67	58	99.5	570	394	414	255	411	730	409
316	51.882	0.165	1.00	78	2.10	67	58	99.5	570	394	414	257	413	725	410

Train C - First Hour Particulate Sampling

Run: 5 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 14:59
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0.003 cfm @ 5 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
Tot / Avg	**9.723**	**0.162**	**2.17**	**66.9**	**-2.13**	**68.8**	**63.9**	**100.2**
Minimum	0.000	0.160	-0.06	66	-2.46	65	62	98.6
Max	9.723	0.165	2.30	68	-1.83	70	65	103.8
0	0.000		-0.06	66	-1.83	65	62	
1	0.162	0.162	2.30	66	-1.93	67	62	102.4
2	0.326	0.164	2.28	66	-2.01	67	62	103.8
3	0.491	0.165	2.26	66	-1.91	67	62	101.7
4	0.654	0.163	2.24	66	-2.20	67	63	100.3
5	0.817	0.163	2.23	66	-1.89	67	63	100.5
6	0.979	0.162	2.20	66	-2.08	67	63	99.9
7	1.141	0.162	2.20	66	-2.17	67	63	99.8
8	1.303	0.162	2.19	66	-2.07	67	63	99.9
9	1.464	0.161	2.19	66	-2.20	67	63	99.5
10	1.625	0.161	2.18	66	-1.98	67	63	99.5
11	1.786	0.161	2.16	66	-2.38	67	63	99.3
12	1.946	0.160	2.17	66	-2.19	68	63	98.6
13	2.107	0.161	2.26	66	-1.95	68	63	99.4
14	2.271	0.164	2.25	67	-2.43	68	63	101.2
15	2.435	0.164	2.26	67	-2.26	68	63	101.0
16	2.599	0.164	2.24	66	-2.33	68	63	101.2
17	2.761	0.162	2.24	66	-2.08	68	63	100.4
18	2.924	0.163	2.25	67	-2.08	68	63	101.0
19	3.088	0.164	2.23	67	-2.06	68	63	101.4
20	3.251	0.163	2.23	67	-1.99	68	63	100.9
21	3.414	0.163	2.24	67	-1.92	68	63	101.0
22	3.577	0.163	2.22	67	-1.92	69	63	100.7
23	3.739	0.162	2.23	67	-1.92	69	63	100.1
24	3.902	0.163	2.23	67	-2.45	69	63	101.0
25	4.065	0.163	2.22	67	-2.16	69	64	101.0
26	4.227	0.162	2.22	67	-2.14	69	64	100.3
27	4.389	0.162	2.22	67	-2.03	69	64	100.3
28	4.552	0.163	2.20	67	-2.18	69	64	101.0
29	4.713	0.161	2.22	67	-2.41	69	64	100.0
30	4.876	0.163	2.22	67	-1.97	69	64	101.4
31	5.038	0.162	2.20	67	-2.35	69	64	100.8
32	5.199	0.161	2.21	67	-1.93	69	64	100.0

Train C - First Hour Particulate Sampling

Run: 5
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Start Time: 14:59
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/7/24

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Sample Train Leak Checks
Pre-test cfm @ in. Hg
Post-Test 0.003 cfm @ 5 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
33	5.362	0.163	2.21	67	-2.39	69	64	101.3
34	5.523	0.161	2.21	67	-2.18	69	64	100.1
35	5.685	0.162	2.20	67	-2.28	70	64	100.3
36	5.846	0.161	2.19	67	-1.93	70	64	99.5
37	6.008	0.162	2.20	67	-2.36	70	64	100.3
38	6.169	0.161	2.18	67	-1.99	70	64	99.7
39	6.331	0.162	2.18	67	-2.14	70	64	100.4
40	6.492	0.161	2.20	67	-1.94	70	65	99.7
41	6.654	0.162	2.17	67	-1.93	70	65	100.2
42	6.815	0.161	2.19	67	-2.01	70	65	99.6
43	6.977	0.162	2.19	67	-2.43	70	65	100.3
44	7.139	0.162	2.20	67	-1.96	70	65	100.4
45	7.300	0.161	2.20	67	-1.95	70	65	99.9
46	7.462	0.162	2.18	67	-2.18	70	65	100.5
47	7.623	0.161	2.19	67	-2.44	70	65	99.8
48	7.785	0.162	2.18	67	-2.24	70	65	100.1
49	7.946	0.161	2.18	67	-2.30	70	65	99.3
50	8.107	0.161	2.19	67	-2.24	70	65	99.0
51	8.270	0.163	2.18	68	-1.93	70	65	100.2
52	8.431	0.161	2.19	68	-1.93	70	65	99.2
53	8.593	0.162	2.19	68	-2.18	70	65	99.8
54	8.754	0.161	2.20	68	-2.16	70	65	99.1
55	8.915	0.161	2.20	68	-2.15	70	65	99.1
56	9.078	0.163	2.18	68	-2.26	70	65	100.5
57	9.238	0.160	2.20	68	-1.94	70	65	98.6
58	9.401	0.163	2.17	68	-2.41	70	65	100.1
59	9.562	0.161	2.19	68	-2.17	70	65	98.6
60	9.723	0.161	2.20	68	-2.46	70	65	98.9

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
Tot / Avg	**58.771**	**0.186**	**1.50**	**67.8**	**-2.01**	**233.97**	**-0.066**	**459.6**	**0.17**	**13.43**
Minimum	0.000	0.148	1.48	67	-2.20	186.00	-0.082	2.5	0.00	1.34
Max	58.771	11.782	1.61	69	-1.90	321.00	-0.056	1040.0	1.27	17.22
0	0.000		0.61	67	-0.80	247	-0.069	1040.0	0.29	1.80
1	11.782	11.782	1.61	67	-2.00	256	-0.067	1040.0	0.23	1.34
2	11.937	0.155	1.60	67	-1.90	246	-0.067	56.6	0.00	6.95
3	12.090	0.153	1.58	67	-2.20	246	-0.069	91.9	0.01	9.05
4	12.243	0.153	1.58	67	-1.90	251	-0.071	90.6	0.00	9.37
5	12.396	0.153	1.57	67	-2.10	255	-0.072	80.6	0.00	9.44
6	12.548	0.152	1.56	67	-2.00	258	-0.072	66.9	0.00	9.51
7	12.700	0.152	1.56	67	-1.90	261	-0.073	59.8	0.00	9.43
8	12.851	0.151	1.55	67	-1.90	263	-0.074	64.4	0.00	10.35
9	13.002	0.151	1.54	67	-2.10	265	-0.075	67.3	0.00	9.99
10	13.153	0.151	1.54	67	-2.20	268	-0.075	56.9	0.00	10.66
11	13.304	0.151	1.54	67	-1.90	276	-0.077	1040.0	0.43	15.15
12	13.454	0.150	1.53	67	-1.90	288	-0.078	1040.0	0.79	16.00
13	13.605	0.151	1.52	67	-2.00	293	-0.079	1040.0	0.17	15.17
14	13.755	0.150	1.54	67	-1.90	298	-0.079	860.5	0.05	15.15
15	13.905	0.150	1.53	67	-1.90	305	-0.080	982.9	0.10	14.82
16	14.055	0.150	1.52	67	-1.90	306	-0.080	197.5	0.01	14.13
17	14.206	0.151	1.51	67	-2.20	306	-0.080	79.9	0.00	12.18
18	14.355	0.149	1.53	67	-2.10	303	-0.079	74.7	0.00	11.24
19	14.505	0.150	1.52	67	-1.90	300	-0.079	68.9	0.00	11.33
20	14.654	0.149	1.51	67	-1.90	302	-0.080	73.1	0.00	11.88
21	14.804	0.150	1.51	67	-2.00	303	-0.079	71.5	0.00	12.20
22	14.953	0.149	1.52	67	-1.90	304	-0.079	67.3	0.00	12.84
23	15.103	0.150	1.51	67	-1.90	305	-0.079	67.9	0.00	13.07
24	15.252	0.149	1.50	67	-2.10	305	-0.079	60.5	0.00	13.60
25	15.401	0.149	1.51	67	-2.00	309	-0.081	1040.0	0.56	14.56
26	15.550	0.149	1.51	67	-2.00	313	-0.081	1040.0	1.27	16.42
27	15.699	0.149	1.51	67	-1.90	316	-0.081	1040.0	0.62	16.44
28	15.848	0.149	1.50	67	-2.00	318	-0.081	1040.0	0.26	17.09
29	15.997	0.149	1.51	67	-1.90	319	-0.081	1040.0	0.67	17.08
30	16.146	0.149	1.51	67	-2.00	319	-0.082	1040.0	0.70	17.22
31	16.295	0.149	1.51	67	-2.10	321	-0.081	1040.0	0.42	16.91
32	16.444	0.149	1.50	67	-2.10	319	-0.080	1040.0	0.20	16.68

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
33	16.593	0.149	1.50	67	-1.90	317	-0.081	1040.0	0.36	16.57
34	16.742	0.149	1.50	67	-1.90	316	-0.081	1040.0	0.77	16.66
35	16.891	0.149	1.50	67	-1.90	314	-0.080	1040.0	0.89	16.32
36	17.039	0.148	1.50	67	-2.00	313	-0.080	1040.0	0.36	15.77
37	17.188	0.149	1.49	67	-1.90	311	-0.080	1040.0	0.22	14.88
38	17.337	0.149	1.50	67	-2.10	306	-0.080	1016.9	0.09	14.30
39	17.486	0.149	1.51	67	-2.20	302	-0.079	565.3	0.05	13.94
40	17.635	0.149	1.51	67	-1.90	299	-0.079	393.0	0.03	13.75
41	17.783	0.148	1.50	67	-1.90	296	-0.078	343.8	0.03	13.67
42	17.932	0.149	1.50	67	-1.90	293	-0.077	322.6	0.03	13.29
43	18.082	0.150	1.51	67	-2.00	291	-0.077	161.9	0.01	13.08
44	18.230	0.148	1.50	67	-1.90	288	-0.077	184.6	0.01	13.36
45	18.379	0.149	1.49	67	-2.20	287	-0.077	191.3	0.01	13.62
46	18.528	0.149	1.49	67	-2.00	286	-0.076	150.5	0.01	13.66
47	18.677	0.149	1.50	67	-1.90	286	-0.076	174.8	0.01	14.11
48	18.825	0.148	1.50	67	-2.20	285	-0.076	154.7	0.01	14.27
49	18.974	0.149	1.49	67	-2.00	285	-0.076	96.1	0.01	14.38
50	19.123	0.149	1.49	67	-1.90	283	-0.076	76.3	0.00	14.23
51	19.272	0.149	1.49	67	-1.90	282	-0.076	126.2	0.01	13.54
52	19.421	0.149	1.50	67	-2.10	279	-0.076	100.0	0.01	12.86
53	19.570	0.149	1.51	67	-2.20	276	-0.075	114.2	0.01	13.17
54	19.719	0.149	1.50	67	-1.90	275	-0.074	697.0	0.08	13.31
55	19.868	0.149	1.49	67	-2.00	275	-0.075	1040.0	0.18	13.42
56	20.017	0.149	1.50	67	-1.90	276	-0.075	1040.0	0.17	13.55
57	20.166	0.149	1.51	67	-2.20	275	-0.075	1040.0	0.27	13.62
58	20.314	0.148	1.50	67	-2.10	275	-0.075	1040.0	0.22	13.86
59	20.463	0.149	1.49	67	-2.00	273	-0.075	1040.0	0.17	13.90
60	20.613	0.150	1.50	67	-1.90	272	-0.073	1040.0	0.11	13.99
61	20.761	0.148	1.50	67	-1.90	271	-0.074	1040.0	0.17	14.20
62	20.910	0.149	1.50	67	-2.00	272	-0.074	1040.0	0.28	14.61
63	21.059	0.149	1.50	67	-2.20	270	-0.074	1040.0	0.30	14.73
64	21.209	0.150	1.49	67	-2.00	271	-0.074	1040.0	0.32	14.69
65	21.357	0.148	1.50	67	-2.00	273	-0.075	1040.0	0.34	15.08
66	21.506	0.149	1.51	67	-2.20	273	-0.074	1040.0	0.29	15.24
67	21.656	0.150	1.50	67	-2.20	273	-0.074	1040.0	0.23	14.79
68	21.805	0.149	1.50	67	-1.90	270	-0.073	1040.0	0.16	14.91

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
69	21.954	0.149	1.51	67	-2.00	269	-0.073	1040.0	0.18	15.23
70	22.103	0.149	1.50	67	-2.10	270	-0.074	1040.0	0.32	15.20
71	22.252	0.149	1.49	67	-2.10	271	-0.073	1040.0	0.43	15.16
72	22.401	0.149	1.49	67	-2.00	271	-0.073	1040.0	0.46	14.90
73	22.550	0.149	1.49	67	-1.90	270	-0.073	1040.0	0.46	15.34
74	22.699	0.149	1.50	67	-2.20	268	-0.073	1040.0	0.46	15.32
75	22.848	0.149	1.49	67	-2.00	267	-0.072	1040.0	0.41	15.23
76	22.997	0.149	1.49	67	-1.90	266	-0.073	1040.0	0.46	15.20
77	23.146	0.149	1.50	67	-1.90	266	-0.072	1040.0	0.47	15.02
78	23.294	0.148	1.50	67	-1.90	267	-0.073	1040.0	0.49	15.22
79	23.443	0.149	1.50	67	-1.90	266	-0.073	1040.0	0.47	14.80
80	23.591	0.148	1.50	67	-1.90	264	-0.072	1040.0	0.48	14.71
81	23.740	0.149	1.49	67	-2.00	264	-0.073	1040.0	0.44	14.36
82	23.890	0.150	1.50	67	-2.10	262	-0.073	1040.0	0.33	14.62
83	24.038	0.148	1.50	67	-1.90	262	-0.072	1040.0	0.41	14.79
84	24.187	0.149	1.50	67	-1.90	261	-0.073	1040.0	0.43	14.79
85	24.336	0.149	1.49	67	-2.00	256	-0.071	1040.0	0.12	15.32
86	24.486	0.150	1.50	67	-1.90	258	-0.072	1040.0	0.13	15.36
87	24.634	0.148	1.50	68	-2.00	260	-0.071	1040.0	0.18	15.84
88	24.783	0.149	1.50	68	-2.20	260	-0.072	1040.0	0.31	16.02
89	24.932	0.149	1.50	68	-2.20	263	-0.074	1040.0	0.49	16.30
90	25.081	0.149	1.50	68	-1.90	262	-0.073	1040.0	0.56	16.36
91	25.230	0.149	1.50	68	-1.90	261	-0.072	1040.0	0.61	16.27
92	25.379	0.149	1.51	68	-1.90	260	-0.071	1040.0	0.65	16.45
93	25.528	0.149	1.50	68	-1.90	260	-0.071	1040.0	0.57	16.28
94	25.678	0.150	1.49	68	-2.00	258	-0.073	1040.0	0.50	16.29
95	25.827	0.149	1.51	68	-2.20	258	-0.072	1040.0	0.62	16.41
96	25.976	0.149	1.51	68	-2.10	257	-0.072	1040.0	0.58	16.41
97	26.125	0.149	1.50	68	-2.00	253	-0.073	1040.0	0.58	16.40
98	26.274	0.149	1.50	68	-1.90	251	-0.071	1040.0	0.57	16.08
99	26.423	0.149	1.49	68	-2.00	249	-0.073	1040.0	0.52	15.73
100	26.572	0.149	1.51	68	-2.10	249	-0.071	1040.0	0.57	15.79
101	26.721	0.149	1.50	68	-1.90	247	-0.071	1040.0	0.68	15.90
102	26.871	0.150	1.50	68	-2.10	245	-0.070	1040.0	0.52	15.78
103	27.020	0.149	1.50	68	-2.20	245	-0.071	1040.0	0.50	15.47
104	27.169	0.149	1.51	68	-2.10	242	-0.069	1040.0	0.48	14.96

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
105	27.318	0.149	1.51	68	-2.00	239	-0.069	1040.0	0.49	15.38
106	27.468	0.150	1.50	68	-1.90	238	-0.072	1040.0	0.29	14.78
107	27.617	0.149	1.51	68	-1.90	237	-0.067	1040.0	0.26	15.21
108	27.766	0.149	1.51	68	-1.90	236	-0.070	1040.0	0.19	15.56
109	27.915	0.149	1.50	68	-2.00	235	-0.071	1040.0	0.20	15.45
110	28.064	0.149	1.50	67	-2.10	234	-0.067	1040.0	0.39	15.50
111	28.214	0.150	1.51	67	-2.20	235	-0.069	1040.0	0.37	15.23
112	28.363	0.149	1.51	67	-2.00	235	-0.067	1040.0	0.41	15.82
113	28.512	0.149	1.51	67	-1.90	235	-0.069	1040.0	0.32	15.33
114	28.661	0.149	1.50	67	-2.00	234	-0.067	1040.0	0.29	14.99
115	28.811	0.150	1.50	67	-1.90	233	-0.067	1040.0	0.27	15.27
116	28.959	0.148	1.50	68	-2.10	231	-0.066	1040.0	0.36	15.75
117	29.108	0.149	1.50	68	-1.90	226	-0.066	1040.0	0.51	15.15
118	29.257	0.149	1.50	68	-2.00	222	-0.065	1040.0	0.94	15.49
119	29.406	0.149	1.49	68	-2.00	219	-0.065	1040.0	0.99	15.30
120	29.556	0.150	1.49	68	-2.00	220	-0.065	1040.0	0.85	15.49
121	29.704	0.148	1.50	68	-2.20	217	-0.064	1040.0	0.78	15.45
122	29.853	0.149	1.49	68	-1.90	215	-0.064	1040.0	0.75	15.44
123	30.002	0.149	1.49	68	-2.10	213	-0.064	1040.0	0.61	15.50
124	30.151	0.149	1.50	68	-2.20	213	-0.064	1040.0	0.51	15.61
125	30.299	0.148	1.50	68	-2.10	212	-0.064	1040.0	0.49	15.12
126	30.448	0.149	1.50	68	-2.10	212	-0.063	1040.0	0.60	15.20
127	30.597	0.149	1.49	68	-1.90	211	-0.062	1040.0	0.55	14.83
128	30.745	0.148	1.49	68	-2.00	208	-0.063	1040.0	0.63	14.55
129	30.894	0.149	1.50	68	-2.20	208	-0.062	1040.0	0.55	14.45
130	31.043	0.149	1.50	68	-1.90	207	-0.062	1040.0	0.55	14.78
131	31.192	0.149	1.50	68	-2.00	207	-0.062	1040.0	0.12	14.69
132	31.340	0.148	1.49	68	-2.00	205	-0.062	191.3	0.01	14.68
133	31.489	0.149	1.50	68	-2.20	205	-0.062	123.0	0.01	13.81
134	31.638	0.149	1.50	68	-1.90	205	-0.062	97.7	0.01	14.03
135	31.786	0.148	1.50	68	-2.00	205	-0.062	104.5	0.01	13.94
136	31.935	0.149	1.49	68	-2.00	205	-0.062	110.0	0.01	13.94
137	32.084	0.149	1.49	68	-1.90	205	-0.062	87.0	0.01	13.89
138	32.233	0.149	1.48	68	-2.00	206	-0.061	102.6	0.01	13.88
139	32.382	0.149	1.50	68	-1.90	205	-0.062	103.2	0.01	14.11
140	32.531	0.149	1.49	68	-2.20	206	-0.062	95.1	0.01	13.86

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
141	32.679	0.148	1.49	68	-1.90	211	-0.062	185.5	0.01	13.81
142	32.828	0.149	1.49	68	-2.10	209	-0.062	121.1	0.01	13.97
143	32.977	0.149	1.50	68	-2.20	212	-0.062	109.7	0.01	14.12
144	33.125	0.148	1.50	68	-2.00	212	-0.063	138.8	0.01	14.58
145	33.274	0.149	1.49	68	-1.90	213	-0.063	1040.0	0.19	14.94
146	33.423	0.149	1.49	68	-2.20	215	-0.064	1040.0	0.27	14.57
147	33.572	0.149	1.49	68	-2.00	215	-0.064	1040.0	0.35	15.29
148	33.721	0.149	1.50	68	-1.90	216	-0.064	1040.0	0.40	15.27
149	33.870	0.149	1.49	68	-1.90	218	-0.063	1040.0	0.37	15.32
150	34.019	0.149	1.49	68	-1.90	218	-0.063	1040.0	0.40	15.24
151	34.168	0.149	1.50	68	-1.90	220	-0.064	1040.0	0.38	14.68
152	34.316	0.148	1.50	68	-1.90	220	-0.064	1040.0	0.27	15.06
153	34.465	0.149	1.50	68	-1.90	219	-0.064	1040.0	0.22	14.69
154	34.614	0.149	1.49	68	-2.10	219	-0.063	1040.0	0.11	14.42
155	34.763	0.149	1.50	68	-2.10	217	-0.064	626.1	0.06	13.71
156	34.912	0.149	1.50	68	-2.20	218	-0.064	557.2	0.05	13.99
157	35.061	0.149	1.50	68	-2.00	217	-0.063	307.9	0.02	13.30
158	35.209	0.148	1.49	68	-1.90	216	-0.062	308.5	0.03	13.60
159	35.358	0.149	1.49	68	-2.00	215	-0.062	263.1	0.02	13.72
160	35.508	0.150	1.48	68	-2.00	215	-0.063	239.3	0.02	13.52
161	35.656	0.148	1.50	68	-1.90	213	-0.062	228.2	0.02	13.68
162	35.805	0.149	1.49	68	-2.10	213	-0.063	91.3	0.01	13.35
163	35.954	0.149	1.49	68	-1.90	215	-0.062	108.1	0.01	13.12
164	36.103	0.149	1.49	68	-2.10	213	-0.062	106.5	0.01	13.22
165	36.251	0.148	1.50	68	-2.20	214	-0.063	142.1	0.01	13.53
166	36.400	0.149	1.50	68	-2.20	214	-0.063	168.0	0.01	13.47
167	36.549	0.149	1.49	68	-2.00	214	-0.062	181.2	0.02	13.55
168	36.698	0.149	1.49	68	-2.20	213	-0.063	223.1	0.02	13.48
169	36.847	0.149	1.50	68	-1.90	214	-0.062	157.6	0.01	13.55
170	36.996	0.149	1.50	68	-2.20	215	-0.063	139.8	0.01	13.27
171	37.145	0.149	1.49	68	-2.00	214	-0.063	100.7	0.01	13.42
172	37.294	0.149	1.49	68	-1.90	215	-0.063	94.8	0.01	12.97
173	37.443	0.149	1.49	68	-1.90	215	-0.062	86.4	0.00	13.02
174	37.592	0.149	1.50	68	-1.90	215	-0.062	87.4	0.00	12.90
175	37.740	0.148	1.49	68	-2.10	215	-0.063	80.3	0.00	12.72
176	37.889	0.149	1.49	68	-2.20	215	-0.063	76.6	0.00	12.59

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
177	38.038	0.149	1.49	68	-2.10	217	-0.063	76.3	0.00	12.47
178	38.187	0.149	1.50	68	-1.90	216	-0.063	75.7	0.00	12.45
179	38.336	0.149	1.50	68	-2.20	216	-0.063	73.1	0.00	12.63
180	38.485	0.149	1.50	68	-2.10	217	-0.062	74.1	0.00	12.46
181	38.634	0.149	1.49	68	-2.10	216	-0.063	72.4	0.00	12.42
182	38.784	0.150	1.50	68	-1.90	218	-0.063	71.8	0.00	12.47
183	38.933	0.149	1.50	68	-2.20	218	-0.063	72.8	0.00	12.43
184	39.081	0.148	1.49	69	-2.10	219	-0.063	74.4	0.00	12.68
185	39.230	0.149	1.49	69	-2.00	219	-0.063	76.0	0.00	12.84
186	39.380	0.150	1.50	69	-2.10	220	-0.063	74.1	0.00	12.68
187	39.528	0.148	1.50	69	-2.00	221	-0.063	78.3	0.00	12.84
188	39.678	0.150	1.49	68	-2.00	220	-0.063	76.0	0.00	13.14
189	39.827	0.149	1.49	69	-1.90	219	-0.062	77.6	0.00	13.59
190	39.976	0.149	1.49	69	-2.10	220	-0.064	75.7	0.00	13.75
191	40.124	0.148	1.50	69	-2.20	223	-0.064	74.4	0.00	13.68
192	40.273	0.149	1.50	69	-2.10	223	-0.066	76.0	0.00	14.03
193	40.423	0.150	1.49	69	-2.10	221	-0.063	67.3	0.00	14.38
194	40.572	0.149	1.49	69	-1.90	223	-0.063	71.8	0.00	14.32
195	40.721	0.149	1.50	69	-2.10	224	-0.066	70.6	0.00	14.99
196	40.870	0.149	1.50	69	-2.00	225	-0.064	72.4	0.00	15.42
197	41.018	0.148	1.49	69	-2.00	225	-0.064	101.9	0.01	15.59
198	41.168	0.150	1.49	69	-2.00	228	-0.066	111.3	0.01	15.66
199	41.317	0.149	1.48	69	-2.00	229	-0.067	263.2	0.03	15.45
200	41.466	0.149	1.50	69	-2.20	228	-0.065	611.9	0.07	15.99
201	41.615	0.149	1.49	69	-2.10	230	-0.066	1040.0	0.25	15.80
202	41.764	0.149	1.49	69	-1.90	230	-0.065	1040.0	0.49	15.84
203	41.913	0.149	1.48	69	-1.90	230	-0.065	1040.0	0.69	15.56
204	42.062	0.149	1.50	69	-2.00	228	-0.066	1040.0	0.91	15.57
205	42.211	0.149	1.50	69	-2.20	229	-0.065	1040.0	0.82	14.95
206	42.360	0.149	1.49	69	-1.90	225	-0.064	1040.0	1.14	16.10
207	42.509	0.149	1.50	69	-2.10	224	-0.064	1040.0	0.90	15.37
208	42.658	0.149	1.50	69	-2.10	222	-0.064	1040.0	0.84	14.80
209	42.807	0.149	1.50	69	-2.00	219	-0.064	1040.0	0.72	14.61
210	42.956	0.149	1.49	69	-2.10	217	-0.064	1040.0	0.48	14.51
211	43.105	0.149	1.49	69	-2.10	215	-0.063	1040.0	0.43	14.29
212	43.255	0.150	1.50	69	-2.10	212	-0.063	1040.0	0.28	14.10

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
213	43.404	0.149	1.50	69	-2.10	208	-0.061	1040.0	0.17	13.61
214	43.553	0.149	1.50	69	-1.90	207	-0.061	909.3	0.08	13.27
215	43.702	0.149	1.49	69	-1.90	206	-0.060	268.1	0.02	13.07
216	43.852	0.150	1.50	69	-1.90	203	-0.059	116.2	0.01	13.17
217	44.001	0.149	1.50	69	-2.00	201	-0.059	58.2	0.00	12.88
218	44.149	0.148	1.49	69	-2.00	199	-0.058	50.1	0.00	12.65
219	44.299	0.150	1.49	69	-2.10	195	-0.058	47.9	0.00	12.07
220	44.448	0.149	1.49	69	-2.00	194	-0.058	49.2	0.00	12.43
221	44.597	0.149	1.50	69	-2.20	193	-0.057	46.9	0.00	12.01
222	44.746	0.149	1.49	69	-2.20	192	-0.058	49.2	0.00	11.71
223	44.895	0.149	1.49	69	-2.00	190	-0.057	50.8	0.00	11.95
224	45.045	0.150	1.50	69	-1.90	188	-0.056	52.7	0.00	12.14
225	45.193	0.148	1.50	68	-2.20	188	-0.057	52.7	0.00	12.00
226	45.343	0.150	1.50	68	-1.90	187	-0.057	52.7	0.00	12.10
227	45.492	0.149	1.49	68	-2.10	186	-0.057	54.3	0.00	12.15
228	45.641	0.149	1.50	68	-1.90	188	-0.056	56.3	0.00	12.35
229	45.790	0.149	1.50	68	-1.90	187	-0.057	56.2	0.00	12.25
230	45.939	0.149	1.50	68	-1.90	189	-0.057	55.3	0.00	11.99
231	46.088	0.149	1.50	68	-2.00	188	-0.056	58.2	0.00	12.40
232	46.238	0.150	1.49	68	-2.00	189	-0.056	56.9	0.00	12.38
233	46.387	0.149	1.51	68	-1.90	189	-0.057	58.5	0.00	12.50
234	46.536	0.149	1.50	68	-2.00	191	-0.057	58.5	0.00	12.45
235	46.685	0.149	1.49	68	-1.90	190	-0.058	57.2	0.00	12.26
236	46.835	0.150	1.50	68	-1.90	192	-0.057	55.3	0.00	12.38
237	46.984	0.149	1.49	68	-1.90	194	-0.057	55.9	0.00	12.35
238	47.133	0.149	1.50	68	-2.20	197	-0.059	2.5	0.00	2.67
239	47.282	0.149	1.50	68	-2.10	198	-0.058	55.9	0.00	12.37
240	47.432	0.150	1.49	68	-2.00	200	-0.058	54.7	0.00	12.11
241	47.581	0.149	1.50	68	-2.00	202	-0.058	55.0	0.00	11.94
242	47.730	0.149	1.51	68	-1.90	200	-0.059	56.2	0.00	12.22
243	47.879	0.149	1.50	68	-2.00	201	-0.059	56.2	0.00	12.13
244	48.028	0.149	1.49	68	-1.90	203	-0.059	54.3	0.00	12.11
245	48.178	0.150	1.49	68	-1.90	203	-0.060	55.3	0.00	12.19
246	48.327	0.149	1.50	68	-1.90	204	-0.060	55.3	0.00	11.94
247	48.476	0.149	1.49	68	-2.10	205	-0.059	55.6	0.00	12.05
248	48.625	0.149	1.49	68	-1.90	206	-0.059	55.0	0.00	12.07

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
249	48.775	0.150	1.50	68	-2.10	207	-0.060	56.2	0.00	11.97
250	48.924	0.149	1.50	68	-2.00	208	-0.060	54.3	0.00	11.70
251	49.073	0.149	1.50	68	-1.90	209	-0.060	55.3	0.00	11.97
252	49.223	0.150	1.49	68	-2.10	208	-0.060	57.2	0.00	11.82
253	49.372	0.149	1.50	68	-1.90	209	-0.060	55.3	0.00	11.68
254	49.521	0.149	1.50	68	-2.10	209	-0.060	56.2	0.00	11.70
255	49.670	0.149	1.49	68	-2.10	210	-0.061	55.6	0.00	11.54
256	49.820	0.150	1.49	68	-1.90	210	-0.060	56.6	0.00	11.72
257	49.969	0.149	1.50	68	-2.20	210	-0.060	54.3	0.00	11.63
258	50.118	0.149	1.51	68	-1.90	212	-0.060	52.7	0.00	11.64
259	50.267	0.149	1.50	68	-1.90	212	-0.061	53.4	0.00	11.50
260	50.416	0.149	1.50	68	-2.20	212	-0.061	52.7	0.00	11.36
261	50.566	0.150	1.50	68	-1.90	213	-0.061	52.7	0.00	11.27
262	50.715	0.149	1.50	68	-2.20	212	-0.061	54.0	0.00	11.36
263	50.864	0.149	1.50	68	-2.00	212	-0.061	54.0	0.00	11.17
264	51.013	0.149	1.50	68	-1.90	211	-0.061	54.0	0.00	11.36
265	51.162	0.149	1.49	68	-2.10	212	-0.062	55.0	0.00	11.55
266	51.312	0.150	1.51	68	-1.90	213	-0.061	54.7	0.00	11.57
267	51.461	0.149	1.50	68	-2.10	213	-0.060	54.7	0.00	11.74
268	51.610	0.149	1.50	68	-2.10	213	-0.061	54.0	0.00	11.61
269	51.759	0.149	1.50	68	-2.00	212	-0.061	54.6	0.00	11.52
270	51.908	0.149	1.51	68	-2.20	212	-0.061	55.6	0.00	11.59
271	52.058	0.150	1.50	68	-2.00	212	-0.060	55.3	0.00	11.36
272	52.206	0.148	1.49	68	-2.00	213	-0.062	54.6	0.00	11.40
273	52.356	0.150	1.49	68	-2.00	213	-0.062	52.4	0.00	11.29
274	52.505	0.149	1.50	68	-2.10	213	-0.061	51.7	0.00	11.02
275	52.654	0.149	1.50	68	-1.90	212	-0.062	53.0	0.00	11.06
276	52.803	0.149	1.50	68	-1.90	214	-0.061	53.4	0.00	11.18
277	52.952	0.149	1.50	68	-1.90	214	-0.062	55.0	0.00	11.09
278	53.102	0.150	1.50	68	-2.10	214	-0.062	56.2	0.00	11.29
279	53.251	0.149	1.50	68	-1.90	213	-0.062	55.3	0.00	11.18
280	53.400	0.149	1.50	68	-2.20	212	-0.062	55.9	0.00	11.36
281	53.549	0.149	1.49	68	-2.00	214	-0.061	55.0	0.00	11.56
282	53.699	0.150	1.50	68	-2.00	214	-0.061	52.7	0.00	11.73
283	53.847	0.148	1.50	68	-2.10	213	-0.061	52.4	0.00	11.57
284	53.996	0.149	1.50	68	-1.90	213	-0.061	49.8	0.00	11.54

Train D - Ambient Background and Flue Gas Data

Run: 5 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 14:59
Total Sampling Time 316 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
285	54.145	0.149	1.50	68	-2.10	215	-0.061	48.2	0.00	11.81
286	54.295	0.150	1.50	68	-1.90	213	-0.061	48.5	0.00	11.78
287	54.444	0.149	1.51	68	-2.00	213	-0.061	46.5	0.00	11.77
288	54.593	0.149	1.51	68	-2.10	213	-0.061	44.6	0.00	11.94
289	54.742	0.149	1.50	68	-1.90	213	-0.061	44.6	0.00	11.91
290	54.891	0.149	1.50	68	-1.90	213	-0.061	44.6	0.00	11.88
291	55.041	0.150	1.50	68	-2.20	214	-0.062	42.3	0.00	11.63
292	55.190	0.149	1.50	68	-1.90	212	-0.061	43.6	0.00	11.85
293	55.339	0.149	1.50	68	-1.90	211	-0.062	40.7	0.00	11.96
294	55.488	0.149	1.50	68	-2.10	211	-0.061	39.8	0.00	11.82
295	55.638	0.150	1.50	68	-2.20	213	-0.061	40.7	0.00	11.78
296	55.787	0.149	1.51	68	-2.20	210	-0.062	41.4	0.00	11.98
297	55.935	0.148	1.50	68	-1.90	211	-0.061	41.4	0.00	11.96
298	56.085	0.150	1.49	67	-2.10	211	-0.061	43.0	0.00	11.72
299	56.234	0.149	1.50	67	-1.90	210	-0.061	43.6	0.00	11.83
300	56.383	0.149	1.50	67	-2.00	209	-0.060	42.3	0.00	11.96
301	56.532	0.149	1.50	67	-1.90	210	-0.061	43.3	0.00	11.72
302	56.681	0.149	1.50	67	-2.20	208	-0.061	43.3	0.00	11.97
303	56.831	0.150	1.49	67	-1.90	207	-0.060	44.6	0.00	11.88
304	56.979	0.148	1.51	67	-1.90	209	-0.061	42.7	0.00	11.93
305	57.129	0.150	1.51	67	-2.00	207	-0.060	43.0	0.00	12.07
306	57.278	0.149	1.50	67	-1.90	208	-0.060	43.3	0.00	12.01
307	57.427	0.149	1.51	67	-2.00	209	-0.060	42.7	0.00	12.10
308	57.576	0.149	1.51	67	-2.10	208	-0.060	43.7	0.00	12.28
309	57.726	0.150	1.50	67	-2.00	207	-0.061	44.3	0.00	12.20
310	57.875	0.149	1.50	67	-2.10	205	-0.059	44.9	0.00	12.12
311	58.025	0.150	1.51	67	-1.90	204	-0.060	45.9	0.00	12.05
312	58.174	0.149	1.51	67	-2.00	205	-0.059	45.6	0.00	12.04
313	58.323	0.149	1.51	67	-1.90	205	-0.059	46.2	0.00	11.89
314	58.472	0.149	1.50	67	-2.00	204	-0.060	46.5	0.00	11.83
315	58.622	0.150	1.51	67	-2.20	203	-0.060	46.5	0.00	11.88
316	58.771	0.149	1.51	67	-2.10	203	-0.060	48.2	0.00	11.76

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Tracking No.:	BK30.2
Project No.:	0142WS021E
Run No.:	5
Test Date:	3/7/24

OMNI Eq. ID Numbers	
Analytical Scale	
Audit Weight Set:	
Analytical Scale	
Hydrometer	
Filters are weighed	Singly

Train A

Sample Component / Date / Time in Dessicator		Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
Front Filter		Filter	F235	121.0	120.2	0.8	0.8
Rear Filter		Filter	F238	121.6	121.4	0.2	0.2
Probe catch*		Probe	29	114276.2	114275.8	0.4	0.4
ilter seals catch*		Seals	S687	3373.1	3372.4	0.7	0.7
				Total Particulate, mg:		**2.1**	**2.1**

Train B

Sample Component / Date / Time in Dessicator		Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
Front Filter		Filter	F232	122.6	121.6	1.0	1.0
Rear Filter		Filter	F231	120.4	120.5	-0.1	0.0
Probe catch*		Probe	34	115868.3	115867.9	0.4	0.4
ilter seals catch*		Seals	S695	3384.2	3384.0	0.2	0.2
			Sub-Total	Total Particulate, mg:		**1.5**	**1.6**

Train C - *First Hour*

Sample Component / Date / Time in Dessicator		Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
Front Filter		Filter	F236	121.8	121.5	0.3	0.3
Rear Filter		Filter	F237	121.1	121.0	0.1	0.1
Probe catch*		Probe	2	115012.5	115011.9	0.6	0.6
ilter seals catch*		Seals	S696	3314.6	3313.5	1.1	1.1
				Total Particulate, mg:		**2.1**	**2.1**

Train D - *Ambient Background*

Sample Component / Date / Time in Dessicator		Reagent	Filter # or	Weights: Final, mg	Weights: Tare, mg	Particulate, mg
Filter catch*		Filter	F212	122.7	122.6	0.1
				Total Particulate, mg:		**0.1**

Final (mg) - Tare (mg) = Particulate (mg)

NOTE: The Uncorrected values are those where any negative filter weights are taken as a negative value. This can possibly occur when filter matter adheres the O-ring seals and thereby transfers some mass to the O-ring. The Corrected values reflect where any negative filter weights are taken as ZERO, thus not accounting for any transfer of mass and resultingly over-reporting. Corrected values were added to this analysis to report the "Corrected" results in this report in response to a request by the US EPA. In cases where the Final weight minus the Tare weight of the Ambient filter occurs, it is taken as a ZERO. Any negative probe weights are evaluated pursuant to clause of ASTM E25215 (or appropriatelt associated test standard as defined in the introduction of this report).

Technician Signature:_____ Reviewed By:_____

Run 5 - Run Notes

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	5
Test Date:	3/7/2024

This supplemental section of miscellaneous run notes is comprised of the following:

- Appliance Operation Notes
- Velocity Traverse / Supplementa Run Notes
- Test Fuel Notes
- Gravimetric Analysis Notes

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Project Number: 0142WS021E Run Number: 5

Model: AF 30,2 Tracking Number: 2254 Date: 3/7/2024

Test Crew: K. Morgan R. Tiegs

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

Open 40° From Full open

Secondary: N/A

Tertiary/Pilot: N/A

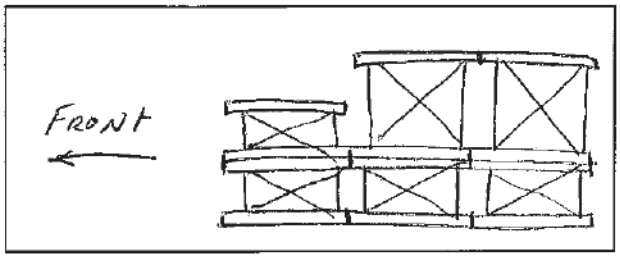
Fan: No Fan (Fan Confirmation test)

Preburn Notes

Time	Notes
1358 1458	At 5.5 lbs preburn, air setting set to test setting At 4.5 lbs preburn was stopped

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Used to load fuel only

Fuel loaded by: 45

Door closed at: 50

Primary air: At test setting

Notes:

Time	Notes
1459 1559	test start 1st hour sampling stopped

Technician Signature: K. Morgan Date: 3/7/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Project Number: 0142WS021E Run Number: 5

Model: AF 30.2 Tracking Number: 2254 Date: 3/7/2024

Test Crew: R. Tiegs, K. Morgan

OMNI Equipment ID numbers: ______

Wood Heater Supplemental Data

Bias check 16.81

~~Ati~~ 1st hour: 0.003 @ -5.00

Start Time: 14:59 Booth #: E1

Stop Time: 20:15

Stack Gas Leak Check: Initial: ✓ Final: ✓

Sample Train Leak Check:

A: Ø @ 9.68 "Hg

B: Ø @ 10.14 "Hg

Calibrations: Span Gas CO_2: 16.86 % CO: 4.37 % CO ppm: 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	10:03	10:05	20:22	20:25
CO_2	Ø	16.87	0.00	16.86
CO	Ø	4.38	0.00	4.38
ppm	Ø	492	Ø	500

Air Velocity (ft/min): Initial: 12 Final: 6

Scale Audit (lbs): Initial: 20.0 Final: 20.0

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 6

Induced Draft: None

% Smoke Capture: 100%

Flue Pipe Cleaned Prior to First Test in Series:

Date: 3/05/24 Initials: K

Tunnel Traverse		
Microtector Reading	dP (in H_2O)	T(°F)
.037	.074	78
.053	.106	78
.054	.104	78
.032	.064	79
.036	.072	79
.051	.102	79
.045	.090	79
.030	.060	79
Center:		
.062	.124	79

	Initial	Middle	Ending
P_b (in/Hg)	30.22	30.22	30.23
RH (%)	27	26	27
Ambient (°F)	69	71	67

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.4	-0.4

Background Filter Volume: ______

Technician Signature: K. Morgan Date: 3/7/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Project Number: 0142WS021E Run Number: 5

Model: AF 30.2 Tracking Number: 2254 Date: 3/7/2024

Test Crew: R. Thys K. Morgan

OMNI Equipment ID numbers:

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.0

Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16.75 in	21.3	7	16.75 in	18.1
2	/ in	24.7	8	/ in	20.6
3	/ in	26.6	9	/ in	22.2
4	/ in	24.9	10	/ in	23.0
5	/ in	23.0	11	/ in	
6	/ in	20.3	12	/ in	

Total Pre-Burn Fuel Weight: 18.4 Pre-Burn Fuel Average Moisture: 22.5

Time (clock): 13:10 Room Temperature (F): 70 Initials: K

Test Fuel

Firebox Volume (ft³): ~~2.91~~ 2.874 K Test Fuel Piece Length (in): 16.75

Load Weight Range (lb): ~~18.4 – 22.4~~ K Total Wet Fuel Load Weight (lb): 18.5

3.7 – 4.6 CBR

Fuel Type & Amount: 2 x 4: 4 4 x 4: 2

Weight (with spacers): ~~9.5~~ 9.6 Weight (with spacers): 8.8

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	2.5 / 2.0	24.3	24.3	24.7	2x4
2	2.4 / 1.8	21.9	22.2	22.0	2x4
3	2.3 / 1.8	22.7	23.1	23.2	2x4
4	~~2.2 / 1.7~~	~~23.4~~	~~24.3~~	~~23.2~~	~~2x4~~
5	4.5 / 3.9	23.8	22.5	19.1	4x4
6	4.4 / 3.8	22.3	22.5	22.4	4x4
7	2.4 / 1.9	19.1	19.9	20.2	2x4

17.57% WB

15.25 lb dry

6.92 kg dry

5.5 – 8

Spacer Moisture Readings (%DB)

15.2	19.9	17.9	16.3	11.2	16.3		
17.1	17.5	20.2	17.8	20.9	10.4		
13.2	14.1	18.0	23.4	17.2	15.8		
15.1	22.7	15.6	21.0	19.4	18.8		

Time (clock): 1320 Room Temperature (F): 70 Initials: K

Technician Signature: K. J. Morgan Date: 3/7/24

1.31 @ 0.46 / 0.47
2.72 / 2.72

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Project Number: 0142WS021E Run Number: 5
Model: AF 30.2 Tracking Number: 2254 Date: 3/7/2024
Test Crew: R. Tiegs K. Morgan
OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: R. TIEGS

Date/Time in Dessicator: 3/7/24 20:43

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/11/24 9:21	3/11/24 16:20			
R/H %:	29	33			
Temp:	65	67			
200 mg Audit:	200.0	200.0			
2 g Audit:	2000.2	2000.3			
100 g Audit:	99997.7	99997.9			
Initials:	IC	IC			

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	✓ Front Filter	F236	121.5	121.8	121.8			
	✓ Rear Filter	F237	121.0	121.1	121.1			
	✓ Probe	2	115011.9	115012.3	115012.5			
	✓ O-Ring Set	5696	3313.5	3314.5	3314.6			
A (Remainder)	✓ Front Filter	F235	120.2	121.1	121.0			
	✓ Rear Filter	F238	121.4	121.6	121.6			
	✓ Probe	29	114275.8	114276.3	114276.2			
	✓ O-Ring Set	5687	3372.4	3373.0	3373.1			
B	✓ Front Filter	F232	121.6	122.6	122.6			
	✓ Rear Filter	IC F231	120.5	120.4	120.4			
	✓ Probe	34	115867.9	115868.2	115868.3			
	✓ O-Ring Set	5685	3384.0	3384.1	3384.2			
BG	✓ Filter	F212	122.6	122.6	122.7			

Technician Signature: K. A. Morgan Date: 3/11/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	5

Sample calculations of each equation used in the refernced standards for this test run.

Summary of INPUT values necessary for calculations

	Global Input Parameters for Equations	Value	Source
FM_S	- Average moisture of test fuel spacers, % dry basis	17.33	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	3.3	Fuel Properties Work Sheet
M_{CPnwb}	- Weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis , kg	[1]Varies	Fuel Properties Work Sheet
FM_{CPn}	- Average fuel Fuel moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.441	Fuel Properties Work Sheet
V_{SCENT}	- Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse, ft/sec	0.00	Traverse Worksheet
V_{STRAV}	- Average gas velocity calculated after the multipoint Pitot traverse	15.71	Traverse Worksheet
θ	- Duration of test, min	316	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.23	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

[1] *Denotes that this pararmeter for each individual piece of fuel is calculated in the Test Fuel Properties worksheet and the input values are pulled into these sample caculations.*

	Sample Train Input Parameters for Equations	Train A	Train B	Train C	Train D
V_m	- Volume of gas sample measured at the dry gas meter, dcf	51.116	51.882	9.723	58.771
Y	Dry gas meter calibration factor	1.016	1.011	1.015	1.011
ΔH	- Average pressure differential across the orifice meter, in. H_2O	1.28	1.00	2.17	1.50
T_m	- Temperature of Dry Gas Meter, °F	78.2	78.4	66.9	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.4	0.4	0.6	n/a
m_f	- mass of particulate matter from filters, mg	1.0	0.9	0.4	0.1
m_g	- mass of particulate matter from filter seals, mg	0.7	0.2	1.1	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.4	0.4	0.6	n/a
m_f	- mass of particulate matter from filters, mg	1.0	1.0	0.4	n/a
m_g	- mass of particulate matter from filter seals, mg	0.7	0.2	1.1	n/a

M_{Sdb} – Weight of test fuel spacers, dry basis, kg - ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})\left(\frac{100}{100 + FM_S}\right)$$

Where,

FM_S = average moisture of test fuel spacers, % dry basis
M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 17.33 %, dry basis
M_{Swb} = 3.3 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((3.3 x 0.4536) (100 / (100 + 17.33))

M_{Sdb} = **1.276** kg

MCdb– Weight of test fuel crib, excluding nails and spacers, dry basis, kg - ASTM E2780 equation (2)

$$M_{Cdb} = \sum (M_{CPnwb})\left(\frac{100}{100 + FM_{CPn}}\right)$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation:

ΣM_{CPnwb} = 15.2 lb.
FM_{CPn} = 22.26 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 15.2 x 0.4536 x (100 / (100 + 22.2611111111111))

M_{Cdb} = **5.64** kg

DCdb - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft3 - ASTM E2780 equation (3)

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

Where,

V_C = Volume of Fuel Crib, ft³ (less spacers)

Sample Calculation:

M_{Cdb} = 12.43 lb
V_C = 0.441 ft³

D_{Cdb} = 12.43 / 0.441

D_{Cdb} = **28.19** lb/ft³

M_{FTAdb} - Total weight of fuel crib including spacers and nails, dry basis - ASTM E2780 equation (4)

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

Sample Calculation:

M_{Sdb} = 1.276
M_{Cdb} = 5.64

M_{FTAdb} = 1.276 + 5.64

M_{FTAdb} = **6.92** kg

BR – dry burn rate, kg/hr - ASTM E2780 equation (5)

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

Sample Calculation:

M_{FTAdb} = 6.915
θ = 316

BR = (60 x 6.915) / 316

BR = **1.31** kg / hr

***Vs* – Average gas velocity in the dilution tunnel, ft/sec -** ASTM E2515 equation (9)

$$V_S = F_P \times K_P \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where

F_P = Adjustment factor for center of tunnel pitot tube placement, where $F_P = V_{STRAV} / V_{SCENT}$

V_{SCENT} = Dilution tunnel velocity, at the center, ft/sec

V_{STRAV} = Dilution tunnel velocity, multi-point pitot traverse, ft/sec

K_P = Pitot tube constant, 85.49

C_P = Pitot tube coefficient: 0.99, unitless

$\Delta P^{1/2}_{AVG}$ = Velocity pressure in the dilution tunnel, in H_2O

$T_{S\,(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R

P_S = Absolute average gas static pressure in tunnel, = Pbar + Pg , where Pbar = Barometric Pressure, in. Hg, Pg = Static pressure in tunnel, Hg (in H_2O / 13.6)

M_S = The dilution tunnel wet molecular weight; Ms = 28.78 assuming a dry weight of 29 lb/lb-mole

(Duration of Test)

F_P = 0.8182

$\Delta P^{1/2}_{AVG}$ = 0.3525

$T_{S\,(avg)}$ = 540.9527

Pbar = 30.2250

Pg = -0.4000

Ps = 30.1956

V_S = 0.818 x 85.49 x 0.99 x 0.353 x √ [(541 / (30.2 x 28.78)]

V_S = **19.259** ft/sec

(First Hour of Test)

F_P = 0.8182

$\Delta P^{1/2}_{AVG}$ = 0.3509

$T_{S\,(avg)}$ = 546.5574

Pbar = 30.2200

Pg = -0.4000

Ps = 30.1906

V_S = 0.818 x 85.49 x 0.99 x 0.351 x √ [(547 / (30.19 x 28.78)]

V_S = **19.273** ft/sec

Q_{std} – Average gas flow rate in dilution tunnel, dscf/hr - ASTM E2515 equation (3)

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

Where:

3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
A = Cross sectional area of dilution tunnel, ft2
T_{std} = solute temperature, 528 °R
P_s = Absolute average gas static pressure in dilution tunnel, = Pbar + Pg , in Hg
$T_{s(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std} = Standard absolute pressure, 29.92 in Hg

(Duration of Test):

B_{ws} = 0.02
A = 0.19635
P_s = 30.20
$T_{s(avg)}$ = 541
Vs = 19.26

Qstd = 3600 x (1 - 0.02) x 19.259 x 0.19635 x (528 / 541) x (30.2 / 29.92)

Qstd = **13141.9** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 30.19
$T_{s(avg)}$ = 547
Vs = 19.273

Qstd = 3600 x (1 - 0.02) x 19.273 x 0.1963 x (528 / 547) x (30.19 / 29.92)

Qstd = **13014.2** dscf/hr

Vm(std) – Volume of Gas Sampled (Corrected), 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
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Train A

$$V_{m(std)} = 17.64 \times 51.116 \times 1.016 \times \frac{(30.23 + \frac{1.28}{13.6})}{(78.2 + 460)}$$

$V_{m(std)}$ = **51.610** dscf

Train B

$$V_{m(std)} = 17.64 \times 51.882 \times 1.011 \times \frac{(30.23 + \frac{1.00}{13.6})}{(78 + 460)}$$

$V_{m(std)}$ = **52.064** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.72 \times 1.015 \times \frac{(\underline{30.22} + \frac{2.17}{13.6})}{(66.9 + 460)}$$

$V_{m(std)}$ = **10.037** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 58.77 \times 1.011 \times \frac{(\underline{30.23} + \frac{1.50}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **58.989** dscf

mn – 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 Calculations (Uncorrected):

Train A

m_n = 0.4 + 1.0 + 0.7

m_n = **2.1** mg

Train B

m_n = 0.4 + 0.9 + 0.2

m_n = **1.5** mg

Train C (1st hour)

m_n = 0.6 + 0.4 + 1.1

m_n = **2.1** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

Sample Calculations (Corrected):

Train A

m_n = 0.4 + 1.0 + 0.7

m_n = **2.1** mg

Train B

m_n = 0.4 + 1.0 + 0.2

m_n = **1.6** mg

Train C (1st hour)

m_n = 0.6 + 0.4 + 1.1

m_n = **2.1** mg

Train D (Background)

$m_n = m_f$ = 0.1

m_n = **0.1** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions

g/dscf - ASTM E2515 equation (13)

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

Where:

K_2 = Constant, 0.001 g/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample Calculations (Uncorrected):

Train A

$$C_s = 0.001 \times \frac{2.1}{51.61}$$

C_s = **0.000041** g/dscf

Train B

$$C_s = 0.001 \times \frac{1.5}{52.06}$$

C_s = **0.0000288** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{2.1}{10.04}$$

Cs = **0.000209** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{58.99}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{2.1}{51.61}$$

C_s = **0.000041** g/dscf

Train B

$$C_s = 0.001 \times \frac{1.6}{52.06}$$

C_s = **0.0000307** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{2.1}{10.04}$$

Cs = **0.000209** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.1}{58.99}$$

C_r = **0.000000** g/dscf

ET – Total Particulate Emissions, g - ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculations (uncorrected)

Train A

E_T = (0.000041 - 0.000000) x 13141.9 x 316 / 60

E_T = **2.82** g

Train B

E_T = (0.000029 - 0.000000) x 13141.9 x 316 / 60

E_T = **1.99** g

First Hour

E_T = (0.000209 - 0.000000) x 13014.2 x 60 / 60

E_T = 2.72 g

Trains A and B Average

E = **2.41** g

Sample calculations (Corrected)

Train A

E_T = (0.000041 - 0.000000) x 13141.9 x 316 / 60

E_T = **2.82** g

Train B

E_T = (0.000031 - 0.000000) x 13141.9 x 316 / 60

E_T = **2.13** g

First Hour

E_T = (0.000209 - 0.000000) x 13014.2 x 60 / 60

E_T = **2.72** g

Trains A and B Average

E_T = **2.47** g

PM_R – Particulate emissions for test run, g/hr - ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation (Uncorrected)

Train A

E_T = 2.82 g

θ = 316 min

$PM_R = 60 \times (2.82 / 316)$

PM_R = **0.53** g/hr

Train B

E_T = 1.99 g

θ = 316 min

$PM_R = 60 \times (1.99 / 316)$

PM_R = **0.38** g/hr

A and B Average

E_T = **0.46** g/hr

First Hour

E_T = 2.72 g

θ = 60 min

$PM_R = 60 \times (2.72 / 60)$

PM_R = **2.72** g/hr

Sample Calculation (Corrected)

Train A

E_T = 2.82 g

θ = 316 min

$PM_R = 60 \times (2.82 / 316)$

PM_R = **0.53** g/hr

Train B

E_T = 2.13 g

θ = 316 min

$PM_R = 60 \times (2.13 / 316)$

PM_R = **0.40** g/hr

A and B Average

E_T = **0.47** g

First Hour

E_T = 2.72 g

θ = 60 min

$PM_R = 60 \times (2.72 / 60)$

PM_R = **2.72** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned - ASTM E2780 equation (7)

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

Sample Calculation (Uncorrected)

Train A

E_T = 2.82 g
M_{FTAdb} = 6.92 kg
PM_F = 2.82 / 6.92
PM_F = **0.41** g/kg

Train B

E_T = 1.99 g
M_{FTAdb} = 6.92 kg
PM_F = 1.99 / 6.92
PM_F = **0.29** g/kg

Sample Calculation (Corrected)

Train A

E_T = 2.82 g
M_{FTAdb} = 6.92 kg
PM_F = 2.82 / 6.92
PM_F = **0.41** g/kg

Train B

E_T = 2.13 g
M_{FTAdb} = 6.92 kg
PM_F = 2.13 / 6.92
PM_F = **0.31** g/kg

PR - Proportional Rate Variation - ASTM E2515 equation (16)

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

Where:			Train A	Train B	Train C
θ	=	Total sampling time, min	316	316	60
θ_i	=	Length of recording interval, min	1	1	1
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.161	0.16	0.164
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	51.116	51.882	9.723
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	19.452	19.452	19.452
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	19.261	19.261	19.279
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	532.0	532.0	526.0
T_m	=	Absolute average dry gas meter temperature, ^oR	538.2	538.4	526.9
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	564.5	564.5	564.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	541.0	541.0	546.6

NOTE: These sample calculations are for the Second interval of each train)

Train A PR = $\left(\frac{316 \text{ x } 0.161 \text{ x } 19.261 \text{ x } 538 \text{ x } 565}{1 \text{ x } 51.116 \text{ x } 19.452 \text{ x } 532 \text{ x } 541}\right)$ X 100 = 104.0 %

Train B PR = $\left(\frac{316 \text{ x } 0.16 \text{ x } 19.261 \text{ x } 538 \text{ x } 565}{1 \text{ x } 51.882 \text{ x } 19.452 \text{ x } 532 \text{ x } 541}\right)$ X 100 = 101.9 %

Train B PR = $\left(\frac{60 \text{ x } 0.164 \text{ x } 19.279 \text{ x } 527 \text{ x } 565}{1 \text{ x } 9.723 \text{ x } 19.452 \text{ x } 526 \text{ x } 547}\right)$ X 100 = 103.8 %

Run 6 Test Data

Test Date:	3/7/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	Ashford 30.2

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Project No.: 0142WS021E
Tracking No.: BK30.2
Run: 6
Test Date: 03/07/24

Burn-Rate Result

2.47 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	10.67	10.67	9.79	9.79
Emission Rate, g/hr	**3.81**	3.81	**9.79**	9.79
Emissions Factor, g/kg	1.54	1.54	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		94.2	88.9
Average Tunnel Gas Velocity (vs), feet/second		21.961	21.948
Average Tunnel Gas Flow Rate(Qsd)	DSCF/hr	14640.8	14775.6
	DSCF/min	244.0	246.3
Average Delta p, in. H2O		0.167	0.169
Tunnel Static Pressure, in. H2O		-0.500	-0.500
Total Time of Test, Min		60	168

Particulate Sample Measurement Parameters

	Uncorrected				*Corrected*			
	AMBIENT	Train A	Train B	First Hour	AMBIENT	Train A	Train B	First Hour
Total Sample Volume (V_m), ft^3	23.892	22.562	23.383	8.096	23.892	22.562	23.383	8.096
Average Gas Meter Temperature, °F	79	75	76	66	79	75	76	66
Total Sample Volume (V_{mstd}), DSCF	24.006	22.928	23.591	8.374	24.006	22.928	23.591	8.374
Total Particulates (mn), mg - m_n	0.0	5.7	6.3	5.6	0.0	5.7	6.3	5.6
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00025	0.00027	0.00067	0.00000	0.00025	0.00027	0.00067
Total Particulate Emissions (ET), grams	n/a	10.29	11.05	9.79	n/a	10.29	11.05	9.79
Particulate Emission Rate, g/hr	n/a	3.67	3.95	9.79	n/a	3.67	3.95	9.79
Emissions Factor, g/kg	n/a	1.49	1.60	n/a	n/a	1.49	1.60	n/a
Difference, ET from from Average ET, grams	n/a	-0.38	0.38	n/a	n/a	-0.38	0.38	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	69	67	68	✓
Filter Face Velocity, fpm	< 30	7.34	7.28	7.55	✓
Dryer Exit Temperature, °F	< 80	63	61	61	✓
Tunnel Velocity, fpm	>800	1,318	1,317		✓
First Hour Leakage	0.005	0.000			✓
Train A Leakage Rate	0.005		0.001		✓
Train B Leakage Rate	0.006			0.000	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	1.2	0.9	1.8	✓
Pro-Rate Variation	< 90 for < 10% of θ	1.67%	0.00%	0.00%	✓
	> 110 for < 10% of θ	0.00%	0.000%	0.00%	✓
	# Readings < 80%	1	0	0	✗
	# Readings > 120%	0	0	0	✓
Ambient Temp, °F	> 55		66		✓
Ambient Temp, °F	< 90		71		✓
Trains A and B Precision	(*A*) < 7.5%		3.58%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.11		✓
Stove Surface ΔT	<= 125 °F		61		✓
Room Air Velocity	< 50 fpm		8		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	6
Test Date:	3/7/2024

Efficiency results reported herein are based on a stack-loss method in accordance with CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". OMNI uses the spreadsheet provided by CSA that is to be used in conjunction with the current version of the test standard. The most recent version of the software is version 2.4, dated April 15, 2010. OMNI received confirmation from CSA on October 18, 2023 that this is the current version of the software.

Stack Loss Eficiency

Manufacturer: Valley Comfort
Model: AF30.2
Date: 03/07/24
Run: 6
Control #: 2254
Test Duration: 168
Output Category: IV

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	77.6%	83.9%
Combustion Efficiency	97.1%	97.1%
Heat Transfer Efficiency	80%	86.4%

Output Rate (kJ/h)	38,028	36,074	**(Btu/h)**
Burn Rate (kg/h)	2.47	5.45	**(lb/h)**
Input (kJ/h)	49,006	46,487	**(Btu/h)**

Test Load Weight (dry kg)	6.93	15.27	**dry lb**
MC wet (%)	17.48		
MC dry (%)	21.18		
Particulate (g)	10.67		
CO (g)	284		
Test Duration (h)	2.80		

Emissions	**Particulate**	**CO**
g/MJ Output	0.10	2.67
g/kg Dry Fuel	1.54	40.98
g/h	3.81	101.38
lb/MM Btu Output	0.23	6.20

Air/Fuel Ratio (A/F)	8.39

VERSION: **2.4** **4/15/2010**

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	AF30.2				
Date:	3/7/2024		**Temp. Units**	F	(F or C)
Run:	6		**Weight Units**	lb	(kg or lb)
Control #:	2254				
Test Duration:	168				
Output Category:	IV		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.48		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	18.50		**%C**	48.73	
Burn Rate (dry kg/h):	2.47		**%H**	6.87	
Total Particulate Emissions:	10.67 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.39**	**13.24**	**#DIV/0!**	**367.13**	**69.04**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	18.50	0.03	4.78		364.0	70.0
1	18.40	0.06	1.90		383.0	70.0
2	18.20	0.01	11.56		361.0	70.0
3	18.10	0.33	14.35		366.0	69.0
4	17.80	1.26	16.39		376.0	69.0
5	17.60	1.13	16.44		385.0	69.0
6	17.40	1.20	16.64		391.0	69.0
7	17.20	1.20	16.50		396.0	69.0
8	17.00	0.92	16.32		398.0	69.0
9	16.70	0.94	16.24		400.0	69.0
10	16.50	0.87	16.18		403.0	69.0
11	16.30	0.87	16.23		404.0	69.0
12	16.10	0.91	16.39		403.0	69.0
13	15.80	0.98	16.45		404.0	69.0
14	15.60	1.02	16.47		406.0	69.0
15	15.40	0.95	16.46		405.0	69.0
16	15.20	0.89	16.52		407.0	69.0
17	15.00	0.97	16.65		408.0	69.0
18	14.70	1.05	16.76		408.0	70.0
19	14.50	1.12	16.72		407.0	69.0
20	14.30	1.08	16.74		408.0	69.0
21	14.10	1.12	16.92		409.0	70.0
22	13.90	1.21	16.89		409.0	70.0
23	13.70	1.26	16.98		408.0	70.0
24	13.50	1.33	17.10		408.0	69.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	13.30	1.49	17.22		407.0	70.0
26	13.00	1.51	17.24		405.0	70.0
27	12.80	1.56	17.19		405.0	70.0
28	12.60	1.63	17.25		406.0	70.0
29	12.40	1.54	17.40		405.0	70.0
30	12.20	1.53	17.47		405.0	70.0
31	12.00	1.47	17.48		406.0	70.0
32	11.80	1.42	17.65		404.0	70.0
33	11.60	1.23	16.91		406.0	71.0
34	11.40	1.21	16.53		404.0	70.0
35	11.30	1.05	16.21		403.0	70.0
36	11.10	1.00	16.19		400.0	70.0
37	10.90	0.91	16.18		400.0	70.0
38	10.70	0.75	16.08		397.0	70.0
39	10.60	0.78	15.87		396.0	71.0
40	10.40	0.57	16.02		393.0	70.0
41	10.30	0.50	15.85		392.0	70.0
42	10.10	0.47	15.71		391.0	71.0
43	10.00	0.54	15.52		389.0	70.0
44	9.80	0.52	15.32		388.0	71.0
45	9.70	0.47	15.23		388.0	70.0
46	9.60	0.56	15.13		388.0	70.0
47	9.40	0.59	15.28		386.0	70.0
48	9.30	0.60	15.32		387.0	70.0
49	9.10	0.58	15.3		386	70
50	9.00	0.62	15.18		385	70
51	8.80	0.6	15.25		387	70
52	8.70	0.45	15.26		386	70
53	8.60	0.32	14.93		387	70
54	8.40	0.34	14.56		385	70
55	8.30	0.4	14.33		384	70
56	8.10	0.79	14.25		382	70
57	8.00	1.07	14.59		384	70
58	7.90	1.06	14.53		386	70
59	7.70	1.01	14.56		387	70
60	7.60	0.99	14.49		387	70
61	7.40	0.9	14.49		387	70
62	7.30	0.95	14.5		387	70
63	7.20	0.84	14.63		386	70
64	7.00	0.72	14.77		386	70
65	6.90	0.76	14.76		386	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	6.80	0.85	14.78		385	70
67	6.70	0.9	14.83		387	70
68	6.50	0.37	15.08		386	70
69	6.40	0.47	15.21		384	70
70	6.30	0.47	15.43		384	70
71	6.10	0.41	15.6		384	70
72	6.00	0.39	15.53		387	70
73	5.90	0.34	15.48		387	70
74	5.70	0.26	15.3		385	70
75	5.60	0.15	15.26		385	70
76	5.50	0.25	15.07		384	70
77	5.40	0.29	15.06		384	70
78	5.30	0.22	14.97		384	70
79	5.20	0.16	14.73		383	70
80	5.10	0.1	14.51		381	69
81	5.00	0.07	14.28		379	70
82	4.90	0.06	14.13		378	70
83	4.80	0.05	14.03		377	70
84	4.70	0.02	13.97		374	70
85	4.60	0.01	14.06		372	70
86	4.50	0.01	14.1		371	70
87	4.40	0.01	14.13		370	69
88	4.30	0.02	14.06		368	69
89	4.20	0.01	13.49		367	69
90	4.10	0.01	13.32		366	70
91	4.00	0.01	13.23		367	70
92	4.00	0.00394	13.07		366	69
93	3.90	0.00317	12.98		366	69
94	3.80	0.00268	12.96		366	69
95	3.70	0.00248	12.94		366	69
96	3.60	0.00232	12.82		366	69
97	3.60	0.00219	12.66		365	69
98	3.50	0.002	12.64		365	69
99	3.40	0.002	12.48		360	69
100	3.40	0.002	12.33		357	69
101	3.30	0.00209	12.3		355	69
102	3.20	0.00213	12.21		355	69
103	3.10	0.00213	12.14		355	69
104	3.10	0.00226	12.01		354	69
105	3.00	0.00239	11.8		353	69
106	3.00	0.00236	11.77		352	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	2.90	0.00239	11.75		352	69
108	2.80	0.00206	11.63		351	69
109	2.80	0.0019	11.62		349	69
110	2.70	0.00181	11.53		348	69
111	2.70	0.00193	11.6		347	69
112	2.60	0.00206	11.57		350	69
113	2.60	0.00209	11.56		348	69
114	2.50	0.00219	11.64		349	69
115	2.40	0.00216	11.72		348	69
116	2.40	0.00232	11.79		348	69
117	2.30	0.00255	11.85		348	69
118	2.30	0.00245	11.8		348	69
119	2.20	0.00223	11.86		347	69
120	2.10	0.00216	11.86		345	69
121	2.10	0.00223	11.82		344	69
122	2.00	0.00226	11.76		343	68
123	2.00	0.00213	11.98		344	68
124	1.90	0.00274	11.7		344	68
125	1.90	0.00278	11.86		343	68
126	1.80	0.00258	12		343	69
127	1.70	0.00274	12.09		343	68
128	1.70	0.00294	12.14		342	68
129	1.60	0.0031	12.25		343	68
130	1.50	0.00284	12.14		343	68
131	1.50	0.00294	11.94		342	68
132	1.40	0.00307	11.75		342	68
133	1.40	0.00307	11.22		342	68
134	1.30	0.00304	10.99		342	68
135	1.30	0.00216	11.29		340	68
136	1.20	0.00203	10.98		337	68
137	1.20	0.00129	9.59		335	68
138	1.20	0.00141	9.46		333	68
139	1.10	0.00154	9.51		331	68
140	1.10	0.00164	9.61		330	68
141	1.00	0.00164	9.64		330	68
142	1.00	0.00193	9.71		329	68
143	1.00	0.00203	9.92		327	68
144	0.90	0.00226	9.9		327	68
145	0.90	0.00248	9.81		326	68
146	0.90	0.00261	9.81		326	68
147	0.80	0.00262	8.91		326	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	0.80	0.00271	8.91		325	68
149	0.70	0.00278	8.94		324	67
150	0.70	0.00291	9.07		323	67
151	0.70	0.00294	9		323	67
152	0.70	0.00294	9.14		325	67
153	0.60	0.0031	9.4		326	67
154	0.60	0.00303	9.45		326	67
155	0.50	0.00307	9.51		326	67
156	0.50	0.00303	9.51		326	67
157	0.50	0.0031	9.53		324	67
158	0.40	0.00297	9.36		324	67
159	0.40	0.003	9.19		323	67
160	0.40	0.00281	8.83		323	67
161	0.30	0.00288	8.67		322	67
162	0.30	0.00297	8.67		321	67
163	0.30	0.00294	8.73		322	67
164	0.20	0.00297	8.71		320	66
165	0.20	0.00297	8.69		320	67
166	0.20	0.00303	8.74		320	67
167	0.10	0.00303	8.75		320	67
168	0.00	0.00329	8.98		321	67

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : Ashford 30.2
Tracking No. : BK30.2
Project No. : 0142WS021E
Test Date : 3/7/2024
Run No. : 6

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.874** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 20.118 lb.
Minimum Fuel Weight : 18.11 lb.
Maximum Fuel Weight : 22.13 lb.

Fuel Piece Data

PC #	Weight, lb	Size	Length, In	Moisture Readings, Dry Basis %			Average MC, % db	Dry Weight, lb.	Volume, ft3	Wet Weights, lb 4 x 4	Wet Weights, lb 2 x 4	Dry Weights, lb 4 x 4	Dry Weights, lb 2 x 4
1	1.80	2x4	16.75	21.6	24.2	22.5	22.8	1.47	0.0509		1.8		1.47
2	2.00	2x4	16.75	23.0	20.5	20.4	21.3	1.65	0.0509		2.0		1.65
3	1.70	2x4	16.75	22.6	22.2	23.8	22.9	1.38	0.0509		1.7		1.38
4	1.70	2x4	16.75	24.7	23.3	22.1	23.4	1.38	0.0509		1.7		1.38
5	4.30	4x4	16.75	20.3	22.7	22.2	21.7	3.53	0.1187	4.3		3.53	
6	4.00	4x4	16.75	20.3	20.4	19.2	20.0	3.33	0.1187	4.0		3.33	
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
18.5	20.3	19.0	15.3	18.8	24.6	23.8	20.0	
18.3	17.1	19.1	23.1	16.1	21.5	15.1	19.4	
23.8	17.0	19.9	16.6					
15.0	17.6	19.3	15.1					

Avg : 18.9

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.30	2x4		2.3000
2	2.40	2x4		2.4000
3	2.20	2x4		2.2000
4	2.30	2x4		2.3000
5	4.80	4x4	4.80	
6	4.50	4x4	4.50	
7				
8				
9				

Combined Mass of 4 x 4s 9.3 lb
Combined Mass of 2 x 4s 9.2 lb

Total Wet Mass of Fuel Load **18.5** lb

Fuel Load Properties

Type	*Number of Pieces*	*Wet Weight, lb.*	*Dry Weight, lb.*	*Fuel Loading Density, lb/ft³* Wet Basis	*Fuel Loading Density, lb/ft³* Dry Basis	Dry Fuel Density, lb/ft^3	Wet Fuel Density, lb/ft^3	*Moisture, %* Dry Basis	*Moisture, %* Wet Basis
2 x 4	4	7.2	5.88	6.44	5.31	28.89	35.14	21.19	17.48
4 x 4	2	8.3	6.87						
Spacers	24	3.0	2.52						
Totals		18.5	15.27						

Compliance Checks

	Fuel Load, Wet Lb.	Load Density, lb/ft^3 of FB vol	Fuel Density, lb/ft^3	% of Fuel load mass which is 2x4	Fuel Load Peices Mositure, % db
Measured	18.5	6.44	28.89	50	22.0
Required	18.1 - 22.1	6.3 - 7.7	25 - 36	35 - 65	19 -25
Complies ?	Yes	Yes	Yes	Yes	Yes

Dilution Tunnel Velocity Traverse and Supplementary Data

ASTM E2515-11

Run:	6	Tracking No.:	BK30.2
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WS021E
Model:	Ashford 30.2	Test Date:	3/7/2024

Dillution Tunnel Velocity Traverse

Pitot Location

Traverse Point	*% of Diameter*	*Inches into Tunnel*	*dP in. H_2O*	*Tunnel Temp, °F*	*$dP^{1/2}$*
X1	6.7	0.5 *	0.094	97	0.307
X2	25.0	0.00	0.116	97	0.341
X3	75.0	0.00	0.132	97	0.363
X4	93.3	-0.5 *	0.086	97	0.293
Y1	6.7	0.5 *	0.088	97	0.297
Y2	25.0	0.00	0.132	97	0.363
Y3	75.0	0.00	0.116	96	0.341
Y4	93.3	-0.5 *	0.084	96	0.290
Center	50.0	0.00	0.166	98	0.407

Tunnel Static Pressure	-0.500	*in. H_2O*
Tunnel Moisture	2.00	%
Tunnel Diameter	6.00	inches
Pitot Tube C_p	0.99	inches
Tunnel Molecular Weight	29	(dry)
Tunnel Molecular Weight	28.78	(M_S, wet)
Tunnel Area	0.19634954	*ft^2*
K_p	85.49	constant
$P_s=P_{bar}$+Tunnel Static	30.2232353	in HG

** Probe location must be no closer than 0.50 in to tunnel wall*

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 21.9567$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 27.6189$$

$$F_P = V_{strav} / V_{scent} = 0.795$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 17.455\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	23:03	1:51
Barometric Pressure, in. Hg	30.26	30.27
Room Air Velocity, fpm	6	8
Room Air Temperature, °F	66	65
Room Relative Humidity, %	29.0	31.0
Platform Scale Audit, lb.	20.0	20.0

Leak Checks

Pitot and associated tubing, (pass/fail)[1]	Pass	Pass

See sampling box worksheets for sampling boxes

Dillution Tunnel

Date last cleaned	3/5/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.500	-0.500

1 Both sides (independantly) of the pitot system are brought under a minimum vacuum of 3 in. H_2O and then sealed. Any indiction of pressure loss is deemed a fail.

2 Create a smoking condition during start of pre-burn activites and using adequate lighting pointed upward and aroud tunnel hood, visually observe if 100% of visible smoke is being captured by the hood. If not, increase flow tunnel flow and / or re-assess chimney proximity to draft hood as required and repeat until 100% capture is observed.

3 With the appliance installed and the dillution tunnel flow turned-off, observe the flue draft gauge while turning the dulution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducemnt is occuring. Determine the cause (i.e. flue chimnet too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 6

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E
Test Date: 3/7/24
Beginning Clock Time: 21:27

Coal Bed Range (lb):	3.7 (min)	4.6 (max)

Preburn Fuel Data

10 pieces @ 16.75 inches
____ pieces @ ____ inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

23.8	22.8					
21.9	23.8					
24.8	23.3					
22	22.8					
23.8	20.5					

Avg Preburn Moisture (% DB): **22.95**

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
0	21	-0.082	670	525	385	241	541	672	472	402	70
1	20.9	-0.085	653	530	369	232	524	761	462	371	70
2	20.8	-0.087	644	534	353	215	505	813	450	363	70
3	20.6	-0.088	638	536	339	213	490	849	443	365	70
4	20.4	-0.09	640	537	328	200	479	928	437	376	70
5	20.1	-0.092	647	537	320	199	471	993	435	389	69
6	19.9	-0.093	664	536	313	187	466	1082	433	400	69
7	19.6	-0.094	680	535	307	188	461	1103	434	408	69
8	19.3	-0.094	692	533	302	188	459	1098	435	413	69
9	19.1	-0.095	705	531	297	184	456	1107	435	415	69
10	18.8	-0.095	715	529	293	180	455	1112	434	420	69
11	18.5	-0.096	725	527	290	180	454	1121	435	422	69
12	18.2	-0.096	733	525	288	172	455	1123	435	426	69
13	17.9	-0.096	740	522	285	178	454	1121	436	427	69
14	17.7	-0.097	746	519	283	175	455	1118	436	429	69
15	17.4	-0.097	752	516	282	177	457	1117	437	429	69
16	17.1	-0.096	757	514	281	178	459	1123	438	430	69
17	16.8	-0.097	762	511	280	170	461	1125	437	432	69
18	16.5	-0.097	766	508	279	174	463	1124	438	432	70
19	16.2	-0.097	770	505	279	176	465	1125	439	432	69
20	16	-0.096	775	502	279	177	468	1142	440	433	70
21	15.7	-0.096	779	499	279	175	472	1147	441	434	69
22	15.4	-0.096	784	497	279	172	475	1161	441	433	69
23	15.1	-0.096	789	494	280	174	479	1168	443	432	69
24	14.8	-0.096	794	492	280	178	482	1180	445	433	69
25	14.6	-0.095	798	489	281	173	487	1192	446	432	69
26	14.3	-0.095	803	487	282	178	491	1196	448	431	69
27	14	-0.095	807	485	282	175	496	1201	449	429	69
28	13.7	-0.095	810	483	283	179	500	1201	451	427	70
29	13.6	-0.095	813	481	284	182	505	1198	453	425	69
30	13.4	-0.095	815	480	286	182	509	1195	454	423	70
31	13.1	-0.095	817	477	287	181	514	1194	455	422	70
32	12.9	-0.095	818	476	289	184	519	1192	457	423	70
33	12.7	-0.094	820	474	290	184	523	1189	458	424	70
34	12.4	-0.095	821	473	291	181	527	1189	459	422	70
35	12.2	-0.095	822	473	293	187	531	1195	461	421	70
36	12	-0.093	823	472	295	189	535	1192	463	419	70
37	11.7	-0.094	823	471	296	182	540	1186	462	417	70
38	11.5	-0.094	823	471	297	189	543	1176	465	415	71
39	11.3	-0.093	820	470	299	189	546	1161	465	414	70
40	11.1	-0.093	817	470	300	188	549	1151	465	413	70
41	10.9	-0.093	815	469	302	193	552	1147	466	411	71
42	10.7	-0.092	812	469	303	191	555	1142	466	410	71

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
43	10.5	-0.091	810	469	304	189	556	1138	466	408	71
44	10.3	-0.092	807	469	305	193	558	1139	466	405	71
45	10.1	-0.092	806	469	307	195	561	1146	468	404	71
46	10	-0.091	805	470	309	201	563	1144	470	403	71
47	9.8	-0.092	804	470	310	198	566	1147	470	405	71
48	9.6	-0.09	803	470	313	203	568	1130	471	405	71
49	9.4	-0.092	801	471	315	199	569	1126	471	404	71
50	9.3	-0.09	799	471	317	200	571	1115	472	402	71
51	9.1	-0.092	797	472	320	203	572	1113	473	402	71
52	8.9	-0.091	795	473	322	205	574	1114	474	398	71
53	8.8	-0.091	794	473	324	201	575	1113	473	397	71
54	8.6	-0.09	792	474	325	207	576	1115	475	396	71
55	8.4	-0.09	791	475	327	209	577	1112	476	393	71
56	8.3	-0.091	790	476	328	209	576	1114	476	394	71
57	8.1	-0.091	789	477	330	208	578	1116	476	393	71
58	8	-0.09	789	478	331	209	578	1117	477	394	71
59	7.8	-0.089	789	479	332	210	579	1122	478	393	71
60	7.7	-0.091	790	479	333	219	580	1126	480	391	70
61	7.5	-0.09	790	480	334	216	581	1127	480	391	71
62	7.3	-0.09	789	481	335	213	582	1115	480	392	71
63	7.2	-0.09	789	483	335	213	583	1114	481	391	71
64	7	-0.09	788	483	336	216	584	1110	481	391	71
65	6.9	-0.089	788	484	337	217	586	1107	482	391	71
66	6.7	-0.09	787	485	338	216	588	1105	483	390	71
67	6.6	-0.089	787	486	339	216	589	1102	483	388	71
68	6.5	-0.09	787	486	340	221	591	1106	485	387	71
69	6.3	-0.089	786	487	342	221	593	1105	486	386	71
70	6.2	-0.089	785	488	344	222	595	1099	487	385	71
71	6.1	-0.089	784	489	346	228	598	1094	489	384	71
72	5.9	-0.089	782	490	349	222	602	1087	489	383	71
73	5.8	-0.088	780	492	352	223	606	1080	491	381	71
74	5.6	-0.088	777	493	355	229	610	1058	493	380	71
75	5.5	-0.088	775	494	358	227	614	1051	494	380	71
76	5.4	-0.087	772	496	361	227	619	1044	495	379	71
77	5.3	-0.087	770	497	365	232	622	1064	497	377	71
78	5.2	-0.088	770	499	369	230	622	1081	498	376	71
79	5.1	-0.086	769	500	375	241	621	1088	501	374	71
80	5	-0.086	767	501	381	238	620	1082	501	373	71
81	4.9	-0.086	764	503	387	239	620	1069	503	369	71
82	4.8	-0.085	761	505	392	242	619	1051	504	366	71
83	4.7	-0.086	756	507	397	238	617	1034	503	365	70
84	4.7	-0.085	751	509	400	245	615	1017	504	363	71
85	4.6	-0.084	744	511	403	249	612	995	504	363	71
86	4.6	-0.084	736	513	405	248	609	971	502	359	71
87	4.5	-0.084	728	515	406	244	606	957	500	355	70
88	4.4	-0.083	721	517	407	247	602	946	499	352	71
89	4.4	-0.082	713	519	406	248	599	935	497	350	71
90	4.4	-0.083	706	521	405	247	595	927	495	348	71
91	4.3	-0.082	699	523	404	250	591	923	493	345	70
92	4.3	-0.082	693	524	402	243	587	919	490	345	70
93	4.2	-0.081	687	526	400	245	584	916	488	344	70
94	4.2	-0.082	682	527	399	250	580	913	488	342	70
95	4.1	-0.082	677	529	397	241	576	910	484	342	70
96	4.1	-0.082	672	531	395	246	573	907	483	341	70
97	4	-0.081	667	532	394	238	569	905	480	338	70
98	4	-0.081	663	533	392	241	566	905	479	338	70
99	4	-0.081	659	535	391	239	563	887	477	337	70
100	3.9	-0.082	653	536	389	236	560	873	475	336	69
	NOTE: 0.1 lb. Was added to scale when flue gas probe was installed										
	Actual final coal bed weight = 3.8 lb.										

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 23:03
Test Length: 168 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 16.81 in. Hg
Post-Test 0.001 cfm @ 6.54 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H (" H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP (" H_2O)*	$\sqrt{dP}$	*vs*
Tot / Avg		0.3	**22.562**	**0.134**	**0.88**	**74.9**	**1.50**	**67.15**	**60.96**	**69.04**	**100.0**	**88.9**	**0.169**	**0.411**	**21.95**
Minimum	0.0	-18.1	0.000	0.129	0.87	70	1.46	65	59	66	97.8	82	0.162	0.402	21.73
Max	18.4	0.3	22.562	0.136	0.89	77	1.51	68	62	71	103.6	126	0.173	0.416	22.51
0	0.3		0.000		0.87	70	1.46	65	61	70		100	0.167	0.409	22.51
1	18.4	-18.1	0.129	0.129	0.89	70	1.47	66	59	70	99.2	126	0.166	0.407	22.28
2	18.2	0.2	0.263	0.134	0.88	70	1.48	66	59	70	103.6	99	0.166	0.407	22.24
3	18.1	0.1	0.397	0.134	0.89	70	1.50	67	59	69	101.4	95	0.168	0.410	22.00
4	17.8	0.3	0.531	0.134	0.89	70	1.50	67	59	69	101.5	94	0.167	0.409	21.98
5	17.6	0.2	0.666	0.135	0.89	70	1.50	67	59	69	102.3	94	0.168	0.410	21.97
6	17.4	0.2	0.800	0.134	0.89	70	1.49	67	59	69	101.6	94	0.166	0.407	21.94
7	17.2	0.2	0.933	0.133	0.89	70	1.49	67	59	69	100.9	94	0.168	0.410	21.94
8	17.0	0.2	1.068	0.135	0.88	70	1.48	67	59	69	102.6	94	0.164	0.405	21.88
9	16.7	0.3	1.200	0.132	0.88	70	1.49	67	59	69	100.8	95	0.165	0.406	21.79
10	16.5	0.2	1.334	0.134	0.89	70	1.50	67	59	69	102.4	95	0.166	0.407	21.86
11	16.3	0.2	1.469	0.135	0.89	71	1.50	67	59	69	102.8	95	0.166	0.407	21.90
12	16.1	0.2	1.603	0.134	0.88	71	1.49	68	59	69	101.9	95	0.166	0.407	21.90
13	15.8	0.3	1.736	0.133	0.88	71	1.50	68	59	69	101.0	95	0.168	0.410	21.96
14	15.6	0.2	1.871	0.135	0.88	71	1.49	68	60	69	102.1	95	0.169	0.411	22.06
15	15.4	0.2	2.005	0.134	0.88	71	1.49	68	60	69	101.3	95	0.166	0.407	21.99
16	15.2	0.2	2.138	0.133	0.89	71	1.49	68	60	69	101.0	95	0.165	0.406	21.86
17	15.0	0.2	2.272	0.134	0.88	71	1.49	68	60	69	102.0	95	0.167	0.409	21.90
18	14.7	0.3	2.406	0.134	0.87	71	1.49	68	60	70	101.9	95	0.165	0.406	21.90
19	14.5	0.2	2.539	0.133	0.88	72	1.49	68	60	69	100.9	95	0.168	0.410	21.93
20	14.3	0.2	2.673	0.134	0.88	72	1.49	68	60	69	101.6	95	0.164	0.405	21.90
21	14.1	0.2	2.807	0.134	0.88	72	1.49	68	60	70	101.9	95	0.165	0.406	21.80
22	13.9	0.2	2.940	0.133	0.88	72	1.50	68	60	70	101.5	95	0.162	0.402	21.73
23	13.7	0.2	3.075	0.135	0.88	72	1.49	68	60	70	103.1	95	0.166	0.407	21.76
24	13.5	0.2	3.208	0.133	0.87	72	1.49	68	60	69	101.4	95	0.164	0.405	21.83
25	13.3	0.2	3.341	0.133	0.88	72	1.49	68	60	70	101.2	95	0.167	0.409	21.86
26	13.0	0.3	3.475	0.134	0.88	72	1.50	68	61	70	101.8	95	0.165	0.406	21.90
27	12.8	0.2	3.609	0.134	0.87	73	1.50	68	61	70	101.8	95	0.164	0.405	21.80
28	12.6	0.2	3.742	0.133	0.88	73	1.50	68	61	70	101.0	95	0.167	0.409	21.86
29	12.4	0.2	3.877	0.135	0.88	73	1.50	68	61	70	102.3	95	0.166	0.407	21.93
30	12.2	0.2	4.011	0.134	0.87	73	1.50	68	61	70	101.3	94	0.167	0.409	21.92
31	12.0	0.2	4.144	0.133	0.88	73	1.50	68	61	70	100.5	95	0.167	0.409	21.95
32	11.8	0.2	4.278	0.134	0.88	73	1.51	68	61	70	101.0	94	0.169	0.411	22.02
33	11.6	0.2	4.412	0.134	0.88	73	1.50	68	61	71	100.7	95	0.169	0.411	22.08
34	11.4	0.2	4.545	0.133	0.87	73	1.51	68	61	70	99.9	94	0.168	0.410	22.05
35	11.3	0.1	4.680	0.135	0.88	74	1.51	68	61	70	101.4	94	0.167	0.409	21.97
36	11.1	0.2	4.814	0.134	0.87	74	1.50	68	61	70	100.8	94	0.167	0.409	21.94
37	10.9	0.2	4.947	0.133	0.88	74	1.50	68	61	70	100.2	94	0.166	0.407	21.91
38	10.7	0.2	5.081	0.134	0.88	74	1.50	68	61	70	100.9	93	0.168	0.410	21.93
39	10.6	0.1	5.216	0.135	0.88	74	1.50	68	61	71	101.2	93	0.171	0.414	22.09
40	10.4	0.2	5.349	0.133	0.88	74	1.50	68	61	70	99.1	93	0.171	0.414	22.18

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 23:03
Test Length: 168 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 16.81 in. Hg
Post-Test 0.001 cfm @ 6.54 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
41	10.3	0.1	5.483	0.134	0.88	74	1.51	68	61	70	99.9	92	0.166	0.407	22.01
42	10.1	0.2	5.618	0.135	0.88	74	1.50	68	61	71	101.1	92	0.170	0.412	21.97
43	10.0	0.1	5.751	0.133	0.88	74	1.50	68	61	70	99.5	92	0.169	0.411	22.07
44	9.8	0.2	5.885	0.134	0.88	75	1.51	68	61	71	100.0	92	0.168	0.410	22.00
45	9.7	0.1	6.020	0.135	0.88	75	1.51	68	62	70	101.1	92	0.166	0.407	21.90
46	9.6	0.1	6.153	0.133	0.88	75	1.51	68	62	70	99.8	92	0.168	0.410	21.90
47	9.4	0.2	6.287	0.134	0.88	75	1.50	68	62	70	100.4	92	0.168	0.410	21.97
48	9.3	0.1	6.423	0.136	0.87	75	1.50	68	62	70	101.6	92	0.170	0.412	22.03
49	9.1	0.2	6.556	0.133	0.88	75	1.50	68	62	70	99.1	91	0.168	0.410	22.02
50	9.0	0.1	6.690	0.134	0.88	75	1.50	68	62	70	100.1	91	0.167	0.409	21.92
51	8.8	0.2	6.825	0.135	0.88	75	1.50	68	62	70	100.9	91	0.170	0.412	21.98
52	8.7	0.1	6.959	0.134	0.87	75	1.50	68	62	70	99.7	91	0.171	0.414	22.11
53	8.6	0.1	7.092	0.133	0.88	75	1.50	68	62	70	98.7	91	0.169	0.411	22.08
54	8.4	0.2	7.227	0.135	0.88	75	1.51	68	62	70	100.5	91	0.168	0.410	21.98
55	8.3	0.1	7.361	0.134	0.87	75	1.50	68	62	70	100.2	91	0.167	0.409	21.92
56	8.1	0.2	7.495	0.134	0.88	75	1.51	68	62	70	100.1	91	0.171	0.414	22.01
57	8.0	0.1	7.629	0.134	0.87	75	1.50	68	62	70	99.7	91	0.169	0.411	22.08
58	7.9	0.1	7.764	0.135	0.88	76	1.51	68	62	70	100.4	91	0.169	0.411	22.01
59	7.7	0.2	7.898	0.134	0.88	76	1.50	68	62	70	99.9	91	0.166	0.407	21.92
60	7.6	0.1	8.031	0.133	0.88	76	1.50	68	62	70	99.4	91	0.169	0.411	21.92
61	7.4	0.2	8.166	0.135	0.88	76	1.51	68	62	70	100.7	91	0.168	0.410	21.98
62	7.3	0.1	8.300	0.134	0.88	76	1.51	68	62	70	100.0	91	0.166	0.407	21.88
63	7.2	0.1	8.434	0.134	0.87	76	1.50	68	62	70	100.3	91	0.168	0.410	21.88
64	7.0	0.2	8.569	0.135	0.87	76	1.51	68	62	70	101.0	91	0.166	0.407	21.88
65	6.9	0.1	8.703	0.134	0.87	76	1.51	68	62	70	100.2	91	0.169	0.411	21.92
66	6.8	0.1	8.837	0.134	0.88	76	1.51	68	62	70	100.0	91	0.167	0.409	21.95
67	6.7	0.1	8.972	0.135	0.87	76	1.51	68	62	70	100.8	91	0.168	0.410	21.92
68	6.5	0.2	9.106	0.134	0.87	76	1.51	68	62	70	100.1	91	0.167	0.409	21.92
69	6.4	0.1	9.240	0.134	0.88	76	1.50	68	62	70	100.0	90	0.169	0.411	21.94
70	6.3	0.1	9.374	0.134	0.88	76	1.50	68	62	70	99.8	91	0.169	0.411	22.00
71	6.1	0.2	9.509	0.135	0.88	76	1.51	68	62	70	100.5	91	0.168	0.410	21.98
72	6.0	0.1	9.643	0.134	0.88	76	1.51	68	62	70	99.7	91	0.170	0.412	22.01
73	5.9	0.1	9.777	0.134	0.88	76	1.50	68	62	70	99.9	91	0.165	0.406	21.92
74	5.7	0.2	9.912	0.135	0.88	76	1.50	68	62	70	100.9	90	0.168	0.410	21.84
75	5.6	0.1	10.046	0.134	0.88	76	1.51	68	62	70	100.1	90	0.168	0.410	21.93
76	5.5	0.1	10.180	0.134	0.88	76	1.50	68	62	70	99.9	90	0.168	0.410	21.93
77	5.4	0.1	10.316	0.136	0.88	76	1.50	68	62	70	101.3	90	0.169	0.411	21.96
78	5.3	0.1	10.450	0.134	0.87	76	1.51	68	62	70	99.7	90	0.168	0.410	21.96
79	5.2	0.1	10.583	0.133	0.88	76	1.50	68	62	70	99.0	90	0.169	0.411	21.96
80	5.1	0.1	10.718	0.135	0.88	76	1.50	68	62	69	100.3	90	0.170	0.412	22.03
81	5.0	0.1	10.853	0.135	0.88	76	1.51	68	62	70	100.0	89	0.170	0.412	22.05
82	4.9	0.1	10.987	0.134	0.88	76	1.51	67	62	70	99.2	89	0.169	0.411	22.01
83	4.8	0.1	11.121	0.134	0.88	76	1.50	68	62	70	99.6	89	0.167	0.409	21.91
84	4.7	0.1	11.257	0.136	0.88	76	1.50	68	62	70	101.3	89	0.168	0.410	21.88

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Date: 3/7/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Test Start Time: 23:03
Test Length: 168 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test 0.002 cfm @ 16.81 in. Hg
Post-Test 0.001 cfm @ 6.54 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($" H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($" H_2O$)*	$\sqrt{dP}$	*vs*
85	4.6	0.1	11.391	0.134	0.87	76	1.51	67	62	70	99.6	89	0.171	0.414	22.01
86	4.5	0.1	11.525	0.134	0.88	76	1.50	67	62	70	99.4	89	0.167	0.409	21.97
87	4.4	0.1	11.660	0.135	0.87	76	1.50	67	62	69	100.1	88	0.172	0.415	22.00
88	4.3	0.1	11.795	0.135	0.87	76	1.50	67	62	69	99.9	88	0.168	0.410	22.02
89	4.2	0.1	11.928	0.133	0.88	76	1.51	67	62	69	98.6	88	0.169	0.411	21.92
90	4.1	0.1	12.063	0.135	0.88	77	1.51	67	62	70	100.3	88	0.167	0.409	21.89
91	4.0	0.1	12.198	0.135	0.88	76	1.51	67	62	70	100.3	88	0.170	0.412	21.92
92	4.0	0.0	12.332	0.134	0.88	76	1.50	67	62	69	99.4	88	0.169	0.411	21.99
93	3.9	0.1	12.466	0.134	0.88	76	1.50	67	62	69	99.1	88	0.172	0.415	22.05
94	3.8	0.1	12.602	0.136	0.88	76	1.50	67	62	69	100.2	87	0.171	0.414	22.10
95	3.7	0.1	12.736	0.134	0.88	76	1.50	67	61	69	98.8	88	0.169	0.411	22.01
96	3.6	0.1	12.870	0.134	0.88	76	1.51	67	61	69	99.1	87	0.171	0.414	22.01
97	3.6	0.0	13.006	0.136	0.88	76	1.50	67	61	69	100.5	87	0.169	0.411	22.00
98	3.5	0.1	13.140	0.134	0.88	76	1.50	67	61	69	99.2	87	0.169	0.411	21.93
99	3.4	0.1	13.274	0.134	0.88	76	1.50	67	61	69	99.3	87	0.169	0.411	21.93
100	3.4	0.0	13.409	0.135	0.88	76	1.50	67	61	69	100.0	86	0.169	0.411	21.92
101	3.3	0.1	13.544	0.135	0.88	77	1.50	67	61	69	99.6	86	0.172	0.415	22.01
102	3.2	0.1	13.678	0.134	0.88	77	1.51	67	61	69	98.5	86	0.171	0.414	22.07
103	3.1	0.1	13.813	0.135	0.88	77	1.50	67	61	69	99.3	86	0.168	0.410	21.95
104	3.1	0.0	13.948	0.135	0.88	76	1.51	67	61	69	99.9	86	0.169	0.411	21.88
105	3.0	0.1	14.082	0.134	0.87	77	1.50	67	61	69	99.1	86	0.170	0.412	21.95
106	3.0	0.0	14.216	0.134	0.88	76	1.51	67	61	69	98.8	85	0.171	0.414	22.00
107	2.9	0.1	14.351	0.135	0.88	76	1.50	67	61	69	99.3	85	0.171	0.414	22.02
108	2.8	0.1	14.487	0.136	0.88	76	1.51	67	61	69	100.3	85	0.167	0.409	21.89
109	2.8	0.0	14.621	0.134	0.88	77	1.50	67	61	69	99.3	85	0.168	0.410	21.80
110	2.7	0.1	14.755	0.134	0.88	76	1.51	67	61	69	99.3	85	0.169	0.411	21.86
111	2.7	0.0	14.891	0.136	0.88	76	1.50	67	61	69	100.5	85	0.172	0.415	21.99
112	2.6	0.1	15.025	0.134	0.88	76	1.51	67	61	69	98.6	85	0.170	0.412	22.02
113	2.6	0.0	15.159	0.134	0.88	76	1.51	67	61	69	98.6	85	0.171	0.414	21.99
114	2.5	0.1	15.294	0.135	0.88	77	1.50	67	61	69	99.4	85	0.169	0.411	21.96
115	2.4	0.1	15.429	0.135	0.88	76	1.50	67	61	69	99.6	85	0.169	0.411	21.89
116	2.4	0.0	15.563	0.134	0.88	76	1.51	67	61	69	99.1	85	0.170	0.412	21.93
117	2.3	0.1	15.697	0.134	0.88	76	1.50	67	61	69	99.0	85	0.169	0.411	21.93
118	2.3	0.0	15.833	0.136	0.88	76	1.50	67	61	69	100.2	85	0.173	0.416	22.02
119	2.2	0.1	15.967	0.134	0.88	76	1.50	67	61	69	98.4	85	0.171	0.414	22.09
120	2.1	0.1	16.101	0.134	0.88	76	1.51	67	61	69	98.5	85	0.170	0.412	21.99
121	2.1	0.0	16.237	0.136	0.88	76	1.51	67	61	69	100.2	85	0.171	0.414	21.99
122	2.0	0.1	16.371	0.134	0.87	76	1.51	67	61	68	98.8	85	0.168	0.410	21.93
123	2.0	0.0	16.505	0.134	0.88	76	1.51	67	61	68	99.0	84	0.170	0.412	21.88
124	1.9	0.1	16.640	0.135	0.88	76	1.50	67	61	68	99.7	85	0.170	0.412	21.95
125	1.9	0.0	16.775	0.135	0.88	76	1.50	67	61	68	99.6	85	0.170	0.412	21.96
126	1.8	0.1	16.909	0.134	0.88	76	1.50	67	61	69	99.1	85	0.167	0.409	21.86
127	1.7	0.1	17.044	0.135	0.88	76	1.50	66	61	68	100.2	85	0.168	0.410	21.80
128	1.7	0.0	17.179	0.135	0.87	76	1.50	66	61	68	100.2	85	0.169	0.411	21.86

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 23:03
Test Length: 168 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0.002 cfm @ 16.81 in. Hg
Post-Test 0.001 cfm @ 6.54 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
129	1.6	0.1	17.313	0.134	0.87	76	1.50	66	61	68	99.1	85	0.170	0.412	21.93
130	1.5	0.1	17.447	0.134	0.88	76	1.50	66	61	68	98.9	85	0.170	0.412	21.96
131	1.5	0.0	17.583	0.136	0.88	76	1.50	66	61	68	100.3	84	0.169	0.411	21.92
132	1.4	0.1	17.717	0.134	0.87	76	1.51	66	61	68	98.9	84	0.169	0.411	21.87
133	1.4	0.0	17.851	0.134	0.88	76	1.51	66	61	68	99.0	84	0.169	0.411	21.87
134	1.3	0.1	17.986	0.135	0.88	76	1.51	66	61	68	99.8	84	0.169	0.411	21.87
135	1.3	0.0	18.121	0.135	0.88	76	1.51	66	61	68	99.6	84	0.171	0.414	21.94
136	1.2	0.1	18.255	0.134	0.87	76	1.51	66	61	68	98.7	84	0.170	0.412	21.97
137	1.2	0.0	18.389	0.134	0.88	76	1.50	66	61	68	98.7	84	0.169	0.411	21.91
138	1.2	0.0	18.525	0.136	0.87	76	1.50	66	61	68	100.4	84	0.170	0.412	21.91
139	1.1	0.1	18.659	0.134	0.88	76	1.50	66	61	68	98.7	84	0.172	0.415	22.00
140	1.1	0.0	18.793	0.134	0.88	76	1.50	66	61	68	98.3	83	0.171	0.414	22.02
141	1.0	0.1	18.928	0.135	0.88	76	1.51	66	61	68	99.0	83	0.171	0.414	21.98
142	1.0	0.0	19.063	0.135	0.88	76	1.51	66	61	68	99.2	83	0.170	0.412	21.95
143	1.0	0.0	19.197	0.134	0.88	76	1.50	66	61	68	98.4	83	0.172	0.415	21.98
144	0.9	0.1	19.331	0.134	0.88	76	1.50	66	61	68	98.3	83	0.171	0.414	22.01
145	0.9	0.0	19.467	0.136	0.88	76	1.50	66	61	68	99.8	83	0.170	0.412	21.95
146	0.9	0.0	19.600	0.133	0.88	76	1.51	66	61	68	97.8	83	0.170	0.412	21.92
147	0.8	0.1	19.735	0.135	0.88	76	1.51	66	61	68	99.5	83	0.168	0.410	21.85
148	0.8	0.0	19.870	0.135	0.88	76	1.50	66	61	68	99.8	83	0.169	0.411	21.82
149	0.7	0.1	20.005	0.135	0.88	76	1.50	66	61	67	99.7	83	0.170	0.412	21.88
150	0.7	0.0	20.139	0.134	0.88	76	1.50	66	60	67	98.9	83	0.168	0.410	21.85
151	0.7	0.0	20.273	0.134	0.88	76	1.50	66	60	67	99.0	83	0.169	0.411	21.82
152	0.7	0.0	20.409	0.136	0.88	76	1.50	66	60	67	100.5	83	0.169	0.411	21.85
153	0.6	0.1	20.543	0.134	0.88	76	1.51	66	60	67	98.7	82	0.171	0.414	21.91
154	0.6	0.0	20.677	0.134	0.88	76	1.50	66	60	67	98.4	83	0.172	0.415	22.00
155	0.5	0.1	20.813	0.136	0.88	76	1.50	66	60	67	99.8	83	0.170	0.412	21.98
156	0.5	0.0	20.947	0.134	0.88	76	1.50	66	60	67	98.6	83	0.169	0.411	21.88
157	0.5	0.0	21.081	0.134	0.88	76	1.50	66	60	67	98.8	83	0.170	0.412	21.88
158	0.4	0.1	21.216	0.135	0.88	76	1.50	66	60	67	99.5	83	0.169	0.411	21.88
159	0.4	0.0	21.351	0.135	0.88	76	1.50	66	60	67	99.3	82	0.172	0.415	21.94
160	0.4	0.0	21.486	0.135	0.88	76	1.50	66	60	67	99.1	83	0.171	0.414	22.00
161	0.3	0.1	21.620	0.134	0.88	76	1.50	66	60	67	98.5	82	0.168	0.410	21.87
162	0.3	0.0	21.756	0.136	0.88	76	1.50	66	60	67	100.1	82	0.172	0.415	21.90
163	0.3	0.0	21.890	0.134	0.88	76	1.50	66	60	67	98.3	82	0.172	0.415	22.03
164	0.2	0.1	22.024	0.134	0.88	76	1.50	66	60	66	98.1	82	0.170	0.412	21.96
165	0.2	0.0	22.159	0.135	0.89	76	1.50	66	60	67	99.2	82	0.169	0.411	21.86
166	0.2	0.0	22.294	0.135	0.88	76	1.50	66	60	67	99.4	82	0.171	0.414	21.90
167	0.1	0.1	22.428	0.134	0.88	76	1.50	66	60	67	98.5	82	0.170	0.412	21.93
168	0.0	0.1	22.562	0.134	0.88	76	1.50	65	60	67	98.4	82	0.171	0.414	21.93

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 23:03
Total Sampling Time: 168 min
Recording Interval: 1 min

Test Date: 3/7/24

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 17.7 in. Hg
Post-Test 0 cfm @ 5.46 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
Tot / Avg	**23.383**	**0.139**	**0.68**	**75.9**	**1.76**	**68.18**	**61.49**	**100.0**	**690.9**	**499.7**	**325.4**	**201.0**	**534.7**	**1076.4**	**60.8**
Minimum	0.000	0.130	0.65	71	1.70	66	60	96.4	536	457	282	165	463	836	411
Max	23.383	0.141	0.69	77	1.80	68	62	102.6	790	539	385	237	577	1349	472
0	0.000		0.65	71	1.70	66	62		646	537	385	237	554	836	472
1	0.130	0.130	0.67	71	1.70	67	61	96.4	630	538	379	232	540	963	464
2	0.266	0.136	0.67	71	1.70	67	61	101.4	622	538	366	227	524	912	455
3	0.404	0.138	0.69	71	1.70	67	61	100.8	629	538	354	220	509	1029	450
4	0.543	0.139	0.69	71	1.70	67	61	101.6	640	539	342	211	497	1041	446
5	0.681	0.138	0.68	71	1.70	68	61	100.9	654	538	333	204	489	1084	444
6	0.819	0.138	0.68	71	1.70	68	61	101.0	667	538	324	200	482	1082	442
7	0.957	0.138	0.68	71	1.70	68	61	101.0	678	537	316	196	477	1147	441
8	1.096	0.139	0.68	71	1.70	68	61	101.9	688	537	310	189	475	1115	440
9	1.233	0.137	0.67	72	1.70	68	61	100.8	696	536	304	188	473	1083	439
10	1.370	0.137	0.67	72	1.70	68	61	100.8	704	535	299	182	472	1094	438
11	1.509	0.139	0.68	72	1.70	68	61	102.0	710	534	295	182	472	1140	439
12	1.647	0.138	0.68	72	1.70	68	61	101.2	717	532	292	176	472	1140	438
13	1.785	0.138	0.68	72	1.70	68	61	101.1	723	530	289	176	472	1167	438
14	1.923	0.138	0.68	72	1.70	68	61	100.7	729	529	287	180	473	1192	440
15	2.060	0.137	0.68	72	1.70	69	61	99.9	735	527	286	175	473	1173	439
16	2.199	0.139	0.67	72	1.70	69	61	101.8	740	526	285	170	475	1174	439
17	2.337	0.138	0.67	72	1.70	69	61	101.3	745	524	284	170	476	1187	440
18	2.474	0.137	0.67	73	1.70	69	61	100.4	750	521	283	167	478	1196	440
19	2.612	0.138	0.67	73	1.70	69	61	101.0	754	519	283	166	481	1212	441
20	2.750	0.138	0.67	73	1.70	69	61	101.0	757	517	282	168	484	1212	442
21	2.888	0.138	0.67	73	1.70	69	61	101.3	760	516	282	167	487	1217	442
22	3.025	0.137	0.68	73	1.70	69	61	100.9	763	513	282	169	490	1233	443
23	3.163	0.138	0.67	73	1.70	69	61	101.7	766	512	282	165	493	1231	444
24	3.302	0.139	0.67	73	1.70	69	61	102.2	768	510	282	165	496	1235	444
25	3.439	0.137	0.67	73	1.70	69	61	100.5	771	508	282	165	501	1247	445
26	3.576	0.137	0.67	74	1.70	69	61	100.3	774	506	283	167	505	1273	447
27	3.714	0.138	0.67	74	1.70	69	61	101.1	777	504	283	166	509	1276	448
28	3.854	0.140	0.69	74	1.80	69	61	102.6	779	503	284	168	513	1270	449
29	3.994	0.140	0.70	74	1.80	69	61	102.3	782	501	285	166	517	1286	450
30	4.133	0.139	0.69	74	1.80	69	61	101.4	784	499	287	169	522	1276	452
31	4.273	0.140	0.69	74	1.80	69	61	102.0	786	498	288	170	526	1282	454
32	4.412	0.139	0.70	74	1.80	69	62	101.1	788	496	289	169	531	1291	455
33	4.552	0.140	0.69	74	1.80	69	62	101.5	790	495	291	170	536	1349	456
34	4.692	0.140	0.69	75	1.80	69	62	101.3	790	493	291	169	539	1309	456
35	4.831	0.139	0.68	75	1.80	69	62	100.7	788	492	292	174	544	1340	458
36	4.970	0.139	0.68	75	1.80	69	62	100.9	787	490	293	173	547	1310	458
37	5.108	0.138	0.68	75	1.80	69	62	100.3	783	489	295	173	550	1291	458
38	5.247	0.139	0.69	75	1.80	69	62	101.0	780	488	296	173	554	1313	458
39	5.387	0.140	0.68	75	1.70	69	62	101.2	777	487	297	177	555	1303	459
40	5.525	0.138	0.68	75	1.80	70	62	99.2	774	486	298	174	557	1298	458

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 23:03
Total Sampling Time: 168 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0.001 cfm @ 17.7 in. Hg
Post-Test 0 cfm @ 5.46 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
41	5.664	0.139	0.68	75	1.70	69	62	100.0	772	485	300	179	559	1282	459
42	5.803	0.139	0.69	75	1.80	69	62	100.4	770	484	301	176	560	1259	458
43	5.942	0.139	0.69	75	1.70	70	62	100.3	767	483	302	179	561	1270	458
44	6.082	0.140	0.68	76	1.80	69	62	100.8	765	482	303	180	562	1281	458
45	6.220	0.138	0.68	76	1.70	69	62	99.7	763	481	304	181	563	1257	458
46	6.359	0.139	0.68	76	1.80	69	62	100.6	760	480	304	183	564	1278	458
47	6.498	0.139	0.69	76	1.70	69	62	100.5	757	479	305	182	565	1249	458
48	6.637	0.139	0.68	76	1.70	69	62	100.2	756	478	305	185	566	1269	458
49	6.777	0.140	0.68	76	1.80	69	62	100.7	756	478	306	182	567	1284	458
50	6.916	0.139	0.68	76	1.80	69	62	100.1	755	477	307	181	569	1286	458
51	7.054	0.138	0.68	76	1.80	69	62	99.5	755	476	308	185	570	1281	459
52	7.193	0.139	0.69	76	1.70	69	62	99.8	755	475	308	182	571	1256	458
53	7.333	0.140	0.69	76	1.80	69	62	100.3	753	475	308	186	572	1247	459
54	7.472	0.139	0.68	76	1.80	69	62	99.9	751	474	308	187	571	1229	458
55	7.611	0.139	0.68	76	1.80	69	62	100.2	749	474	308	186	570	1264	457
56	7.750	0.139	0.69	77	1.80	69	62	100.1	750	474	309	188	570	1288	458
57	7.889	0.139	0.68	77	1.80	69	62	99.6	755	473	311	190	571	1307	460
58	8.028	0.139	0.69	77	1.80	69	62	99.6	759	473	312	193	572	1320	462
59	8.168	0.140	0.69	77	1.70	69	62	100.7	763	472	312	188	572	1313	461
60	8.307	0.139	0.68	77	1.80	69	62	100.2	766	472	313	192	571	1295	463
61	8.446	0.139	0.68	77	1.80	69	62	100.1	768	471	314	197	570	1291	464
62	8.585	0.139	0.69	77	1.80	69	62	100.1	770	471	316	199	568	1302	465
63	8.724	0.139	0.68	77	1.80	69	62	100.3	771	470	317	193	566	1300	463
64	8.864	0.140	0.68	77	1.80	69	62	101.1	773	470	318	198	565	1292	465
65	9.003	0.139	0.68	77	1.80	69	62	100.3	774	469	319	198	563	1286	465
66	9.142	0.139	0.69	77	1.80	69	62	100.1	775	468	320	205	562	1293	466
67	9.281	0.139	0.68	77	1.80	69	62	100.1	775	467	321	197	560	1283	464
68	9.420	0.139	0.68	77	1.80	69	62	100.2	775	467	322	209	560	1264	467
69	9.560	0.140	0.68	77	1.80	69	62	100.8	774	466	322	201	559	1263	464
70	9.699	0.139	0.68	77	1.80	69	62	99.9	773	465	321	206	559	1253	465
71	9.838	0.139	0.69	77	1.80	69	62	99.9	773	464	321	206	560	1259	465
72	9.977	0.139	0.69	77	1.80	69	62	99.8	772	464	320	207	562	1263	465
73	10.117	0.140	0.69	77	1.80	69	62	100.7	770	463	320	211	564	1263	466
74	10.257	0.140	0.68	77	1.80	69	62	101.0	769	463	320	218	566	1240	467
75	10.396	0.139	0.68	77	1.80	69	62	100.2	767	462	321	206	569	1250	465
76	10.535	0.139	0.68	77	1.80	69	62	100.0	766	461	321	210	571	1236	466
77	10.674	0.139	0.69	77	1.80	69	62	99.9	766	461	321	210	573	1235	466
78	10.813	0.139	0.69	77	1.80	69	62	99.8	766	460	321	208	574	1228	466
79	10.953	0.140	0.69	77	1.80	69	62	100.5	764	460	322	210	575	1197	466
80	11.093	0.140	0.68	77	1.80	69	62	100.4	763	459	323	211	577	1178	467
81	11.232	0.139	0.68	77	1.80	69	62	99.4	761	458	324	211	577	1168	466
82	11.371	0.139	0.69	77	1.80	69	62	99.3	759	458	325	215	577	1168	467
83	11.510	0.139	0.69	77	1.70	69	62	99.6	756	457	326	213	577	1150	466
84	11.650	0.140	0.69	77	1.80	69	62	100.7	753	457	327	212	577	1063	465

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 23:03
Total Sampling Time: 168 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test 0.001 cfm @ 17.7 in. Hg
Post-Test 0 cfm @ 5.46 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
85	11.790	0.140	0.69	77	1.80	69	62	100.4	750	457	329	211	576	1081	465
86	11.929	0.139	0.68	77	1.80	69	62	99.5	748	457	331	211	576	1016	465
87	12.068	0.139	0.69	77	1.80	69	62	99.4	745	457	332	215	576	1040	465
88	12.208	0.140	0.69	77	1.80	69	62	100.0	742	458	334	212	575	1021	464
89	12.347	0.139	0.69	77	1.80	69	62	99.4	740	458	336	214	576	1032	465
90	12.487	0.140	0.69	78	1.80	69	62	100.3	737	458	337	218	575	1023	465
91	12.627	0.140	0.69	77	1.80	69	62	100.3	734	459	339	217	574	1018	465
92	12.766	0.139	0.68	77	1.70	69	62	99.5	729	460	341	213	573	1022	463
93	12.905	0.139	0.69	77	1.80	69	62	99.2	724	460	342	218	572	1020	463
94	13.045	0.140	0.69	77	1.80	69	62	99.5	719	461	344	220	571	1010	463
95	13.185	0.140	0.69	77	1.80	69	62	99.6	713	463	345	218	570	1004	462
96	13.325	0.140	0.69	77	1.70	68	62	99.9	708	464	346	221	568	1001	461
97	13.464	0.139	0.68	77	1.80	68	62	99.1	702	465	347	218	567	984	460
98	13.603	0.139	0.69	78	1.80	68	62	99.2	698	466	348	223	566	984	460
99	13.743	0.140	0.69	78	1.80	68	62	99.9	693	468	349	222	564	979	459
100	13.883	0.140	0.69	77	1.70	68	62	99.9	688	469	350	224	564	981	459
101	14.022	0.139	0.69	77	1.80	68	62	99.1	684	470	350	220	561	971	457
102	14.163	0.141	0.69	77	1.80	68	62	100.1	680	472	350	223	560	963	457
103	14.302	0.139	0.69	77	1.70	68	62	98.9	676	474	351	221	558	967	456
104	14.441	0.139	0.69	77	1.80	68	62	99.3	672	476	351	221	557	969	455
105	14.581	0.140	0.69	77	1.80	68	62	100.0	669	477	351	222	556	971	455
106	14.720	0.139	0.69	77	1.80	68	62	98.9	666	479	351	220	554	957	454
107	14.861	0.141	0.69	77	1.80	68	62	100.1	663	481	351	215	552	954	452
108	15.000	0.139	0.69	77	1.70	68	62	98.9	660	482	350	217	551	935	452
109	15.140	0.140	0.68	77	1.80	68	62	100.1	655	484	348	221	550	929	452
110	15.279	0.139	0.69	77	1.70	68	62	99.5	651	486	346	222	551	926	451
111	15.419	0.140	0.69	77	1.80	68	62	99.8	648	489	344	217	551	932	450
112	15.558	0.139	0.69	77	1.70	68	62	98.7	646	491	342	219	552	926	450
113	15.699	0.141	0.68	77	1.80	68	62	100.1	643	493	340	213	552	927	448
114	15.839	0.140	0.69	77	1.80	68	62	99.6	640	496	339	215	553	924	449
115	15.978	0.139	0.69	77	1.70	68	61	99.1	639	498	338	214	553	926	448
116	16.117	0.139	0.69	77	1.70	68	61	99.1	637	500	337	212	554	923	448
117	16.257	0.140	0.69	77	1.80	68	61	99.8	635	503	336	211	554	924	448
118	16.397	0.140	0.69	77	1.80	68	61	99.6	635	506	336	208	554	920	448
119	16.537	0.140	0.68	77	1.80	68	61	99.2	634	509	336	212	553	933	449
120	16.677	0.140	0.69	77	1.70	68	61	99.3	632	512	336	212	553	925	449
121	16.816	0.139	0.69	77	1.80	68	61	98.8	631	514	336	208	552	935	448
122	16.955	0.139	0.69	77	1.80	68	61	98.9	630	516	337	215	550	926	450
123	17.095	0.140	0.69	77	1.70	68	61	99.8	630	519	338	211	549	937	449
124	17.235	0.140	0.69	77	1.80	68	61	99.7	630	521	339	210	548	945	450
125	17.375	0.140	0.69	77	1.70	68	61	99.7	628	523	341	214	546	956	450
126	17.515	0.140	0.68	77	1.80	68	61	99.8	628	524	344	212	544	956	450
127	17.654	0.139	0.69	77	1.80	67	61	99.5	627	525	348	208	543	965	450
128	17.794	0.140	0.69	77	1.80	67	61	100.2	628	526	351	213	541	964	452

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 23:03
Total Sampling Time: 168 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test 0.001 cfm @ 17.7 in. Hg
Post-Test 0 cfm @ 5.46 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
129	17.933	0.139	0.69	77	1.80	67	61	99.2	628	526	356	216	539	959	453
130	18.074	0.141	0.69	77	1.70	67	61	100.4	628	526	360	217	537	967	454
131	18.213	0.139	0.69	77	1.70	67	61	98.9	629	527	364	217	535	954	454
132	18.353	0.140	0.69	77	1.80	67	61	99.7	629	527	366	218	533	949	455
133	18.492	0.139	0.69	77	1.80	67	61	99.1	628	527	367	222	531	936	455
134	18.632	0.140	0.69	77	1.80	67	61	99.8	626	527	366	220	529	908	454
135	18.771	0.139	0.69	77	1.80	67	61	99.0	623	527	365	218	526	913	452
136	18.912	0.141	0.68	77	1.80	67	61	100.2	618	527	363	222	524	917	451
137	19.051	0.139	0.68	77	1.80	67	61	98.8	614	528	362	217	525	936	449
138	19.191	0.140	0.69	77	1.80	67	61	99.7	611	528	361	218	525	924	449
139	19.330	0.139	0.68	77	1.70	67	61	98.8	607	529	360	219	525	929	448
140	19.470	0.140	0.69	77	1.70	67	61	99.1	604	529	359	219	524	918	447
141	19.610	0.140	0.69	77	1.80	67	61	99.1	600	529	358	222	522	910	446
142	19.750	0.140	0.69	77	1.80	67	61	99.2	597	530	356	219	520	906	444
143	19.889	0.139	0.68	77	1.80	67	61	98.5	594	531	354	220	518	905	443
144	20.029	0.140	0.69	77	1.80	67	61	99.1	593	532	352	213	516	895	441
145	20.168	0.139	0.69	77	1.70	67	61	98.4	591	532	350	219	514	886	441
146	20.308	0.140	0.69	77	1.70	67	61	99.4	589	533	347	217	511	872	439
147	20.448	0.140	0.69	77	1.80	67	61	99.6	586	533	345	214	508	871	437
148	20.588	0.140	0.68	77	1.70	67	61	99.8	583	534	343	210	506	864	435
149	20.728	0.140	0.69	77	1.70	67	61	99.7	580	534	341	204	503	863	432
150	20.867	0.139	0.68	77	1.80	67	61	99.0	577	534	339	205	500	861	431
151	21.007	0.140	0.69	77	1.70	67	61	99.8	574	534	337	209	496	855	430
152	21.146	0.139	0.69	77	1.80	67	61	99.1	571	535	335	217	493	854	430
153	21.287	0.141	0.69	77	1.70	67	61	100.2	569	535	333	208	491	853	427
154	21.427	0.140	0.69	77	1.80	67	61	99.2	567	535	332	206	488	850	426
155	21.566	0.139	0.69	77	1.80	67	61	98.4	564	536	331	210	486	852	425
156	21.706	0.140	0.69	77	1.80	67	61	99.4	562	536	330	213	484	850	425
157	21.845	0.139	0.69	77	1.80	67	61	98.9	560	536	329	208	482	850	423
158	21.985	0.140	0.69	77	1.70	67	61	99.6	557	536	329	203	480	848	421
159	22.126	0.141	0.68	77	1.80	67	61	100.1	555	535	328	206	478	844	420
160	22.265	0.139	0.68	77	1.80	67	61	98.4	553	536	328	204	477	841	420
161	22.404	0.139	0.69	77	1.80	67	61	98.5	550	536	328	199	475	839	418
162	22.544	0.140	0.69	76	1.70	66	61	99.5	548	535	327	200	474	838	417
163	22.684	0.140	0.69	76	1.80	66	61	99.2	545	535	327	197	472	838	415
164	22.824	0.140	0.69	76	1.70	67	61	99.1	543	535	326	199	471	844	415
165	22.964	0.140	0.68	76	1.80	67	61	99.5	541	535	325	198	468	842	413
166	23.104	0.140	0.69	76	1.80	66	61	99.6	540	535	324	195	466	842	412
167	23.243	0.139	0.69	76	1.80	66	61	98.8	538	536	323	196	465	842	412
168	23.383	0.140	0.69	76	1.80	66	60	99.4	536	536	322	198	463	843	411

Train C - First Hour Particulate Sampling

Run: 6 **Test Date:** 3/7/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 23:03
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 20.8 in. Hg
Post-Test 0 cfm @ 4.52 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
Tot / Avg	**8.096**	**0.135**	**1.56**	**65.8**	**-1.69**	**68.4**	**62.6**	**100.5**
Minimum	0.000	0.079	1.52	65	-2.00	65	61	59.5
Max	8.096	0.137	1.60	66	-1.44	69	63	102.6
0	0.000		1.57	65	-1.91	65	61	
1	0.079	0.079	1.55	65	-1.52	66	62	59.5
2	0.213	0.134	1.54	65	-1.94	66	62	101.4
3	0.349	0.136	1.57	65	-1.71	67	62	100.8
4	0.486	0.137	1.55	65	-1.68	67	62	101.7
5	0.621	0.135	1.59	65	-1.52	67	62	100.2
6	0.758	0.137	1.57	65	-1.47	67	62	101.8
7	0.894	0.136	1.57	65	-1.79	67	62	101.1
8	1.030	0.136	1.56	65	-1.52	67	62	101.2
9	1.166	0.136	1.58	65	-1.48	67	62	101.7
10	1.303	0.137	1.58	65	-1.55	68	62	102.6
11	1.439	0.136	1.57	65	-1.80	68	62	101.6
12	1.575	0.136	1.57	65	-1.97	68	62	101.6
13	1.712	0.137	1.56	65	-1.80	68	62	102.2
14	1.847	0.135	1.56	66	-1.91	68	62	100.2
15	1.983	0.136	1.58	66	-1.81	68	62	100.8
16	2.118	0.135	1.58	66	-1.65	68	62	100.5
17	2.254	0.136	1.56	66	-1.48	68	62	101.5
18	2.389	0.135	1.57	66	-1.69	68	62	100.7
19	2.525	0.136	1.55	66	-1.77	68	62	101.4
20	2.660	0.135	1.58	66	-1.71	69	62	100.7
21	2.795	0.135	1.56	66	-1.60	69	62	101.0
22	2.930	0.135	1.55	66	-1.92	69	62	101.4
23	3.065	0.135	1.55	66	-1.58	69	62	101.5
24	3.201	0.136	1.54	66	-2.00	69	62	102.1
25	3.335	0.134	1.55	66	-1.46	69	63	100.4
26	3.471	0.136	1.54	66	-1.70	69	63	101.7
27	3.605	0.134	1.55	66	-1.96	69	63	100.4
28	3.741	0.136	1.54	66	-1.44	69	63	102.0
29	3.876	0.135	1.54	66	-1.77	69	63	101.0
30	4.011	0.135	1.52	66	-1.48	69	63	100.8
31	4.146	0.135	1.60	66	-1.98	69	63	100.8
32	4.282	0.136	1.56	66	-1.48	69	63	101.3

Train C - First Hour Particulate Sampling

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Start Time: 23:03
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/7/24

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Sample Train Leak Checks
Pre-test 0 cfm @ 20.8 in. Hg
Post-Test 0 cfm @ 4.52 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
33	4.417	0.135	1.57	66	-1.63	69	63	100.3
34	4.554	0.137	1.55	66	-1.88	69	63	101.7
35	4.690	0.136	1.56	66	-1.94	69	63	101.2
36	4.826	0.136	1.57	66	-1.56	69	63	101.4
37	4.962	0.136	1.57	66	-1.61	69	63	101.6
38	5.098	0.136	1.57	66	-1.71	69	63	101.6
39	5.235	0.137	1.56	66	-1.95	69	63	101.8
40	5.371	0.136	1.58	66	-1.94	69	63	100.5
41	5.507	0.136	1.57	66	-1.62	69	63	100.6
42	5.643	0.136	1.57	66	-1.54	69	63	101.0
43	5.780	0.137	1.55	66	-1.84	69	63	101.7
44	5.916	0.136	1.57	66	-1.49	69	63	100.9
45	6.052	0.136	1.57	66	-1.60	69	63	101.2
46	6.189	0.137	1.56	66	-1.54	69	63	102.2
47	6.325	0.136	1.58	66	-1.53	69	63	101.4
48	6.461	0.136	1.57	66	-1.91	69	63	101.1
49	6.597	0.136	1.57	66	-1.48	69	63	100.9
50	6.734	0.137	1.55	66	-1.82	69	63	101.8
51	6.870	0.136	1.57	66	-1.49	69	63	101.2
52	7.006	0.136	1.57	66	-1.49	69	63	100.8
53	7.143	0.137	1.56	66	-1.74	69	63	101.3
54	7.279	0.136	1.57	66	-1.75	69	63	100.9
55	7.415	0.136	1.57	66	-1.89	69	63	101.2
56	7.551	0.136	1.57	66	-1.66	69	63	101.2
57	7.688	0.137	1.54	66	-1.52	69	63	101.6
58	7.824	0.136	1.57	66	-1.73	69	63	100.8
59	7.960	0.136	1.58	66	-1.68	69	63	101.2
60	8.096	0.136	1.57	66	-1.74	69	63	101.5

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 23:03
Total Sampling Time 168 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
Tot / Avg	**23.892**	**0.142**	**1.39**	**65.0**	**-1.88**	**367.13**	**-0.087**	**511.9**	**0.38**	**13.24**
Minimum	0.000	0.141	1.37	65	-2.10	320.00	-0.095	12.9	0.00	1.90
Max	23.892	0.144	1.41	66	-1.70	409.00	-0.079	1040.0	1.63	17.65
0	0.000		1.36	65	-1.80	364	-0.085	189.1	0.03	4.78
1	0.142	0.142	1.39	65	-1.80	383	-0.081	553.9	0.06	1.90
2	0.284	0.142	1.37	65	-1.80	361	-0.089	90.6	0.01	11.56
3	0.428	0.144	1.41	65	-1.90	366	-0.090	1040.0	0.33	14.35
4	0.571	0.143	1.41	65	-1.80	376	-0.091	1040.0	1.26	16.39
5	0.714	0.143	1.40	65	-1.90	385	-0.093	1040.0	1.13	16.44
6	0.856	0.142	1.39	65	-1.90	391	-0.093	1040.0	1.20	16.64
7	0.999	0.143	1.39	65	-1.80	396	-0.093	1040.0	1.20	16.50
8	1.141	0.142	1.38	65	-2.00	398	-0.094	1040.0	0.92	16.32
9	1.282	0.141	1.37	65	-2.00	400	-0.093	1040.0	0.94	16.24
10	1.426	0.144	1.41	65	-2.10	403	-0.094	1040.0	0.87	16.18
11	1.570	0.144	1.40	65	-2.00	404	-0.094	1040.0	0.87	16.23
12	1.713	0.143	1.40	65	-1.80	403	-0.094	1040.0	0.91	16.39
13	1.856	0.143	1.40	65	-1.90	404	-0.094	1040.0	0.98	16.45
14	1.999	0.143	1.39	65	-2.00	406	-0.094	1040.0	1.02	16.47
15	2.142	0.143	1.39	65	-1.80	405	-0.095	1040.0	0.95	16.46
16	2.285	0.143	1.39	65	-1.90	407	-0.094	1040.0	0.89	16.52
17	2.427	0.142	1.39	65	-1.90	408	-0.094	1040.0	0.97	16.65
18	2.570	0.143	1.39	65	-1.70	408	-0.094	1040.0	1.05	16.76
19	2.712	0.142	1.39	65	-2.00	407	-0.094	1040.0	1.12	16.72
20	2.854	0.142	1.38	65	-1.90	408	-0.094	1040.0	1.08	16.74
21	2.996	0.142	1.38	65	-2.00	409	-0.094	1040.0	1.12	16.92
22	3.138	0.142	1.39	65	-2.00	409	-0.094	1040.0	1.21	16.89
23	3.280	0.142	1.38	65	-2.00	408	-0.093	1040.0	1.26	16.98
24	3.422	0.142	1.39	65	-2.00	408	-0.094	1040.0	1.33	17.10
25	3.563	0.141	1.39	65	-1.90	407	-0.094	1040.0	1.49	17.22
26	3.705	0.142	1.38	65	-2.00	405	-0.093	1040.0	1.51	17.24
27	3.847	0.142	1.38	65	-1.70	405	-0.093	1040.0	1.56	17.19
28	3.989	0.142	1.38	65	-1.80	406	-0.093	1040.0	1.63	17.25
29	4.130	0.141	1.38	65	-1.70	405	-0.093	1040.0	1.54	17.40
30	4.272	0.142	1.38	65	-1.80	405	-0.093	1040.0	1.53	17.47
31	4.413	0.141	1.37	65	-1.90	406	-0.092	1040.0	1.47	17.48
32	4.555	0.142	1.37	65	-1.90	404	-0.093	1040.0	1.42	17.65

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 23:03
Total Sampling Time 168 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
33	4.698	0.143	1.40	65	-2.00	406	-0.093	1040.0	1.23	16.91
34	4.840	0.142	1.39	65	-1.80	404	-0.093	1040.0	1.21	16.53
35	4.983	0.143	1.39	65	-1.80	403	-0.093	1040.0	1.05	16.21
36	5.126	0.143	1.39	65	-2.00	400	-0.092	1040.0	1.00	16.19
37	5.268	0.142	1.39	65	-1.80	400	-0.091	1040.0	0.91	16.18
38	5.410	0.142	1.39	65	-1.90	397	-0.091	1040.0	0.75	16.08
39	5.552	0.142	1.39	65	-2.00	396	-0.091	1040.0	0.78	15.87
40	5.695	0.143	1.39	65	-1.70	393	-0.091	1040.0	0.57	16.02
41	5.837	0.142	1.39	65	-1.70	392	-0.090	1040.0	0.50	15.85
42	5.979	0.142	1.39	65	-2.00	391	-0.090	1040.0	0.47	15.71
43	6.121	0.142	1.39	65	-2.00	389	-0.090	1040.0	0.54	15.52
44	6.263	0.142	1.39	65	-2.00	388	-0.090	1040.0	0.52	15.32
45	6.406	0.143	1.38	66	-1.80	388	-0.090	1040.0	0.47	15.23
46	6.548	0.142	1.38	66	-1.70	388	-0.090	1040.0	0.56	15.13
47	6.690	0.142	1.39	66	-2.00	386	-0.090	1040.0	0.59	15.28
48	6.832	0.142	1.39	65	-1.90	387	-0.090	1040.0	0.60	15.32
49	6.974	0.142	1.39	65	-1.80	386	-0.090	1040.0	0.58	15.30
50	7.116	0.142	1.38	65	-2.00	385	-0.090	1040.0	0.62	15.18
51	7.258	0.142	1.38	65	-1.80	387	-0.090	1040.0	0.60	15.25
52	7.400	0.142	1.38	65	-1.70	386	-0.090	1040.0	0.45	15.26
53	7.542	0.142	1.38	65	-2.00	387	-0.090	1040.0	0.32	14.93
54	7.685	0.143	1.39	65	-2.00	385	-0.089	1040.0	0.34	14.56
55	7.826	0.141	1.38	65	-1.90	384	-0.089	1040.0	0.40	14.33
56	7.969	0.143	1.38	65	-1.70	382	-0.090	1040.0	0.79	14.25
57	8.110	0.141	1.38	66	-1.90	384	-0.090	1040.0	1.07	14.59
58	8.253	0.143	1.39	65	-1.80	386	-0.090	1040.0	1.06	14.53
59	8.395	0.142	1.39	65	-1.80	387	-0.090	1040.0	1.01	14.56
60	8.537	0.142	1.39	65	-2.00	387	-0.090	1040.0	0.99	14.49
61	8.679	0.142	1.39	65	-2.00	387	-0.090	1040.0	0.90	14.49
62	8.821	0.142	1.39	65	-1.90	387	-0.089	1040.0	0.95	14.50
63	8.963	0.142	1.39	65	-1.90	386	-0.089	1040.0	0.84	14.63
64	9.106	0.143	1.39	65	-1.80	386	-0.089	1040.0	0.72	14.77
65	9.248	0.142	1.38	65	-2.00	386	-0.089	1040.0	0.76	14.76
66	9.389	0.141	1.38	65	-1.80	385	-0.090	1040.0	0.85	14.78
67	9.531	0.142	1.38	65	-2.00	387	-0.090	1040.0	0.90	14.83
68	9.673	0.142	1.38	65	-2.00	386	-0.090	1040.0	0.37	15.08

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 23:03
Total Sampling Time 168 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
69	9.815	0.142	1.38	65	-2.00	384	-0.089	1040.0	0.47	15.21
70	9.957	0.142	1.38	65	-1.80	384	-0.089	1040.0	0.47	15.43
71	10.099	0.142	1.38	65	-2.00	384	-0.089	1040.0	0.41	15.60
72	10.241	0.142	1.38	65	-1.80	387	-0.091	1040.0	0.39	15.53
73	10.384	0.143	1.38	65	-1.80	387	-0.089	1040.0	0.34	15.48
74	10.525	0.141	1.39	65	-1.80	385	-0.089	1040.0	0.26	15.30
75	10.667	0.142	1.39	65	-1.90	385	-0.088	1040.0	0.15	15.26
76	10.810	0.143	1.39	65	-1.80	384	-0.089	1040.0	0.25	15.07
77	10.952	0.142	1.38	65	-1.80	384	-0.089	1040.0	0.29	15.06
78	11.093	0.141	1.39	65	-1.80	384	-0.089	1040.0	0.22	14.97
79	11.236	0.143	1.39	65	-1.70	383	-0.089	1040.0	0.16	14.73
80	11.378	0.142	1.38	65	-1.80	381	-0.089	979.4	0.10	14.51
81	11.520	0.142	1.37	65	-1.80	379	-0.089	661.1	0.07	14.28
82	11.662	0.142	1.39	65	-1.80	378	-0.088	588.3	0.06	14.13
83	11.804	0.142	1.39	65	-1.80	377	-0.087	497.3	0.05	14.03
84	11.946	0.142	1.38	65	-1.90	374	-0.087	227.9	0.02	13.97
85	12.088	0.142	1.38	65	-2.00	372	-0.087	92.5	0.01	14.06
86	12.230	0.142	1.38	65	-2.00	371	-0.088	87.7	0.01	14.10
87	12.372	0.142	1.38	65	-1.80	370	-0.087	49.5	0.01	14.13
88	12.514	0.142	1.38	65	-1.90	368	-0.087	156.3	0.02	14.06
89	12.656	0.142	1.38	65	-2.00	367	-0.087	135.6	0.01	13.49
90	12.798	0.142	1.38	65	-1.70	366	-0.087	114.2	0.01	13.32
91	12.940	0.142	1.39	65	-2.00	367	-0.087	69.6	0.01	13.23
92	13.082	0.142	1.39	65	-2.00	366	-0.086	39.4	0.00	13.07
93	13.224	0.142	1.39	65	-1.80	366	-0.086	31.7	0.00	12.98
94	13.366	0.142	1.39	65	-2.00	366	-0.086	26.8	0.00	12.96
95	13.508	0.142	1.39	65	-1.70	366	-0.085	24.8	0.00	12.94
96	13.650	0.142	1.39	65	-2.00	366	-0.086	23.2	0.00	12.82
97	13.793	0.143	1.37	65	-1.90	365	-0.085	21.9	0.00	12.66
98	13.935	0.142	1.39	65	-1.80	365	-0.085	20.0	0.00	12.64
99	14.077	0.142	1.39	65	-1.80	360	-0.085	20.0	0.00	12.48
100	14.219	0.142	1.38	65	-1.90	357	-0.085	20.0	0.00	12.33
101	14.361	0.142	1.38	65	-2.00	355	-0.085	20.9	0.00	12.30
102	14.503	0.142	1.38	65	-1.70	355	-0.085	21.3	0.00	12.21
103	14.645	0.142	1.38	65	-1.90	355	-0.084	21.3	0.00	12.14
104	14.787	0.142	1.38	65	-2.00	354	-0.084	22.6	0.00	12.01

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 23:03
Total Sampling Time 168 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
105	14.929	0.142	1.39	65	-1.80	353	-0.084	23.9	0.00	11.80
106	15.071	0.142	1.38	65	-1.80	352	-0.084	23.6	0.00	11.77
107	15.213	0.142	1.38	65	-2.00	352	-0.084	23.9	0.00	11.75
108	15.355	0.142	1.38	65	-1.70	351	-0.084	20.6	0.00	11.63
109	15.497	0.142	1.39	65	-2.00	349	-0.084	19.0	0.00	11.62
110	15.640	0.143	1.39	65	-1.70	348	-0.083	18.1	0.00	11.53
111	15.782	0.142	1.39	65	-2.00	347	-0.083	19.3	0.00	11.60
112	15.923	0.141	1.39	65	-2.00	350	-0.083	20.6	0.00	11.57
113	16.066	0.143	1.39	65	-1.80	348	-0.083	20.9	0.00	11.56
114	16.208	0.142	1.39	65	-1.80	349	-0.083	21.9	0.00	11.64
115	16.351	0.143	1.39	65	-2.00	348	-0.083	21.6	0.00	11.72
116	16.493	0.142	1.39	65	-1.80	348	-0.084	23.2	0.00	11.79
117	16.635	0.142	1.39	65	-1.90	348	-0.083	25.5	0.00	11.85
118	16.777	0.142	1.39	65	-1.80	348	-0.083	24.5	0.00	11.80
119	16.919	0.142	1.38	65	-1.90	347	-0.083	22.3	0.00	11.86
120	17.061	0.142	1.38	65	-1.80	345	-0.083	21.6	0.00	11.86
121	17.204	0.143	1.38	65	-1.80	344	-0.083	22.3	0.00	11.82
122	17.346	0.142	1.38	65	-1.90	343	-0.084	22.6	0.00	11.76
123	17.488	0.142	1.38	65	-2.00	344	-0.084	21.3	0.00	11.98
124	17.630	0.142	1.39	65	-2.00	344	-0.084	27.4	0.00	11.70
125	17.773	0.143	1.39	65	-1.70	343	-0.084	27.8	0.00	11.86
126	17.915	0.142	1.38	65	-1.80	343	-0.084	25.8	0.00	12.00
127	18.057	0.142	1.38	65	-1.80	343	-0.084	27.4	0.00	12.09
128	18.199	0.142	1.39	65	-1.90	342	-0.083	29.4	0.00	12.14
129	18.342	0.143	1.39	65	-1.90	343	-0.084	31.0	0.00	12.25
130	18.484	0.142	1.39	65	-2.00	343	-0.083	28.4	0.00	12.14
131	18.627	0.143	1.39	65	-1.90	342	-0.083	29.4	0.00	11.94
132	18.768	0.141	1.39	65	-1.90	342	-0.083	30.7	0.00	11.75
133	18.911	0.143	1.39	65	-2.00	342	-0.083	30.7	0.00	11.22
134	19.053	0.142	1.40	65	-1.70	342	-0.083	30.4	0.00	10.99
135	19.196	0.143	1.40	65	-2.00	340	-0.082	21.6	0.00	11.29
136	19.338	0.142	1.39	65	-1.70	337	-0.083	20.3	0.00	10.98
137	19.481	0.143	1.39	65	-2.00	335	-0.082	12.9	0.00	9.59
138	19.623	0.142	1.39	65	-2.00	333	-0.082	14.1	0.00	9.46
139	19.765	0.142	1.39	65	-2.00	331	-0.082	15.4	0.00	9.51
140	19.907	0.142	1.39	65	-1.80	330	-0.081	16.4	0.00	9.61

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/7/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 23:03
Total Sampling Time 168 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
141	20.049	0.142	1.38	65	-1.90	330	-0.081	16.4	0.00	9.64
142	20.192	0.143	1.39	65	-2.00	329	-0.081	19.3	0.00	9.71
143	20.334	0.142	1.39	65	-1.70	327	-0.081	20.3	0.00	9.92
144	20.476	0.142	1.39	65	-1.90	327	-0.081	22.6	0.00	9.90
145	20.618	0.142	1.39	65	-2.00	326	-0.081	24.8	0.00	9.81
146	20.761	0.143	1.39	65	-1.80	326	-0.082	26.1	0.00	9.81
147	20.903	0.142	1.39	65	-2.00	326	-0.081	26.2	0.00	8.91
148	21.045	0.142	1.38	65	-2.00	325	-0.081	27.1	0.00	8.91
149	21.188	0.143	1.38	65	-1.90	324	-0.080	27.8	0.00	8.94
150	21.330	0.142	1.40	65	-2.00	323	-0.081	29.1	0.00	9.07
151	21.473	0.143	1.39	65	-1.80	323	-0.080	29.4	0.00	9.00
152	21.615	0.142	1.40	65	-1.80	325	-0.080	29.4	0.00	9.14
153	21.757	0.142	1.39	65	-2.00	326	-0.080	31.0	0.00	9.40
154	21.899	0.142	1.39	65	-2.00	326	-0.080	30.3	0.00	9.45
155	22.042	0.143	1.39	65	-2.00	326	-0.079	30.7	0.00	9.51
156	22.184	0.142	1.40	65	-1.80	326	-0.081	30.3	0.00	9.51
157	22.327	0.143	1.38	65	-1.90	324	-0.080	31.0	0.00	9.53
158	22.469	0.142	1.39	65	-1.90	324	-0.080	29.7	0.00	9.36
159	22.612	0.143	1.39	65	-1.80	323	-0.080	30.0	0.00	9.19
160	22.754	0.142	1.39	65	-2.00	323	-0.080	28.1	0.00	8.83
161	22.896	0.142	1.39	65	-1.90	322	-0.080	28.8	0.00	8.67
162	23.038	0.142	1.39	65	-1.90	321	-0.080	29.7	0.00	8.67
163	23.181	0.143	1.39	65	-1.80	322	-0.080	29.4	0.00	8.73
164	23.323	0.142	1.39	65	-1.70	320	-0.079	29.7	0.00	8.71
165	23.465	0.142	1.39	65	-1.70	320	-0.079	29.7	0.00	8.69
166	23.608	0.143	1.39	65	-1.90	320	-0.080	30.3	0.00	8.74
167	23.750	0.142	1.39	65	-1.80	320	-0.080	30.3	0.00	8.75
168	23.892	0.142	1.40	65	-2.00	321	-0.079	32.9	0.00	8.98

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Tracking No.:	BK30.2
Project No.:	0142WS021E
Run No.:	6
Test Date:	3/7/24

OMNI Eq. ID Numbers	
Analytical Scale	
Audit Weight Set:	
Analytical Scale	
Hydrometer	
Filters are weighed	In Pairs

Train A

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/08/24 @ 2:09	Filter	F266	242.8	238.8	4.0	4.0
Probe catch*	3/08/24 @ 2:09	Probe	53	118273.9	118273.0	0.9	0.9
ilter seals catch*	3/08/24 @ 2:09	Seals	S683	3415.8	3415.0	0.8	0.8
				Total Particulate, mg:		**5.7**	**5.7**

Train B

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/08/24 @ 2:09	Filter	F265	242.7	238.9	3.8	3.8
Probe catch*	3/08/24 @ 2:09	Probe	72	115951.2	115949.4	1.8	1.8
ilter seals catch*	3/08/24 @ 2:09	Seals	S698	3414.6	3413.9	0.7	0.7
			Sub-Total	Total Particulate, mg:		**6.3**	**6.3**

Train C - *First Hour*

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/08/24 @ 2:09	Filter	F264	240.9	238.6	2.3	2.3
Probe catch*	3/08/24 @ 2:09	Probe	76	116968.2	116967.0	1.2	1.2
ilter seals catch*	3/08/24 @ 2:09	Seals	S686	4164.2	4162.1	2.1	2.1
				Total Particulate, mg:		**5.6**	**5.6**

Train D - *Ambient Background*

Sample Component	Date / Time in Dessicator	Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*	3/08/24 @ 2:09	Filter	F233	121.7	121.7	0.0
				Total Particulate, mg:		**0.0**

Final (mg) - Tare (mg) = Particulate (mg)

NOTE: The Uncorrected values are those where any negative filter weights are taken as a negative value. This can possibly occur when filter matter adheres the O-ring seals and thereby transfers some mass to the O-ring. The Corrected values reflect where any negative filter weights are taken as ZERO, thus not accounting for any transfer of mass and resultingly over-reporting. Corrected values were added to this analysis to report the "Corrected" results in this report in response to a request by the US EPA. In cases where the Final weight minus the Tare weight of the Ambient filter occurs, it is taken as a ZERO. Any negative probe weights are evaluated pursuant to clause of ASTM E25215 (or appropriatelt associated test standard as defined in the introduction of this report).

Technician Signature:_____ Reviewed By:_____

Run 6 - Run Notes

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	6
Test Date:	3/7/2024

This supplemental section of miscellaneous run notes is comprised of the following:

- Appliance Operation Notes
- Velocity Traverse / Supplementa Run Notes
- Test Fuel Notes
- Gravimetric Analysis Notes

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client :Valley Comfort Project Number: 0142WS021E Run Number: 6

Model: AF30.2 Tracking Number: 2254 Date: 3-07-24

Test Crew: K. Morgan

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary: Full open (0°)

Secondary: N/A

Tertiary/Pilot: N/A

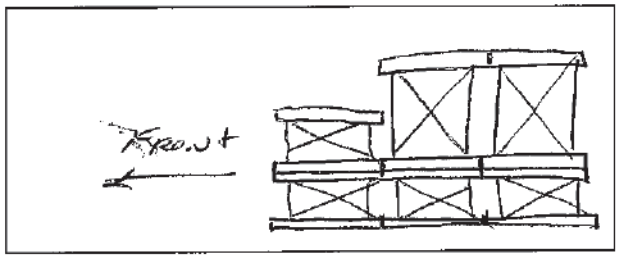
Fan: ON - High

Preburn Notes

Time	Notes
0	Started when Pre-burn loaded
29	0.1 lb. added due to flue gas probe insertion

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: open for loading, closed when door closed

Fuel loaded by: 60

Door closed at: 60

Primary air: Full open Duration of test (No adjustments)

Notes:

Time	Notes
23:03 0	START test
03/08/24 1:51	Test completed

Technician Signature: K. Morgan Date: 3/7/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client :Valley Comfort Project Number: 0142WS021E Run Number: 6

Model: AF30.2 Tracking Number: 2254 Date: 3/7/24

Test Crew: K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 23:03 3/1/24

Stop Time: 1:51 3/8/24 2 hr, 48 min

Booth #:

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Sample Train Leak Check:

PRE TEST

A: .002 @16.81 "Hg

B: .001 @17.7 "Hg

1st hr Ø @20.8

Post-TEST

A .001 " @ 6.54

B Ø @ 5.46

1st hr Ø @ 4.52

Calibrations: Span Gas CO_2: CO:

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	21:43	21:46	1:58	2:01
CO_2	0.00	16.86	0.00	16.87
CO %	0.00	4.38	0.00	4.39
CO ppm	0.0	502.8	1.9	508

Air Velocity (ft/min): Initial: 6 Final: 8

Scale Audit (lbs): Initial: 20.0 Final: 20.0

Pitot Tube Leak Test: Initial: good Final: good

Stack Diameter (in): 6.0

Induced Draft: Ø

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: Initials:

	Initial	Middle	Ending
P_b (in/Hg)	30.26		30.27
RH (%)	29		31
Ambient (°F)	66		65

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
~~.067~~ .047	~~0.134~~ .094	97
.058	0.116	97
.066	0.132	97
.043	0.086	97
.044	0.088	97
.066	0.132	97
.058	0.116	96
.042	0.084	96
Center:		
0.083	~~1.66~~ .166	98

Background Filter Volume:

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.5	-0.5

Technician Signature: K. Morgan Date: 3/7/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client :Valley Comfort Project Number: 0142WS021E Run Number: 6

Model: AF30.2 Tracking Number: 2254 Date: 3/7/24

Test Crew: K. Morgan

OMNI Equipment ID numbers:

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

19.5 lb,

Calibration: Cal Value (1) = 12% Actual Reading 12.0

Cal Value (2) = 22% Actual Reading 22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16.75 in	23.8	7	16.75 in	23.8
2	16.75 in	21.9	8	16.75 in	23.3
3	16.75 in	24.8	9	16.75 in	22.8
4	16.75 in	22.0	10	16.75 in	20.5
5	16.75 in	23.8	11	in	
6	16.75 in	22.8	12	in	

Total Pre-Burn Fuel Weight: 19.5 lb Pre-Burn Fuel Average Moisture: 22.95 % db

Time (clock): 7:55 pm Room Temperature (F): 69 Initials: K

Test Fuel

Firebox Volume (ft³): ~~2.94~~ 2.894 K Test Fuel Piece Length (in): 16.75

Load Weight Range (lb): ~~18.4 - 22.4~~ K Total Wet Fuel Load Weight (lb): 18.5

3.7 - 4.6

Fuel Type & Amount: 2 x 4: 4 4 x 4: 2

Weight (with spacers): 9.3 Weight (with spacers): 9.2

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	1.8 / 2.3	21.6	24.2	22.5	2x4
2	2.0 / 2.4	23.0	20.5	20.4	2x4
3	1.7 / 2.2	22.6	22.2	23.8	2x4
4	4.3 / 4.8	20.3	22.7	22.2	~~2x4~~ 4x4
5	4.0 / 4.5	20.3	20.4	19.2	4x4
6					~~4x4~~ K
7	1.7 / ~~2.2~~ 2.3 K	24.7	23.3	22.1	2x4

Spacer Moisture Readings (%DB)

18.5	20.3	19.0	15.3	18.8	24.6	23.8	20.0
18.3	17.1	19.1	23.1	16.1	21.5	15.1	19.4
23.8	17.0	19.9	16.6	~~24.3~~ 14	~~22.5~~ K	~~2~~ K	
15.0	17.6	19.3	15.1				

Time (clock): 22:19 Room Temperature (F): 70 Initials: K

Technician Signature: K. J. Morgan Date: 3/7/24

2,47 @ 3.80 / 3.81
9.79 / 9.79

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client : Valley Comfort Project Number: 0142WS021E Run Number: 6

Model: AF30.2 Tracking Number: 2254 Date: 3/7/24

Test Crew: K. Morgan, ~~T. Foote~~

OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: K. MORGAN

Date/Time in Dessicator: 3/8/24 2:09

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/11/24 9:25	3/11/24 18:25			
R/H %:	29	33			
Temp:	65	67			
200 mg Audit:	200.0	200.0			
2 g Audit:	2000.2	2000.3			
100 g Audit:	99997.7	99997.9			
Initials:	IK	IK			

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	√ Front Filter	F264	238.6	240.9	240.9			
	Rear Filter	F264A						
	√ Probe	76	116967.0	116968.3	116968.2			
	√ O-Ring Set	S686	4162.1	4164.2	4164.2			
A (Remainder)	√ Front Filter	F266	238.8	242.7	242.8			
	Rear Filter	F266A						
	√ Probe	53	118273.0	118273.8	118273.9			
	√ O-Ring Set	S683	3415.0	3415.7	3415.8			
B	√ Front Filter	F265	238.9	242.7	242.7			
	Rear Filter	F265A						
	√ Probe	72	115949.4	115951.2	115951.2			
	√ O-Ring Set	S698	3413.9	3414.5	3414.6			
BG	√ Filter	F233	121.7	121.7	121.7			

Technician Signature: K. Morgan Date: 3/11/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	6

Sample calculations of each equation used in the refernced standards for this test run.

Summary of INPUT values necessary for calculations

	Global Input Parameters for Equations	Value	Source
FM_S	- Average moisture of test fuel spacers, % dry basis	18.93	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	3	Fuel Properties Work Sheet
M_{CPnwb}	- Weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis , kg	[1]Varies	Fuel Properties Work Sheet
FM_{CPn}	- Average fuel Fuel moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.441	Fuel Properties Work Sheet
V_{SCENT}	- Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse, ft/sec	0.00	Traverse Worksheet
V_{STRAV}	- Average gas velocity calculated after the multipoint Pitot traverse	17.46	Traverse Worksheet
θ	- Duration of test, min	168	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.27	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.5	*Traverse Worksheet*

[1] *Denotes that this pararmeter for each individual piece of fuel is calculated in the Test Fuel Properties worksheet and the input values are pulled into these sample caculations.*

	Sample Train Input Parameters for Equations	Train A	Train B	Train C	Train D
V_m	- Volume of gas sample measured at the dry gas meter, dcf	22.562	23.383	8.096	23.892
Y	Dry gas meter calibration factor	1.016	1.011	1.015	1.011
ΔH	- Average pressure differential across the orifice meter, in. H_2O	0.88	0.68	1.56	1.39
T_m	- Temperature of Dry Gas Meter, °F	74.9	75.9	65.8	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.9	1.8	1.2	n/a
m_f	- mass of particulate matter from filters, mg	4.0	3.8	2.3	0.0
m_g	- mass of particulate matter from filter seals, mg	0.8	0.7	2.1	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.9	1.8	1.2	n/a
m_f	- mass of particulate matter from filters, mg	4.0	3.8	2.3	n/a
m_g	- mass of particulate matter from filter seals, mg	0.8	0.7	2.1	n/a

M_{Sdb} – Weight of test fuel spacers, dry basis, kg - ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})\left(\frac{100}{100 + FM_S}\right)$$

Where,

FM_S = average moisture of test fuel spacers, % dry basis
M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 18.93 %, dry basis
M_{Swb} = 3 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((3 x 0.4536) (100 / (100 + 18.93))

M_{Sdb} = **1.144** kg

MCdb– Weight of test fuel crib, excluding nails and spacers, dry basis, kg - ASTM E2780 equation (2)

$$M_{Cdb} = \sum (M_{CPnwb})\left(\frac{100}{100 + FM_{CPn}}\right)$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation:

ΣM_{CPnwb} = 15.5 lb.
FM_{CPn} = 22.00 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 15.5 x 0.4536 x (100 / (100 + 22))

M_{Cdb} = **5.76** kg

DCdb - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft3 - ASTM E2780 equation (3)

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

Where,

V_C = Volume of Fuel Crib, ft^3 (less spacers)

Sample Calculation:

M_{Cdb} = 12.71 lb
V_C = 0.441 ft^3

D_{Cdb} = 12.71 / 0.441

D_{Cdb} = **28.81** lb/ft^3

M_{FTAdb} - Total weight of fuel crib including spacers and nails, dry basis - ASTM E2780 equation (4)

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

Sample Calculation:

M_{Sdb} = 1.144
M_{Cdb} = 5.76

M_{FTAdb} = 1.144 + 5.76

M_{FTAdb} = **6.91** kg

BR – dry burn rate, kg/hr - ASTM E2780 equation (5)

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

Sample Calculation:

M_{FTAdb} = 6.907
θ = 168

BR = (60 x 6.907) / 168

BR = **2.47** kg / hr

***Vs* – Average gas velocity in the dilution tunnel, ft/sec -** ASTM E2515 equation (9)

$$V_S = F_P \times K_P \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where

F_P = Adjustment factor for center of tunnel pitot tube placement, where $F_P = V_{STRAV} / V_{SCENT}$

V_{SCENT} = Dilution tunnel velocity, at the center, ft/sec

V_{STRAV} = Dilution tunnel velocity, multi-point pitot traverse, ft/sec

K_P = Pitot tube constant, 85.49

C_P = Pitot tube coefficient: 0.99, unitless

$\Delta P^{1/2}_{AVG}$ = Velocity pressure in the dilution tunnel, in H_2O

$T_{S\,(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R

P_S = Absolute average gas static pressure in tunnel, = Pbar + Pg , where
Pbar = Barometric Pressure, in. Hg,
Pg = Static pressure in tunnel, Hg (in H_2O / 13.6)

M_S = The dilution tunnel wet molecular weight; Ms = 28.78 assuming a dry weight of 29 lb/lb-mole

(Duration of Test)

F_P = 0.7950
$\Delta P^{1/2}_{AVG}$ = 0.4107
$T_{S\,(avg)}$ = 548.8994
Pbar = 30.2650
Pg = -0.5000
Ps = 30.2282

V_S = 0.795 x 85.49 x 0.99 x 0.411 x √ [(549 / (30.23 x 28.78)]
V_S = **21.948** ft/sec

(First Hour of Test)

F_P = 0.7950
$\Delta P^{1/2}_{AVG}$ = 0.4089
$T_{S\,(avg)}$ = 554.1967
Pbar = 30.2600
Pg = -0.5000
Ps = 30.2232

V_S = 0.795 x 85.49 x 0.99 x 0.409 x √ [(554 / (30.22 x 28.78)]
V_S = **21.961** ft/sec

Q_{std} – Average gas flow rate in dilution tunnel, dscf/hr - ASTM E2515 equation (3)

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

Where:

3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
A = Cross sectional area of dilution tunnel, ft2
T_{std} = solute temperature, 528 °R
P_s = Absolute average gas static pressure in dilution tunnel, = Pbar + Pg , in Hg
$T_{s(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std} = Standard absolute pressure, 29.92 in Hg

(Duration of Test):

B_{ws} = 0.02
A = 0.19635
P_s = 30.23
$T_{s(avg)}$ = 549
Vs = 21.95

Qstd = 3600 x (1 - 0.02) x 21.948 x 0.19635 x (528 / 549) x (30.23 / 29.92)

Qstd = **14775.6** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 30.22
$T_{s(avg)}$ = 554
Vs = 21.961

Qstd = 3600 x (1 - 0.02) x 21.961 x 0.1963 x (528 / 554) x (30.22 / 29.92)

Qstd = **14640.8** dscf/hr

Vm(std) – Volume of Gas Sampled (Corrected), 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
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Train A

$$V_{m(std)} = 17.64 \times 22.562 \times 1.016 \times \frac{\left(30.27 + \frac{0.88}{13.6}\right)}{(74.9 + 460)}$$

$V_{m(std)}$ = **22.928** dscf

Train B

$$V_{m(std)} = 17.64 \times 23.383 \times 1.011 \times \frac{\left(30.27 + \frac{0.68}{13.6}\right)}{(76 + 460)}$$

$V_{m(std)}$ = **23.591** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 8.10 \times 1.015 \times \frac{\left(\underline{30.26} + \frac{1.56}{13.6}\right)}{(65.8 + 460)}$$

$V_{m(std)}$ = **8.374** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 23.89 \times 1.011 \times \frac{\left(\underline{30.27} + \frac{1.39}{13.6}\right)}{(79.0 + 460)}$$

$V_{m(std)}$ = **24.006** dscf

mn – 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 Calculations (Uncorrected):

Train A

m_n = 0.9 + 4.0 + 0.8

m_n = **5.7** mg

Train B

m_n = 1.8 + 3.8 + 0.7

m_n = **6.3** mg

Train C (1st hour)

m_n = 1.2 + 2.3 + 2.1

m_n = **5.6** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 0.9 + 4.0 + 0.8

m_n = **5.7** mg

Train B

m_n = 1.8 + 3.8 + 0.7

m_n = **6.3** mg

Train C (1st hour)

m_n = 1.2 + 2.3 + 2.1

m_n = **5.6** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions

g/dscf - ASTM E2515 equation (13)

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

Where:

K_2 = Constant, 0.001 g/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample Calculations (Uncorrected):

Train A

$$C_s = 0.001 \times \frac{5.7}{22.93}$$

C_s = **0.000249** g/dscf

Train B

$$C_s = 0.001 \times \frac{6.3}{23.59}$$

C_s = **0.0002670** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{5.6}{8.37}$$

Cs = **0.000669** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{24.01}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{5.7}{22.93}$$

C_s = **0.000249** g/dscf

Train B

$$C_s = 0.001 \times \frac{6.3}{23.59}$$

C_s = **0.0002670** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{5.6}{8.37}$$

Cs = **0.000669** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{24.01}$$

C_r = **0.000000** g/dscf

ET – Total Particulate Emissions, g - ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculations (uncorrected)

Train A

E_T = (0.000249 - 0.000000) x 14775.6 x 168 / 60

E_T = **10.29** g

Train B

E_T = (0.000267 - 0.000000) x 14775.6 x 168 / 60

E_T = **11.05** g

First Hour

E_T = (0.000669 - 0.000000) x 14640.8 x 60 / 60

E_T = 9.79 g

Trains A and B Average

E = **10.67** g

Sample calculations (Corrected)

Train A

E_T = (0.000249 - 0.000000) x 14775.6 x 168 / 60

E_T = **10.29** g

Train B

E_T = (0.000267 - 0.000000) x 14775.6 x 168 / 60

E_T = **11.05** g

First Hour

E_T = (0.000669 - 0.000000) x 14640.8 x 60 / 60

E_T = **9.79** g

Trains A and B Average

E_T = **10.67** g

PM_R – Particulate emissions for test run, g/hr - ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation (Uncorrected)

Train A

E_T = 10.29 g

θ = 168 min

PM_R = 60 x (10.29 / 168)

PM_R = **3.67** g/hr

Train B

E_T = 11.05 g

θ = 168 min

PM_R = 60 x (11.05 / 168)

PM_R = **3.95** g/hr

A and B Average

E_T = **3.81** g/hr

First Hour

E_T = 9.79 g

θ = 60 min

PM_R = 60 x (9.79 / 60)

PM_R = **9.79** g/hr

Sample Calculation (Corrected)

Train A

E_T = 10.29 g

θ = 168 min

PM_R = 60 x (10.29 / 168)

PM_R = **3.67** g/hr

Train B

E_T = 11.05 g

θ = 168 min

PM_R = 60 x (11.05 / 168)

PM_R = **3.95** g/hr

A and B Average

E_T = **3.81** g

First Hour

E_T = 9.79 g

θ = 60 min

PM_R = 60 x (9.79 / 60)

PM_R = **9.79** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned - ASTM E2780 equation (7)

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

Sample Calculation (Uncorrected)

Train A

E_T = 10.29 g
M_{FTAdb} = 6.91 kg
PM_F = 10.29 / 6.91
PM_F = **1.49** g/kg

Train B

E_T = 11.05 g
M_{FTAdb} = 6.91 kg
PM_F = 11.05 / 6.91
PM_F = **1.60** g/kg

Sample Calculation (Corrected)

Train A

E_T = 10.29 g
M_{FTAdb} = 6.91 kg
PM_F = 10.29 / 6.91
PM_F = **1.49** g/kg

Train B

E_T = 11.05 g
M_{FTAdb} = 6.91 kg
PM_F = 11.05 / 6.91
PM_F = **1.60** g/kg

PR - Proportional Rate Variation - ASTM E2515 equation (16)

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

Where:			Train A	Train B	Train C
θ	=	Total sampling time, min	168	168	60
θ_i	=	Length of recording interval, min	1	1	1
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.134	0.136	0.134
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	22.562	23.383	8.096
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	22.260	22.260	22.260
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	21.950	21.950	21.967
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	530.0	531.0	525.0
T_m	=	Absolute average dry gas meter temperature, ^oR	534.9	535.9	525.8
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	572.5	572.5	572.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	548.9	548.9	554.2

NOTE: These sample calculations are for the Second interval of each train)

Train A PR = $\left(\frac{168 \text{ x } 0.134 \text{ x } 21.95 \text{ x } 535 \text{ x } 573}{1 \text{ x } 22.562 \text{ x } 22.26 \text{ x } 530 \text{ x } 549}\right)$ X 100 = 103.6 %

Train B PR = $\left(\frac{168 \text{ x } 0.136 \text{ x } 21.95 \text{ x } 536 \text{ x } 573}{1 \text{ x } 23.383 \text{ x } 22.26 \text{ x } 531 \text{ x } 549}\right)$ X 100 = 101.4 %

Train B PR = $\left(\frac{60 \text{ x } 0.134 \text{ x } 21.967 \text{ x } 526 \text{ x } 573}{1 \text{ x } 8.096 \text{ x } 22.26 \text{ x } 525 \text{ x } 554}\right)$ X 100 = 101.4 %

Run 7 Test Data

Test Date:	3/8/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	Ashford 30.2

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Project No.: 0142WS021E
Tracking No.: BK30.2
Run: 7
Test Date: 03/08/24

Burn-Rate Result

1.08 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	2.80	2.80	1.31	1.31
Emission Rate, g/hr	**0.43**	0.43	**1.31**	1.31
Emissions Factor, g/kg	0.39	0.39	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		80.0	76.9
Average Tunnel Gas Velocity (vs), feet/second		17.321	17.285
Average Tunnel Gas Flow Rate(Qsd)	DSCF/hr	11789.3	11810.2
	DSCF/min	196.5	196.8
Average Delta p, in. H2O		0.107	0.107
Tunnel Static Pressure, in. H2O		-0.350	-0.350
Total Time of Test, Min		60	394

Particulate Sample Measurement Parameters

	Uncorrected				*Corrected*			
	AMBIENT	Train A	Train B	First Hour	AMBIENT	Train A	Train B	First Hour
Total Sample Volume (V_m), ft^3	62.797	63.351	63.664	9.622	62.797	63.351	63.664	9.622
Average Gas Meter Temperature, °F	79	77	77	65	79	77	77	65
Total Sample Volume (V_{mstd}), DSCF	62.665	63.742	63.685	9.931	62.665	63.742	63.685	9.931
Total Particulates (mn), mg - m_n	0.0	2.2	2.4	1.1	0.0	2.2	2.4	1.1
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00003	0.00004	0.00011	0.00000	0.00003	0.00004	0.00011
Total Particulate Emissions (ET), grams	n/a	2.68	2.92	1.31	n/a	2.68	2.92	1.31
Particulate Emission Rate, g/hr	n/a	0.41	0.45	1.31	n/a	0.41	0.45	1.31
Emissions Factor, g/kg	n/a	0.38	0.41	n/a	n/a	0.38	0.41	n/a
Difference, ET from from Average ET, grams	n/a	-0.12	0.12	n/a	n/a	-0.12	0.12	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	67	67	67	✓
Filter Face Velocity, fpm	< 30	8.78	8.73	8.73	✓
Dryer Exit Temperature, °F	< 80	62	48	50	✓
Tunnel Velocity, fpm	>800	1,039	1,037		✓
First Hour Leakage	0.006	0.000			✓
Train A Leakage Rate	0.006		0.000		✓
Train B Leakage Rate	0.006			0.000	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.1	0.3	0.2	✓
Pro-Rate Variation	< 90 for < 10% of θ	1.67%	0.00%	0.00%	✓
	> 110 for < 10% of θ	0.00%	0.000%	0.00%	✓
	# Readings < 80%	0	0	0	✓
	# Readings > 120%	0	0	0	✓
Ambient Temp, °F	> 55		65		✓
Ambient Temp, °F	< 90		69		✓
Trains A and B Precision	(*A*) < 7.5%		4.39%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.03		✓
Stove Surface ΔT	<= 125 °F		27		✓
Room Air Velocity	< 50 fpm		16		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	7
Test Date:	3/8/2024

Efficiency results reported herein are based on a stack-loss method in accordance with CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance". OMNI uses the spreadsheet provided by CSA that is to be used in conjunction with the current version of the test standard. The most recent version of the software is version 2.4, dated April 15, 2010. OMNI received confirmation from CSA on October 18, 2023 that this is the current version of the software.

Stack Loss Efficiency

Manufacturer: Valley Comfort
Model: AF30.2
Date: 03/08/24
Run: 7
Control #: 2254
Test Duration: 394
Output Category: II

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	81.1%	87.7%
Combustion Efficiency	95.8%	95.8%
Heat Transfer Efficiency	85%	91.5%

Output Rate (kJ/h)	17,403	16,508	**(Btu/h)**
Burn Rate (kg/h)	1.08	2.39	**(lb/h)**
Input (kJ/h)	21,454	20,351	**(Btu/h)**

Test Load Weight (dry kg)	7.11	15.67	**dry lb**
MC wet (%)	17.07		
MC dry (%)	20.58		
Particulate (g)	2.8		
CO (g)	417		
Test Duration (h)	6.57		

Emissions	**Particulate**	**CO**
g/MJ Output	0.02	3.64
g/kg Dry Fuel	0.39	58.57
g/h	0.43	63.43
lb/MM Btu Output	0.06	8.47

Air/Fuel Ratio (A/F)	8.05

VERSION: **2.4** **4/15/2010**

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	AF30.2				
Date:	3/8/2024		**Temp. Units**	F	(F or C)
Run:	7		**Weight Units**	lb	(kg or lb)
Control #:	2254				
Test Duration:	394				
Output Category:	II		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.07		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	18.90		**%C**	48.73	
Burn Rate (dry kg/h):	1.08		**%H**	6.87	
Total Particulate Emissions:	2.8 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.62**	**13.61**	**#DIV/0!**	**197.48**	**67.47**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	18.90	0.24	2.08		200.0	66.0
1	18.70	0.13	0.66		212.0	66.0
2	18.70	0.08	6.86		201.0	66.0
3	18.60	0.00	8.44		196.0	66.0
4	18.50	0.00	8.96		195.0	66.0
5	18.50	0.00	11.46		199.0	66.0
6	18.40	0.00	11.58		202.0	66.0
7	18.30	0.00	11.64		205.0	66.0
8	18.20	0.00	12.42		210.0	66.0
9	18.10	0.00	13.09		217.0	66.0
10	18.00	0.00	12.43		223.0	66.0
11	17.90	0.00	11.78		227.0	65.0
12	17.80	0.00	13.22		231.0	66.0
13	17.70	0.00	14.09		236.0	66.0
14	17.60	0.00	12.75		243.0	66.0
15	17.50	0.00	11.97		244.0	66.0
16	17.40	0.00	12.15		246.0	66.0
17	17.30	0.00	12.21		247.0	66.0
18	17.20	0.00	12.07		249.0	66.0
19	17.10	0.00	12.52		250.0	66.0
20	17.00	0.00	13.54		252.0	66.0
21	16.80	0.00	12.98		254.0	66.0
22	16.70	0.00	12.78		257.0	66.0
23	16.60	0.00	13.34		260.0	66.0
24	16.50	0.00	13.73		260.0	66.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	16.40	0.00	14.11		264.0	66.0
26	16.20	0.00	14.96		266.0	66.0
27	16.10	0.01	15.32		269.0	66.0
28	16.00	0.02	15.43		270.0	66.0
29	15.90	0.02	15.51		273.0	66.0
30	15.70	0.03	15.77		273.0	66.0
31	15.60	0.03	15.84		275.0	66.0
32	15.50	0.06	14.83		273.0	66.0
33	15.40	0.00	14.39		274.0	66.0
34	15.30	0.00	15.02		274.0	66.0
35	15.20	0.00	16.05		273.0	66.0
36	15.00	0.09	16.81		274.0	66.0
37	14.90	0.42	17.24		272.0	66.0
38	14.80	0.81	17.18		270.0	66.0
39	14.70	1.05	17.13		268.0	66.0
40	14.60	0.88	17.02		268.0	66.0
41	14.40	0.62	17.07		265.0	66.0
42	14.30	0.52	16.72		261.0	66.0
43	14.20	0.52	16.81		259.0	66.0
44	14.10	0.53	16.75		256.0	66.0
45	14.00	0.57	16.48		253.0	66.0
46	13.90	0.59	16.39		251.0	66.0
47	13.80	0.63	16.31		248.0	66.0
48	13.70	0.69	16.22		248.0	67.0
49	13.60	0.98	16.07		246	67
50	13.50	2.99	15.38		244	67
51	13.40	2.6	15.56		242	66
52	13.30	2.81	15.35		239	67
53	13.20	2.33	15.42		235	67
54	13.10	1.42	15.62		231	67
55	13.10	1.45	15.26		228	67
56	13.00	1.36	15		225	67
57	12.90	1.32	14.83		222	67
58	12.90	1.24	14.82		220	67
59	12.80	1.32	14.93		217	67
60	12.70	1.21	14.72		215	67
61	12.60	1.44	14.79		214	67
62	12.60	1.54	14.91		211	67
63	12.50	1.68	14.63		209	67
64	12.40	1.85	14.69		209	67
65	12.30	2.1	14.68		208	67

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	12.20	2.46	14.59		208	67
67	12.20	3.05	14.33		207	67
68	12.10	3.24	14.35		207	67
69	12.00	3.06	14.32		207	67
70	12.00	2.71	14.54		206	67
71	11.90	2.56	14.45		205	67
72	11.80	2.73	14.44		205	67
73	11.70	2.86	14.72		204	67
74	11.70	2.77	14.41		204	67
75	11.60	2.78	14.35		204	67
76	11.50	2.82	14.47		203	67
77	11.50	2.84	14.63		203	67
78	11.40	2.65	14.63		203	67
79	11.30	2.64	14.8		203	67
80	11.30	2.39	14.79		204	67
81	11.20	2.42	14.71		204	67
82	11.10	2.61	14.64		205	67
83	11.00	2.72	14.51		206	67
84	11.00	2.89	14.75		207	67
85	10.90	2.98	14.8		208	67
86	10.80	3.05	14.65		209	67
87	10.70	3.23	14.74		209	67
88	10.70	3.22	14.63		209	67
89	10.60	3.21	14.77		209	67
90	10.50	3.43	14.88		211	67
91	10.40	3.38	14.76		211	67
92	10.40	3.51	14.81		211	67
93	10.30	3.43	14.71		212	67
94	10.20	3.43	14.69		212	67
95	10.10	3.38	14.67		212	67
96	10.10	3.25	14.51		210	67
97	10.00	3.16	14.59		210	67
98	9.90	3.11	14.65		211	67
99	9.90	2.94	14.77		211	67
100	9.80	2.79	14.59		210	67
101	9.70	2.75	14.85		211	67
102	9.60	2.66	15.05		210	67
103	9.60	2.51	14.7		210	67
104	9.50	2.38	14.87		210	67
105	9.40	2.26	15		212	67
106	9.40	1.66	14.97		210	67

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	9.30	1.84	14.99		210	67
108	9.30	1.77	14.97		210	67
109	9.20	1.72	15.19		210	67
110	9.10	1.64	15.31		209	67
111	9.10	1.56	15.28		208	67
112	9.00	1.5	15.35		209	67
113	8.90	1.39	15.48		209	67
114	8.90	1.3	15.13		209	67
115	8.80	1.28	15.39		209	67
116	8.70	1.34	15.53		209	67
117	8.70	1.4	15.48		208	67
118	8.60	1.24	15.26		208	67
119	8.60	1.27	15.49		208	67
120	8.50	1.25	15		207	67
121	8.40	1.25	15.21		208	67
122	8.40	1.27	15.5		207	67
123	8.30	1.22	15.48		206	67
124	8.30	1.19	15.45		206	67
125	8.20	1.15	15.19		206	67
126	8.10	1.11	15.48		207	67
127	8.10	1.13	15.5		207	67
128	8.00	1.15	15.7		207	67
129	8.00	1.19	15.55		207	67
130	7.90	1.23	15.5		207	67
131	7.90	1.34	15.57		207	67
132	7.80	1.46	15.69		207	67
133	7.70	1.45	15.59		207	67
134	7.70	1.6	15.46		207	67
135	7.60	1.58	15.63		207	67
136	7.60	1.33	15.57		207	67
137	7.50	1.22	15.48		206	68
138	7.40	1.11	15.43		206	68
139	7.40	0.99	15.56		204	68
140	7.30	1.03	15.63		204	67
141	7.30	0.95	15.58		204	67
142	7.20	0.97	15.3		204	67
143	7.20	0.97	15.39		203	68
144	7.10	0.86	15.19		203	68
145	7.10	0.84	15.32		203	68
146	7.00	1.25	15.14		203	68
147	7.00	1.24	15.37		204	67

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	6.90	1.2	15.09		203	67
149	6.90	1.16	15.11		201	67
150	6.80	1.15	15.07		199	68
151	6.80	1.13	14.71		199	68
152	6.70	1.13	14.82		198	68
153	6.70	1.19	15		198	68
154	6.60	1.18	15.06		197	68
155	6.60	1.15	14.72		197	68
156	6.50	1.15	14.91		197	68
157	6.50	0.96	14.99		197	68
158	6.50	0.76	15.15		196	68
159	6.40	0.7	15.29		196	68
160	6.40	0.57	15.19		195	68
161	6.30	0.52	15.18		194	68
162	6.30	0.42	15.25		194	68
163	6.30	0.36	15.15		193	68
164	6.20	0.26	15.06		192	68
165	6.20	0.22	15.11		193	68
166	6.10	0.2	15.09		192	68
167	6.10	0.18	15.1		191	68
168	6.00	0.15	15.15		191	68
169	6.00	0.18	14.93		190	68
170	6.00	0.17	14.87		191	68
171	5.90	0.17	14.89		191	68
172	5.90	0.17	15.13		189	68
173	5.90	0.19	14.95		189	68
174	5.80	0.21	14.82		189	68
175	5.80	0.17	14.92		188	68
176	5.70	0.17	15.15		189	68
177	5.70	0.16	15		189	68
178	5.70	0.14	14.9		189	68
179	5.60	0.16	15.11		189	68
180	5.60	0.16	15.17		188	68
181	5.50	0.18	15.21		187	68
182	5.50	0.17	14.97		188	68
183	5.50	0.02	14.47		189	68
184	5.40	0.12	14.86		188	68
185	5.40	0.14	14.94		188	68
186	5.40	0.15	15		187	68
187	5.30	0.19	15.17		187	68
188	5.30	0.22	14.92		185	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	5.30	0.35	14.63		186	68
190	5.20	0.35	15.03		186	68
191	5.20	0.33	14.91		185	68
192	5.10	0.3	14.87		184	68
193	5.10	0.3	14.84		185	68
194	5.10	0.32	15.13		186	68
195	5.00	0.22	15.59		187	68
196	5.00	0.14	15.42		187	68
197	4.90	0.17	15.53		187	68
198	4.90	0.14	15.2		186	68
199	4.80	0.15	15.27		188	68
200	4.80	0.16	15.29		189	68
201	4.70	0.21	15.11		189	68
202	4.70	0.25	15.36		188	68
203	4.60	0.28	15.34		188	68
204	4.60	0.31	15.43		189	68
205	4.50	0.39	15.36		189	68
206	4.50	0.42	15.22		189	68
207	4.50	0.59	15.23		190	68
208	4.40	0.71	15.41		190	68
209	4.40	0.95	15.56		190	68
210	4.30	1.03	15.5		191	68
211	4.20	1.38	15.61		190	68
212	4.20	1.52	15.58		190	68
213	4.10	1.66	15.24		192	68
214	4.10	1.54	15.68		192	68
215	4.10	1.26	15.44		191	68
216	4.00	1.02	15.34		189	68
217	4.00	0.76	15.52		188	68
218	3.90	0.57	15.32		187	68
219	3.90	0.41	15.21		185	68
220	3.90	0.22	14.58		184	69
221	3.80	0.15	14.47		182	69
222	3.80	0.09	14.14		180	69
223	3.80	0.05	13.82		179	69
224	3.80	0.02	13.65		178	69
225	3.70	0	13.24		176	69
226	3.70	0	13.33		174	69
227	3.70	0	13.04		172	69
228	3.70	0	12.91		171	69
229	3.70	0	12.62		170	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	3.60	0	12.49		170	69
231	3.60	0	12.4		170	69
232	3.60	0	12.46		168	69
233	3.60	0	12.29		167	69
234	3.60	0	12.49		165	69
235	3.60	0	12.29		165	69
236	3.50	0	12.43		164	69
237	3.50	0	12.21		164	69
238	3.50	0	12.34		164	69
239	3.50	0	12.42		164	69
240	3.50	0	12.4		165	69
241	3.40	0	12.49		165	69
242	3.40	0	12.49		166	69
243	3.40	0	12.47		165	69
244	3.40	0	12.65		167	68
245	3.40	0	12.7		169	68
246	3.40	0	12.71		170	69
247	3.30	0	12.8		170	69
248	3.30	0	12.78		172	69
249	3.30	0	12.8		173	68
250	3.30	0	12.86		173	68
251	3.20	0	12.75		174	68
252	3.20	0	12.79		175	68
253	3.20	0	12.98		177	68
254	3.20	0	12.91		177	68
255	3.10	0	13.01		179	68
256	3.10	0	12.96		180	68
257	3.10	0	12.96		180	68
258	3.10	0	12.88		180	69
259	3.10	0	12.95		179	68
260	3.00	0	13.1		181	68
261	3.00	0	12.92		181	68
262	3.00	0	13.09		181	68
263	3.00	0	13.14		182	68
264	2.90	0	13.19		182	68
265	2.90	0	13.09		182	68
266	2.90	0	13.12		183	68
267	2.90	0	13.1		184	68
268	2.80	0	13.08		183	68
269	2.80	0	12.99		183	68
270	2.80	0	13.2		184	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	2.80	0	13.04		183	68
272	2.70	0	13.01		182	68
273	2.70	0	12.91		183	68
274	2.70	0	12.86		184	68
275	2.70	0	12.94		185	68
276	2.60	0	12.89		184	68
277	2.60	0	12.82		185	68
278	2.60	0	12.88		185	68
279	2.60	0	12.94		184	68
280	2.60	0	12.74		183	68
281	2.50	0	12.86		185	68
282	2.50	0	12.95		186	68
283	2.50	0	13.3		185	68
284	2.50	0	13.27		184	68
285	2.40	0	13.16		185	68
286	2.40	0	13.2		184	68
287	2.40	0	13.05		184	68
288	2.30	0	12.87		184	68
289	2.30	0	13.08		184	68
290	2.30	0	12.91		184	68
291	2.30	0	12.8		182	68
292	2.30	0	12.85		182	68
293	2.20	0	12.84		183	68
294	2.20	0	12.73		183	68
295	2.20	0	12.8		183	68
296	2.20	0	12.78		182	68
297	2.10	0	12.83		182	68
298	2.10	0	12.95		182	68
299	2.10	0	12.76		182	68
300	2.10	0	12.94		182	68
301	2.00	0	12.65		182	68
302	2.00	0	13.04		182	67
303	2.00	0	12.82		183	68
304	2.00	0	12.97		182	68
305	2.00	0	12.93		182	68
306	1.90	0	13.06		182	68
307	1.90	0	12.9		182	68
308	1.90	0	12.8		183	68
309	1.90	0	12.68		183	68
310	1.80	0	12.7		183	68
311	1.80	0	12.71		183	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	1.80	0	12.71		183	68
313	1.80	0	12.74		182	68
314	1.70	0	12.6		183	68
315	1.70	0	12.61		182	68
316	1.70	0	12.68		183	68
317	1.70	0	12.75		183	68
318	1.60	0	12.54		184	68
319	1.60	0	12.86		184	68
320	1.60	0	12.88		183	68
321	1.60	0	12.67		183	68
322	1.50	0	12.82		184	67
323	1.50	0	12.68		184	68
324	1.50	0	12.6		183	68
325	1.50	0	12.37		183	68
326	1.50	0	12.43		183	68
327	1.40	0	12.36		183	68
328	1.40	0	12.42		183	68
329	1.40	0	12.33		183	67
330	1.40	0	12.34		183	68
331	1.30	0	12.22		182	67
332	1.30	0	12.23		182	67
333	1.30	0	12.2		182	67
334	1.30	0	12.11		181	68
335	1.20	0	12.23		180	68
336	1.20	0	12.18		180	67
337	1.20	0	12.12		181	68
338	1.20	0	11.92		181	68
339	1.20	0	12.27		181	68
340	1.10	0	12.19		182	68
341	1.10	0	12.23		182	68
342	1.10	0	11.95		181	68
343	1.10	0	12.12		181	68
344	1.10	0	12.13		181	68
345	1.00	0	12.05		181	68
346	1.00	0	12.03		181	68
347	1.00	0	12.08		180	68
348	1.00	0	11.83		181	68
349	0.90	0	11.75		180	68
350	0.90	0	11.42		181	68
351	0.90	0	11.46		181	68
352	0.90	0	11.43		180	67

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	0.90	0	11.31		180	68
354	0.80	0	11.39		179	67
355	0.80	0	11.16		179	68
356	0.80	0	11.1		179	67
357	0.80	0	10.92		179	67
358	0.80	0	11.08		178	67
359	0.70	0	10.76		179	67
360	0.70	0	10.77		178	67
361	0.70	0	10.66		178	67
362	0.70	0	10.78		178	68
363	0.70	0	10.69		178	68
364	0.60	0	10.58		177	68
365	0.60	0	10.72		177	67
366	0.60	0	10.57		176	67
367	0.60	0	10.68		176	67
368	0.60	0	10.67		176	67
369	0.60	0	10.56		177	67
370	0.50	0	10.54		176	67
371	0.50	0	10.53		176	67
372	0.50	0	10.49		176	67
373	0.50	0	10.46		177	67
374	0.50	0	10.36		176	67
375	0.50	0	10.27		177	67
376	0.40	0	10.22		177	67
377	0.40	0	10.04		177	67
378	0.40	0	10.2		178	67
379	0.40	0	10.21		178	67
380	0.40	0	9.92		178	67
381	0.40	0	9.96		178	67
382	0.30	0	10.08		179	67
383	0.30	0	9.96		180	67
384	0.30	0	10.2		180	67
385	0.30	0	10.4		181	67
386	0.30	0	10.31		182	67
387	0.20	0	10.42		182	67
388	0.20	0	10.22		183	67
389	0.20	0	10.22		183	67
390	0.20	0	10.21		184	67
391	0.20	0	10.16		184	68
392	0.10	0	10.23		183	67
393	0.10	0	10.23		184	67

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
394	0.00	0	10.17		184	67

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : Ashford 30.2
Tracking No. : BK30.2
Project No. : 0142WS021E
Test Date : 3/8/2024
Run No. : 7

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.874** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 20.118 lb.
Minimum Fuel Weight : 18.11 lb.
Maximum Fuel Weight : 22.13 lb.

Fuel Piece Data

PC #	Weight, lb	Size	Length, In	Moisture Readings, Dry Basis %			Average MC, % db	Dry Weight, lb.	Volume, ft3	Wet Weights, lb 4 x 4	Wet Weights, lb 2 x 4	Dry Weights, lb 4 x 4	Dry Weights, lb 2 x 4
1	4.00	4x4	16.75	21.2	21.4	20.1	20.9	3.31	0.1187	4.0		3.31	
2	4.00	4x4	16.75	21.6	21.7	19.4	20.9	3.31	0.1187	4.0		3.31	
3	2.00	2x4	16.75	22.0	21.1	22.7	21.9	1.64	0.0509		2.0		1.64
4	1.80	2x4	16.75	23.8	19.1	19.1	20.7	1.49	0.0509		1.8		1.49
5	1.90	2x4	16.75	22.4	24.0	19.3	21.9	1.56	0.0509		1.9		1.56
6	1.70	2x4	16.75	21.2	22.3	19.5	21.0	1.40	0.0509		1.7		1.40
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
18.9	19.1	20.8	21.1	19.5	22.0			
22.0	17.3	10.1	20.8	12.9	13.8			
16.6	20.4	21.0	17.5	19.1	20.8			
16.4	15.0	21.0	10.2	20.7	19.3			

Avg : 18.2

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	4.60	4x4	4.60	
2	4.60	4x4	4.60	
3	2.50	2x4		2.5000
4	2.40	2x4		2.4000
5	2.50	2x4		2.5000
6	2.30	2x4		2.3000
7				
8				
9				

Combined Mass of 4 x 4s 9.2 lb
Combined Mass of 2 x 4s 9.7 lb

Total Wet Mass of Fuel Load **18.9** lb

Fuel Load Properties

Type	*Number of Pieces*	*Wet Weight, lb.*	*Dry Weight, lb.*	*Fuel Loading Density, lb/ft³* Wet Basis	*Fuel Loading Density, lb/ft³* Dry Basis	Dry Fuel Density, lb/ft³	Wet Fuel Density, lb/ft³	*Moisture, %* Dry Basis	*Moisture, %* Wet Basis
2 x 4	4	7.4	6.10	6.58	5.45	28.82	34.92	20.58	17.07
4 x 4	2	8.0	6.62						
Spacers	24	3.5	2.96						
Totals		18.9	15.67						

Compliance Checks

	Fuel Load, Wet Lb.	Load Density, lb/ft³ of FB vol	Fuel Density, lb/ft³	% of Fuel load mass which is 2x4	Fuel Load Peices Mositure, % db
Measured	18.9	6.58	28.82	51	21.2
Required	18.1 - 22.1	6.3 - 7.7	25 - 36	35 - 65	19 -25
Complies ?	Yes	Yes	Yes	Yes	Yes

Dilution Tunnel Velocity Traverse and Supplementary Data

ASTM E2515-11

Run:	7	Tracking No.:	BK30.2
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WS021E
Model:	Ashford 30.2	Test Date:	3/8/2024

Dillution Tunnel Velocity Traverse

Pitot Location

Traverse Point	*% of Diameter*	*Inches into Tunnel*	*dP in. H_2O*	*Tunnel Temp, °F*	*$dP^{1/2}$*
X1	6.7	0.5 *	0.052	73	0.228
X2	25.0	0.00	0.082	73	0.286
X3	75.0	0.00	0.088	73	0.297
X4	93.3	-0.5 *	0.048	73	0.219
Y1	6.7	0.5 *	0.052	72	0.228
Y2	25.0	0.00	0.086	72	0.293
Y3	75.0	0.00	0.076	72	0.276
Y4	93.3	-0.5 *	0.038	72	0.195
Center	50.0	0.00	0.102	73	0.319

Tunnel Static Pressure	-0.350	*in. H_2O*
Tunnel Moisture	2.00	%
Tunnel Diameter	6.00	inches
Pitot Tube C_p	0.99	inches
Tunnel Molecular Weight	29	(dry)
Tunnel Molecular Weight	28.78	(M_S, wet)
Tunnel Area	0.19634954	*ft^2*
K_p	85.49	constant
$P_s=P_{bar}$+Tunnel Static	30.0642647	in HG

** Probe location must be no closer than 0.50 in to tunnel wall*

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 16.7818$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 21.2150$$

$$F_P = V_{strav} / V_{scent} = 0.791$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 13.275\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	13:56	20:30
Barometric Pressure, in. Hg	30.09	29.98
Room Air Velocity, fpm	16	12
Room Air Temperature, °F	66	67
Room Relative Humidity, %	32.0	32.0
Platform Scale Audit, lb.	20.0	20.0

Leak Checks

Pitot and associated tubing, (pass/fail)[1]	Pass	Pass

See sampling box worksheets for sampling boxes

Dillution Tunnel

Date last cleaned	3/5/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.350	-0.350

1 Both sides (independantly) of the pitot system are brought under a minimum vacuum of 3 in. H_2O and then sealed. Any indiction of pressure loss is deemed a fail.

2 Create a smoking condition during start of pre-burn activites and using adequate lighting pointed upward and aroud tunnel hood, visually observe if 100% of visible smoke is being captured by the hood. If not, increase flow tunnel flow and / or re-assess chimney proximity to draft hood as required and repeat until 100% capture is observed.

3 With the appliance installed and the dillution tunnel flow turned-off, observe the flue draft gauge while turning the dulution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducemnt is occuring. Determine the cause (i.e. flue chimnet too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 7

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E
Test Date: 3/8/24
Beginning Clock Time: 13:56

Coal Bed Range (lb):	3.8 (min)	4.7 (max)

Preburn Fuel Data

10 pieces @ 16.75 inches
____ pieces @ ____ inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

23.8	21.7					
22	24.8					
25.8	21					
24.9	24.2					
23.8	23.8					

Avg Preburn Moisture (% DB): **23.58**

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
0	5.2	-0.066	814	421	444	302	548	1039	506	334	68
1	5.2	-0.065	805	422	444	302	544	991	503	287	68
2	5.1	-0.063	795	422	443	301	542	957	501	250	68
3	5.1	-0.061	785	423	442	302	535	934	497	223	68
4	5.1	-0.058	775	424	441	301	529	918	494	203	68
5	5.1	-0.057	765	424	439	301	521	905	490	187	68
6	5	-0.054	756	424	437	297	515	896	486	176	68
7	5	-0.053	747	424	434	295	509	892	482	167	68
8	5	-0.052	739	424	431	293	500	890	477	159	68
9	5	-0.051	732	424	428	290	494	887	474	153	68
10	5	-0.05	725	424	425	292	489	882	471	149	68
11	5	-0.05	718	424	421	288	481	875	466	146	67
12	4.9	-0.049	711	423	418	284	476	867	462	142	67
13	4.9	-0.049	704	422	415	286	469	859	459	140	67
14	4.9	-0.048	697	422	412	281	465	851	455	138	67
15	4.9	-0.047	690	421	408	279	459	842	451	136	67
16	4.9	-0.047	683	420	405	278	454	834	448	134	67
17	4.9	-0.046	676	419	402	277	448	825	444	132	67
18	4.9	-0.046	669	418	399	274	443	816	441	131	67
19	4.9	-0.045	663	417	396	272	439	807	437	130	67
20	4.9	-0.045	656	416	392	270	433	798	433	128	67
21	4.9	-0.044	649	415	389	269	430	789	430	127	67
22	4.8	-0.043	642	414	386	264	424	780	426	124	67
23	4.9	-0.043	635	413	383	263	420	769	423	122	66
24	4.9	-0.042	628	412	380	262	415	756	419	120	66
25	4.8	-0.043	621	410	377	259	411	744	416	119	66
26	4.8	-0.042	614	409	374	258	406	732	412	117	66
27	4.8	-0.041	606	408	371	258	403	720	409	115	66
28	4.8	-0.042	599	406	368	253	398	710	405	114	66
29	4.9	-0.041	592	405	365	253	393	699	402	113	66
30	4.9	-0.041	585	404	362	255	390	690	399	112	66
31	4.8	-0.04	578	402	360	250	385	681	395	111	66
32	4.9	-0.04	571	401	357	250	382	671	392	110	66
33	4.9	-0.039	564	400	354	246	381	662	389	110	66
34	4.9	-0.04	557	399	352	244	375	654	385	109	66
35	4.9	-0.039	551	397	349	242	371	646	382	107	66
36	4.9	-0.038	544	396	347	243	368	638	380	107	66
37	4.9	-0.038	538	395	344	241	364	631	376	106	66
38	4.9	-0.037	532	393	342	238	360	624	373	105	66
39	4.9	-0.038	526	392	340	238	358	618	371	104	66
40	4.9	-0.038	521	391	337	237	356	612	368	103	66
41	4.9	-0.038	515	390	335	235	351	607	365	103	66
42	4.9	-0.037	510	388	333	234	347	602	362	103	66

			Temperatures (°F)								
Elapsed Time (min)	Scale (lb)	Stack Draft (in H_2O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Cat Exit	Avg. FB	Stack	Ambient
43	4.9	-0.038	505	387	330	232	343	599	359	104	66
44	4.9	-0.039	500	386	328	231	341	596	357	105	66
45	4.9	-0.04	496	385	326	231	338	597	355	106	66
46	4.9	-0.041	492	384	323	228	336	599	353	109	66
47	4.9	-0.042	488	383	321	226	334	605	350	111	66
48	4.9	-0.042	486	382	319	224	330	614	348	115	66
49	4.9	-0.043	484	381	317	226	326	628	347	120	66
50	4.9	-0.044	484	381	315	224	324	644	346	124	66
51	4.9	-0.045	484	380	313	222	321	664	344	130	66
52	4.9	-0.046	485	379	312	219	319	685	343	135	66
53	4.9	-0.048	488	379	311	222	317	707	343	140	66
54	4.9	-0.049	491	378	310	219	315	729	343	146	66
55	4.8	-0.042	495	378	309	219	313	749	343	151	66
56	4.8	-0.051	499	377	310	217	314	760	343	157	66
57	4.8	-0.051	499	377	313	216	312	727	343	161	66
58	4.8	-0.052	497	377	315	218	312	693	344	165	66
59	4.8	-0.052	495	377	318	217	312	676	344	166	65
60	4.7	-0.053	493	377	321	213	312	667	343	169	66

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
Tot / Avg		0.0	**63.351**	**0.161**	**1.25**	**76.6**	**1.80**	**67.16**	**48.35**	**67.47**	**100.0**	**76.9**	**0.107**	**0.327**	**17.29**
Minimum	0.0	-18.7	0.000	0.151	0.06	68	0.07	63	43	65	97.9	74	0.104	0.322	17.09
Max	18.7	0.2	63.351	0.163	1.31	78	1.83	68	50	69	104.5	103	0.111	0.333	17.73
0	0.0		0.000		0.06	68	0.07	63	49	66		99	0.105	0.324	17.73
1	18.7	-18.7	0.151	0.151	1.31	68	1.83	65	44	66	97.9	103	0.105	0.324	17.48
2	18.7	0.0	0.313	0.162	1.31	68	1.83	65	43	66	104.5	84	0.107	0.327	17.45
3	18.6	0.1	0.474	0.161	1.23	68	1.79	65	43	66	101.9	79	0.108	0.329	17.38
4	18.5	0.1	0.633	0.159	1.26	68	1.81	65	43	66	100.4	78	0.107	0.327	17.33
5	18.5	0.0	0.791	0.158	1.25	68	1.80	65	43	66	99.8	77	0.108	0.329	17.32
6	18.4	0.1	0.950	0.159	1.26	68	1.79	65	43	66	100.5	76	0.105	0.324	17.22
7	18.3	0.1	1.109	0.159	1.25	68	1.79	65	43	66	100.9	76	0.107	0.327	17.17
8	18.2	0.1	1.268	0.159	1.26	68	1.81	65	43	66	100.8	77	0.107	0.327	17.26
9	18.1	0.1	1.426	0.158	1.26	69	1.79	65	43	66	99.8	77	0.108	0.329	17.31
10	18.0	0.1	1.585	0.159	1.26	69	1.80	65	43	66	100.2	77	0.107	0.327	17.31
11	17.9	0.1	1.744	0.159	1.25	69	1.80	65	43	65	100.4	77	0.106	0.326	17.23
12	17.8	0.1	1.902	0.158	1.25	69	1.79	65	43	66	100.2	78	0.106	0.326	17.20
13	17.7	0.1	2.062	0.160	1.27	69	1.81	66	43	66	101.7	78	0.106	0.326	17.20
14	17.6	0.1	2.222	0.160	1.27	69	1.81	66	44	66	101.4	78	0.108	0.329	17.28
15	17.5	0.1	2.382	0.160	1.27	69	1.81	66	44	66	101.2	78	0.106	0.326	17.28
16	17.4	0.1	2.541	0.159	1.26	69	1.81	66	44	66	101.0	78	0.104	0.322	17.12
17	17.3	0.1	2.700	0.159	1.26	69	1.81	66	44	66	101.4	78	0.107	0.327	17.16
18	17.2	0.1	2.860	0.160	1.27	70	1.81	66	44	66	101.1	79	0.110	0.332	17.41
19	17.1	0.1	3.020	0.160	1.26	70	1.81	66	44	66	100.3	79	0.108	0.329	17.46
20	17.0	0.1	3.179	0.159	1.26	70	1.81	66	44	66	99.7	79	0.108	0.329	17.38
21	16.8	0.2	3.338	0.159	1.27	70	1.81	66	44	66	100.0	79	0.108	0.329	17.38
22	16.7	0.1	3.498	0.160	1.26	70	1.80	66	44	66	100.6	79	0.108	0.329	17.38
23	16.6	0.1	3.658	0.160	1.25	70	1.81	66	44	66	100.7	80	0.108	0.329	17.39
24	16.5	0.1	3.817	0.159	1.26	71	1.81	66	45	66	100.2	80	0.106	0.326	17.32
25	16.4	0.1	3.977	0.160	1.26	71	1.81	66	45	66	101.0	80	0.108	0.329	17.32
26	16.2	0.2	4.136	0.159	1.26	71	1.81	66	45	66	100.3	81	0.107	0.327	17.37
27	16.1	0.1	4.297	0.161	1.25	71	1.81	67	45	66	101.6	81	0.107	0.327	17.33
28	16.0	0.1	4.456	0.159	1.25	71	1.81	67	45	66	100.3	81	0.108	0.329	17.37
29	15.9	0.1	4.615	0.159	1.26	71	1.81	67	45	66	99.9	80	0.109	0.330	17.45
30	15.7	0.2	4.774	0.159	1.26	72	1.81	67	45	66	99.8	81	0.106	0.326	17.37
31	15.6	0.1	4.935	0.161	1.25	72	1.81	67	45	66	101.4	81	0.108	0.329	17.33
32	15.5	0.1	5.094	0.159	1.25	72	1.81	67	45	66	100.4	81	0.105	0.324	17.29
33	15.4	0.1	5.253	0.159	1.26	72	1.81	67	46	66	100.4	81	0.109	0.330	17.33
34	15.3	0.1	5.413	0.160	1.26	72	1.81	67	46	66	100.6	80	0.107	0.327	17.41
35	15.2	0.1	5.573	0.160	1.26	72	1.81	67	46	66	100.2	80	0.110	0.332	17.44
36	15.0	0.2	5.733	0.160	1.26	72	1.81	67	46	66	100.0	81	0.108	0.329	17.49
37	14.9	0.1	5.893	0.160	1.26	72	1.81	67	46	66	100.2	81	0.108	0.329	17.41
38	14.8	0.1	6.052	0.159	1.26	73	1.81	67	46	66	99.8	81	0.107	0.327	17.37
39	14.7	0.1	6.212	0.160	1.26	73	1.80	67	46	66	100.7	81	0.106	0.326	17.29
40	14.6	0.1	6.373	0.161	1.25	73	1.81	67	46	66	101.7	81	0.106	0.326	17.25

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Test Date: 3/8/24

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.1 in. Hg
Post-Test 0 cfm @ 6 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
41	14.4	0.2	6.532	0.159	1.26	73	1.80	67	46	66	100.2	80	0.108	0.329	17.32
42	14.3	0.1	6.692	0.160	1.26	73	1.82	67	46	66	100.6	80	0.106	0.326	17.32
43	14.2	0.1	6.852	0.160	1.26	73	1.81	67	46	66	100.5	80	0.109	0.330	17.36
44	14.1	0.1	7.012	0.160	1.26	73	1.81	67	46	66	100.1	80	0.108	0.329	17.44
45	14.0	0.1	7.173	0.161	1.26	73	1.81	67	47	66	100.9	80	0.106	0.326	17.32
46	13.9	0.1	7.333	0.160	1.25	74	1.81	67	47	66	100.7	79	0.106	0.326	17.23
47	13.8	0.1	7.492	0.159	1.25	74	1.81	67	47	66	100.2	80	0.106	0.326	17.23
48	13.7	0.1	7.652	0.160	1.26	74	1.80	67	47	67	100.8	80	0.107	0.327	17.28
49	13.6	0.1	7.813	0.161	1.27	74	1.81	67	47	67	100.8	80	0.110	0.332	17.44
50	13.5	0.1	7.973	0.160	1.25	74	1.81	67	47	67	99.6	79	0.107	0.327	17.43
51	13.4	0.1	8.133	0.160	1.26	74	1.81	67	47	66	99.9	79	0.107	0.327	17.30
52	13.3	0.1	8.292	0.159	1.26	74	1.81	67	47	67	99.6	79	0.108	0.329	17.34
53	13.2	0.1	8.453	0.161	1.26	74	1.81	67	47	67	100.3	79	0.110	0.332	17.46
54	13.1	0.1	8.614	0.161	1.26	74	1.81	67	47	67	100.0	79	0.108	0.329	17.46
55	13.1	0.0	8.774	0.160	1.26	74	1.80	67	47	67	99.8	79	0.106	0.326	17.30
56	13.0	0.1	8.934	0.160	1.26	74	1.82	67	47	67	100.2	78	0.108	0.329	17.29
57	12.9	0.1	9.094	0.160	1.26	75	1.81	67	47	67	99.6	78	0.110	0.332	17.45
58	12.9	0.0	9.254	0.160	1.26	75	1.81	67	47	67	99.3	78	0.106	0.326	17.37
59	12.8	0.1	9.416	0.162	1.25	75	1.81	67	47	67	101.0	78	0.108	0.329	17.28
60	12.7	0.1	9.576	0.160	1.26	75	1.81	67	47	67	99.9	78	0.107	0.327	17.32
61	12.6	0.1	9.736	0.160	1.26	75	1.80	67	48	67	99.7	78	0.109	0.330	17.37
62	12.6	0.0	9.896	0.160	1.26	75	1.81	67	48	67	99.6	78	0.107	0.327	17.37
63	12.5	0.1	10.057	0.161	1.26	75	1.81	67	48	67	100.3	77	0.107	0.327	17.28
64	12.4	0.1	10.218	0.161	1.26	75	1.81	67	48	67	100.6	78	0.107	0.327	17.28
65	12.3	0.1	10.379	0.161	1.26	75	1.81	67	48	67	100.5	77	0.108	0.329	17.32
66	12.2	0.1	10.539	0.160	1.26	75	1.81	67	48	67	99.6	78	0.108	0.329	17.36
67	12.2	0.0	10.699	0.160	1.26	75	1.81	67	48	67	99.7	78	0.107	0.327	17.32
68	12.1	0.1	10.860	0.161	1.26	75	1.81	67	48	67	100.6	77	0.106	0.326	17.24
69	12.0	0.1	11.021	0.161	1.25	75	1.81	67	48	67	100.8	77	0.107	0.327	17.23
70	12.0	0.0	11.182	0.161	1.26	75	1.81	67	48	67	100.8	77	0.106	0.326	17.23
71	11.9	0.1	11.342	0.160	1.26	75	1.81	67	48	67	99.9	77	0.109	0.330	17.31
72	11.8	0.1	11.502	0.160	1.26	75	1.81	67	48	67	99.6	77	0.107	0.327	17.35
73	11.7	0.1	11.663	0.161	1.26	76	1.81	67	48	67	100.2	77	0.107	0.327	17.27
74	11.7	0.0	11.824	0.161	1.26	76	1.81	67	48	67	100.5	77	0.106	0.326	17.23
75	11.6	0.1	11.985	0.161	1.26	76	1.81	67	48	67	100.6	77	0.107	0.327	17.23
76	11.5	0.1	12.145	0.160	1.26	76	1.80	67	48	67	100.0	78	0.106	0.326	17.24
77	11.5	0.0	12.306	0.161	1.26	76	1.81	67	48	67	100.5	77	0.108	0.329	17.28
78	11.4	0.1	12.466	0.160	1.26	76	1.81	67	48	67	99.4	77	0.109	0.330	17.39
79	11.3	0.1	12.627	0.161	1.26	76	1.81	67	48	67	99.6	77	0.109	0.330	17.43
80	11.3	0.0	12.788	0.161	1.25	76	1.81	67	48	67	99.3	77	0.110	0.332	17.47
81	11.2	0.1	12.949	0.161	1.26	76	1.80	67	48	67	99.4	78	0.108	0.329	17.44
82	11.1	0.1	13.109	0.160	1.26	76	1.80	67	48	67	99.2	77	0.107	0.327	17.32
83	11.0	0.1	13.269	0.160	1.26	76	1.81	67	48	67	99.5	77	0.108	0.329	17.31
84	11.0	0.0	13.430	0.161	1.26	76	1.81	67	48	67	100.1	78	0.108	0.329	17.36

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
85	10.9	0.1	13.592	0.162	1.26	76	1.81	67	48	67	100.9	78	0.106	0.326	17.28
86	10.8	0.1	13.753	0.161	1.26	76	1.81	67	48	67	100.7	78	0.106	0.326	17.20
87	10.7	0.1	13.913	0.160	1.25	76	1.81	67	48	67	100.1	77	0.107	0.327	17.24
88	10.7	0.0	14.074	0.161	1.26	76	1.81	67	48	67	100.5	77	0.107	0.327	17.27
89	10.6	0.1	14.234	0.160	1.26	76	1.81	67	48	67	99.9	78	0.106	0.326	17.24
90	10.5	0.1	14.395	0.161	1.26	76	1.81	67	48	67	100.8	78	0.106	0.326	17.20
91	10.4	0.1	14.557	0.162	1.26	76	1.81	67	48	67	101.6	78	0.106	0.326	17.20
92	10.4	0.0	14.717	0.160	1.25	76	1.81	67	48	67	100.0	78	0.109	0.330	17.32
93	10.3	0.1	14.877	0.160	1.26	76	1.81	67	48	67	99.5	78	0.107	0.327	17.37
94	10.2	0.1	15.038	0.161	1.26	76	1.81	67	48	67	100.1	78	0.108	0.329	17.32
95	10.1	0.1	15.199	0.161	1.26	76	1.81	67	48	67	100.2	77	0.107	0.327	17.32
96	10.1	0.0	15.360	0.161	1.26	76	1.81	67	48	67	100.2	77	0.107	0.327	17.27
97	10.0	0.1	15.521	0.161	1.26	77	1.81	67	48	67	100.2	77	0.108	0.329	17.31
98	9.9	0.1	15.682	0.161	1.25	77	1.81	67	48	67	100.2	77	0.105	0.324	17.23
99	9.9	0.0	15.842	0.160	1.26	77	1.81	67	48	67	99.9	78	0.108	0.329	17.24
100	9.8	0.1	16.003	0.161	1.26	77	1.81	67	48	67	100.2	78	0.108	0.329	17.37
101	9.7	0.1	16.164	0.161	1.26	77	1.81	67	48	67	99.9	78	0.107	0.327	17.32
102	9.6	0.1	16.326	0.162	1.26	77	1.80	67	48	67	100.5	78	0.109	0.330	17.37
103	9.6	0.0	16.486	0.160	1.26	77	1.82	67	49	67	99.1	78	0.108	0.329	17.41
104	9.5	0.1	16.647	0.161	1.26	77	1.80	67	49	67	99.7	78	0.108	0.329	17.37
105	9.4	0.1	16.807	0.160	1.26	77	1.81	67	48	67	99.3	78	0.107	0.327	17.32
106	9.4	0.0	16.968	0.161	1.26	77	1.81	67	48	67	100.2	78	0.107	0.327	17.28
107	9.3	0.1	17.130	0.162	1.26	77	1.81	67	48	67	100.9	78	0.107	0.327	17.28
108	9.3	0.0	17.290	0.160	1.25	77	1.81	67	48	67	99.4	78	0.109	0.330	17.37
109	9.2	0.1	17.451	0.161	1.26	77	1.81	67	49	67	99.9	78	0.106	0.326	17.32
110	9.1	0.1	17.612	0.161	1.26	77	1.81	67	49	67	100.3	77	0.106	0.326	17.20
111	9.1	0.0	17.772	0.160	1.26	77	1.81	67	49	67	99.8	78	0.108	0.329	17.28
112	9.0	0.1	17.933	0.161	1.26	77	1.80	67	49	67	100.2	78	0.107	0.327	17.32
113	8.9	0.1	18.095	0.162	1.26	77	1.81	67	49	67	100.7	78	0.108	0.329	17.32
114	8.9	0.0	18.256	0.161	1.26	77	1.81	67	49	67	99.9	78	0.108	0.329	17.37
115	8.8	0.1	18.416	0.160	1.26	77	1.81	67	49	67	99.4	78	0.106	0.326	17.28
116	8.7	0.1	18.577	0.161	1.26	77	1.81	67	49	67	100.2	78	0.109	0.330	17.32
117	8.7	0.0	18.738	0.161	1.26	77	1.81	67	49	67	99.7	78	0.109	0.330	17.45
118	8.6	0.1	18.899	0.161	1.26	77	1.81	67	49	67	99.3	77	0.109	0.330	17.44
119	8.6	0.0	19.060	0.161	1.26	77	1.81	67	49	67	99.4	78	0.108	0.329	17.40
120	8.5	0.1	19.221	0.161	1.25	77	1.81	67	49	67	99.8	77	0.107	0.327	17.32
121	8.4	0.1	19.382	0.161	1.26	77	1.81	67	49	67	100.0	77	0.107	0.327	17.27
122	8.4	0.0	19.542	0.160	1.26	77	1.81	67	49	67	99.6	78	0.107	0.327	17.28
123	8.3	0.1	19.703	0.161	1.26	77	1.81	68	49	67	100.1	78	0.109	0.330	17.37
124	8.3	0.0	19.865	0.162	1.25	77	1.81	67	49	67	100.2	77	0.108	0.329	17.40
125	8.2	0.1	20.026	0.161	1.26	77	1.81	67	49	67	99.6	78	0.108	0.329	17.36
126	8.1	0.1	20.186	0.160	1.25	77	1.80	67	49	67	99.4	78	0.106	0.326	17.28
127	8.1	0.0	20.347	0.161	1.26	77	1.81	67	49	67	100.3	78	0.108	0.329	17.28
128	8.0	0.1	20.508	0.161	1.26	77	1.81	67	49	67	99.9	78	0.109	0.330	17.41

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
129	8.0	0.0	20.669	0.161	1.26	77	1.80	67	49	67	99.5	78	0.109	0.330	17.45
130	7.9	0.1	20.831	0.162	1.25	77	1.81	67	49	67	99.9	78	0.110	0.332	17.49
131	7.9	0.0	20.991	0.160	1.25	77	1.81	67	49	67	98.6	78	0.108	0.329	17.45
132	7.8	0.1	21.152	0.161	1.26	77	1.81	68	49	67	99.6	78	0.108	0.329	17.37
133	7.7	0.1	21.312	0.160	1.26	77	1.81	68	49	67	99.3	78	0.107	0.327	17.32
134	7.7	0.0	21.473	0.161	1.26	77	1.81	68	49	67	100.3	78	0.106	0.326	17.24
135	7.6	0.1	21.635	0.162	1.25	77	1.81	68	49	67	100.9	78	0.109	0.330	17.32
136	7.6	0.0	21.796	0.161	1.26	77	1.81	68	49	67	99.8	78	0.108	0.329	17.41
137	7.5	0.1	21.956	0.160	1.26	77	1.81	68	49	68	98.8	78	0.110	0.332	17.45
138	7.4	0.1	22.117	0.161	1.26	77	1.80	68	49	68	99.5	78	0.107	0.327	17.41
139	7.4	0.0	22.278	0.161	1.26	77	1.81	68	49	68	99.9	78	0.107	0.327	17.28
140	7.3	0.1	22.439	0.161	1.26	77	1.81	68	49	67	100.2	78	0.108	0.329	17.32
141	7.3	0.0	22.600	0.161	1.26	77	1.81	68	49	67	99.8	78	0.109	0.330	17.41
142	7.2	0.1	22.761	0.161	1.25	77	1.81	68	49	67	99.2	78	0.111	0.333	17.53
143	7.2	0.0	22.921	0.160	1.25	77	1.80	68	49	68	98.7	78	0.105	0.324	17.37
144	7.1	0.1	23.082	0.161	1.26	77	1.81	68	49	68	100.2	78	0.108	0.329	17.24
145	7.1	0.0	23.243	0.161	1.26	77	1.81	68	49	68	100.3	78	0.107	0.327	17.32
146	7.0	0.1	23.404	0.161	1.25	77	1.81	68	49	68	100.2	78	0.107	0.327	17.28
147	7.0	0.0	23.565	0.161	1.25	77	1.81	68	49	67	100.2	78	0.108	0.329	17.32
148	6.9	0.1	23.726	0.161	1.26	78	1.80	68	49	67	100.2	78	0.105	0.324	17.24
149	6.9	0.0	23.887	0.161	1.25	78	1.81	68	49	67	100.2	78	0.109	0.330	17.28
150	6.8	0.1	24.047	0.160	1.26	78	1.81	68	49	68	99.1	78	0.108	0.329	17.41
151	6.8	0.0	24.208	0.161	1.26	78	1.81	68	49	68	99.5	78	0.108	0.329	17.37
152	6.7	0.1	24.370	0.162	1.25	78	1.81	68	49	68	100.1	77	0.109	0.330	17.40
153	6.7	0.0	24.531	0.161	1.25	78	1.80	68	49	68	99.2	77	0.109	0.330	17.43
154	6.6	0.1	24.692	0.161	1.26	78	1.81	68	49	68	99.4	77	0.106	0.326	17.31
155	6.6	0.0	24.852	0.160	1.26	78	1.81	68	49	68	99.6	78	0.106	0.326	17.20
156	6.5	0.1	25.013	0.161	1.26	78	1.80	68	49	68	100.3	78	0.108	0.329	17.28
157	6.5	0.0	25.174	0.161	1.26	78	1.81	68	49	68	99.9	78	0.108	0.329	17.37
158	6.5	0.0	25.336	0.162	1.25	78	1.81	68	49	68	100.5	78	0.106	0.326	17.28
159	6.4	0.1	25.497	0.161	1.25	78	1.81	68	49	68	100.2	78	0.107	0.327	17.24
160	6.4	0.0	25.657	0.160	1.26	78	1.81	68	49	68	99.6	78	0.107	0.327	17.28
161	6.3	0.1	25.818	0.161	1.26	78	1.80	68	49	68	100.2	78	0.106	0.326	17.24
162	6.3	0.0	25.979	0.161	1.26	78	1.81	68	49	68	100.3	78	0.107	0.327	17.24
163	6.3	0.0	26.141	0.162	1.25	78	1.81	68	49	68	100.7	78	0.108	0.329	17.32
164	6.2	0.1	26.301	0.160	1.26	78	1.81	68	49	68	99.2	78	0.107	0.327	17.32
165	6.2	0.0	26.462	0.161	1.25	78	1.81	68	49	68	99.9	77	0.107	0.327	17.28
166	6.1	0.1	26.623	0.161	1.26	78	1.80	68	49	68	100.2	78	0.106	0.326	17.24
167	6.1	0.0	26.783	0.160	1.25	78	1.81	68	49	68	99.7	78	0.107	0.327	17.24
168	6.0	0.1	26.945	0.162	1.26	78	1.80	68	49	68	100.8	78	0.107	0.327	17.28
169	6.0	0.0	27.106	0.161	1.25	78	1.81	68	49	68	100.0	77	0.107	0.327	17.28
170	6.0	0.0	27.267	0.161	1.25	78	1.80	68	49	68	100.1	77	0.106	0.326	17.23
171	5.9	0.1	27.428	0.161	1.25	78	1.81	68	49	68	100.2	77	0.107	0.327	17.23
172	5.9	0.0	27.588	0.160	1.26	78	1.81	68	49	68	99.3	77	0.109	0.330	17.35

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
173	5.9	0.0	27.749	0.161	1.26	78	1.81	68	49	68	99.5	78	0.108	0.329	17.40
174	5.8	0.1	27.911	0.162	1.26	78	1.81	68	49	68	100.0	77	0.109	0.330	17.40
175	5.8	0.0	28.072	0.161	1.26	78	1.81	68	49	68	99.3	77	0.108	0.329	17.39
176	5.7	0.1	28.233	0.161	1.25	78	1.81	68	49	68	99.4	77	0.108	0.329	17.35
177	5.7	0.0	28.393	0.160	1.25	78	1.81	68	49	68	98.6	78	0.111	0.333	17.48
178	5.7	0.0	28.554	0.161	1.26	78	1.81	68	49	68	99.0	77	0.107	0.327	17.44
179	5.6	0.1	28.715	0.161	1.26	78	1.81	68	49	68	99.5	77	0.107	0.327	17.27
180	5.6	0.0	28.877	0.162	1.25	78	1.81	68	49	68	100.7	77	0.106	0.326	17.23
181	5.5	0.1	29.037	0.160	1.25	78	1.81	68	49	68	99.7	78	0.107	0.327	17.24
182	5.5	0.0	29.198	0.161	1.25	78	1.81	68	49	68	99.8	77	0.110	0.332	17.40
183	5.5	0.0	29.359	0.161	1.25	78	1.81	68	49	68	99.2	77	0.108	0.329	17.43
184	5.4	0.1	29.520	0.161	1.26	78	1.81	68	49	68	99.5	77	0.106	0.326	17.27
185	5.4	0.0	29.681	0.161	1.26	78	1.81	68	49	68	100.2	77	0.106	0.326	17.19
186	5.4	0.0	29.843	0.162	1.26	78	1.80	68	49	68	101.3	77	0.104	0.322	17.11
187	5.3	0.1	30.003	0.160	1.25	78	1.81	68	49	68	100.3	78	0.107	0.327	17.15
188	5.3	0.0	30.164	0.161	1.26	78	1.81	68	49	68	100.2	77	0.109	0.330	17.36
189	5.3	0.0	30.324	0.160	1.26	78	1.81	68	49	68	99.0	77	0.106	0.326	17.31
190	5.2	0.1	30.485	0.161	1.26	78	1.80	68	49	68	99.9	77	0.108	0.329	17.27
191	5.2	0.0	30.647	0.162	1.25	78	1.81	68	49	68	100.4	77	0.108	0.329	17.35
192	5.1	0.1	30.808	0.161	1.26	78	1.80	68	49	68	99.5	78	0.109	0.330	17.40
193	5.1	0.0	30.969	0.161	1.25	78	1.81	68	49	68	99.4	78	0.108	0.329	17.41
194	5.1	0.0	31.130	0.161	1.25	78	1.81	68	49	68	99.6	78	0.107	0.327	17.32
195	5.0	0.1	31.290	0.160	1.26	78	1.80	68	49	68	99.6	78	0.105	0.324	17.20
196	5.0	0.0	31.451	0.161	1.26	78	1.81	68	49	68	100.7	77	0.105	0.324	17.11
197	4.9	0.1	31.613	0.162	1.25	78	1.80	68	49	68	101.1	77	0.109	0.330	17.27
198	4.9	0.0	31.774	0.161	1.25	78	1.81	68	49	68	99.9	77	0.106	0.326	17.31
199	4.8	0.1	31.935	0.161	1.26	78	1.81	68	49	68	99.6	77	0.110	0.332	17.35
200	4.8	0.0	32.096	0.161	1.26	78	1.81	68	49	68	99.6	77	0.105	0.324	17.31
201	4.7	0.1	32.256	0.160	1.26	78	1.81	68	49	68	99.6	77	0.106	0.326	17.15
202	4.7	0.0	32.418	0.162	1.25	78	1.80	68	49	68	101.0	77	0.108	0.329	17.27
203	4.6	0.1	32.579	0.161	1.25	78	1.80	68	49	68	100.0	77	0.106	0.326	17.27
204	4.6	0.0	32.740	0.161	1.25	78	1.81	68	49	68	100.0	77	0.108	0.329	17.27
205	4.5	0.1	32.901	0.161	1.25	78	1.81	68	49	68	99.8	77	0.108	0.329	17.35
206	4.5	0.0	33.061	0.160	1.25	78	1.81	68	49	68	99.1	77	0.106	0.326	17.27
207	4.5	0.0	33.222	0.161	1.26	78	1.81	68	49	68	100.0	77	0.108	0.329	17.27
208	4.4	0.1	33.384	0.162	1.26	78	1.81	68	49	68	100.6	77	0.106	0.326	17.27
209	4.4	0.0	33.545	0.161	1.25	78	1.81	68	49	68	99.9	77	0.109	0.330	17.31
210	4.3	0.1	33.706	0.161	1.25	78	1.81	68	49	68	99.8	77	0.106	0.326	17.31
211	4.2	0.1	33.867	0.161	1.25	78	1.80	68	49	68	100.1	77	0.106	0.326	17.19
212	4.2	0.0	34.027	0.160	1.26	78	1.81	68	49	68	99.6	77	0.108	0.329	17.27
213	4.1	0.1	34.188	0.161	1.25	78	1.81	68	49	68	99.9	77	0.107	0.327	17.31
214	4.1	0.0	34.350	0.162	1.25	78	1.81	68	49	68	100.4	77	0.108	0.329	17.31
215	4.1	0.0	34.511	0.161	1.26	78	1.80	68	49	68	99.5	77	0.109	0.330	17.39
216	4.0	0.1	34.672	0.161	1.25	78	1.81	68	49	68	99.4	77	0.107	0.327	17.35

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
217	4.0	0.0	34.832	0.160	1.25	78	1.81	68	49	68	99.1	77	0.107	0.327	17.27
218	3.9	0.1	34.993	0.161	1.26	78	1.81	68	49	68	100.1	77	0.106	0.326	17.23
219	3.9	0.0	35.154	0.161	1.26	78	1.81	68	49	68	100.0	77	0.109	0.330	17.31
220	3.9	0.0	35.316	0.162	1.25	78	1.81	68	49	69	100.1	77	0.108	0.329	17.39
221	3.8	0.1	35.477	0.161	1.26	78	1.81	68	49	69	99.3	76	0.108	0.329	17.34
222	3.8	0.0	35.638	0.161	1.25	78	1.81	68	49	69	99.2	75	0.109	0.330	17.36
223	3.8	0.0	35.799	0.161	1.25	78	1.81	68	49	69	99.3	76	0.107	0.327	17.32
224	3.8	0.0	35.960	0.161	1.26	78	1.81	68	49	69	99.6	76	0.108	0.329	17.29
225	3.7	0.1	36.121	0.161	1.26	78	1.80	68	49	69	99.8	76	0.106	0.326	17.25
226	3.7	0.0	36.283	0.162	1.25	78	1.81	68	49	69	101.0	76	0.104	0.322	17.09
227	3.7	0.0	36.444	0.161	1.25	78	1.81	68	49	69	100.8	76	0.106	0.326	17.09
228	3.7	0.0	36.605	0.161	1.25	78	1.81	68	49	69	100.3	76	0.109	0.330	17.29
229	3.7	0.0	36.766	0.161	1.25	78	1.81	68	49	69	99.6	76	0.107	0.327	17.33
230	3.6	0.1	36.927	0.161	1.26	78	1.81	68	49	69	99.5	75	0.108	0.329	17.28
231	3.6	0.0	37.088	0.161	1.26	78	1.81	68	49	69	99.4	75	0.108	0.329	17.32
232	3.6	0.0	37.250	0.162	1.25	78	1.81	68	49	69	99.8	75	0.109	0.330	17.36
233	3.6	0.0	37.411	0.161	1.25	78	1.81	68	49	69	99.1	75	0.108	0.329	17.36
234	3.6	0.0	37.571	0.160	1.26	78	1.81	68	49	69	98.7	75	0.107	0.327	17.28
235	3.6	0.0	37.733	0.162	1.25	78	1.81	68	49	69	100.5	76	0.106	0.326	17.20
236	3.5	0.1	37.894	0.161	1.25	78	1.80	68	50	69	100.4	76	0.105	0.324	17.13
237	3.5	0.0	38.055	0.161	1.26	78	1.81	67	49	69	100.4	75	0.107	0.327	17.16
238	3.5	0.0	38.217	0.162	1.26	78	1.81	67	49	69	100.8	75	0.106	0.326	17.20
239	3.5	0.0	38.378	0.161	1.25	78	1.81	67	49	69	100.2	75	0.106	0.326	17.16
240	3.5	0.0	38.538	0.160	1.26	78	1.80	67	49	69	99.6	76	0.107	0.327	17.20
241	3.4	0.1	38.699	0.161	1.26	78	1.81	67	49	69	99.9	76	0.108	0.329	17.29
242	3.4	0.0	38.861	0.162	1.26	78	1.81	67	49	69	100.2	75	0.107	0.327	17.28
243	3.4	0.0	39.022	0.161	1.26	78	1.80	67	49	69	99.7	76	0.107	0.327	17.24
244	3.4	0.0	39.184	0.162	1.26	78	1.81	67	49	68	100.5	75	0.107	0.327	17.24
245	3.4	0.0	39.345	0.161	1.25	78	1.80	67	49	68	99.9	75	0.106	0.326	17.20
246	3.4	0.0	39.505	0.160	1.26	78	1.80	67	49	69	99.4	75	0.107	0.327	17.20
247	3.3	0.1	39.666	0.161	1.26	78	1.81	67	49	69	99.9	75	0.107	0.327	17.24
248	3.3	0.0	39.827	0.161	1.26	78	1.81	67	49	69	99.9	75	0.106	0.326	17.20
249	3.3	0.0	39.989	0.162	1.26	78	1.81	67	49	68	100.4	75	0.109	0.330	17.28
250	3.3	0.0	40.151	0.162	1.26	78	1.81	67	49	68	100.0	76	0.108	0.329	17.36
251	3.2	0.1	40.312	0.161	1.25	78	1.80	67	49	68	99.6	76	0.106	0.326	17.25
252	3.2	0.0	40.472	0.160	1.26	78	1.80	67	49	68	99.6	75	0.105	0.324	17.12
253	3.2	0.0	40.633	0.161	1.26	78	1.81	67	49	68	100.1	76	0.110	0.332	17.28
254	3.2	0.0	40.794	0.161	1.25	78	1.81	67	49	68	99.6	76	0.106	0.326	17.33
255	3.1	0.1	40.956	0.162	1.26	78	1.81	67	49	68	100.4	76	0.107	0.327	17.21
256	3.1	0.0	41.118	0.162	1.25	78	1.81	67	49	68	100.8	76	0.106	0.326	17.21
257	3.1	0.0	41.279	0.161	1.25	78	1.81	67	49	68	100.2	75	0.106	0.326	17.16
258	3.1	0.0	41.439	0.160	1.26	78	1.81	67	49	69	99.8	75	0.105	0.324	17.11
259	3.1	0.0	41.600	0.161	1.26	78	1.80	67	49	68	100.3	75	0.108	0.329	17.20
260	3.0	0.1	41.761	0.161	1.25	78	1.81	67	49	68	99.8	75	0.107	0.327	17.28

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.1 in. Hg
Post-Test 0 cfm @ 6 in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
261	3.0	0.0	41.923	0.162	1.26	78	1.81	67	49	68	100.2	75	0.108	0.329	17.28
262	3.0	0.0	42.084	0.161	1.26	78	1.81	67	49	68	99.6	76	0.107	0.327	17.28
263	3.0	0.0	42.246	0.162	1.25	78	1.81	67	49	68	100.3	76	0.108	0.329	17.29
264	2.9	0.1	42.406	0.160	1.26	78	1.81	67	49	68	99.1	76	0.107	0.327	17.29
265	2.9	0.0	42.567	0.161	1.26	78	1.81	67	49	68	99.9	76	0.106	0.326	17.21
266	2.9	0.0	42.728	0.161	1.26	78	1.81	67	49	68	99.9	75	0.108	0.329	17.24
267	2.9	0.0	42.890	0.162	1.26	78	1.81	67	49	68	100.4	76	0.107	0.327	17.28
268	2.8	0.1	43.051	0.161	1.26	78	1.81	67	49	68	99.9	76	0.106	0.326	17.21
269	2.8	0.0	43.212	0.161	1.25	78	1.81	67	49	68	100.1	76	0.107	0.327	17.21
270	2.8	0.0	43.373	0.161	1.25	78	1.80	67	49	68	100.0	76	0.107	0.327	17.25
271	2.8	0.0	43.534	0.161	1.25	78	1.80	67	49	68	99.9	76	0.107	0.327	17.25
272	2.7	0.1	43.695	0.161	1.25	78	1.80	67	49	68	99.9	76	0.107	0.327	17.25
273	2.7	0.0	43.857	0.162	1.26	78	1.80	67	49	68	100.5	76	0.107	0.327	17.25
274	2.7	0.0	44.018	0.161	1.26	78	1.81	67	49	68	99.7	75	0.108	0.329	17.28
275	2.7	0.0	44.179	0.161	1.26	78	1.81	67	49	68	99.6	75	0.107	0.327	17.28
276	2.6	0.1	44.340	0.161	1.25	78	1.81	67	49	68	99.7	75	0.107	0.327	17.24
277	2.6	0.0	44.500	0.160	1.26	78	1.81	67	49	68	99.1	76	0.108	0.329	17.28
278	2.6	0.0	44.661	0.161	1.26	78	1.81	67	49	68	99.6	75	0.107	0.327	17.28
279	2.6	0.0	44.823	0.162	1.26	78	1.80	67	49	68	100.2	75	0.108	0.329	17.28
280	2.6	0.0	44.985	0.162	1.25	78	1.80	67	49	68	100.4	76	0.106	0.326	17.24
281	2.5	0.1	45.145	0.160	1.26	78	1.80	67	49	68	99.4	75	0.107	0.327	17.20
282	2.5	0.0	45.306	0.161	1.25	78	1.80	67	49	68	100.0	75	0.106	0.326	17.20
283	2.5	0.0	45.467	0.161	1.26	78	1.80	67	49	68	100.2	75	0.106	0.326	17.16
284	2.5	0.0	45.628	0.161	1.26	78	1.80	67	49	68	100.2	76	0.107	0.327	17.20
285	2.4	0.1	45.790	0.162	1.25	78	1.80	67	49	68	100.8	76	0.106	0.326	17.21
286	2.4	0.0	45.951	0.161	1.26	78	1.81	67	49	68	100.0	76	0.108	0.329	17.25
287	2.4	0.0	46.112	0.161	1.25	78	1.81	67	49	68	99.8	75	0.106	0.326	17.24
288	2.3	0.1	46.273	0.161	1.26	78	1.81	67	49	68	100.0	75	0.106	0.326	17.16
289	2.3	0.0	46.434	0.161	1.26	78	1.81	67	49	68	99.9	75	0.109	0.330	17.28
290	2.3	0.0	46.595	0.161	1.26	78	1.80	67	49	68	99.5	75	0.107	0.327	17.32
291	2.3	0.0	46.757	0.162	1.25	78	1.81	67	49	68	100.5	75	0.104	0.322	17.11
292	2.3	0.0	46.918	0.161	1.26	78	1.80	67	49	68	100.5	75	0.107	0.327	17.11
293	2.2	0.1	47.079	0.161	1.25	78	1.80	67	49	68	100.3	76	0.106	0.326	17.20
294	2.2	0.0	47.240	0.161	1.26	78	1.80	67	49	68	100.1	75	0.107	0.327	17.20
295	2.2	0.0	47.401	0.161	1.26	78	1.80	67	49	68	99.8	75	0.108	0.329	17.28
296	2.2	0.0	47.562	0.161	1.26	78	1.80	67	49	68	99.6	75	0.107	0.327	17.28
297	2.1	0.1	47.724	0.162	1.26	78	1.81	67	49	68	100.1	75	0.109	0.330	17.32
298	2.1	0.0	47.885	0.161	1.26	78	1.81	67	49	68	99.6	75	0.105	0.324	17.24
299	2.1	0.0	48.045	0.160	1.25	78	1.81	67	49	68	99.3	75	0.108	0.329	17.20
300	2.1	0.0	48.206	0.161	1.25	78	1.80	67	49	68	99.9	75	0.106	0.326	17.24
301	2.0	0.1	48.367	0.161	1.26	78	1.80	67	49	68	99.9	75	0.107	0.327	17.20
302	2.0	0.0	48.529	0.162	1.26	78	1.80	67	49	67	100.5	75	0.107	0.327	17.24
303	2.0	0.0	48.691	0.162	1.26	78	1.81	67	49	68	100.3	75	0.108	0.329	17.28
304	2.0	0.0	48.851	0.160	1.25	78	1.81	67	49	68	99.0	75	0.107	0.327	17.28

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ($"H_2O$)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ($"H_2O$)*	$\sqrt{dP}$	*vs*
305	2.0	0.0	49.012	0.161	1.26	78	1.80	67	49	68	99.6	75	0.108	0.329	17.28
306	1.9	0.1	49.173	0.161	1.25	78	1.81	67	49	68	99.3	75	0.109	0.330	17.36
307	1.9	0.0	49.334	0.161	1.26	78	1.81	67	49	68	99.5	75	0.105	0.324	17.24
308	1.9	0.0	49.495	0.161	1.26	78	1.81	67	49	68	99.9	75	0.108	0.329	17.20
309	1.9	0.0	49.657	0.162	1.26	78	1.80	67	49	68	100.3	75	0.108	0.329	17.32
310	1.8	0.1	49.818	0.161	1.25	78	1.80	67	49	68	99.7	75	0.105	0.324	17.20
311	1.8	0.0	49.979	0.161	1.26	78	1.81	67	49	68	100.0	75	0.108	0.329	17.20
312	1.8	0.0	50.140	0.161	1.25	78	1.81	67	49	68	99.8	75	0.107	0.327	17.28
313	1.8	0.0	50.301	0.161	1.26	78	1.80	67	49	68	99.6	75	0.108	0.329	17.28
314	1.7	0.1	50.462	0.161	1.26	78	1.81	67	49	68	99.7	75	0.106	0.326	17.24
315	1.7	0.0	50.624	0.162	1.26	78	1.80	67	49	68	100.6	76	0.107	0.327	17.20
316	1.7	0.0	50.785	0.161	1.25	78	1.80	67	49	68	100.1	75	0.106	0.326	17.20
317	1.7	0.0	50.945	0.160	1.26	78	1.80	67	49	68	99.4	75	0.107	0.327	17.20
318	1.6	0.1	51.106	0.161	1.26	78	1.81	67	49	68	99.9	75	0.107	0.327	17.24
319	1.6	0.0	51.267	0.161	1.26	78	1.80	67	49	68	99.8	75	0.107	0.327	17.24
320	1.6	0.0	51.429	0.162	1.25	78	1.81	67	49	68	100.5	76	0.107	0.327	17.24
321	1.6	0.0	51.591	0.162	1.26	78	1.81	67	49	68	100.5	75	0.107	0.327	17.24
322	1.5	0.1	51.752	0.161	1.25	78	1.80	67	49	67	99.7	75	0.108	0.329	17.28
323	1.5	0.0	51.912	0.160	1.26	78	1.81	67	49	68	98.9	76	0.108	0.329	17.32
324	1.5	0.0	52.073	0.161	1.26	78	1.80	67	49	68	99.7	76	0.106	0.326	17.25
325	1.5	0.0	52.234	0.161	1.25	78	1.80	67	49	68	100.1	76	0.106	0.326	17.17
326	1.5	0.0	52.396	0.162	1.25	78	1.81	67	49	68	100.9	75	0.106	0.326	17.16
327	1.4	0.1	52.557	0.161	1.26	78	1.80	67	49	68	100.3	75	0.106	0.326	17.16
328	1.4	0.0	52.718	0.161	1.25	78	1.81	67	49	68	99.9	75	0.109	0.330	17.28
329	1.4	0.0	52.879	0.161	1.26	78	1.80	67	49	67	99.5	75	0.107	0.327	17.32
330	1.4	0.0	53.040	0.161	1.25	78	1.81	67	49	68	99.6	76	0.107	0.327	17.24
331	1.3	0.1	53.201	0.161	1.26	78	1.81	67	49	67	99.9	75	0.107	0.327	17.24
332	1.3	0.0	53.363	0.162	1.26	78	1.80	67	49	67	100.4	75	0.107	0.327	17.24
333	1.3	0.0	53.524	0.161	1.26	78	1.80	67	49	67	99.9	75	0.106	0.326	17.20
334	1.3	0.0	53.685	0.161	1.25	78	1.81	67	49	68	100.2	76	0.106	0.326	17.16
335	1.2	0.1	53.846	0.161	1.25	78	1.81	67	49	68	100.5	76	0.105	0.324	17.13
336	1.2	0.0	54.007	0.161	1.26	78	1.81	67	49	67	100.5	75	0.106	0.326	17.12
337	1.2	0.0	54.168	0.161	1.25	78	1.80	67	49	68	100.4	75	0.106	0.326	17.16
338	1.2	0.0	54.330	0.162	1.26	78	1.81	67	49	68	100.8	75	0.107	0.327	17.20
339	1.2	0.0	54.491	0.161	1.25	78	1.81	67	49	68	100.0	75	0.106	0.326	17.20
340	1.1	0.1	54.652	0.161	1.26	78	1.80	67	49	68	99.9	75	0.108	0.329	17.24
341	1.1	0.0	54.812	0.160	1.26	78	1.80	67	49	68	99.2	75	0.106	0.326	17.24
342	1.1	0.0	54.973	0.161	1.26	78	1.81	67	49	68	100.2	75	0.105	0.324	17.11
343	1.1	0.0	55.134	0.161	1.25	78	1.81	67	49	68	100.5	75	0.106	0.326	17.11
344	1.1	0.0	55.296	0.162	1.26	78	1.80	67	49	68	101.0	75	0.106	0.326	17.16
345	1.0	0.1	55.457	0.161	1.26	78	1.81	67	49	68	100.0	75	0.108	0.329	17.24
346	1.0	0.0	55.618	0.161	1.26	78	1.81	67	49	68	99.6	75	0.108	0.329	17.32
347	1.0	0.0	55.779	0.161	1.26	78	1.80	67	49	68	99.3	75	0.108	0.329	17.32
348	1.0	0.0	55.940	0.161	1.26	78	1.81	67	49	68	99.3	75	0.108	0.329	17.32

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
349	0.9	0.1	56.101	0.161	1.26	78	1.80	67	49	68	99.3	75	0.108	0.329	17.32
350	0.9	0.0	56.263	0.162	1.25	78	1.81	67	49	68	100.1	75	0.107	0.327	17.28
351	0.9	0.0	56.424	0.161	1.26	78	1.81	67	49	68	99.6	75	0.108	0.329	17.28
352	0.9	0.0	56.585	0.161	1.26	78	1.81	67	49	67	99.6	75	0.107	0.327	17.28
353	0.9	0.0	56.746	0.161	1.26	78	1.80	67	49	68	99.7	75	0.107	0.327	17.24
354	0.8	0.1	56.907	0.161	1.26	78	1.80	67	49	67	100.0	75	0.105	0.324	17.16
355	0.8	0.0	57.068	0.161	1.26	78	1.80	67	49	68	100.4	75	0.106	0.326	17.11
356	0.8	0.0	57.230	0.162	1.25	78	1.81	67	49	67	101.1	75	0.105	0.324	17.11
357	0.8	0.0	57.391	0.161	1.26	78	1.81	67	49	67	100.0	75	0.110	0.332	17.28
358	0.8	0.0	57.551	0.160	1.25	78	1.80	67	49	67	98.7	75	0.107	0.327	17.36
359	0.7	0.1	57.712	0.161	1.26	78	1.80	67	49	67	99.5	75	0.107	0.327	17.24
360	0.7	0.0	57.873	0.161	1.25	78	1.80	67	49	67	99.8	75	0.107	0.327	17.24
361	0.7	0.0	58.035	0.162	1.26	78	1.81	67	49	67	100.4	74	0.107	0.327	17.23
362	0.7	0.0	58.196	0.161	1.25	78	1.81	67	49	68	99.6	75	0.108	0.329	17.27
363	0.7	0.0	58.357	0.161	1.25	78	1.80	67	49	68	99.5	75	0.108	0.329	17.32
364	0.6	0.1	58.518	0.161	1.26	78	1.81	67	50	68	99.5	75	0.107	0.327	17.28
365	0.6	0.0	58.679	0.161	1.26	78	1.81	67	50	67	99.5	75	0.109	0.330	17.32
366	0.6	0.0	58.840	0.161	1.26	78	1.80	67	49	67	99.1	75	0.109	0.330	17.40
367	0.6	0.0	59.002	0.162	1.26	78	1.81	67	49	67	99.6	75	0.108	0.329	17.36
368	0.6	0.0	59.163	0.161	1.26	78	1.80	67	49	67	99.1	75	0.109	0.330	17.36
369	0.6	0.0	59.324	0.161	1.25	78	1.80	67	49	67	99.1	75	0.108	0.329	17.36
370	0.5	0.1	59.484	0.160	1.26	78	1.80	67	49	67	98.8	75	0.106	0.326	17.24
371	0.5	0.0	59.645	0.161	1.26	78	1.80	67	49	67	99.8	75	0.108	0.329	17.24
372	0.5	0.0	59.806	0.161	1.26	78	1.80	67	49	67	99.6	75	0.108	0.329	17.32
373	0.5	0.0	59.968	0.162	1.25	78	1.81	67	50	67	100.1	75	0.107	0.327	17.28
374	0.5	0.0	60.129	0.161	1.26	78	1.81	67	49	67	99.2	75	0.111	0.333	17.40
375	0.5	0.0	60.290	0.161	1.25	78	1.81	67	49	67	99.1	75	0.105	0.324	17.32
376	0.4	0.1	60.451	0.161	1.26	78	1.80	67	49	67	99.9	75	0.106	0.326	17.11
377	0.4	0.0	60.612	0.161	1.26	78	1.80	67	49	67	100.3	74	0.106	0.326	17.15
378	0.4	0.0	60.773	0.161	1.26	78	1.81	67	50	67	100.0	75	0.108	0.329	17.23
379	0.4	0.0	60.935	0.162	1.25	78	1.81	67	50	67	100.2	75	0.108	0.329	17.32
380	0.4	0.0	61.096	0.161	1.26	78	1.81	67	50	67	99.6	75	0.106	0.326	17.24
381	0.4	0.0	61.257	0.161	1.25	78	1.80	67	50	67	100.0	75	0.106	0.326	17.16
382	0.3	0.1	61.417	0.160	1.25	78	1.81	67	49	67	99.5	74	0.107	0.327	17.19
383	0.3	0.0	61.578	0.161	1.26	78	1.81	67	50	67	99.8	75	0.108	0.329	17.27
384	0.3	0.0	61.739	0.161	1.26	78	1.81	67	50	67	99.6	75	0.107	0.327	17.28
385	0.3	0.0	61.902	0.163	1.25	78	1.81	67	50	67	100.8	75	0.108	0.329	17.28
386	0.3	0.0	62.062	0.160	1.25	78	1.80	67	50	67	99.2	75	0.105	0.324	17.20
387	0.2	0.1	62.223	0.161	1.26	78	1.81	67	50	67	100.2	75	0.107	0.327	17.16
388	0.2	0.0	62.384	0.161	1.26	78	1.81	67	50	67	100.2	75	0.106	0.326	17.20
389	0.2	0.0	62.545	0.161	1.26	78	1.80	67	50	67	100.0	74	0.107	0.327	17.19
390	0.2	0.0	62.706	0.161	1.25	78	1.81	67	50	67	99.7	74	0.108	0.329	17.26
391	0.2	0.0	62.868	0.162	1.25	78	1.81	67	50	68	100.4	75	0.105	0.324	17.19
392	0.1	0.1	63.029	0.161	1.25	78	1.81	67	50	67	100.3	75	0.106	0.326	17.11

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.016
Sampling Box ID: 335

Test Start Time: 13:56
Test Length: 394 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	17.1	in. Hg
Post-Test	0	cfm @	6	in. Hg

θ	Fuel Consumption		Train A Sampling System									Dilution Tunnel			
Elapsed Time (min)	*Scale Reading (lb.)*	*Weight Change*	*Meter Volume (ft^3)*	*Sample Rate (CFM)*	*Meter Δ H ("H_2O)*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Room Ambient (°F)*	*Pro - Rate*	*Tunnel Temp (°F)*	*Center dP ("H_2O)*	$\sqrt{dP}$	*vs*
393	0.1	0.0	63.190	0.161	1.26	78	1.81	67	50	67	100.4	75	0.106	0.326	17.16
394	0.0	0.1	63.351	0.161	1.26	78	1.81	67	50	67	99.9	75	0.109	0.330	17.28

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	**Train B Sampling System**								**Appliance Temperatures, °F**						
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*	*Top*	*Bottom*	*Back*	*Left*	*Right*	*Catalyst Exit*	*Average Stove Surface (Tot = Δ T)*
Tot / Avg	**63.664**	**0.162**	**0.95**	**76.7**	**2.00**	**66.96**	**49.86**	**100.0**	**638.1**	**352.0**	**312.5**	**224.1**	**365.9**	**773.8**	**26.8**
Minimum	0.000	0.147	-0.11	68	1.90	64	45	94.9	473	327	280	195	283	456	330
Max	63.664	0.163	0.96	78	2.00	68	51	103.3	748	383	359	243	424	1049	393
0	0.000		-0.11	68	1.90	64	49		490	377	325	222	314	479	346
1	0.147	0.147	0.96	68	2.00	65	45	94.9	484	377	324	217	309	456	342
2	0.308	0.161	0.95	68	2.00	65	45	103.3	476	376	321	216	307	495	339
3	0.467	0.159	0.95	68	2.00	65	45	100.1	473	376	316	214	302	486	336
4	0.626	0.159	0.94	69	2.00	65	45	99.8	473	376	311	211	298	684	334
5	0.785	0.159	0.94	69	2.00	65	45	99.7	475	376	307	209	296	632	333
6	0.943	0.158	0.94	69	2.00	65	45	99.2	477	376	304	210	293	659	332
7	1.103	0.160	0.97	69	2.00	65	45	100.8	480	376	300	206	291	626	331
8	1.264	0.161	0.96	69	2.00	65	45	101.4	485	376	297	206	288	648	330
9	1.424	0.160	0.96	69	2.00	65	45	100.5	491	376	294	205	287	665	331
10	1.585	0.161	0.96	69	2.00	65	45	101.0	497	376	292	203	285	673	331
11	1.745	0.160	0.95	69	2.00	65	45	100.6	502	375	289	203	286	673	331
12	1.905	0.160	0.95	69	2.00	65	45	101.0	506	375	287	203	286	765	331
13	2.065	0.160	0.95	69	2.00	65	45	101.2	513	375	285	202	284	742	332
14	2.226	0.161	0.95	69	2.00	65	45	101.5	521	375	284	202	283	718	333
15	2.385	0.159	0.95	69	2.00	65	45	100.0	527	375	282	200	284	726	334
16	2.545	0.160	0.95	70	2.00	66	45	101.1	531	375	281	199	283	714	334
17	2.706	0.161	0.95	70	2.00	66	45	102.0	535	375	281	198	283	709	334
18	2.866	0.160	0.95	70	2.00	66	45	100.6	540	374	281	198	283	685	335
19	3.025	0.159	0.95	70	2.00	66	45	99.2	546	374	280	198	283	719	336
20	3.186	0.161	0.95	70	2.00	66	45	100.5	552	374	281	195	283	740	337
21	3.346	0.160	0.95	70	2.00	66	45	100.1	558	373	281	196	283	734	338
22	3.506	0.160	0.95	70	2.00	66	45	100.1	563	373	281	198	283	737	340
23	3.666	0.160	0.94	71	2.00	66	46	100.1	568	373	282	199	283	732	341
24	3.826	0.160	0.95	71	2.00	66	46	100.3	574	372	282	200	284	766	342
25	3.986	0.160	0.95	71	2.00	66	46	100.5	580	372	282	197	284	810	343
26	4.147	0.161	0.94	71	2.00	66	46	101.1	586	372	283	196	284	845	344
27	4.306	0.159	0.94	71	2.00	66	46	99.9	593	371	284	197	285	870	346
28	4.466	0.160	0.95	71	2.00	66	46	100.5	601	371	285	197	287	879	348
29	4.627	0.161	0.94	72	2.00	66	46	100.6	608	370	287	198	288	892	350
30	4.786	0.159	0.95	72	2.00	66	46	99.3	615	370	288	201	289	909	353
31	4.947	0.161	0.95	72	2.00	66	46	100.9	623	370	290	200	291	902	355
32	5.108	0.161	0.95	72	2.00	66	46	101.1	636	369	290	198	292	853	357
33	5.267	0.159	0.94	72	2.00	66	46	99.9	652	369	290	202	293	821	361
34	5.427	0.160	0.94	72	2.00	66	46	100.1	658	369	290	202	295	833	363
35	5.588	0.161	0.94	72	2.00	66	47	100.3	663	368	291	200	297	890	364
36	5.748	0.160	0.94	73	2.00	66	47	99.5	669	368	292	204	299	934	366
37	5.908	0.160	0.95	73	2.00	66	47	99.5	675	368	293	202	301	979	368
38	6.069	0.161	0.95	73	2.00	66	47	100.5	680	368	294	200	303	1034	369
39	6.229	0.160	0.94	73	2.00	67	47	100.2	684	367	295	203	306	1026	371
40	6.389	0.160	0.95	73	2.00	67	47	100.6	689	367	296	203	308	1027	373

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks

Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
41	6.549	0.160	0.95	73	2.00	67	47	100.4	693	367	297	205	310	1020	374
42	6.710	0.161	0.95	73	2.00	67	47	100.7	698	367	298	207	313	1012	377
43	6.870	0.160	0.95	73	2.00	67	47	100.0	703	366	299	202	313	1009	377
44	7.031	0.161	0.95	74	2.00	67	47	100.2	708	366	299	204	315	1049	378
45	7.192	0.161	0.95	74	2.00	67	47	100.2	713	366	299	206	315	1036	380
46	7.352	0.160	0.95	74	2.00	67	48	100.1	718	366	299	206	317	1023	381
47	7.512	0.160	0.95	74	2.00	67	48	100.3	723	365	299	209	317	1018	383
48	7.674	0.162	0.95	74	2.00	67	48	101.5	728	365	299	209	319	1021	384
49	7.834	0.160	0.94	74	2.00	67	48	99.7	730	365	299	210	320	952	385
50	7.994	0.160	0.95	74	2.00	67	48	99.2	731	364	299	208	320	987	384
51	8.155	0.161	0.95	74	2.00	67	48	100.1	730	364	300	209	321	950	385
52	8.316	0.161	0.94	74	2.00	67	48	100.3	728	364	301	211	323	935	385
53	8.476	0.160	0.95	74	2.00	67	48	99.2	726	364	301	209	324	936	385
54	8.637	0.161	0.95	74	2.00	67	48	99.5	725	363	302	210	324	858	385
55	8.798	0.161	0.95	75	2.00	67	48	99.9	729	363	301	210	324	855	385
56	8.958	0.160	0.95	75	2.00	67	48	99.6	735	362	300	213	325	852	387
57	9.119	0.161	0.95	75	2.00	67	48	99.7	739	362	299	210	324	845	387
58	9.281	0.162	0.95	75	2.00	67	48	100.1	743	361	299	210	324	841	387
59	9.442	0.161	0.94	75	2.00	67	48	99.9	745	361	298	212	324	837	388
60	9.602	0.160	0.95	75	2.00	67	48	99.4	747	361	297	212	324	833	388
61	9.763	0.161	0.96	75	2.00	67	48	99.8	748	360	296	207	324	832	387
62	9.925	0.162	0.95	75	2.00	67	48	100.3	748	360	295	212	325	831	388
63	10.086	0.161	0.96	75	2.00	67	49	99.9	748	359	295	211	323	829	387
64	10.247	0.161	0.96	75	2.00	67	49	100.1	748	359	294	212	323	825	387
65	10.409	0.162	0.96	75	2.00	67	49	100.6	747	358	293	214	323	826	387
66	10.571	0.162	0.96	75	2.00	67	49	100.4	747	357	293	210	324	826	386
67	10.732	0.161	0.96	75	2.00	67	49	99.8	746	357	292	211	323	824	386
68	10.894	0.162	0.95	75	2.00	67	49	100.7	745	356	292	211	323	818	385
69	11.056	0.162	0.96	76	2.00	67	49	100.8	744	356	291	209	323	821	385
70	11.218	0.162	0.96	76	2.00	67	49	100.7	743	355	290	211	323	818	384
71	11.379	0.161	0.96	76	2.00	67	49	99.9	742	354	290	212	322	817	384
72	11.540	0.161	0.96	76	2.00	67	49	99.5	741	354	289	211	322	813	383
73	11.702	0.162	0.95	76	2.00	67	49	100.3	740	353	289	211	322	811	383
74	11.864	0.162	0.95	76	2.00	67	49	100.6	738	352	288	210	322	811	382
75	12.025	0.161	0.96	76	2.00	67	49	100.1	737	351	288	209	323	810	382
76	12.186	0.161	0.96	76	2.00	67	49	100.2	736	351	288	211	323	810	382
77	12.349	0.163	0.95	76	2.00	67	49	101.3	736	350	287	209	323	810	381
78	12.510	0.161	0.95	76	2.00	67	49	99.5	735	350	287	210	323	812	381
79	12.671	0.161	0.95	76	2.00	67	49	99.1	735	349	286	208	324	813	380
80	12.833	0.162	0.96	76	2.00	67	49	99.5	735	348	286	210	324	817	381
81	12.996	0.163	0.96	76	2.00	67	49	100.2	736	347	285	213	325	819	381
82	13.157	0.161	0.96	76	2.00	67	49	99.4	737	347	285	214	324	819	381
83	13.318	0.161	0.96	76	2.00	67	49	99.6	738	346	285	211	324	821	381
84	13.480	0.162	0.96	76	2.00	67	49	100.2	739	345	285	210	324	824	381

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
85	13.642	0.162	0.96	76	2.00	67	49	100.4	740	344	284	211	325	824	381
86	13.803	0.161	0.95	76	2.00	67	49	100.2	740	344	284	210	325	828	381
87	13.965	0.162	0.96	76	2.00	67	49	100.9	741	343	284	212	325	826	381
88	14.127	0.162	0.95	76	2.00	67	49	100.6	742	343	284	211	326	828	381
89	14.289	0.162	0.95	76	2.00	67	49	100.7	743	342	283	211	326	831	381
90	14.450	0.161	0.96	76	2.00	67	49	100.4	744	342	283	209	327	832	381
91	14.612	0.162	0.96	76	2.00	67	49	101.1	745	341	283	212	326	833	381
92	14.773	0.161	0.96	77	2.00	67	49	100.0	745	340	283	211	327	834	381
93	14.935	0.162	0.96	77	2.00	67	50	100.1	746	340	283	210	327	834	381
94	15.097	0.162	0.96	77	2.00	67	50	100.1	746	339	283	210	328	836	381
95	15.258	0.161	0.96	77	2.00	67	50	99.5	747	339	283	211	329	835	382
96	15.420	0.162	0.96	77	2.00	67	50	100.2	747	338	283	212	329	837	382
97	15.582	0.162	0.96	77	2.00	67	49	100.2	747	338	283	212	329	837	382
98	15.743	0.161	0.95	77	2.00	67	50	99.7	747	337	283	212	329	836	382
99	15.905	0.162	0.96	77	2.00	67	49	100.6	747	337	283	211	330	834	382
100	16.067	0.162	0.95	77	2.00	67	50	100.3	747	337	283	211	332	834	382
101	16.229	0.162	0.95	77	2.00	67	50	100.1	747	336	283	213	331	834	382
102	16.390	0.161	0.96	77	2.00	67	50	99.4	747	336	284	210	331	832	382
103	16.552	0.162	0.96	77	2.00	67	50	99.8	747	336	284	211	333	833	382
104	16.715	0.163	0.96	77	2.00	67	50	100.5	746	335	284	213	332	833	382
105	16.876	0.161	0.95	77	2.00	67	50	99.4	746	335	284	214	333	925	382
106	17.037	0.161	0.96	77	2.00	67	50	99.7	745	334	284	214	334	833	382
107	17.199	0.162	0.96	77	2.00	67	50	100.4	744	334	285	216	335	834	383
108	17.362	0.163	0.96	77	2.00	67	50	100.8	744	334	285	217	335	837	383
109	17.523	0.161	0.95	77	2.00	67	50	99.4	744	334	285	215	336	837	383
110	17.684	0.161	0.95	77	2.00	67	50	99.8	744	333	285	213	337	839	382
111	17.846	0.162	0.96	77	2.00	67	50	100.6	744	333	285	216	337	841	383
112	18.009	0.163	0.95	77	2.00	67	50	100.9	743	333	286	213	338	840	383
113	18.170	0.161	0.95	77	2.00	67	50	99.6	743	332	286	214	338	841	383
114	18.332	0.162	0.95	77	2.00	67	50	100.1	743	332	286	216	340	842	383
115	18.493	0.161	0.96	77	2.00	67	50	99.6	743	332	286	217	340	841	384
116	18.656	0.163	0.96	77	2.00	67	50	100.9	743	331	286	218	339	842	383
117	18.817	0.161	0.95	77	2.00	67	50	99.2	743	331	287	217	339	842	383
118	18.979	0.162	0.96	77	2.00	67	50	99.4	743	331	287	215	340	841	383
119	19.141	0.162	0.96	77	2.00	67	50	99.6	743	331	288	218	340	843	384
120	19.303	0.162	0.95	77	2.00	67	50	99.9	743	331	288	216	341	844	384
121	19.465	0.162	0.95	77	2.00	67	50	100.2	743	331	288	220	342	843	385
122	19.626	0.161	0.95	77	2.00	67	50	99.8	743	331	289	217	343	844	385
123	19.788	0.162	0.95	77	2.00	67	50	100.2	743	331	289	218	343	844	385
124	19.951	0.163	0.96	77	2.00	67	50	100.4	743	330	289	217	344	844	385
125	20.113	0.162	0.95	77	2.00	67	50	99.8	743	330	290	219	344	846	385
126	20.274	0.161	0.96	77	2.00	67	50	99.6	743	330	290	221	346	845	386
127	20.436	0.162	0.96	77	2.00	67	50	100.4	743	330	290	219	347	847	386
128	20.598	0.162	0.95	77	2.00	67	50	100.1	743	330	291	221	347	848	386

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
129	20.760	0.162	0.95	77	2.00	67	50	99.6	742	330	291	219	348	850	386
130	20.921	0.161	0.95	77	2.00	67	50	98.8	742	330	291	220	348	852	386
131	21.083	0.162	0.96	77	2.00	67	50	99.4	742	329	292	221	350	856	387
132	21.246	0.163	0.95	77	2.00	67	50	100.3	742	329	292	221	350	856	387
133	21.407	0.161	0.95	77	2.00	67	50	99.4	742	329	292	219	351	856	387
134	21.568	0.161	0.96	77	2.00	67	50	99.8	742	329	293	220	352	855	387
135	21.730	0.162	0.95	77	2.00	67	50	100.4	743	329	293	221	352	855	388
136	21.893	0.163	0.95	77	2.00	67	50	100.6	743	329	293	224	354	855	389
137	22.054	0.161	0.95	77	2.00	67	50	99.0	743	329	294	221	353	854	388
138	22.215	0.161	0.95	77	2.00	67	50	99.0	744	329	294	222	355	855	389
139	22.377	0.162	0.95	77	2.00	67	50	100.1	744	329	294	226	355	855	390
140	22.540	0.163	0.95	77	2.00	67	50	100.9	744	328	294	222	357	853	389
141	22.701	0.161	0.95	78	2.00	67	50	99.2	744	328	294	224	357	851	389
142	22.862	0.161	0.95	78	2.00	67	50	98.6	744	328	295	223	357	850	389
143	23.024	0.162	0.96	78	2.00	67	50	99.3	744	328	295	221	357	850	389
144	23.187	0.163	0.95	78	2.00	67	50	100.7	743	328	295	222	358	848	389
145	23.348	0.161	0.95	78	2.00	67	50	99.6	743	328	295	221	358	843	389
146	23.509	0.161	0.95	78	2.00	67	50	99.5	742	328	295	224	361	840	390
147	23.671	0.162	0.96	78	2.00	67	50	100.1	741	328	296	223	361	838	390
148	23.833	0.162	0.95	78	2.00	67	50	100.2	740	328	296	223	361	833	390
149	23.995	0.162	0.95	78	2.00	67	50	100.3	739	328	296	223	362	831	390
150	24.156	0.161	0.96	78	2.00	67	50	99.3	737	327	297	225	362	829	390
151	24.318	0.162	0.95	78	2.00	67	50	99.6	736	327	297	227	362	826	390
152	24.481	0.163	0.95	78	2.00	67	50	100.2	734	327	298	224	363	825	389
153	24.642	0.161	0.95	78	2.00	67	50	98.7	732	327	298	223	364	824	389
154	24.804	0.162	0.95	78	2.00	67	50	99.6	731	327	298	225	364	823	389
155	24.966	0.162	0.96	78	2.00	67	50	100.3	729	327	299	224	365	819	389
156	25.128	0.162	0.95	78	2.00	67	50	100.5	727	327	299	227	365	819	389
157	25.289	0.161	0.95	78	2.00	67	50	99.4	725	327	300	224	366	818	388
158	25.451	0.162	0.95	78	2.00	67	50	100.0	724	327	300	223	366	815	388
159	25.613	0.162	0.95	78	2.00	67	50	100.3	722	327	301	226	368	814	389
160	25.775	0.162	0.95	78	2.00	67	50	100.3	720	327	301	226	367	811	388
161	25.936	0.161	0.95	78	2.00	67	50	99.7	719	327	302	226	368	810	388
162	26.098	0.162	0.95	78	2.00	67	50	100.5	717	327	302	227	368	809	388
163	26.260	0.162	0.95	78	2.00	67	50	100.2	716	327	303	227	370	807	389
164	26.422	0.162	0.95	78	2.00	67	50	100.0	714	327	303	228	368	806	388
165	26.583	0.161	0.95	78	2.00	67	50	99.4	712	327	303	226	369	804	387
166	26.745	0.162	0.95	78	2.00	67	50	100.3	711	327	304	228	370	803	388
167	26.907	0.162	0.96	78	2.00	67	50	100.5	709	327	304	228	370	801	388
168	27.069	0.162	0.95	78	2.00	67	50	100.3	708	327	305	227	370	799	387
169	27.231	0.162	0.95	78	2.00	67	50	100.2	706	328	305	226	372	796	387
170	27.392	0.161	0.95	78	2.00	67	50	99.6	705	328	305	226	371	795	387
171	27.554	0.162	0.95	78	2.00	67	50	100.4	703	328	306	226	372	794	387
172	27.716	0.162	0.95	78	2.00	67	50	100.0	702	328	306	228	373	794	387

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
173	27.878	0.162	0.95	78	2.00	67	50	99.6	700	328	307	226	372	792	387
174	28.039	0.161	0.95	78	2.00	67	50	98.9	699	328	307	224	371	792	386
175	28.202	0.163	0.95	78	2.00	68	50	100.0	698	328	307	226	371	792	386
176	28.364	0.162	0.95	78	2.00	68	50	99.6	697	328	308	226	372	793	386
177	28.525	0.161	0.95	78	2.00	68	50	98.8	696	328	308	229	372	792	387
178	28.687	0.162	0.95	78	2.00	68	50	99.1	695	329	309	227	372	793	386
179	28.849	0.162	0.95	78	2.00	67	50	99.6	694	329	309	228	372	792	386
180	29.011	0.162	0.95	78	2.00	67	50	100.3	694	329	309	229	373	792	387
181	29.172	0.161	0.95	78	2.00	67	50	99.8	693	329	310	230	372	793	387
182	29.334	0.162	0.95	78	2.00	68	50	100.0	692	329	310	228	371	790	386
183	29.496	0.162	0.95	78	2.00	67	50	99.3	690	329	311	226	373	783	386
184	29.658	0.162	0.95	78	2.00	68	50	99.7	688	329	311	230	373	786	386
185	29.819	0.161	0.95	78	2.00	67	50	99.8	687	329	312	231	372	787	386
186	29.981	0.162	0.95	78	2.00	68	50	100.8	686	329	312	229	373	787	386
187	30.144	0.163	0.96	78	2.00	68	50	101.7	686	329	312	231	373	787	386
188	30.305	0.161	0.95	78	2.00	68	50	99.7	685	330	313	230	371	787	386
189	30.467	0.162	0.95	78	2.00	68	50	99.8	685	330	313	228	373	788	386
190	30.629	0.162	0.95	78	2.00	68	51	100.0	684	330	314	230	373	787	386
191	30.791	0.162	0.95	78	2.00	68	51	99.9	684	330	314	229	373	787	386
192	30.953	0.162	0.95	78	2.00	68	51	99.6	683	330	314	231	373	786	386
193	31.114	0.161	0.95	78	2.00	68	51	98.9	683	330	315	230	373	786	386
194	31.276	0.162	0.96	78	2.00	68	50	99.8	682	331	315	228	373	787	386
195	31.439	0.163	0.95	78	2.00	68	51	101.0	682	331	316	227	373	775	386
196	31.600	0.161	0.95	78	2.00	68	51	100.2	679	331	316	229	374	767	386
197	31.761	0.161	0.95	78	2.00	68	51	100.0	674	331	317	233	375	762	386
198	31.923	0.162	0.95	78	2.00	68	51	100.0	670	332	318	230	376	760	385
199	32.086	0.163	0.95	78	2.00	68	51	100.4	666	332	319	232	378	762	385
200	32.247	0.161	0.95	78	2.00	68	51	99.2	663	332	319	233	381	759	386
201	32.409	0.162	0.95	78	2.00	68	51	100.4	660	332	320	233	381	760	385
202	32.570	0.161	0.95	78	2.00	68	51	99.9	658	332	320	233	381	761	385
203	32.733	0.163	0.95	78	2.00	68	51	100.8	656	332	321	231	385	761	385
204	32.895	0.162	0.95	78	2.00	68	51	100.1	654	332	321	232	387	763	385
205	33.056	0.161	0.95	78	2.00	68	51	99.3	653	332	322	232	387	765	385
206	33.218	0.162	0.95	78	2.00	67	51	99.9	653	332	322	231	389	766	385
207	33.380	0.162	0.95	78	2.00	67	51	100.1	653	333	322	231	391	770	386
208	33.542	0.162	0.95	78	2.00	68	51	100.1	653	333	323	231	392	773	386
209	33.703	0.161	0.95	78	2.00	68	51	99.4	653	333	323	232	395	773	387
210	33.865	0.162	0.95	78	2.00	68	51	99.9	653	333	323	232	396	777	387
211	34.028	0.163	0.95	78	2.00	68	51	100.9	653	333	324	233	398	777	388
212	34.189	0.161	0.94	78	2.00	68	51	99.8	653	334	325	232	401	777	389
213	34.350	0.161	0.95	78	2.00	68	51	99.4	652	334	325	233	405	776	390
214	34.512	0.162	0.95	78	2.00	68	51	99.9	651	334	325	233	408	774	390
215	34.675	0.163	0.95	78	2.00	68	51	100.3	650	335	325	231	411	776	390
216	34.836	0.161	0.95	78	2.00	68	51	98.9	649	335	325	230	415	774	391

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
217	34.998	0.162	0.95	78	2.00	68	51	99.9	649	335	325	232	416	774	391
218	35.159	0.161	0.95	78	2.00	68	51	99.6	649	336	326	230	418	778	392
219	35.322	0.163	0.95	78	2.00	68	51	100.8	649	336	326	231	420	773	392
220	35.484	0.162	0.95	78	2.00	68	51	99.7	649	336	326	231	421	770	393
221	35.645	0.161	0.95	78	2.00	67	51	98.9	648	336	326	227	423	766	392
222	35.807	0.162	0.95	78	2.00	67	51	99.4	646	337	325	233	423	761	393
223	35.970	0.163	0.96	78	2.00	67	51	100.0	644	337	325	234	424	755	393
224	36.131	0.161	0.95	78	2.00	67	51	99.1	641	337	325	232	424	747	392
225	36.293	0.162	0.95	78	2.00	67	51	99.9	638	337	324	228	423	741	390
226	36.455	0.162	0.95	78	2.00	67	51	100.5	634	338	324	229	422	743	389
227	36.618	0.163	0.95	78	2.00	67	51	101.6	630	338	324	226	419	738	387
228	36.779	0.161	0.95	78	2.00	67	51	99.8	626	338	323	226	418	737	386
229	36.941	0.162	0.95	78	2.00	67	51	99.7	622	339	323	227	417	733	386
230	37.103	0.162	0.95	78	2.00	67	51	99.6	618	339	323	231	416	728	385
231	37.265	0.162	0.95	78	2.00	67	51	99.6	614	339	322	228	415	724	384
232	37.427	0.162	0.95	78	2.00	67	51	99.4	610	339	322	227	415	722	383
233	37.589	0.162	0.95	78	2.00	67	51	99.3	606	339	321	229	413	721	382
234	37.751	0.162	0.95	78	2.00	67	51	99.5	602	340	321	226	413	720	380
235	37.913	0.162	0.95	78	2.00	67	51	100.0	599	340	321	227	412	718	380
236	38.075	0.162	0.95	78	2.00	67	51	100.5	596	340	320	226	411	718	379
237	38.237	0.162	0.95	78	2.00	67	51	100.6	593	340	320	230	409	717	378
238	38.398	0.161	0.95	78	2.00	67	51	99.7	590	340	319	227	409	719	377
239	38.561	0.163	0.95	78	2.00	67	51	100.9	588	340	319	227	408	719	376
240	38.723	0.162	0.95	78	2.00	67	51	100.4	585	341	318	226	407	716	375
241	38.884	0.161	0.95	78	2.00	67	51	99.4	583	341	318	226	405	718	375
242	39.046	0.162	0.96	78	2.00	67	51	99.7	581	341	317	226	407	716	374
243	39.209	0.163	0.96	78	2.00	67	51	100.5	579	341	317	225	407	718	374
244	39.371	0.162	0.95	78	2.00	67	51	100.0	577	341	317	227	405	721	373
245	39.532	0.161	0.95	78	2.00	67	51	99.4	576	341	316	226	406	720	373
246	39.694	0.162	0.96	78	2.00	67	51	100.2	575	341	316	225	404	723	372
247	39.857	0.163	0.96	78	2.00	67	51	100.7	573	341	315	226	405	718	372
248	40.019	0.162	0.95	78	2.00	67	51	100.1	572	342	315	227	404	724	372
249	40.180	0.161	0.95	78	2.00	67	51	99.3	571	342	315	229	406	726	373
250	40.342	0.162	0.95	78	2.00	67	51	99.6	570	342	314	224	405	720	371
251	40.504	0.162	0.95	78	2.00	67	51	99.7	569	342	314	228	407	723	372
252	40.666	0.162	0.95	78	2.00	67	51	100.3	569	342	314	228	406	724	372
253	40.828	0.162	0.95	78	2.00	67	51	100.2	568	343	314	226	406	726	371
254	40.990	0.162	0.95	78	2.00	67	51	99.7	568	343	314	225	406	722	371
255	41.152	0.162	0.95	78	2.00	67	51	99.9	567	343	314	226	406	724	371
256	41.314	0.162	0.95	78	2.00	67	51	100.3	567	343	314	225	406	725	371
257	41.476	0.162	0.95	78	2.00	67	51	100.3	567	344	314	224	408	727	371
258	41.638	0.162	0.95	78	2.00	67	51	100.5	567	344	314	225	407	733	371
259	41.800	0.162	0.96	78	2.00	67	51	100.4	567	344	314	228	407	733	372
260	41.962	0.162	0.95	78	2.00	67	51	99.9	567	344	314	228	407	735	372

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
261	42.124	0.162	0.96	78	2.00	67	51	99.7	567	345	315	226	407	742	372
262	42.286	0.162	0.96	78	2.00	67	51	99.8	567	345	315	228	408	741	373
263	42.448	0.162	0.95	78	2.00	67	51	99.8	567	346	315	227	409	742	373
264	42.610	0.162	0.95	78	2.00	67	51	99.8	568	346	315	230	408	740	373
265	42.772	0.162	0.95	78	2.00	67	51	100.0	568	347	315	229	408	743	373
266	42.934	0.162	0.96	78	2.00	67	51	100.1	569	347	315	229	409	746	374
267	43.096	0.162	0.95	78	2.00	67	51	99.9	569	347	316	230	410	742	374
268	43.258	0.162	0.95	78	2.00	67	51	100.1	570	348	316	228	410	737	374
269	43.420	0.162	0.96	78	2.00	67	51	100.3	570	348	316	225	410	740	374
270	43.581	0.161	0.96	78	2.00	67	51	99.5	571	349	316	228	412	738	375
271	43.743	0.162	0.96	78	2.00	67	51	100.0	571	349	317	229	411	743	375
272	43.906	0.163	0.95	78	2.00	67	51	100.7	571	350	317	231	410	738	376
273	44.068	0.162	0.95	78	2.00	67	51	100.0	572	350	318	231	410	737	376
274	44.229	0.161	0.95	78	2.00	67	51	99.2	572	350	318	232	410	740	376
275	44.391	0.162	0.95	78	2.00	67	51	99.7	573	351	318	230	411	737	377
276	44.554	0.163	0.95	78	2.00	67	51	100.4	573	351	319	231	410	739	377
277	44.716	0.162	0.95	78	2.00	67	51	99.9	573	352	319	233	409	737	377
278	44.877	0.161	0.95	78	2.00	67	51	99.1	574	352	319	232	408	741	377
279	45.039	0.162	0.95	78	2.00	67	51	99.7	574	353	320	231	407	744	377
280	45.202	0.163	0.95	78	2.00	67	51	100.5	575	353	320	230	408	741	377
281	45.364	0.162	0.95	78	2.00	67	51	100.1	575	353	321	231	410	740	378
282	45.525	0.161	0.95	78	2.00	67	51	99.5	574	354	321	233	408	751	378
283	45.687	0.162	0.95	78	2.00	67	51	100.3	574	354	321	229	409	755	377
284	45.850	0.163	0.96	78	2.00	67	51	101.0	574	355	322	232	409	758	378
285	46.011	0.161	0.95	78	2.00	67	51	99.7	574	355	322	232	407	757	378
286	46.173	0.162	0.96	78	2.00	67	51	100.2	574	356	322	230	407	757	378
287	46.335	0.162	0.95	78	2.00	67	51	100.0	573	356	323	232	409	757	379
288	46.498	0.163	0.95	78	2.00	67	51	100.8	573	356	323	232	409	756	379
289	46.659	0.161	0.95	78	2.00	67	51	99.4	573	357	323	230	409	756	378
290	46.821	0.162	0.95	78	2.00	67	51	99.6	573	357	324	232	409	759	379
291	46.983	0.162	0.95	78	2.00	67	51	100.1	573	358	324	235	408	756	380
292	47.145	0.162	0.95	78	2.00	67	51	100.7	573	358	324	232	410	756	379
293	47.307	0.162	0.95	78	2.00	67	51	100.5	573	359	325	233	409	760	380
294	47.469	0.162	0.95	78	2.00	67	51	100.2	572	359	325	234	409	757	380
295	47.631	0.162	0.95	78	2.00	67	51	99.9	572	359	325	235	408	758	380
296	47.793	0.162	0.95	78	2.00	67	51	99.7	573	360	325	232	412	756	380
297	47.955	0.162	0.95	78	2.00	67	51	99.6	573	360	326	232	409	759	380
298	48.116	0.161	0.95	78	2.00	67	51	99.1	573	361	326	236	411	754	381
299	48.278	0.162	0.95	78	2.00	67	51	100.1	573	361	326	234	410	754	381
300	48.441	0.163	0.96	78	2.00	67	51	100.7	573	362	326	235	409	752	381
301	48.603	0.162	0.95	78	2.00	67	51	100.1	573	362	327	234	409	751	381
302	48.764	0.161	0.95	78	2.00	67	51	99.4	574	363	327	233	410	751	381
303	48.926	0.162	0.95	78	2.00	67	51	99.8	574	363	327	237	409	756	382
304	49.088	0.162	0.95	78	2.00	67	51	99.7	575	364	327	234	410	759	382

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
305	49.250	0.162	0.95	78	2.00	67	51	99.7	575	364	328	238	410	760	383
306	49.412	0.162	0.95	78	2.00	67	51	99.5	575	364	328	235	411	762	383
307	49.574	0.162	0.95	78	2.00	67	51	99.6	576	365	328	239	409	754	383
308	49.736	0.162	0.95	78	2.00	67	51	100.1	576	365	328	237	410	756	383
309	49.898	0.162	0.95	78	2.00	67	51	99.8	577	366	329	237	411	753	384
310	50.060	0.162	0.96	78	2.00	67	51	99.8	577	366	329	236	408	750	383
311	50.222	0.162	0.96	78	2.00	67	51	100.2	578	366	329	236	411	746	384
312	50.384	0.162	0.95	78	2.00	67	51	99.9	578	367	330	237	410	743	384
313	50.546	0.162	0.94	78	2.00	67	51	99.7	579	367	330	237	409	744	384
314	50.708	0.162	0.95	78	2.00	67	51	99.8	579	368	330	236	410	746	385
315	50.870	0.162	0.96	78	2.00	67	51	100.1	580	368	331	237	409	742	385
316	51.032	0.162	0.95	78	2.00	67	51	100.2	580	368	331	234	407	740	384
317	51.194	0.162	0.95	78	2.00	67	51	100.2	580	369	331	238	411	738	386
318	51.355	0.161	0.95	78	2.00	67	51	99.4	580	369	331	235	410	747	385
319	51.517	0.162	0.96	78	2.00	67	51	99.9	581	370	331	235	409	752	385
320	51.680	0.163	0.95	78	2.00	67	51	100.6	580	370	331	236	409	755	385
321	51.842	0.162	0.95	78	2.00	67	51	100.0	580	371	331	236	407	754	385
322	52.003	0.161	0.95	78	2.00	67	51	99.2	580	371	331	235	407	752	385
323	52.165	0.162	0.96	78	2.00	67	51	99.7	579	371	331	236	407	755	385
324	52.327	0.162	0.96	78	2.00	67	51	99.8	579	371	331	237	406	754	385
325	52.490	0.163	0.95	78	2.00	67	51	100.9	579	372	331	235	406	759	385
326	52.651	0.161	0.95	78	2.00	67	51	99.8	578	372	331	238	404	752	385
327	52.813	0.162	0.95	78	2.00	67	51	100.4	578	372	331	238	406	751	385
328	52.975	0.162	0.95	78	2.00	67	51	100.1	578	372	332	238	401	748	384
329	53.138	0.163	0.95	78	2.00	67	51	100.2	578	372	332	239	402	749	385
330	53.299	0.161	0.95	78	2.00	67	51	99.2	578	372	332	238	401	738	384
331	53.461	0.162	0.96	78	2.00	67	51	100.0	577	372	332	237	401	736	384
332	53.623	0.162	0.96	78	2.00	67	51	99.9	577	373	332	236	399	737	383
333	53.786	0.163	0.95	78	2.00	67	51	100.7	577	373	333	239	398	730	384
334	53.947	0.161	0.95	78	2.00	67	51	99.8	577	373	333	241	398	733	384
335	54.109	0.162	0.95	78	2.00	67	51	100.7	576	373	333	240	396	730	384
336	54.271	0.162	0.96	78	2.00	67	51	100.7	576	374	334	239	397	731	384
337	54.433	0.162	0.95	78	2.00	67	51	100.5	576	374	334	240	395	733	384
338	54.595	0.162	0.95	78	2.00	67	51	100.3	575	374	334	240	394	733	383
339	54.756	0.161	0.95	78	2.00	67	51	99.6	575	374	334	241	395	731	384
340	54.918	0.162	0.96	78	2.00	67	51	100.1	574	374	334	237	395	731	383
341	55.081	0.163	0.95	78	2.00	67	51	100.6	574	375	335	239	393	725	383
342	55.243	0.162	0.95	78	2.00	67	51	100.3	573	375	335	240	392	726	383
343	55.404	0.161	0.96	78	2.00	67	51	100.0	573	375	336	242	392	727	384
344	55.566	0.162	0.95	78	2.00	67	51	100.5	572	375	337	239	392	725	383
345	55.729	0.163	0.95	78	2.00	67	51	100.8	571	375	338	241	391	724	383
346	55.891	0.162	0.95	78	2.00	67	51	99.7	571	376	340	241	392	726	384
347	56.052	0.161	0.95	78	2.00	67	51	98.9	570	376	341	241	392	716	384
348	56.214	0.162	0.95	78	2.00	67	51	99.5	569	376	343	239	391	710	384

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	Train B Sampling System								Appliance Temperatures, °F						
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate	Top	Bottom	Back	Left	Right	Catalyst Exit	Average Stove Surface (Tot = Δ T)
349	56.377	0.163	0.95	78	2.00	67	51	100.1	568	376	344	241	389	712	384
350	56.538	0.161	0.95	78	2.00	67	51	99.0	567	376	345	243	390	707	384
351	56.700	0.162	0.95	78	2.00	67	51	99.7	566	376	346	240	388	700	383
352	56.862	0.162	0.96	78	2.00	67	51	99.7	565	376	348	243	390	702	384
353	57.025	0.163	0.95	78	2.00	67	51	100.4	564	376	349	240	388	703	383
354	57.186	0.161	0.95	78	2.00	67	51	99.6	563	376	350	240	386	700	383
355	57.348	0.162	0.95	78	2.00	67	51	100.5	562	376	352	241	386	699	383
356	57.510	0.162	0.95	78	2.00	67	51	100.7	561	376	353	241	387	696	384
357	57.672	0.162	0.95	78	2.00	67	51	100.2	560	376	354	238	385	694	383
358	57.834	0.162	0.95	78	2.00	67	51	99.5	559	376	355	239	385	687	383
359	57.996	0.162	0.95	78	2.00	67	51	99.6	557	376	356	241	383	687	383
360	58.157	0.161	0.95	78	2.00	67	51	99.3	556	376	357	241	384	677	383
361	58.320	0.163	0.95	78	2.00	67	51	100.5	555	376	358	239	382	678	382
362	58.482	0.162	0.95	78	2.00	67	51	99.8	554	376	358	239	385	670	382
363	58.643	0.161	0.95	78	2.00	67	51	99.0	553	376	359	236	380	668	381
364	58.805	0.162	0.95	78	2.00	67	51	99.6	552	376	359	238	378	664	381
365	58.968	0.163	0.95	78	2.00	67	51	100.2	551	376	359	238	379	666	381
366	59.129	0.161	0.95	78	2.00	67	51	98.6	549	376	359	238	377	663	380
367	59.291	0.162	0.95	78	2.00	67	51	99.1	548	377	358	238	378	662	380
368	59.453	0.162	0.96	78	2.00	67	51	99.3	548	377	358	238	376	665	379
369	59.615	0.162	0.95	78	2.00	67	51	99.3	547	377	357	238	375	664	379
370	59.777	0.162	0.95	78	2.00	67	51	99.6	547	377	356	240	376	661	379
371	59.939	0.162	0.95	78	2.00	67	51	99.9	546	377	356	239	374	660	378
372	60.101	0.162	0.95	78	2.00	67	51	99.7	546	377	355	233	372	662	377
373	60.263	0.162	0.95	78	2.00	67	51	99.6	546	377	354	236	373	658	377
374	60.425	0.162	0.95	78	2.00	67	51	99.4	545	377	353	235	371	657	376
375	60.586	0.161	0.96	78	2.00	67	51	98.6	545	377	352	234	371	651	376
376	60.748	0.162	0.95	78	2.00	67	51	100.1	545	378	351	237	371	652	376
377	60.911	0.163	0.95	78	2.00	67	51	101.1	544	378	350	236	368	651	375
378	61.073	0.162	0.95	78	2.00	67	51	100.1	544	378	349	238	368	649	375
379	61.234	0.161	0.96	78	2.00	67	51	99.1	543	378	349	236	366	648	374
380	61.396	0.162	0.95	78	2.00	67	51	99.7	543	379	348	237	366	648	375
381	61.558	0.162	0.95	78	2.00	67	51	100.2	542	379	347	232	365	646	373
382	61.721	0.163	0.95	78	2.00	67	51	100.9	541	379	346	233	366	645	373
383	61.882	0.161	0.96	78	2.00	67	51	99.3	541	379	346	235	364	651	373
384	62.044	0.162	0.96	78	2.00	67	51	99.7	541	380	345	233	365	648	373
385	62.206	0.162	0.95	78	2.00	67	51	99.7	541	380	344	236	363	651	373
386	62.368	0.162	0.95	78	2.00	67	51	99.9	542	380	343	233	362	653	372
387	62.530	0.162	0.95	78	2.00	67	51	100.3	542	381	343	234	361	645	372
388	62.692	0.162	0.95	78	2.00	67	51	100.3	542	381	343	234	362	643	372
389	62.854	0.162	0.96	78	2.00	67	51	100.1	541	381	343	237	361	637	373
390	63.016	0.162	0.95	78	2.00	67	51	99.8	540	382	344	232	359	637	371
391	63.178	0.162	0.95	78	2.00	67	51	99.9	538	382	345	234	359	632	372
392	63.339	0.161	0.95	78	2.00	67	51	99.8	537	382	346	235	361	630	372

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.011
Sampling Box ID: 336

Test Start Time: 13:56
Total Sampling Time: 394 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.51 in. Hg
Post-Test 0 cfm @ 8 in. Hg

Elapsed Time (min)	**Train B Sampling System**								**Appliance Temperatures, °F**						
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter Δ H*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*	*Top*	*Bottom*	*Back*	*Left*	*Right*	*Catalyst Exit*	*Average Stove Surface (Tot = Δ T)*
393	63.502	0.163	0.95	78	2.00	67	51	101.2	535	383	347	235	360	633	372
394	63.664	0.162	0.95	78	2.00	67	51	100.1	534	383	349	236	360	631	372

Train C - First Hour Particulate Sampling

Run: 7
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Start Time: 13:56
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/8/24

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Sample Train Leak Checks
Pre-test 0 cfm @ 22.43 in. Hg
Post-Test 0 cfm @ 5.82 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
Tot / Avg	**9.622**	**0.160**	**2.18**	**64.8**	**-2.07**	**65.7**	**61.9**	**100.2**
Minimum	0.000	0.138	1.72	64	-2.37	62	61	88.2
Max	9.622	0.164	2.29	66	-1.81	67	62	103.6
0	0.000		1.72	64	-2.16	62	61	
1	0.138	0.138	2.26	64	-1.99	64	61	88.2
2	0.301	0.163	2.24	64	-2.24	64	61	103.6
3	0.462	0.161	2.24	64	-2.33	64	62	100.5
4	0.625	0.163	2.29	64	-1.91	64	61	101.5
5	0.786	0.161	2.22	64	-1.97	64	62	100.3
6	0.949	0.163	2.21	64	-2.30	64	62	101.7
7	1.110	0.161	2.20	64	-2.33	64	62	100.8
8	1.270	0.160	2.19	64	-2.22	64	62	100.1
9	1.431	0.161	2.15	64	-2.32	64	62	100.4
10	1.591	0.160	2.18	64	-1.87	64	62	99.7
11	1.751	0.160	2.16	64	-2.18	65	62	99.9
12	1.911	0.160	2.16	64	-2.32	65	62	100.3
13	2.071	0.160	2.15	64	-2.29	65	62	100.5
14	2.230	0.159	2.16	64	-1.87	65	62	99.6
15	2.389	0.159	2.14	64	-1.88	65	62	99.4
16	2.548	0.159	2.14	64	-2.31	65	62	99.9
17	2.707	0.159	2.12	64	-2.28	65	62	100.2
18	2.865	0.158	2.05	64	-2.18	65	62	98.8
19	3.029	0.164	2.23	64	-2.37	65	62	101.8
20	3.192	0.163	2.24	64	-2.36	65	62	101.3
21	3.354	0.162	2.22	64	-1.99	65	62	100.9
22	3.516	0.162	2.22	64	-2.37	66	62	100.9
23	3.677	0.161	2.22	64	-2.09	66	62	100.4
24	3.839	0.162	2.22	64	-1.92	66	62	101.3
25	4.002	0.163	2.20	65	-2.17	66	62	102.0
26	4.163	0.161	2.17	65	-1.81	66	62	100.6
27	4.324	0.161	2.16	65	-1.91	66	62	100.7
28	4.485	0.161	2.17	65	-1.86	66	62	100.7
29	4.645	0.160	2.19	65	-1.82	66	62	99.6
30	4.805	0.160	2.18	65	-1.83	66	62	99.6
31	4.965	0.160	2.19	65	-1.99	66	62	100.0
32	5.126	0.161	2.18	65	-1.96	66	62	100.9

Train C - First Hour Particulate Sampling

Run: 7 **Test Date:** 3/8/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.015
Sample Box ID: 371

Start Time: 13:56
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 22.43 in. Hg
Post-Test 0 cfm @ 5.82 in. Hg

Elapsed Time (min)	Train C Sampling System							
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Filter Temp (°F)	Dryer Temp (°F)	Pro - Rate
33	5.286	0.160	2.18	65	-1.87	66	62	100.3
34	5.448	0.162	2.18	65	-2.35	66	62	101.1
35	5.607	0.159	2.18	65	-1.83	66	62	98.9
36	5.768	0.161	2.19	65	-1.88	66	62	100.0
37	5.928	0.160	2.18	65	-2.13	66	62	99.5
38	6.088	0.160	2.19	65	-2.30	66	62	99.8
39	6.249	0.161	2.16	65	-2.35	66	62	100.8
40	6.409	0.160	2.19	65	-2.35	66	62	100.5
41	6.565	0.156	2.18	65	-2.16	66	62	97.8
42	6.726	0.161	2.18	65	-2.30	66	62	100.7
43	6.886	0.160	2.19	65	-1.82	67	62	100.0
44	7.047	0.161	2.18	65	-2.35	67	62	100.3
45	7.208	0.161	2.19	65	-2.34	67	62	100.4
46	7.369	0.161	2.17	65	-1.96	67	62	100.9
47	7.529	0.160	2.18	65	-1.89	67	62	100.5
48	7.691	0.162	2.18	65	-2.08	67	62	101.8
49	7.851	0.160	2.17	66	-1.81	67	62	99.8
50	8.012	0.161	2.19	66	-1.83	67	62	99.8
51	8.173	0.161	2.17	66	-1.82	67	62	100.1
52	8.334	0.161	2.19	66	-2.02	67	62	100.4
53	8.495	0.161	2.18	66	-1.81	67	62	99.9
54	8.655	0.160	2.18	66	-2.34	67	62	98.9
55	8.817	0.162	2.19	66	-1.81	67	62	100.6
56	8.977	0.160	2.19	66	-2.07	67	62	99.8
57	9.138	0.161	2.19	66	-1.85	67	62	99.9
58	9.299	0.161	2.18	66	-1.82	67	62	99.7
59	9.460	0.161	2.18	66	-1.92	67	62	100.2
60	9.622	0.162	2.19	66	-1.87	66	62	100.9

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
Tot / Avg	**62.797**	**0.159**	**1.69**	**66.4**	**-2.17**	**197.48**	**-0.059**	**529.1**	**0.62**	**13.61**
Minimum	0.000	0.154	1.63	64	-2.30	164.00	-0.081	23.5	0.00	0.66
Max	62.797	0.161	1.71	67	-2.00	275.00	-0.050	1040.0	3.51	17.24
0	0.000		1.52	64	-2.20	200	-0.062	1040.0	0.24	2.08
1	0.159	0.159	1.71	64	-2.30	212	-0.058	1040.0	0.13	0.66
2	0.317	0.158	1.70	64	-2.20	201	-0.058	1040.0	0.08	6.86
3	0.476	0.159	1.69	64	-2.20	196	-0.060	30.6	0.00	8.44
4	0.634	0.158	1.68	64	-2.30	195	-0.062	31.0	0.00	8.96
5	0.792	0.158	1.67	64	-2.10	199	-0.063	24.5	0.00	11.46
6	0.949	0.157	1.66	64	-2.10	202	-0.064	23.5	0.00	11.58
7	1.105	0.156	1.66	64	-2.00	205	-0.065	27.1	0.00	11.64
8	1.261	0.156	1.65	64	-2.10	210	-0.067	31.3	0.00	12.42
9	1.417	0.156	1.68	64	-2.20	217	-0.068	30.0	0.00	13.09
10	1.575	0.158	1.68	64	-2.20	223	-0.069	33.9	0.00	12.43
11	1.732	0.157	1.66	64	-2.20	227	-0.069	28.4	0.00	11.78
12	1.888	0.156	1.66	64	-2.20	231	-0.071	29.4	0.00	13.22
13	2.045	0.157	1.66	64	-2.30	236	-0.071	63.0	0.00	14.09
14	2.202	0.157	1.65	64	-2.20	243	-0.072	35.8	0.00	12.75
15	2.358	0.156	1.65	64	-2.10	244	-0.073	29.0	0.00	11.97
16	2.514	0.156	1.65	64	-2.10	246	-0.072	31.6	0.00	12.15
17	2.670	0.156	1.63	64	-2.00	247	-0.072	36.2	0.00	12.21
18	2.824	0.154	1.67	64	-2.20	249	-0.074	41.0	0.00	12.07
19	2.982	0.158	1.68	64	-2.20	250	-0.075	42.0	0.00	12.52
20	3.139	0.157	1.67	64	-2.30	252	-0.074	43.3	0.00	13.54
21	3.297	0.158	1.69	64	-2.20	254	-0.074	37.5	0.00	12.98
22	3.455	0.158	1.71	64	-2.10	257	-0.075	39.7	0.00	12.78
23	3.614	0.159	1.70	64	-2.00	260	-0.075	41.6	0.00	13.34
24	3.773	0.159	1.71	64	-2.30	260	-0.075	43.0	0.00	13.73
25	3.933	0.160	1.70	65	-2.30	264	-0.076	46.5	0.00	14.11
26	4.092	0.159	1.70	65	-2.10	266	-0.076	58.8	0.00	14.96
27	4.250	0.158	1.71	65	-2.30	269	-0.076	196.4	0.01	15.32
28	4.410	0.160	1.71	65	-2.10	270	-0.076	224.0	0.02	15.43
29	4.569	0.159	1.71	65	-2.10	273	-0.076	233.3	0.02	15.51
30	4.728	0.159	1.71	65	-2.10	273	-0.076	347.6	0.03	15.77
31	4.887	0.159	1.69	65	-2.20	275	-0.076	426.6	0.03	15.84
32	5.046	0.159	1.71	65	-2.20	273	-0.081	714.4	0.06	14.83

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
33	5.205	0.159	1.71	65	-2.20	274	-0.076	76.9	0.00	14.39
34	5.363	0.158	1.69	65	-2.10	274	-0.076	59.1	0.00	15.02
35	5.522	0.159	1.70	65	-2.30	273	-0.076	66.9	0.00	16.05
36	5.682	0.160	1.70	65	-2.20	274	-0.075	728.0	0.09	16.81
37	5.840	0.158	1.70	65	-2.10	272	-0.075	1040.0	0.42	17.24
38	6.000	0.160	1.70	65	-2.10	270	-0.076	1040.0	0.81	17.18
39	6.159	0.159	1.70	65	-2.30	268	-0.075	1040.0	1.05	17.13
40	6.317	0.158	1.69	65	-2.10	268	-0.075	1040.0	0.88	17.02
41	6.476	0.159	1.70	65	-2.30	265	-0.074	1040.0	0.62	17.07
42	6.635	0.159	1.69	65	-2.10	261	-0.073	1040.0	0.52	16.72
43	6.794	0.159	1.69	65	-2.00	259	-0.073	1040.0	0.52	16.81
44	6.952	0.158	1.70	65	-2.20	256	-0.074	1040.0	0.53	16.75
45	7.112	0.160	1.69	65	-2.10	253	-0.073	1040.0	0.57	16.48
46	7.271	0.159	1.69	65	-2.30	251	-0.074	1040.0	0.59	16.39
47	7.429	0.158	1.70	65	-2.00	248	-0.074	1040.0	0.63	16.31
48	7.588	0.159	1.69	65	-2.30	248	-0.071	1040.0	0.69	16.22
49	7.748	0.160	1.70	65	-2.10	246	-0.071	1040.0	0.98	16.07
50	7.906	0.158	1.70	65	-2.30	244	-0.070	1040.0	2.99	15.38
51	8.065	0.159	1.69	65	-2.00	242	-0.071	1040.0	2.60	15.56
52	8.224	0.159	1.70	65	-2.20	239	-0.068	1040.0	2.81	15.35
53	8.384	0.160	1.70	65	-2.30	235	-0.069	1040.0	2.33	15.42
54	8.542	0.158	1.69	65	-2.30	231	-0.068	1040.0	1.42	15.62
55	8.701	0.159	1.70	65	-2.30	228	-0.068	1040.0	1.45	15.26
56	8.860	0.159	1.70	65	-2.20	225	-0.068	1040.0	1.36	15.00
57	9.019	0.159	1.70	65	-2.20	222	-0.068	1040.0	1.32	14.83
58	9.178	0.159	1.70	65	-2.20	220	-0.067	1040.0	1.24	14.82
59	9.337	0.159	1.70	65	-2.10	217	-0.066	1040.0	1.32	14.93
60	9.496	0.159	1.69	65	-2.00	215	-0.066	1040.0	1.21	14.72
61	9.655	0.159	1.69	65	-2.10	214	-0.066	1040.0	1.44	14.79
62	9.814	0.159	1.69	65	-2.10	211	-0.065	1040.0	1.54	14.91
63	9.973	0.159	1.69	66	-2.00	209	-0.065	1040.0	1.68	14.63
64	10.132	0.159	1.70	66	-2.10	209	-0.066	1040.0	1.85	14.69
65	10.292	0.160	1.70	66	-2.30	208	-0.065	1040.0	2.10	14.68
66	10.451	0.159	1.70	66	-2.10	208	-0.065	1040.0	2.46	14.59
67	10.610	0.159	1.70	66	-2.10	207	-0.065	1040.0	3.05	14.33
68	10.769	0.159	1.69	66	-2.00	207	-0.066	1040.0	3.24	14.35

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
69	10.929	0.160	1.70	66	-2.20	207	-0.064	1040.0	3.06	14.32
70	11.088	0.159	1.70	66	-2.00	206	-0.063	1040.0	2.71	14.54
71	11.247	0.159	1.69	66	-2.20	205	-0.064	1040.0	2.56	14.45
72	11.406	0.159	1.69	66	-2.10	205	-0.063	1040.0	2.73	14.44
73	11.565	0.159	1.70	66	-2.00	204	-0.063	1040.0	2.86	14.72
74	11.725	0.160	1.70	66	-2.20	204	-0.063	1040.0	2.77	14.41
75	11.884	0.159	1.70	66	-2.20	204	-0.064	1040.0	2.78	14.35
76	12.043	0.159	1.70	66	-2.00	203	-0.064	1040.0	2.82	14.47
77	12.202	0.159	1.69	66	-2.00	203	-0.063	1040.0	2.84	14.63
78	12.361	0.159	1.70	66	-2.30	203	-0.063	1040.0	2.65	14.63
79	12.521	0.160	1.71	66	-2.10	203	-0.063	1040.0	2.64	14.80
80	12.680	0.159	1.69	66	-2.20	204	-0.063	1040.0	2.39	14.79
81	12.839	0.159	1.70	66	-2.20	204	-0.063	1040.0	2.42	14.71
82	12.998	0.159	1.69	66	-2.00	205	-0.063	1040.0	2.61	14.64
83	13.157	0.159	1.69	66	-2.10	206	-0.064	1040.0	2.72	14.51
84	13.316	0.159	1.70	66	-2.10	207	-0.063	1040.0	2.89	14.75
85	13.476	0.160	1.70	66	-2.20	208	-0.064	1040.0	2.98	14.80
86	13.635	0.159	1.69	66	-2.10	209	-0.064	1040.0	3.05	14.65
87	13.794	0.159	1.70	66	-2.30	209	-0.064	1040.0	3.23	14.74
88	13.954	0.160	1.70	66	-2.10	209	-0.064	1040.0	3.22	14.63
89	14.113	0.159	1.69	66	-2.00	209	-0.064	1040.0	3.21	14.77
90	14.272	0.159	1.70	66	-2.30	211	-0.064	1040.0	3.43	14.88
91	14.432	0.160	1.69	66	-2.10	211	-0.065	1040.0	3.38	14.76
92	14.590	0.158	1.69	66	-2.10	211	-0.064	1040.0	3.51	14.81
93	14.750	0.160	1.70	66	-2.20	212	-0.064	1040.0	3.43	14.71
94	14.910	0.160	1.70	66	-2.20	212	-0.064	1040.0	3.43	14.69
95	15.068	0.158	1.70	66	-2.00	212	-0.065	1040.0	3.38	14.67
96	15.228	0.160	1.70	66	-2.00	210	-0.064	1040.0	3.25	14.51
97	15.388	0.160	1.69	66	-2.20	210	-0.064	1040.0	3.16	14.59
98	15.546	0.158	1.69	66	-2.10	211	-0.064	1040.0	3.11	14.65
99	15.706	0.160	1.70	66	-2.30	211	-0.064	1040.0	2.94	14.77
100	15.866	0.160	1.70	66	-2.00	210	-0.063	1040.0	2.79	14.59
101	16.024	0.158	1.70	66	-2.30	211	-0.063	1040.0	2.75	14.85
102	16.184	0.160	1.70	66	-2.20	210	-0.063	1040.0	2.66	15.05
103	16.343	0.159	1.70	66	-2.30	210	-0.063	1040.0	2.51	14.70
104	16.502	0.159	1.69	66	-2.00	210	-0.063	1040.0	2.38	14.87

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
105	16.662	0.160	1.71	66	-2.30	212	-0.060	1040.0	2.26	15.00
106	16.821	0.159	1.69	66	-2.20	210	-0.063	1040.0	1.66	14.97
107	16.980	0.159	1.69	66	-2.10	210	-0.063	1040.0	1.84	14.99
108	17.140	0.160	1.70	66	-2.00	210	-0.062	1040.0	1.77	14.97
109	17.299	0.159	1.70	66	-2.20	210	-0.062	1040.0	1.72	15.19
110	17.458	0.159	1.69	66	-2.20	209	-0.063	1040.0	1.64	15.31
111	17.618	0.160	1.70	66	-2.10	208	-0.062	1040.0	1.56	15.28
112	17.777	0.159	1.69	66	-2.20	209	-0.062	1040.0	1.50	15.35
113	17.936	0.159	1.69	66	-2.30	209	-0.062	1040.0	1.39	15.48
114	18.096	0.160	1.70	66	-2.10	209	-0.062	1040.0	1.30	15.13
115	18.256	0.160	1.70	66	-2.30	209	-0.063	1040.0	1.28	15.39
116	18.415	0.159	1.70	66	-2.10	209	-0.062	1040.0	1.34	15.53
117	18.574	0.159	1.70	66	-2.30	208	-0.063	1040.0	1.40	15.48
118	18.734	0.160	1.69	66	-2.00	208	-0.062	1040.0	1.24	15.26
119	18.893	0.159	1.69	66	-2.30	208	-0.062	1040.0	1.27	15.49
120	19.053	0.160	1.71	66	-2.30	207	-0.062	1040.0	1.25	15.00
121	19.213	0.160	1.70	66	-2.00	208	-0.061	1040.0	1.25	15.21
122	19.372	0.159	1.70	66	-2.00	207	-0.062	1040.0	1.27	15.50
123	19.531	0.159	1.71	66	-2.10	206	-0.062	1040.0	1.22	15.48
124	19.691	0.160	1.69	66	-2.20	206	-0.062	1040.0	1.19	15.45
125	19.850	0.159	1.69	66	-2.30	206	-0.062	1040.0	1.15	15.19
126	20.009	0.159	1.70	66	-2.00	207	-0.061	1040.0	1.11	15.48
127	20.169	0.160	1.70	66	-2.30	207	-0.061	1040.0	1.13	15.50
128	20.328	0.159	1.69	66	-2.10	207	-0.061	1040.0	1.15	15.70
129	20.487	0.159	1.70	66	-2.00	207	-0.061	1040.0	1.19	15.55
130	20.648	0.161	1.69	66	-2.30	207	-0.062	1040.0	1.23	15.50
131	20.806	0.158	1.69	66	-2.10	207	-0.061	1040.0	1.34	15.57
132	20.966	0.160	1.70	66	-2.30	207	-0.061	1040.0	1.46	15.69
133	21.125	0.159	1.70	66	-2.10	207	-0.061	1040.0	1.45	15.59
134	21.284	0.159	1.69	66	-2.20	207	-0.062	1040.0	1.60	15.46
135	21.444	0.160	1.70	66	-2.20	207	-0.061	1040.0	1.58	15.63
136	21.604	0.160	1.69	66	-2.10	207	-0.061	1040.0	1.33	15.57
137	21.762	0.158	1.69	66	-2.20	206	-0.061	1040.0	1.22	15.48
138	21.922	0.160	1.70	66	-2.10	206	-0.061	1040.0	1.11	15.43
139	22.082	0.160	1.70	67	-2.20	204	-0.061	1040.0	0.99	15.56
140	22.240	0.158	1.69	67	-2.20	204	-0.060	1040.0	1.03	15.63

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
141	22.400	0.160	1.70	67	-2.30	204	-0.061	1040.0	0.95	15.58
142	22.560	0.160	1.69	67	-2.30	204	-0.061	1040.0	0.97	15.30
143	22.719	0.159	1.69	67	-2.30	203	-0.060	1040.0	0.97	15.39
144	22.878	0.159	1.70	67	-2.20	203	-0.060	1040.0	0.86	15.19
145	23.038	0.160	1.69	67	-2.10	203	-0.060	1040.0	0.84	15.32
146	23.197	0.159	1.69	67	-2.00	203	-0.060	1040.0	1.25	15.14
147	23.356	0.159	1.70	67	-2.00	204	-0.059	1040.0	1.24	15.37
148	23.516	0.160	1.70	67	-2.20	203	-0.059	1040.0	1.20	15.09
149	23.675	0.159	1.69	66	-2.30	201	-0.060	1040.0	1.16	15.11
150	23.834	0.159	1.70	67	-2.30	199	-0.059	1040.0	1.15	15.07
151	23.994	0.160	1.69	66	-2.30	199	-0.059	1040.0	1.13	14.71
152	24.153	0.159	1.69	67	-2.20	198	-0.059	1040.0	1.13	14.82
153	24.312	0.159	1.70	67	-2.10	198	-0.059	1040.0	1.19	15.00
154	24.472	0.160	1.70	67	-2.00	197	-0.058	1040.0	1.18	15.06
155	24.631	0.159	1.69	67	-2.20	197	-0.058	1040.0	1.15	14.72
156	24.791	0.160	1.70	67	-2.20	197	-0.058	1040.0	1.15	14.91
157	24.951	0.160	1.69	67	-2.10	197	-0.058	1040.0	0.96	14.99
158	25.110	0.159	1.69	67	-2.10	196	-0.058	1040.0	0.76	15.15
159	25.269	0.159	1.70	67	-2.10	196	-0.057	1040.0	0.70	15.29
160	25.429	0.160	1.70	67	-2.00	195	-0.057	1040.0	0.57	15.19
161	25.587	0.158	1.69	67	-2.10	194	-0.057	1040.0	0.52	15.18
162	25.747	0.160	1.70	67	-2.30	194	-0.057	1040.0	0.42	15.25
163	25.907	0.160	1.68	67	-2.30	193	-0.056	1040.0	0.36	15.15
164	26.065	0.158	1.69	67	-2.30	192	-0.057	1040.0	0.26	15.06
165	26.225	0.160	1.70	67	-2.10	193	-0.057	1040.0	0.22	15.11
166	26.385	0.160	1.70	67	-2.00	192	-0.056	1040.0	0.20	15.09
167	26.543	0.158	1.69	67	-2.30	191	-0.056	1040.0	0.18	15.10
168	26.703	0.160	1.70	67	-2.10	191	-0.056	1040.0	0.15	15.15
169	26.863	0.160	1.70	67	-2.10	190	-0.056	1040.0	0.18	14.93
170	27.021	0.158	1.69	67	-2.00	191	-0.056	1040.0	0.17	14.87
171	27.181	0.160	1.70	67	-2.20	191	-0.056	1040.0	0.17	14.89
172	27.340	0.159	1.69	67	-2.20	189	-0.056	1040.0	0.17	15.13
173	27.499	0.159	1.68	67	-2.00	189	-0.056	1040.0	0.19	14.95
174	27.659	0.160	1.70	67	-2.10	189	-0.056	1040.0	0.21	14.82
175	27.818	0.159	1.69	67	-2.20	188	-0.056	1040.0	0.17	14.92
176	27.977	0.159	1.69	67	-2.30	189	-0.056	1040.0	0.17	15.15

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
177	28.137	0.160	1.70	67	-2.10	189	-0.056	1040.0	0.16	15.00
178	28.297	0.160	1.68	67	-2.10	189	-0.056	1040.0	0.14	14.90
179	28.455	0.158	1.68	67	-2.20	189	-0.055	1040.0	0.16	15.11
180	28.615	0.160	1.70	67	-2.10	188	-0.056	1040.0	0.16	15.17
181	28.775	0.160	1.69	67	-2.30	187	-0.056	1040.0	0.18	15.21
182	28.933	0.158	1.69	67	-2.20	188	-0.055	1040.0	0.17	14.97
183	29.093	0.160	1.70	67	-2.30	189	-0.055	246.7	0.02	14.47
184	29.253	0.160	1.68	67	-2.00	188	-0.055	1040.0	0.12	14.86
185	29.412	0.159	1.69	67	-2.10	188	-0.055	1040.0	0.14	14.94
186	29.571	0.159	1.70	67	-2.30	187	-0.055	1040.0	0.15	15.00
187	29.731	0.160	1.70	67	-2.30	187	-0.056	1040.0	0.19	15.17
188	29.890	0.159	1.69	67	-2.20	185	-0.055	1040.0	0.22	14.92
189	30.050	0.160	1.70	67	-2.10	186	-0.055	1040.0	0.35	14.63
190	30.210	0.160	1.68	67	-2.10	186	-0.055	1040.0	0.35	15.03
191	30.369	0.159	1.69	67	-2.00	185	-0.055	1040.0	0.33	14.91
192	30.528	0.159	1.70	67	-2.20	184	-0.054	1040.0	0.30	14.87
193	30.688	0.160	1.70	67	-2.30	185	-0.055	1040.0	0.30	14.84
194	30.847	0.159	1.69	67	-2.10	186	-0.055	1040.0	0.32	15.13
195	31.006	0.159	1.70	67	-2.20	187	-0.055	1040.0	0.22	15.59
196	31.166	0.160	1.68	67	-2.20	187	-0.056	1040.0	0.14	15.42
197	31.325	0.159	1.69	67	-2.30	187	-0.056	1040.0	0.17	15.53
198	31.485	0.160	1.70	67	-2.10	186	-0.056	1040.0	0.14	15.20
199	31.645	0.160	1.70	67	-2.30	188	-0.056	1040.0	0.15	15.27
200	31.804	0.159	1.69	67	-2.10	189	-0.056	1040.0	0.16	15.29
201	31.963	0.159	1.70	67	-2.30	189	-0.056	1040.0	0.21	15.11
202	32.123	0.160	1.69	67	-2.30	188	-0.057	1040.0	0.25	15.36
203	32.283	0.160	1.69	67	-2.10	188	-0.056	1040.0	0.28	15.34
204	32.442	0.159	1.70	67	-2.00	189	-0.056	1040.0	0.31	15.43
205	32.602	0.160	1.70	67	-2.20	189	-0.056	1040.0	0.39	15.36
206	32.761	0.159	1.69	67	-2.30	189	-0.057	1040.0	0.42	15.22
207	32.921	0.160	1.70	67	-2.00	190	-0.057	1040.0	0.59	15.23
208	33.080	0.159	1.69	67	-2.30	190	-0.057	1040.0	0.71	15.41
209	33.240	0.160	1.69	67	-2.30	190	-0.057	1040.0	0.95	15.56
210	33.400	0.160	1.69	67	-2.10	191	-0.058	1040.0	1.03	15.50
211	33.559	0.159	1.70	67	-2.20	190	-0.058	1040.0	1.38	15.61
212	33.719	0.160	1.69	67	-2.00	190	-0.057	1040.0	1.52	15.58

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
213	33.878	0.159	1.69	67	-2.30	192	-0.058	1040.0	1.66	15.24
214	34.037	0.159	1.70	67	-2.20	192	-0.057	1040.0	1.54	15.68
215	34.197	0.160	1.69	67	-2.00	191	-0.057	1040.0	1.26	15.44
216	34.357	0.160	1.68	67	-2.20	189	-0.056	1040.0	1.02	15.34
217	34.516	0.159	1.70	67	-2.00	188	-0.056	1040.0	0.76	15.52
218	34.676	0.160	1.69	67	-2.10	187	-0.055	1040.0	0.57	15.32
219	34.836	0.160	1.69	67	-2.10	185	-0.054	1040.0	0.41	15.21
220	34.995	0.159	1.70	67	-2.20	184	-0.054	1040.0	0.22	14.58
221	35.155	0.160	1.69	67	-2.30	182	-0.053	1040.0	0.15	14.47
222	35.314	0.159	1.69	67	-2.10	180	-0.054	1012.0	0.09	14.14
223	35.475	0.161	1.70	67	-2.20	179	-0.053	540.7	0.05	13.82
224	35.635	0.160	1.70	67	-2.30	178	-0.053	292.9	0.02	13.65
225	35.794	0.159	1.69	67	-2.30	176	-0.052	105.5	0.00	13.24
226	35.954	0.160	1.70	67	-2.30	174	-0.052	55.3	0.00	13.33
227	36.114	0.160	1.70	67	-2.30	172	-0.051	48.1	0.00	13.04
228	36.274	0.160	1.69	67	-2.30	171	-0.051	44.9	0.00	12.91
229	36.433	0.159	1.70	67	-2.30	170	-0.051	43.0	0.00	12.62
230	36.593	0.160	1.70	67	-2.30	170	-0.050	43.9	0.00	12.49
231	36.753	0.160	1.69	67	-2.30	170	-0.051	46.2	0.00	12.40
232	36.913	0.160	1.69	67	-2.30	168	-0.050	47.2	0.00	12.46
233	37.072	0.159	1.70	67	-2.20	167	-0.050	47.2	0.00	12.29
234	37.232	0.160	1.69	67	-2.20	165	-0.050	48.8	0.00	12.49
235	37.392	0.160	1.70	67	-2.00	165	-0.050	47.8	0.00	12.29
236	37.551	0.159	1.70	67	-2.10	164	-0.050	49.5	0.00	12.43
237	37.711	0.160	1.69	67	-2.00	164	-0.050	47.2	0.00	12.21
238	37.871	0.160	1.69	67	-2.10	164	-0.050	49.8	0.00	12.34
239	38.030	0.159	1.70	67	-2.30	164	-0.050	50.1	0.00	12.42
240	38.190	0.160	1.69	67	-2.20	165	-0.050	49.2	0.00	12.40
241	38.350	0.160	1.69	67	-2.10	165	-0.051	49.8	0.00	12.49
242	38.510	0.160	1.70	67	-2.10	166	-0.050	49.8	0.00	12.49
243	38.670	0.160	1.70	67	-2.10	165	-0.050	50.4	0.00	12.47
244	38.829	0.159	1.69	67	-2.00	167	-0.050	50.7	0.00	12.65
245	38.989	0.160	1.70	67	-2.00	169	-0.051	50.1	0.00	12.70
246	39.149	0.160	1.68	67	-2.00	170	-0.052	49.5	0.00	12.71
247	39.308	0.159	1.70	67	-2.30	170	-0.052	50.7	0.00	12.80
248	39.468	0.160	1.70	67	-2.10	172	-0.052	49.1	0.00	12.78

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
249	39.628	0.160	1.69	67	-2.00	173	-0.052	48.5	0.00	12.80
250	39.788	0.160	1.69	67	-2.00	173	-0.052	49.1	0.00	12.86
251	39.947	0.159	1.70	67	-2.20	174	-0.053	50.7	0.00	12.75
252	40.107	0.160	1.70	67	-2.30	175	-0.053	52.7	0.00	12.79
253	40.267	0.160	1.69	67	-2.30	177	-0.053	52.0	0.00	12.98
254	40.427	0.160	1.70	67	-2.30	177	-0.052	51.1	0.00	12.91
255	40.587	0.160	1.70	67	-2.30	179	-0.053	51.7	0.00	13.01
256	40.746	0.159	1.69	67	-2.30	180	-0.053	49.5	0.00	12.96
257	40.906	0.160	1.69	67	-2.20	180	-0.054	52.0	0.00	12.96
258	41.066	0.160	1.70	67	-2.10	180	-0.054	50.4	0.00	12.88
259	41.226	0.160	1.70	67	-2.30	179	-0.053	49.1	0.00	12.95
260	41.385	0.159	1.70	67	-2.10	181	-0.054	51.1	0.00	13.10
261	41.545	0.160	1.70	67	-2.20	181	-0.054	50.7	0.00	12.92
262	41.705	0.160	1.70	67	-2.10	181	-0.053	49.1	0.00	13.09
263	41.865	0.160	1.70	67	-2.00	182	-0.054	41.7	0.00	13.14
264	42.025	0.160	1.70	67	-2.20	182	-0.053	50.4	0.00	13.19
265	42.185	0.160	1.70	67	-2.30	182	-0.054	49.1	0.00	13.09
266	42.344	0.159	1.69	67	-2.00	183	-0.055	50.7	0.00	13.12
267	42.504	0.160	1.70	67	-2.20	184	-0.054	54.0	0.00	13.10
268	42.664	0.160	1.70	67	-2.30	183	-0.054	54.9	0.00	13.08
269	42.824	0.160	1.69	67	-2.10	183	-0.055	52.0	0.00	12.99
270	42.983	0.159	1.70	67	-2.30	184	-0.054	51.7	0.00	13.20
271	43.143	0.160	1.70	67	-2.20	183	-0.055	49.8	0.00	13.04
272	43.303	0.160	1.69	67	-2.00	182	-0.054	48.5	0.00	13.01
273	43.463	0.160	1.69	67	-2.20	183	-0.055	49.5	0.00	12.91
274	43.623	0.160	1.70	67	-2.30	184	-0.055	48.5	0.00	12.86
275	43.782	0.159	1.69	67	-2.00	185	-0.055	48.5	0.00	12.94
276	43.942	0.160	1.70	67	-2.30	184	-0.055	50.1	0.00	12.89
277	44.102	0.160	1.70	67	-2.30	185	-0.055	50.4	0.00	12.82
278	44.262	0.160	1.70	67	-2.00	185	-0.055	50.4	0.00	12.88
279	44.422	0.160	1.70	67	-2.20	184	-0.055	52.7	0.00	12.94
280	44.581	0.159	1.70	67	-2.00	183	-0.056	48.5	0.00	12.74
281	44.741	0.160	1.69	67	-2.30	185	-0.054	47.8	0.00	12.86
282	44.901	0.160	1.70	67	-2.20	186	-0.055	48.5	0.00	12.95
283	45.061	0.160	1.70	67	-2.30	185	-0.055	46.5	0.00	13.30
284	45.221	0.160	1.70	67	-2.30	184	-0.055	43.6	0.00	13.27

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
285	45.380	0.159	1.69	67	-2.30	185	-0.055	44.6	0.00	13.16
286	45.540	0.160	1.70	67	-2.30	184	-0.055	47.2	0.00	13.20
287	45.701	0.161	1.70	67	-2.30	184	-0.055	46.2	0.00	13.05
288	45.860	0.159	1.69	67	-2.00	184	-0.055	46.5	0.00	12.87
289	46.019	0.159	1.70	67	-2.10	184	-0.055	46.5	0.00	13.08
290	46.180	0.161	1.70	67	-2.00	184	-0.055	47.2	0.00	12.91
291	46.339	0.159	1.69	67	-2.30	182	-0.055	46.5	0.00	12.80
292	46.498	0.159	1.69	67	-2.00	182	-0.055	48.2	0.00	12.85
293	46.658	0.160	1.69	67	-2.20	183	-0.054	48.5	0.00	12.84
294	46.818	0.160	1.69	67	-2.20	183	-0.055	50.1	0.00	12.73
295	46.978	0.160	1.70	67	-2.30	183	-0.056	51.1	0.00	12.80
296	47.137	0.159	1.70	67	-2.10	182	-0.055	51.1	0.00	12.78
297	47.297	0.160	1.69	67	-2.30	182	-0.055	50.4	0.00	12.83
298	47.457	0.160	1.69	67	-2.00	182	-0.055	50.4	0.00	12.95
299	47.617	0.160	1.70	67	-2.30	182	-0.054	47.8	0.00	12.76
300	47.777	0.160	1.69	67	-2.00	182	-0.055	49.1	0.00	12.94
301	47.936	0.159	1.69	67	-2.30	182	-0.055	47.8	0.00	12.65
302	48.096	0.160	1.70	67	-2.30	182	-0.055	49.1	0.00	13.04
303	48.256	0.160	1.70	67	-2.30	183	-0.055	51.7	0.00	12.82
304	48.415	0.159	1.70	67	-2.10	182	-0.055	51.4	0.00	12.97
305	48.575	0.160	1.70	67	-2.30	182	-0.055	50.7	0.00	12.93
306	48.735	0.160	1.69	67	-2.30	182	-0.054	53.7	0.00	13.06
307	48.894	0.159	1.70	67	-2.30	182	-0.056	54.0	0.00	12.90
308	49.054	0.160	1.70	67	-2.10	183	-0.054	53.3	0.00	12.80
309	49.215	0.161	1.69	67	-2.00	183	-0.055	52.4	0.00	12.68
310	49.374	0.159	1.69	67	-2.10	183	-0.055	55.3	0.00	12.70
311	49.533	0.159	1.71	67	-2.00	183	-0.055	59.2	0.00	12.71
312	49.694	0.161	1.70	67	-2.10	183	-0.055	58.5	0.00	12.71
313	49.853	0.159	1.69	67	-2.20	182	-0.055	59.8	0.00	12.74
314	50.013	0.160	1.70	67	-2.20	183	-0.055	60.5	0.00	12.60
315	50.173	0.160	1.70	67	-2.10	182	-0.055	59.5	0.00	12.61
316	50.332	0.159	1.69	67	-2.30	183	-0.055	59.5	0.00	12.68
317	50.492	0.160	1.69	67	-2.30	183	-0.055	60.1	0.00	12.75
318	50.652	0.160	1.70	67	-2.20	184	-0.056	60.5	0.00	12.54
319	50.812	0.160	1.70	67	-2.30	184	-0.054	48.8	0.00	12.86
320	50.972	0.160	1.70	67	-2.30	183	-0.055	53.7	0.00	12.88

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
321	51.131	0.159	1.70	67	-2.30	183	-0.055	53.3	0.00	12.67
322	51.291	0.160	1.70	67	-2.00	184	-0.055	53.3	0.00	12.82
323	51.451	0.160	1.70	67	-2.00	184	-0.054	52.4	0.00	12.68
324	51.611	0.160	1.70	67	-2.00	183	-0.055	51.4	0.00	12.60
325	51.771	0.160	1.70	67	-2.00	183	-0.055	51.4	0.00	12.37
326	51.930	0.159	1.69	67	-2.10	183	-0.055	49.8	0.00	12.43
327	52.090	0.160	1.71	67	-2.10	183	-0.055	50.1	0.00	12.36
328	52.251	0.161	1.70	67	-2.10	183	-0.055	50.1	0.00	12.42
329	52.410	0.159	1.69	67	-2.30	183	-0.055	50.7	0.00	12.33
330	52.569	0.159	1.70	67	-2.20	183	-0.056	51.7	0.00	12.34
331	52.730	0.161	1.70	67	-2.20	182	-0.055	52.0	0.00	12.22
332	52.889	0.159	1.69	67	-2.20	182	-0.055	50.7	0.00	12.23
333	53.049	0.160	1.71	67	-2.30	182	-0.055	50.4	0.00	12.20
334	53.209	0.160	1.70	67	-2.00	181	-0.055	48.2	0.00	12.11
335	53.369	0.160	1.69	67	-2.30	180	-0.055	50.7	0.00	12.23
336	53.528	0.159	1.69	67	-2.20	180	-0.055	49.8	0.00	12.18
337	53.688	0.160	1.70	67	-2.10	181	-0.055	49.1	0.00	12.12
338	53.848	0.160	1.70	67	-2.00	181	-0.055	48.8	0.00	11.92
339	54.008	0.160	1.70	67	-2.30	181	-0.055	51.4	0.00	12.27
340	54.167	0.159	1.71	67	-2.30	182	-0.055	48.2	0.00	12.19
341	54.327	0.160	1.69	67	-2.10	182	-0.055	54.0	0.00	12.23
342	54.487	0.160	1.70	67	-2.10	181	-0.055	49.5	0.00	11.95
343	54.647	0.160	1.70	67	-2.20	181	-0.055	49.5	0.00	12.12
344	54.807	0.160	1.70	67	-2.20	181	-0.055	51.1	0.00	12.13
345	54.966	0.159	1.69	67	-2.00	181	-0.055	48.2	0.00	12.05
346	55.126	0.160	1.70	67	-2.20	181	-0.054	48.2	0.00	12.03
347	55.286	0.160	1.70	67	-2.30	180	-0.056	46.9	0.00	12.08
348	55.445	0.159	1.70	67	-2.30	181	-0.054	45.2	0.00	11.83
349	55.605	0.160	1.71	67	-2.30	180	-0.054	44.6	0.00	11.75
350	55.766	0.161	1.70	67	-2.30	181	-0.055	44.0	0.00	11.42
351	55.925	0.159	1.69	67	-2.00	181	-0.054	43.8	0.00	11.46
352	56.085	0.160	1.70	67	-2.00	180	-0.055	43.6	0.00	11.43
353	56.245	0.160	1.69	67	-2.10	180	-0.055	44.0	0.00	11.31
354	56.404	0.159	1.69	67	-2.20	179	-0.055	45.2	0.00	11.39
355	56.564	0.160	1.70	67	-2.00	179	-0.055	43.0	0.00	11.16
356	56.724	0.160	1.71	67	-2.20	179	-0.055	41.4	0.00	11.10

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter Δ H	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
357	56.884	0.160	1.70	67	-2.30	179	-0.054	41.4	0.00	10.92
358	57.044	0.160	1.70	67	-2.10	178	-0.054	42.3	0.00	11.08
359	57.203	0.159	1.70	67	-2.10	179	-0.054	42.3	0.00	10.76
360	57.364	0.161	1.69	67	-2.30	178	-0.055	43.3	0.00	10.77
361	57.524	0.160	1.70	67	-2.30	178	-0.055	46.2	0.00	10.66
362	57.684	0.160	1.70	67	-2.10	178	-0.054	44.3	0.00	10.78
363	57.844	0.160	1.70	67	-2.30	178	-0.054	43.6	0.00	10.69
364	58.003	0.159	1.69	67	-2.20	177	-0.055	41.7	0.00	10.58
365	58.163	0.160	1.70	67	-2.10	177	-0.054	42.7	0.00	10.72
366	58.323	0.160	1.70	67	-2.00	176	-0.054	45.2	0.00	10.57
367	58.482	0.159	1.69	67	-2.20	176	-0.054	47.8	0.00	10.68
368	58.642	0.160	1.70	67	-2.10	176	-0.054	49.1	0.00	10.67
369	58.802	0.160	1.70	67	-2.00	177	-0.055	50.1	0.00	10.56
370	58.962	0.160	1.69	67	-2.10	176	-0.054	50.1	0.00	10.54
371	59.122	0.160	1.70	67	-2.20	176	-0.054	51.7	0.00	10.53
372	59.281	0.159	1.70	67	-2.20	176	-0.054	51.4	0.00	10.49
373	59.441	0.160	1.69	67	-2.20	177	-0.054	50.1	0.00	10.46
374	59.601	0.160	1.70	67	-2.10	176	-0.054	52.7	0.00	10.36
375	59.761	0.160	1.71	67	-2.00	177	-0.055	51.4	0.00	10.27
376	59.921	0.160	1.70	67	-2.20	177	-0.055	50.4	0.00	10.22
377	60.080	0.159	1.70	67	-2.30	177	-0.055	50.4	0.00	10.04
378	60.240	0.160	1.70	67	-2.00	178	-0.055	50.7	0.00	10.20
379	60.400	0.160	1.71	67	-2.30	178	-0.054	50.7	0.00	10.21
380	60.560	0.160	1.69	67	-2.10	178	-0.054	47.8	0.00	9.92
381	60.720	0.160	1.70	67	-2.00	178	-0.055	48.2	0.00	9.96
382	60.880	0.160	1.70	67	-2.30	179	-0.055	48.2	0.00	10.08
383	61.039	0.159	1.70	67	-2.30	180	-0.055	49.8	0.00	9.96
384	61.199	0.160	1.70	67	-2.10	180	-0.055	55.9	0.00	10.20
385	61.359	0.160	1.70	67	-2.20	181	-0.055	61.4	0.00	10.40
386	61.519	0.160	1.69	67	-2.30	182	-0.056	64.4	0.00	10.31
387	61.678	0.159	1.71	67	-2.10	182	-0.056	50.4	0.00	10.42
388	61.838	0.160	1.70	67	-2.30	183	-0.056	43.3	0.00	10.22
389	61.998	0.160	1.69	67	-2.00	183	-0.057	43.3	0.00	10.22
390	62.158	0.160	1.70	67	-2.20	184	-0.056	42.3	0.00	10.21
391	62.318	0.160	1.71	67	-2.30	184	-0.056	41.4	0.00	10.16
392	62.477	0.159	1.70	67	-2.10	183	-0.056	41.7	0.00	10.23

Train D - Ambient Background and Flue Gas Data

Run: 7 **Test Date:** 3/8/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: Ashford 30.2
Tracking No.: BK30.2
Project No.: 0142WS021E

Meter Box Y Regression Offset: 1.011
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.011
Sample Box ID: 372

Test Start Time: 13:56
Total Sampling Time 394 min
Recording Interval 1 min

Elapsed Time (min)	Ambient Sampling System					Flue Gas Data				
	Meter Volume (ft^3)	Sample Rate (CFM)	Meter ΔH	Meter Temp (°F)	Filter Vac (in. Hg)	Stack Temp (°F)	Draft (In. H_2O)	CO (ppm)	CO (%)	CO_2 (%)
393	62.637	0.160	1.70	67	-2.30	184	-0.056	41.3	0.00	10.23
394	62.797	0.160	1.71	67	-2.10	184	-0.056	41.7	0.00	10.17

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Tracking No.:	BK30.2
Project No.:	0142WS021E
Run No.:	7
Test Date:	3/8/24

OMNI Eq. ID Numbers	
Analytical Scale	
Audit Weight Set:	
Analytical Scale	
Hydrometer	
Filters are weighed	In Pairs

Train A

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/08/24 @ 20:45	Filter	F268	239.1	238.2	0.9	0.9
Probe catch*	3/08/24 @ 20:45	Probe	31	114363.4	114363.1	0.3	0.3
ilter seals catch*	3/08/24 @ 20:45	Seals	S685	3292.8	3291.8	1.0	1.0
				Total Particulate, mg:		**2.2**	**2.2**

Train B

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/08/24 @ 20:45	Filter	F269	239.9	238.6	1.3	1.3
Probe catch*	3/08/24 @ 20:45	Probe	78	117461.6	117461.4	0.2	0.2
ilter seals catch*	3/08/24 @ 20:45	Seals	S688	3325.4	3324.5	0.9	0.9
			Sub-Total	Total Particulate, mg:		**2.4**	**2.4**

Train C - *First Hour*

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	3/08/24 @ 20:45	Filter	F267	239.7	239.2	0.5	0.5
Probe catch*	3/08/24 @ 20:45	Probe	28	114749.6	114749.5	0.1	0.1
ilter seals catch*	3/08/24 @ 20:45	Seals	S684	3411.5	3411.0	0.5	0.5
				Total Particulate, mg:		**1.1**	**1.1**

Train D - *Ambient Background*

Sample Component	Date / Time in Dessicator	Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*	3/08/24 @ 20:45	Filter	F234	121.4	121.4	0.0
				Total Particulate, mg:		**0.0**

Final (mg) - Tare (mg) = Particulate (mg)

NOTE: The Uncorrected values are those where any negative filter weights are taken as a negative value. This can possibly occur when filter matter adheres the O-ring seals and thereby transfers some mass to the O-ring. The Corrected values reflect where any negative filter weights are taken as ZERO, thus not accounting for any transfer of mass and resultingly over-reporting. Corrected values were added to this analysis to report the "Corrected" results in this report in response to a request by the US EPA. In cases where the Final weight minus the Tare weight of the Ambient filter occurs, it is taken as a ZERO. Any negative probe weights are evaluated pursuant to clause of ASTM E25215 (or appropriatelt associated test standard as defined in the introduction of this report).

Technician Signature:_____ Reviewed By:_____

Run 7 - Run Notes

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	7
Test Date:	3/8/2024

This supplemental section of miscellaneous run notes is comprised of the following:

- Appliance Operation Notes
- Velocity Traverse / Supplementa Run Notes
- Test Fuel Notes
- Gravimetric Analysis Notes

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Project Number: 0142WS021E Run Number: 7

Model: 30.2 Tracking Number: 2254 Date: 3/8/2024

Test Crew: RT TT

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary: Open 53° from full open

Secondary: N/A

Tertiary/Pilot: N/A

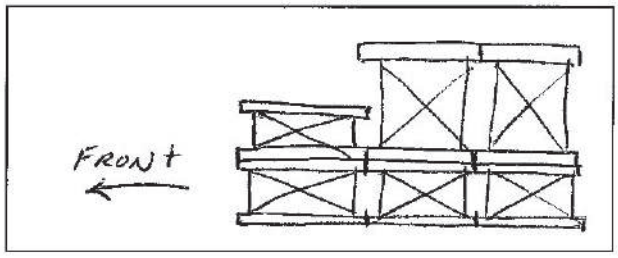
Fan: No Fan (Confirmation Test)

Preburn Notes

Time	Notes
11:55	Flue gas probe installed.
12:54	Recording preburn at 5.2 lbs
1354	Preburn stopped at 4.7 lbs

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Used

Fuel loaded by: 35

Door closed at: 40

Primary air: At test setting

Notes:

Time	Notes
1358	test start
14:56	First hour sampling stopped
2030	Test done

Technician Signature: K. Mays Date: 3/8/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client :Valley Comfort Project Number: 0142WS021E Run Number: 7

Model: AF30.2 Tracking Number: 2254 Date: 03/08/24

Test Crew: R. Tiggs, T. Tong, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 13:56

Stop Time: 20:30

Booth #: 1

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Sample Train Leak Check:

Pre-Test

A: 0.000 @ 17.10 "Hg

B: 0.000 @ 18.51 "Hg

A_1: 0.000 @ 22.43 "Hg

Post-Test

A: 0.000 @ 6

B: 0.000 @ 8

A_1: 0.000 @ 5.82 "Hg

Calibrations: Span Gas CO_2: 16.86% CO: 4.37% CO: 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	11:50	11:51	2040	2042
CO_2 %	0.00	16.85	0.03	16.77
CO %	0.00	438	0.01	4.36
CO ppm	0.0	497.1	-4	494

Air Velocity (ft/min): Initial: 16 Final: 12

Scale Audit (lbs): Initial: 20 Final: 20

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 6

Induced Draft: 0.000

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 03/05/24 Initials: TT

	Initial	Middle	Ending
P_b (in/Hg)	30.09	30.00	29.98
RH (%)	32	32	32
Ambient (°F)	66	68	67

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
.026	.052	73
.041	.082	73
.044	.088	73
.024	.048	73
.026	.052	72
.043	.086	72
.038	.076	72
.019	.038	72
Center:		
.051	.102	73

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.35	-0.35

Background Filter Volume:

Technician Signature: K. Morgan Date: 3/8/24

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Project Number: 0142WS021E Run Number: 7

Model: AF30.2 Tracking Number: 2254 Date: 03/08/24

Test Crew: R. Trigg, T. Towy, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Fuel Data

Fuel: Douglas fir, untreated and air dried, standard grade or better dimensional lumber

Pre-Burn Fuel

Calibration: Cal Value (1) = 12% Actual Reading 12.9/12.0

Cal Value (2) = 22% Actual Reading 22.9/22.0

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	16 3/4 in	23.8	7	16 3/4 in	21.7
2	" in	~~22.0~~	8	" in	24.8
3	" in	~~25.8~~	9	" in	21.0
4	" in	24.9	10	" in	24.2
5	" in	23.8	11	in	
6	" in	23.8	12	in	

Total Pre-Burn Fuel Weight: 19.7 Pre-Burn Fuel Average Moisture: 23.58

Time (clock): 11:10 Room Temperature (F): 63 Initials:

Test Fuel

Firebox Volume (ft³): ~~2.91~~ 2.874 /K Test Fuel Piece Length (in): 16 3/4

Load Weight Range (lb): ~~(18.3, 23.4)~~ /K Total Wet Fuel Load Weight (lb): ~~19.0~~ 18.9 (3.8, 4.7)

Fuel Type & Amount: 2 x 4: 4 4 x 4: 2

Weight (with spacers): 9.7 Weight (with spacers): 9.2

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	4.6 / 4.8	21.2	21.4	20.1	4x4
2	4.6 / 4.0	21.6	21.7	19.4	4x4
3	2.5 / 2.0	22.0	21.1	22.7	2x4
4	2.4 / 1.8	23.8	19.1	19.1	2x4
5	2.5 / 1.9	22.4	24.0	19.3	2x4
6	2.3 / 1.7	21.2	22.3	19.5	2x4
7					

Spacer Moisture Readings (%DB)

18.9	19.1	20.8	21.1	19.5	22.0		
22.0	17.3	10.1	20.8	12.9	13.8		
16.6	20.4	21.0	17.5	19.1	20.8		
16.4	15.0	21.0	10.2	20.7	19.3		

Time (clock): 11:10 Room Temperature (F): 69 Initials: K

Technician Signature: K. A. Morgan Date: 3/8/24

1,08 (@ 0.45) 0.45
1.36/1.36

OMNI-Test Laboratories, Inc. **ASTM E2780 Wood Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WS021E Run Number: 7
Model: AF30.2 Tracking Number: 2254 Date: 03/08/2024
Test Crew: T. Tong, R. Tiegs
OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: T. Tong

Date/Time in Dessicator: 3/08/24, 20:45

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/11/24 9:30	3/11/24 16:30			
R/H %:	29	33			
Temp:	65	67			
200 mg Audit:	200.0	200.0			
2 g Audit:	2000.2	2000.3			
100 g Audit:	99997.7	99997.9			
Initials:	IK	IK			

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	√ Front Filter	F267/A	239.2	239.6	239.7			
	Rear Filter							
	√ Probe	28	114749.5	114749.7	114749.6			
	√ O-Ring Set	S684	3411.0	3411.4	3411.5			
A	√ Front Filter	F268/A	238.2	239.1	239.1			
	Rear Filter							
	√ Probe	31	114363.1	114363.4	114363.4			
	√ O-Ring Set	S685	3291.8	3292.8	3292.8			
B	√ Front Filter	F269/A	238.6	239.9	239.9			
	Rear Filter							
	√ Probe	78	117461.4	117461.5	117461.6			
	√ O-Ring Set	S688	3324.5	3325.3	3325.4			
BG	√ Filter	F234	121.4	121.3	121.4			

Technician Signature: K. A. Morgan Date: 3/11/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	Ashford 30.2
Project Number:	0142WS021E
Run Number:	7

Sample calculations of each equation used in the refernced standards for this test run.

Summary of INPUT values necessary for calculations

	Global Input Parameters for Equations	Value	Source
FM_S	- Average moisture of test fuel spacers, % dry basis	18.18	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	3.5	Fuel Properties Work Sheet
M_{CPnwb}	- Weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis , kg	[1]Varies	Fuel Properties Work Sheet
FM_{CPn}	- Average fuel Fuel moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.441	Fuel Properties Work Sheet
V_{SCENT}	- Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse, ft/sec	0.00	Traverse Worksheet
V_{STRAV}	- Average gas velocity calculated after the multipoint Pitot traverse	13.27	Traverse Worksheet
θ	- Duration of test, min	394	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.04	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.35	*Traverse Worksheet*

[1] *Denotes that this pararmeter for each individual piece of fuel is calculated in the Test Fuel Properties worksheet and the input values are pulled into these sample caculations.*

	Sample Train Input Parameters for Equations	Train A	Train B	Train C	Train D
V_m	- Volume of gas sample measured at the dry gas meter, dcf	63.351	63.664	9.622	62.797
Y	Dry gas meter calibration factor	1.016	1.011	1.015	1.011
ΔH	- Average pressure differential across the orifice meter, in. H_2O	1.25	0.95	2.18	1.69
T_m	- Temperature of Dry Gas Meter, °F	76.6	76.7	64.8	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.3	0.2	0.1	n/a
m_f	- mass of particulate matter from filters, mg	0.9	1.3	0.5	0.0
m_g	- mass of particulate matter from filter seals, mg	1.0	0.9	0.5	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.3	0.2	0.1	n/a
m_f	- mass of particulate matter from filters, mg	0.9	1.3	0.5	n/a
m_g	- mass of particulate matter from filter seals, mg	1.0	0.9	0.5	n/a

M_{Sdb} – Weight of test fuel spacers, dry basis, kg - ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})\left(\frac{100}{100 + FM_S}\right)$$

Where,

FM_S = average moisture of test fuel spacers, % dry basis
M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = 18.18 %, dry basis
M_{Swb} = 3.5 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((3.5 x 0.4536) (100 / (100 + 18.18))

M_{Sdb} = **1.343** kg

MCdb– Weight of test fuel crib, excluding nails and spacers, dry basis, kg - ASTM E2780 equation (2)

$$M_{Cdb} = \sum (M_{CPnwb})\left(\frac{100}{100 + FM_{CPn}}\right)$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg
FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation:

ΣM_{CPnwb} = 15.4 lb.
FM_{CPn} = 21.22 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 15.4 x 0.4536 x (100 / (100 + 21.2166666666667))

M_{Cdb} = **5.76** kg

DCdb - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft3 - ASTM E2780 equation (3)

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

Where,

V_C = Volume of Fuel Crib, ft^3 (less spacers)

Sample Calculation:

M_{Cdb} = 12.70 lb
V_C = 0.441 ft^3

D_{Cdb} = 12.7 / 0.441

D_{Cdb} = **28.81** lb/ft^3

M_{FTAdb} - Total weight of fuel crib including spacers and nails, dry basis - ASTM E2780 equation (4)

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

Sample Calculation:

M_{Sdb} = 1.343
M_{Cdb} = 5.76

M_{FTAdb} = 1.343 + 5.76

M_{FTAdb} = **7.11** kg

BR – dry burn rate, kg/hr - ASTM E2780 equation (5)

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

Sample Calculation:

M_{FTAdb} = 7.106
θ = 394

BR = (60 x 7.106) / 394

BR = **1.08** kg / hr

***Vs* – Average gas velocity in the dilution tunnel, ft/sec -** ASTM E2515 equation (9)

$$V_S = F_P \times K_P \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where

F_P = Adjustment factor for center of tunnel pitot tube placement, where $F_P = V_{STRAV} / V_{SCENT}$

V_{SCENT} = Dilution tunnel velocity, at the center, ft/sec

V_{STRAV} = Dilution tunnel velocity, multi-point pitot traverse, ft/sec

K_P = Pitot tube constant, 85.49

C_P = Pitot tube coefficient: 0.99, unitless

$\Delta P^{1/2}_{AVG}$ = Velocity pressure in the dilution tunnel, in H_2O

$T_{S\,(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R

P_S = Absolute average gas static pressure in tunnel, = Pbar + Pg , where Pbar = Barometric Pressure, in. Hg, Pg = Static pressure in tunnel, Hg (in H_2O / 13.6)

M_S = The dilution tunnel wet molecular weight; Ms = 28.78 assuming a dry weight of 29 lb/lb-mole

(Duration of Test)

F_P = 0.7910

$\Delta P^{1/2}_{AVG}$ = 0.3274

$T_{S\,(avg)}$ = 536.8911

Pbar = 30.0350

Pg = -0.3500

Ps = 30.0093

V_S = 0.791 x 85.49 x 0.99 x 0.327 x √ [(537 / (30.01 x 28.78)]

V_S = **17.285** ft/sec

(First Hour of Test)

F_P = 0.7910

$\Delta P^{1/2}_{AVG}$ = 0.3275

$T_{S\,(avg)}$ = 539.9672

Pbar = 30.0900

Pg = -0.3500

Ps = 30.0643

V_S = 0.791 x 85.49 x 0.99 x 0.328 x √ [(540 / (30.06 x 28.78)]

V_S = **17.321** ft/sec

Q_{std} – Average gas flow rate in dilution tunnel, dscf/hr - ASTM E2515 equation (3)

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

Where:

3600 = Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws} = Water vapor in gas stream, proportion by volume; assume 2%
A = Cross sectional area of dilution tunnel, ft2
T_{std} = solute temperature, 528 °R
P_s = Absolute average gas static pressure in dilution tunnel, = Pbar + Pg , in Hg
$T_{s(avg)}$ = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std} = Standard absolute pressure, 29.92 in Hg

(Duration of Test):

B_{ws} = 0.02
A = 0.19635
P_s = 30.01
$T_{s(avg)}$ = 537
Vs = 17.28

Qstd = 3600 x (1 - 0.02) x 17.285 x 0.19635 x (528 / 537) x (30.01 / 29.92)

Qstd = **11810.2** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 30.06
$T_{s(avg)}$ = 540
Vs = 17.321

Qstd = 3600 x (1 - 0.02) x 17.321 x 0.1963 x (528 / 540) x (30.06 / 29.92)

Qstd = **11789.3** dscf/hr

Vm(std) – Volume of Gas Sampled (Corrected), 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
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Train A

$$V_{m(std)} = 17.64 \times 63.351 \times 1.016 \times \frac{(30.04 + \frac{1.25}{13.6})}{(76.6 + 460)}$$

$V_{m(std)}$ = **63.742** dscf

Train B

$$V_{m(std)} = 17.64 \times 63.664 \times 1.011 \times \frac{(30.04 + \frac{0.95}{13.6})}{(77 + 460)}$$

$V_{m(std)}$ = **63.685** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.62 \times 1.015 \times \frac{(\underline{30.09} + \frac{2.18}{13.6})}{(64.8 + 460)}$$

$V_{m(std)}$ = **9.931** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 62.80 \times 1.011 \times \frac{(\underline{30.04} + \frac{1.69}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **62.665** dscf

mn – 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 Calculations (Uncorrected):

Train A

m_n = 0.3 + 0.9 + 1.0

m_n = **2.2** mg

Train B

m_n = 0.2 + 1.3 + 0.9

m_n = **2.4** mg

Train C (1st hour)

m_n = 0.1 + 0.5 + 0.5

m_n = **1.1** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 0.3 + 0.9 + 1.0

m_n = **2.2** mg

Train B

m_n = 0.2 + 1.3 + 0.9

m_n = **2.4** mg

Train C (1st hour)

m_n = 0.1 + 0.5 + 0.5

m_n = **1.1** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions

g/dscf - ASTM E2515 equation (13)

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

Where:

K_2 = Constant, 0.001 g/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample Calculations (Uncorrected):

Train A

$$C_s = 0.001 \times \frac{2.2}{63.74}$$

C_s = **0.000035** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.4}{63.69}$$

C_s = **0.0000377** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.1}{9.93}$$

Cs = **0.000111** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{62.67}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{2.2}{63.74}$$

C_s = **0.000035** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.4}{63.69}$$

C_s = **0.0000377** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.1}{9.93}$$

Cs = **0.000111** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{62.67}$$

C_r = **0.000000** g/dscf

ET – Total Particulate Emissions, g - ASTM E2515 equation (15)

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculations (uncorrected)

Train A

E_T = (0.000035 - 0.000000) x 11810.2 x 394 / 60

E_T = **2.68** g

Train B

E_T = (0.000038 - 0.000000) x 11810.2 x 394 / 60

E_T = **2.92** g

First Hour

E_T = (0.000111 - 0.000000) x 11789.3 x 60 / 60

E_T = 1.31 g

Trains A and B Average

E = **2.80** g

Sample calculations (Corrected)

Train A

E_T = (0.000035 - 0.000000) x 11810.2 x 394 / 60

E_T = **2.68** g

Train B

E_T = (0.000038 - 0.000000) x 11810.2 x 394 / 60

E_T = **2.92** g

First Hour

E_T = (0.000111 - 0.000000) x 11789.3 x 60 / 60

E_T = **1.31** g

Trains A and B Average

E_T = **2.80** g

PM_R – Particulate emissions for test run, g/hr - ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation (Uncorrected)

Train A

E_T = 2.68 g

θ = 394 min

$PM_R = 60 \times (2.68 / 394)$

PM_R = **0.41** g/hr

Train B

E_T = 2.92 g

θ = 394 min

$PM_R = 60 \times (2.92 / 394)$

PM_R = **0.45** g/hr

A and B Average

E_T = **0.43** g/hr

First Hour

E_T = 1.31 g

θ = 60 min

$PM_R = 60 \times (1.31 / 60)$

PM_R = **1.31** g/hr

Sample Calculation (Corrected)

Train A

E_T = 2.68 g

θ = 394 min

$PM_R = 60 \times (2.68 / 394)$

PM_R = **0.41** g/hr

Train B

E_T = 2.92 g

θ = 394 min

$PM_R = 60 \times (2.92 / 394)$

PM_R = **0.45** g/hr

A and B Average

E_T = **0.43** g

First Hour

E_T = 1.31 g

θ = 60 min

$PM_R = 60 \times (1.31 / 60)$

PM_R = **1.31** g/hr

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned - ASTM E2780 equation (7)

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

Sample Calculation (Uncorrected)

Train A

E_T = 2.68 g
M_{FTAdb} = 7.11 kg
PM_F = 2.68 / 7.11
PM_F = **0.38** g/kg

Train B

E_T = 2.92 g
M_{FTAdb} = 7.11 kg
PM_F = 2.92 / 7.11
PM_F = **0.41** g/kg

Sample Calculation (Corrected)

Train A

E_T = 2.68 g
M_{FTAdb} = 7.11 kg
PM_F = 2.68 / 7.11
PM_F = **0.38** g/kg

Train B

E_T = 2.92 g
M_{FTAdb} = 7.11 kg
PM_F = 2.92 / 7.11
PM_F = **0.41** g/kg

PR - Proportional Rate Variation - ASTM E2515 equation (16)

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

Where:			Train A	Train B	Train C
θ	=	Total sampling time, min	394	394	60
θ_i	=	Length of recording interval, min	1	1	1
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.162	0.161	0.163
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	63.351	63.664	9.622
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	17.467	17.467	17.467
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	17.285	17.285	17.343
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	528.0	528.0	524.0
T_m	=	Absolute average dry gas meter temperature, ^oR	536.6	536.7	524.8
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	553.5	553.5	553.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	536.9	536.9	540.0

NOTE: These sample calculations are for the Second interval of each train)

Train A PR = $\left(\frac{394 \times 0.162 \times 17.285 \times 537 \times 554}{1 \times 63.351 \times 17.467 \times 528 \times 537}\right)$ X 100 = 104.5 %

Train B PR = $\left(\frac{394 \times 0.161 \times 17.285 \times 537 \times 554}{1 \times 63.664 \times 17.467 \times 528 \times 537}\right)$ X 100 = 103.3 %

Train B PR = $\left(\frac{60 \times 0.163 \times 17.343 \times 525 \times 554}{1 \times 9.622 \times 17.467 \times 524 \times 540}\right)$ X 100 = 103.6 %

Tare Sheet: (check one) **Probes**____ **47mm Filters** ✓ **100mm Filters**____ **O-Ring Pair**____

Prepared By: Balance ID #: 632 Thermohygrometer ID #: 209 Audit Weight ID #/Mass: 283-0 /

Placed in Dessicator: Date: 11-21-23 Time: 0930	Date: 11-22-23 Time: 0930 RH %: 11.4 T (°F): 67.2 Audit: 200.0	Date: 11/28/23 Time: 15:00 RH %: 9.9 T (°F): 67.7 Audit: 200.1	Date: 3/12/24 Time: 14:13 RH %: 30 T (°F): 69 Audit: 2000.0	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
ID #							
F201	123.7X	123.8					
F202	122.5	122.3					
F203	124.3	124.2					
F204	123.5	123.3					
F205	122.2	122.0					
~~F205~~ F206	122.4	122.2					
F207	122.4	122.6					
F208	124.2	124.0					
F209	124.1	123.9					
F210	125.2	125.0					
F211	123.5	123.4					
F212	122.7	122.6			3/7/24	0142WS021E	5
F213	125.7	125.8	125.7	— 3/12/24 check			
F214	125.1	125.0	125.0				
F215	125.0	125.0	125.0				
F216	123.3	123.3	123.2				
F217	124.5	124.5	124.5				
F218	123.3	123.4	123.4				
F219	123.8	123.7	123.7				
F220	123.9	124.1	124.2				
	Initials: FC	Initials: TT	Initials:	Initials:			

Final Technician Signature: [illegible] Date: 1/10/24 Evaluator signature: [illegible] Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) **Probes**_____ **47mm Filters**_____ **100mm Filters**_____ **O-Ring Pair**_____

Prepared By: Balance ID #: Thermohygrometer ID #: Audit Weight ID #/Mass: 1

Placed in Dessicator: Date: 2-14-24 Time: 1345	Date: 2-15-24 Time: 1530 RH %: 11.2 T (°F): 69.3 Audit: 200.0, 999.9	Date: 2-22-24 Time: 1620 RH %: 12.1 T (°F): 69.2 Audit: 200.1, 1000.0	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
ID #							
F241/F241A	241.8	241.8 ✓					
F242/F242A	238.4	238.5 ✓					
F243/F243A	238.8	238.7 ✓					
F244/F244A	239.5	239.5 ✓					
F245/F245A	238.8	238.9 ✓			03/05/24	0142WS021E	1
F246/F246A	239.6	239.7 ✓			↓	↓	↓
F247/F247A	238.3	238.4 ✓			3/5/24	0142WS021E	2
F248/F248A	239.2	239.3 ✓			3/5/24	0142WS021E	2
F249/F249A	238.4	238.3 ✓			3/5/24	0142WS021E	2
F250/F250A	238.0	238.1 ✓			Not used		
F251/F251A	238.0	238.4			03/06/24	0142WS021E	~~3~~
F252/F252A	238.3	238.1 ✓			↓	↓	↓
F253/F253A	238.8	238.8 ✓			Not used		
F254/F254A	240.3	240.3 ✓			03/06/24	0142WS021E	4
F255/F255A	239.0	239.0 ✓			↓	↓	↓
F256/F256A	239.7	239.6 ✓			03/06/24	0142WS021E	4
F257/F257A	239.2	239.2 ✓					
F258/F258A	239.1	239.2 ✓					
F259/F259A	238.5	238.5 ✓					
F260/F260A	239.8	239.8					
	Initials: RT	Initials: RT	Initials:	Initials:			

Final Technician Signature: K. Morgan Date: 2/22/24 Evaluator signature: Kyf. Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) **Probes**____ **47mm Filters**____ **100mm Filters**____ **O-Ring Pair**____

Prepared By: Balance ID #: Thermohygrometer ID #: Audit Weight ID #/Mass: /

Placed in Dessicator: Date: 03-13-24 1010 Time: 1010 ID #	Date: 3-7-24 Time: 1230 RH %: 18.3 T (°F): 66.4 Audit: 200.0	Date: 3-7-24 Time: 2050 RH %: 20 T (°F): 64 Audit: 200.0	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
F261/F261A	N/A						
F262/F262A	N/A						
F263/F263A	N/A						
F264/F264A	238.5	238.6			3/7/24	0142WS021E	6
F265/F265A	239.0	238.9			3/7/24	0142WS021E	6
F266/F266A	238.9	238.8			3/7/24	0142WS021E	6
F267/F267A	239.2	239.2			3/08/24	0142WS021E	7
F268/F268A	238.2	238.2			↓	↓	↓
F269/F269A	238.6	238.6					
F270/F270A	239.2	239.2					
F271/F271A	238.9	238.9					
F272/F272A	238.6	238.9					
F273/F273A	238.7	238.7					
F274/F274A	238.7	238.7					
F275/F275A	239.0	239.0					
F276/F276A	239.5	239.5					
F277/F277A	239.1	239.2					
F278/F278A	237.6	238.0					
F279/F279A	239.4	239.5	SCRAPPED				
F280/F280A	238.8	238.9					
	Initials: RT	Initials: JH	Initials:	Initials:			

Final Technician Signature: _____ Date: _____ Evaluator signature: _____

Tare Sheet: (check one) Probes____ 47mm Filters✓ 100mm Filters____ O-Ring Pair____

Prepared By: Tony Tong Balance ID #: 00637 Thermohygrometer ID #: Audit Weight ID #/Mass: 1

Placed in Dessicator: Date: 11/30/23 Time: 15:40 ID #	Date: 12/04/23 Time: 8:30 RH %: 10.7 T (°F): 65.2 Audit: 200.1	Date: 12/05/23 Time: 9:00 RH %: 12.9 T (°F): 67.5 Audit: 200.1	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
F221	125.2 ✓	125.2 ✓					
F222	120.6 ✓	120.5 ✓					
F223	120.3 ✓	120.5 ✓					
F224	121.9 ✓	122.0 ✓					
F225	122.0 ✓	122.1 ✓					
F226	120.3 ✓	120.4 ✓					
F227	123.1 ✓	123.1 ✓			03/05/24	0142WS021E	1
F228	122.5 ✓	122.4 ✓			3/5/24	0142WS021E	2
F229	120.4 ✓	120.5 ✓			03/06/24	0142WS021E	3
F230	120.6 ✓	120.6 ✓			03/06/24	0142WS021E	4
F231	120.4 ✓	120.5 ✓			3/7/24	0142WS021E	5
F232	121.5 ✓	121.6 ✓			3/7/24	0142WS021E	5
F233	121.8 ✓	121.7 ✓			3/7/24	0142WS021E	6
F234	121.4 ✓	121.4 ✓			03/08/24	0142WS021E	7
F235	120.0 ✓	120.2 ✓			3/7/24	0142WS021E	5
F236	121.4 ✓	121.5 ✓			3/7/24	0142WS021E	5
F237	120.9 ✓	121.0 ✓			3/7/24	0142WS021E	5
F238	121.5 ✓	121.4 ✓			3/7/24	0142WS021E	5
F239	121.0 ✓	121.0 ✓	1		3/12/24	SCRAPED	
F240	121.5 ✓	121.6 ✓	121.6 3/12/24 check				
	Initials: TT	Initials: TT	Initials:	Initials:			

Final Technician Signature: Tony Tong Date: 12/05/23 Evaluator signature: M. Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) **Probes** ✓ **47mm Filters** ____ **100mm Filters** ____ **O-Ring Pair** ____

Prepared By: Balance ID #: 00637 Thermohygrometer ID #: 00733 Audit Weight ID #/Mass: 00283A 1 100g

Placed in Dessicator: Date: 02/08/24 Time: 11:30 ID #	Date: 02/12/24 Time: 8:45 RH %: 12.3 T (°F): 64.5 Audit: 99997.8	Date: 02/13/24 Time: 15:20 RH %: 12.6 T (°F): 66.5 Audit: 99997.9	Date: 02/14/24 Time: 14:15 RH %: 13.7 T (°F): 68.4 Audit: 99997.9	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
69	117370.8	117370.5	117370.3		03/05/24	0142WS021E	1
78	117070.0	117070.1					
28	114749.4	114749.5					
68	116880.1	116880.1					
	Initials: TT	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: Tom Tong Date: 02/14/24 Evaluator signature: M. Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) Probes ✓ 47mm Filters____ 100mm Filters____ O-Ring Pair____

Prepared By: Balance ID #: 00687 Thermohygrometer ID #: 00733 Audit Weight ID #/Mass: 10283 A / 100g

Placed in Dessicator: Date: 02/08/24 Time: 11:30	Date: 02/12/24 Time: 8:45 RH %: 12.3 T (°F): 64.5	Date: 02/13/24 Time: 15:20 RH %: 12.6 T (°F): 66.5	Date: 02/14/24 Time: 14:15 RH %: 13.7 T (°F): 68.4	Date: Time: RH %: T (°F):	Date Used	Project Number	Run No.
ID #	Audit: 99997.8	Audit: 99997.9	Audit: 99997.9	Audit:			
3	116010.6	116010.6 ✓					
OES 4	114448.6	114448.7 ✓					
OES 5	113570.3	113570.3 ✓					
OES 6	113709.0	113708.7 ✓	113708.6 ✓				
12	114284.6	114285.0 ✓	114284.3 ✓				
14	114546.9	114546.4 ✓	114546.3 ✓		03/05/24	0142WS021E	1
18	~~114399.7~~ 117663.4	114399.2 ✓	114399.0 ✓		3/5/24	0142WS021E	2
15	114339.9	114339.7 ✓					
23	114076.3	114076.3 ✓					
24	114126.4	114126.5 ✓					
33	113944.0	113943.9 ✓					
25	114327.4	114327.4 ✓			3/5/24	0142WS021E	2
66	118457.5	118457.1 ✓	118457.0 ✓				
62	117663.8	117663.1 ✓	117663.3 ✓				
75	117641.0	117641.0 ✓			03/06/24	0142WS021E	4
78	117460.7	117460.6 ✓					
65	117079.1	117079.2 ✓					
77	116181.6	116181.6 ✓			3/5/24	0142WS021E	2
21	114390.6	114390.4 ✓					
27	114349.8	114349.7 ✓					
	Initials: TT	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: Tom Long Date: 02/14/24 Evaluator signature: M. Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) **Probes** ✓ **47mm Filters**____ **100mm Filters**____ **O-Ring Pair**____

Prepared By: RT Balance ID #: 637 Thermohygrometer ID #: 205 Audit Weight ID #/Mass: 283A 1

Placed in Dessicator: Date: 11-15-23 Time: 1200 ID #	Date: 11-16-23 Time: 1245 RH %: 11.7 T (°F): 67.9 Audit: 99997.8	Date: 11-21-2023 Time: 0800 RH %: 11.3 T (°F): 66.3 Audit: 99997.9	Date: 11-22-23 Time: 0800 RH %: 9.8 T (°F): 66.9 Audit: 99997.9	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
14	114547.1	114547.0 ✓					
69	117370.5	117370.5 ✓					
23	114076.1	114076.0 ✓					
27	114350.2	114350.3 ✓					
22	114340.1	114340.0 ✓					
OES 5	113571.2	113570.7	113570.8 ✓				
3	116011.0	116010.8 ✓					
65	117079.4	117079.3 ✓					
38	114149.4	114149.3 ✓					
11	114185.5	114185.3 ✓					
18	114399.3	114399.2 ✓					
24	114127.3	114127.1 ✓					
61	118128.2	118128.1 ✓					
77	116182.7	116182.5 ✓					
72	115949.6	115949.7 ✓					
76	116965.1	116950 ✓					
37	114465.8	114465.6 ✓					
20	114254.1	114253.9 ✓			03/05/24	0142WS021E	1
13	114321.6	114321.7 ✓					
62	117664.4	117664.5 ✓					
	Initials: RT	Initials: RT	Initials: RT	Initials:			

Final Technician Signature: [signature] Date: 01/10/24 Evaluator signature: K. J. Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) Probes ✓ 47mm Filters____ 100mm Filters____ O-Ring Pair____

Prepared By: Balance ID #: 00637 Thermohygrometer ID #: 00733 Audit Weight ID #/Mass: 00283A / 100g

ID #	Placed in Dessicator: Date: 03/01/24 Time: 1300	Date: 03/04/24 Time: 14:00 RH %: 22.0 T (°F): 71.0 Audit: 99997.9	Date: 03/05/24 Time: 14:30 RH %: 24.0 T (°F): 71.3 Audit: 99997.9	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
78		117461.4	117461.4			03/08/24	0124WS021E	7
38		114149.5	114149.5			03/06/24	0124WS021E	4
6		115346.1	115346.5					
22		114340.3	114340.1					
31		114363.0	114363.1			03/08/24	0124WS021E	7
74		117666.6	117666.4					
11		114186.2	114186.0			03/06/24	0142WS021E	3
84		117636.9	117637.0			↓	↓	↓
32		114743.8	114743.9					
61		118128.1	118128.1			03/06/24	0142WS021E	4
28		114749.3	114749.5			03/08/24	0142WS021E	7
65		117080.7	117080.6			03/06/24	0142WS021E	3
76		116967.1	116967.0			3/7/24	0142WS021E	6
30		114327.3	114327.3					
SC53		118273.0	118273.0			3/7/24	0142WS021E	6
72		115949.4	115949.4			3/7/24	0142WS021E	6
34		115867.9	115867.9			3/7/24	0142WS021E	5
58		117067.4	117067.4					
29		114275.8	114275.8			3/7/24	0142WS021E	5
2		115012.1	115011.9			3/7/24	0142WS021E	5
		Initials: TT	Initials: TT	Initials:	Initials:			

Final Technician Signature: _____ Date: _____ Evaluator signature: _____

Tare Sheet: (check one) **Probes**_____ **47mm Filters**_____ **100mm Filters**_____ **O-Ring Pair** X

Prepared By: Balance ID #: Thermohygrometer ID #: Audit Weight ID #/Mass: /

Placed in Dessicator: Date: 2-14-24 Time: 1100 ID #	Date: 2-15-24 Time: 1145 RH %: 11.2 T (°F): 69.6 Audit: 4999.8	Date: 2-22-24 Time: 1707 RH %: 11.7 T (°F): 69.7 Audit: 4999.8	Date: 02/26/24 Time: 0900 RH %: 11.2 T (°F): 69.9 Audit: 4999.9	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
S659	3322.3	3322.1 ✓					
S660	3409.3	3409.1 ✓					
S661	3401.5	3401.0	3401.0 ✓				
S662	3322.3	3322.1 ✓					
S663	3307.6	3307.4 ✓					
S664	4145.1	4144.6	4144.7 ✓				
S665	3305.5	3305.1	3305.2 ✓				
S666	3400.4	3400.0	3400.1 ✓				
S667	3415.0	3414.8 ✓					
S668	3397.5	3397.4 ✓					
S669	3339.2	3339.0 ✓					
S670	3266.6	3266.4 ✓			03/05/24	0142WS021E	1
S671	3431.6	3431.4 ✓			3/5/24	0142WS021E	2
S672	3354.0	3354.0 ✓			3/5/24	0142WS021E	2
S673	3410.7	3410.5 ✓			3/5/24	0142WS021E	2
S674	3289.4	3289.2 ✓			03/05/24	0142WS021E	1
S675	3401.2	3401.1 ✓			↓	↓	↓
S676	3225.9	3225.7 ✓			03/06/24	0142WS021E	3
S677	3296.1	3296.0 ✓			03/06/24	0142WS021E	4
S678	3314.2	3314.0 ✓			03/06/24	0142WS021E	3
	Initials: RC	Initials: RC	Initials:	Initials:			

Final Technician Signature: Ih J. Morgan Date: 2/26/24 Evaluator signature: Ih J. Morgan

Control No. P-SFDP-0002.xls, Effective date: 2/1/2017

Tare Sheet: (check one) **Probes**____ **47mm Filters**____ **100mm Filters**____ **O-Ring Pair** ✓

Prepared By: Balance ID #: 00637 Thermohygrometer ID #: 00733 Audit Weight ID #/Mass: 00283A 15g

Placed in Dessicator: Date: / Time:	Date: 03/04/24 Time: 14:30 RH %: 21.3 T (°F): 71.0 Audit: 5000.0	Date: 03/05/24 Time: 14:35 RH %: 22.9 T (°F): 71.4 Audit: 5000.0	Date: Time: RH %: T (°F): Audit:	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
ID #							
15679	3336.8	3336.9					
5680	4093.9	4093.4					
5681	3278.7	3278.8			03/6/24	0142WS021E	4
5682	3353.7	3353.6					
5683	3415.0	3415.0			3/7/24	0142WS021E	6
5684	3411.0	3411.0			03/08/24	0142WS021E	7
5685	3291.8	3291.8			↓	↓	↓
5686	4162.1	4162.1			3/7/24	0142WS021E	6
5687	3372.5	3372.4			3/7/24	0142WS021E	5
5688	3324.4	3324.5			03/08/24	0142WS021E	7
5689	3335.3	3335.5			03/06/24	0142WS021E	3
5690	3231.2	3231.4					
5691	4167.2	4167.1					
5692	3435.2	3435.4			03/06/24	0142WS021E	4
5693	4129.2	4129.3					
5694	3430.6	3430.7					
5695	3384.0	3384.0			3/7/24	0142WS021E	5
5696	3313.5	3313.5			3/7/24	0142WS021E	5
5697	3340.6	3340.5					
5698	3413.8	3413.9			3/7/24	0142WS021E	6
	Initials: TT	Initials: TT	Initials:	Initials:			

Final Technician Signature: _____ Date: _____ Evaluator signature: _____

6. Appliance Engineering Drawings

(CBI Report Only)

7. Appliance Labeling and Owner's Manual(s)

ASHFORD AF30.2

SN - 63.

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

MODEL / MODÈLE: AF30.2
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S627:2023
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA
APPROVED FOR USE IN MOBILE HOMES (USA) AND IN TRANSPORTABLE BUILDINGS (CAN) / APPROUVÉ POUR UNE UTILISATION DANS LES MAISONS MOBILES (USA) ET DANS LES BÂTIMENTS TRANSPORTABLES (CAN)

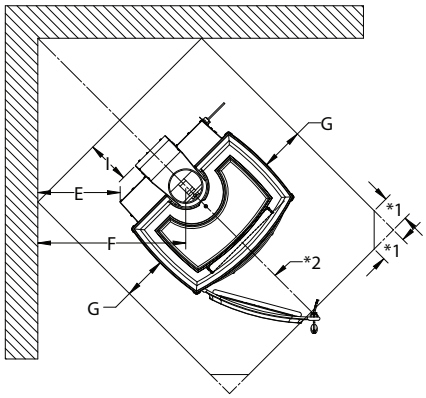
0142WS021E
0142WS014S

Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. To be installed as a freestanding space heater with the clearances listed below and in the installation instructions. Not to be installed in any fireplace. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Except for the installation detailed below, use a 6" listed, factory built chimney suitable for use with solid fuels conforming to UL-103HT (USA) or CAN/ULC-S629 (CAN) or a code comliant, masonry chimney.
Mobile Home (USA) or Transportable Building (CAN) and residential close clearance 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 UL-103HT (USA) or CAN/ULC-S629 (CAN). Mobile Home (USA) or Transportable Buildings (CAN) installations are approved for roof exit only. Do not install in a sleeping room. Connection through a wall or ceiling requires special methods, see instructions and refer to local building codes to ensure proper installation.

Installez et utilisez cet appareil conformément aux instructions d'installation et d'utilisation de Blaze King. Contactez les responsables locaux du bâtiment ou des pompiers au sujet des restrictions et de l'inspection de l'installation dans votre région. À installer en tant qu'appareil de chauffage autonome avec les dégagements indiqués ci-dessous et dans les instructions d'installation. Ne pas installer dans une cheminée. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". À l'exception de l'installation détaillée ci-dessous, utilisez une cheminée de 6" homologuée et fabriquée en usine adaptée à une utilisation avec des combustibles solides conformes à UL-103HT (USA) ou CAN/ULC-S629 (CAN) ou un code conforme, cheminée en maçonnerie.
Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) et résidentielles à dégagement réduit nécessitent un connecteur de cheminée homologué à double paroi et à dégagement réduit avec une cheminée fabriquée en usine homologuée adaptée à une utilisation avec des combustibles solides et conforme à UL-103HT (USA) ou CAN/ULC-S629 (CAN). Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) sont approuvées pour une sortie sur le toit uniquement. Ne pas installer dans une chambre à coucher. La connexion à travers un mur ou un plafond nécessite des méthodes spéciales, voir les instructions et se référer aux codes du bâtiment locaux pour assurer une installation correcte.

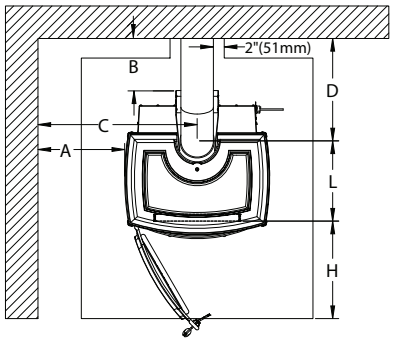
MINIMUM CLEARANCES TO COMBUSTIBLES (see owners manual for complete description of all requirements)
*** In Canada, 18" clearances from single wall pipe is required. Check with local codes and pipe manufacturers for minimum pipe clearances.**
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)
*** Au Canada, un dégagement de 18 po est exigé pour un tuyau à simple paroi. Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements.**

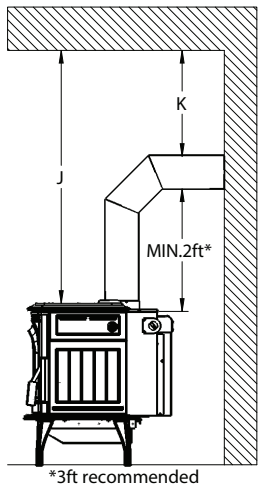
Residential Installations / Installations Résidentielles	A	B	* C	* D	E	* F	J
Roof Exit or Wall Exit, Parallel or Corner minimum clearances Dégagements minimaux de sortie de toit ou de sortie murale, parallèle ou d'angle	10.75" 273 mm	6" 153 mm	25.5" 648 mm	16.375" 416 mm	4" 102 mm	16.875" 429 mm	37" 940 mm
Mobile Home (USA) or Transportable Building (CAN) / Maison mobile (USA) or Bâtiment transportable (CAN)							
Roof Exit, Parallel or Corner minimum clearances; outside Air Kit and Fan Kit or Rear Shield required Dégagements minimaux de sortie de toit, parallèles ou en coin; Kit d'air extérieur et kit de ventilateur ou écran arrière requis	10.75" 273 mm	6" 153 mm	25.5" 648 mm	16.375" 416 mm	4" 102 mm	16.875" 429 mm	37" 940 mm



*1= 5.875" in Canada and 2.125" in USA

*2 = 57.625" in Canada and 55.625" in USA





*3ft recommended

G = 2.75" (70 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (457 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (457 mm) for single wall pipe in Canada	L = 15.75" (400 mm)

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. Minimum floor protection size is: 35" x 42.125" (889 mm x 1070 mm) in USA and 45.5" x 52.125" (1156 mm x 1324 mm) in Canada.
This appliance is certified to comply with 2020 particulate emission standards using crib wood (certified to EPA test methods 28R/5G with an emission-rate of 0.81 g/hr). It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual or if the catalytic combustor is deactivated or removed. This appliance needs periodic inspection and repair for proper operation; consult the owner's manual for instruction.
ONLY OPERATE WITH DOORS CLOSED; open door to feed fire ONLY. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS OR THE SPACE BENEATH THEAPPLIANCE. Provide adequate outside air for combustion. For use with solid wood fuel only; do not burn other fuels as this will cause the catalyst in the combustor to become inactive. The performance of the combustor or its durability has not been evaluated as part of the certification. Combustor OEM part number: Z0336A-M. Replace glass with 5mm ceramic glass only.

Cet appareil ne nécessite pas de protection thermique du sol du foyer; cependant, s'il est installé sur un plancher combustible, un protecteur de plancher non combustible doit être utilisé. La taille minimale de la protection de plancher est de: 35" x 42 1/8" (889 mm x 1070 mm) aux USA ou 45 1/2" x 52 1/8" (1156 mm x 1324 mm) au Canada.
Cet appareil est certifié conforme aux normes d'émission de particules 2020 utilisant du bois de lit (certifié selon les méthodes de test EPA 28R/5G avec un taux d'émission de 0.81 g/h). Il est contraire aux réglementations fédérales d'utiliser cet appareil d'une manière incompatible avec les instructions d'utilisation du manuel du propriétaire ou si la chambre de combustion catalytique est désactivée ou retirée. Cet appareil nécessite une inspection et une réparation périodiques pour un bon fonctionnement; consultez le manuel du propriétaire pour obtenir des instructions.
NE FAIRE FONCTIONNER QU'AVEC LES PORTES FERMÉES; ouvrir la porte UNIQUEMENT pour alimenter le feu. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION ou l'espace sous l'appareil. Fournir suffisamment d'air extérieur pour la combustion. À utiliser uniquement avec du bois de chauffage solide; ne brûlez pas d'autres combustibles car cela rendrait le catalyseur dans la chambre de combustion inactif. Les performances de la chambre de combustion ou sa durabilité n'ont pas été évaluées dans le cadre de la certification. Numéro de pièce OEM de la chambre de combustion: Z0336A-M. Remplacez le verre par du verre céramique de 5 mm uniquement.

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 ☐
2024 ☐ 2025 ☐ 2026 ☐ 2027 ☐ 2028 ☐ 2029 ☐

170-0273 [04 24]

CHINOOK CK30.2

SN - 54.

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

MODEL / MODÈLE: CK30.2
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S627:2023
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA
APPROVED FOR USE IN MOBILE HOMES (USA) AND IN TRANSPORTABLE BUILDINGS (CAN) / APPROUVÉ POUR UNE UTILISATION DANS LES MAISONS MOBILES (USA) ET DANS LES BÂTIMENTS TRANSPORTABLES (CAN)

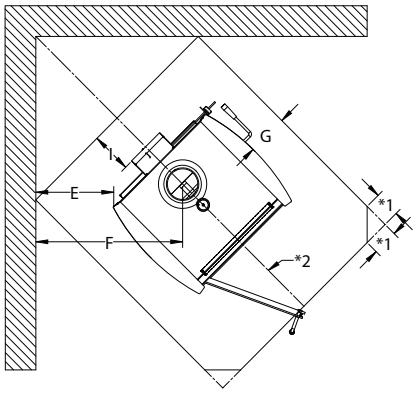
0142WS021E
0142WS014S

Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. To be installed as a freestanding space heater with the clearances listed below and in the installation instructions. Not to be installed in any fireplace. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Except for the installation detailed below, use a 6" listed, factory built chimney suitable for use with solid fuels conforming to UL-103HT (USA) or CAN/ULC-S629 (CAN) or a code compliant, masonry chimney.
Mobile Home (USA) or Transportable Building (CAN) and residential close clearance 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 UL-103HT (USA) or CAN/ULC-S629 (CAN). Mobile Home (USA) or Transportable Buildings (CAN) installations are approved for roof exit only. Do not install in a sleeping room. Connection through a wall or ceiling requires special methods, see instructions and refer to local building codes to ensure proper installation.

Installez et utilisez cet appareil conformément aux instructions d'installation et d'utilisation de Blaze King. Contactez les responsables locaux du bâtiment ou des pompiers au sujet des restrictions et de l'inspection de l'installation dans votre région. À installer en tant qu'appareil de chauffage autonome avec les dégagements indiqués ci-dessous et dans les instructions d'installation. Ne pas installer dans une cheminée. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". À l'exception de l'installation détaillée ci-dessous, utilisez une cheminée de 6" homologuée et fabriquée en usine adaptée à une utilisation avec des combustibles solides conformes à UL-103HT (USA) ou CAN/ULC-S629 (CAN) ou un code conforme, cheminée en maçonnerie.
Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) et résidentielles à dégagement réduit nécessitent un connecteur de cheminée homologué à double paroi et à dégagement réduit avec une cheminée fabriquée en usine homologuée adaptée à une utilisation avec des combustibles solides et conforme à UL-103HT (USA) ou CAN/ULC-S629 (CAN). Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) sont approuvées pour une sortie sur le toit uniquement. Ne pas installer dans une chambre à coucher. La connexion à travers un mur ou un plafond nécessite des méthodes spéciales, voir les instructions et se référer aux codes du bâtiment locaux pour assurer une installation correcte.

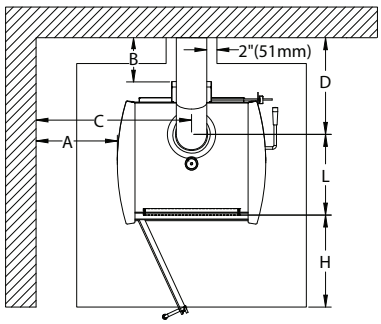
MINIMUM CLEARANCES TO COMBUSTIBLES (see owners manual for complete description of all requirements)
*** In Canada, 18" clearances from single wall pipe is required. Check with local codes and pipe manufacturers for minimum pipe clearances.**
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)
*** Au Canada, un dégagement de 18 po est exigé pour un tuyau à simple paroi. Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements.**

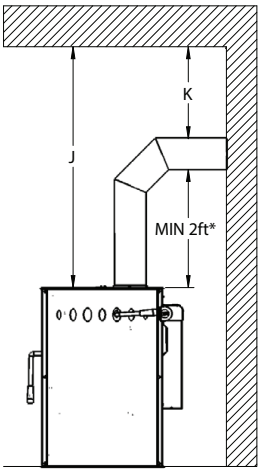
Residential Installations / Installations Résidentielles	A	B	* C	* D	E	* F	J
Roof Exit or Wall Exit, Parallel or Corner minimum clearances Dégagements minimaux de sortie de toit ou de sortie murale, parallèle ou d'angle	9.5" 241 mm	6" 153 mm	24.125" 603 mm	16.375" 416 mm	4" 102 mm	17.625" 448 mm	37" 940 mm
Mobile Home (USA) or Transportable Building (CAN) / Maison mobile (USA) or Bâtiment transportable (CAN)							
Roof Exit, Parallel or Corner minimum clearances; outside Air Kit and Fan Kit or Rear Shield required Dégagements minimaux de sortie de toit, parallèles ou en coin; Kit d'air extérieur et kit de ventilateur ou écran arrière requis	9.5" 241 mm	6" 153 mm	24.125" 603 mm	16.375" 416 mm	4" 102 mm	17.625" 448 mm	37" 940 mm



*1= 5.625" in Canada and 2.125" in USA

*2 = 58.625" in Canada and 56.625" in USA





*3ft recommended

G = 3" (77 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (457 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (457 mm) for single wall pipe in Canada	L = 15.75" (400mm)

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. Minimum floor protection size is: 35" x 42.125" (889 mm x 1070 mm) in USA or 45.25" x 52.125" (1150 mm x 1324 mm) in Canada.
This appliance is certified to comply with 2020 particulate emission standards using crib wood (certified to EPA test methods 28R/5G with an emission-rate of 0.81 g/hr). It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual or if the catalytic combustor is deactivated or removed. This appliance needs periodic inspection and repair for proper operation; consult the owner's manual for instruction.
ONLY OPERATE WITH DOOR CLOSED; open door to feed fire ONLY. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS OR THE SPACE BENEATH THE APPLIANCE. Provide adequate outside air for combustion. For use with solid wood fuel only; do not burn other fuels as this will cause the catalyst in the combustor to become inactive. The performance of the combustor or its durability has not been evaluated as part of the certification. Combustor OEM part number: Z0336A-M. Replace glass with 5 mm ceramic glass only.

Cet appareil ne nécessite pas de protection thermique du sol du foyer; cependant, s'il est installé sur un plancher combustible, un protecteur de plancher non combustible doit être utilisé. La taille minimale de la protection de plancher est de: 35" x 42.125" (889 mm x 1070 mm) aux USA ou 45.25" x 52.125" (1150 mm x 1324 mm) au Canada.
Cet appareil est certifié conforme aux normes d'émission de particules 2020 utilisant du bois de lit (certifié selon les méthodes de test EPA 28R/5G avec un taux d'émission de 0.81 g/h). Il est contraire aux réglementations fédérales d'utiliser cet appareil d'une manière incompatible avec les instructions d'utilisation du manuel du propriétaire ou si la chambre de combustion catalytique est désactivée ou retirée. Cet appareil nécessite une inspection et une réparation périodiques pour un bon fonctionnement; consultez le manuel du propriétaire pour obtenir des instructions.
FONCTIONNER UNIQUEMENT AVEC LA PORTE FERMÉE; ouvrir la porte UNIQUEMENT pour alimenter le feu. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION ou l'espace sous l'appareil. Fournir suffisamment d'air extérieur pour la combustion. À utiliser uniquement avec du bois de chauffage solide; ne brûlez pas d'autres combustibles car cela rendrait le catalyseur dans la chambre de combustion inactif. Les performances de la chambre de combustion ou sa durabilité n'ont pas été évaluées dans le cadre de la certification. Numéro de pièce OEM de la chambre de combustion: Z0336A-M. Remplacez le verre par du verre céramique de 5 mm uniquement.

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 ☐
2024 ☐ 2025 ☐ 2026 ☐ 2027 ☐ 2028 ☐ 2029 ☐

170-0264 [04 24]

SIROCCO SC30.2

SN - 56.

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

MODEL / MODÈLE: SC30.2
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S627:2023
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA
APPROVED FOR USE IN MOBILE HOMES (USA) AND IN TRANSPORTABLE BUILDINGS (CAN) / APPROUVÉ POUR UNE UTILISATION DANS LES MAISONS MOBILES (USA) ET DANS LES BÂTIMENTS TRANSPORTABLES (CAN)

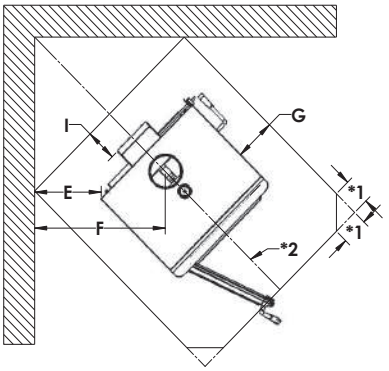
0142WS021E
0142WS014S

Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. To be installed as a freestanding space heater with the clearances listed below and in the installation instructions. Not to be installed in any fireplace. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Except for the installation detailed below, use a 6" listed, factory built chimney suitable for use with solid fuels conforming to UL-103HT (USA) or CAN/ULC-S629 (CAN) or a code comliant, masonry chimney.
Mobile Home (USA) or Transportable Building (CAN) and residential close clearance 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 UL-103HT (USA) or CAN/ULC-S629 (CAN). Mobile Home (USA) or Transportable Buildings (CAN) installations are approved for roof exit only. Do not install in a sleeping room. Connection through a wall or ceiling requires special methods, see instructions and refer to local building codes to ensure proper installation.

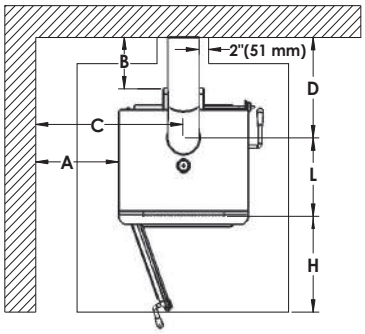
Installez et utilisez cet appareil conformément aux instructions d'installation et d'utilisation de Blaze King. Contactez les responsables locaux du bâtiment ou des pompiers au sujet des restrictions et de l'inspection de l'installation dans votre région. À installer en tant qu'appareil de chauffage autonome avec les dégagements indiqués ci-dessous et dans les instructions d'installation. Ne pas installer dans une cheminée. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". À l'exception de l'installation détaillée ci-dessous, utilisez une cheminée de 6" homologuée et fabriquée en usine adaptée à une utilisation avec des combustibles solides conformes à UL-103HT (USA) ou CAN/ULC-S629 (CAN) ou un code conforme, cheminée en maçonnerie.
Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) et résidentielles à dégagement réduit nécessitent un connecteur de cheminée homologué à double paroi et à dégagement réduit avec une cheminée fabriquée en usine homologuée adaptée à une utilisation avec des combustibles solides et conforme à UL-103HT (USA) ou CAN/ULC-S629 (CAN). Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) sont approuvées pour une sortie sur le toit uniquement. Ne pas installer dans une chambre à coucher. La connexion à travers un mur ou un plafond nécessite des méthodes spéciales, voir les instructions et se référer aux codes du bâtiment locaux pour assurer une installation correcte.

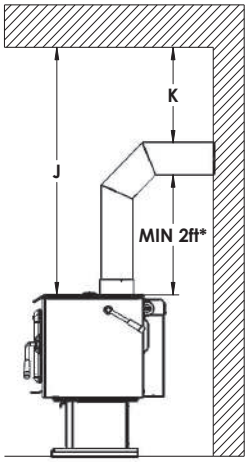
MINIMUM CLEARANCES TO COMBUSTIBLES (see owners manual for complete description of all requirements)
*** In Canada, 18" clearances from single wall pipe is required. Check with local codes and pipe manufacturers for minimum pipe clearances.**
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)
*** Au Canada, un dégagement de 18 po est exigé pour un tuyau à simple paroi. Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements.**

Residential Installations / Installations Résidentielles	A	B	* C	* D	E	* F	J
Roof Exit or Wall Exit, Parallel or Corner minimum clearances Dégagements minimaux de sortie de toit ou de sortie murale, parallèle ou d'angle	10.75" 273 mm	6" 153 mm	24.5" 623 mm	16.375" 416 mm	4" 102 mm	18" 458 mm	37" 940 mm
Mobile Home (USA) or Transportable Building (CAN) / Maison mobile (USA) or Bâtiment transportable (CAN)							
Roof Exit, Parallel or Corner minimum clearances; outside Air Kit and Fan Kit or Rear Shield required Dégagements minimaux de sortie de toit, parallèles ou en coin; Kit d'air extérieur et kit de ventilateur ou écran arrière requis	10.75" 273 mm	6" 153 mm	24.5" 623 mm	16.375" 416 mm	4" 102 mm	18" 458 mm	37" 940 mm



***1= 4.75" in Canada and 2.125" in USA**
***2 = 59.25" in Canada and 57.25" in USA**





***3ft recommended**

G = 3.75" (96 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (457 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (457 mm) for single wall pipe in Canada	L = 15.75" (400 mm)

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. Minimum floor protection size is: 35" x 42.125" (889 mm x 1070 mm) in USA or 43.5" x 52.125" (1105 mm x 1324 mm) in Canada.
This appliance is certified to comply with 2020 particulate emission standards using crib wood (certified to EPA test methods 28R/5G with an emission-rate of 0.81 g/hr). It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual or if the catalytic combustor is deactivated or removed. This appliance needs periodic inspection and repair for proper operation; consult the owner's manual for instruction.
ONLY OPERATE WITH DOOR CLOSED; open door to feed fire ONLY. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS OR THE SPACE BENEATH THE APPLIANCE. Provide adequate outside air for combustion. For use with solid wood fuel only; do not burn other fuels as this will cause the catalyst in the combustor to become inactive. The performance of the combustor or its durability has not been evaluated as part of the certification. Combustor OEM part number: Z0336A-M. Replace glass with 5 mm ceramic glass only. This appliance must be installed with either Blaze King Leg Kit Z2613 or Blaze King Pedestal Kit Z3903; attach as instructed in the installation instructions.

Cet appareil ne nécessite pas de protection thermique du sol du foyer; cependant, s'il est installé sur un plancher combustible, un protecteur de plancher non combustible doit être utilisé. La taille minimale de la protection de plancher est de: 35" x 42.125" (889 mm x 1070 mm) aux USA ou 43.5" x 52.125" (1105 mm x 1324 mm) au Canada.
Cet appareil est certifié conforme aux normes d'émission de particules 2020 utilisant du bois de lit (certifié selon les méthodes de test EPA 28R/5G avec un taux d'émission de 0.81 g/h). Il est contraire aux réglementations fédérales d'utiliser cet appareil d'une manière incompatible avec les instructions d'utilisation du manuel du propriétaire ou si la chambre de combustion catalytique est désactivée ou retirée. Cet appareil nécessite une inspection et une réparation périodiques pour un bon fonctionnement; consultez le manuel du propriétaire pour obtenir des instructions.
FONCTIONNER UNIQUEMENT AVEC LA PORTE FERMÉE; ouvrir la porte UNIQUEMENT pour alimenter le feu. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION ou l'espace sous l'appareil. Fournir suffisamment d'air extérieur pour la combustion. À utiliser uniquement avec du bois de chauffage solide; ne brûlez pas d'autres combustibles car cela rendrait le catalyseur dans la chambre de combustion inactif. Les performances de la chambre de combustion ou sa durabilité n'ont pas été évaluées dans le cadre de la certification. Numéro de pièce OEM de la chambre de combustion: Z0336A-M. Remplacez le verre par du verre céramique de 5 mm uniquement. Cet appareil doit être installé avec kit de pattes Blaze King Z2613 ou kit de piédestal Blaze King Z3903; fixer 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 ☐
2024 ☐ 2025 ☐ 2026 ☐ 2027 ☐ 2028 ☐ 2029 ☐

170-0266 [04 24]

ASHFORD AF30.2

SOLID FUEL WOOD CATALYTIC STOVE

We recommend that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

U.S. Environmental Protection Agency certified to comply with 2020 particulate emission standards using crib wood.

0142WS021E
0142WS014S

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
Phone: 250-493-7444 w Fax: 250-493-5833 w www.blazeking.com w info@blazeking.com

Pour la version française de nos manuels S.V.P. vous référez à notre site web: www.blazeking.com

TABLE OF CONTENTS

CERTIFICATION LABEL
For reference only - please refer to label on the appliance

ASHFORD AF30.2

SN - 63.

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

0142WS021E
0142WS014S

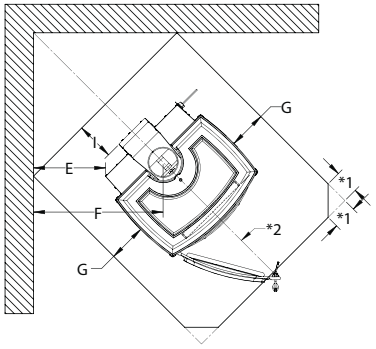
MODEL / MODÈLE: AF30.2
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S627:2023
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA
APPROVED FOR USE IN MOBILE HOMES (USA) AND IN TRANSPORTABLE BUILDINGS (CAN) / APPROUVÉ POUR UNE UTILISATION DANS LES MAISONS MOBILES (USA) ET DANS LES BÂTIMENTS TRANSPORTABLES (CAN)

Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. To be installed as a freestanding space heater with the clearances listed below and in the installation instructions. Not to be installed in any fireplace. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Except for the installation detailed below, use a 6" listed, factory built chimney suitable for use with solid fuels conforming to UL-103HT (USA) or CAN/ULC-S629 (CAN) or a code comliant, masonry chimney.
Mobile Home (USA) or Transportable Building (CAN) and residential close clearance 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 UL-103HT (USA) or CAN/ULC-S629 (CAN). Mobile Home (USA) or Transportable Buildings (CAN) installations are approved for roof exit only. Do not install in a sleeping room. Connection through a wall or ceiling requires special methods, see instructions and refer to local building codes to ensure proper installation.

Installez et utilisez cet appareil conformément aux instructions d'installation et d'utilisation de Blaze King. Contactez les responsables locaux du bâtiment ou des pompiers au sujet des restrictions et de l'inspection de l'installation dans votre région. À installer en tant qu'appareil de chauffage autonome avec les dégagements indiqués ci-dessous et dans les instructions d'installation. Ne pas installer dans une cheminée. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". À l'exception de l'installation détaillée ci-dessous, utilisez une cheminée de 6" homologuée et fabriquée en usine adaptée à une utilisation avec des combustibles solides conformes à UL-103HT (USA) ou CAN/ULC-S629 (CAN) ou un code conforme, cheminée en maçonnerie.
Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) et résidentielles à dégagement réduit nécessitent un connecteur de cheminée homologué à double paroi et à dégagement réduit avec une cheminée fabriquée en usine homologuée adaptée à une utilisation avec des combustibles solides et conforme à UL-103HT (USA) ou CAN/ULC-S629 (CAN). Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) sont approuvées pour une sortie sur le toit uniquement. Ne pas installer dans une chambre à coucher. La connexion à travers un mur ou un plafond nécessite des méthodes spéciales, voir les instructions et se référer aux codes du bâtiment locaux pour assurer une installation correcte.

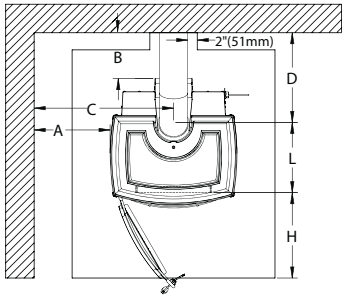
MINIMUM CLEARANCES TO COMBUSTIBLES (see owners manual for complete description of all requirements)
*** In Canada, 18" clearances from single wall pipe is required. Check with local codes and pipe manufacturers for minimum pipe clearances.**
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)
*** Au Canada, un dégagement de 18 po est exigé pour un tuyau à simple paroi. Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements.**

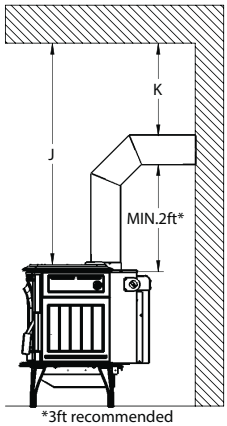
Residential Installations / Installations Résidentielles	A	B	* C	* D	E	* F	J
Roof Exit or Wall Exit, Parallel or Corner minimum clearances Dégagements minimaux de sortie de toit ou de sortie murale, parallèle ou d'angle	10.75" 273 mm	6" 153 mm	25.5" 648 mm	16.375" 416 mm	4" 102 mm	16.875" 429 mm	37" 940 mm
Mobile Home (USA) or Transportable Building (CAN) / Maison mobile (USA) or Bâtiment transportable (CAN)							
Roof Exit, Parallel or Corner minimum clearances; outside Air Kit and Fan Kit or Rear Shield required Dégagements minimaux de sortie de toit, parallèles ou en coin; Kit d'air extérieur et kit de ventilateur ou écran arrière requis	10.75" 273 mm	6" 153 mm	25.5" 648 mm	16.375" 416 mm	4" 102 mm	16.875" 429 mm	37" 940 mm



*1= 5.875" in Canada and 2.125" in USA

*2 = 57.625" in Canada and 55.625" in USA





*3ft recommended

G = 2.75" (70 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (457 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (457 mm) for single wall pipe in Canada	L = 15.75" (400 mm)

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. Minimum floor protection size is: 35" x 42.125" (889 mm x 1070 mm) in USA and 45.5" x 52.125" (1156 mm x 1324 mm) in Canada.
This appliance is certified to comply with 2020 particulate emission standards using crib wood (certified to EPA test methods 28R/5G with an emission-rate of 0.81 g/hr). It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual or if the catalytic combustor is deactivated or removed. This appliance needs periodic inspection and repair for proper operation; consult the owner's manual for instruction.
ONLY OPERATE WITH DOORS CLOSED; open door to feed fire ONLY. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS OR THE SPACE BENEATH THEAPPLIANCE. Provide adequate outside air for combustion. For use with solid wood fuel only; do not burn other fuels as this will cause the catalyst in the combustor to become inactive. The performance of the combustor or its durability has not been evaluated as part of the certification. Combustor OEM part number: Z0336A-M. Replace glass with 5mm ceramic glass only.

Cet appareil ne nécessite pas de protection thermique du sol du foyer; cependant, s'il est installé sur un plancher combustible, un protecteur de plancher non combustible doit être utilisé. La taille minimale de la protection de plancher est de: 35" x 42 1/8" (889 mm x 1070 mm) aux USA ou 45 1/2" x 52 1/8" (1156 mm x 1324 mm) au Canada.
Cet appareil est certifié conforme aux normes d'émission de particules 2020 utilisant du bois de lit (certifié selon les méthodes de test EPA 28R/5G avec un taux d'émission de 0.81 g/h). Il est contraire aux réglementations fédérales d'utiliser cet appareil d'une manière incompatible avec les instructions d'utilisation du manuel du propriétaire ou si la chambre de combustion catalytique est désactivée ou retirée. Cet appareil nécessite une inspection et une réparation périodiques pour un bon fonctionnement; consultez le manuel du propriétaire pour obtenir des instructions.
NE FAIRE FONCTIONNER QU'AVEC LES PORTES FERMÉES; ouvrir la porte UNIQUEMENT pour alimenter le feu. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION ou l'espace sous l'appareil. Fournir suffisamment d'air extérieur pour la combustion. À utiliser uniquement avec du bois de chauffage solide; ne brûlez pas d'autres combustibles car cela rendrait le catalyseur dans la chambre de combustion inactif. Les performances de la chambre de combustion ou sa durabilité n'ont pas été évaluées dans le cadre de la certification. Numéro de pièce OEM de la chambre de combustion: Z0336A-M. Remplacez le verre par du verre céramique de 5 mm uniquement.

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 ☐
2024 ☐ 2025 ☐ 2026 ☐ 2027 ☐ 2028 ☐ 2029 ☐

170-0273 [04 24]

The content within this manual describes the installation and operation of the Blaze King AF30.2. It is against federal regulations to operate this appliance in a manner inconsistent with the operating instructions in this manual. Blaze King grants no warranty, implied or stated, for the installation and maintenance of this appliance and assumes no responsibility of any consequential damage(s).

EPA CERTIFICATION TEST DATA		
Burn Category	**CO Ave**	**Emission Rate**
Low Burn	0.03 g/min	0.20 g/hr
Med-low Burn (1)	0.32 g/min	0.62 g/hr
Med-low Burn (2)	0.39 g/min	0.46 g/hr
Med-high Burn	0.81 g/min	1.23 g/hr
High Burn	1.69 g/min	3.81 g/hr
EPA emission rate weighted average		0.81 g/hr

This appliance was tested and listed to CAN/ULC-S628:2022 & UL1482-11 (R2022) by OMNI-Test Laboratories. This appliance is certified to comply with the 2020 U.S. Environmental Protection Agency's particulate emission standards using crib wood. Under specific test conditions, this appliance has been shown to deliver heat at rates ranging from 10,094 to 36,076 Btu/hr. This appliance has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting.

This appliance contains a catalytic combustor which needs periodic inspection and may require replacement to ensure proper operation. It is against federal regulations to operate this appliance if the catalytic combustor is deactivated or removed.

⚠WARNING

IF THIS APPLIANCE IS NOT PROPERLY INSTALLED OR OPERATED, A HOUSE FIRE MAY RESULT LEADING TO SERIOUS BODILY HARM AND EVEN DEATH. TO REDUCE THE RISK OF FIRE, PLEASE READ THIS ENTIRE MANUAL BEFORE INSTALLING AND OPERATING THIS APPLIANCE. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

DO NOT OPERATE THIS APPLIANCE WITHOUT FULLY ASSEMBLING ALL COMPONENTS. DO NOT INSTALL DAMAGED, INCOMPLETE, OR SUBSTITUTE COMPONENTS. FAILURE TO POSITION COMPONENTS IN ACCORDANCE WITH THE DIAGRAMS IN THIS BOOKLET, OR FAILURE TO USE COMPONENTS SPECIFICALLY APPROVED WITH THIS APPLIANCE, MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY.

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

⚠WARNING

THIS APPLIANCE MAY NOT BE INSTALLED INTO A FACTORY BUILT FIREPLACE. FAILURE TO COMPLY WILL VOID ANY AND ALL WARRANTIES.

CALIFORNIA PROPOSITION 65

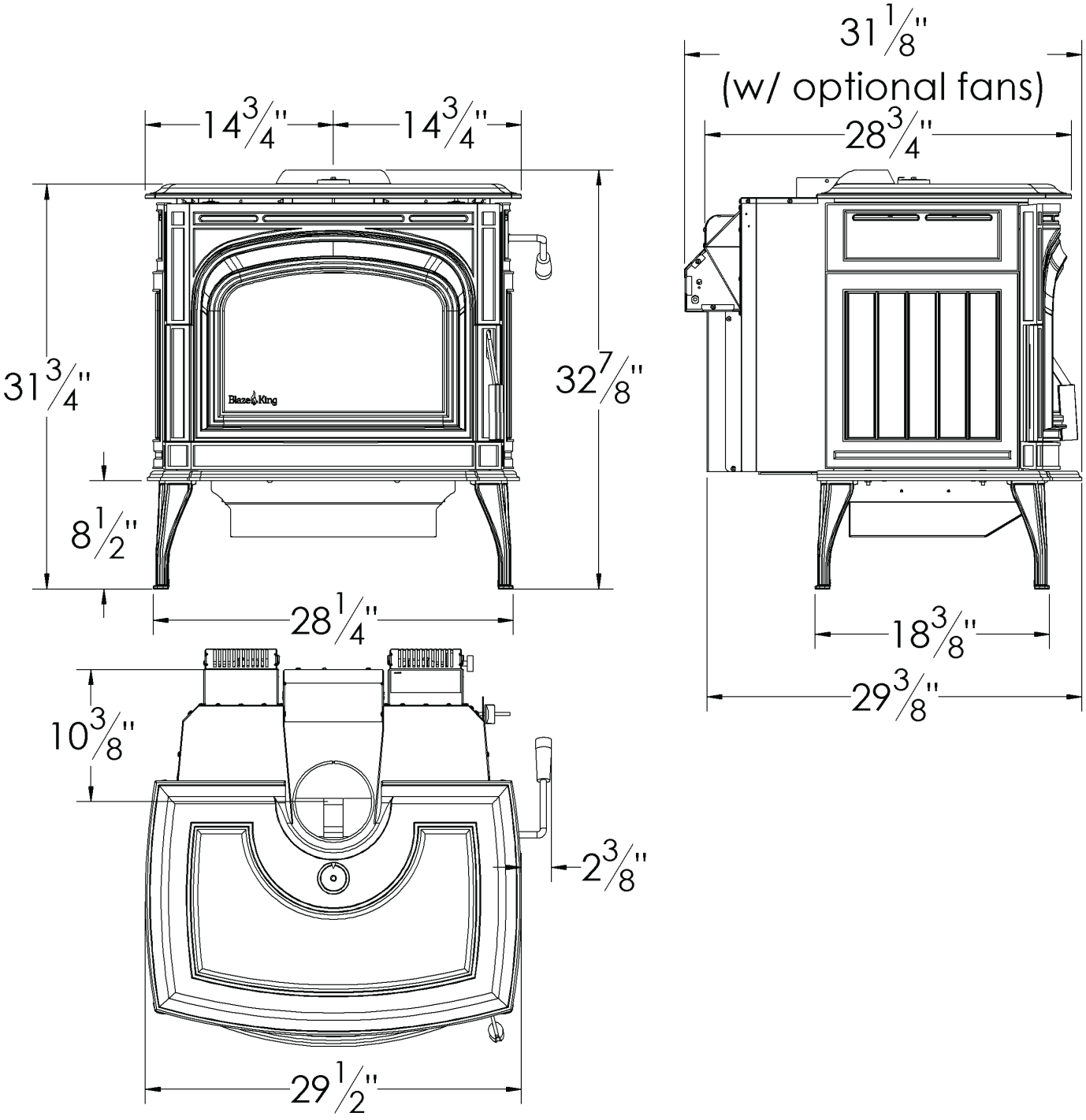
WARNING: This product can expose you to chemicals including benzene, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information:
www.P65Warnings.ca.gov

SPECIFICATIONS

ASHFORD AF30.2 SPECIFICATIONS	
Model	Ashford 30.2 (AF30.2) (catalytic)
Flue Collar Opening	6” I.D. (152 mm)
Firebox Door Opening	18 5/8” x 9 7/8” (473 mm x 251 mm)
Firebox Depth	18” (457 mm) brick to brick, 20 1/2” (521 mm) brick to glass
Firebox Width	20” (508 mm)
Firebox Height	12.84” (326.1 mm)
Firebox Volume	2.91 cu. ft. (0.0824 m^3)
Tested Fuel Length	16.75” (426 mm)
Wood Capacity (approximate)	White Oak - 60 lb (27.2 kg) / Douglas Fir - 40 lb (18.1 kg)
Shipping Weight	500 lbs. (226.8 kg)

PARTS INCLUDED	
1.	Poker (S.Z3134)
2.	Manual kit (w/ warranty cards, thermometer, bypass handle)

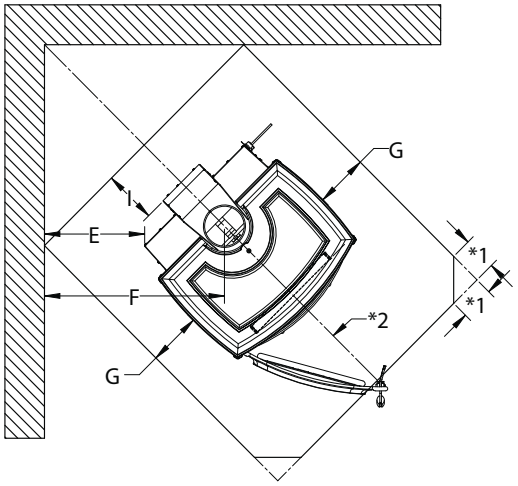
OPTIONAL EQUIPMENT			
1.	Fan Kit (S.Z2814)	2.	Side Shelf (S.Z2853)
3.	3” Outside Air Kit (S.Z1726B)	4.	4” Outside Air Kit (S.Z1726)


14 3/4"
14 3/4"
31 3/4"
32 7/8"
8 1/2"
28 1/4"
10 3/8"
2 3/8"
29 1/2"
31 1/8"
(w/ optional fans)
28 3/4"
18 3/8"
29 3/8"

MINIMUM CLEARANCES

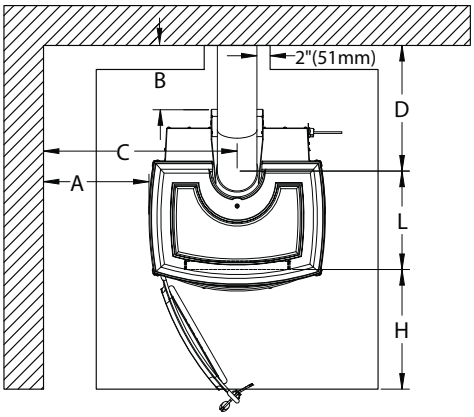
This appliance must be installed in compliance with all local codes and regulations. Minimum clearances may only be reduced by means approved by the regulatory authority. Flue pipe must be 6" diameter and 24 MSG steel construction. Do not use aluminum or galvanized steel. Refer to local codes and pipe manufacturer specs for required minimum clearances. ***In Canada, a minimum 18" (450 mm) clearance from single wall pipe is required.**

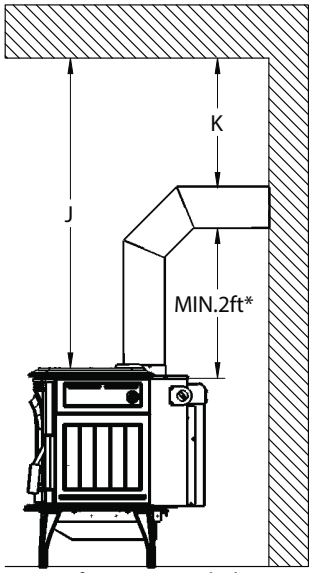
RESIDENTIAL INSTALLATION	A	B	* C	* D	E	* F	J
Roof or Wall exit; Parallel or Corner min clearances	10.75" 273 mm	6" 153 mm	25.5" 648 mm	16.375" 416 mm	4" 102 mm	16.875" 429 mm	37" 940 mm
MOBILE HOME (USA) OR TRANSPORTABLE BUILDING (CAN) INSTALLATION							
Roof exit only; Parallel or Corner min clearances *Outside Air Kit required	10.75" 273 mm	6" 153 mm	25.5" 648 mm	16.375" 416 mm	4" 102 mm	16.875" 429 mm	37" 940 mm



*1= 5.875" in Canada and 2.125" in USA

*2 = 57.625" in Canada and 55.625" in USA





*3ft recommended

G = 2.75" (70 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (457 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (457 mm) for single wall pipe in Canada	L = 15.75" (400mm)

FLOOR PROTECTION

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. In the USA, this floor shield must extend 16" out from the front and 8" out from either side of the fuel-loading door. In Canada, to comply with CSA B365, any combustible covering beneath the appliance and/or within the area extending horizontally at least 18" (450 mm) beyond the appliance on any side equipped with a door, and at least 8" (200 mm) beyond the appliance on other sides, shall be protected by a continuous, durable, non-combustible pad that will provide ember protection. The 18" (450 mm) ember protection required on any side with a door shall extend for the full width of the appliance plus the 8" (200 mm) required on each side of the appliance without a door. Where an appliance is installed less than 8" (200 mm) from a wall, the ember pad need only extend to the base of the wall. An ember pad shall not be placed on top of a carpet unless the pad is structurally supported to prevent displacement and distortion. A non-combustible shield is also required underneath the chimney connector and extend at least 2" on either side of the chimney connector. This shield does not need an insulation value, but must be listed under UL 1618-2009 (Type 1) and have a minimum size of:

35" x 42.125" (889 mm x 1070 mm) in USA and 45.5" x 52.125" (1156 mm x 1324 mm) in Canada

Blaze King does not recommend adhesive based vinyl flooring in front of appliances due to thermal expansion and warping which could be permanent.

⚠WARNING

DO NOT CONNECT TO OR USE THIS APPLIANCE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATIONS
THIS APPLIANCE MUST BE CONNECTED TO: 1) A CHIMNEY COMPLYING WITH THE REQUIREMENTS FOR TYPE HT CHIMNEYS IN THE STANDARD FOR CHIMNEYS, FACTORY-BUILT, RESIDENTIAL TYPE AND BUILDING HEATING APPLIANCE, UL 103, OR 2) A CODE-APPROVED MASONRY CHIMNEY WITH A FLUE LINER. FAILURE TO DO SO MAY RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

COMBUSTION AIR

In air tight homes (most modern construction), careful considerations must be taken into account before installing a wood burning appliance. It is important to ensure there is adequate intake (combustion) air for all exhausting type appliances within the dwelling. Heat recovery ventilator (HRV) systems along with constant running fan motors in air handlers are examples of appliances that must be taken into account when balancing intake air (others include fireplaces, range hoods, dryers, etc.). It is recommended that a fresh air intake inlet into the room where the appliance is located be installed. Failure to do so may result in air starvation, smoke spillage, and carbon monoxide threats. Consult a HVAC specialist for proper installation practices.

DRAFT PERFORMANCE

Draft is the movement of combustion air into the appliance and out through the chimney as exhaust gas. In essence, it is the difference in pressure between the exhaust gas inside the chimney and the outside air that creates this movement. Warmer, lighter exhaust gasses in the chimney tend to move upward. The amount of draft created by your chimney can depend on chimney length, horizontal offsets, insulating properties, local geography, external forces, and other factors. External factors (outdoor temperature, wind, barometric pressure, topography, etc.) or internal factors within the dwelling (negative pressure from exhaust fans, chimneys, air infiltration, etc.) may adversely affect draft.

Too much draft can yield very high temperatures within the appliance and may result in damage. An uncontrollable burn or excessive room temperatures are indicators of too much draft. Too little draft may cause back puffing (smoke spillage) into the room and plugging of the chimney, chimney cap, or spark arrestor screen. Inadequate draft can also lead to low heat output and the inability for the combustor to remain active at low burn rate settings. Your Blaze King heater is a high efficiency appliance and will require fine tuning of your chimney system in order to maximize draft performance. **Blaze King cannot be responsible for external forces leading to less than optimal draft performance.**

ROLE OF THE CHIMNEY

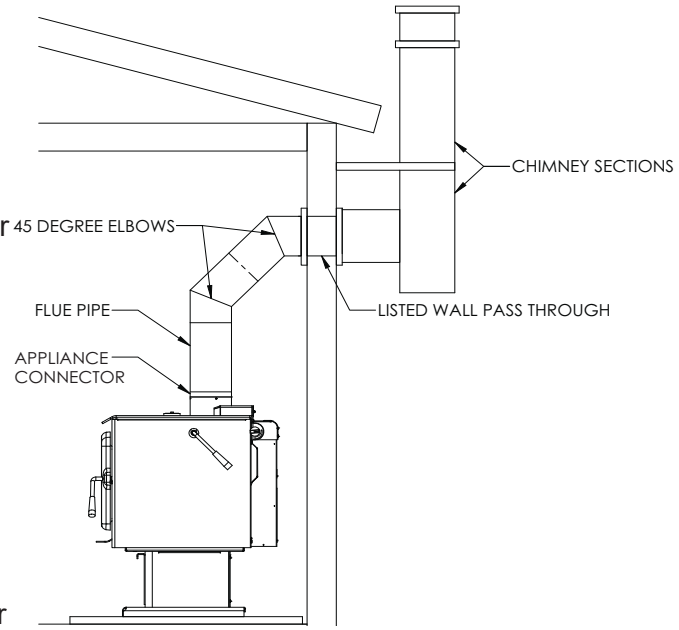
The role of the chimney is to maintain sufficient draft to achieve complete combustion. To ensure maximum performance, Blaze King recommends a minimum vertical chimney height of 15 ft (from stove top to termination) when installing an appliance at sea level (and up to 1000 ft of elevation). For freestanding installations, it is also recommended to use double wall pipe from stove top adaptor to ceiling support box. Double wall pipe helps to keep the chimney warm and improve draft performance. For wall exit installations, a vertical length of 3 ft from stove top to elbow is recommended. It is also recommended to use a pair of 45 degree elbows rather than a single 90 degree elbow to allow for a smoother transition of airflow. When possible, outside chimney systems should be isolated from the external environment by building a chase around the chimney. Doing so will help keep the chimney warm and maintain sufficient draft (please refer to the "***RECOMMENDED FLUE HEIGHTS***" section). **Without a properly installed chimney, this appliance will not operate at its maximum performance which could yield incomplete combustion.**

CHIMNEY CONNECTIONS

VENTING SYSTEM

A venting system consists of:

- Appliance Connector - a “stove top adaptor” that creates a positive connection between the appliance and flue pipe.
- Flue Pipe - either single or double wall pipe that is only used within the room, connecting the appliance to either a ceiling box or wall pass through.
- Chimney - a listed, factory built component with either 1” or 2” insulation that is suitable for use with solid fuels, conforming to CAN/ULC-S629 in Canada or UL 103HT in the USA. Note: This appliance may also be connected to a code compliant Masonry Chimney.

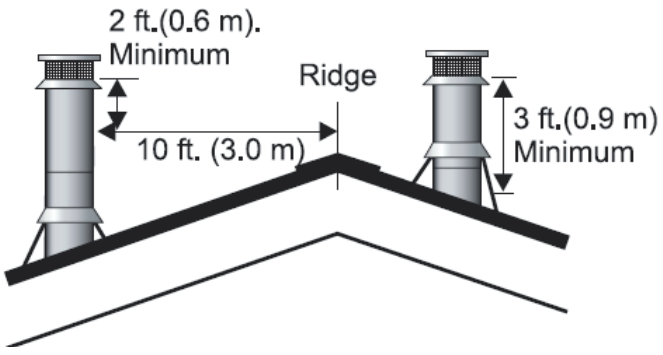


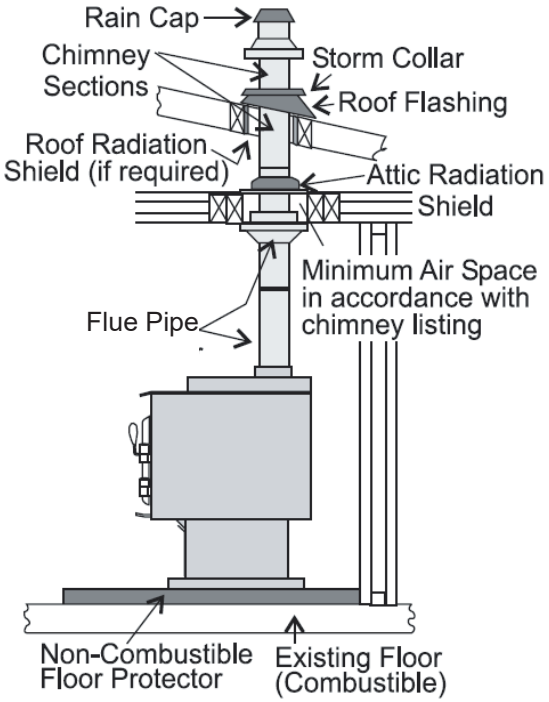
Do not install the chimney directly at the outlet of the appliance. A chimney connector is required unless the appliance is specifically approved for that type of installation. The flue pipe between the appliance connector and chimney should be kept as direct as possible. Do not use a flue pipe to pass through an attic or roof space, closet or similar concealed space, or a floor or ceiling. All joints within the venting system must be securely fastened with sheet metal screws. A chimney support package must be used when a connection is made through a ceiling to a listed prefabricated chimney. A listed wall thimble must be used when a connection is made through a combustible wall to a chimney. These accessories are necessary to provide safe clearances to combustible walls and ceilings as these components can get extremely hot during use. In the event of a creosote fire, temperatures inside the chimney may exceed 2000F (1100°C). An effective vapor barrier must be maintained at the location where the chimney or vent component penetrates the exterior structure. Do not connect this appliance to a chimney serving another appliance, doing so will affect the safe operation of both appliances and will void warranty. You must comply with the local authority having jurisdiction and, in Canada, CSA installation standard B365-M87.

CONNECTION TO A METAL PREFABRICATED CHIMNEY

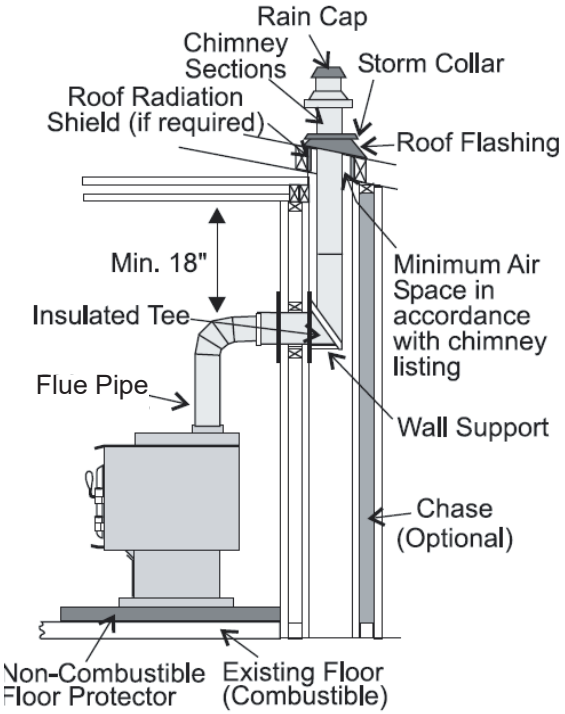
Refer to the prefabricated chimney manufacturer’s installation instructions to ensure safe clearance to combustibles are maintained when installing. All components (ceiling support package or wall pass through and “T” section package, fire stops, insulation shield, roof flashing, chimney cap, etc.) must be purchased from the same prefab chimney manufacturer. There are two common methods of a prefab chimney installation: the recommended method is to install the chimney inside the dwelling up through the ceiling(s) and the roof, while the alternative method is to install an exterior chimney that runs up the outside of the structure. Though not recommended, the alternative method is sometimes it is the only option. In that case it is recommended to build a chase around the external chimney.

The chimney must meet a minimum height above the roof and/or other obstruction(s) for safety purposes and to ensure sufficient draft. It is required that the chimney be at least 3ft higher than the highest point where it passes through the roof and at least 2ft higher than the highest part of the roof or any obstruction within 10ft (measured horizontally) of the chimney. Refer to the “***RECOMMENDED CHIMNEY HEIGHTS***” chart for minimum flue height recommendations and CAN/ULC-S629 in Canada or UL-103HT in the USA for installation codes.





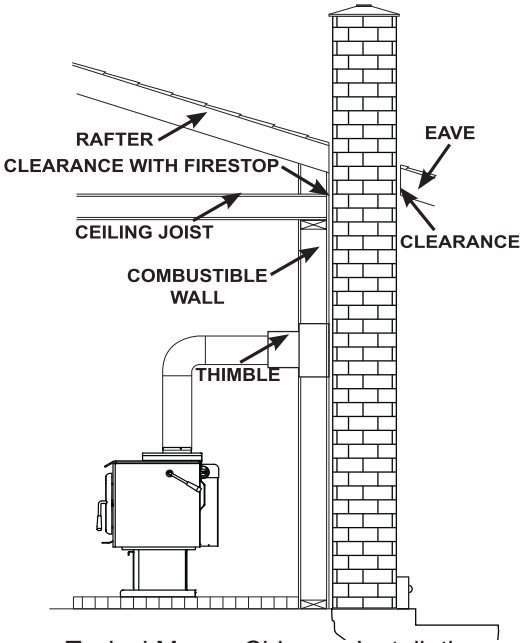
Prefab Chimney Through Ceiling Installation



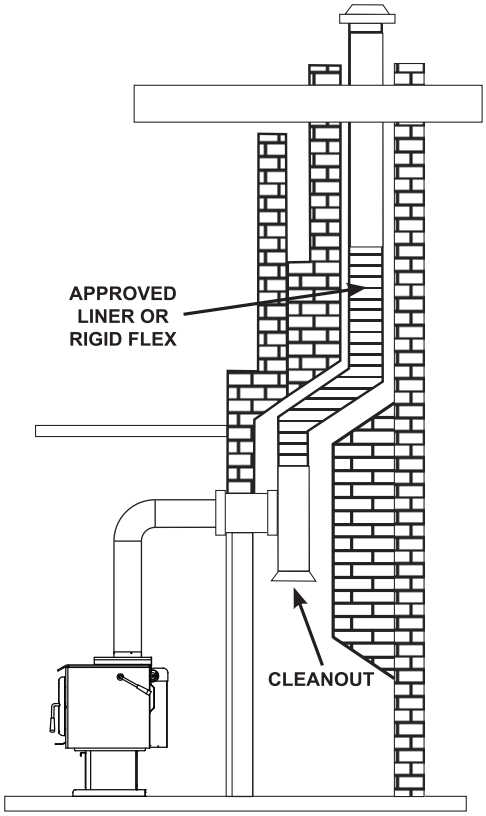
Prefab Chimney Exterior Installation

CONNECTION TO A MASONRY CHIMNEY

First and foremost, ensure the masonry chimney meets the minimum standards per the National Fire Protection Association by having it inspected by a certified professional. There must be no cracks, no loose mortar, and no signs of deterioration or blockage. Ensure the chimney is properly cleaned before installing the appliance. When connecting the appliance through a combustible wall, special methods are required; refer to local jurisdiction for the approved methods of passing a chimney connector through a combustible wall in your area (In the USA, refer to the NFPA minimum standards, and in Canada, refer to CAN/CSA-B365, the Installation Code for Solid Fuel Burning Appliances and Equipment). **Blaze King recommends the use of a stainless steel liner, preferably insulated, inside a masonry chimney. This is to help maintain a proper draft to achieve optimal performance of the appliance.**



Typical Mason Chimney Installation



Blaze King Recommend Installation

RECOMMENDED CHIMNEY HEIGHTS

Every installation is unique, especially when considering geographical location. As previously mentioned, maintaining sufficient draft is of utmost importance, but this can be a challenge as draft can be heavily influenced by topographical and geographical phenomena. The understanding of pressure planes and the stack effect are imperative in planning and executing a successful installation.

As previously mentioned, Blaze King recommends a minimum vertical chimney height of 15 feet (from stove top to termination) when installing an appliance at sea level (and up to 1000 feet of elevation). If the install is at a higher elevation, please refer to the table below for recommended chimney heights:

MINIMUM RECOMMENDED CHIMNEY 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 ft 4.6 m	16 ft 4.9 m	18 ft 5.5 m	19 ft 5.8 m
1000 - 2000 ft 305 - 610 m	15.5 ft 4.7 m	16.5 ft 5.0 m	18.5 ft 5.6 m	19.5 ft 5.9 m
2000 - 3000 ft 610 - 914 m	16 ft 4.9 m	17 ft 5.2 m	19 ft 5.8 m	20 ft 6.1 m
3000 - 4000 ft 914 - 1219 m	16.5 ft 5.0 m	17.5 ft 5.3 m	19.5 ft 5.9 m	20.5 ft 6.2 m
4000 - 5000 ft 1219 - 1524 m	17 ft 5.2 m	18 ft 5.5 m	20 ft 6.1 m	21 ft 6.4 m
5000 - 6000 ft 1524 - 1829 m	17.5 ft 5.3 m	18.5 ft 5.6 m	20.5 ft 6.2 m	21.5 ft 6.6 m
6000-7000 ft 1829 - 2134 m	18 ft 5.5 m	19 ft 5.8 m	21 ft 6.4 m	22 ft 6.7 m
7000 - 8000 ft 2134 - 2438 m	18.5 ft 5.6 m	19.5 ft 5.9 m	21.5 ft 6.6 m	22.5 ft 6.9 m
NOTE: No more than one offset (two elbows) are allowed. Two 45°elbows equal one 90° elbow				

For other common chimney components, use the following vertical height(s) to compensate for:

90° elbow = 2.0 ft (0.610 m)
"T" section = 3.0 ft (0.915 m)
1.0 ft (0.305 m) of horizontal run = 2 ft (0.610 m) of vertical rise

Example Chimny Height Calculation (at sea level):

Min Chimney Height	= 15.0 ft (4.575 m)
One 90° Elbow	= 2.0 ft (0.610 m)
2.0' Horizontal Run	= 4.0 ft (1.200 m)
One Base "T"	= 3.0 ft (0.915 m)
Final Chimney Height = 24.0 ft (7.3 m)	

The above figures are only guidelines, please refer to the "***DRAFT PERFORMANCE"*** section.

⚠WARNING

IF THIS APPLIANCE IS NOT PROPERLY INSTALLED OR OPERATED, A HOUSE FIRE AND/OR PERSONAL INJURY MAY RESULT. TO REDUCE THE RISK OF FIRE AND PERSONAL INJURY, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

ALCOVES AND FIREPLACES

In Canada, DO NOT INSTALL THIS APPLIANCE IN AN ALCOVE or FIREPLACE.
In USA, please adhere to minimum safe clearance dimensions.

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 OF OR UNDER THE APPLIANCE.

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.

MOBILE HOME or TRANSPORTABLE BUILDING INSTALLATION

For Mobile Home (in USA) or Transportable Building (in Canada) installations, an Outside Air Kit (S.Z1726 / S.Z1726B) and either a Fan Kit (S.Z1714) or Rear Shield Kit (S.Z4015) are required. It is recommended that the kits be installed prior to appliance installation (refer to the instructions provided with the kits).

When a metal prefabricated chimney is used, the manufacturer's installation instructions must be followed precisely. The ceiling support package must be purchased from the same manufacturer (ie. fire stops, insulation shield and roof flashing, chimney cap, etc). Be sure to maintain required safe clearances to combustibles as recommended by the manufacturer. The flue pipe must be double wall, close clearance type with either CAN/ULC-S629 or ULCS610 designation (single wall pipe is not allowed). Insulated chimney components must be a listed factory built chimney suitable for use with solid fuels and conforming to, CAN/ULC-S629 in Canada or UL-103HT in the USA. Where the space heater is installed in mobile home or transportable building, removal of the chimney is required for transportation of the building

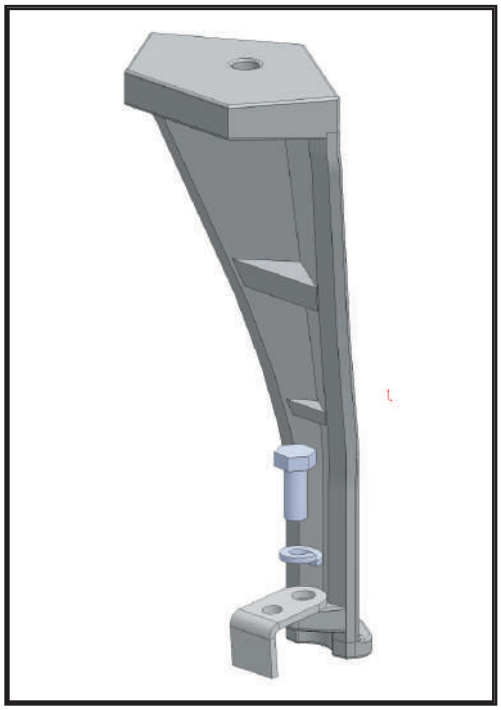
Note: Under no circumstances should the fresh air intake hose (Outside Air Kit) penetrate a wall at a location higher than the bottom of the intake air channel on the rear of the appliance (ie. the fresh air hose must feed up into the intake channel on the rear of the appliance).

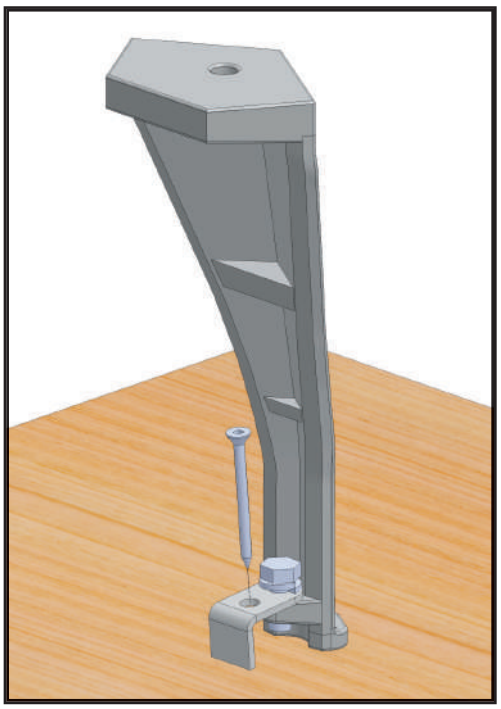
CAUTION: THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

⚠WARNING

THE APPLIANCE MAY ONLY BE INSTALLED IN AN OPEN AREA THAT IS NOT USED FOR SLEEPING. UNDER NO CIRCUMSTANCES SHOULD THE APPLIANCE BE INSTALLED INSIDE A BEDROOM. FAILURE TO COMPLY MAY LEAD TO SERIOUS BODILY HARM IN THE EVENT OF A HOUSE FIRE.

For mobile home or transportable building installations, the appliance must be securely fastened to the floor using the tie-downs provided in the leg anchor kit (Z2872).





OPTIONAL ACCESSORIES

- **FAN KIT (S.Z2814)** - used to disperse super heated air from appliance throughout the dwelling; required for mobile home or alcove installations.
- **OUTSIDE AIR KIT (S.Z1726 / S.Z1726B)** - The fresh air intake hose is a flexible metal tube used to supply combustion air into the appliance from the outdoor environment. It can be installed through an external wall or up through the floor (DO NOT CHANGE THE STRUCTURAL INTEGRITY OF THE FLOOR). This hose must be kept open at all times. **Under no circumstances should the fresh air intake hose penetrate a wall at a location higher than the bottom of the intake air channel on the rear of the appliance (ie. the fresh air hose must feed up into the intake channel on the rear of the appliance).**

DOOR INSTALLATION AND CHANGE-OUT (Z2810BK)

To install the door assembly or to change it out, follow these steps:

WARNING: CAST PARTS ARE HEAVY, PLEASE HOLD FIRMLY.

REMOVAL

1. Remove catalytic thermometer and cast top from stove. (**Fig A**)
2. Remove left and right cast sides from stove by lifting up and out from hangers. (**Fig B**) If necessary use a 7/16” wrench to loosen the top two bolts that secure the cast sides to the firebox.
3. Remove the Cast iron front and door: This operation requires two people as the cast iron front is large and heavy. Loosen four 1/4-20 hex bolts and 1/4” spacer washers. (**Fig C**) Use a 1/2” wrench. Have an assistant support the front then remove the bolts, washers, and spacers.

INSTALLATION

Perform the above tasks in reverse order.

Fig A

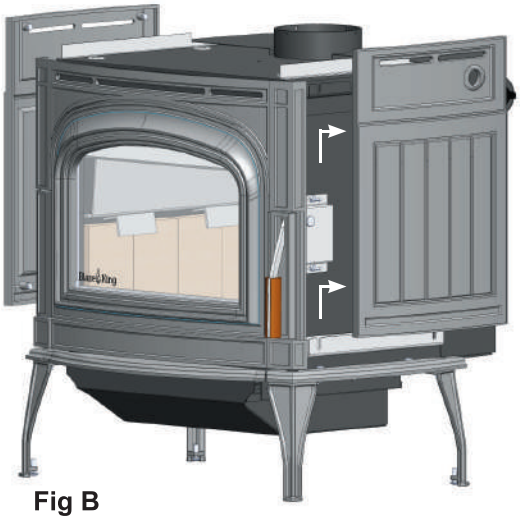


Fig B

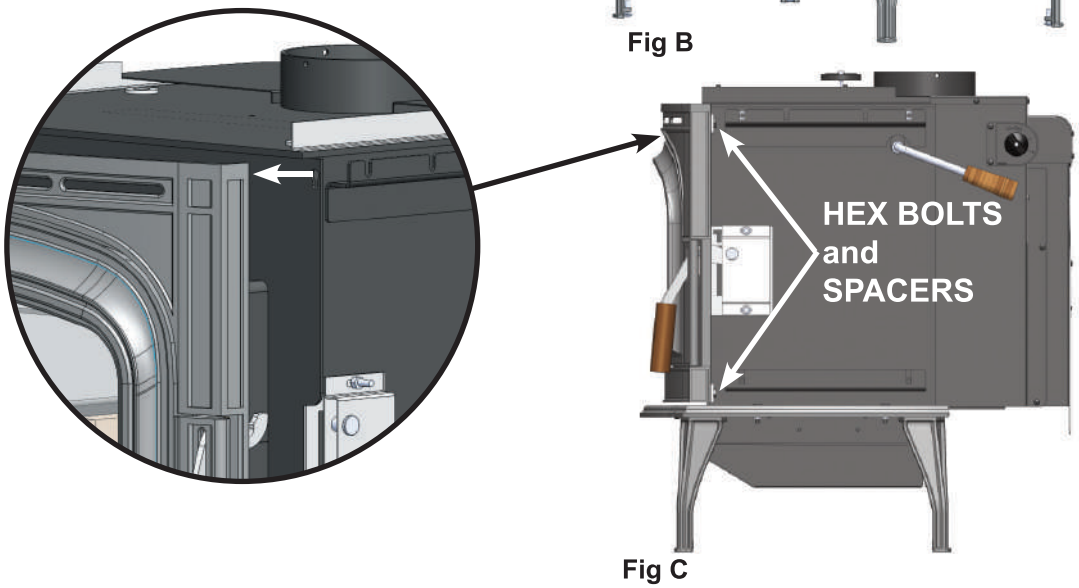


Fig C

YOUR FIRST FIRE!

The following pages contain information on the operation of the major components on your Blaze King appliance. Please take the time to read through this section as it will give you a better understanding of how your appliance works. This understanding will help you to operate your appliance at its optimum level thus extended its life while allowing you to get the highest efficiencies from your heater.

INTRODUCTION

All Blaze King wood burning appliances are designed as radiant room space heaters. They have been tested and certified to be installed in insulated, habitable rooms within 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 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 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.

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.

FAN OPERATION

Fans are an optional item for most Blaze King appliances. If fans are installed on your appliance, they should be turned off until the stove reaches normal operating temperatures. Approximately 30 minutes after a fire has been established within the appliance, the fan speed should match the thermostat control setting. (i.e. if your thermostat is set to a medium heat output then your fan should also be set at medium, low—low, high—high etc.). We recommend the use of fans on all of our wood appliances. The fan system recirculates room air over the hot surfaces of your appliance and helps spread this super heated air around your home.

SELECTING WOOD

It takes a great deal of energy to evaporate the moisture contained in green or wet wood and that energy will not be heating your home. Green or wet wood will also greatly increase creosote issues. To ensure that your wood fuel has a moisture content of 20% or lower, only use seasoned wood that has been split, stacked, and protected from rain or snow for at least 24 months. Firewood should be split and stacked in a manner that allows for air flow to all areas.

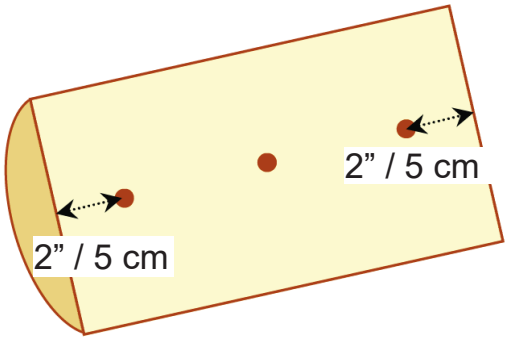
Both hardwood and softwood burn equally well in this appliance, but the more dense hardwood will weigh more per cord and burn a little slower and longer. Never burn salt-water driftwood as it is very corrosive and will deteriorate the structure of the appliance. The burning of salt-water driftwood will void the warranty. The only way to accurately determine wood moisture is to purchase and measure with a moisture meter.

⚠WARNING

THIS APPLIANCE IS DESIGNED TO BURN NATURAL WOOD ONLY. DO NOT BURN WET UNSEASONED WOOD. DOING SO CAN CAUSE EXCESSIVE CREOSOTE ACCUMULATION AND IF IGNITED, CAN CAUSE A CHIMNEY FIRE THAT MAY RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM. BURNING AIR DRIED SEASONED WOOD WILL REDUCE THE RISK OF CHIMNEY FIRES AND YIELD HIGHER EFFICIENCIES AND LOWER EMISSIONS.

HOW TO USE MOISTURE METERS

1. Randomly select three logs from your wood pile and split each one down the middle.
2. Three points of measurement are required to determine the moisture content of each log: 2” (5 cm) from either end and in the middle of the split surface of the log. To take these measurements, insert the moisture meter pins at the points described, keeping the pins in line with the wood grain. Record each measurement.
3. Do this to all three logs and take an average of the readings (this is an approximate indication).



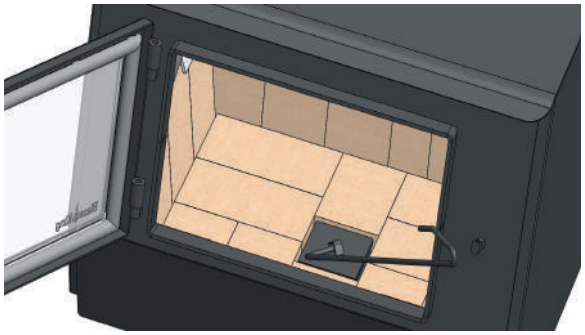
⚠WARNING

DO NOT BURN TREATED WOOD, COAL, CHARCOAL, COLORED PAPER, CARDBOARD, SOLVENTS OR GARBAGE. BURNING THESE MATERIALS MAY RESULT IN THE RELEASE OF TOXIC FUMES AND/OR CARBON MONOXIDE WHICH MAY RESULT IN POISONING. DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA, OR ENGINE GEL. DO NOT USE CHEMICALS OR FLUIDS SUCH AS GASOLINE TYPE LANTERN FUEL, KEROSENE, OR CHARCOAL LIGHTER FLUID TO START OR FRESHEN UP A FIRE IN THIS APPLIANCE. DOING SO MAY LEAD TO OVER FIRING RESULTING IN A HOUSE FIRE AND SERIOUS BODILY HARM.

FIRE POKER

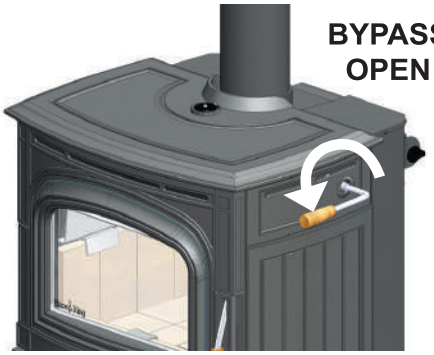
The steel fire poker that is provided with this appliance serves two purposes:

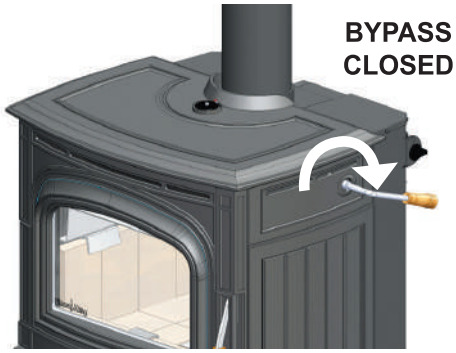
1) to manipulate fuel loads
2) to remove the ash plug via hook welded to the top plate.

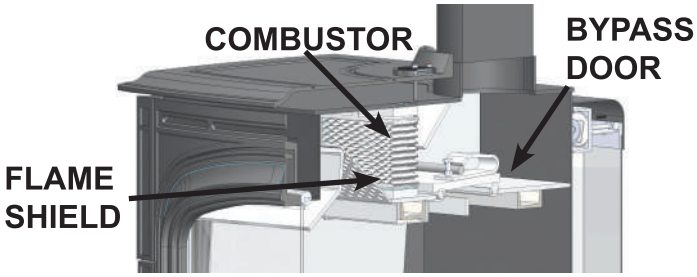


BYPASS DOOR

Your catalytic wood burning appliance is fitted with a bypass door which allows exhaust from the fire to temporarily bypass the catalytic combustor. The bypass door is located inside the dome of the firebox at the top of the appliance. It is a hinged, steel plate door and is controlled by the bypass handle located on the right side of the appliance. When the handle is pointing forward, the bypass door is open. To close the bypass door you must rotate the handle clockwise until it points to the rear of the appliance. To ensure the bypass door is fully closed, push down on the bypass handle until you hear a positive click.







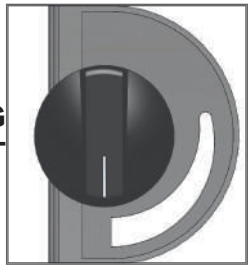
CATALYTIC THERMOMETER

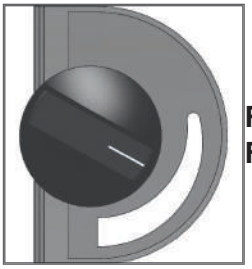
The catalytic thermometer is located on the top of the appliance. Its sole purpose is measure the exhaust gasses after they have passed through the combustor to indicate whether the combustor is ACTIVE or INACTIVE. It is important to ensure that the appliance is operated in the ACTIVE zone. When the thermometer reads INACTIVE it means that the combustor temperature is below 500F and is not producing a clean burn. For the most accurate reading, turn the fan off for approximately 5 minutes before reading the thermometer. For calibration instructions, please refer to the "***MAINTENANCE***" section.

THERMOSTAT

The thermostat is located at the rear of the appliance and is controlled by the thermostat knob which is located at the upper right rear corner of the appliance. When the knob is positioned at the HIGH setting, the appliance will operate at its highest burn rate and deliver its maximum heat output. As the knob is rotated counter clockwise the burn rate will decrease along with heat output. Burn rate is greatly influenced by location, installation, and external environment, so you may find it necessary to reposition the knob until you find the ideal setting to suit your situation. Please note that all adjustments to the thermostat should be done gradually as too rapid a change may cause the thermostat to operate improperly. The 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.

HIGH SETTING
MAXIMUM HEAT OUTPUT





ROTATE COUNTER CLOCKWISE
FOR REDUCED HEAT OUTPUT

LIGHTING THE FIRE

NOTE: As you heat up the appliance for the first time, the paint will go through a curing process and will give off a strong odor coupled with smoke. To minimize the inconvenience, burn the stove at a low temperature setting for several hours. It is recommended to open a door or window until the odor and smoke dissipates. You may also notice a change in color as the paint cures, this is normal and will appear uniform after subsequent firings.

1. **ENSURE ALL BRICKS ARE CORRECTLY POSITIONED INSIDE THE FIREBOX AND BUILD THE FIRE DIRECTLY ON THE BRICK IN THE BOTTOM OF THE STOVE. DO NOT USE A GRATE.**
2. Position the thermostat to the **HIGH** setting and turn the fan (if equiped) **OFF**.
3. Open the bypass then open the loading door.
4. Place 10 balls of non-glossy paper towards the front of the bottom of the firebox 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. **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. **DO NOT LEAVE THE STOVE UNATTENDED.**
7. Once the logs are burning, latch the loading door shut. Once loading door is closed and combustor temperature begins to climb, close the bypass door, turn fan(s) on to high (if equipped). Leaving the loading door open after the wood load has caught fire may cause premature failure of the catalytic combustor.
8. When nearly all of the wood in the firebox is fully burning and the catalytic thermometer is in the active zone, open the bypass door and loading door, and finish loading the appliance. Lay the wood as far back in the stove as possible. Latch the loading door shut, and close the bypass door.
9. Let the fire burn with the thermostat at the **HIGH** setting until the fire is well established. This ensures that the stove, catalyst, and wood load are all stabilized at optimum operating temperatures. The temperature in the stove and the gases entering the combustor must be raised to at least 500F (indicated by the thermometer needle in the **ACTIVE ZONE**) for catalytic activity to be initiated.
10. Gradually turn the thermostat down to the desired heat output setting once the fire is well established. Please note that if the thermostat is turned down too low too quickly, the fire may go out or the combustor may stop working, indicated by the thermometer needle falling into the **INACTIVE ZONE**. If this happens, simply turn the thermostat back to a higher heat output setting to let the fire reestablish itself.
11. Turn the fan (if equipped) on after the initial warm up.

Probably the least understood requirement of maintaining a good fire is that of establishing a good base of coals or embers. A glowing hot coal bed will help to maintain more even temperatures as well as assist in relighting the next fuel load. Put as much wood into the appliance 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 thermostat, the wood will only burn at the rate set on the thermostat. Once the fire is established, the appliance should be left to complete the full burn cycle. This is evident by a) only a glowing coal bed (ember bed) remaining or b) the catalytic thermometer hovers just inside the active zone. Following this procedure will maximize the efficiency of the appliance as well as limit exhaust emissions and smoke spillage.

RELOADING PROCEDURE

WHEN PREPARING TO RELOAD, IF THE NEEDLE ON THE CATALYTIC THERMOMETER IS STILL IN THE ACTIVE ZONE, FOLLOW THE PROCEDURE BELOW; IF THE NEEDLE HAS DROPPED INTO THE INACTIVE ZONE, REFER BACK TO THE "LIGHTING THE FIRE" PROCEDURE ON THE PREVIOUS PAGE.

It is important to note that the catalytic thermometer is simply displaying the temperature of the catalytic combustor. It may be used as an aid when it comes to identifying a reload point, but other factors such as lack of fuel in the firebox or dropping room temperatures should be used as well.

1. Have your next load of wood ready before beginning. Turn the thermostat to **HIGH** to ensure the remaining coal bed is active before reloading. Wait a few minutes for the air flow to stabilize.
2. To help minimize smoke spillage into the room, open the bypass door and again wait a few minutes for the air flow to stabilize.
3. Open the bypass door and crack open the loading door to allow ambient room air to be introduced into the firebox, this may take a minute 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 (if opened) close the bypass door immediately. Let the fire burn on the HIGH thermostat setting until the fire is 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, simply run the stove on **HIGH** for approximately 30 minutes. The **HIGH** setting will burn off most of the deposits.

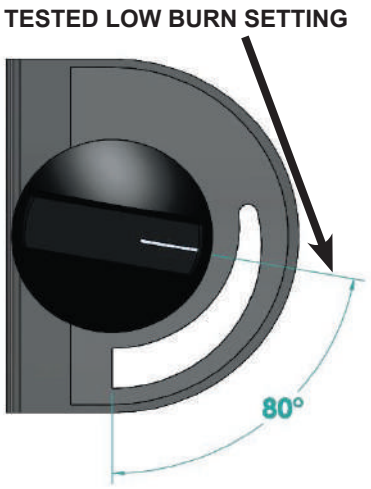
Note: Our loading instructions are outlined in general terms due to the variables that arise with each installation. Such variables include type of wood fuel, chimney height and configuration, installation altitude, seasonal weather conditions, draft, and the desired heat output required. Over time you will learn which settings are necessary to achieve optimal performance with your specific installation.

⚠WARNING

THIS APPLIANCE IS HOT WHILE IN OPERATION. CHILDREN AND PETS MUST BE KEPT FROM TOUCHING THE APPLIANCE WHEN IN USE. COMBUSTIBLE OBJECTS MUST BE KEPT A MINIMUM OF 48"(1219 MM) FROM THE FRONT OF THE APPLIANCE. COMBUSTIBLE MATERIAL SUCH AS CLOTHING OR FURNITURE PLACED TOO CLOSE TO THE APPLIANCE CAN CATCH FIRE. DO NOT STORE WOOD WITHIN THE SPECIFIED SAFETY CLEARANCES OR WITHIN THE SPACE REQUIRED FOR RE-FUELING AND ASH REMOVAL. FAILURE TO COMPLY MAY CAUSE SKIN BURNS OR RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

OPTIMAL LOW BURN THERMOSTAT SETTING

Your Blaze King appliance was tested and certified in accordance to the New Source Performance Standards for Residential Wood Heaters. During this test series, the low burn rate of the unit was determined by setting the thermostat knob to a position that yielded the lowest burn rate achievable. If you find that you are setting your thermostat beyond the test setting, please note that if the thermostat is turned down too low the fire will go out or the combustor may stop working which is indicated by the thermometer needle falling into the **INACTIVE ZONE**. If this happens, simply turn the thermostat back to a higher heat output setting and let the fire reestablish itself.



WOOD BURNING IN THE SHOULDER SEASON

There are a few things to consider if you choose to light a fire during the spring or fall seasons when the outside temperature is milder, perhaps 55F to 70F (13°C to 21°C).

You may notice smoke spillage out of the loading door when it is opened during start up or reloading. This is caused by a lack of natural draft within the chimney system. The temperature difference between the chimney system and the outside air causes flue gasses to be drawn up and out of the chimney. Smaller temperature differences produce less draft in your chimney system than larger temperature differences. This air movement, referred to as Stack Effect, is also influenced by air density and moisture differences. To eliminate the smoke spillage you may have to stoke the fire for longer than usual. Once the fire warms the chimney the draft will improve and spillage will be reduced. When operating the appliance on a lower thermostat setting, the resultant lower flue temperatures can cause your chimney system to cool down. This also decreases natural draft and spillage may occur.

General Rules for burning in the shoulder season:

- Run your appliance on **HIGH** for 30 minutes after start up and reloading before gradually turning the thermostat down to the desired heat output setting.
- The thermostat setting needs to be high enough to keep the catalytic thermometer in the active zone. If the thermometer will not stay in the active zone, turn the thermostat to a higher setting and then wait 15 minutes to confirm that the thermometer remains in the active zone. Repeat as required.
- If your appliance is producing too much heat, try to reduce the volume of wood fuel loads rather than turning your thermostat down. It is good burning practice to build smaller, hotter fires on milder days in the spring and fall.

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, burn the appliance for 5 to 10 minutes with the thermostat set to **HIGH** to melt any possible ice build.

⚠WARNING

DO NOT OPERATE THIS APPLIANCE WITHOUT THE CATALYTIC COMBUSTOR INSTALLED. DOING SO WILL LEAD TO EXCESSIVE SMOKE AND TEMPERATURES THAT COULD RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM. ONLY BURN SEASONED WOOD. FAILURE TO DO SO MAY DAMAGE THE COMBUSTOR AND WILL VOID ALL WARRANTIES.

COMBUSTOR MONITORING

It is good practice to monitor the catalytic combustor to ensure it is functioning properly. An improperly functioning combustor will result in a loss of heating efficiency and an increase in emissions and creosote buildup. The following list of items 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. Please refer to the "***COMBUSTOR TROUBLESHOOTING***" section.
- This appliance is equipped with a catalytic thermometer to monitor combustor operation. A properly functioning combustor will maintain temperatures in excess of 500F (indicated by the thermometer needle in the ACTIVE zone) and often reach temperatures in excess of 1000F. If the combustor temperature falls below 500F (thermometer needle in the INACTIVE zone), refer to the "***COMBUSTOR TESTING***" section.
- A good way to determine whether the combustor is functioning properly is by comparing the amount of smoke exiting the chimney while the combustor is engaged (bypass door closed) versus when the combustor is bypassed (bypass door open).
  Note: After opening the bypass door, wait approximately 15 minutes before observing the smoke exiting the chimney. Smoke may be visible shortly after lighting the fire and shortly after reloading the fire so allow 20 to 30 minutes for the fire to stabilize before making observations.

COMBUSTOR TESTING

Follow these instructions to test the catalytic combustor:

1. Light a fire per the "***LIGHTING THE FIRE"*** instructions.
2. After burning a well established fire for 1 hour, position the thermostat knob to a medium-low burn rate setting.
3. After 5 minutes at the lower burn rate, observe the location of the thermometer needle. A properly functioning combustor will have a temperature greater than 500F with the thermometer needle in the ACTIVE zone. An improperly functioning combustor will yield thermometer reading in the INACTIVE zone.
4. Repeat step 3 for at least 3 burn cycles.
5. If the thermometer needled is still not reaching the ACTIVE zone, your combustor may require cleaning.
6. If, after cleaning the combustor and reburning, the thermometer needle is still not reaching the ACTIVE zone, your combustor may need replacing. Contact your Blaze King dealer for a replacement combustor.

Note - It is also possible that the catalytic thermometer itself may not be functioning properly. Before deeming the combustor "dysfunctional", please refer to the "***CATALYTIC THERMOMETER"*** section.

⚠WARNING

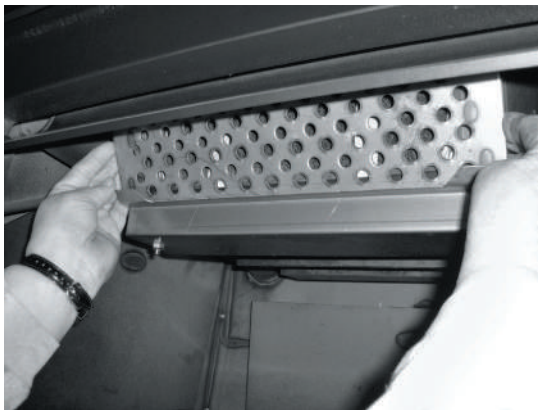
DO NOT PERFORM ANY CLEANING UNTIL THE FIRE IS OUT AND THE APPLIANCE IS COOL. HOT ASH IN A VACUUM CLEANER BAG COULD MELT THE VACUUM AND COULD RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

COMBUSTOR CLEANING

Under certain conditions, ash particles may become attached to the face of the combustor. These particles may be seen while the combustor is glowing under fire or when the fire is out. Any deposits on the face of the combustor should be removed. There are two ways to clean the face of the combustor: (1) Brushing the combustor with a soft bristle paint brush, or (2) Passing a vacuum cleaner wand or brush near the face of the combustor. Limit cleaning to the face of the combustor (note - the flame shield will have to be removed to gain access to the face). Do not scrape the combustor with any hard tool or brush and do not run pipe cleaner through the individual cells of the combustor as this may do more harm than good. Do not remove the combustor during this process. **Note - simply burning a hot fire usually proves to be the best method of cleaning the combustor of deposits.**

COMBUSTOR REPLACEMENT

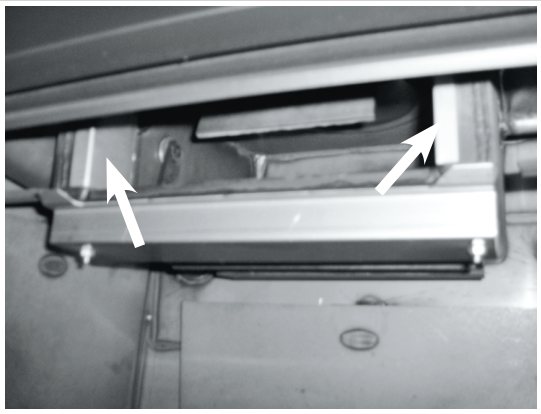
If the catalytic combustor has been deemed "dysfunctional" per the guidelines in "***COMBUSTOR TESTING***", discontinue use of the appliance until the combustor is replaced. Follow the steps below to complete the replacement **(BLAZE KING RECOMMENDS THAT YOUR DEALER OR CERTIFIED INSTALLER PERFORM THIS PROCEDURE):**



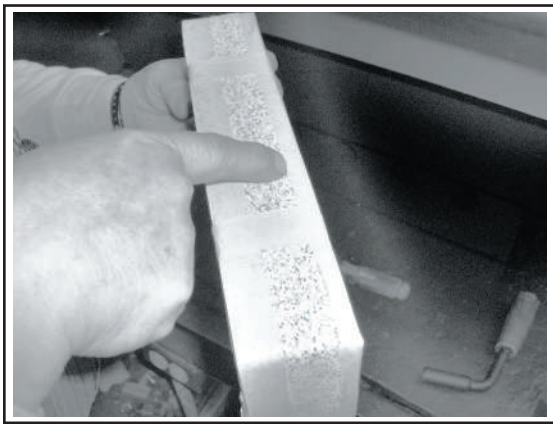
1. The appliance must be cool to touch, having gone at least 12 hours without being burned. A combustor can reach 1400F and hold temperatures for several hours, even after the fire is out. After waiting 12 hours, begin by removing the flame shield by simply lifting the shield off the two tabs at either lower corner. Pay particular attention to orientation of the flame shield in order to reinstall in the correct position.

2. Once the flame shield is removed, you will have access to the combustor. The combustor can be made of different materials such as cordierite, mulite, or 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 (please refer to the "***COMBUSTOR CLEANING***" section).

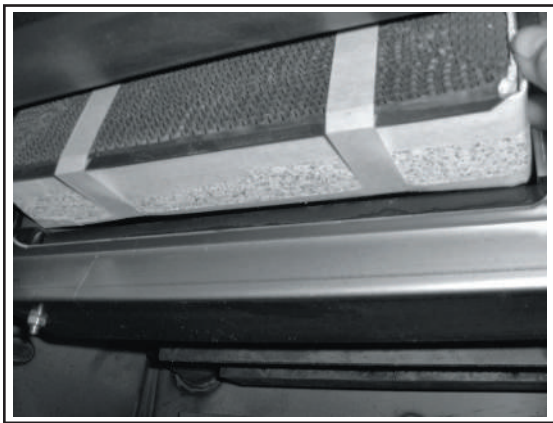
3. There are metal tabs across the bottom and on either side of the combustor. Using a flat blade screwdriver or pocket knife blade, slide the tip in between the metal tab on the left side of the combustor and the steel dome of the stove (the dome is the housing that encases the combustor). Apply slight pressure until the combustor begins to move forward. Repeat the process on the metal tab on the right side of the combustor. By working back and forth the combustor will work free of the dome housing. It is normal for the gasket that is wrapped around the combustor to fall apart during this process. New combustors are shipped with a new gasket.



4. With the combustor removed, you will see two bypass retainers on either side of the combustor opening within the dome. These retainers are not fixed in position and can fall into the firebox upon combustor removal. Ensure that they are put back into position before replacing the combustor. Use the screwdriver or pocket knife to scrape any old gasket from the surface areas of the dome. If you intend to reuse your existing combustor, you will need to order replacement combustor gasket. It is a good idea to have this combustor gasket on hand prior to performing this procedure.

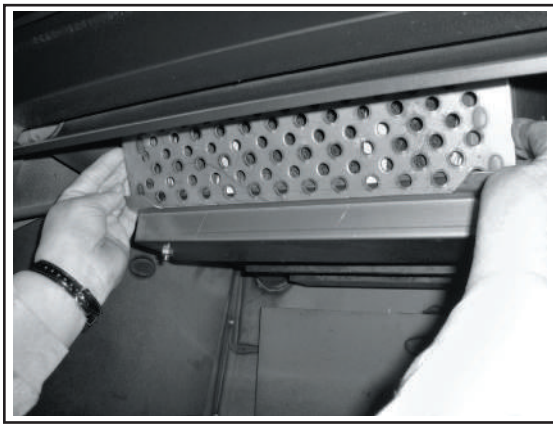


5. The new combustor will already be wrapped in gasket. Note the 1” wide masking tape - this will help to keep the leading edge of the gasket from snagging during installation. If you intend to reuse you original combustor, wrap the combustor gasket as you see here and use the 1” masking tape around the front and rear perimeter. During the first fire the masking tape will burn off and the combustor gasket will swell to provide a tight seal. This seal ensures optimal efficiency and performance. Do not burn the appliance without the combustor gasket installed.



6. Before installing, align the combustor within the opening of the dome housing. Slowly push the combustor in at the top and 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 OPENING. TAKE YOUR TIME AND WORK IT INTO PLACE SLOWLY.**

7. Once the combustor is fully reinserted into the opening of the dome housing, replace the flame shield. Note the flame shield sides are shaped like a triangle. The point of the triangle should face down to install correctly. Do not operate your appliance without the flame shield in place. The flame shield protects the face of the combustor against direct flame impingement and potential collisions when loading fuel.



8. When correctly installed, the flame shield will rest on the two tabs located on the dome guard and will lean slightly forward. Now that the combustor and flame shield have been properly reinstalled, the appliance can be relit.

A few reminders, do not burn anything other than dry, seasoned cordwood. Burning other materials may contaminate or ruin your new combustor. Also, remember to keep your firebox door gasket seal properly adjusted (please refer to the "***LOADING DOOR TENSION ADJUSTMENT"*** section). Doing so will ensure optimal performance of both the appliance and the combustor.

COMBUSTOR WARRANTY

This appliance contains a catalytic combustor, which needs periodic inspection and may require replacement for proper operation. It is against federal regulations to operate this appliance if the catalytic combustor is deactivated or removed.

The catalytic combustor supplied with this appliance is **OEM Blaze King part # S.CAT203032**.

Please consult the catalytic combustor warranty info also supplied with this appliance. Warranty claims should be addressed to:

CANADA	USA
Blaze King Industries / Valley Comfort Systems Warranty Department 1290 Commercial Way Penticton, BC, Canada V2A 3H5	Blaze King Industries Warranty Department 146 A Street Walla Walla, Washington, USA 99362

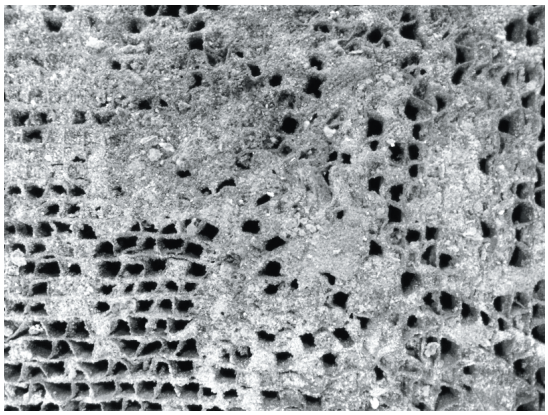
COMBUSTOR TROUBLESHOOTING

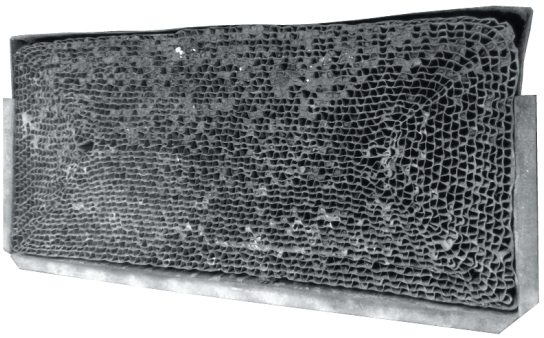
PROBLEM: CREOSOTE PLUGGING

Possible Cause: The combustor is coated with creosote burning material that produces substantial char and fly-ash.
Solution: Only burn dry, seasoned wood. Do not burn materials such as garbage, gift wrap, or cardboard.

Possible Cause: Burning wet, pitchy wood or burning large amounts of small diameter wood without the catalytic thermometer needle in the ACTIVE zone.
Solution: Burn dry, seasoned wood until temperatures are high enough to initiate catalyst light-off (indicated by the catalytic thermometer needle in the ACTIVE zone).

Possible Cause: Combustor not functioning.
Solution: If proper burning procedures have been followed and this problem persists, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).

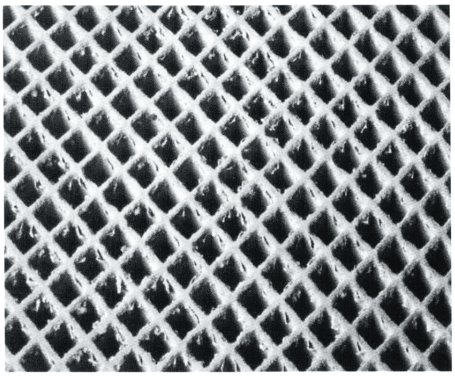




PROBLEM: COMBUSTOR PEELING

Possible Cause: Over firing and flame impingement can yield extreme temperatures (above 1800F/1000°C) at combustor surface and can cause peeling.
Solution: Avoid extreme temperatures by adjusting size of fuel loads. If peeling is severe, replace combustor.

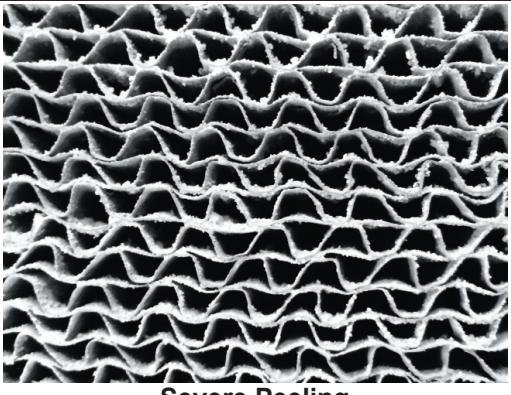
The images to the right are examples of minor peeling (does not affect proper combustor function) and severe peeling (closed or plugged combustor that needs replacement).



Minor Peeling

PROBLEM: CATALYTIC DEACTIVATION

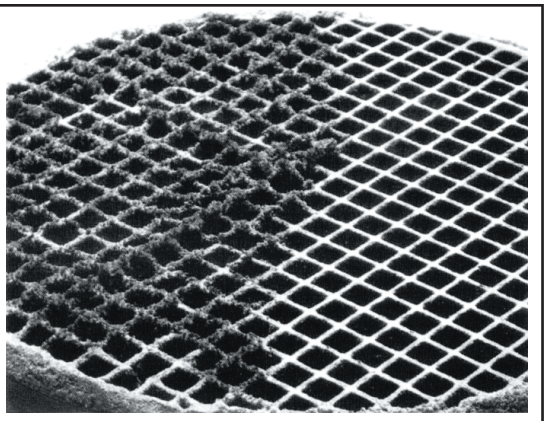
Possible Cause: Burning improper fuels (ie. garbage, pressure-treated lumber, painted wood, etc.).
Solution: Burn good quality, dry, seasoned wood. If proper burning procedures have been followed and this problem persists, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



Severe Peeling

PROBLEM: COMBUSTOR MASKING

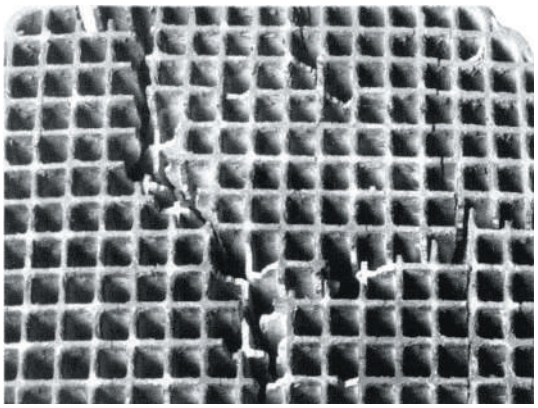
Possible Cause: The combustor is coated with a layer of fly-ash or soot from burning material that produces substantial char and fly-ash.
Solution: When the appliance is cool to touch, clean the front face of the combustor with a soft-bristled brush or vacuum lightly (refer to ***COMBUSTOR CLEANING*** for proper procedure).



PROBLEM: THERMAL CRACKING

Possible Cause: Extreme temperature fluctuations (ie. opening loading door while the combustor is in the ACTIVE zone) can cause thermal shock which can lead to cracking.
Solution: Avoid flooding a hot, active combustor with cool room air when reloading.

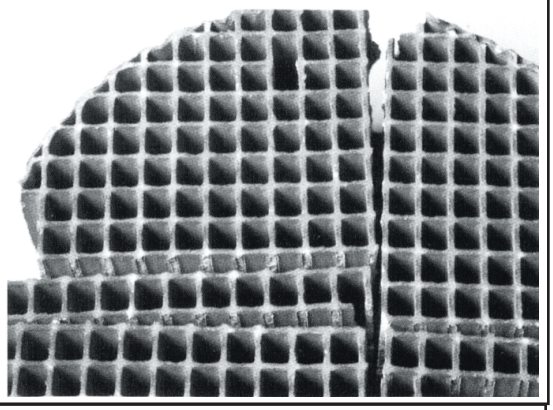
If cracking causes large pieces of the combustor to separate, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



PROBLEM: MECHANICAL CRACKING

Possible Cause: Mishandling the combustor or operating the appliance without the proper gasket installed.
Solution: Handle with care. Ensure combustor is wrapped with gasket upon reinstallation.

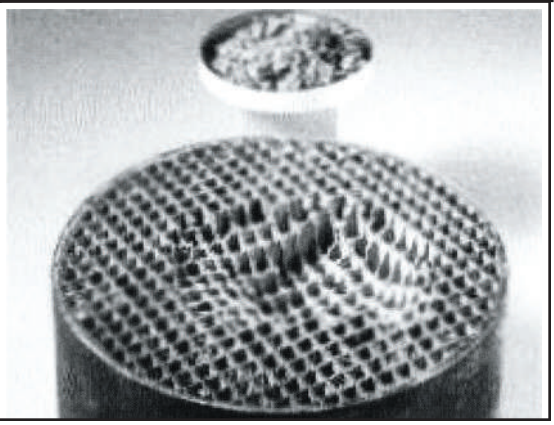
Possible Cause: Distortion of surrounding dome housing.
Solution: The combustor should slide in and out of the dome housing with relative ease. If this is not the case, contact your dealer for further inspection.



PROBLEM: COMBUSTOR CRUMBLING

Possible Cause: Excess air leaking into the firebox.
Solution: Ensure tight seal at loading door (see ***MAINTENANCE*** for instruction on gasket inspection).

Possible Cause: Excessive chimney draft.
Solution: Use a manometer to check and ensure chimney draft is within manufacturer specifications. Adjusting the appliance thermostat can help regulate chimney draft.



⚠WARNING

TO PREVENT SERIOUS BURNS, DO NOT PERFORM ANY MAINTENANCE UNTIL THE APPLIANCE IS COOL. APPLIANCE SURFACES, INCLUDING THE GLASS AND ANY ATTACHED COMPONENT, WILL REMAIN HOT FOR EXTENDED PERIODS OF TIME AFTER THE FIRE HAS BEEN PUT OUT.

RECOMMENDED MAINTENANCE

It is strongly recommended to complete the following tasks on a regular basis throughout the heating season:

1. Visually inspect Catalytic Combustor and clean as required (see "***COMBUSTOR CLEANING***")
2. Clean behind internal baffles (where applicable) and inspect metal components for warping/distortion.
3. Check Catalytic Thermometer for proper calibration.
4. Check Thermostat for proper function.
5. Check Fan Assemblies for proper operation.
6. Remove all ash from firebox and ash drawer after final burn of season.
7. Check all gaskets for proper seal and adjust as required.
8. Inspect and clean the Venting System.

CATALYTIC THERMOMETER MAINTENANCE

The catalytic thermometer probe (shaft) should be cleaned regularly. Ensure the fire is out and the appliance is cool, then remove the thermometer and wipe the probe clean. While removed, confirm the thermometer indicator needle points towards the bottom of the INACTIVE zone (allow the thermometer to sit at room temperature for 10 minutes before checking). If the needle does not point towards the bottom of the INACTIVE zone, it may need adjustment. Grasp the probe with a pair of pliers then slightly loosen the bolt on the top of the dial. Turn the dial to align the needle to the bottom of the INACTIVE zone and then retighten the bolt. Once finished, reinsert the thermometer back into the appliance. **Note: If your appliance is equipped with an optional fan kit, turn it off and wait 10 minutes before observing the catalytic thermometer reading.**

THERMOSTAT or THERMOMETER MAINTENANCE

Any thermostat or thermometer maintenance must be completed by a certified installer. If the thermostat or thermometer malfunctions, contact your dealer for replacement.

OPTIONAL FAN ASSEMBLY MAINTENANCE

Fan assemblies should be inspected at the beginning of each burn season to ensure they are free from debris such as ash, dust, pet dander, lint, etc. The accumulation of such debris could prevent the fan blades/blower wheels from rotating freely and put excessive strain on the fan motors, ultimately leading to failure.

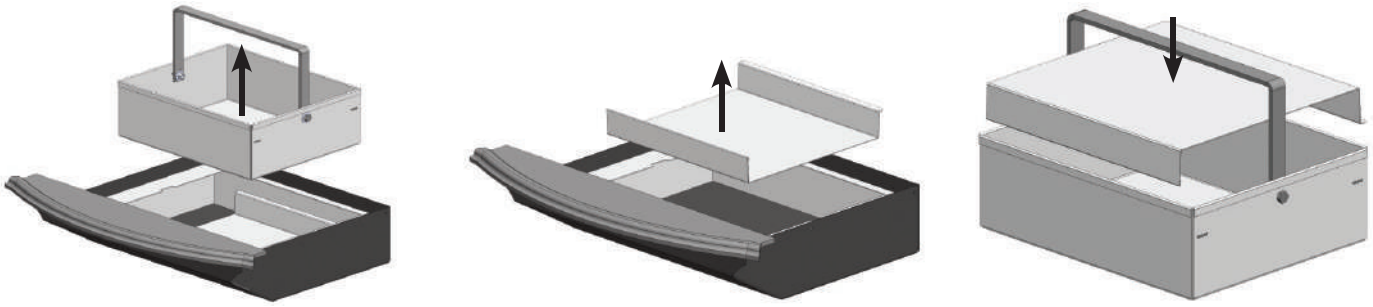
ASH REMOVAL

Ashes should be removed any time they come within one inch of the door opening, though it is not advisable to completely remove all of the ashes as wood burns best on a bed of ashes around 1/2" thick. When removing ashes, ensure the fire is out and the appliance is cool to touch. 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, while awaiting 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. Do not place other waste in this container.

⚠WARNING

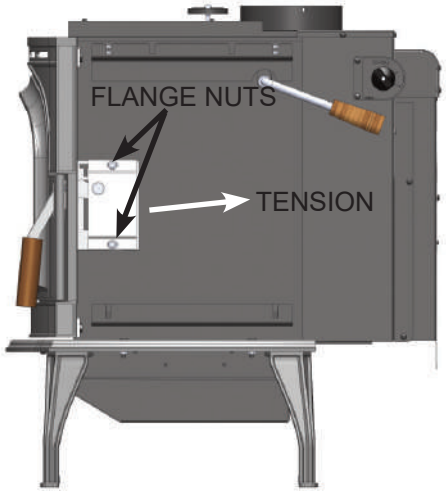
NEVER STORE HOT ASHES IN A GARAGE OR BASEMENT. HOT ASHES WILL GENERATE CARBON MONOXIDE AND / OR FLAMMABLE GASES. THESE GASES MAY CAUSE SUFFOCATION AND POSSIBLE DEATH.

ASH REMOVAL CONTINUED



LOADING DOOR TENSION ADJUSTMENT

1. Remove the Catalytic Thermometer, Cast Top, and the Left and Right Cast Sides from the appliance (use a 7/16" wrench to loosen the top two bolts that secure the cast sides to the firebox).
2. Use a 7/16" wrench to loosen the two flange nuts on the Latch Catch.
3. Slide the Latch Catch backwards (away from the door) to increase tension.
4. Retighten the Latch Catch flange nuts and perform a paper test (see "***DOOR GASKET PAPER TEST***").
5. Once satisfied with the adjusted tension, reinstall all removed components.



LOADING DOOR GASKET INSPECTION

Inspect the loading door gasket for physical deterioration, missing sections, or obvious leakage. The appliance door flange should make a groove in the gasket material. The side of the gasket on the inside of the groove will be dark or black while the outer side will be light or white. Dark smudges on the outer side of the gasket may indicate an air leak. If the groove in the gasket is very shallow 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 a need for replacement. Any time a piece of gasket is missing or broken the entire gasket must be replaced. A way to physically check if the gasket needs replacing is by performing a paper test (see ***"DOOR GASKET PAPER TEST")***

LOADING DOOR GASKET REPLACEMENT

If door gasket replacement is required, only replace with OEM door gasket ordered through your Blaze King dealer. This gasket will be properly sized and ready to install. **Do not stretch or cut the gasket at any time during this installation. Ensure only high temperature silicone adhesive is used for this installation (do not use household silicone caulking). Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch before removing the loading door.
2. Use a pair of pliers to pull the old door gasket out of the channel and dispose of it.
3. Clean the gasket channel of any residual adhesive to ensure the new adhesive will adhere sufficiently.
4. To ensure proper fit, dry fit the new gasket by distributing it evenly around the frame and then remove.
5. Run a small bead of a high temperature silicone adhesive along the center of the gasket channel.
6. Starting in the lower right corner, insert the new gasket into the gasket channel. Be sure to distribute the gasket evenly around the entire channel frame.
7. Allow the adhesive to dry for at least 1 hour before reinstalling and closing the loading door.
8. Confirm proper gasket installation by performing a paper test (see ***"DOOR GASKET PAPER TEST").***

⚠WARNING

DO NOT OPERATE THIS APPLIANCE IF THE DOOR GASKET IS MISSING OR DAMAGED. OVER-FIRING MAY OCCUR WHICH CAN CAUSE DAMAGE TO THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY WHICH COULD LEAD TO A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

DOOR GASKET PAPER TEST

Perform this test when inspecting or replacing loading door gasket:

1. Ensure the fire is out and the appliance is cooled to touch.
2. Insert a piece of paper (ie. a dollar bill) into the door opening and then latch the door shut.
3. Pull the paper out of the door while noting any obvious resistance when doing so.
4. If no resistance is felt, adjust the door tension (see "***LOADING DOOR TENSION ADJUSTMENT***").
5. Repeat this process around the perimeter of the door until consistent resistance is achieved.

DOOR GLASS GASKET INSPECTION

To inspect the door glass gasket:

1. Ensure the fire is out and the appliance is cooled to touch.
2. Hold the glass by placing the palm of each hand on either side and try to move it; If the glass moves:
   a. Inspect the glass retainers and ensure the screws holding the retainers in place are tight (hand tight plus 1/4 turn). If loose, retighten, but do not over tighten.
   b. Inspect the door glass gasket. If the gasket is frayed or missing sections, replace the gasket.

⚠WARNING

REFRAIN FROM STRIKING THE GLASS OR SLAMMING THE DOOR SHUT. DO NOT OPERATE THIS APPLIANCE IF THE DOOR GLASS OR GASKET SEAL IS BROKEN. DOING SO MAY LEAD TO A RUN AWAY FIRE WHICH COULD RESULT IN PROPERTY DAMAGE.

DOOR GLASS GASKET REPLACEMENT

If door glass gasket replacement is required, only replace with OEM door glass gasket ordered through your Blaze King dealer. The OEM gasket will be ordered to size and ready to re-install. **Do not stretch or cut the gasket at any time during this installation. Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch.
2. Remove the old glass gasket.
3. Starting at the corner opposite of the "Blaze King" logo, carefully wrap the gasket around the edges of the door glass, 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. Reposition the glass onto the door and then install the glass retainers with original fasteners. Ensure the glass is parallel to the frame and tighten the fasteners (hand tight plus 1/4 turn).

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 AND 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.

BYPASS DOOR GASKET INSPECTION

Visually note the amount of smoke exiting the chimney while the bypass door is both OPEN and CLOSED. There should be significantly less smoke when the door is in the CLOSED position. If this is not the case, the bypass gasket may need to be replaced.

Note: This inspection could also yield a dead combustor, see "*COMBUSTOR MONITORING*".

BYPASS DOOR GASKET REPLACEMENT

If bypass door gasket replacement is required, only replace with OEM 5/8" fiber glass gasket ordered through your Blaze King dealer. The OEM gasket will be ordered to size and ready to re-install. **Do not stretch or cut the gasket at any time during this installation. Ensure only THERMOSEAL® 1000F high-temperature resistant cement is used for this installation (do not use household silicone caulking). Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch
2. Remove the flue pipe from the appliance in order to have a clear view of the bypass door **(Fig. 13)**.
3. Remove the combustor (see "*COMBUSTOR REPLACEMENT*").
4. After removing the combustor you will notice stainless bypass retainers on both the left and right sides of the combustor opening **(Fig. 14)**. They secure the bypass door in position during operation. Remove the stainless bypass retainers and set aside.
5. Working down through the flue collar, unhinge the bypass door from the bypass rod (rotating the bypass handle into a neutral position will help), then rotate the bypass door 90 degrees to remove through the combustor opening **(Fig. 15)**.
6. Remove the old gasket and clean away any residual cement from the gasket channel.
7. Apply the new high-temperature cement along the channel.
8. Place the new gasket into the channel, tapping it down to seat it securely.
9. Apply high temp anti-seize lubricant to the under side of the bypass hook **(Fig. 16)** and then reinstall the bypass door by following the previous steps in reverse order.
10. Rotate the bypass handle several times to OPEN/CLOSE the bypass door to ensure smooth and proper operation. Once satisfied, reattach the flue pipe.
11. Reinstall stainless bypass retainers into combustor opening.
12. Refer back to "*COMBUSTOR REPLACEMENT*" to reinstall the combustor. **Note: if the gasket around the combustor is damaged, it will have to be replaced.**

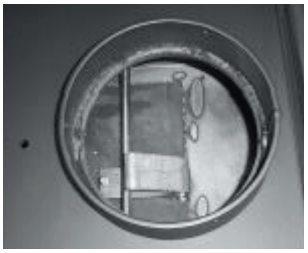


Fig. 13

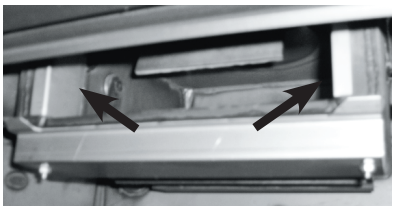


Fig. 14

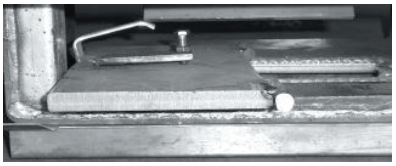


Fig. 15

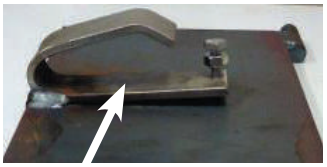


Fig. 16

VENTING SYSTEM MAINTENANCE

The entire chimney system must be cleaned and inspected regularly, especially during the coldest months of the burn season. The most efficient method to clean the chimney is to "sweep" it 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. **Ensure the bypass door is OPEN prior to chimney cleaning so soot and creosote fall into the firebox.** Once cleaned, inspect the chimney for any possible damage. If damage is present, the chimney section in question must be replaced.

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. Be aware that the hotter the fire, the less creosote is deposited. The flue pipe and chimney should be inspected regularly during the heating season, until a safe frequency for cleaning is established to determine if a creosote build up has occurred. If creosote accumulation is excessive, cleaning is required. It is recommended that a professional chimney sweep does the cleaning. Both the chimney and the appliance have to be cleaned at least once a year or as often as necessary.

⚠WARNING

A CHIMNEY FIRE CAN PERMANENTLY DAMAGE YOUR VENTING SYSTEM, WHICH CAN ONLY BE REPAIRED BY REPLACING THE DAMAGED COMPONENTS. FAILURE TO REPAIR COULD LEAD TO FURTHER PROPERTY DAMAGE. DAMAGE FROM A CHIMNEY FIRE IS NOT COVERED BY THE LIMITED WARRANTY.

RUN-AWAY OR CHIMNEY FIRE

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 thermostat by rotating the knob fully counter clockwise and ensure the firebox door is closed.
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, hose area down 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

IT IS ADVISED TO HAVE A WELL UNDERSTOOD PLAN OF ACTION IN THE EVENT OF A CHIMNEY FIRE

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 wood stove. Please study the operation instructions carefully. Consult your BLAZE KING dealer 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.

PROBLEM: Chimney Fire	
CAUSE Act immediately regardless of cause	**SOLUTION** Turn the thermostat to lowest setting, check loading door to be sure it is tightly closed. **Call Fire Department.**
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 Pipe”.	

PROBLEM: Not enough heat.	
CAUSE Green or wet wood. Not enough fuel in stove.	**SOLUTION** Use a moisture meter to ensure you are burning 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 a poorly designed chimney system.	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.

PROBLEM: Too much heat.	
CAUSE	**SOLUTION**
Bypass door left open.	Close the bypass 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.

PROBLEM: One or both fans will not run, or there is no adjustment for fan speed.	
CAUSE	**SOLUTION**
Fans mounted improperly.	Check that fan blade’s not touch edges of hole.
Fan speed control.	Consult your Blaze King dealer for replacement.

PROBLEM: Fans minimum speed too fast or maximum speed too slow.	
CAUSE	**SOLUTION**
Fan speed control out of adjustment.	Consult your Blaze King Dealer.

PROBLEM: Excessive creosote formation in chimney and chimney Connector.	
CAUSE	**SOLUTION**
Bypass door left open.	Close bypass door.
Bypass door not sealing tightly.	Inspect bypass door and seal for warping. Ash or creosote buildup may occur on door or seat. With stove cold scrape and vacuum area around bypass. 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 a poorly designed chimney system.	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.

PROBLEM: Catalytic 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)	
CAUSE	**SOLUTION**
Improper operation.	Check thermostat setting and operating procedures. See “THERMOSTAT & OPTIMAL THERMOSTAT SETTING”
Obstruction in chimney or cap.	Clean chimney, remove obstructions.
Faulty catalytic thermometer.	Check catalytic thermometer calibration.
Wood too green or wet.	Use seasoned wood.

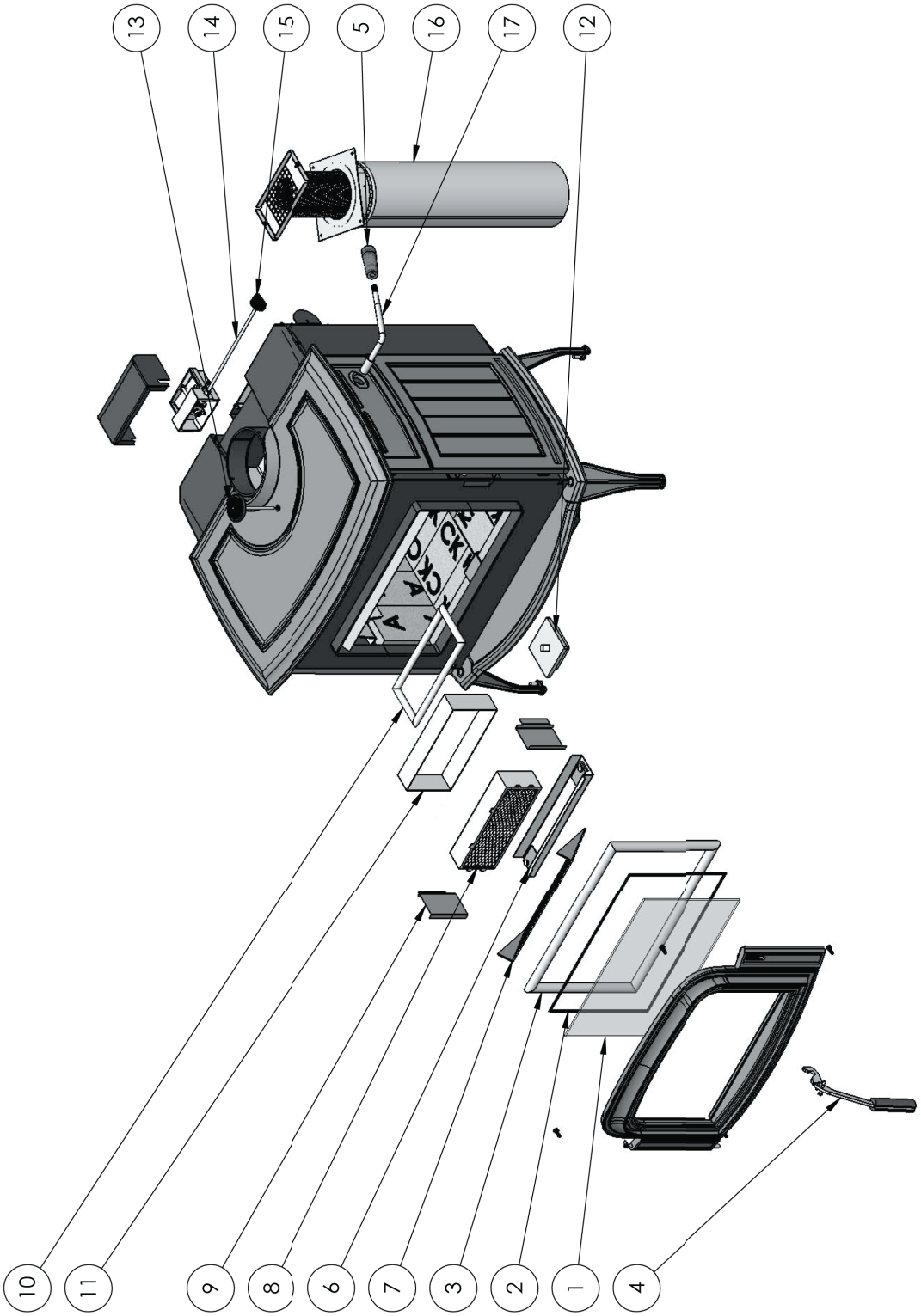
Combustor plugged or coated.	Clean combustor. See “CATALYTIC COMBUSTOR TESTING”
Combustor not functioning.	Check and test combustor. If needed replace combustor. See “CATALYTIC COMBUSTOR, REPLACING”
Thermostat not operating properly.	Consult your blaze King Dealer.
Bypass door leaking or not closing completely.	Inspect and clean area around bypass doors. Adjust or replace gasket if necessary. Consult your Blaze King Dealer.

PROBLEM: Spots of creosote accumulation in flue pipe or chimney.	
CAUSE Air leaks in flue pipe or chimney.	**SOLUTION** Inspect flue pipe and chimney. Repair or replace as necessary. Check to be sure that the flue pipe is installed correctly.
CAUTION: a leaking chimney system 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 Low thermostat setting or lowering the thermostat setting too far, too quickly.	**SOLUTION** 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. Install a Fresh Air Kit.
Burning poorly seasoned wet wood, or wood with high pitch content.	Use seasoned wood with low pitch content, such as some types of pine.

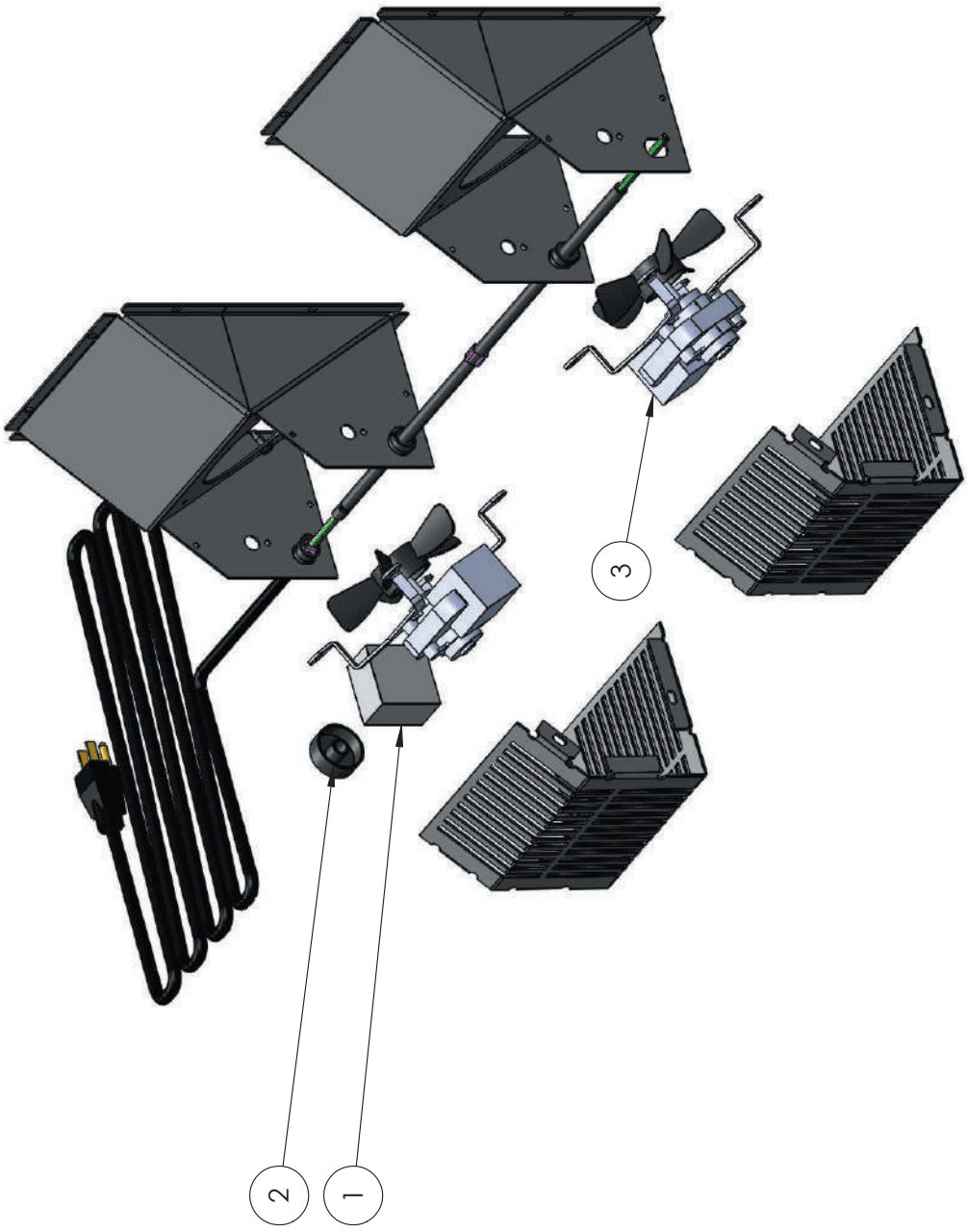
PROBLEM: The combustor temperature cannot be controlled. Turning the thermostat down often makes the combustor temperature go up.
CAUSE Turning the thermostat down, particularly in the first half of the burn cycle, causes the fire to emit more smoke, which is fuel for the combustor. The combustor temperature 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 Spark arrestor screen on cap plugged.	**SOLUTION** 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.


13
14
15
5
16
17
12
10
11
9
8
6
7
3
2
1
4

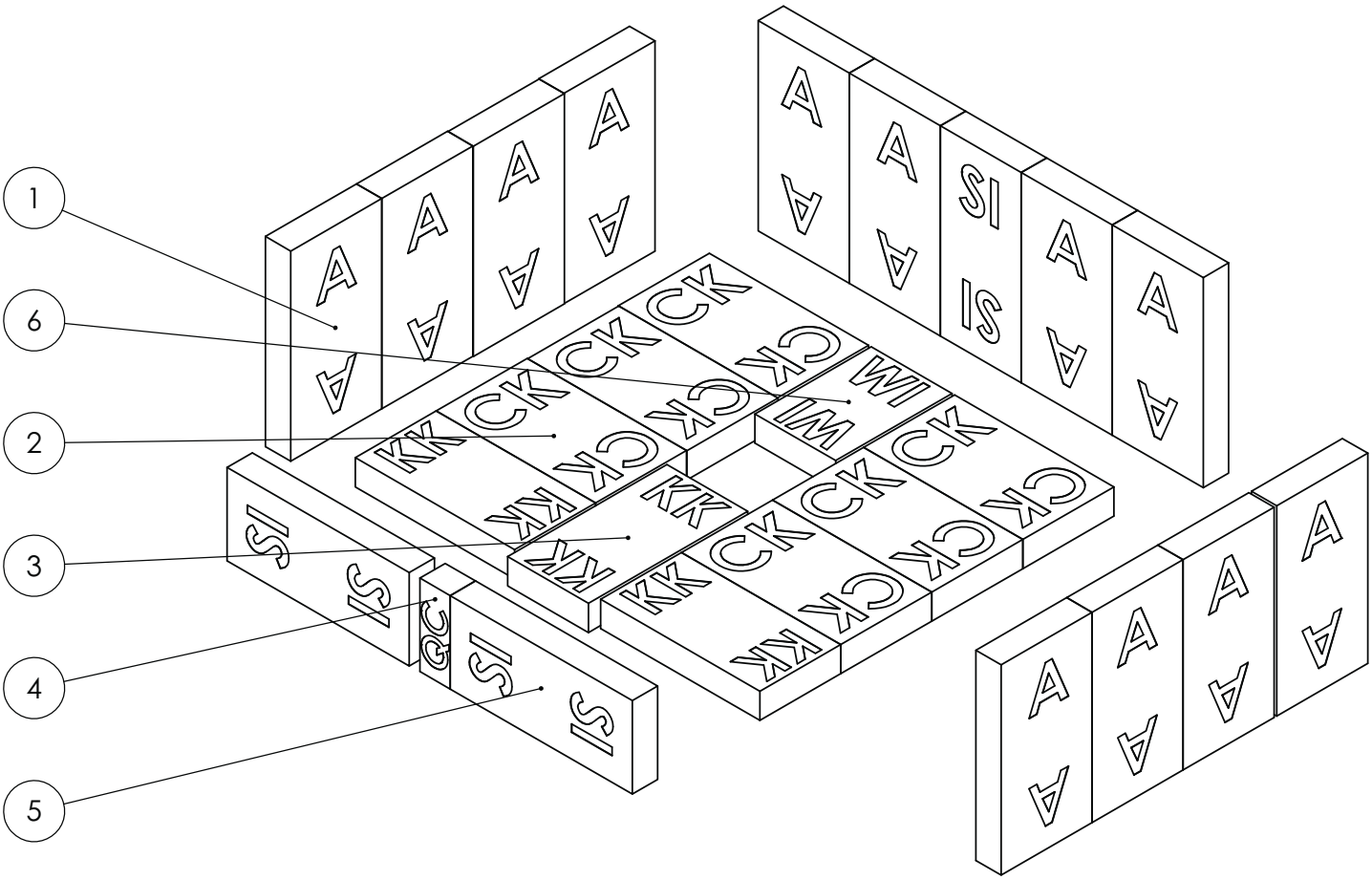
No. exploded view	Part #	Description	QTY
1	130-0243	GLASS CERAMIC 5MM 30.1 A/C/S	1
2	S.155.0254.6	GASKET 1/8 X 3/4 W/PSA SPEC / FT - 5ft	1
3	S.155.0186.6	GASKET 7/8 RND BLK MID / FT - 6ft	1
4	S.Z2844	DOOR HANDLE W/ WOODEN GRIP	1
5	2821	WOODEN BYPASS HANDLE GRIP	1
6	S.Z4551	DOME GUARD KIT COMPLETE	1
7	Z2430	FLAME SHIELD	1
8	S.CAT203032	COMBUSTOR	1
9	Z4498	BYPASS RETAINER KIT COMPLETE	1
10	S.155.0255.B.3	GASKET 5/8 DENSE RND /FT - 3ft	1
11	S.155.0341.C.33	COMBUSTOR GASKET SLIT 2” X 1/16”- 3 FT	1
12	S.Z3808	ASH CHANNEL LID ASM 4 INCH	1
13	120-0342-E	CAT THERMOMETER W/PAN 4” PROBE	1
14	S.Z3009	THERMOSTAT	1
15	220-0102	THERMOSTAT KNOB BLACK	1
16	S.Z1726 / S.Z1726B	(MOBILE HOME) OUTSIDE AIR KIT	1
17	S.Z2452-SW	BYPASS HANDLE (INCL. WOOD END) (PLATED/WALNUT)	1

Z2814 Fan Kit Replacement Parts



No. exploded view	Part #	Description	QTY
1	Z0136	Rheostat with off switch	1
2	0137	Rheostat knob silver inlay	1
3	Z7005	Replacement axial fan	1

Brick Layout



ITEM NO.	PART NUMBER	QTY.
1	A Size Brick	12
2	CK Size Brick	6
3	KK Size Brick	3
4	QC Size Brick	1
5	SI Size Brick	3
6	WI Size Brick	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 first 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 wood stove 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.

INSTALLER NOTES

Installer - Please complete the following information:

Dealer Name & Address:_____

_____

Installer Name (print): _____

Installer Signature: _____

Installer Phone #: _____

Date Installed:_____

Appliance Serial No.: _____

Blaze King

CHINOOK CK30.2

SOLID FUEL CATALYTIC STOVE

OPERATION & INSTALLATION MANUAL

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We recommend that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

U.S. EPA CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD

EM G-TL C US

0142WS021E
0142WS014S

Installer: Please COMPLETE THE DETAILS ON THE LAST PAGE and leave this manual with the homeowner.
Homeowner: Please SAVE THESE INSTRUCTIONS for future reference.

MANUFACTURED BY
Valley Comfort Systems Inc., 1290 Commercial Way, Penticton BC, Canada, V2A 3H5
web: www.blazeking.com email: info@blazeking.com

ATTENTION: The authority having jurisdiction (municipal building department, fire department, etc.) should be consulted before installation to determine the need to obtain a permit.

Pour la version française de nos manuels S.V.P. vous référez à notre site web: www.blazeking.com

TABLE OF CONTENTS

CERTIFICATION LABEL

For reference only - please refer to label on the appliance

CHINOOK CK30.2

SN - 54.

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

0142WS021E
0142WS014S

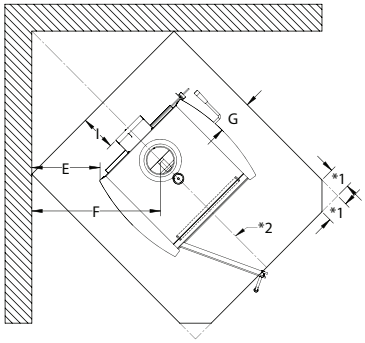
MODEL / MODÈLE: CK30.2
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S627:2023
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA
APPROVED FOR USE IN MOBILE HOMES (USA) AND IN TRANSPORTABLE BUILDINGS (CAN) / APPROUVÉ POUR UNE UTILISATION DANS LES MAISONS MOBILES (USA) ET DANS LES BÂTIMENTS TRANSPORTABLES (CAN)

Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. To be installed as a freestanding space heater with the clearances listed below and in the installation instructions. Not to be installed in any fireplace. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Except for the installation detailed below, use a 6" listed, factory built chimney suitable for use with solid fuels conforming to UL-103HT (USA) or CAN/ULC-S629 (CAN) or a code compliant, masonry chimney.
Mobile Home (USA) or Transportable Building (CAN) and residential close clearance 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 UL-103HT (USA) or CAN/ULC-S629 (CAN). Mobile Home (USA) or Transportable Buildings (CAN) installations are approved for roof exit only. Do not install in a sleeping room. Connection through a wall or ceiling requires special methods, see instructions and refer to local building codes to ensure proper installation.

Installez et utilisez cet appareil conformément aux instructions d'installation et d'utilisation de Blaze King. Contactez les responsables locaux du bâtiment ou des pompiers au sujet des restrictions et de l'inspection de l'installation dans votre région. À installer en tant qu'appareil de chauffage autonome avec les dégagements indiqués ci-dessous et dans les instructions d'installation. Ne pas installer dans une cheminée. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". À l'exception de l'installation détaillée ci-dessous, utilisez une cheminée de 6" homologuée et fabriquée en usine adaptée à une utilisation avec des combustibles solides conformes à UL-103HT (USA) ou CAN/ULC-S629 (CAN) ou un code conforme, cheminée en maçonnerie.
Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) et résidentielles à dégagement réduit nécessitent un connecteur de cheminée homologué à double paroi et à dégagement réduit avec une cheminée fabriquée en usine homologuée adaptée à une utilisation avec des combustibles solides et conforme à UL-103HT (USA) ou CAN/ULC-S629 (CAN). Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) sont approuvées pour une sortie sur le toit uniquement. Ne pas installer dans une chambre à coucher. La connexion à travers un mur ou un plafond nécessite des méthodes spéciales, voir les instructions et se référer aux codes du bâtiment locaux pour assurer une installation correcte.

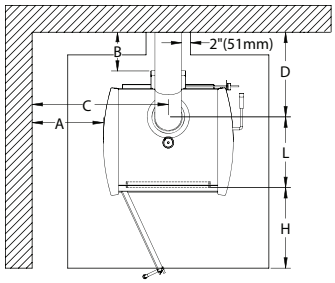
MINIMUM CLEARANCES TO COMBUSTIBLES (see owners manual for complete description of all requirements)
*** In Canada, 18" clearances from single wall pipe is required. Check with local codes and pipe manufacturers for minimum pipe clearances.**
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)
*** Au Canada, un dégagement de 18 po est exigé pour un tuyau à simple paroi. Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements.**

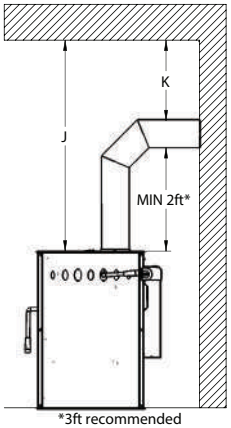
Residential Installations / Installations Résidentielles	A	B	* C	* D	E	* F	J
Roof Exit or Wall Exit, Parallel or Corner minimum clearances Dégagements minimaux de sortie de toit ou de sortie murale, parallèle ou d'angle	9.5" 241 mm	6" 153 mm	24.125" 603 mm	16.375" 416 mm	4" 102 mm	17.625" 448 mm	37" 940 mm
Mobile Home (USA) or Transportable Building (CAN) / Maison mobile (USA) or Bâtiment transportable (CAN)							
Roof Exit, Parallel or Corner minimum clearances; outside Air Kit and Fan Kit or Rear Shield required Dégagements minimaux de sortie de toit, parallèles ou en coin; Kit d'air extérieur et kit de ventilateur ou écran arrière requis	9.5" 241 mm	6" 153 mm	24.125" 603 mm	16.375" 416 mm	4" 102 mm	17.625" 448 mm	37" 940 mm



*1= 5.625" in Canada and 2.125" in USA

*2 = 58.625" in Canada and 56.625" in USA





*3ft recommended

G = 3" (77 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (457 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (457 mm) for single wall pipe in Canada	L = 15.75" (400mm)

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. Minimum floor protection size is: 35" x 42.125" (889 mm x 1070 mm) in USA or 45.25" x 52.125" (1150 mm x 1324 mm) in Canada.
This appliance is certified to comply with 2020 particulate emission standards using crib wood (certified to EPA test methods 28R/5G with an emission-rate of 0.81 g/hr). It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual or if the catalytic combustor is deactivated or removed. This appliance needs periodic inspection and repair for proper operation; consult the owner's manual for instruction.
ONLY OPERATE WITH DOOR CLOSED; open door to feed fire ONLY. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS OR THE SPACE BENEATH THE APPLIANCE. Provide adequate outside air for combustion. For use with solid wood fuel only; do not burn other fuels as this will cause the catalyst in the combustor to become inactive. The performance of the combustor or its durability has not been evaluated as part of the certification. Combustor OEM part number: Z0336A-M. Replace glass with 5 mm ceramic glass only.

Cet appareil ne nécessite pas de protection thermique du sol du foyer; cependant, s'il est installé sur un plancher combustible, un protecteur de plancher non combustible doit être utilisé. La taille minimale de la protection de plancher est de: 35" x 42.125" (889 mm x 1070 mm) aux USA ou 45.25" x 52.125" (1150 mm x 1324 mm) au Canada.
Cet appareil est certifié conforme aux normes d'émission de particules 2020 utilisant du bois de lit (certifié selon les méthodes de test EPA 28R/5G avec un taux d'émission de 0.81 g/h). Il est contraire aux réglementations fédérales d'utiliser cet appareil d'une manière incompatible avec les instructions d'utilisation du manuel du propriétaire ou si la chambre de combustion catalytique est désactivée ou retirée. Cet appareil nécessite une inspection et une réparation périodiques pour un bon fonctionnement; consultez le manuel du propriétaire pour obtenir des instructions.
FONCTIONNER UNIQUEMENT AVEC LA PORTE FERMÉE; ouvrir la porte UNIQUEMENT pour alimenter le feu. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION ou l'espace sous l'appareil. Fournir suffisamment d'air extérieur pour la combustion. À utiliser uniquement avec du bois de chauffage solide; ne brûlez pas d'autres combustibles car cela rendrait le catalyseur dans la chambre de combustion inactif. Les performances de la chambre de combustion ou sa durabilité n'ont pas été évaluées dans le cadre de la certification. Numéro de pièce OEM de la chambre de combustion: Z0336A-M. Remplacez le verre par du verre céramique de 5 mm uniquement.

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 ☐
2024 ☐ 2025 ☐ 2026 ☐ 2027 ☐ 2028 ☐ 2029 ☐

170-0264 [04 24]

The content within this manual describes the installation and operation of the Blaze King CK30.2. It is against federal regulations to operate this appliance in a manner inconsistent with the operating instructions in this manual. Blaze King grants no warranty, implied or stated, for the installation and maintenance of this appliance and assumes no responsibility of any consequential damage(s).

EPA CERTIFICATION TEST DATA		
Burn Category	**CO Ave**	**Emission Rate**
Low Burn	0.03 g/min	0.20 g/hr
Med-low Burn (1)	0.32 g/min	0.62 g/hr
Med-low Burn (2)	0.39 g/min	0.46 g/hr
Med-high Burn	0.81 g/min	1.23 g/hr
High Burn	1.69 g/min	3.81 g/hr
EPA emission rate weighted average		0.81 g/hr

This appliance was tested and listed to CAN/ULC-S628:2022 & UL1482-11 (R2022) by OMNI-Test Laboratories. This appliance is certified to comply with the 2020 U.S. Environmental Protection Agency's particulate emission standards using crib wood. Under specific test conditions, this appliance has been shown to deliver heat at rates ranging from 10,094 to 36,076 Btu/hr. This appliance has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting.

This appliance contains a catalytic combustor which needs periodic inspection and may require replacement to ensure proper operation. It is against federal regulations to operate this appliance if the catalytic combustor is deactivated or removed.

⚠WARNING

IF THIS APPLIANCE IS NOT PROPERLY INSTALLED OR OPERATED, A HOUSE FIRE MAY RESULT LEADING TO SERIOUS BODILY HARM AND EVEN DEATH. TO REDUCE THE RISK OF FIRE, PLEASE READ THIS ENTIRE MANUAL BEFORE INSTALLING AND OPERATING THIS APPLIANCE. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

DO NOT OPERATE THIS APPLIANCE WITHOUT FULLY ASSEMBLING ALL COMPONENTS. DO NOT INSTALL DAMAGED, INCOMPLETE, OR SUBSTITUTE COMPONENTS. FAILURE TO POSITION COMPONENTS IN ACCORDANCE WITH THE DIAGRAMS IN THIS BOOKLET, OR FAILURE TO USE COMPONENTS SPECIFICALLY APPROVED WITH THIS APPLIANCE, MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY.

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

⚠WARNING

THIS APPLIANCE MAY NOT BE INSTALLED INTO A FACTORY BUILT FIREPLACE. FAILURE TO COMPLY WILL VOID ANY AND ALL WARRANTIES.

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

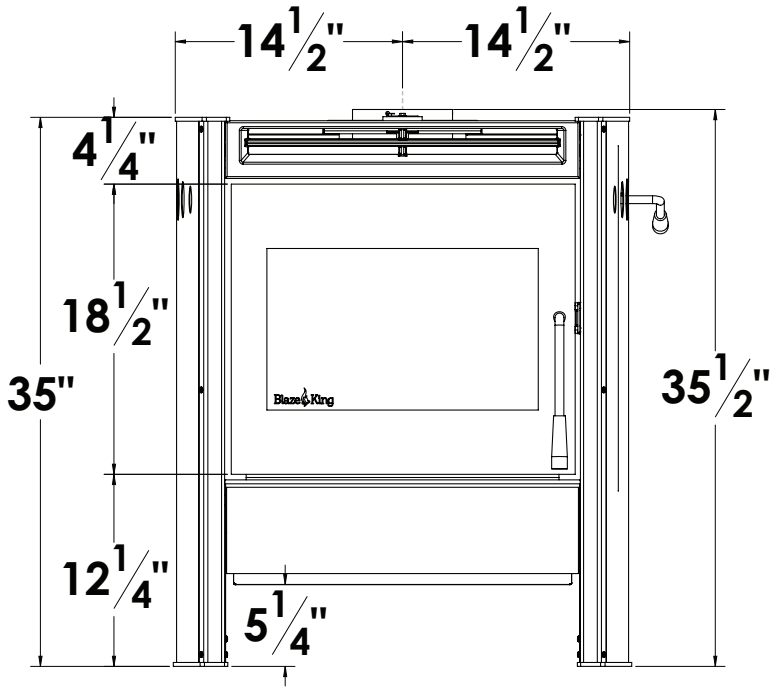
SPECIFICATIONS

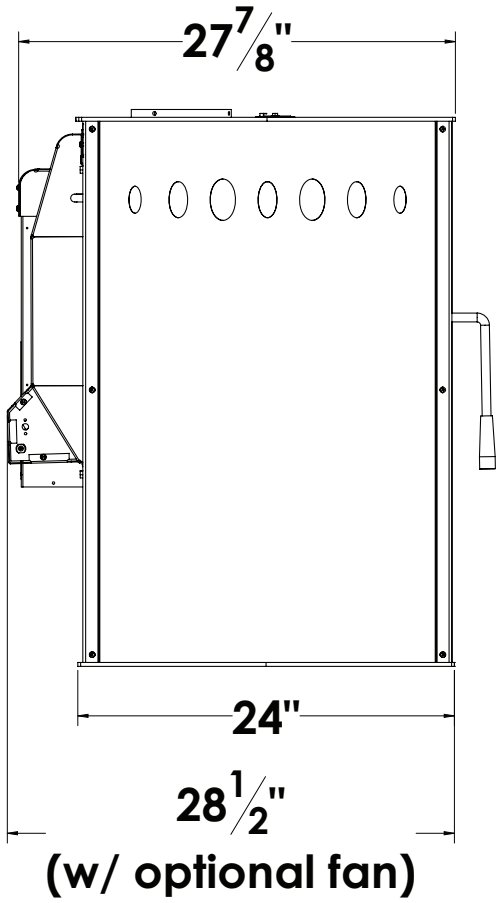
CHINOOK 30.2, CK30.2 SPECIFICATIONS	
Flue Collar Opening	6” I.D. (152.4 mm)
Firebox Door Opening	18 5/8” x 9 7/8” (473 mm x 251 mm)
Firebox Depth	18” (457 mm) brick to brick, 20 1/2” (521 mm) brick to glass
Firebox Width	20” (508 mm)
Firebox Height	12.84” (326.1 mm)
Firebox Volume	2.91 cu. ft. (0.0824 m^3)
Tested Fuel Length	16.75” (426 mm)
Wood Capacity (approximate)	White Oak - 60 lb (27.2 kg) / Douglas Fir - 40 lb (18.1 kg)
Shipping Weight	400 lb (181 kg)

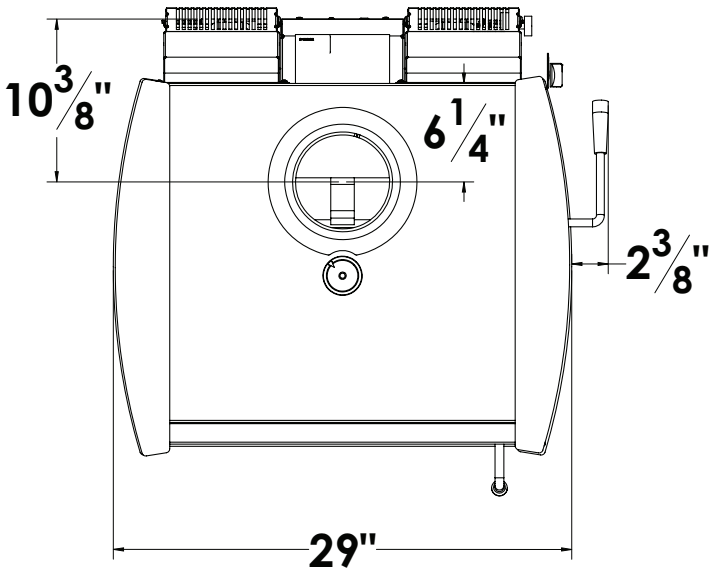
PARTS INCLUDED
1. Fire Poker
2. Manual Kit (w/ Warranty Cards, Catalytic Thermometer, Bypass Handle)

OPTIONAL ACCESSORIES	
1. S.Z1714 - Fan Kit	2. S.Z4015 - Rear Shield
3. 3” Outside Air Kit (S.Z1726B)	4. 4” Outside Air Kit (S.Z1726)

CK30.2


14 1/2"
14 1/2"
4 1/4"
18 1/2"
35"
35 1/2"
12 1/4"
5 1/4"
Blaze King

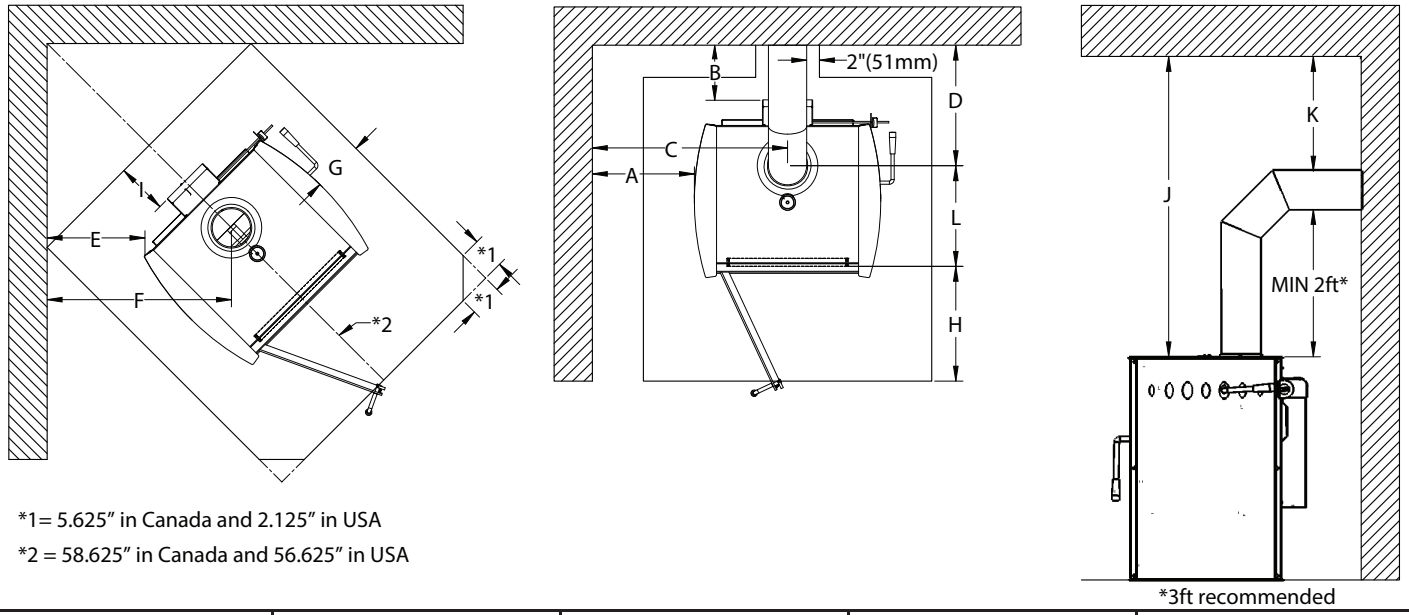

27 7/8"
24"
28 1/2"
(w/ optional fan)


10 3/8"
6 1/4"
2 3/8"
29"

MINIMUM CLEARANCES

This appliance must be installed in compliance with all local codes and regulations. Minimum clearances may only be reduced by means approved by the regulatory authority. Flue pipe must be 6" diameter and 24 MSG steel construction. Do not use aluminum or galvanized steel. Refer to local codes and pipe manufacturer specs for required minimum clearances. ***In Canada, a minimum 18" (450 mm) clearance from single wall pipe is required.**

RESIDENTIAL INSTALLATION	A	B	* C	* D	E	* F	J
Roof or Wall exit; Parallel or Corner min clearances	9.5" 241 mm	6" 153 mm	24.125" 603 mm	16.375" 416 mm	4" 102 mm	17.625" 448 mm	37" 940 mm
MOBILE HOME (USA) OR TRANSPORTABLE BUILDING (CAN) INSTALLATION							
Roof exit only; Parallel or Corner min clearances *Fan Kit or Rear Shield Kit + Outside Air Kit required	9.5" 241 mm	6" 153 mm	24.125" 603 mm	16.375" 416 mm	4" 102 mm	17.625" 448 mm	37" 940 mm



*1= 5.625" in Canada and 2.125" in USA

*2 = 58.625" in Canada and 56.625" in USA

G = 3" (77 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (456 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (456 mm) for single wall pipe in Canada	L = 15.75" (400mm)

FLOOR PROTECTION

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. In the USA, this floor shield must extend 16" out from the front and 8" out from either side of the fuel-loading door. In Canada, to comply with CSA B365, any combustible covering beneath the appliance and/or within the area extending horizontally at least 18" (450 mm) beyond the appliance on any side equipped with a door, and at least 8" (200 mm) beyond the appliance on other sides, shall be protected by a continuous, durable, non-combustible pad that will provide ember protection. The 18" (450 mm) ember protection required on any side with a door shall extend for the full width of the appliance plus the 8" (200 mm) required on each side of the appliance without a door. Where an appliance is installed less than 8" (200 mm) from a wall, the ember pad need only extend to the base of the wall. An ember pad shall not be placed on top of a carpet unless the pad is structurally supported to prevent displacement and distortion. A non-combustible shield is also required underneath the chimney connector and extend at least 2" on either side of the chimney connector. This shield does not need an insulation value, but must be listed under UL 1618-2009 (Type 1) and have a minimum size of:

35" x 42.125" (889 mm x 1070 mm) in USA and 45.25" x 52.125" (1150 mm x 1324 mm) in Canada

Blaze King does not recommend adhesive based vinyl flooring in front of appliances due to thermal expansion and warping which could be permanent.

⚠WARNING

DO NOT CONNECT TO OR USE THIS APPLIANCE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATIONS
THIS APPLIANCE MUST BE CONNECTED TO: 1) A CHIMNEY COMPLYING WITH THE REQUIREMENTS FOR TYPE HT CHIMNEYS IN THE STANDARD FOR CHIMNEYS, FACTORY-BUILT, RESIDENTIAL TYPE AND BUILDING HEATING APPLIANCE, UL 103, OR 2) A CODE-APPROVED MASONRY CHIMNEY WITH A FLUE LINER. FAILURE TO DO SO MAY RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

COMBUSTION AIR

In air tight homes (most modern construction), careful considerations must be taken into account before installing a wood burning appliance. It is important to ensure there is adequate intake (combustion) air for all exhausting type appliances within the dwelling. Heat recovery ventilator (HRV) systems along with constant running fan motors in air handlers are examples of appliances that must be taken into account when balancing intake air (others include fireplaces, range hoods, dryers, etc.). It is recommended that a fresh air intake inlet into the room where the appliance is located be installed. Failure to do so may result in air starvation, smoke spillage, and carbon monoxide threats. Consult a HVAC specialist for proper installation practices.

DRAFT PERFORMANCE

Draft is the movement of combustion air into the appliance and out through the chimney as exhaust gas. In essence, it is the difference in pressure between the exhaust gas inside the chimney and the outside air that creates this movement. Warmer, lighter exhaust gasses in the chimney tend to move upward. The amount of draft created by your chimney can depend on chimney length, horizontal offsets, insulating properties, local geography, external forces, and other factors. External factors (outdoor temperature, wind, barometric pressure, topography, etc.) or internal factors within the dwelling (negative pressure from exhaust fans, chimneys, air infiltration, etc.) may adversely affect draft.

Too much draft can yield very high temperatures within the appliance and may result in damage. An uncontrollable burn or excessive room temperatures are indicators of too much draft. Too little draft may cause back puffing (smoke spillage) into the room and plugging of the chimney, chimney cap, or spark arrestor screen. Inadequate draft can also lead to low heat output and the inability for the combustor to remain active at low burn rate settings. Your Blaze King heater is a high efficiency appliance and will require fine tuning of your chimney system in order to maximize draft performance. **Blaze King cannot be responsible for external forces leading to less than optimal draft performance.**

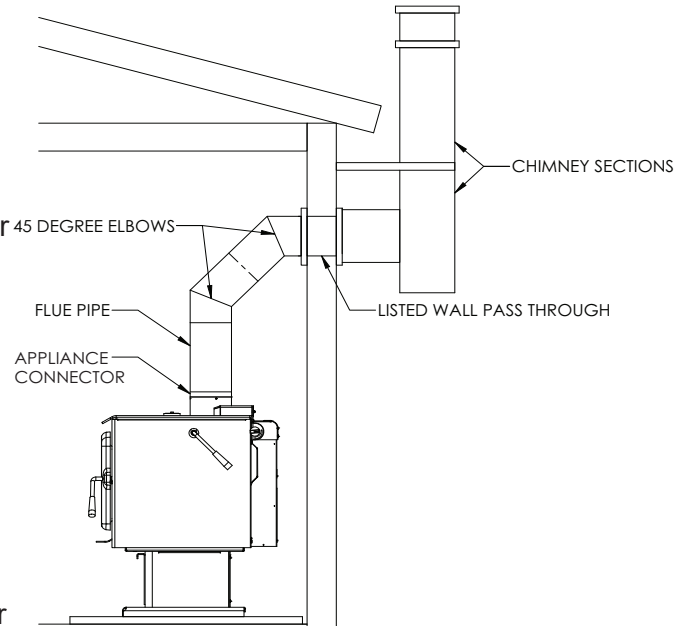
ROLE OF THE CHIMNEY

The role of the chimney is to maintain sufficient draft to achieve complete combustion. To ensure maximum performance, Blaze King recommends a minimum vertical chimney height of 15 ft (from stove top to termination) when installing an appliance at sea level (and up to 1000 ft of elevation). For freestanding installations, it is also recommended to use double wall pipe from stove top adaptor to ceiling support box. Double wall pipe helps to keep the chimney warm and improve draft performance. For wall exit installations, a vertical length of 3 ft from stove top to elbow is recommended. It is also recommended to use a pair of 45 degree elbows rather than a single 90 degree elbow to allow for a smoother transition of airflow. When possible, outside chimney systems should be isolated from the external environment by building a chase around the chimney. Doing so will help keep the chimney warm and maintain sufficient draft (please refer to the "***RECOMMENDED FLUE HEIGHTS***" section). **Without a properly installed chimney, this appliance will not operate at its maximum performance which could yield incomplete combustion.**

VENTING SYSTEM

A venting system consists of:

- Appliance Connector - a “stove top adaptor” that creates a positive connection between the appliance and flue pipe.
- Flue Pipe - either single or double wall pipe that is only used within the room, connecting the appliance to either a ceiling box or wall pass through.
- Chimney - a listed, factory built component with either 1” or 2” insulation that is suitable for use with solid fuels, conforming to CAN/ULC-S629 in Canada or UL 103HT in the USA. Note: This appliance may also be connected to a code compliant Masonry Chimney.

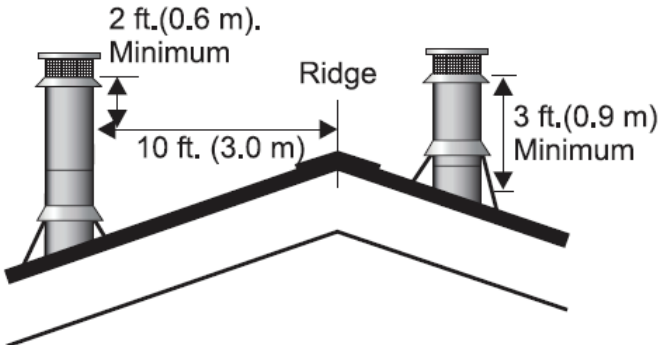


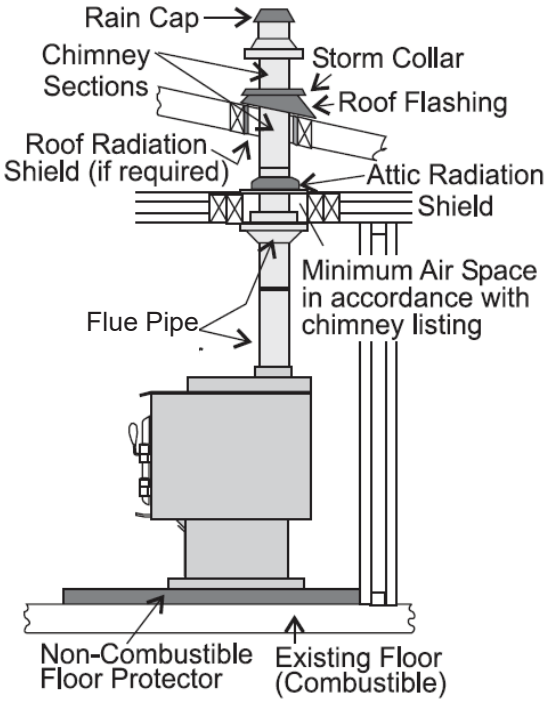
Do not install the chimney directly at the outlet of the appliance. A chimney connector is required unless the appliance is specifically approved for that type of installation. The flue pipe between the appliance connector and chimney should be kept as direct as possible. Do not use a flue pipe to pass through an attic or roof space, closet or similar concealed space, or a floor or ceiling. All joints within the venting system must be securely fastened with sheet metal screws. A chimney support package must be used when a connection is made through a ceiling to a listed prefabricated chimney. A listed wall thimble must be used when a connection is made through a combustible wall to a chimney. These accessories are necessary to provide safe clearances to combustible walls and ceilings as these components can get extremely hot during use. In the event of a creosote fire, temperatures inside the chimney may exceed 2000F (1100°C). An effective vapor barrier must be maintained at the location where the chimney or vent component penetrates the exterior structure. Do not connect this appliance to a chimney serving another appliance, doing so will affect the safe operation of both appliances and will void warranty. You must comply with the local authority having jurisdiction and, in Canada, CSA installation standard B365-M87.

CONNECTION TO A METAL PREFABRICATED CHIMNEY

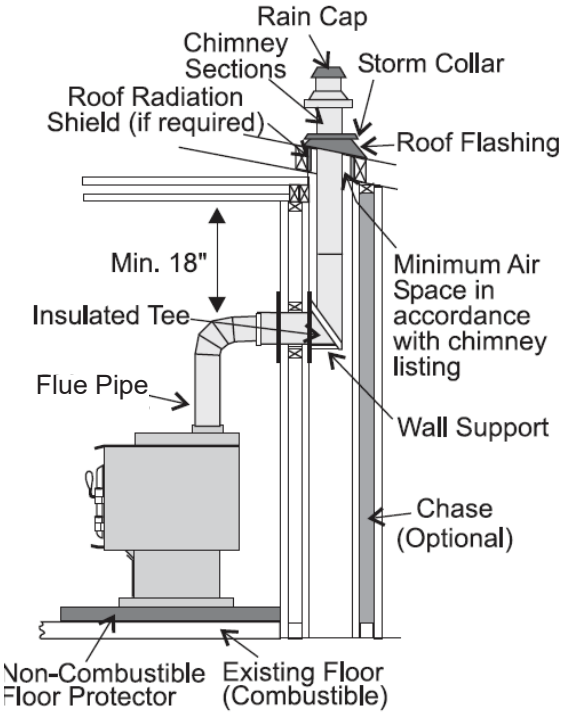
Refer to the prefabricated chimney manufacturer’s installation instructions to ensure safe clearance to combustibles are maintained when installing. All components (ceiling support package or wall pass through and “T” section package, fire stops, insulation shield, roof flashing, chimney cap, etc.) must be purchased from the same prefab chimney manufacturer. There are two common methods of a prefab chimney installation: the recommended method is to install the chimney inside the dwelling up through the ceiling(s) and the roof, while the alternative method is to install an exterior chimney that runs up the outside of the structure. Though not recommended, the alternative method is sometimes it is the only option. In that case it is recommended to build a chase around the external chimney.

The chimney must meet a minimum height above the roof and/or other obstruction(s) for safety purposes and to ensure sufficient draft. It is required that the chimney be at least 3ft higher than the highest point where it passes through the roof and at least 2ft higher than the highest part of the roof or any obstruction within 10ft (measured horizontally) of the chimney. Refer to the “***RECOMMENDED CHIMNEY HEIGHTS***” chart for minimum flue height recommendations and CAN/ULC-S629 in Canada or UL-103HT in the USA for installation codes.





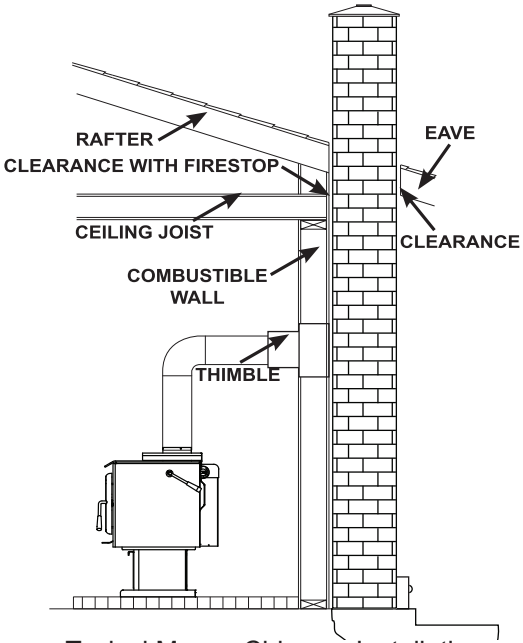
Prefab Chimney Through Ceiling Installation



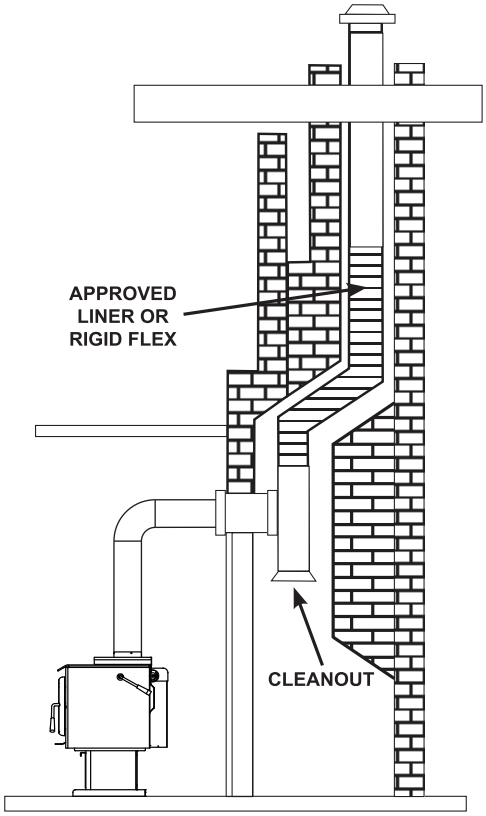
Prefab Chimney Exterior Installation

CONNECTION TO A MASONRY CHIMNEY

First and foremost, ensure the masonry chimney meets the minimum standards per the National Fire Protection Association by having it inspected by a certified professional. There must be no cracks, no loose mortar, and no signs of deterioration or blockage. Ensure the chimney is properly cleaned before installing the appliance. When connecting the appliance through a combustible wall, special methods are required; refer to local jurisdiction for the approved methods of passing a chimney connector through a combustible wall in your area (In the USA, refer to the NFPA minimum standards, and in Canada, refer to CAN/CSA-B365, the Installation Code for Solid Fuel Burning Appliances and Equipment). **Blaze King recommends the use of a stainless steel liner, preferably insulated, inside a masonry chimney. This is to help maintain a proper draft to achieve optimal performance of the appliance.**



Typical Mason Chimney Installation



Blaze King Recommend Installation

RECOMMENDED CHIMNEY HEIGHTS

Every installation is unique, especially when considering geographical location. As previously mentioned, maintaining sufficient draft is of utmost importance, but this can be a challenge as draft can be heavily influenced by topographical and geographical phenomena. The understanding of pressure planes and the stack effect are imperative in planning and executing a successful installation.

As previously mentioned, Blaze King recommends a minimum vertical chimney height of 15 feet (from stove top to termination) when installing an appliance at sea level (and up to 1000 feet of elevation). If the install is at a higher elevation, please refer to the table below for recommended chimney heights:

MINIMUM RECOMMENDED CHIMNEY 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 ft 4.6 m	16 ft 4.9 m	18 ft 5.5 m	19 ft 5.8 m
1000 - 2000 ft 305 - 610 m	15.5 ft 4.7 m	16.5 ft 5.0 m	18.5 ft 5.6 m	19.5 ft 5.9 m
2000 - 3000 ft 610 - 914 m	16 ft 4.9 m	17 ft 5.2 m	19 ft 5.8 m	20 ft 6.1 m
3000 - 4000 ft 914 - 1219 m	16.5 ft 5.0 m	17.5 ft 5.3 m	19.5 ft 5.9 m	20.5 ft 6.2 m
4000 - 5000 ft 1219 - 1524 m	17 ft 5.2 m	18 ft 5.5 m	20 ft 6.1 m	21 ft 6.4 m
5000 - 6000 ft 1524 - 1829 m	17.5 ft 5.3 m	18.5 ft 5.6 m	20.5 ft 6.2 m	21.5 ft 6.6 m
6000-7000 ft 1829 - 2134 m	18 ft 5.5 m	19 ft 5.8 m	21 ft 6.4 m	22 ft 6.7 m
7000 - 8000 ft 2134 - 2438 m	18.5 ft 5.6 m	19.5 ft 5.9 m	21.5 ft 6.6 m	22.5 ft 6.9 m
NOTE: No more than one offset (two elbows) are allowed. Two 45°elbows equal one 90° elbow				

For other common chimney components, use the following vertical height(s) to compensate for:

90° elbow = 2.0 ft (0.610 m)
"T" section = 3.0 ft (0.915 m)
1.0 ft (0.305 m) of horizontal run = 2 ft (0.610 m) of vertical rise

Example Chimny Height Calculation (at sea level):

Min Chimney Height	= 15.0 ft (4.575 m)
One 90° Elbow	= 2.0 ft (0.610 m)
2.0' Horizontal Run	= 4.0 ft (1.200 m)
One Base "T"	= 3.0 ft (0.915 m)
Final Chimney Height = 24.0 ft (7.3 m)	

The above figures are only guidelines, please refer to the "***DRAFT PERFORMANCE"*** section.

⚠WARNING

IF THIS APPLIANCE IS NOT PROPERLY INSTALLED OR OPERATED, A HOUSE FIRE AND/OR PERSONAL INJURY MAY RESULT. TO REDUCE THE RISK OF FIRE AND PERSONAL INJURY, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

ALCOVES AND FIREPLACES

In Canada, DO NOT INSTALL THIS APPLIANCE IN AN ALCOVE or FIREPLACE.
In USA, please adhere to minimum safe clearance dimensions.

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 OF OR UNDER THE APPLIANCE.

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.

MOBILE HOME or TRANSPORTABLE BUILDING INSTALLATION

For Mobile Home (in USA) or Transportable Building (in Canada) installations, an Outside Air Kit (S.Z1726 / S.Z1726B) and either a Fan Kit (S.Z1714) or Rear Shield Kit (S.Z4015) are required. It is recommended that the kits be installed prior to appliance installation (refer to the instructions provided with the kits).

When a metal prefabricated chimney is used, the manufacturer's installation instructions must be followed precisely. The ceiling support package must be purchased from the same manufacturer (ie. fire stops, insulation shield and roof flashing, chimney cap, etc). Be sure to maintain required safe clearances to combustibles as recommended by the manufacturer. The flue pipe must be double wall, close clearance type with either CAN/ULC-S629 or ULCS610 designation (single wall pipe is not allowed). Insulated chimney components must be a listed factory built chimney suitable for use with solid fuels and conforming to, CAN/ULC-S629 in Canada or UL-103HT in the USA. Where the space heater is installed in mobile home or transportable building, removal of the chimney is required for transportation of the building

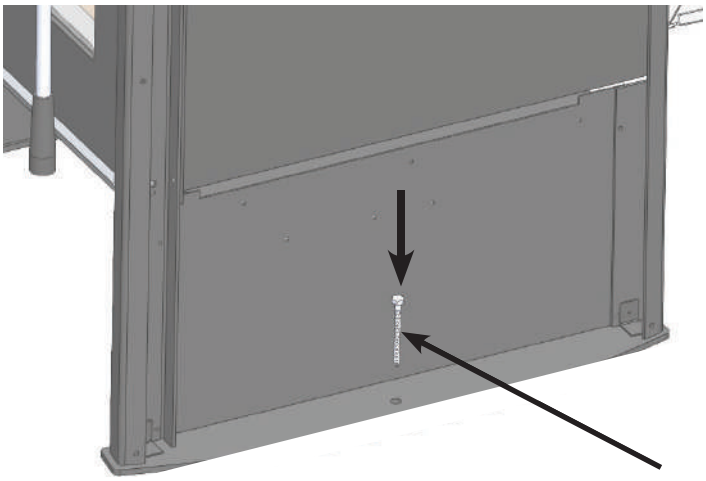
Note: Under no circumstances should the fresh air intake hose (Outside Air Kit) penetrate a wall at a location higher than the bottom of the intake air channel on the rear of the appliance (ie. the fresh air hose must feed up into the intake channel on the rear of the appliance).

CAUTION: THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

⚠WARNING

THE APPLIANCE MAY ONLY BE INSTALLED IN AN OPEN AREA THAT IS NOT USED FOR SLEEPING. UNDER NO CIRCUMSTANCES SHOULD THE APPLIANCE BE INSTALLED INSIDE A BEDROOM. FAILURE TO COMPLY MAY LEAD TO SERIOUS BODILY HARM IN THE EVENT OF A HOUSE FIRE.

For mobile home or transportable building installations, the appliance must be securely fastened to the floor using the tie-downs provided in the Outside Air Kit. To access the tie down holes, both the left and right Side Shields must be removed (refer to ***"SIDESHIELD REMOVAL"*** for removal process).



OPTIONAL ACCESSORIES

- **REAR SHIELD KIT (S.Z4015)** - used to achieve minimum rear clearances; required for mobile home or alcove installations.
- **FAN KIT (S.Z1714)** - used to disperse super heated air from appliance throughout the dwelling; required for mobile home or alcove installations.
- **OUTSIDE AIR KIT (S.Z1726 / S.Z1726B)** - The fresh air intake hose is a flexible metal tube used to supply combustion air into the appliance from the outdoor environment. It can be installed through an external wall or up through the floor (DO NOT CHANGE THE STRUCTURAL INTEGRITY OF THE FLOOR). This hose must be kept open at all times. **Under no circumstances should the fresh air intake hose penetrate a wall at a location higher than the bottom of the intake air channel on the rear of the appliance (ie. the fresh air hose must feed up into the intake channel on the rear of the appliance).**

SIDE SHIELD REMOVAL

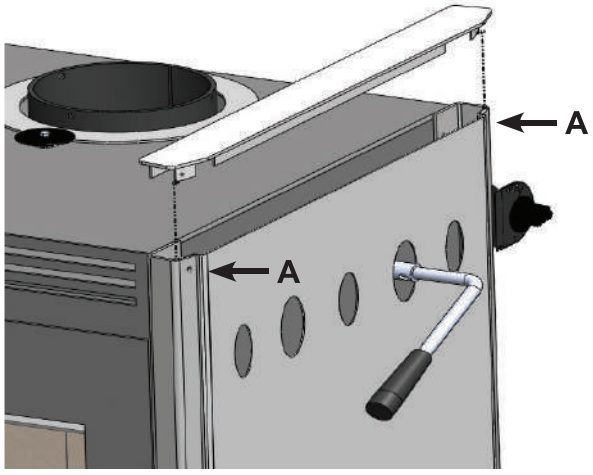
To remove the Side Shields, follow these steps:

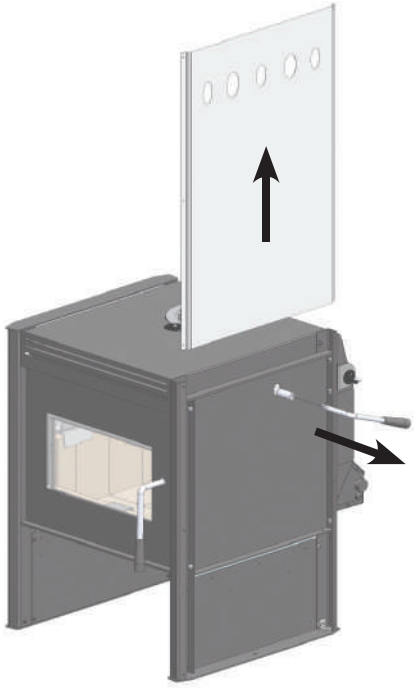
1. Unfasten the two top screws (**A**) and then remove the Side Shield Cover Plate by lifting up.

2. Unfasten the remaining x4 screws to free the Side Shield.

3. Grasp the Side Shield at the upper and lower cut outs and lift up to remove (ensure the Bypass Handle is removed before removing the Right Side Shield).

4. To reinstall, follow these steps in reverse order.

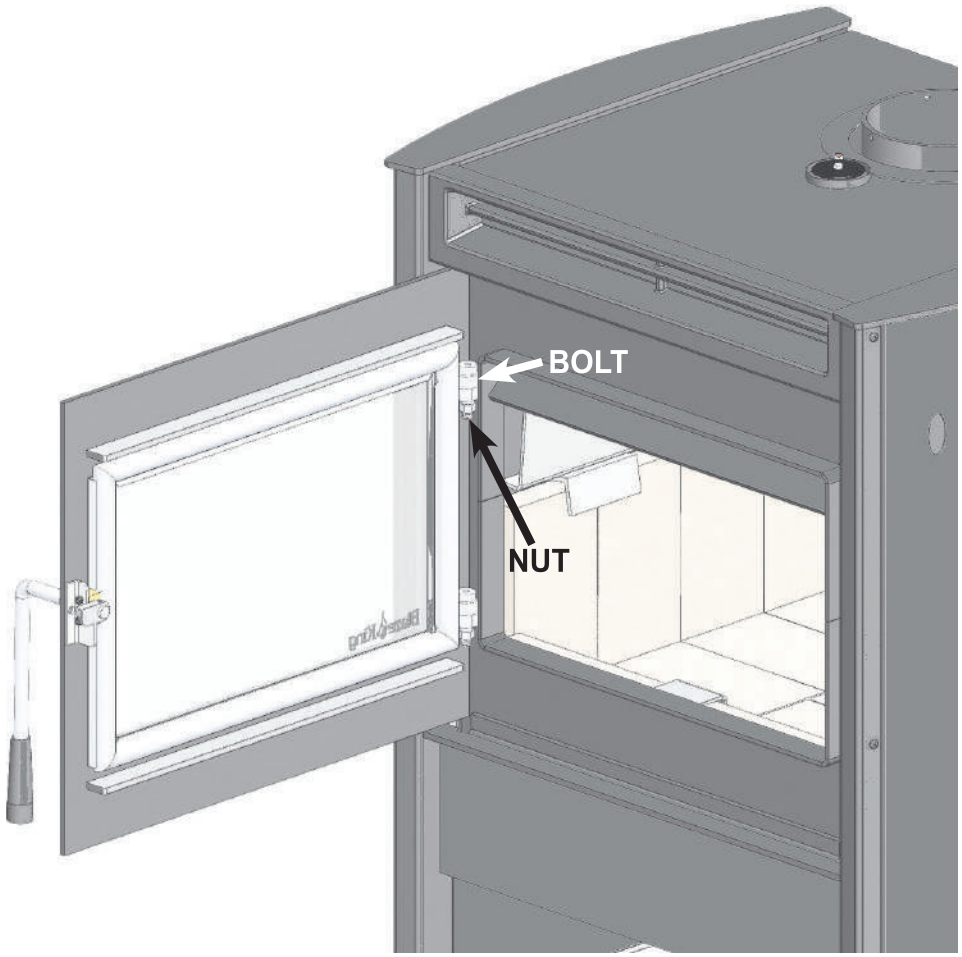




DOOR REMOVAL

To remove the Loading Door, follow these steps:

1. Insert a 1/4” allen key into the head of the shoulder bolton the top side of the upper hinge.
2. Use a 9/16” wrench to secure the nut on the bottom side of the upper hinge.
3. Rotate the shoulder bolt counter-clockwise to remove the nut.
4. Follow the same procedure to remove the nut on the lower hinge.
5. While holding the door securely, pull out the shoulder bolts to remove the Door.
6. To Install the Door, follow these steps in reverse order.



⚠WARNING

DO NOT OPERATE THIS APPLIANCE WITH THE LOADING DOOR UNINSTALLED OR LEFT OPEN. DOING SO MAY LEAD TO A RUN AWAY FIRE RESULTING IN PROPERTY DAMAGE.

YOUR FIRST FIRE!

The following pages contain information on the operation of the major components on your Blaze King appliance. Please take the time to read through this section as it will give you a better understanding of how your appliance works. This understanding will help you to operate your appliance at its optimum level thus extended its life while allowing you to get the highest efficiencies from your heater.

INTRODUCTION

All Blaze King wood burning appliances are designed as radiant room space heaters. They have been tested and certified to be installed in insulated, habitable rooms within 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 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 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.

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.

FAN OPERATION

Fans are an optional item for most Blaze King appliances. If fans are installed on your appliance, they should be turned off until the stove reaches normal operating temperatures. Approximately 30 minutes after a fire has been established within the appliance, the fan speed should match the thermostat control setting. (i.e. if your thermostat is set to a medium heat output then your fan should also be set at medium, low—low, high—high etc.). We recommend the use of fans on all of our wood appliances. The fan system recirculates room air over the hot surfaces of your appliance and helps spread this super heated air around your home.

SELECTING WOOD

It takes a great deal of energy to evaporate the moisture contained in green or wet wood and that energy will not be heating your home. Green or wet wood will also greatly increase creosote issues. To ensure that your wood fuel has a moisture content of 20% or lower, only use seasoned wood that has been split, stacked, and protected from rain or snow for at least 24 months. Firewood should be split and stacked in a manner that allows for air flow to all areas.

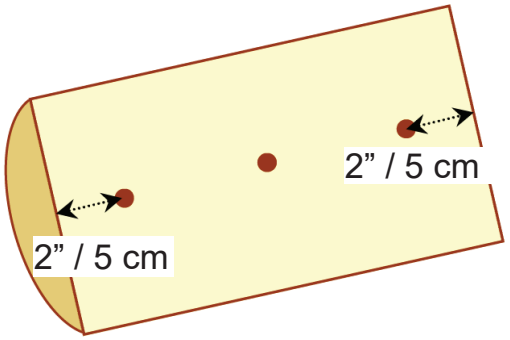
Both hardwood and softwood burn equally well in this appliance, but the more dense hardwood will weigh more per cord and burn a little slower and longer. Never burn salt-water driftwood as it is very corrosive and will deteriorate the structure of the appliance. The burning of salt-water driftwood will void the warranty. The only way to accurately determine wood moisture is to purchase and measure with a moisture meter.

⚠WARNING

THIS APPLIANCE IS DESIGNED TO BURN NATURAL WOOD ONLY. DO NOT BURN WET UNSEASONED WOOD. DOING SO CAN CAUSE EXCESSIVE CREOSOTE ACCUMULATION AND IF IGNITED, CAN CAUSE A CHIMNEY FIRE THAT MAY RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM. BURNING AIR DRIED SEASONED WOOD WILL REDUCE THE RISK OF CHIMNEY FIRES AND YIELD HIGHER EFFICIENCIES AND LOWER EMISSIONS.

HOW TO USE MOISTURE METERS

1. Randomly select three logs from your wood pile and split each one down the middle.
2. Three points of measurement are required to determine the moisture content of each log: 2” (5 cm) from either end and in the middle of the split surface of the log. To take these measurements, insert the moisture meter pins at the points described, keeping the pins in line with the wood grain. Record each measurement.
3. Do this to all three logs and take an average of the readings (this is an approximate indication).



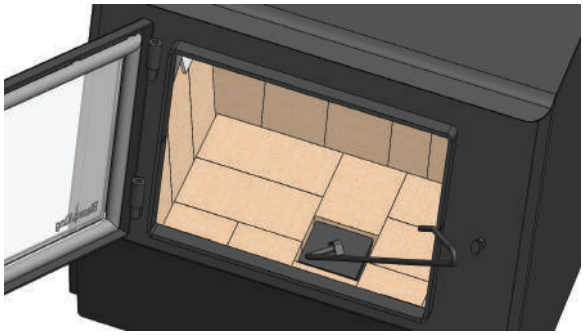
⚠WARNING

DO NOT BURN TREATED WOOD, COAL, CHARCOAL, COLORED PAPER, CARDBOARD, SOLVENTS OR GARBAGE. BURNING THESE MATERIALS MAY RESULT IN THE RELEASE OF TOXIC FUMES AND/OR CARBON MONOXIDE WHICH MAY RESULT IN POISONING. DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA, OR ENGINE GEL. DO NOT USE CHEMICALS OR FLUIDS SUCH AS GASOLINE TYPE LANTERN FUEL, KEROSENE, OR CHARCOAL LIGHTER FLUID TO START OR FRESHEN UP A FIRE IN THIS APPLIANCE. DOING SO MAY LEAD TO OVER FIRING RESULTING IN A HOUSE FIRE AND SERIOUS BODILY HARM.

FIRE POKER

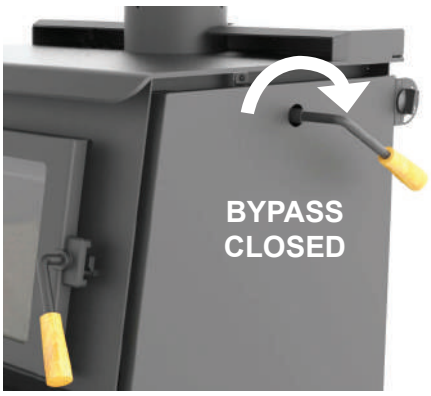
The steel fire poker that is provided with this appliance serves two purposes:

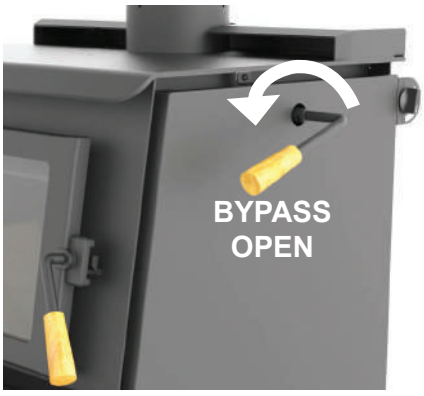
1) to manipulate fuel loads
2) to remove the ash plug via hook welded to the top plate.

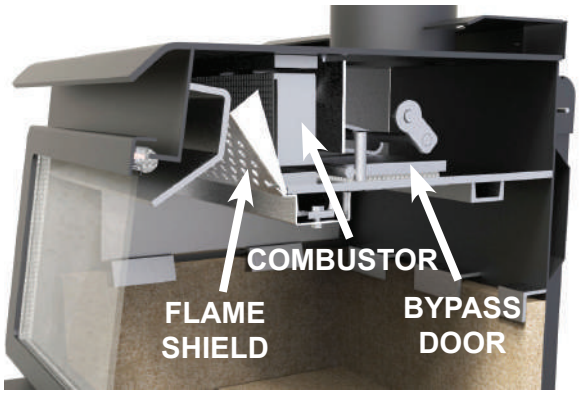


BYPASS DOOR

Your catalytic wood burning appliance is fitted with a bypass door which allows exhaust from the fire to temporarily bypass the catalytic combustor. The bypass door is located inside the dome of the firebox at the top of the appliance. It is a hinged, steel plate door and is controlled by the bypass handle located on the right side of the appliance. When the handle is pointing forward, the bypass door is open. To close the bypass door you must rotate the handle clockwise until it points to the rear of the appliance. To ensure the bypass door is fully closed, push down on the bypass handle until you hear a positive click.







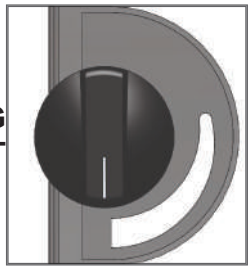
CATALYTIC THERMOMETER

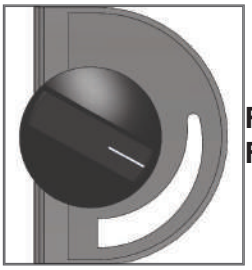
The catalytic thermometer is located on the top of the appliance. Its sole purpose is measure the exhaust gasses after they have passed through the combustor to indicate whether the combustor is ACTIVE or INACTIVE. It is important to ensure that the appliance is operated in the ACTIVE zone. When the thermometer reads INACTIVE it means that the combustor temperature is below 500F and is not producing a clean burn. For the most accurate reading, turn the fan off for approximately 5 minutes before reading the thermometer. For calibration instructions, please refer to the "***MAINTENANCE***" section.

THERMOSTAT

The thermostat is located at the rear of the appliance and is controlled by the thermostat knob which is located at the upper right rear corner of the appliance. When the knob is positioned at the HIGH setting, the appliance will operate at its highest burn rate and deliver its maximum heat output. As the knob is rotated counter clockwise the burn rate will decrease along with heat output. Burn rate is greatly influenced by location, installation, and external environment, so you may find it necessary to reposition the knob until you find the ideal setting to suit your situation. Please note that all adjustments to the thermostat should be done gradually as too rapid a change may cause the thermostat to operate improperly. The 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.

HIGH SETTING
MAXIMUM HEAT OUTPUT





ROTATE COUNTER CLOCKWISE
FOR REDUCED HEAT OUTPUT

LIGHTING THE FIRE

NOTE: As you heat up the appliance for the first time, the paint will go through a curing process and will give off a strong odor coupled with smoke. To minimize the inconvenience, burn the stove at a low temperature setting for several hours. It is recommended to open a door or window until the odor and smoke dissipates. You may also notice a change in color as the paint cures, this is normal and will appear uniform after subsequent firings.

1. **ENSURE ALL BRICKS ARE CORRECTLY POSITIONED INSIDE THE FIREBOX AND BUILD THE FIRE DIRECTLY ON THE BRICK IN THE BOTTOM OF THE STOVE. DO NOT USE A GRATE.**
2. Position the thermostat to the **HIGH** setting and turn the fan (if equiped) **OFF**.
3. Open the bypass then open the loading door.
4. Place 10 balls of non-glossy paper towards the front of the bottom of the firebox 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. **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. **DO NOT LEAVE THE STOVE UNATTENDED.**
7. Once the logs are burning, latch the loading door shut. Once loading door is closed and combustor temperature begins to climb, close the bypass door, turn fan(s) on to high (if equipped). Leaving the loading door open after the wood load has caught fire may cause premature failure of the catalytic combustor.
8. When nearly all of the wood in the firebox is fully burning and the catalytic thermometer is in the active zone, open the bypass door and loading door, and finish loading the appliance. Lay the wood as far back in the stove as possible. Latch the loading door shut, and close the bypass door.
9. Let the fire burn with the thermostat at the **HIGH** setting until the fire is well established. This ensures that the stove, catalyst, and wood load are all stabilized at optimum operating temperatures. The temperature in the stove and the gases entering the combustor must be raised to at least 500F (indicated by the thermometer needle in the **ACTIVE ZONE**) for catalytic activity to be initiated.
10. Gradually turn the thermostat down to the desired heat output setting once the fire is well established. Please note that if the thermostat is turned down too low too quickly, the fire may go out or the combustor may stop working, indicated by the thermometer needle falling into the **INACTIVE ZONE**. If this happens, simply turn the thermostat back to a higher heat output setting to let the fire reestablish itself.
11. Turn the fan (if equipped) on after the initial warm up.

Probably the least understood requirement of maintaining a good fire is that of establishing a good base of coals or embers. A glowing hot coal bed will help to maintain more even temperatures as well as assist in relighting the next fuel load. Put as much wood into the appliance 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 thermostat, the wood will only burn at the rate set on the thermostat. Once the fire is established, the appliance should be left to complete the full burn cycle. This is evident by a) only a glowing coal bed (ember bed) remaining or b) the catalytic thermometer hovers just inside the active zone. Following this procedure will maximize the efficiency of the appliance as well as limit exhaust emissions and smoke spillage.

RELOADING PROCEDURE

WHEN PREPARING TO RELOAD, IF THE NEEDLE ON THE CATALYTIC THERMOMETER IS STILL IN THE ACTIVE ZONE, FOLLOW THE PROCEDURE BELOW; IF THE NEEDLE HAS DROPPED INTO THE INACTIVE ZONE, REFER BACK TO THE "LIGHTING THE FIRE" PROCEDURE ON THE PREVIOUS PAGE.

It is important to note that the catalytic thermometer is simply displaying the temperature of the catalytic combustor. It may be used as an aid when it comes to identifying a reload point, but other factors such as lack of fuel in the firebox or dropping room temperatures should be used as well.

1. Have your next load of wood ready before beginning. Turn the thermostat to **HIGH** to ensure the remaining coal bed is active before reloading. Wait a few minutes for the air flow to stabilize.
2. To help minimize smoke spillage into the room, open the bypass door and again wait a few minutes for the air flow to stabilize.
3. Open the bypass door and crack open the loading door to allow ambient room air to be introduced into the firebox, this may take a minute 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 (if opened) close the bypass door immediately. Let the fire burn on the HIGH thermostat setting until the fire is 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, simply run the stove on **HIGH** for approximately 30 minutes. The **HIGH** setting will burn off most of the deposits.

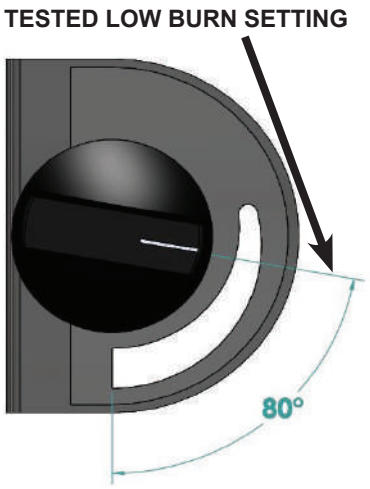
Note: Our loading instructions are outlined in general terms due to the variables that arise with each installation. Such variables include type of wood fuel, chimney height and configuration, installation altitude, seasonal weather conditions, draft, and the desired heat output required. Over time you will learn which settings are necessary to achieve optimal performance with your specific installation.

⚠WARNING

THIS APPLIANCE IS HOT WHILE IN OPERATION. CHILDREN AND PETS MUST BE KEPT FROM TOUCHING THE APPLIANCE WHEN IN USE. COMBUSTIBLE OBJECTS MUST BE KEPT A MINIMUM OF 48"(1219 MM) FROM THE FRONT OF THE APPLIANCE. COMBUSTIBLE MATERIAL SUCH AS CLOTHING OR FURNITURE PLACED TOO CLOSE TO THE APPLIANCE CAN CATCH FIRE. DO NOT STORE WOOD WITHIN THE SPECIFIED SAFETY CLEARANCES OR WITHIN THE SPACE REQUIRED FOR RE-FUELING AND ASH REMOVAL. FAILURE TO COMPLY MAY CAUSE SKIN BURNS OR RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

OPTIMAL LOW BURN THERMOSTAT SETTING

Your Blaze King appliance was tested and certified in accordance to the New Source Performance Standards for Residential Wood Heaters. During this test series, the low burn rate of the unit was determined by setting the thermostat knob to a position that yielded the lowest burn rate achievable. If you find that you are setting your thermostat beyond the test setting, please note that if the thermostat is turned down too low the fire will go out or the combustor may stop working which is indicated by the thermometer needle falling into the **INACTIVE ZONE**. If this happens, simply turn the thermostat back to a higher heat output setting and let the fire reestablish itself.



WOOD BURNING IN THE SHOULDER SEASON

There are a few things to consider if you choose to light a fire during the spring or fall seasons when the outside temperature is milder, perhaps 55F to 70F (13°C to 21°C).

You may notice smoke spillage out of the loading door when it is opened during start up or reloading. This is caused by a lack of natural draft within the chimney system. The temperature difference between the chimney system and the outside air causes flue gasses to be drawn up and out of the chimney. Smaller temperature differences produce less draft in your chimney system than larger temperature differences. This air movement, referred to as Stack Effect, is also influenced by air density and moisture differences. To eliminate the smoke spillage you may have to stoke the fire for longer than usual. Once the fire warms the chimney the draft will improve and spillage will be reduced. When operating the appliance on a lower thermostat setting, the resultant lower flue temperatures can cause your chimney system to cool down. This also decreases natural draft and spillage may occur.

General Rules for burning in the shoulder season:

- Run your appliance on **HIGH** for 30 minutes after start up and reloading before gradually turning the thermostat down to the desired heat output setting.
- The thermostat setting needs to be high enough to keep the catalytic thermometer in the active zone. If the thermometer will not stay in the active zone, turn the thermostat to a higher setting and then wait 15 minutes to confirm that the thermometer remains in the active zone. Repeat as required.
- If your appliance is producing too much heat, try to reduce the volume of wood fuel loads rather than turning your thermostat down. It is good burning practice to build smaller, hotter fires on milder days in the spring and fall.

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, burn the appliance for 5 to 10 minutes with the thermostat set to **HIGH** to melt any possible ice build.

⚠WARNING

DO NOT OPERATE THIS APPLIANCE WITHOUT THE CATALYTIC COMBUSTOR INSTALLED. DOING SO WILL LEAD TO EXCESSIVE SMOKE AND TEMPERATURES THAT COULD RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM. ONLY BURN SEASONED WOOD. FAILURE TO DO SO MAY DAMAGE THE COMBUSTOR AND WILL VOID ALL WARRANTIES.

COMBUSTOR MONITORING

It is good practice to monitor the catalytic combustor to ensure it is functioning properly. An improperly functioning combustor will result in a loss of heating efficiency and an increase in emissions and creosote buildup. The following list of items 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. Please refer to the "***COMBUSTOR TROUBLESHOOTING***" section.
- This appliance is equipped with a catalytic thermometer to monitor combustor operation. A properly functioning combustor will maintain temperatures in excess of 500F (indicated by the thermometer needle in the ACTIVE zone) and often reach temperatures in excess of 1000F. If the combustor temperature falls below 500F (thermometer needle in the INACTIVE zone), refer to the "***COMBUSTOR TESTING***" section.
- A good way to determine whether the combustor is functioning properly is by comparing the amount of smoke exiting the chimney while the combustor is engaged (bypass door closed) versus when the combustor is bypassed (bypass door open).
  Note: After opening the bypass door, wait approximately 15 minutes before observing the smoke exiting the chimney. Smoke may be visible shortly after lighting the fire and shortly after reloading the fire so allow 20 to 30 minutes for the fire to stabilize before making observations.

COMBUSTOR TESTING

Follow these instructions to test the catalytic combustor:

1. Light a fire per the "***LIGHTING THE FIRE"*** instructions.
2. After burning a well established fire for 1 hour, position the thermostat knob to a medium-low burn rate setting.
3. After 5 minutes at the lower burn rate, observe the location of the thermometer needle. A properly functioning combustor will have a temperature greater than 500F with the thermometer needle in the ACTIVE zone. An improperly functioning combustor will yield thermometer reading in the INACTIVE zone.
4. Repeat step 3 for at least 3 burn cycles.
5. If the thermometer needled is still not reaching the ACTIVE zone, your combustor may require cleaning.
6. If, after cleaning the combustor and reburning, the thermometer needle is still not reaching the ACTIVE zone, your combustor may need replacing. Contact your Blaze King dealer for a replacement combustor.

Note - It is also possible that the catalytic thermometer itself may not be functioning properly. Before deeming the combustor "dysfunctional", please refer to the "***CATALYTIC THERMOMETER"*** section.

⚠WARNING

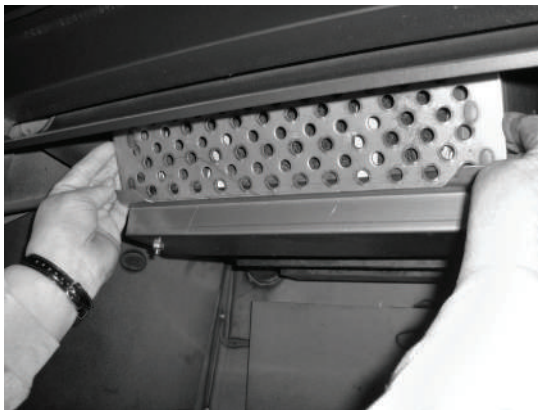
DO NOT PERFORM ANY CLEANING UNTIL THE FIRE IS OUT AND THE APPLIANCE IS COOL. HOT ASH IN A VACUUM CLEANER BAG COULD MELT THE VACUUM AND COULD RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

COMBUSTOR CLEANING

Under certain conditions, ash particles may become attached to the face of the combustor. These particles may be seen while the combustor is glowing under fire or when the fire is out. Any deposits on the face of the combustor should be removed. There are two ways to clean the face of the combustor: (1) Brushing the combustor with a soft bristle paint brush, or (2) Passing a vacuum cleaner wand or brush near the face of the combustor. Limit cleaning to the face of the combustor (note - the flame shield will have to be removed to gain access to the face). Do not scrape the combustor with any hard tool or brush and do not run pipe cleaner through the individual cells of the combustor as this may do more harm than good. Do not remove the combustor during this process. **Note - simply burning a hot fire usually proves to be the best method of cleaning the combustor of deposits.**

COMBUSTOR REPLACEMENT

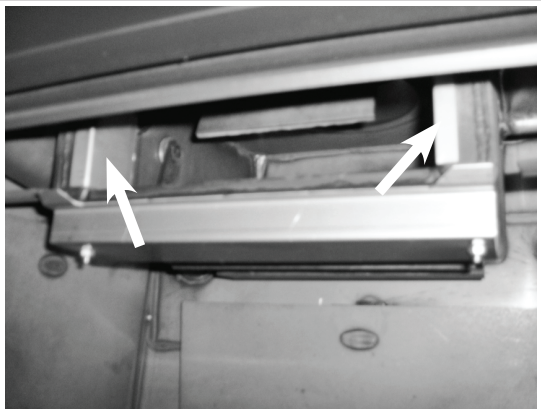
If the catalytic combustor has been deemed "dysfunctional" per the guidelines in "***COMBUSTOR TESTING***", discontinue use of the appliance until the combustor is replaced. Follow the steps below to complete the replacement **(BLAZE KING RECOMMENDS THAT YOUR DEALER OR CERTIFIED INSTALLER PERFORM THIS PROCEDURE):**



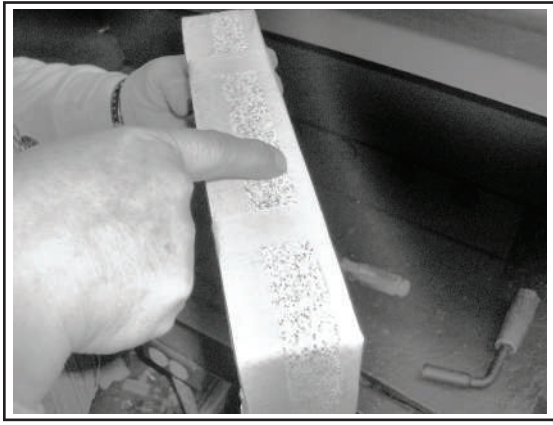
1. The appliance must be cool to touch, having gone at least 12 hours without being burned. A combustor can reach 1400F and hold temperatures for several hours, even after the fire is out. After waiting 12 hours, begin by removing the flame shield by simply lifting the shield off the two tabs at either lower corner. Pay particular attention to orientation of the flame shield in order to reinstall in the correct position.

2. Once the flame shield is removed, you will have access to the combustor. The combustor can be made of different materials such as cordierite, mulite, or 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 (please refer to the "***COMBUSTOR CLEANING***" section).

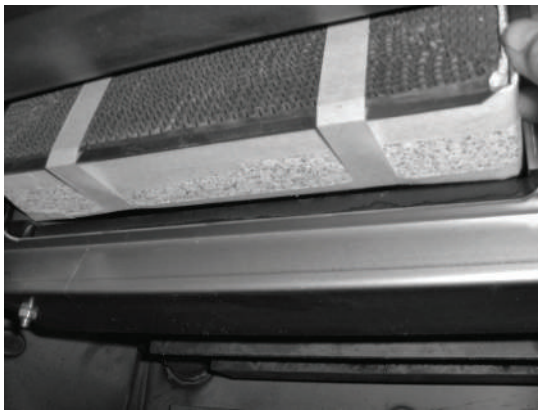
3. There are metal tabs across the bottom and on either side of the combustor. Using a flat blade screwdriver or pocket knife blade, slide the tip in between the metal tab on the left side of the combustor and the steel dome of the stove (the dome is the housing that encases the combustor). Apply slight pressure until the combustor begins to move forward. Repeat the process on the metal tab on the right side of the combustor. By working back and forth the combustor will work free of the dome housing. It is normal for the gasket that is wrapped around the combustor to fall apart during this process. New combustors are shipped with a new gasket.



4. With the combustor removed, you will see two bypass retainers on either side of the combustor opening within the dome. These retainers are not fixed in position and can fall into the firebox upon combustor removal. Ensure that they are put back into position before replacing the combustor. Use the screwdriver or pocket knife to scrape any old gasket from the surface areas of the dome. If you intend to reuse your existing combustor, you will need to order replacement combustor gasket. It is a good idea to have this combustor gasket on hand prior to performing this procedure.

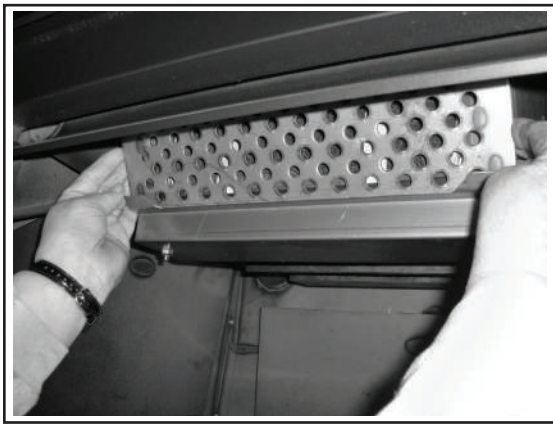


5. The new combustor will already be wrapped in gasket. Note the 1” wide masking tape - this will help to keep the leading edge of the gasket from snagging during installation. If you intend to reuse you original combustor, wrap the combustor gasket as you see here and use the 1” masking tape around the front and rear perimeter. During the first fire the masking tape will burn off and the combustor gasket will swell to provide a tight seal. This seal ensures optimal efficiency and performance. Do not burn the appliance without the combustor gasket installed.



6. Before installing, align the combustor within the opening of the dome housing. Slowly push the combustor in at the top and 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 OPENING. TAKE YOUR TIME AND WORK IT INTO PLACE SLOWLY.**

7. Once the combustor is fully reinserted into the opening of the dome housing, replace the flame shield. Note the flame shield sides are shaped like a triangle. The point of the triangle should face down to install correctly. Do not operate your appliance without the flame shield in place. The flame shield protects the face of the combustor against direct flame impingement and potential collisions when loading fuel.



8. When correctly installed, the flame shield will rest on the two tabs located on the dome guard and will lean slightly forward. Now that the combustor and flame shield have been properly reinstalled, the appliance can be relit.

A few reminders, do not burn anything other than dry, seasoned cordwood. Burning other materials may contaminate or ruin your new combustor. Also, remember to keep your firebox door gasket seal properly adjusted (please refer to the "***LOADING DOOR TENSION ADJUSTMENT"*** section). Doing so will ensure optimal performance of both the appliance and the combustor.

COMBUSTOR WARRANTY

This appliance contains a catalytic combustor, which needs periodic inspection and may require replacement for proper operation. It is against federal regulations to operate this appliance if the catalytic combustor is deactivated or removed.

The catalytic combustor supplied with this appliance is **OEM Blaze King part # S.CAT203032**.

Please consult the catalytic combustor warranty info also supplied with this appliance. Warranty claims should be addressed to:

CANADA	USA
Blaze King Industries / Valley Comfort Systems Warranty Department 1290 Commercial Way Penticton, BC, Canada V2A 3H5	Blaze King Industries Warranty Department 146 A Street Walla Walla, Washington, USA 99362

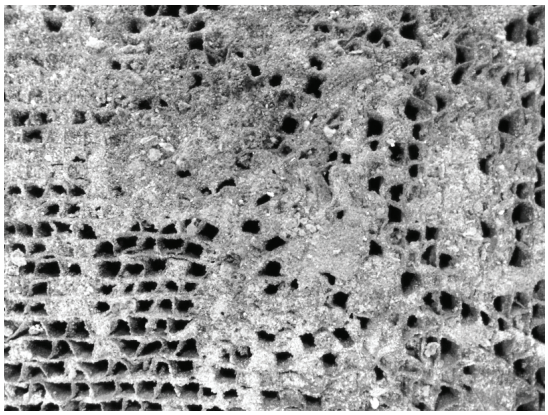
COMBUSTOR TROUBLESHOOTING

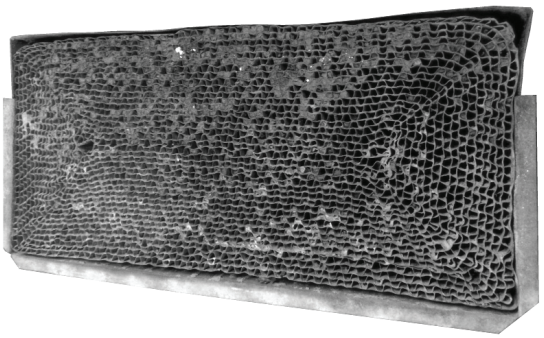
PROBLEM: CREOSOTE PLUGGING

Possible Cause: The combustor is coated with creosote burning material that produces substantial char and fly-ash.
Solution: Only burn dry, seasoned wood. Do not burn materials such as garbage, gift wrap, or cardboard.

Possible Cause: Burning wet, pitchy wood or burning large amounts of small diameter wood without the catalytic thermometer needle in the ACTIVE zone.
Solution: Burn dry, seasoned wood until temperatures are high enough to initiate catalyst light-off (indicated by the catalytic thermometer needle in the ACTIVE zone).

Possible Cause: Combustor not functioning.
Solution: If proper burning procedures have been followed and this problem persists, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).

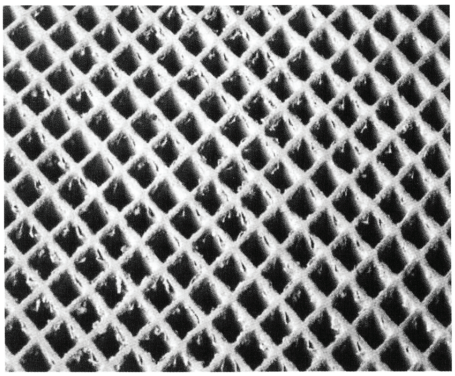




PROBLEM: COMBUSTOR PEELING

Possible Cause: Over firing and flame impingement can yield extreme temperatures (above 1800F/1000°C) at combustor surface and can cause peeling.
Solution: Avoid extreme temperatures by adjusting size of fuel loads. If peeling is severe, replace combustor.

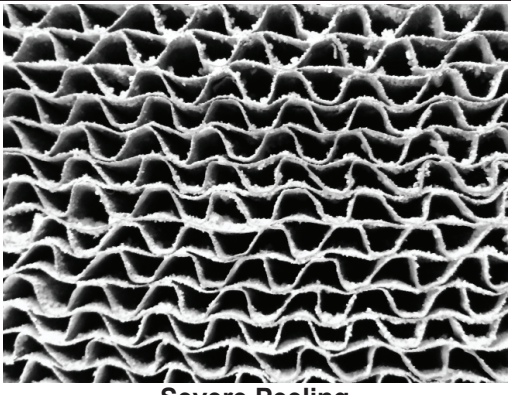
The images to the right are examples of minor peeling (does not affect proper combustor function) and severe peeling (closed or plugged combustor that needs replacement).



Minor Peeling

PROBLEM: CATALYTIC DEACTIVATION

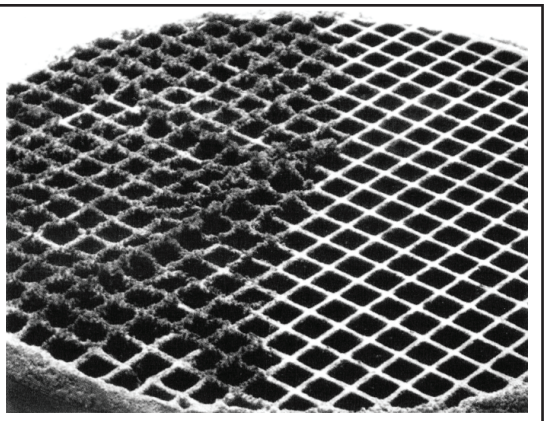
Possible Cause: Burning improper fuels (ie. garbage, pressure-treated lumber, painted wood, etc.).
Solution: Burn good quality, dry, seasoned wood. If proper burning procedures have been followed and this problem persists, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



Severe Peeling

PROBLEM: COMBUSTOR MASKING

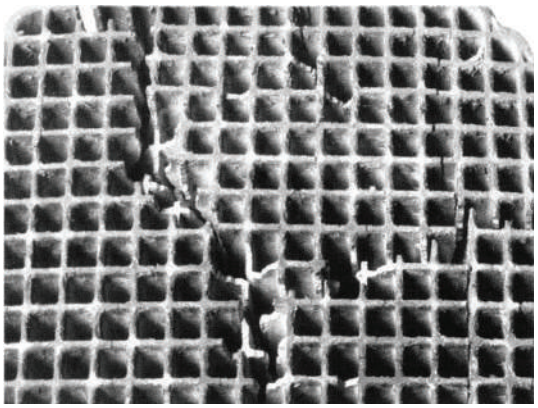
Possible Cause: The combustor is coated with a layer of fly-ash or soot from burning material that produces substantial char and fly-ash.
Solution: When the appliance is cool to touch, clean the front face of the combustor with a soft-bristled brush or vacuum lightly (refer to ***COMBUSTOR CLEANING*** for proper procedure).



PROBLEM: THERMAL CRACKING

Possible Cause: Extreme temperature fluctuations (ie. opening loading door while the combustor is in the ACTIVE zone) can cause thermal shock which can lead to cracking.
Solution: Avoid flooding a hot, active combustor with cool room air when reloading.

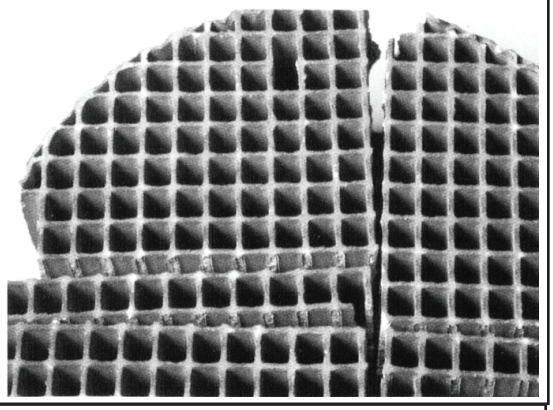
If cracking causes large pieces of the combustor to separate, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



PROBLEM: MECHANICAL CRACKING

Possible Cause: Mishandling the combustor or operating the appliance without the proper gasket installed.
Solution: Handle with care. Ensure combustor is wrapped with gasket upon reinstallation.

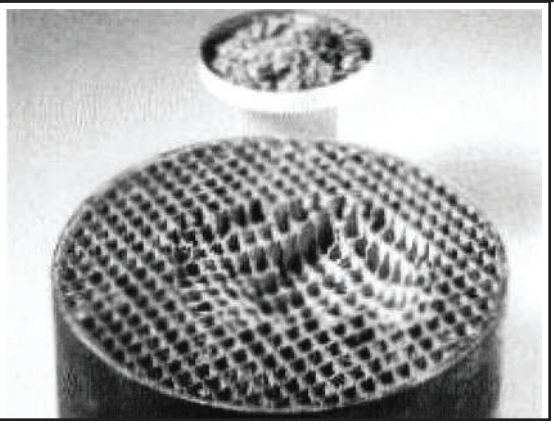
Possible Cause: Distortion of surrounding dome housing.
Solution: The combustor should slide in and out of the dome housing with relative ease. If this is not the case, contact your dealer for further inspection.



PROBLEM: COMBUSTOR CRUMBLING

Possible Cause: Excess air leaking into the firebox.
Solution: Ensure tight seal at loading door (see ***MAINTENANCE*** for instruction on gasket inspection).

Possible Cause: Excessive chimney draft.
Solution: Use a manometer to check and ensure chimney draft is within manufacturer specifications. Adjusting the appliance thermostat can help regulate chimney draft.



⚠WARNING

TO PREVENT SERIOUS BURNS, DO NOT PERFORM ANY MAINTENANCE UNTIL THE APPLIANCE IS COOL. APPLIANCE SURFACES, INCLUDING THE GLASS AND ANY ATTACHED COMPONENT, WILL REMAIN HOT FOR EXTENDED PERIODS OF TIME AFTER THE FIRE HAS BEEN PUT OUT.

RECOMMENDED MAINTENANCE

It is strongly recommended to complete the following tasks on a regular basis throughout the heating season:

1. Visually inspect Catalytic Combustor and clean as required (see "***COMBUSTOR CLEANING***")
2. Clean behind internal baffles (where applicable) and inspect metal components for warping/distortion.
3. Check Catalytic Thermometer for proper calibration.
4. Check Thermostat for proper function.
5. Check Fan Assemblies for proper operation.
6. Remove all ash from firebox and ash drawer after final burn of season.
7. Check all gaskets for proper seal and adjust as required.
8. Inspect and clean the Venting System.

CATALYTIC THERMOMETER MAINTENANCE

The catalytic thermometer probe (shaft) should be cleaned regularly. Ensure the fire is out and the appliance is cool, then remove the thermometer and wipe the probe clean. While removed, confirm the thermometer indicator needle points towards the bottom of the INACTIVE zone (allow the thermometer to sit at room temperature for 10 minutes before checking). If the needle does not point towards the bottom of the INACTIVE zone, it may need adjustment. Grasp the probe with a pair of pliers then slightly loosen the bolt on the top of the dial. Turn the dial to align the needle to the bottom of the INACTIVE zone and then retighten the bolt. Once finished, reinsert the thermometer back into the appliance. **Note: If your appliance is equipped with an optional fan kit, turn it off and wait 10 minutes before observing the catalytic thermometer reading.**

THERMOSTAT or THERMOMETER MAINTENANCE

Any thermostat or thermometer maintenance must be completed by a certified installer. If the thermostat or thermometer malfunctions, contact your dealer for replacement.

OPTIONAL FAN ASSEMBLY MAINTENANCE

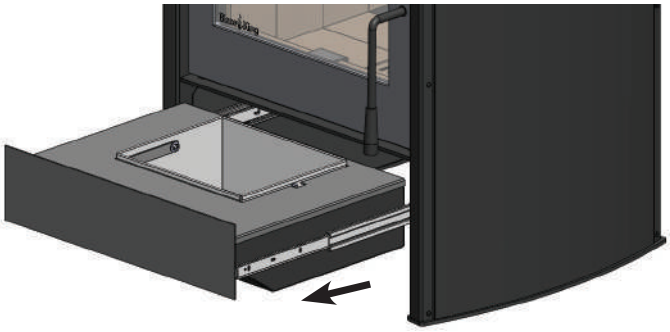
Fan assemblies should be inspected at the beginning of each burn season to ensure they are free from debris such as ash, dust, pet dander, lint, etc. The accumulation of such debris could prevent the fan blades/blower wheels from rotating freely and put excessive strain on the fan motors, ultimately leading to failure.

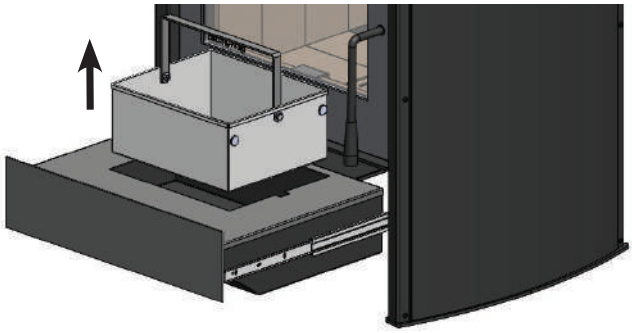
ASH REMOVAL

Ashes should be removed any time they come within one inch of the door opening, though it is not advisable to completely remove all of the ashes as wood burns best on a bed of ashes around 1/2" thick. When removing ashes, ensure the fire is out and the appliance is cool to touch. 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, while awaiting 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. Do not place other waste in this container.

⚠WARNING

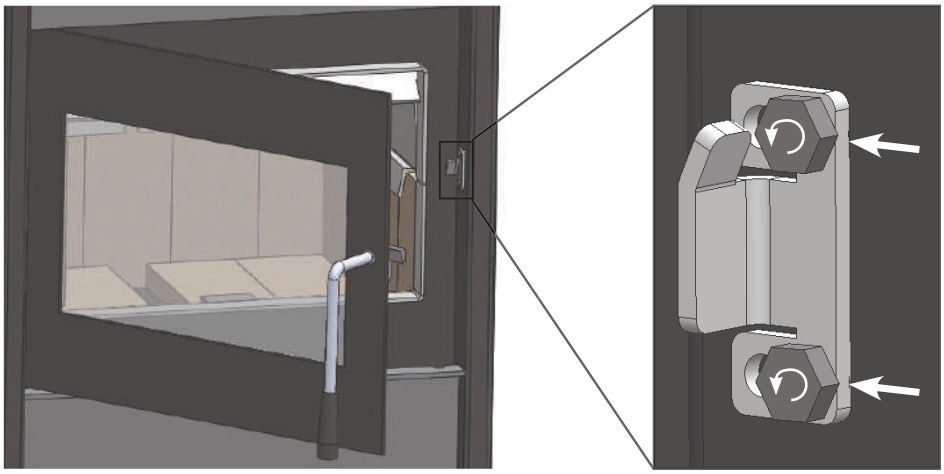
NEVER STORE HOT ASHES IN A GARAGE OR BASEMENT. HOT ASHES WILL GENERATE CARBON MONOXIDE AND / OR FLAMMABLE GASES. THESE GASES MAY CAUSE SUFFOCATION AND POSSIBLE DEATH.





LOADING DOOR TENSION ADJUSTMENT

To tighten the loading door seal, use a 7/16 wrench to loosen latch catch bolts and move latch catch inwards. Tighten the bolts and preform a paper test (see ***"DOOR GASKET PAPER TEST")*** to ensure the proper seal was achieved.



LOADING DOOR GASKET INSPECTION

Inspect the loading door gasket for physical deterioration, missing sections, or obvious leakage. The appliance door flange should make a groove in the gasket material. The side of the gasket on the inside of the groove will be dark or black while the outer side will be light or white. Dark smudges on the outer side of the gasket may indicate an air leak. If the groove in the gasket is very shallow 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 a need for replacement. Any time a piece of gasket is missing or broken the entire gasket must be replaced. A way to physically check if the gasket needs replacing is by performing a paper test (see ***"DOOR GASKET PAPER TEST")***

LOADING DOOR GASKET REPLACEMENT

If door gasket replacement is required, only replace with OEM door gasket ordered through your Blaze King dealer. This gasket will be properly sized and ready to install. **Do not stretch or cut the gasket at any time during this installation. Ensure only high temperature silicone adhesive is used for this installation (do not use household silicone caulking). Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch before removing the loading door.
2. Use a pair of pliers to pull the old door gasket out of the channel and dispose of it.
3. Clean the gasket channel of any residual adhesive to ensure the new adhesive will adhere sufficiently.
4. To ensure proper fit, dry fit the new gasket by distributing it evenly around the frame and then remove.
5. Run a small bead of a high temperature silicone adhesive along the center of the gasket channel.
6. Starting in the lower right corner, insert the new gasket into the gasket channel. Be sure to distribute the gasket evenly around the entire channel frame.
7. Allow the adhesive to dry for at least 1 hour before reinstalling and closing the loading door.
8. Confirm proper gasket installation by performing a paper test (see ***"DOOR GASKET PAPER TEST").***

⚠WARNING

DO NOT OPERATE THIS APPLIANCE IF THE DOOR GASKET IS MISSING OR DAMAGED. OVER-FIRING MAY OCCUR WHICH CAN CAUSE DAMAGE TO THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY WHICH COULD LEAD TO A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

DOOR GASKET PAPER TEST

Perform this test when inspecting or replacing loading door gasket:

1. Ensure the fire is out and the appliance is cooled to touch.
2. Insert a piece of paper (ie. a dollar bill) into the door opening and then latch the door shut.
3. Pull the paper out of the door while noting any obvious resistance when doing so.
4. If no resistance is felt, adjust the door tension (see "***LOADING DOOR TENSION ADJUSTMENT***").
5. Repeat this process around the perimeter of the door until consistent resistance is achieved.

DOOR GLASS GASKET INSPECTION

To inspect the door glass gasket:

1. Ensure the fire is out and the appliance is cooled to touch.
2. Hold the glass by placing the palm of each hand on either side and try to move it; If the glass moves:
   a. Inspect the glass retainers and ensure the screws holding the retainers in place are tight (hand tight plus 1/4 turn). If loose, retighten, but do not over tighten.
   b. Inspect the door glass gasket. If the gasket is frayed or missing sections, replace the gasket.

⚠WARNING

REFRAIN FROM STRIKING THE GLASS OR SLAMMING THE DOOR SHUT. DO NOT OPERATE THIS APPLIANCE IF THE DOOR GLASS OR GASKET SEAL IS BROKEN. DOING SO MAY LEAD TO A RUN AWAY FIRE WHICH COULD RESULT IN PROPERTY DAMAGE.

DOOR GLASS GASKET REPLACEMENT

If door glass gasket replacement is required, only replace with OEM door glass gasket ordered through your Blaze King dealer. The OEM gasket will be ordered to size and ready to re-install. **Do not stretch or cut the gasket at any time during this installation. Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch.
2. Remove the old glass gasket.
3. Starting at the corner opposite of the "Blaze King" logo, carefully wrap the gasket around the edges of the door glass, 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. Reposition the glass onto the door and then install the glass retainers with original fasteners. Ensure the glass is parallel to the frame and tighten the fasteners (hand tight plus 1/4 turn).

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 AND 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.

BYPASS DOOR GASKET INSPECTION

Visually note the amount of smoke exiting the chimney while the bypass door is both OPEN and CLOSED. There should be significantly less smoke when the door is in the CLOSED position. If this is not the case, the bypass gasket may need to be replaced.

Note: This inspection could also yield a dead combustor, see "*COMBUSTOR MONITORING*".

BYPASS DOOR GASKET REPLACEMENT

If bypass door gasket replacement is required, only replace with OEM 5/8" fiber glass gasket ordered through your Blaze King dealer. The OEM gasket will be ordered to size and ready to re-install. **Do not stretch or cut the gasket at any time during this installation. Ensure only THERMOSEAL® 1000F high-temperature resistant cement is used for this installation (do not use household silicone caulking). Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch
2. Remove the flue pipe from the appliance in order to have a clear view of the bypass door **(Fig. 13)**.
3. Remove the combustor (see "*COMBUSTOR REPLACEMENT*").
4. After removing the combustor you will notice stainless bypass retainers on both the left and right sides of the combustor opening **(Fig. 14)**. They secure the bypass door in position during operation. Remove the stainless bypass retainers and set aside.
5. Working down through the flue collar, unhinge the bypass door from the bypass rod (rotating the bypass handle into a neutral position will help), then rotate the bypass door 90 degrees to remove through the combustor opening **(Fig. 15)**.
6. Remove the old gasket and clean away any residual cement from the gasket channel.
7. Apply the new high-temperature cement along the channel.
8. Place the new gasket into the channel, tapping it down to seat it securely.
9. Apply high temp anti-seize lubricant to the under side of the bypass hook **(Fig. 16)** and then reinstall the bypass door by following the previous steps in reverse order.
10. Rotate the bypass handle several times to OPEN/CLOSE the bypass door to ensure smooth and proper operation. Once satisfied, reattach the flue pipe.
11. Reinstall stainless bypass retainers into combustor opening.
12. Refer back to "*COMBUSTOR REPLACEMENT*" to reinstall the combustor. **Note: if the gasket around the combustor is damaged, it will have to be replaced.**

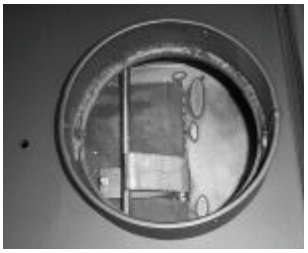


Fig. 13

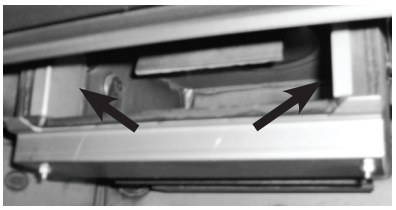


Fig. 14

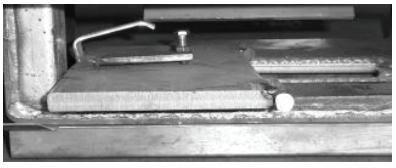


Fig. 15

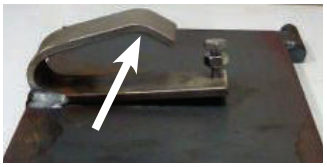


Fig. 16

VENTING SYSTEM MAINTENANCE

The entire chimney system must be cleaned and inspected regularly, especially during the coldest months of the burn season. The most efficient method to clean the chimney is to "sweep" it 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. **Ensure the bypass door is OPEN prior to chimney cleaning so soot and creosote fall into the firebox.** Once cleaned, inspect the chimney for any possible damage. If damage is present, the chimney section in question must be replaced.

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. Be aware that the hotter the fire, the less creosote is deposited. The flue pipe and chimney should be inspected regularly during the heating season, until a safe frequency for cleaning is established to determine if a creosote build up has occurred. If creosote accumulation is excessive, cleaning is required. It is recommended that a professional chimney sweep does the cleaning. Both the chimney and the appliance have to be cleaned at least once a year or as often as necessary.

⚠WARNING

A CHIMNEY FIRE CAN PERMANENTLY DAMAGE YOUR VENTING SYSTEM, WHICH CAN ONLY BE REPAIRED BY REPLACING THE DAMAGED COMPONENTS. FAILURE TO REPAIR COULD LEAD TO FURTHER PROPERTY DAMAGE. DAMAGE FROM A CHIMNEY FIRE IS NOT COVERED BY THE LIMITED WARRANTY.

RUN-AWAY OR CHIMNEY FIRE

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 thermostat by rotating the knob fully counter clockwise and ensure the firebox door is closed.
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, hose area down 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

IT IS ADVISED TO HAVE A WELL UNDERSTOOD PLAN OF ACTION IN THE EVENT OF A CHIMNEY FIRE

TROUBLESHOOTING

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 wood stove. Please study the operation instructions carefully. Consult your BLAZE KING dealer 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.

PROBLEM: Chimney Fire	
CAUSE Act immediately regardless of cause	**SOLUTION** Turn the thermostat to lowest setting, check loading door to be sure it is tightly closed. **Call Fire Department.**
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 Pipe”.	

PROBLEM: Not enough heat.	
CAUSE Green or wet wood. Not enough fuel in stove.	**SOLUTION** Use a moisture meter to ensure you are burning 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 a poorly designed chimney system.	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.

PROBLEM: Too much heat.	
CAUSE	**SOLUTION**
Bypass door left open.	Close the bypass 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.

PROBLEM: One or both fans will not run, or there is no adjustment for fan speed.	
CAUSE	**SOLUTION**
Fans mounted improperly.	Check that fan blade’s not touch edges of hole.
Fan speed control.	Consult your Blaze King dealer for replacement.

PROBLEM: Fans minimum speed too fast or maximum speed too slow.	
CAUSE	**SOLUTION**
Fan speed control out of adjustment.	Consult your Blaze King Dealer.

PROBLEM: Excessive creosote formation in chimney and chimney Connector.	
CAUSE	**SOLUTION**
Bypass door left open.	Close bypass door.
Bypass door not sealing tightly.	Inspect bypass door and seal for warping. Ash or creosote buildup may occur on door or seat. With stove cold scrape and vacuum area around bypass. 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 a poorly designed chimney system.	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.

PROBLEM: Catalytic 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)	
CAUSE	**SOLUTION**
Improper operation.	Check thermostat setting and operating procedures. See “THERMOSTAT & OPTIMAL THERMOSTAT SETTING”
Obstruction in chimney or cap.	Clean chimney, remove obstructions.
Faulty catalytic thermometer.	Check catalytic thermometer calibration.
Wood too green or wet.	Use seasoned wood.

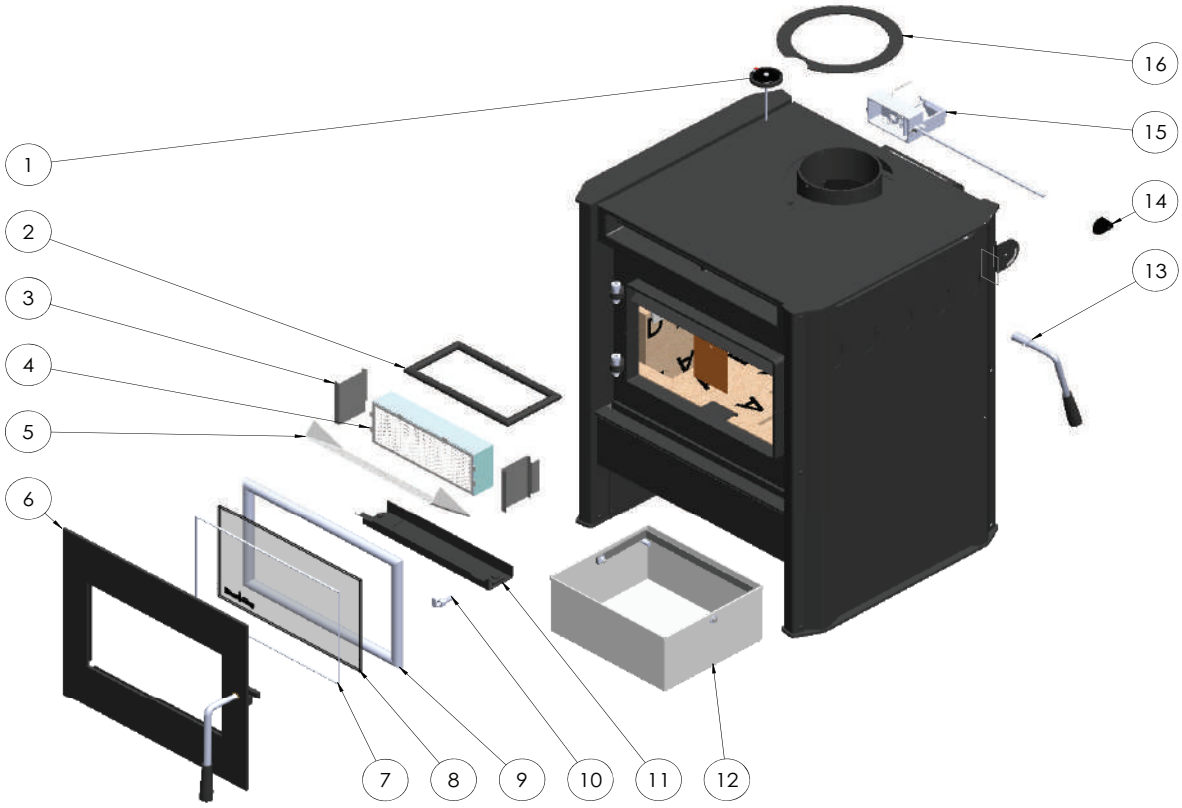
Combustor plugged or coated.	Clean combustor. See “CATALYTIC COMBUSTOR TESTING”
Combustor not functioning.	Check and test combustor. If needed replace combustor. See “CATALYTIC COMBUSTOR, REPLACING”
Thermostat not operating properly.	Consult your blaze King Dealer.
Bypass door leaking or not closing completely.	Inspect and clean area around bypass doors. Adjust or replace gasket if necessary. Consult your Blaze King Dealer.

PROBLEM: Spots of creosote accumulation in flue pipe or chimney.	
CAUSE Air leaks in flue pipe or chimney.	**SOLUTION** Inspect flue pipe and chimney. Repair or replace as necessary. Check to be sure that the flue pipe is installed correctly.
CAUTION: a leaking chimney system 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 Low thermostat setting or lowering the thermostat setting too far, too quickly.	**SOLUTION** 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. Install a Fresh Air Kit.
Burning poorly seasoned wet wood, or wood with high pitch content.	Use seasoned wood with low pitch content, such as some types of pine.

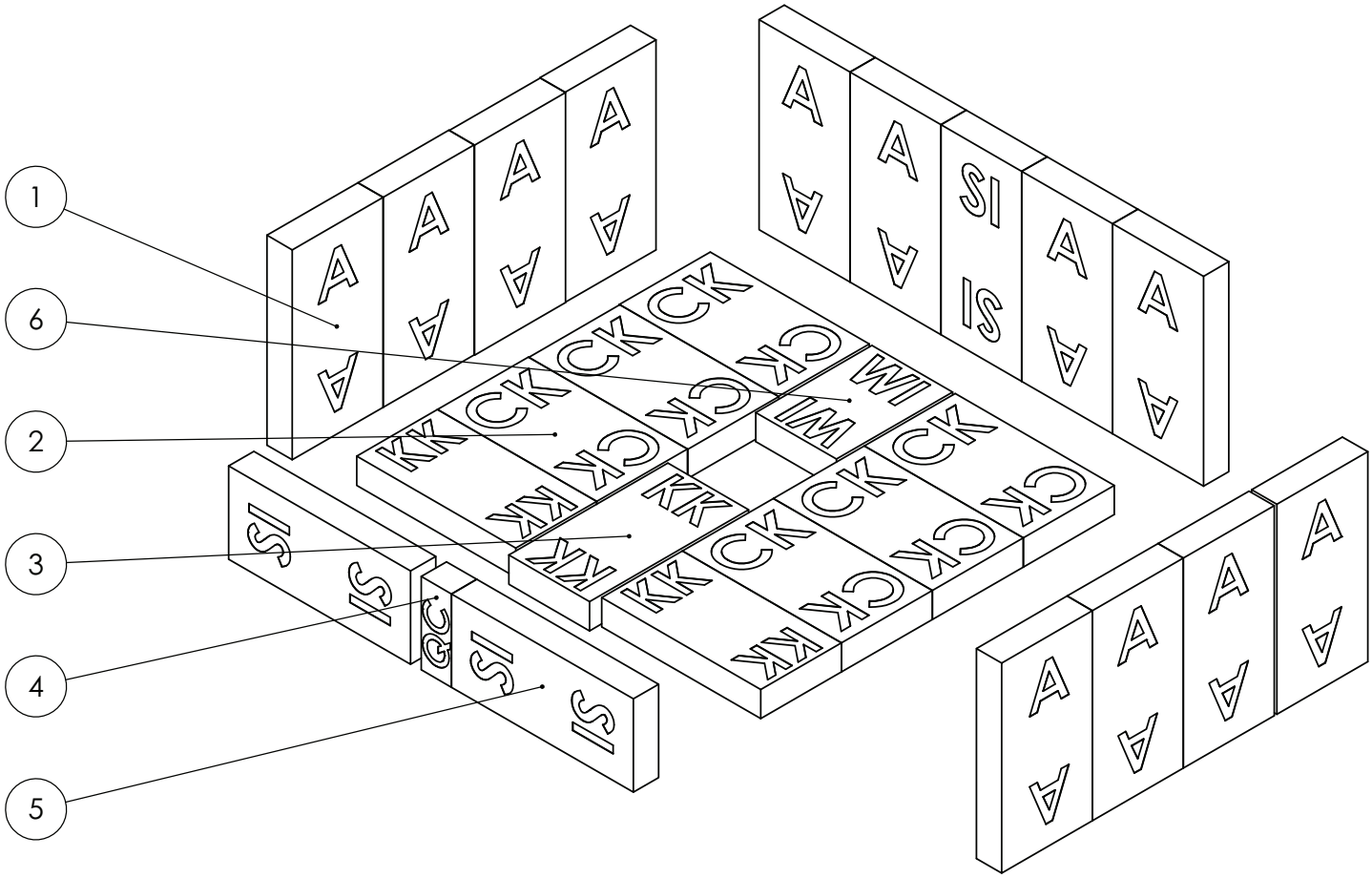
PROBLEM: The combustor temperature cannot be controlled. Turning the thermostat down often makes the combustor temperature go up.
CAUSE Turning the thermostat down, particularly in the first half of the burn cycle, causes the fire to emit more smoke, which is fuel for the combustor. The combustor temperature 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 Spark arrestor screen on cap plugged.	**SOLUTION** 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.



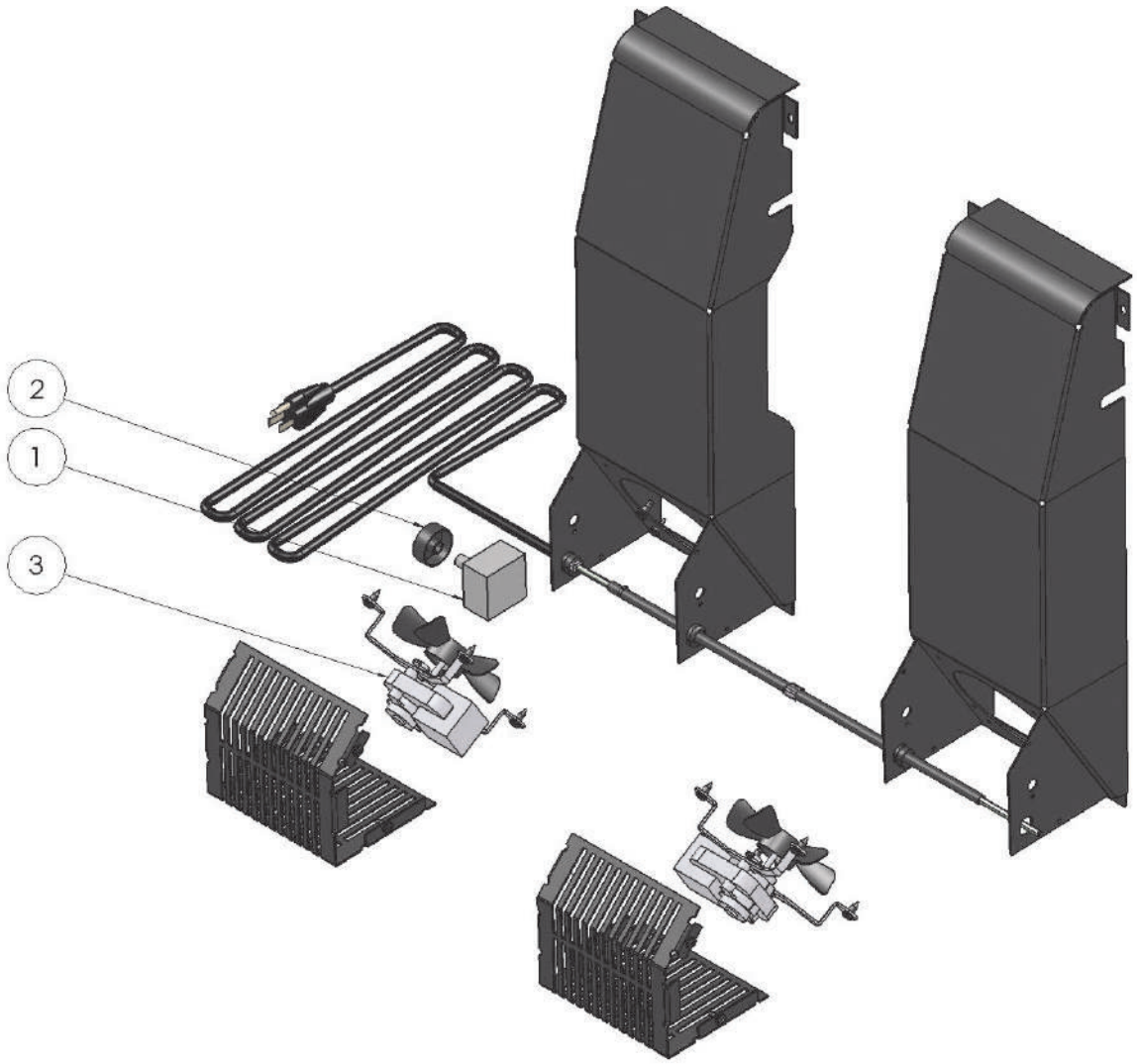
No. exploded view	Part #	Description	QTY
1	120-0342-E	CATALYTIC THERMOMETER	1
2	S.155.0255.B.3	BYPASS GASKET - 3 ft	1
3	S.Z4819	BYPASS RETAINER KIT	1
4	S.CAT203032	COMBUSTOR ASSEMBLY	1
5	S.Z2430	FLAME SHIELD	1
6	S.Z2486	DOOR ASSEMBLY	1
7	S.155.0254.6	DOOR GLASS GASKET - 5 ft	1
8	130-0243	GLASS CERAMIC 5MM	1
9	S.155.0186.6	DOOR GASKET - 6 ft	1
10	S.2449	LATCH CATCH	1
11	S.Z4551	DOME GUARD REPLACEMENT KIT	1
12	S.Z2433	ASH BUCKET	1
13	S.Z2452.M	BYPASS HANDLE	1
14	220-0102	THERMOSTAT KNOB	1
15	S.Z3009	THERMOSTAT ASSEMBLY	1
16	S.Z3849	FLUE RING	1

Brick Layout



ITEM NO.	PART NUMBER	QTY.
1	A Size Brick	12
2	CK Size Brick	6
3	KK Size Brick	3
4	QC Size Brick	1
5	SI Size Brick	3
6	WI Size Brick	1

S.Z1714 Fan Kit



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 first 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 wood stove 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.

INSTALLER NOTES

INSTALLER NOTES

Installer - Please complete the following information:

Dealer Name & Address:_____

_____

Installer Name (print): _____

Installer Signature: _____

Installer Phone #: _____

Date Installed:_____

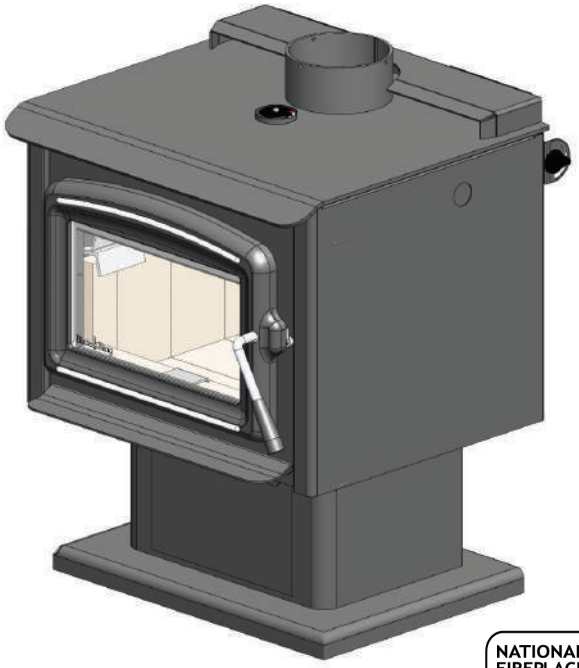
Appliance Serial No.: _____

Blaze King

SIROCCO SC30.2

SOLID FUEL CATALYTIC STOVE

OPERATION & INSTALLATION MANUAL



NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We recommend that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

U.S. EPA CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD

EM C US

0142WS021E
0142WS014S

Installer: Please COMPLETE THE DETAILS ON THE LAST PAGE and leave this manual with the homeowner.
Homeowner: Please SAVE THESE INSTRUCTIONS for future reference.

MANUFACTURED BY
Valley Comfort Systems Inc., 1290 Commercial Way, Penticton BC, Canada, V2A 3H5
web: www.blazeking.com email: info@blazeking.com

ATTENTION: The authority having jurisdiction (municipal building department, fire department, etc.) should be consulted before installation to determine the need to obtain a permit.

Pour la version française de nos manuels S.V.P. vous référez à notre site web: www.blazeking.com

TABLE OF CONTENTS

TABLE OF CONTENTS

CERTIFICATION LABEL

For reference only - please refer to label on the appliance

SIROCCO SC30.2

SN - 56.

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

0142WS021E
0142WS014S

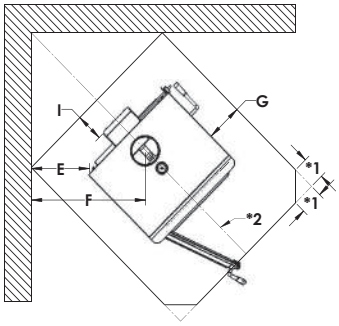
MODEL / MODÈLE: SC30.2
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S627:2023
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA
APPROVED FOR USE IN MOBILE HOMES (USA) AND IN TRANSPORTABLE BUILDINGS (CAN) / APPROUVÉ POUR UNE UTILISATION DANS LES MAISONS MOBILES (USA) ET DANS LES BÂTIMENTS TRANSPORTABLES (CAN)

Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. To be installed as a freestanding space heater with the clearances listed below and in the installation instructions. Not to be installed in any fireplace. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Except for the installation detailed below, use a 6" listed, factory built chimney suitable for use with solid fuels conforming to UL-103HT (USA) or CAN/ULC-S629 (CAN) or a code comliant, masonry chimney.
Mobile Home (USA) or Transportable Building (CAN) and residential close clearance 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 UL-103HT (USA) or CAN/ULC-S629 (CAN). Mobile Home (USA) or Transportable Buildings (CAN) installations are approved for roof exit only. Do not install in a sleeping room. Connection through a wall or ceiling requires special methods, see instructions and refer to local building codes to ensure proper installation.

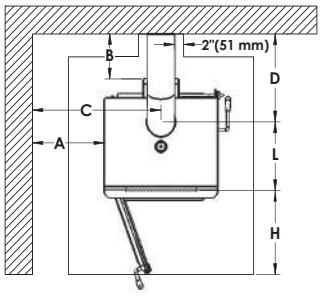
Installez et utilisez cet appareil conformément aux instructions d'installation et d'utilisation de Blaze King. Contactez les responsables locaux du bâtiment ou des pompiers au sujet des restrictions et de l'inspection de l'installation dans votre région. À installer en tant qu'appareil de chauffage autonome avec les dégagements indiqués ci-dessous et dans les instructions d'installation. Ne pas installer dans une cheminée. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". À l'exception de l'installation détaillée ci-dessous, utilisez une cheminée de 6" homologuée et fabriquée en usine adaptée à une utilisation avec des combustibles solides conformes à UL-103HT (USA) ou CAN/ULC-S629 (CAN) ou un code conforme, cheminée en maçonnerie.
Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) et résidentielles à dégagement réduit nécessitent un connecteur de cheminée homologué à double paroi et à dégagement réduit avec une cheminée fabriquée en usine homologuée adaptée à une utilisation avec des combustibles solides et conforme à UL-103HT (USA) ou CAN/ULC-S629 (CAN). Les installations de maisons mobiles (USA) ou de bâtiments transportables (CAN) sont approuvées pour une sortie sur le toit uniquement. Ne pas installer dans une chambre à coucher. La connexion à travers un mur ou un plafond nécessite des méthodes spéciales, voir les instructions et se référer aux codes du bâtiment locaux pour assurer une installation correcte.

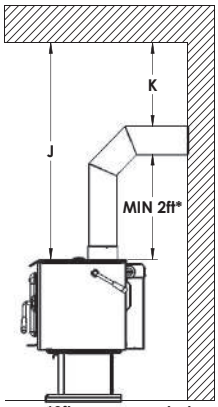
MINIMUM CLEARANCES TO COMBUSTIBLES (see owners manual for complete description of all requirements)
*** In Canada, 18" clearances from single wall pipe is required. Check with local codes and pipe manufacturers for minimum pipe clearances.**
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)
*** Au Canada, un dégagement de 18 po est exigé pour un tuyau à simple paroi. Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements.**

Residential Installations / Installations Résidentielles	A	B	* C	* D	E	* F	J
Roof Exit or Wall Exit, Parallel or Corner minimum clearances Dégagements minimaux de sortie de toit ou de sortie murale, parallèle ou d'angle	10.75" 273 mm	6" 153 mm	24.5" 623 mm	16.375" 416 mm	4" 102 mm	18" 458 mm	37" 940 mm
Mobile Home (USA) or Transportable Building (CAN) / Maison mobile (USA) or Bâtiment transportable (CAN)							
Roof Exit, Parallel or Corner minimum clearances; outside Air Kit and Fan Kit or Rear Shield required Dégagements minimaux de sortie de toit, parallèles ou en coin; Kit d'air extérieur et kit de ventilateur ou écran arrière requis	10.75" 273 mm	6" 153 mm	24.5" 623 mm	16.375" 416 mm	4" 102 mm	18" 458 mm	37" 940 mm



***1= 4.75" in Canada and 2.125" in USA**
***2 = 59.25" in Canada and 57.25" in USA**





***3ft recommended**

G = 3.75" (96 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (457 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	* K = 18" (457 mm) for single wall pipe in Canada	L = 15.75" (400 mm)

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. Minimum floor protection size is: 35" x 42.125" (889 mm x 1070 mm) in USA or 43.5" x 52.125" (1105 mm x 1324 mm) in Canada.
This appliance is certified to comply with 2020 particulate emission standards using crib wood (certified to EPA test methods 28R/5G with an emission-rate of 0.81 g/hr). It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual or if the catalytic combustor is deactivated or removed. This appliance needs periodic inspection and repair for proper operation; consult the owner's manual for instruction.
ONLY OPERATE WITH DOOR CLOSED; open door to feed fire ONLY. DO NOT OBSTRUCT COMBUSTION AIR OPENINGS OR THE SPACE BENEATH THE APPLIANCE. Provide adequate outside air for combustion. For use with solid wood fuel only; do not burn other fuels as this will cause the catalyst in the combustor to become inactive. The performance of the combustor or its durability has not been evaluated as part of the certification. Combustor OEM part number: Z0336A-M. Replace glass with 5 mm ceramic glass only. This appliance must be installed with either Blaze King Leg Kit Z2613 or Blaze King Pedestal Kit Z3903; attach as instructed in the installation instructions.

Cet appareil ne nécessite pas de protection thermique du sol du foyer; cependant, s'il est installé sur un plancher combustible, un protecteur de plancher non combustible doit être utilisé. La taille minimale de la protection de plancher est de: 35" x 42.125" (889 mm x 1070 mm) aux USA ou 43.5" x 52.125" (1105 mm x 1324 mm) au Canada.
Cet appareil est certifié conforme aux normes d'émission de particules 2020 utilisant du bois de lit (certifié selon les méthodes de test EPA 28R/5G avec un taux d'émission de 0.81 g/h). Il est contraire aux réglementations fédérales d'utiliser cet appareil d'une manière incompatible avec les instructions d'utilisation du manuel du propriétaire ou si la chambre de combustion catalytique est désactivée ou retirée. Cet appareil nécessite une inspection et une réparation périodiques pour un bon fonctionnement; consultez le manuel du propriétaire pour obtenir des instructions.
FONCTIONNER UNIQUEMENT AVEC LA PORTE FERMÉE; ouvrir la porte UNIQUEMENT pour alimenter le feu. NE PAS OBSTRUER LES OUVERTURES D'AIR DE COMBUSTION ou l'espace sous l'appareil. Fournir suffisamment d'air extérieur pour la combustion. À utiliser uniquement avec du bois de chauffage solide; ne brûlez pas d'autres combustibles car cela rendrait le catalyseur dans la chambre de combustion inactif. Les performances de la chambre de combustion ou sa durabilité n'ont pas été évaluées dans le cadre de la certification. Numéro de pièce OEM de la chambre de combustion: Z0336A-M. Remplacez le verre par du verre céramique de 5 mm uniquement. Cet appareil doit être installé avec kit de pattes Blaze King Z2613 ou kit de piédestal Blaze King Z3903; fixer 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 ☐
2024 ☐ 2025 ☐ 2026 ☐ 2027 ☐ 2028 ☐ 2029 ☐

170-0266 [04 24]

The content within this manual describes the installation and operation of the Blaze King SC30.2. It is against federal regulations to operate this appliance in a manner inconsistent with the operating instructions in this manual. Blaze King grants no warranty, implied or stated, for the installation and maintenance of this appliance and assumes no responsibility of any consequential damage(s).

EPA CERTIFICATION TEST DATA		
Burn Category	**CO Ave**	**Emission Rate**
Low Burn	0.03 g/min	0.20 g/hr
Med-low Burn (1)	0.32 g/min	0.62 g/hr
Med-low Burn (2)	0.39 g/min	0.46 g/hr
Med-high Burn	0.81 g/min	1.23 g/hr
High Burn	1.69 g/min	3.81 g/hr
EPA emission rate weighted average		0.81 g/hr

This appliance was tested and listed to CAN/ULC-S628:2022 & UL1482-11 (R2022) by OMNI-Test Laboratories. This appliance is certified to comply with the 2020 U.S. Environmental Protection Agency's particulate emission standards using crib wood. Under specific test conditions, this appliance has been shown to deliver heat at rates ranging from 10,094 to 36,076 Btu/hr. This appliance has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting.

This appliance contains a catalytic combustor which needs periodic inspection and may require replacement to ensure proper operation. It is against federal regulations to operate this appliance if the catalytic combustor is deactivated or removed.

⚠WARNING

IF THIS APPLIANCE IS NOT PROPERLY INSTALLED OR OPERATED, A HOUSE FIRE MAY RESULT LEADING TO SERIOUS BODILY HARM AND EVEN DEATH. TO REDUCE THE RISK OF FIRE, PLEASE READ THIS ENTIRE MANUAL BEFORE INSTALLING AND OPERATING THIS APPLIANCE. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

DO NOT OPERATE THIS APPLIANCE WITHOUT FULLY ASSEMBLING ALL COMPONENTS. DO NOT INSTALL DAMAGED, INCOMPLETE, OR SUBSTITUTE COMPONENTS. FAILURE TO POSITION COMPONENTS IN ACCORDANCE WITH THE DIAGRAMS IN THIS BOOKLET, OR FAILURE TO USE COMPONENTS SPECIFICALLY APPROVED WITH THIS APPLIANCE, MAY RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY.

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

⚠WARNING

THIS APPLIANCE MAY NOT BE INSTALLED INTO A FACTORY BUILT FIREPLACE. FAILURE TO COMPLY WILL VOID ANY AND ALL WARRANTIES.

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

SPECIFICATIONS

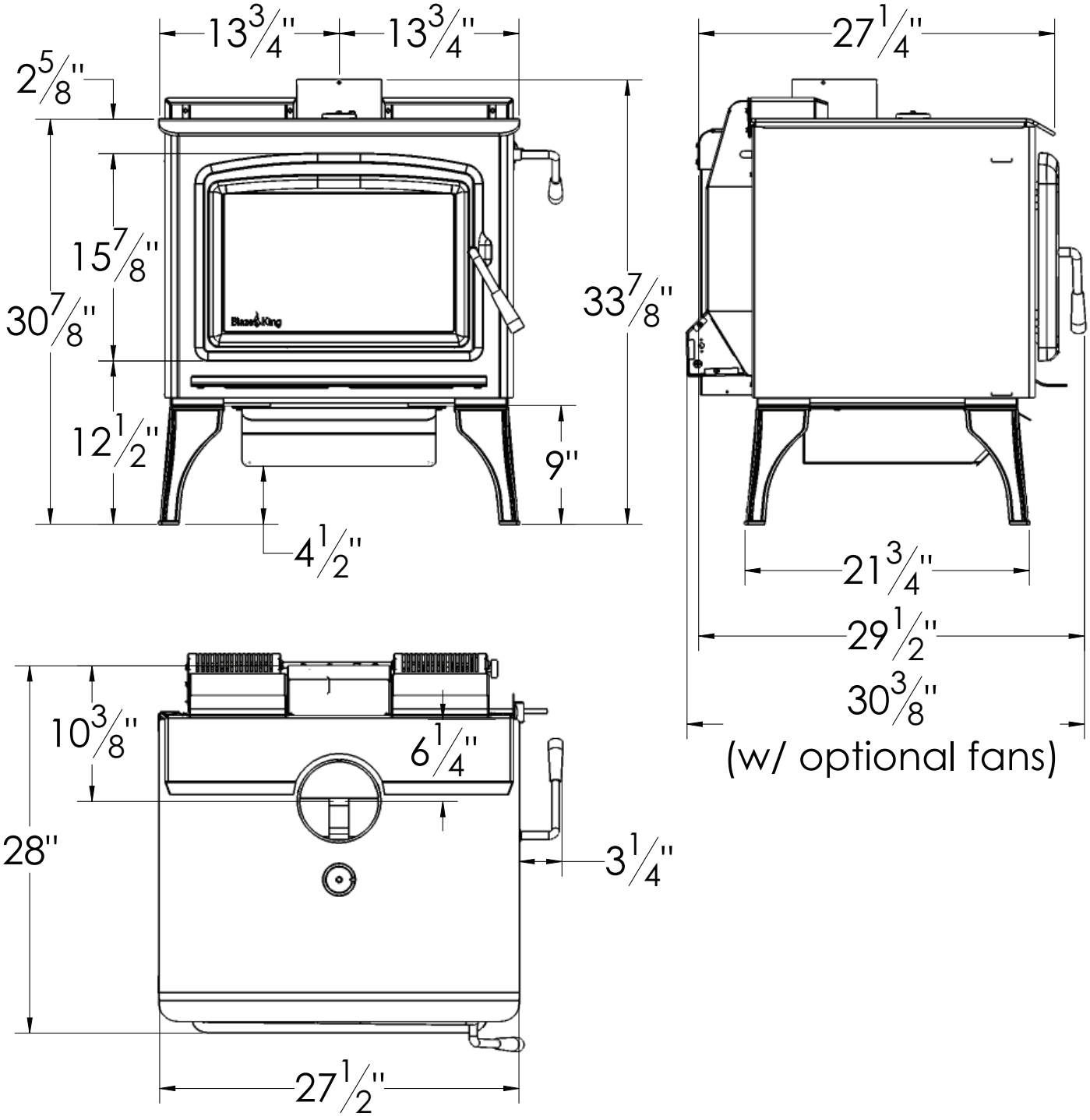
SIROCCO SC30.2, SC30.2 SPECIFICATIONS	
Flue Collar Opening	6” I.D. (152 mm)
Firebox Door Opening	18 5/8” x 9 7/8” (473 mm x 251 mm)
Firebox Depth	18” (457 mm) brick to brick, 20 1/2” (521 mm) brick to glass
Firebox Width	20” (508 mm)
Firebox Height	12.84” (326.1 mm)
Firebox Volume	2.91 cu. ft. (0.0824 m^3)
Tested Fuel Length	16.75” (426 mm)
Wood Capacity (approximate)	White Oak - 60 lb (27.2 kg) / Douglas Fir - 40 lb (18.1 kg)
Shipping Weight (Firebox only)	365 lbs. (165.6 kg)
Shipping Weight (Pedestal Kit)	50 lb (22.7 kg)
Shipping Weight (Leg Kit)	20 lb (9.1 kg)

PARTS INCLUDED
1. Fire Poker
2. Manual Kit (w/ Warranty Cards, Catalytic Thermometer)

REQUIRED KIT (MUST INSTALL ONE OPTION)	
1. S.Z2613 - SC Leg Kit	2. S.Z3903 - Pedestal Kit

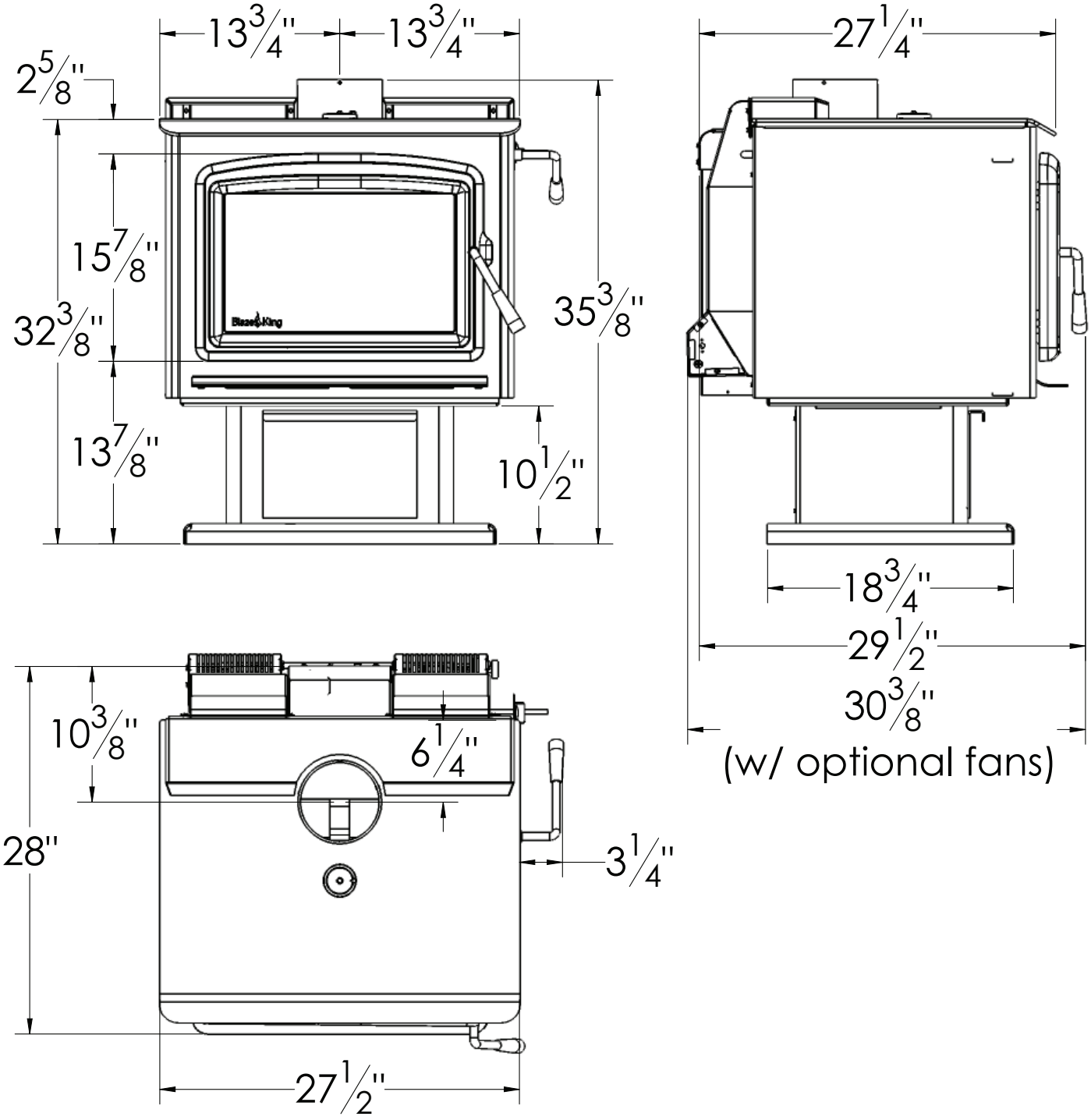
OPTIONAL ACCESSORIES	
1. S.Z1714 - Fan Kit	2. S.Z3820 - Ash Drawer for Leg option
3. S.Z4015 - Rear Shield	4. 3” Outside Air Kit (S.Z1726B)
5. 4” Outside Air Kit (S.Z1726)	

SC30.2 WITH SC LEG KIT (S.Z2613)



APPLIANCE DIMENSIONS

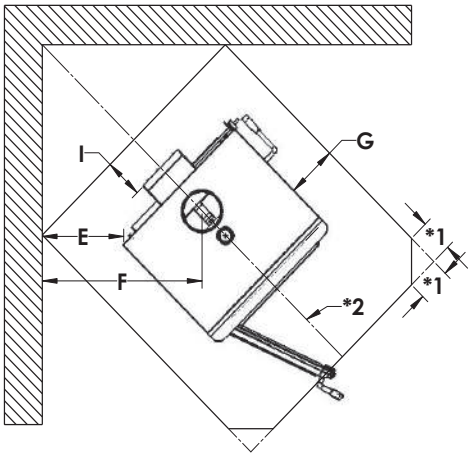
SC30.2 WITH PEDESTAL KIT (S.Z3903)



MINIMUM CLEARANCES

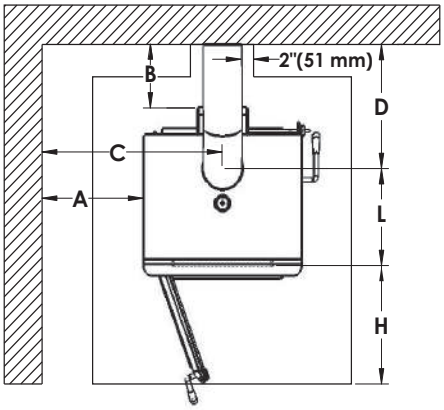
This appliance must be installed in compliance with all local codes and regulations. Minimum clearances may only be reduced by means approved by the regulatory authority. Flue pipe must be 6" diameter and 24 MSG steel construction. Do not use aluminum or galvanized steel. Refer to local codes and pipe manufacturer specs for required minimum clearances. ***In Canada, a minimum 18" (450 mm) clearance from single wall pipe is required.**

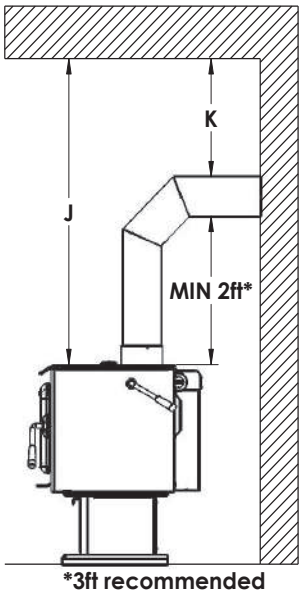
RESIDENTIAL INSTALLATION	A	B	* C	* D	E	* F	J
Roof or Wall exit; Parallel or Corner min clearances	10.75" 273 mm	6" 153 mm	24.5" 623 mm	16.375" 416 mm	4" 102 mm	18" 458 mm	37" 940 mm
MOBILE HOME (USA) OR TRANSPORTABLE BUILDING (CAN) INSTALLATION							
Roof exit only; Parallel or Corner min clearances *Fan Kit or Rear Shield Kit + Outside Air Kit required	10.75" 273 mm	6" 153 mm	24.5" 623 mm	16.375" 416 mm	4" 102 mm	18" 458 mm	37" 940 mm



***1= 4.75" in Canada and 2.125" in USA**

***2 = 59.25" in Canada and 57.25" in USA**





***3ft recommended**

G = 3.75" (96 mm) in USA 8" (203 mm) in Canada	H = 16" (406 mm) in USA 18" (456 mm) in Canada	I = 0" (0 mm) in USA 8" (203 mm) in Canada	K = 18" (456 mm) for single wall pipe in Canada	L = 15.75" (400 mm)

FLOOR PROTECTION

This appliance does not require thermal hearth pad floor protection; however, if installed on a combustible floor, a non-combustible floor shield must be used. In the USA, this floor shield must extend 16" out from the front and 8" out from either side of the fuel-loading door. In Canada, to comply with CSA B365, any combustible covering beneath the appliance and/or within the area extending horizontally at least 18" (450 mm) beyond the appliance on any side equipped with a door, and at least 8" (200 mm) beyond the appliance on other sides, shall be protected by a continuous, durable, non-combustible pad that will provide ember protection. The 18" (450 mm) ember protection required on any side with a door shall extend for the full width of the appliance plus the 8" (200 mm) required on each side of the appliance without a door. Where an appliance is installed less than 8" (200 mm) from a wall, the ember pad need only extend to the base of the wall. An ember pad shall not be placed on top of a carpet unless the pad is structurally supported to prevent displacement and distortion. A non-combustible shield is also required underneath the chimney connector and extend at least 2" on either side of the chimney connector. This shield does not need an insulation value, but must be listed under UL 1618-2009 (Type 1) and have a minimum size of:

35" x 42.125" (889 mm x 1070 mm) in USA and 43.5" x 52.125" (1105 mm x 1324 mm) in Canada

Blaze King does not recommend adhesive based vinyl flooring in front of appliances due to thermal expansion and warping which could be permanent.

⚠WARNING

DO NOT CONNECT TO OR USE THIS APPLIANCE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATIONS
THIS APPLIANCE MUST BE CONNECTED TO: 1) A CHIMNEY COMPLYING WITH THE REQUIREMENTS FOR TYPE HT CHIMNEYS IN THE STANDARD FOR CHIMNEYS, FACTORY-BUILT, RESIDENTIAL TYPE AND BUILDING HEATING APPLIANCE, UL 103, OR 2) A CODE-APPROVED MASONRY CHIMNEY WITH A FLUE LINER. FAILURE TO DO SO MAY RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

COMBUSTION AIR

In air tight homes (most modern construction), careful considerations must be taken into account before installing a wood burning appliance. It is important to ensure there is adequate intake (combustion) air for all exhausting type appliances within the dwelling. Heat recovery ventilator (HRV) systems along with constant running fan motors in air handlers are examples of appliances that must be taken into account when balancing intake air (others include fireplaces, range hoods, dryers, etc.). It is recommended that a fresh air intake inlet into the room where the appliance is located be installed. Failure to do so may result in air starvation, smoke spillage, and carbon monoxide threats. Consult a HVAC specialist for proper installation practices.

DRAFT PERFORMANCE

Draft is the movement of combustion air into the appliance and out through the chimney as exhaust gas. In essence, it is the difference in pressure between the exhaust gas inside the chimney and the outside air that creates this movement. Warmer, lighter exhaust gasses in the chimney tend to move upward. The amount of draft created by your chimney can depend on chimney length, horizontal offsets, insulating properties, local geography, external forces, and other factors. External factors (outdoor temperature, wind, barometric pressure, topography, etc.) or internal factors within the dwelling (negative pressure from exhaust fans, chimneys, air infiltration, etc.) may adversely affect draft.

Too much draft can yield very high temperatures within the appliance and may result in damage. An uncontrollable burn or excessive room temperatures are indicators of too much draft. Too little draft may cause back puffing (smoke spillage) into the room and plugging of the chimney, chimney cap, or spark arrestor screen. Inadequate draft can also lead to low heat output and the inability for the combustor to remain active at low burn rate settings. Your Blaze King heater is a high efficiency appliance and will require fine tuning of your chimney system in order to maximize draft performance. **Blaze King cannot be responsible for external forces leading to less than optimal draft performance.**

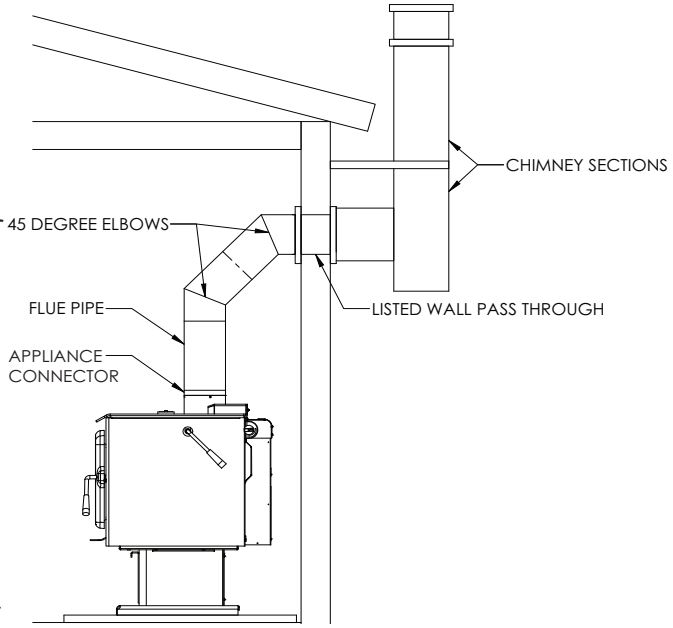
ROLE OF THE CHIMNEY

The role of the chimney is to maintain sufficient draft to achieve complete combustion. To ensure maximum performance, Blaze King recommends a minimum vertical chimney height of 15 ft (from stove top to termination) when installing an appliance at sea level (and up to 1000 ft of elevation). For freestanding installations, it is also recommended to use double wall pipe from stove top adaptor to ceiling support box. Double wall pipe helps to keep the chimney warm and improve draft performance. For wall exit installations, a vertical length of 3 ft from stove top to elbow is recommended. It is also recommended to use a pair of 45 degree elbows rather than a single 90 degree elbow to allow for a smoother transition of airflow. When possible, outside chimney systems should be isolated from the external environment by building a chase around the chimney. Doing so will help keep the chimney warm and maintain sufficient draft (please refer to the "***RECOMMENDED FLUE HEIGHTS***" section). **Without a properly installed chimney, this appliance will not operate at its maximum performance which could yield incomplete combustion.**

VENTING SYSTEM

A venting system consists of:

- Appliance Connector - a “stove top adaptor” that creates a positive connection between the appliance and flue pipe.
- Flue Pipe - either single or double wall pipe that is only used within the room, connecting the appliance to either a ceiling box or wall pass through.
- Chimney - a listed, factory built component with either 1” or 2” insulation that is suitable for use with solid fuels, conforming to CAN/ULC-S629 in Canada or UL 103HT in the USA. Note: This appliance may also be connected to a code compliant Masonry Chimney.

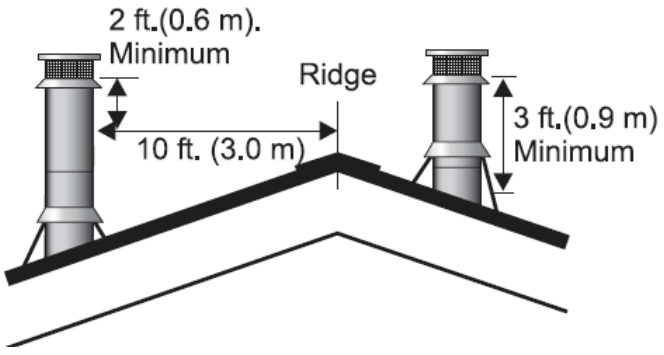


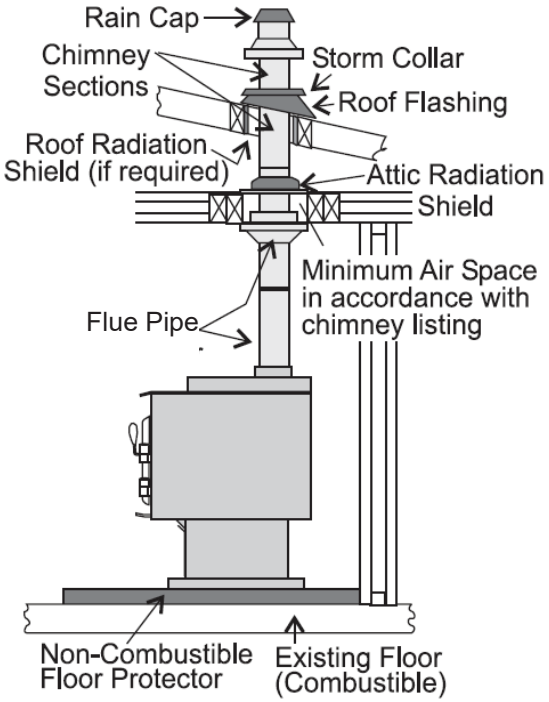
Do not install the chimney directly at the outlet of the appliance. A chimney connector is required unless the appliance is specifically approved for that type of installation. The flue pipe between the appliance connector and chimney should be kept as direct as possible. Do not use a flue pipe to pass through an attic or roof space, closet or similar concealed space, or a floor or ceiling. All joints within the venting system must be securely fastened with sheet metal screws. A chimney support package must be used when a connection is made through a ceiling to a listed prefabricated chimney. A listed wall thimble must be used when a connection is made through a combustible wall to a chimney. These accessories are necessary to provide safe clearances to combustible walls and ceilings as these components can get extremely hot during use. In the event of a creosote fire, temperatures inside the chimney may exceed 2000F (1100°C). An effective vapor barrier must be maintained at the location where the chimney or vent component penetrates the exterior structure. Do not connect this appliance to a chimney serving another appliance, doing so will affect the safe operation of both appliances and will void warranty. You must comply with the local authority having jurisdiction and, in Canada, CSA installation standard B365-M87.

CONNECTION TO A METAL PREFABRICATED CHIMNEY

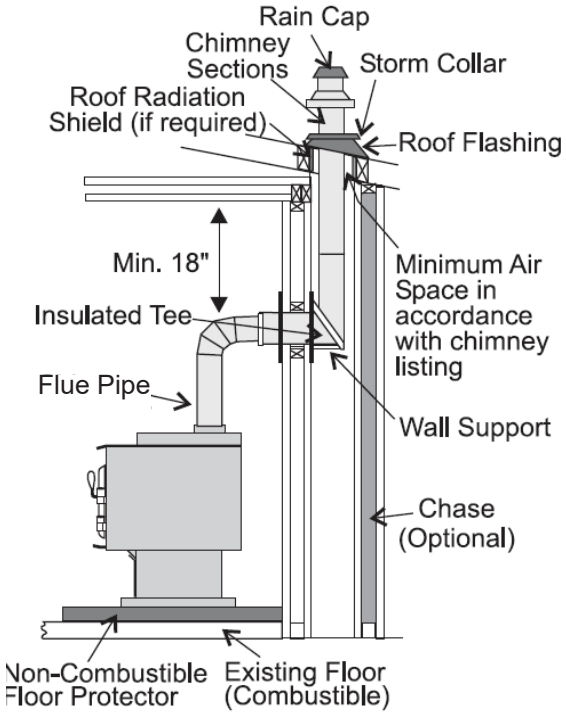
Refer to the prefabricated chimney manufacturer’s installation instructions to ensure safe clearance to combustibles are maintained when installing. All components (ceiling support package or wall pass through and “T” section package, fire stops, insulation shield, roof flashing, chimney cap, etc.) must be purchased from the same prefab chimney manufacturer. There are two common methods of a prefab chimney installation: the recommended method is to install the chimney inside the dwelling up through the ceiling(s) and the roof, while the alternative method is to install an exterior chimney that runs up the outside of the structure. Though not recommended, the alternative method is sometimes it is the only option. In that case it is recommended to build a chase around the external chimney.

The chimney must meet a minimum height above the roof and/or other obstruction(s) for safety purposes and to ensure sufficient draft. It is required that the chimney be at least 3ft higher than the highest point where it passes through the roof and at least 2ft higher than the highest part of the roof or any obstruction within 10ft (measured horizontally) of the chimney. Refer to the “***RECOMMENDED CHIMNEY HEIGHTS***” chart for minimum flue height recommendations and CAN/ULC-S629 in Canada or UL-103HT in the USA for installation codes.





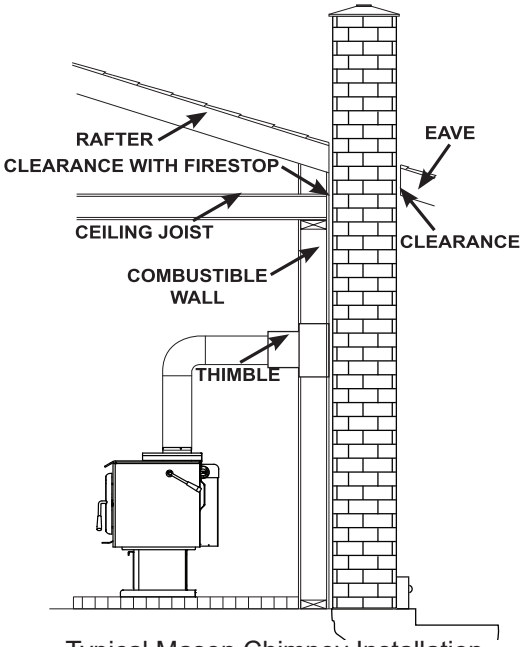
Prefab Chimney Through Ceiling Installation



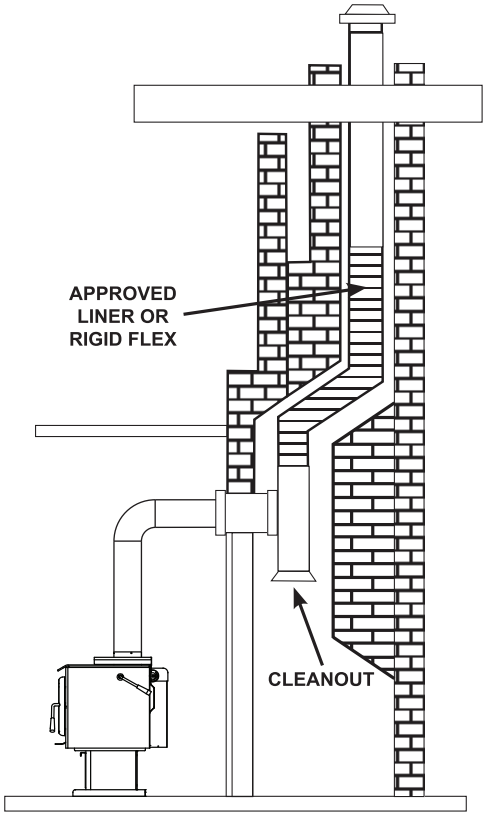
Prefab Chimney Exterior Installation

CONNECTION TO A MASONRY CHIMNEY

First and foremost, ensure the masonry chimney meets the minimum standards per the National Fire Protection Association by having it inspected by a certified professional. There must be no cracks, no loose mortar, and no signs of deterioration or blockage. Ensure the chimney is properly cleaned before installing the appliance. When connecting the appliance through a combustible wall, special methods are required; refer to local jurisdiction for the approved methods of passing a chimney connector through a combustible wall in your area (In the USA, refer to the NFPA minimum standards, and in Canada, refer to CAN/CSA-B365, the Installation Code for Solid Fuel Burning Appliances and Equipment). **Blaze King recommends the use of a stainless steel liner, preferably insulated, inside a masonry chimney. This is to help maintain a proper draft to achieve optimal performance of the appliance.**



Typical Mason Chimney Installation



Blaze King Recommend Installation

RECOMMENDED CHIMNEY HEIGHTS

Every installation is unique, especially when considering geographical location. As previously mentioned, maintaining sufficient draft is of utmost importance, but this can be a challenge as draft can be heavily influenced by topographical and geographical phenomena. The understanding of pressure planes and the stack effect are imperative in planning and executing a successful installation.

As previously mentioned, Blaze King recommends a minimum vertical chimney height of 15 feet (from stove top to termination) when installing an appliance at sea level (and up to 1000 feet of elevation). If the install is at a higher elevation, please refer to the table below for recommended chimney heights:

MINIMUM RECOMMENDED CHIMNEY 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 ft 4.6 m	16 ft 4.9 m	18 ft 5.5 m	19 ft 5.8 m
1000 - 2000 ft 305 - 610 m	15.5 ft 4.7 m	16.5 ft 5.0 m	18.5 ft 5.6 m	19.5 ft 5.9 m
2000 - 3000 ft 610 - 914 m	16 ft 4.9 m	17 ft 5.2 m	19 ft 5.8 m	20 ft 6.1 m
3000 - 4000 ft 914 - 1219 m	16.5 ft 5.0 m	17.5 ft 5.3 m	19.5 ft 5.9 m	20.5 ft 6.2 m
4000 - 5000 ft 1219 - 1524 m	17 ft 5.2 m	18 ft 5.5 m	20 ft 6.1 m	21 ft 6.4 m
5000 - 6000 ft 1524 - 1829 m	17.5 ft 5.3 m	18.5 ft 5.6 m	20.5 ft 6.2 m	21.5 ft 6.6 m
6000-7000 ft 1829 - 2134 m	18 ft 5.5 m	19 ft 5.8 m	21 ft 6.4 m	22 ft 6.7 m
7000 - 8000 ft 2134 - 2438 m	18.5 ft 5.6 m	19.5 ft 5.9 m	21.5 ft 6.6 m	22.5 ft 6.9 m
NOTE: No more than one offset (two elbows) are allowed. Two 45°elbows equal one 90° elbow				

For other common chimney components, use the following vertical height(s) to compensate for:

90° elbow = 2.0 ft (0.610 m)
"T" section = 3.0 ft (0.915 m)
1.0 ft (0.305 m) of horizontal run = 2 ft (0.610 m) of vertical rise

Example Chimny Height Calculation (at sea level):

Min Chimney Height	= 15.0 ft (4.575 m)
One 90° Elbow	= 2.0 ft (0.610 m)
2.0' Horizontal Run	= 4.0 ft (1.200 m)
One Base "T"	= 3.0 ft (0.915 m)
Final Chimney Height = 24.0 ft (7.3 m)	

The above figures are only guidelines, please refer to the "***DRAFT PERFORMANCE"*** section.

⚠WARNING

IF THIS APPLIANCE IS NOT PROPERLY INSTALLED OR OPERATED, A HOUSE FIRE AND/OR PERSONAL INJURY MAY RESULT. TO REDUCE THE RISK OF FIRE AND PERSONAL INJURY, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

ALCOVES AND FIREPLACES

In Canada, DO NOT INSTALL THIS APPLIANCE IN AN ALCOVE or FIREPLACE.
In USA, please adhere to minimum safe clearance dimensions.

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 OF OR UNDER THE APPLIANCE.

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.

MOBILE HOME or TRANSPORTABLE BUILDING INSTALLATION

For Mobile Home (in USA) or Transportable Building (in Canada) installations, an Outside Air Kit (S.Z1726 / S.Z1726B) and either a Fan Kit (S.Z1714) or Rear Shield Kit (S.Z4015) are required. It is recommended that the kits be installed prior to appliance installation (refer to the instructions provided with the kits).

When a metal prefabricated chimney is used, the manufacturer's installation instructions must be followed precisely. The ceiling support package must be purchased from the same manufacturer (ie. fire stops, insulation shield and roof flashing, chimney cap, etc). Be sure to maintain required safe clearances to combustibles as recommended by the manufacturer. The flue pipe must be double wall, close clearance type with either CAN/ULC-S629 or ULCS610 designation (single wall pipe is not allowed). Insulated chimney components must be a listed factory built chimney suitable for use with solid fuels and conforming to, CAN/ULC-S629 in Canada or UL-103HT in the USA. Where the space heater is installed in mobile home or transportable building, removal of the chimney is required for transportation of the building

Note: Under no circumstances should the fresh air intake hose (Outside Air Kit) penetrate a wall at a location higher than the bottom of the intake air channel on the rear of the appliance (ie. the fresh air hose must feed up into the intake channel on the rear of the appliance).

CAUTION: THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

⚠WARNING

THE APPLIANCE MAY ONLY BE INSTALLED IN AN OPEN AREA THAT IS NOT USED FOR SLEEPING. UNDER NO CIRCUMSTANCES SHOULD THE APPLIANCE BE INSTALLED INSIDE A BEDROOM. FAILURE TO COMPLY MAY LEAD TO SERIOUS BODILY HARM IN THE EVENT OF A HOUSE FIRE.

For mobile home or transportable building installations, the appliance must be securely fastened to the floor using the tie-downs provided in the Outside Air Kit.

- For SC Leg Kit (S.Z2613), use the S.ZR8039 Leg Anchor Kit to secure stove to the floor. **(Fig. 1)**
- For Pedestal Kit (S.Z3903), use #10 screws and washers through the two holes in the pedestal base to secure the stove to the floor. **(Fig. 2)**

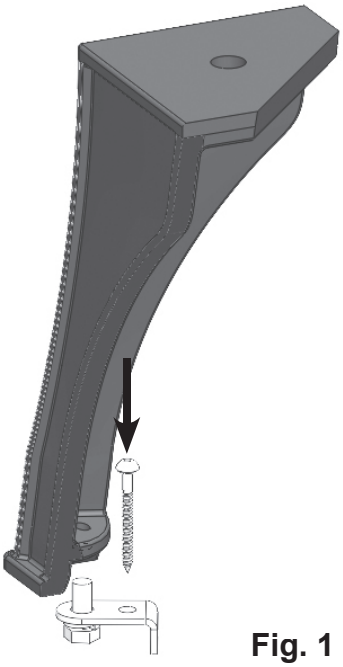


Fig. 1

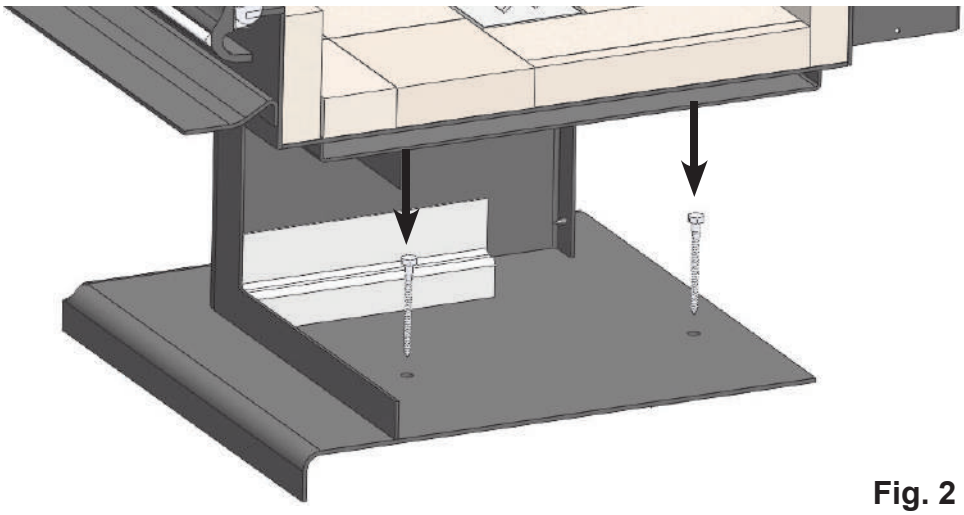


Fig. 2

OPTIONAL ACCESSORIES

- **REAR SHIELD KIT (S.Z4015)** - used to achieve minimum rear clearances; required for mobile home or alcove installations.
- **FAN KIT (S.Z1714)** - used to disperse super heated air from appliance throughout the dwelling; required for mobile home or alcove installations.
- **OUTSIDE AIR KIT (S.Z1726 / S.Z1726B)** - The fresh air intake hose is a flexible metal tube used to supply combustion air into the appliance from the outdoor environment. It can be installed through an external wall or up through the floor (DO NOT CHANGE THE STRUCTURAL INTEGRITY OF THE FLOOR). This hose must be kept open at all times. **Under no circumstances should the fresh air intake hose penetrate a wall at a location higher than the bottom of the intake air channel on the rear of the appliance (ie. the fresh air hose must feed up into the intake channel on the rear of the appliance).**

NOTE: EITHER S.Z2613 SC LEG KIT OR S.Z3903 PEDESTAL KIT MUST BE INSTALLED BEFORE THE APPLIANCE CAN BE CONNECTED TO THE CHIMNEY AND BE READY FOR USE.

SC LEG KIT (S.Z2613)

TOOLS NEEDED FOR INSTALLATION: 3/4” wrench or socket wrench

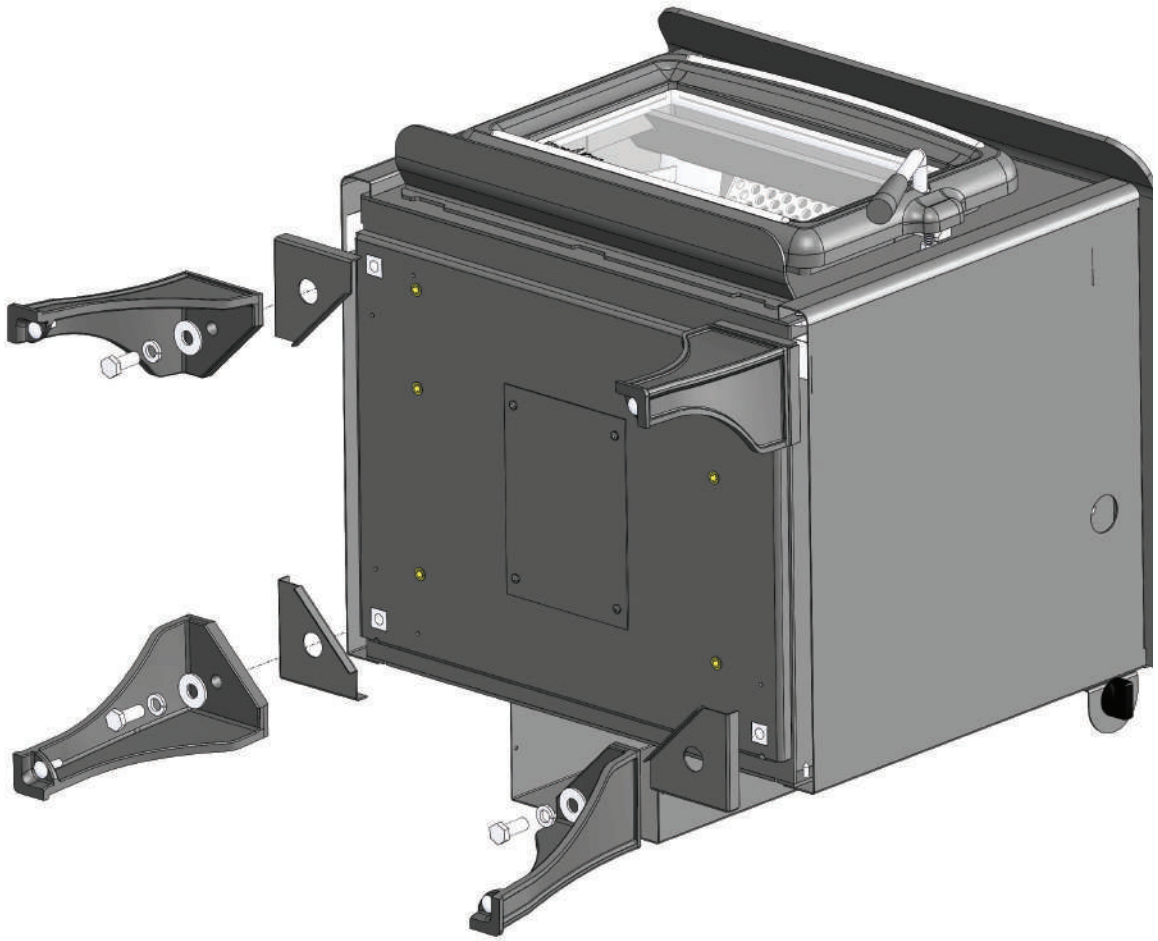
INSTALLATION

1. Lean the appliance backwards onto the main air tube to gain access to the bottom side.
   NOTE: Use extreme caution when maneuvering the appliance to avoid injury and/or damage to the floor or appliance. It is recommended to place cardbaord inside the firebox to support the bricks when leaning the appliance over.

2. Position each leg and leg plate (flanges up, away from leg) parallel to the base edges of the appliance. Fasten the legs to the appliance using the hardware supplied with the kit.

3. Lift the appliance back to its upright position.

4. Adjust levelling bolts at the bottom of each leg in order to level appliance.



PEDESTAL KIT (S.Z3903)

TOOLS NEEDED FOR INSTALLATION:
7/16” wrench or socket wrench

INSTALLATION

1. Lean the appliance backwards to gain access to the bottom side. **NOTE: Use extreme caution when maneuvering the appliance to avoid injury and/or damage to the floor or appliance. It is recommended to place cardbaord inside the firebox to support the bricks when leaning the appliance over.**

2. Remove “ASH CHANNEL SEAL” by unscrewing the 1/4” nut. (**Fig. 3**)

3. Thread all four 1/4”-20 button head cap screws into the stove base until halfway in (included w/ Pedestal Kit).

4. Remove the ash drawer from the assembled pedestal. (Can also remove pedestal rear panel if required).

5. Utilizing the key holes on the top of the pedestal body, install the pedestal into place by pushing it against the bottom of the appliance and then sliding it downward (assuming appliance is on its back). (**Fig. 4**)

6. Once the pedestal is in position, fully tighten all four fasteners and then lift appliance back to its upright position.

7. Insert the ash drawer into the pedestal front. (Reattach pedestal rear panel if removed)

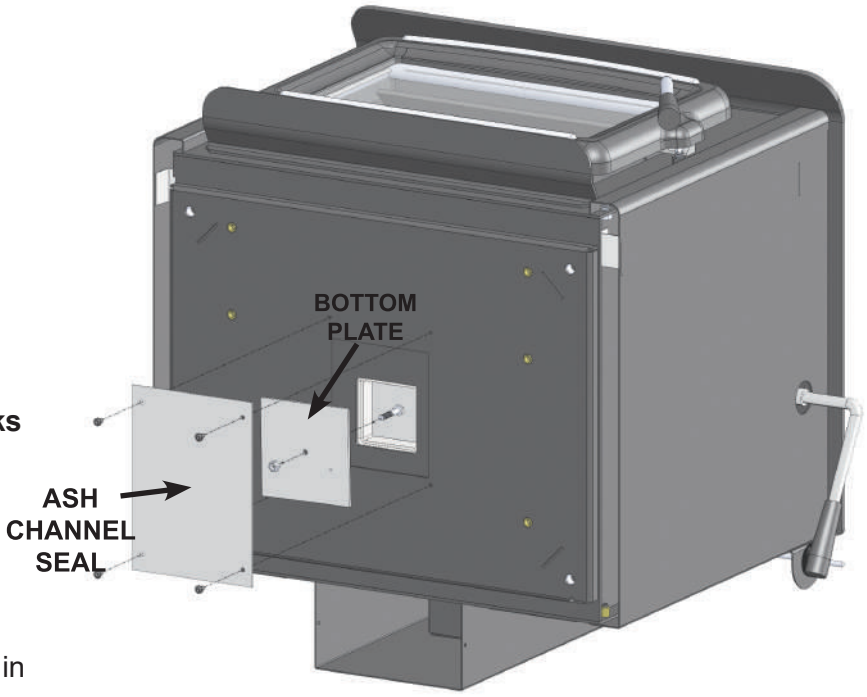


Fig. 3

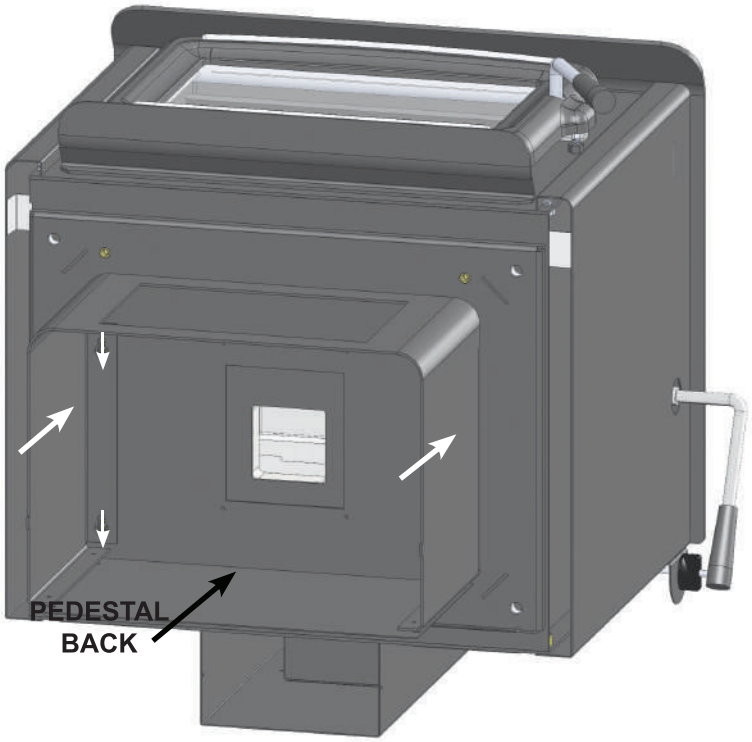


Fig. 4

DOOR INSTALLATION AND CHANGE-OUT

To install the door upon appliance installation or to change it out, follow these steps:

1. Align bottom door hinge hole with bottom firebox hinge pin. (**Fig. 5**)
   Note: Door is heavy, hold firmly.

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.

4. Install Bypass Handle (packaged with door assembly) onto protruding bypass extension on right side of appliance.

   NOTE: If the door is satin or gold plated, please follow the instructions on the "PLATED DOOR & TRIM CARE" card found inside the manual kit.

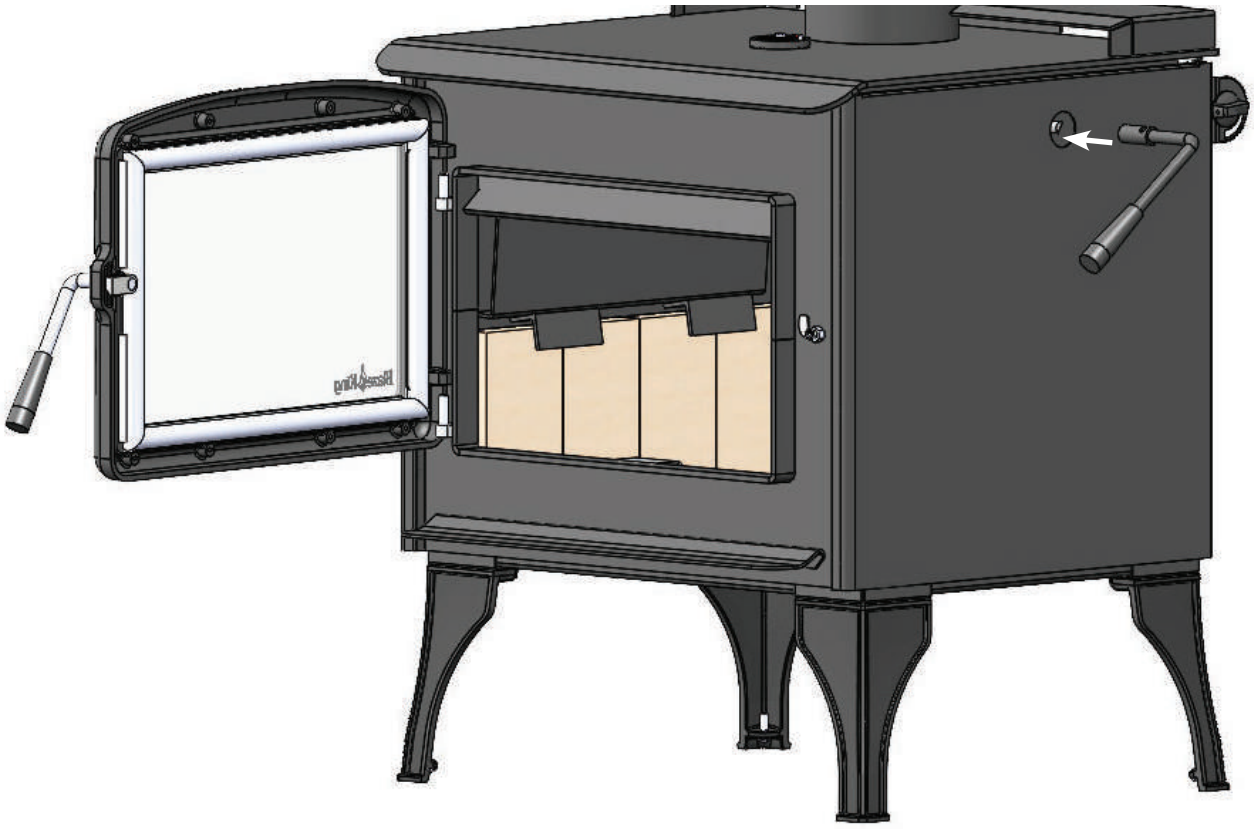


Fig. 5

⚠WARNING

DO NOT OPERATE THIS APPLIANCE WITH THE LOADING DOOR UNINSTALLED OR LEFT OPEN. DOING SO MAY LEAD TO A RUN AWAY FIRE RESULTING IN PROPERTY DAMAGE.

YOUR FIRST FIRE!

The following pages contain information on the operation of the major components on your Blaze King appliance. Please take the time to read through this section as it will give you a better understanding of how your appliance works. This understanding will help you to operate your appliance at its optimum level thus extended its life while allowing you to get the highest efficiencies from your heater.

INTRODUCTION

All Blaze King wood burning appliances are designed as radiant room space heaters. They have been tested and certified to be installed in insulated, habitable rooms within 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 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 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.

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.

FAN OPERATION

Fans are an optional item for most Blaze King appliances. If fans are installed on your appliance, they should be turned off until the stove reaches normal operating temperatures. Approximately 30 minutes after a fire has been established within the appliance, the fan speed should match the thermostat control setting. (i.e. if your thermostat is set to a medium heat output then your fan should also be set at medium, low—low, high—high etc.). We recommend the use of fans on all of our wood appliances. The fan system recirculates room air over the hot surfaces of your appliance and helps spread this super heated air around your home.

SELECTING WOOD

It takes a great deal of energy to evaporate the moisture contained in green or wet wood and that energy will not be heating your home. Green or wet wood will also greatly increase creosote issues. To ensure that your wood fuel has a moisture content of 20% or lower, only use seasoned wood that has been split, stacked, and protected from rain or snow for at least 24 months. Firewood should be split and stacked in a manner that allows for air flow to all areas.

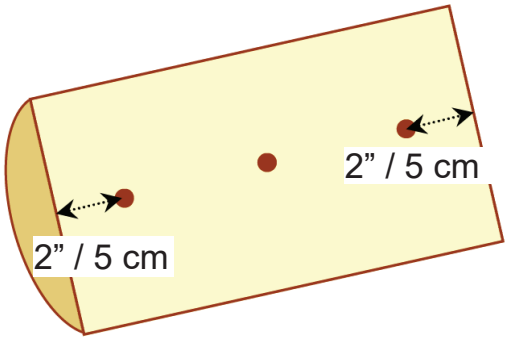
Both hardwood and softwood burn equally well in this appliance, but the more dense hardwood will weigh more per cord and burn a little slower and longer. Never burn salt-water driftwood as it is very corrosive and will deteriorate the structure of the appliance. The burning of salt-water driftwood will void the warranty. The only way to accurately determine wood moisture is to purchase and measure with a moisture meter.

⚠WARNING

THIS APPLIANCE IS DESIGNED TO BURN NATURAL WOOD ONLY. DO NOT BURN WET UNSEASONED WOOD. DOING SO CAN CAUSE EXCESSIVE CREOSOTE ACCUMULATION AND IF IGNITED, CAN CAUSE A CHIMNEY FIRE THAT MAY RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM. BURNING AIR DRIED SEASONED WOOD WILL REDUCE THE RISK OF CHIMNEY FIRES AND YIELD HIGHER EFFICIENCIES AND LOWER EMISSIONS.

HOW TO USE MOISTURE METERS

1. Randomly select three logs from your wood pile and split each one down the middle.
2. Three points of measurement are required to determine the moisture content of each log: 2” (5 cm) from either end and in the middle of the split surface of the log. To take these measurements, insert the moisture meter pins at the points described, keeping the pins in line with the wood grain. Record each measurement.
3. Do this to all three logs and take an average of the readings (this is an approximate indication).



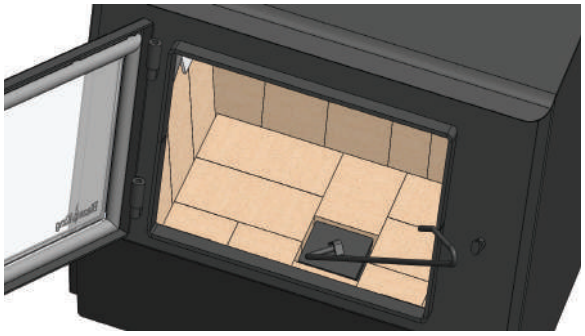
⚠WARNING

DO NOT BURN TREATED WOOD, COAL, CHARCOAL, COLORED PAPER, CARDBOARD, SOLVENTS OR GARBAGE. BURNING THESE MATERIALS MAY RESULT IN THE RELEASE OF TOXIC FUMES AND/OR CARBON MONOXIDE WHICH MAY RESULT IN POISONING. DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA, OR ENGINE GEL. DO NOT USE CHEMICALS OR FLUIDS SUCH AS GASOLINE TYPE LANTERN FUEL, KEROSENE, OR CHARCOAL LIGHTER FLUID TO START OR FRESHEN UP A FIRE IN THIS APPLIANCE. DOING SO MAY LEAD TO OVER FIRING RESULTING IN A HOUSE FIRE AND SERIOUS BODILY HARM.

FIRE POKER

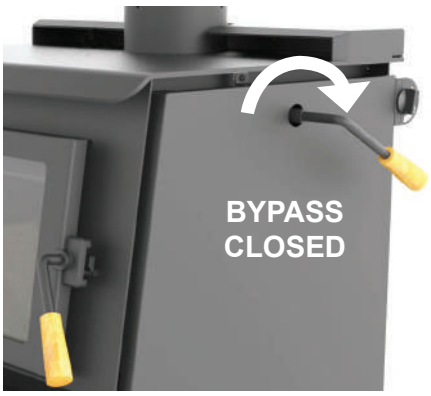
The steel fire poker that is provided with this appliance serves two purposes:

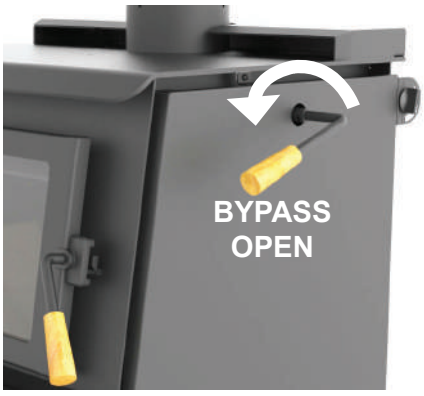
1) to manipulate fuel loads
2) to remove the ash plug via hook welded to the top plate.

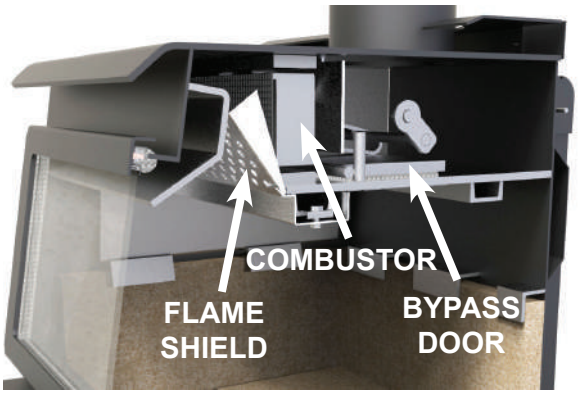


BYPASS DOOR

Your catalytic wood burning appliance is fitted with a bypass door which allows exhaust from the fire to temporarily bypass the catalytic combustor. The bypass door is located inside the dome of the firebox at the top of the appliance. It is a hinged, steel plate door and is controlled by the bypass handle located on the right side of the appliance. When the handle is pointing forward, the bypass door is open. To close the bypass door you must rotate the handle clockwise until it points to the rear of the appliance. To ensure the bypass door is fully closed, push down on the bypass handle until you hear a positive click.







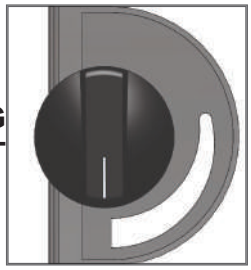
CATALYTIC THERMOMETER

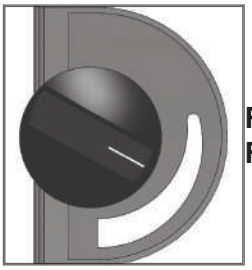
The catalytic thermometer is located on the top of the appliance. Its sole purpose is measure the exhaust gasses after they have passed through the combustor to indicate whether the combustor is ACTIVE or INACTIVE. It is important to ensure that the appliance is operated in the ACTIVE zone. When the thermometer reads INACTIVE it means that the combustor temperature is below 500F and is not producing a clean burn. For the most accurate reading, turn the fan off for approximately 5 minutes before reading the thermometer. For calibration instructions, please refer to the "***MAINTENANCE***" section.

THERMOSTAT

The thermostat is located at the rear of the appliance and is controlled by the thermostat knob which is located at the upper right rear corner of the appliance. When the knob is positioned at the HIGH setting, the appliance will operate at its highest burn rate and deliver its maximum heat output. As the knob is rotated counter clockwise the burn rate will decrease along with heat output. Burn rate is greatly influenced by location, installation, and external environment, so you may find it necessary to reposition the knob until you find the ideal setting to suit your situation. Please note that all adjustments to the thermostat should be done gradually as too rapid a change may cause the thermostat to operate improperly. The 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.

HIGH SETTING
MAXIMUM HEAT OUTPUT





ROTATE COUNTER CLOCKWISE
FOR REDUCED HEAT OUTPUT

LIGHTING THE FIRE

NOTE: As you heat up the appliance for the first time, the paint will go through a curing process and will give off a strong odor coupled with smoke. To minimize the inconvenience, burn the stove at a low temperature setting for several hours. It is recommended to open a door or window until the odor and smoke dissipates. You may also notice a change in color as the paint cures, this is normal and will appear uniform after subsequent firings.

1. **ENSURE ALL BRICKS ARE CORRECTLY POSITIONED INSIDE THE FIREBOX AND BUILD THE FIRE DIRECTLY ON THE BRICK IN THE BOTTOM OF THE STOVE. DO NOT USE A GRATE.**
2. Position the thermostat to the **HIGH** setting and turn the fan (if equiped) **OFF**.
3. Open the bypass then open the loading door.
4. Place 10 balls of non-glossy paper towards the front of the bottom of the firebox 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. **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. **DO NOT LEAVE THE STOVE UNATTENDED.**
7. Once the logs are burning, latch the loading door shut. Once loading door is closed and combustor temperature begins to climb, close the bypass door, turn fan(s) on to high (if equipped). Leaving the loading door open after the wood load has caught fire may cause premature failure of the catalytic combustor.
8. When nearly all of the wood in the firebox is fully burning and the catalytic thermometer is in the active zone, open the bypass door and loading door, and finish loading the appliance. Lay the wood as far back in the stove as possible. Latch the loading door shut, and close the bypass door.
9. Let the fire burn with the thermostat at the **HIGH** setting until the fire is well established. This ensures that the stove, catalyst, and wood load are all stabilized at optimum operating temperatures. The temperature in the stove and the gases entering the combustor must be raised to at least 500F (indicated by the thermometer needle in the **ACTIVE ZONE**) for catalytic activity to be initiated.
10. Gradually turn the thermostat down to the desired heat output setting once the fire is well established. Please note that if the thermostat is turned down too low too quickly, the fire may go out or the combustor may stop working, indicated by the thermometer needle falling into the **INACTIVE ZONE**. If this happens, simply turn the thermostat back to a higher heat output setting to let the fire reestablish itself.
11. Turn the fan (if equipped) on after the initial warm up.

Probably the least understood requirement of maintaining a good fire is that of establishing a good base of coals or embers. A glowing hot coal bed will help to maintain more even temperatures as well as assist in relighting the next fuel load. Put as much wood into the appliance 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 thermostat, the wood will only burn at the rate set on the thermostat. Once the fire is established, the appliance should be left to complete the full burn cycle. This is evident by a) only a glowing coal bed (ember bed) remaining or b) the catalytic thermometer hovers just inside the active zone. Following this procedure will maximize the efficiency of the appliance as well as limit exhaust emissions and smoke spillage.

RELOADING PROCEDURE

WHEN PREPARING TO RELOAD, IF THE NEEDLE ON THE CATALYTIC THERMOMETER IS STILL IN THE ACTIVE ZONE, FOLLOW THE PROCEDURE BELOW; IF THE NEEDLE HAS DROPPED INTO THE INACTIVE ZONE, REFER BACK TO THE "LIGHTING THE FIRE" PROCEDURE ON THE PREVIOUS PAGE.

It is important to note that the catalytic thermometer is simply displaying the temperature of the catalytic combustor. It may be used as an aid when it comes to identifying a reload point, but other factors such as lack of fuel in the firebox or dropping room temperatures should be used as well.

1. Have your next load of wood ready before beginning. Turn the thermostat to **HIGH** to ensure the remaining coal bed is active before reloading. Wait a few minutes for the air flow to stabilize.
2. To help minimize smoke spillage into the room, open the bypass door and again wait a few minutes for the air flow to stabilize.
3. Open the bypass door and crack open the loading door to allow ambient room air to be introduced into the firebox, this may take a minute 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 (if opened) close the bypass door immediately. Let the fire burn on the HIGH thermostat setting until the fire is 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, simply run the stove on **HIGH** for approximately 30 minutes. The **HIGH** setting will burn off most of the deposits.

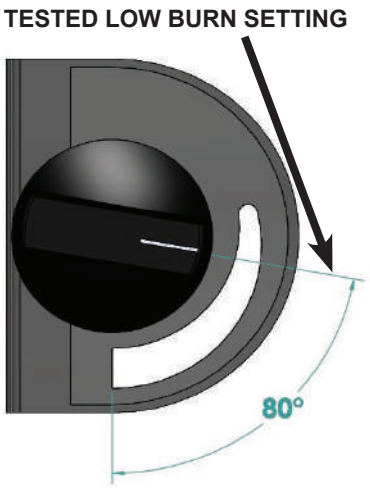
Note: Our loading instructions are outlined in general terms due to the variables that arise with each installation. Such variables include type of wood fuel, chimney height and configuration, installation altitude, seasonal weather conditions, draft, and the desired heat output required. Over time you will learn which settings are necessary to achieve optimal performance with your specific installation.

⚠WARNING

THIS APPLIANCE IS HOT WHILE IN OPERATION. CHILDREN AND PETS MUST BE KEPT FROM TOUCHING THE APPLIANCE WHEN IN USE. COMBUSTIBLE OBJECTS MUST BE KEPT A MINIMUM OF 48"(1219 MM) FROM THE FRONT OF THE APPLIANCE. COMBUSTIBLE MATERIAL SUCH AS CLOTHING OR FURNITURE PLACED TOO CLOSE TO THE APPLIANCE CAN CATCH FIRE. DO NOT STORE WOOD WITHIN THE SPECIFIED SAFETY CLEARANCES OR WITHIN THE SPACE REQUIRED FOR RE-FUELING AND ASH REMOVAL. FAILURE TO COMPLY MAY CAUSE SKIN BURNS OR RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

OPTIMAL LOW BURN THERMOSTAT SETTING

Your Blaze King appliance was tested and certified in accordance to the New Source Performance Standards for Residential Wood Heaters. During this test series, the low burn rate of the unit was determined by setting the thermostat knob to a position that yielded the lowest burn rate achievable. If you find that you are setting your thermostat beyond the test setting, please note that if the thermostat is turned down too low the fire will go out or the combustor may stop working which is indicated by the thermometer needle falling into the **INACTIVE ZONE**. If this happens, simply turn the thermostat back to a higher heat output setting and let the fire reestablish itself.



WOOD BURNING IN THE SHOULDER SEASON

There are a few things to consider if you choose to light a fire during the spring or fall seasons when the outside temperature is milder, perhaps 55F to 70F (13°C to 21°C).

You may notice smoke spillage out of the loading door when it is opened during start up or reloading. This is caused by a lack of natural draft within the chimney system. The temperature difference between the chimney system and the outside air causes flue gasses to be drawn up and out of the chimney. Smaller temperature differences produce less draft in your chimney system than larger temperature differences. This air movement, referred to as Stack Effect, is also influenced by air density and moisture differences. To eliminate the smoke spillage you may have to stoke the fire for longer than usual. Once the fire warms the chimney the draft will improve and spillage will be reduced. When operating the appliance on a lower thermostat setting, the resultant lower flue temperatures can cause your chimney system to cool down. This also decreases natural draft and spillage may occur.

General Rules for burning in the shoulder season:

- Run your appliance on **HIGH** for 30 minutes after start up and reloading before gradually turning the thermostat down to the desired heat output setting.
- The thermostat setting needs to be high enough to keep the catalytic thermometer in the active zone. If the thermometer will not stay in the active zone, turn the thermostat to a higher setting and then wait 15 minutes to confirm that the thermometer remains in the active zone. Repeat as required.
- If your appliance is producing too much heat, try to reduce the volume of wood fuel loads rather than turning your thermostat down. It is good burning practice to build smaller, hotter fires on milder days in the spring and fall.

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, burn the appliance for 5 to 10 minutes with the thermostat set to **HIGH** to melt any possible ice build.

⚠WARNING

DO NOT OPERATE THIS APPLIANCE WITHOUT THE CATALYTIC COMBUSTOR INSTALLED. DOING SO WILL LEAD TO EXCESSIVE SMOKE AND TEMPERATURES THAT COULD RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM. ONLY BURN SEASONED WOOD. FAILURE TO DO SO MAY DAMAGE THE COMBUSTOR AND WILL VOID ALL WARRANTIES.

COMBUSTOR MONITORING

It is good practice to monitor the catalytic combustor to ensure it is functioning properly. An improperly functioning combustor will result in a loss of heating efficiency and an increase in emissions and creosote buildup. The following list of items 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. Please refer to the "***COMBUSTOR TROUBLESHOOTING***" section.
- This appliance is equipped with a catalytic thermometer to monitor combustor operation. A properly functioning combustor will maintain temperatures in excess of 500F (indicated by the thermometer needle in the ACTIVE zone) and often reach temperatures in excess of 1000F. If the combustor temperature falls below 500F (thermometer needle in the INACTIVE zone), refer to the "***COMBUSTOR TESTING***" section.
- A good way to determine whether the combustor is functioning properly is by comparing the amount of smoke exiting the chimney while the combustor is engaged (bypass door closed) versus when the combustor is bypassed (bypass door open).
  Note: After opening the bypass door, wait approximately 15 minutes before observing the smoke exiting the chimney. Smoke may be visible shortly after lighting the fire and shortly after reloading the fire so allow 20 to 30 minutes for the fire to stabilize before making observations.

COMBUSTOR TESTING

Follow these instructions to test the catalytic combustor:

1. Light a fire per the "***LIGHTING THE FIRE"*** instructions.
2. After burning a well established fire for 1 hour, position the thermostat knob to a medium-low burn rate setting.
3. After 5 minutes at the lower burn rate, observe the location of the thermometer needle. A properly functioning combustor will have a temperature greater than 500F with the thermometer needle in the ACTIVE zone. An improperly functioning combustor will yield thermometer reading in the INACTIVE zone.
4. Repeat step 3 for at least 3 burn cycles.
5. If the thermometer needled is still not reaching the ACTIVE zone, your combustor may require cleaning.
6. If, after cleaning the combustor and reburning, the thermometer needle is still not reaching the ACTIVE zone, your combustor may need replacing. Contact your Blaze King dealer for a replacement combustor.

Note - It is also possible that the catalytic thermometer itself may not be functioning properly. Before deeming the combustor "dysfunctional", please refer to the "***CATALYTIC THERMOMETER"*** section.

⚠WARNING

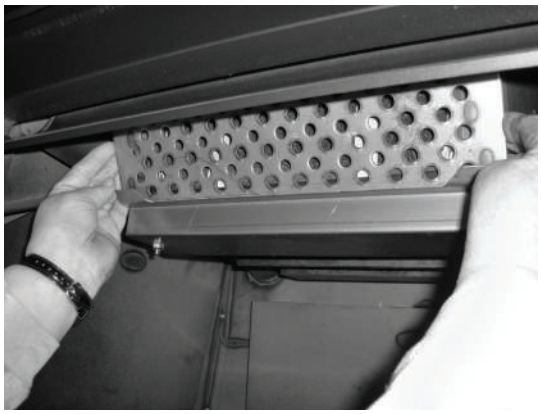
DO NOT PERFORM ANY CLEANING UNTIL THE FIRE IS OUT AND THE APPLIANCE IS COOL. HOT ASH IN A VACUUM CLEANER BAG COULD MELT THE VACUUM AND COULD RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

COMBUSTOR CLEANING

Under certain conditions, ash particles may become attached to the face of the combustor. These particles may be seen while the combustor is glowing under fire or when the fire is out. Any deposits on the face of the combustor should be removed. There are two ways to clean the face of the combustor: (1) Brushing the combustor with a soft bristle paint brush, or (2) Passing a vacuum cleaner wand or brush near the face of the combustor. Limit cleaning to the face of the combustor (note - the flame shield will have to be removed to gain access to the face). Do not scrape the combustor with any hard tool or brush and do not run pipe cleaner through the individual cells of the combustor as this may do more harm than good. Do not remove the combustor during this process. **Note - simply burning a hot fire usually proves to be the best method of cleaning the combustor of deposits.**

COMBUSTOR REPLACEMENT

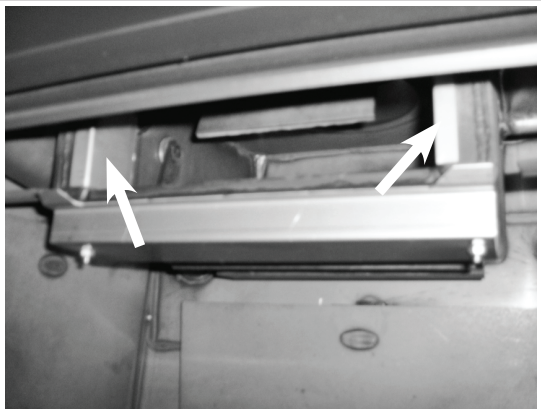
If the catalytic combustor has been deemed "dysfunctional" per the guidelines in "***COMBUSTOR TESTING***", discontinue use of the appliance until the combustor is replaced. Follow the steps below to complete the replacement **(BLAZE KING RECOMMENDS THAT YOUR DEALER OR CERTIFIED INSTALLER PERFORM THIS PROCEDURE):**



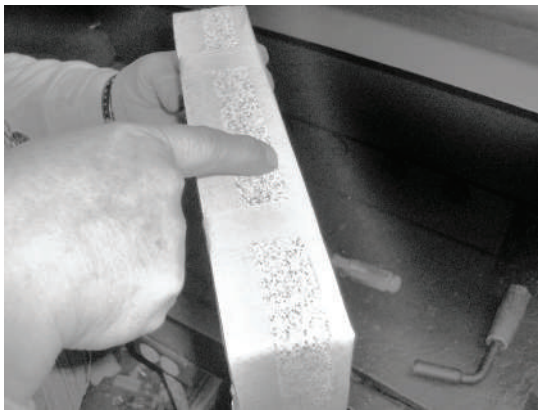
1. The appliance must be cool to touch, having gone at least 12 hours without being burned. A combustor can reach 1400F and hold temperatures for several hours, even after the fire is out. After waiting 12 hours, begin by removing the flame shield by simply lifting the shield off the two tabs at either lower corner. Pay particular attention to orientation of the flame shield in order to reinstall in the correct position.

2. Once the flame shield is removed, you will have access to the combustor. The combustor can be made of different materials such as cordierite, mulite, or 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 (please refer to the "***COMBUSTOR CLEANING***" section).

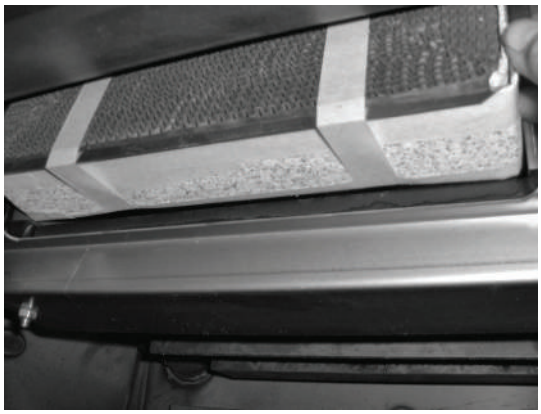
3. There are metal tabs across the bottom and on either side of the combustor. Using a flat blade screwdriver or pocket knife blade, slide the tip in between the metal tab on the left side of the combustor and the steel dome of the stove (the dome is the housing that encases the combustor). Apply slight pressure until the combustor begins to move forward. Repeat the process on the metal tab on the right side of the combustor. By working back and forth the combustor will work free of the dome housing. It is normal for the gasket that is wrapped around the combustor to fall apart during this process. New combustors are shipped with a new gasket.



4. With the combustor removed, you will see two bypass retainers on either side of the combustor opening within the dome. These retainers are not fixed in position and can fall into the firebox upon combustor removal. Ensure that they are put back into position before replacing the combustor. Use the screwdriver or pocket knife to scrape any old gasket from the surface areas of the dome. If you intend to reuse your existing combustor, you will need to order replacement combustor gasket. It is a good idea to have this combustor gasket on hand prior to performing this procedure.

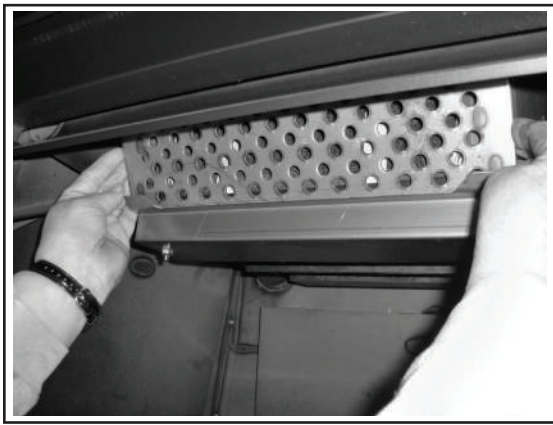


5. The new combustor will already be wrapped in gasket. Note the 1” wide masking tape - this will help to keep the leading edge of the gasket from snagging during installation. If you intend to reuse you original combustor, wrap the combustor gasket as you see here and use the 1” masking tape around the front and rear perimeter. During the first fire the masking tape will burn off and the combustor gasket will swell to provide a tight seal. This seal ensures optimal efficiency and performance. Do not burn the appliance without the combustor gasket installed.



6. Before installing, align the combustor within the opening of the dome housing. Slowly push the combustor in at the top and 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 OPENING. TAKE YOUR TIME AND WORK IT INTO PLACE SLOWLY.**

7. Once the combustor is fully reinserted into the opening of the dome housing, replace the flame shield. Note the flame shield sides are shaped like a triangle. The point of the triangle should face down to install correctly. Do not operate your appliance without the flame shield in place. The flame shield protects the face of the combustor against direct flame impingement and potential collisions when loading fuel.



8. When correctly installed, the flame shield will rest on the two tabs located on the dome guard and will lean slightly forward. Now that the combustor and flame shield have been properly reinstalled, the appliance can be relit.

A few reminders, do not burn anything other than dry, seasoned cordwood. Burning other materials may contaminate or ruin your new combustor. Also, remember to keep your firebox door gasket seal properly adjusted (please refer to the "***LOADING DOOR TENSION ADJUSTMENT"*** section). Doing so will ensure optimal performance of both the appliance and the combustor.

COMBUSTOR WARRANTY

This appliance contains a catalytic combustor, which needs periodic inspection and may require replacement for proper operation. It is against federal regulations to operate this appliance if the catalytic combustor is deactivated or removed.

The catalytic combustor supplied with this appliance is **OEM Blaze King part # S.CAT203032**.

Please consult the catalytic combustor warranty info also supplied with this appliance. Warranty claims should be addressed to:

CANADA	USA
Blaze King Industries / Valley Comfort Systems Warranty Department 1290 Commercial Way Penticton, BC, Canada V2A 3H5	Blaze King Industries Warranty Department 146 A Street Walla Walla, Washington, USA 99362

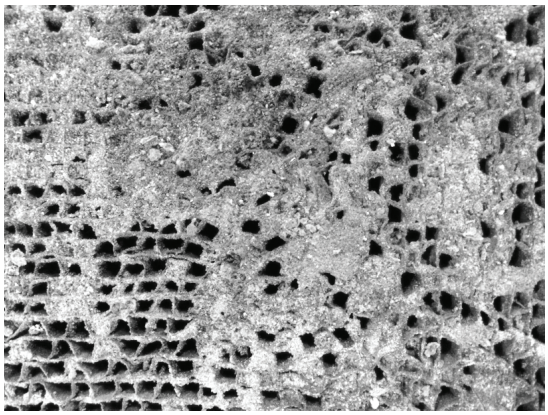
COMBUSTOR TROUBLESHOOTING

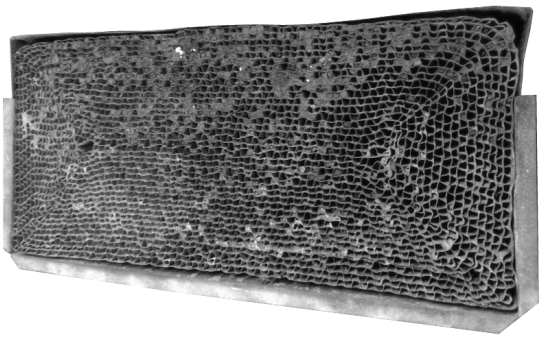
PROBLEM: CREOSOTE PLUGGING

Possible Cause: The combustor is coated with creosote burning material that produces substantial char and fly-ash.
Solution: Only burn dry, seasoned wood. Do not burn materials such as garbage, gift wrap, or cardboard.

Possible Cause: Burning wet, pitchy wood or burning large amounts of small diameter wood without the catalytic thermometer needle in the ACTIVE zone.
Solution: Burn dry, seasoned wood until temperatures are high enough to initiate catalyst light-off (indicated by the catalytic thermometer needle in the ACTIVE zone).

Possible Cause: Combustor not functioning.
Solution: If proper burning procedures have been followed and this problem persists, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).

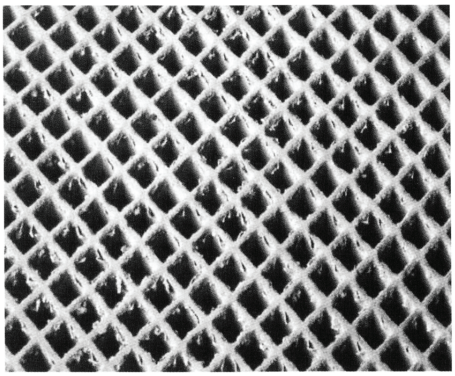




PROBLEM: COMBUSTOR PEELING

Possible Cause: Over firing and flame impingement can yield extreme temperatures (above 1800F/1000°C) at combustor surface and can cause peeling.
Solution: Avoid extreme temperatures by adjusting size of fuel loads. If peeling is severe, replace combustor.

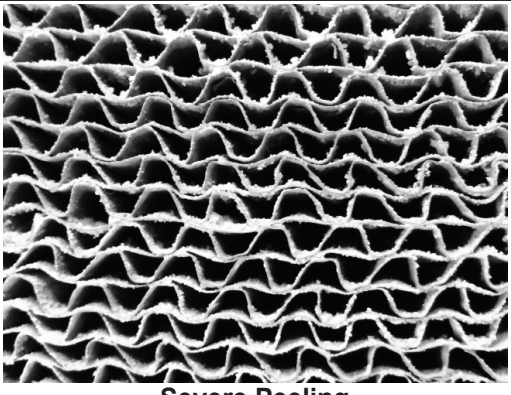
The images to the right are examples of minor peeling (does not affect proper combustor function) and severe peeling (closed or plugged combustor that needs replacement).



Minor Peeling

PROBLEM: CATALYTIC DEACTIVATION

Possible Cause: Burning improper fuels (ie. garbage, pressure-treated lumber, painted wood, etc.).
Solution: Burn good quality, dry, seasoned wood. If proper burning procedures have been followed and this problem persists, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).

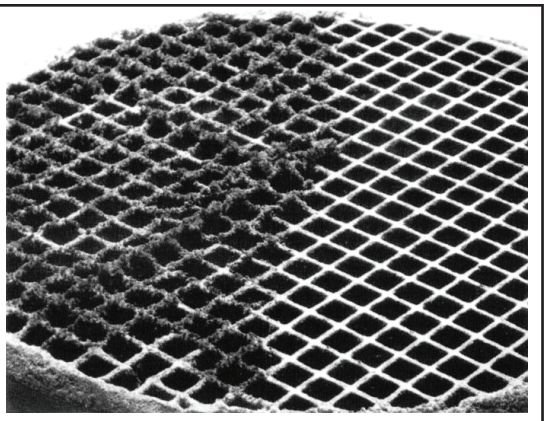


Severe Peeling

CATALYTIC COMBUSTOR

PROBLEM: COMBUSTOR MASKING

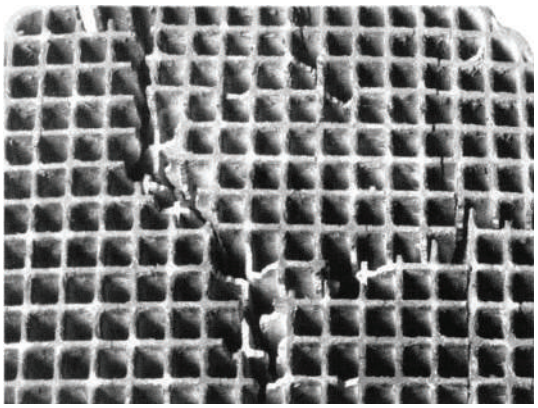
Possible Cause: The combustor is coated with a layer of fly-ash or soot from burning material that produces substantial char and fly-ash.
Solution: When the appliance is cool to touch, clean the front face of the combustor with a soft-bristled brush or vacuum lightly (refer to ***COMBUSTOR CLEANING*** for proper procedure).



PROBLEM: THERMAL CRACKING

Possible Cause: Extreme temperature fluctuations (ie. opening loading door while the combustor is in the ACTIVE zone) can cause thermal shock which can lead to cracking.
Solution: Avoid flooding a hot, active combustor with cool room air when reloading.

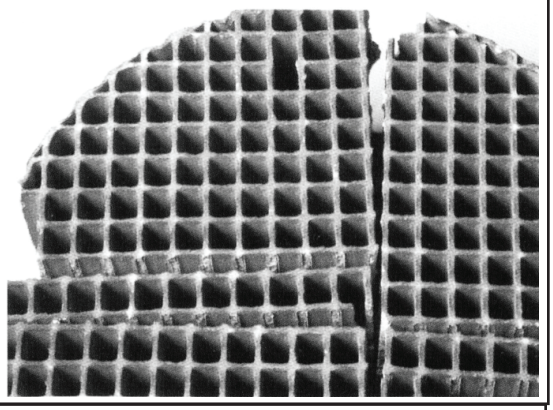
If cracking causes large pieces of the combustor to separate, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



PROBLEM: MECHANICAL CRACKING

Possible Cause: Mishandling the combustor or operating the appliance without the proper gasket installed.
Solution: Handle with care. Ensure combustor is wrapped with gasket upon reinstallation.

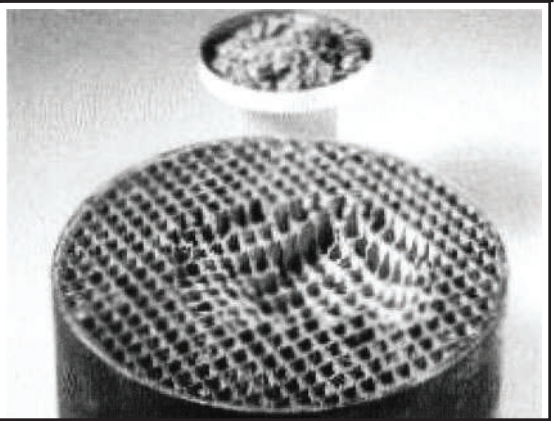
Possible Cause: Distortion of surrounding dome housing.
Solution: The combustor should slide in and out of the dome housing with relative ease. If this is not the case, contact your dealer for further inspection.



PROBLEM: COMBUSTOR CRUMBLING

Possible Cause: Excess air leaking into the firebox.
Solution: Ensure tight seal at loading door (see ***MAINTENANCE*** for instruction on gasket inspection).

Possible Cause: Excessive chimney draft.
Solution: Use a manometer to check and ensure chimney draft is within manufacturer specifications. Adjusting the appliance thermostat can help regulate chimney draft.



⚠WARNING

TO PREVENT SERIOUS BURNS, DO NOT PERFORM ANY MAINTENANCE UNTIL THE APPLIANCE IS COOL. APPLIANCE SURFACES, INCLUDING THE GLASS AND ANY ATTACHED COMPONENT, WILL REMAIN HOT FOR EXTENDED PERIODS OF TIME AFTER THE FIRE HAS BEEN PUT OUT.

RECOMMENDED MAINTENANCE

It is strongly recommended to complete the following tasks on a regular basis throughout the heating season:

1. Visually inspect Catalytic Combustor and clean as required (see "***COMBUSTOR CLEANING***")
2. Clean behind internal baffles (where applicable) and inspect metal components for warping/distortion.
3. Check Catalytic Thermometer for proper calibration.
4. Check Thermostat for proper function.
5. Check Fan Assemblies for proper operation.
6. Remove all ash from firebox and ash drawer after final burn of season.
7. Check all gaskets for proper seal and adjust as required.
8. Inspect and clean the Venting System.

CATALYTIC THERMOMETER MAINTENANCE

The catalytic thermometer probe (shaft) should be cleaned regularly. Ensure the fire is out and the appliance is cool, then remove the thermometer and wipe the probe clean. While removed, confirm the thermometer indicator needle points towards the bottom of the INACTIVE zone (allow the thermometer to sit at room temperature for 10 minutes before checking). If the needle does not point towards the bottom of the INACTIVE zone, it may need adjustment. Grasp the probe with a pair of pliers then slightly loosen the bolt on the top of the dial. Turn the dial to align the needle to the bottom of the INACTIVE zone and then retighten the bolt. Once finished, reinsert the thermometer back into the appliance. **Note: If your appliance is equipped with an optional fan kit, turn it off and wait 10 minutes before observing the catalytic thermometer reading.**

THERMOSTAT or THERMOMETER MAINTENANCE

Any thermostat or thermometer maintenance must be completed by a certified installer. If the thermostat or thermometer malfunctions, contact your dealer for replacement.

OPTIONAL FAN ASSEMBLY MAINTENANCE

Fan assemblies should be inspected at the beginning of each burn season to ensure they are free from debris such as ash, dust, pet dander, lint, etc. The accumulation of such debris could prevent the fan blades/blower wheels from rotating freely and put excessive strain on the fan motors, ultimately leading to failure.

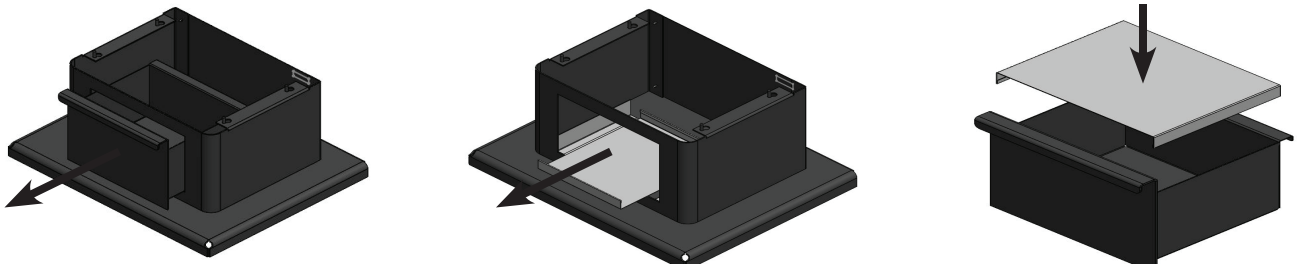
ASH REMOVAL

Ashes should be removed any time they come within one inch of the door opening, though it is not advisable to completely remove all of the ashes as wood burns best on a bed of ashes around 1/2" thick. When removing ashes, ensure the fire is out and the appliance is cool to touch. 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, while awaiting 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. Do not place other waste in this container.

⚠WARNING

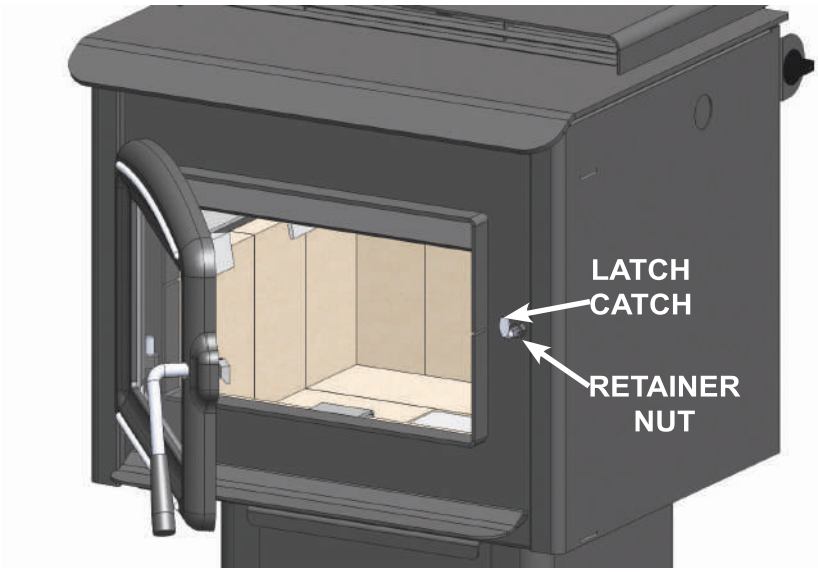
NEVER STORE HOT ASHES IN A GARAGE OR BASEMENT. HOT ASHES WILL GENERATE CARBON MONOXIDE AND / OR FLAMMABLE GASES. THESE GASES MAY CAUSE SUFFOCATION AND POSSIBLE DEATH.

ASH REMOVAL CONTINUED



LOADING DOOR TENSION ADJUSTMENT

To tighten the loading door seal, use a 9/16" wrench to loosen the retainer nut threaded onto the latch catch on the outer right face of the firebox. Once loose, tighten the nut on inside firebox (also threaded onto the latch catch) to secure the latch catch in a position closer to the firebox. Ensure the outer nut is tight and preform a paper test (see "DOOR GASKET PAPER TEST") to ensure the proper seal was achieved. DO NOT FORCE THE NUT LOOSE. Use penetrating oil if necessary to make loosening the nut easier.



LOADING DOOR GASKET INSPECTION

Inspect the loading door gasket for physical deterioration, missing sections, or obvious leakage. The appliance door flange should make a groove in the gasket material. The side of the gasket on the inside of the groove will be dark or black while the outer side will be light or white. Dark smudges on the outer side of the gasket may indicate an air leak. If the groove in the gasket is very shallow 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 a need for replacement. Any time a piece of gasket is missing or broken the entire gasket must be replaced. A way to physically check if the gasket needs replacing is by performing a paper test (see ***"DOOR GASKET PAPER TEST")***

LOADING DOOR GASKET REPLACEMENT

If door gasket replacement is required, only replace with OEM door gasket ordered through your Blaze King dealer. This gasket will be properly sized and ready to install. **Do not stretch or cut the gasket at any time during this installation. Ensure only high temperature silicone adhesive is used for this installation (do not use household silicone caulking). Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch before removing the loading door.
2. Use a pair of pliers to pull the old door gasket out of the channel and dispose of it.
3. Clean the gasket channel of any residual adhesive to ensure the new adhesive will adhere sufficiently.
4. To ensure proper fit, dry fit the new gasket by distributing it evenly around the frame and then remove.
5. Run a small bead of a high temperature silicone adhesive along the center of the gasket channel.
6. Starting in the lower right corner, insert the new gasket into the gasket channel. Be sure to distribute the gasket evenly around the entire channel frame.
7. Allow the adhesive to dry for at least 1 hour before reinstalling and closing the loading door.
8. Confirm proper gasket installation by performing a paper test (see ***"DOOR GASKET PAPER TEST").***

⚠WARNING

DO NOT OPERATE THIS APPLIANCE IF THE DOOR GASKET IS MISSING OR DAMAGED. OVER-FIRING MAY OCCUR WHICH CAN CAUSE DAMAGE TO THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY WHICH COULD LEAD TO A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

DOOR GASKET PAPER TEST

Perform this test when inspecting or replacing loading door gasket:

1. Ensure the fire is out and the appliance is cooled to touch.
2. Insert a piece of paper (ie. a dollar bill) into the door opening and then latch the door shut.
3. Pull the paper out of the door while noting any obvious resistance when doing so.
4. If no resistance is felt, adjust the door tension (see "***LOADING DOOR TENSION ADJUSTMENT***").
5. Repeat this process around the perimeter of the door until consistent resistance is achieved.

DOOR GLASS GASKET INSPECTION

To inspect the door glass gasket:

1. Ensure the fire is out and the appliance is cooled to touch.
2. Hold the glass by placing the palm of each hand on either side and try to move it; If the glass moves:
   a. Inspect the glass retainers and ensure the screws holding the retainers in place are tight (hand tight plus 1/4 turn). If loose, retighten, but do not over tighten.
   b. Inspect the door glass gasket. If the gasket is frayed or missing sections, replace the gasket.

⚠WARNING

REFRAIN FROM STRIKING THE GLASS OR SLAMMING THE DOOR SHUT. DO NOT OPERATE THIS APPLIANCE IF THE DOOR GLASS OR GASKET SEAL IS BROKEN. DOING SO MAY LEAD TO A RUN AWAY FIRE WHICH COULD RESULT IN PROPERTY DAMAGE.

DOOR GLASS GASKET REPLACEMENT

If door glass gasket replacement is required, only replace with OEM door glass gasket ordered through your Blaze King dealer. The OEM gasket will be ordered to size and ready to re-install. **Do not stretch or cut the gasket at any time during this installation. Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch.
2. Remove the old glass gasket.
3. Starting at the corner opposite of the "Blaze King" logo, carefully wrap the gasket around the edges of the door glass, 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. Reposition the glass onto the door and then install the glass retainers with original fasteners. Ensure the glass is parallel to the frame and tighten the fasteners (hand tight plus 1/4 turn).

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 AND 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.

BYPASS DOOR GASKET INSPECTION

Visually note the amount of smoke exiting the chimney while the bypass door is both OPEN and CLOSED. There should be significantly less smoke when the door is in the CLOSED position. If this is not the case, the bypass gasket may need to be replaced.

Note: This inspection could also yield a dead combustor, see "*COMBUSTOR MONITORING*".

BYPASS DOOR GASKET REPLACEMENT

If bypass door gasket replacement is required, only replace with OEM 5/8" fiber glass gasket ordered through your Blaze King dealer. The OEM gasket will be ordered to size and ready to re-install. **Do not stretch or cut the gasket at any time during this installation. Ensure only THERMOSEAL® 1000F high-temperature resistant cement is used for this installation (do not use household silicone caulking). Blaze King recommends that your dealer perform this task:**

1. Ensure the fire is out and the appliance is cooled to touch
2. Remove the flue pipe from the appliance in order to have a clear view of the bypass door **(Fig. 13)**.
3. Remove the combustor (see "*COMBUSTOR REPLACEMENT*").
4. After removing the combustor you will notice stainless bypass retainers on both the left and right sides of the combustor opening **(Fig. 14)**. They secure the bypass door in position during operation. Remove the stainless bypass retainers and set aside.
5. Working down through the flue collar, unhinge the bypass door from the bypass rod (rotating the bypass handle into a neutral position will help), then rotate the bypass door 90 degrees to remove through the combustor opening **(Fig. 15)**.
6. Remove the old gasket and clean away any residual cement from the gasket channel.
7. Apply the new high-temperature cement along the channel.
8. Place the new gasket into the channel, tapping it down to seat it securely.
9. Apply high temp anti-seize lubricant to the under side of the bypass hook **(Fig. 16)** and then reinstall the bypass door by following the previous steps in reverse order.
10. Rotate the bypass handle several times to OPEN/CLOSE the bypass door to ensure smooth and proper operation. Once satisfied, reattach the flue pipe.
11. Reinstall stainless bypass retainers into combustor opening.
12. Refer back to "*COMBUSTOR REPLACEMENT*" to reinstall the combustor. **Note: if the gasket around the combustor is damaged, it will have to be replaced.**

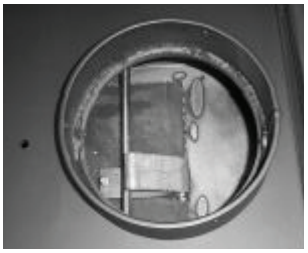


Fig. 13

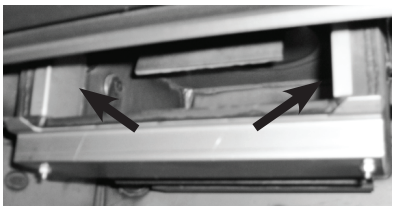


Fig. 14

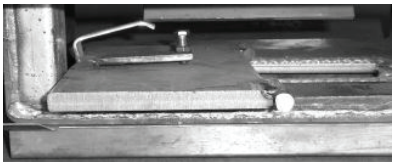


Fig. 15

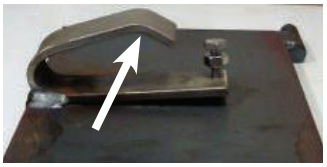


Fig. 16

VENTING SYSTEM MAINTENANCE

The entire chimney system must be cleaned and inspected regularly, especially during the coldest months of the burn season. The most efficient method to clean the chimney is to "sweep" it 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. **Ensure the bypass door is OPEN prior to chimney cleaning so soot and creosote fall into the firebox.** Once cleaned, inspect the chimney for any possible damage. If damage is present, the chimney section in question must be replaced.

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. Be aware that the hotter the fire, the less creosote is deposited. The flue pipe and chimney should be inspected regularly during the heating season, until a safe frequency for cleaning is established to determine if a creosote build up has occurred. If creosote accumulation is excessive, cleaning is required. It is recommended that a professional chimney sweep does the cleaning. Both the chimney and the appliance have to be cleaned at least once a year or as often as necessary.

⚠WARNING

A CHIMNEY FIRE CAN PERMANENTLY DAMAGE YOUR VENTING SYSTEM, WHICH CAN ONLY BE REPAIRED BY REPLACING THE DAMAGED COMPONENTS. FAILURE TO REPAIR COULD LEAD TO FURTHER PROPERTY DAMAGE. DAMAGE FROM A CHIMNEY FIRE IS NOT COVERED BY THE LIMITED WARRANTY.

RUN-AWAY OR CHIMNEY FIRE

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 thermostat by rotating the knob fully counter clockwise and ensure the firebox door is closed.
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, hose area down 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

IT IS ADVISED TO HAVE A WELL UNDERSTOOD PLAN OF ACTION IN THE EVENT OF A CHIMNEY FIRE

TROUBLESHOOTING

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 wood stove. Please study the operation instructions carefully. Consult your BLAZE KING dealer 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.

PROBLEM: Chimney Fire	
CAUSE Act immediately regardless of cause	**SOLUTION** Turn the thermostat to lowest setting, check loading door to be sure it is tightly closed. **Call Fire Department.**
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 Pipe”.	

PROBLEM: Not enough heat.	
CAUSE Green or wet wood. Not enough fuel in stove.	**SOLUTION** Use a moisture meter to ensure you are burning 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 a poorly designed chimney system.	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.

PROBLEM: Too much heat.	
CAUSE	**SOLUTION**
Bypass door left open.	Close the bypass 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.

PROBLEM: One or both fans will not run, or there is no adjustment for fan speed.	
CAUSE	**SOLUTION**
Fans mounted improperly.	Check that fan blade’s not touch edges of hole.
Fan speed control.	Consult your Blaze King dealer for replacement.

PROBLEM: Fans minimum speed too fast or maximum speed too slow.	
CAUSE	**SOLUTION**
Fan speed control out of adjustment.	Consult your Blaze King Dealer.

PROBLEM: Excessive creosote formation in chimney and chimney Connector.	
CAUSE	**SOLUTION**
Bypass door left open.	Close bypass door.
Bypass door not sealing tightly.	Inspect bypass door and seal for warping. Ash or creosote buildup may occur on door or seat. With stove cold scrape and vacuum area around bypass. 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 a poorly designed chimney system.	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.

PROBLEM: Catalytic 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)	
CAUSE	**SOLUTION**
Improper operation.	Check thermostat setting and operating procedures. See “THERMOSTAT & OPTIMAL THERMOSTAT SETTING”
Obstruction in chimney or cap.	Clean chimney, remove obstructions.
Faulty catalytic thermometer.	Check catalytic thermometer calibration.
Wood too green or wet.	Use seasoned wood.

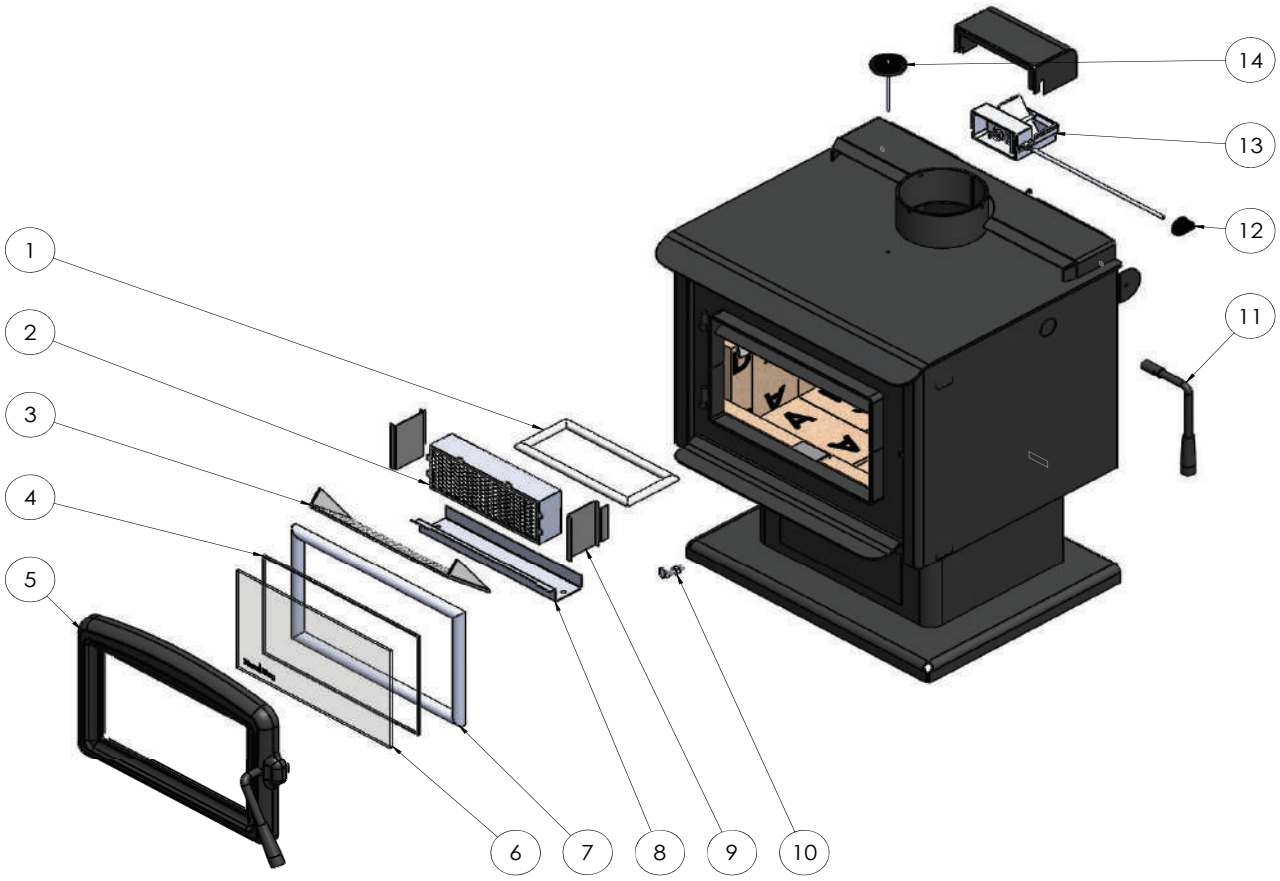
Combustor plugged or coated.	Clean combustor. See “CATALYTIC COMBUSTOR TESTING”
Combustor not functioning.	Check and test combustor. If needed replace combustor. See “CATALYTIC COMBUSTOR, REPLACING”
Thermostat not operating properly.	Consult your blaze King Dealer.
Bypass door leaking or not closing completely.	Inspect and clean area around bypass doors. Adjust or replace gasket if necessary. Consult your Blaze King Dealer.

PROBLEM: Spots of creosote accumulation in flue pipe or chimney.	
CAUSE Air leaks in flue pipe or chimney.	**SOLUTION** Inspect flue pipe and chimney. Repair or replace as necessary. Check to be sure that the flue pipe is installed correctly.
CAUTION: a leaking chimney system 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 Low thermostat setting or lowering the thermostat setting too far, too quickly.	**SOLUTION** 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. Install a Fresh Air Kit.
Burning poorly seasoned wet wood, or wood with high pitch content.	Use seasoned wood with low pitch content, such as some types of pine.

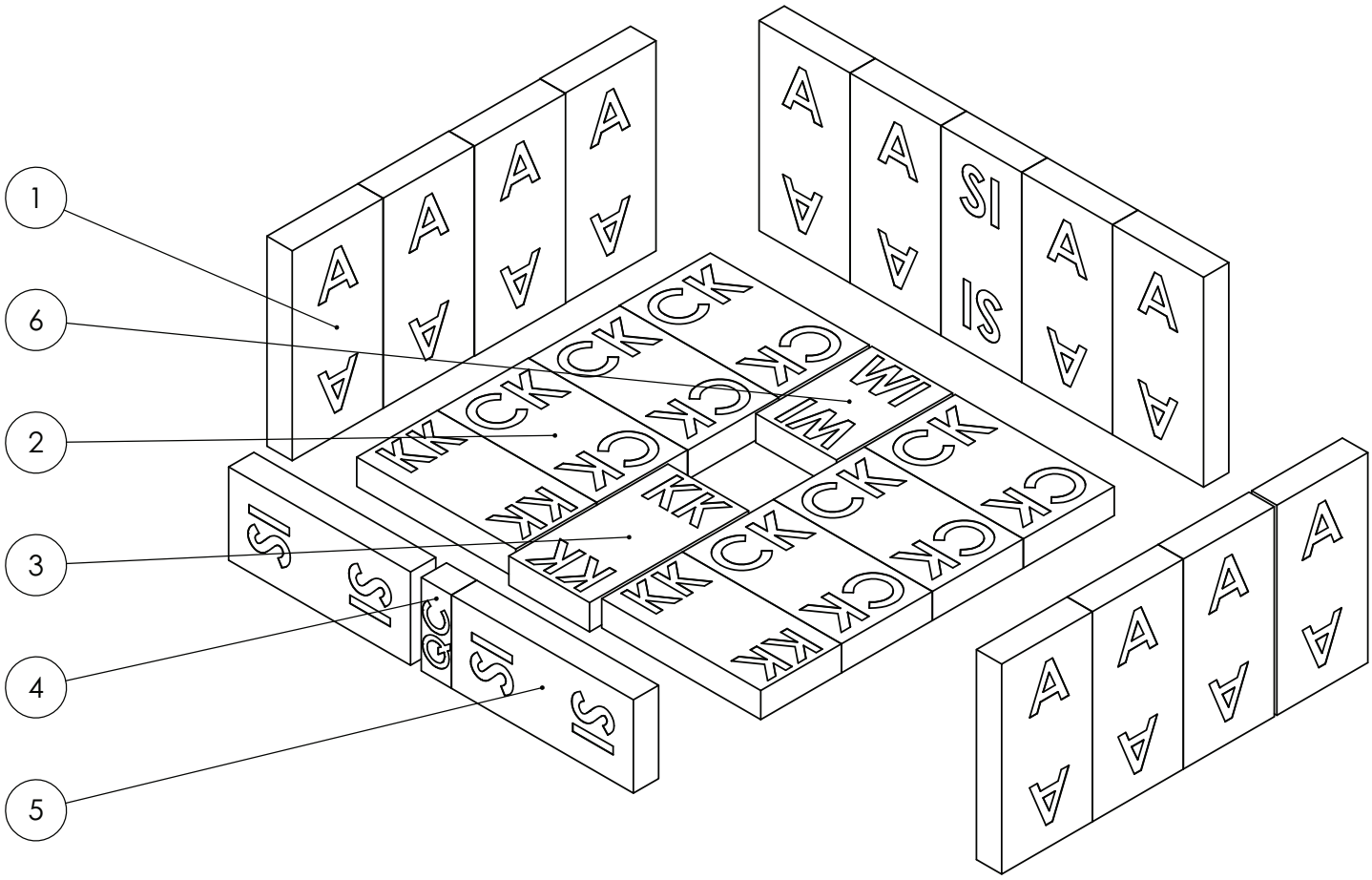
PROBLEM: The combustor temperature cannot be controlled. Turning the thermostat down often makes the combustor temperature go up.
CAUSE Turning the thermostat down, particularly in the first half of the burn cycle, causes the fire to emit more smoke, which is fuel for the combustor. The combustor temperature 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 Spark arrestor screen on cap plugged.	**SOLUTION** 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.



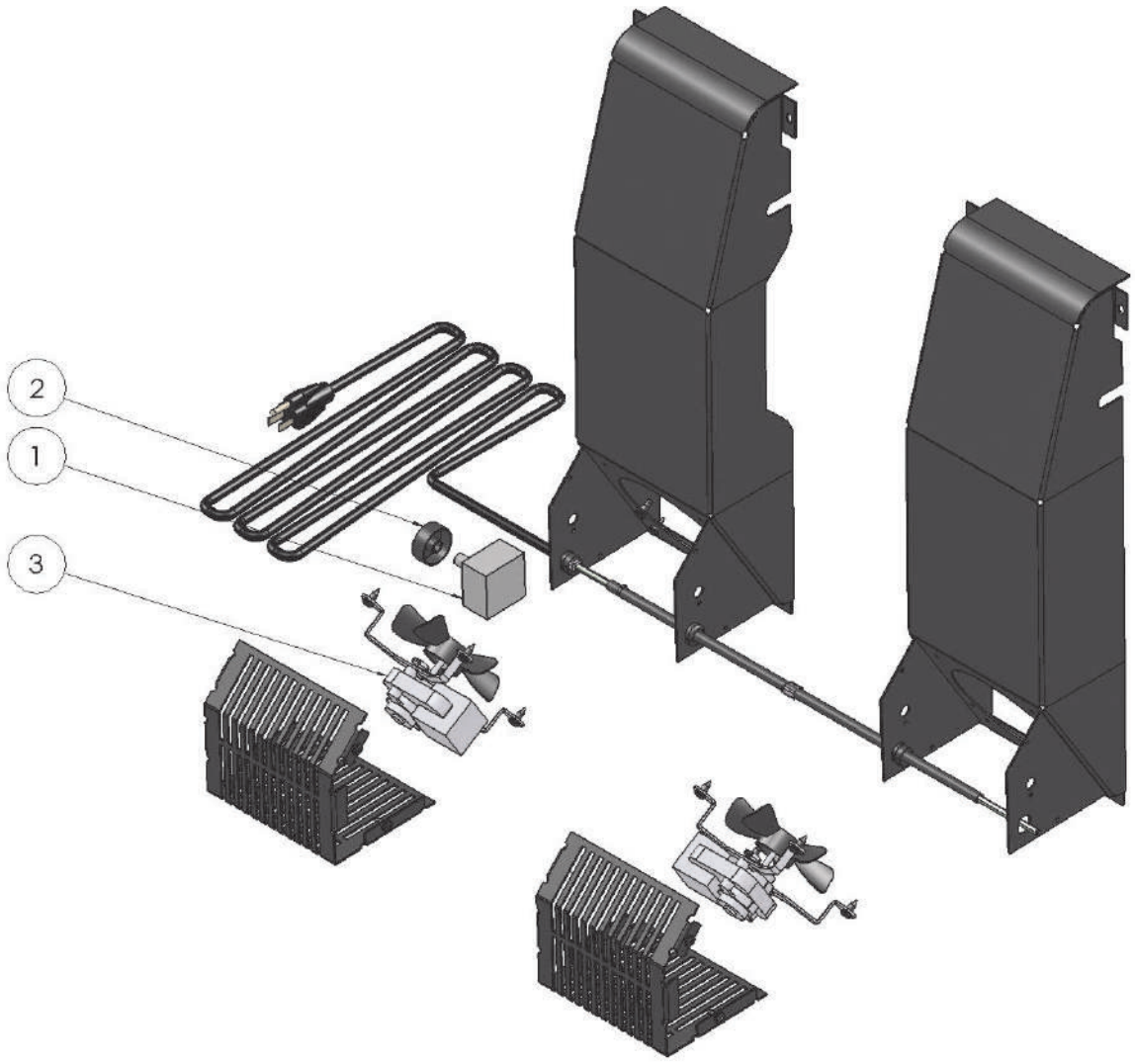
No. exploded view	Part #	Description	QTY
1	S.155.0255.B.3	BYPASS GASKET - 3 ft	1
2	S.CAT203032	COMBUSTOR ASSEMBLY	1
3	S.Z2430	FLAME SHIELD	1
4	S.155.0254.6	DOOR GLASS GASKET - 5 ft	1
5	S.Z2780	DOOR ASSEMBLY	1
6	130-0243	GLASS CERAMIC 5MM	1
7	S.155.0186.6	DOOR GASKET - 5 ft	1
8	S.Z4551	DOME GUARD REPLACEMENT KIT	1
9	S.Z4819	BYPASS RETAINER KIT	1
10	S.0693	LATCH CATCH	1
11	S.Z2452.M	BYPASS HANDLE	1
12	220-0102	THERMOSTAT KNOB	1
13	S.Z3009	THERMOSTAT ASSEMBLY	1
14	120-0342-E	CATALYTIC THERMOMETER	1

Brick Layout



ITEM NO.	PART NUMBER	QTY.
1	A Size Brick	12
2	CK Size Brick	6
3	KK Size Brick	3
4	QC Size Brick	1
5	SI Size Brick	3
6	WI Size Brick	1

S.Z1714 Fan Kit



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 first 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 wood stove 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.

INSTALLER NOTES

INSTALLER NOTES

INSTALLER NOTES

Installer - Please complete the following information:

Dealer Name & Address:_____

_____

Installer Name (print): _____

Installer Signature: _____

Installer Phone #: _____

Date Installed:_____

Appliance Serial No.: _____

8. Quality Assurance / Quality Control

8.1 OMNI's Quality Statement

OMNI's Testing capabilities and Evaluation credentials are covered under the requirements of ISO/IEC Standards, which are utilized by the recognized ILAC Accreditation Agencies to ensure that OMNI's services maintain quality and consistency. This includes the appliance Data/Results (associated with the Construction Evaluation and Performance Evaluation), which are summarized in this specific Report, and are maintained through diligent adherence to the accreditation standards. The Testing, Data Evaluation, Document Review, and Evaluation Report are all conducted and adhere to the system and process/procedures requirements of ISO/IEC 17025, as well as the those set forth by each agency's own program guidelines.

Along with the ISO/IEC 17025 and accreditation agency requirements, OMNI incorporates its own procedures and company policies. These are reviewed (at minimum) on an annual basis, through both internal and external audits of OMNI's Quality Management System. A short list of agencies that accredit OMNI for approval to conduct the scope of services provided, please read the list below.

OMNI's scope of accreditation includes (but is not limited to), the following agencies:

- **International Accreditation Service, Inc. (IAS):** Approved to Test and complete an Evaluation of specified appliances (covered in OMNI's scope of testing certificate) to confirm compliance with performance standard criteria and (ID #TL-130). Also approved for Certification of United States products to the applicable U.S. safety standards (ID #PCA-156) and Inspection/Surveillance of those products (ID #AA-706).
- **Standards Council of Canada (SCC):** Approved for Certification of Canadian products to Canadian safety standards.
- **EPA Recognition and Approval:** Approved under 40 CFR 60 by the United States EPA as a Test Lab, 3rd Party Certification Body, and an Inspection agency.

If this Evaluation Report is used in an appliance's Certification, an Initial Factory Audit will need to be completed before a Certification can be issued (this may be waived after a client's first Certification has been completed and the client has maintained their Listings in good standing). If the appliance covered in this Report is Certified and Listed on OMNI's Public Listing Directory (PLD), then this Report may be used as a reference document to conduct the annual Quality Control and Product Inspections, which is required to maintain the appliance Listing. If discrepancies are found between the appliance and the information in this Report during the annual inspections, and the owner(s) of the Listing appliance fails to produce evidence or data to resolve said discrepancies, especially in cases that may jeopardize an end-user's safety, then OMNI reserves the right to revoke the appliance Listing.

8.2 Manufacturer's Quality Assurance Plan (QAP)

8.3 Equipment and Calibrations

Equipment List

Item No.	Eq. No.	Description	Cal Date	Cal Due
1	OMNI-00335	Dry Gas Meter System A (Train A)	9/18/2023	3/18/2024
2	OMNI-00336	Dry Gas Meter System B (Train B)	9/18/2023	3/18/2024
3	OMNI-00371	Dry Gas Meter System C (First Hour)	9/14/2023	3/14/2024
4	OMNI-00372	Dry Gas Meter System D (Background)	9/14/2023	3/14/2024
5	OMNI-00742	Moisture Meter	VBU[1]	
6	OMNI-00431	Moisture Meter Reference Block	10/28/2023	10/28/2024
7	OMNI-00353	Scale, Fuel Preparation	8/10/2023	8/10/2028
8	OMNI-00743	Tape Measure, Fuel Preparation	12/6/2023	12/6/2028
9	OMNI-00715	Barometer / Humidity gauge	11/7/2023	5/7/2024
10	OMNI-00737	Anemometer (Room air velocity)	10/6/2023	10/6/2024
11	OMNI-00185	Platform Scale, 1000 lb.	9/7/2023	9/7/2024
12	OMNI-00274	10 Lb. Audit Weight (1 of 2)	4/7/2023	4/7/2028
13	OMNI-00132	10 Lb. Audit Weight (2 of 2)	2/15/2023	2/15/2028
14	OMNI-00410	Manometer, microtector	4/6/2023	4/6/2024
15	OMNI-00637	Analytical Balance, 200g	2/8/2024	8/31/2024
16	OMNI-00283A	Gram Audit Weights	10/24/2023	10/24/2028
17	OMNI-00733	Hygrometer/Thermometer	11/9/2022	11/9/2027
18	OMNI-00594	Continuous Analyzer, CO2%, CO%, CO ppm	VBU[2]	
19	CC474450	Span Gas, 16.86% CO2, 4.37% CO	4/25/2023	4/25/1931
20	CC313045	Span Gas, 500 ppm CO	5/14/2021	5/13/2026
21	3AA2400G	Nitrogen (Zero Gas)		

VBU[1] - Verified Before Use using Item No. 6

VBU[2] - Calibrated and verified before use using Items 19, 20 and 21

Thermal Metering System Calibration
Y Factor

Manufacturer:	Apex
Model:	XC-60-EP
Serial Number:	606001
OMNI Tracking No.:	OMNI-000335
Calibrated Orifice:	☐ Yes

Average Gas Meter y Factor	Orifice Meter dH@
1.016	N/A

Calibration Date:	09/18/23	
Calibrated by:	Tony Tong	
Calibration Frequency:	Six Month	
Next Calibration Due:	3/18/2024	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.08	"Hg
Signature/Date:	Tony Tong	09/19/2023

Previous Calibration Comparision

Date	4/27/2023	Acceptable Deviation (5%)	Deviation
y Factor	1.007	0.05035	0.009
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.003
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00330	
	Calib. Date	13-Apr-23	
	Calib. Value	1.0017	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	2.00	1.26	1.00
Initial Reference Meter	380.314	387.061	393.677
Final Reference Meter	386.864	393.561	400.047
Initial DGM	0	0	0
Final DGM	6.471	6.497	6.39
Temp. Ref. Meter (°F), Tr	76.1	76.6	77.7
Temperature DGM (°F), Td	81.0	86.0	87.0
Time (min)	32.0	40.0	44.0
Net Volume Ref. Meter, Vr	6.550	6.500	6.370
Net Volume DGM, Vd	6.471	6.497	6.39
Gas Meter y Factor =	**1.018**	**1.017**	**1.013**
Gas Meter y Factor Deviation (from avg.)	0.002	0.001	0.003
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|
** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]
** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory
** Equations come from EPA Method 5
The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer (Draft)

Maximum Range: 0 – 1" H_2O ID Number: OMNI-00335

Calibration Instrument: Digital Manometer ID Number: OMNI-00633

Date: 09/18/2023 By: Tony Tong

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference | Input – Response |	% Error of Full Span*
0-20% Max. Range 0.0 – 0.2	0.101	0.103	0.002	0.2
20-40% Max. Range 0.2– 0.4	0.230	0.232	0.002	0.2
40-60% Max. Range 0.4 – 0.6	0.463	0.465	0.002	0.2
60-80% Max. Range 0.6 – 0.8	0.728	0.730	0.002	0.2
80-100% Max. Range 0.8 – 1.0	0.943	0.945	0.002	0.2

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: Tony Tong Date: 09/19/2023

Reviewed by: _____ Date: _____

Temperature Calibration EPA Method 28 R, ASTM 2515							
Booth:	Temperature Monitor Type:					Equipment Number:	
E 1	National Instruments Logger					00335, 00336	
Reference Meter Number: 00373				Calibration Due Date: 10/23/2023			
Calibration Performed By:			Date:	Ambient Temperature(F°):		Barometric Pressure(inHg):	
Tony Tong			09/18/2023	75.2		30.09	
Input Temp (°F)	**Ambient**	**Meter A**	**Meter B**	**Filter A**	**Filter B**	**Tunnel**	**FB Interior**
0	1	1	1	1	1	0	0
100	101	101	101	101	101	100	100
300	301	301	301	301	301	300	300
500	501	501	501	501	501	500	500
700	701	701	701	701	701	700	700
1000	1001	1001	1001	1001	1001	1001	1001
1500	1501	1501	1501	1501	1501	1501	1501
2000	2002	2002	2002	2001	2002	2001	2001

Input (°F)	**FB Top**	**FB Bottom**	**FB Back**	**FB Left**	**FB Right**	**Imp A**	**Imp B**	**Cat**	**Stack**
0	0	0	0	0	0	1	1	1	0
100	100	100	100	100	100	100	101	101	100
300	300	300	300	300	300	301	301	300	300
500	500	500	500	500	500	501	501	501	500
700	700	700	700	700	700	701	701	701	700
1000	1001	1001	1001	1001	1001	1001	1001	1001	1001
1500	1501	1501	1501	1501	1501	1501	1501	1501	1501
2000	2001	2001	2001	2001	2001	2002	2002	2001	2001

Technician Signature: Tony Tong Date: 09/19/2023

Reviewed By:_____ Date: _____

Thermal Metering System Calibration
Y Factor

Manufacturer:	Apex
Model:	XC-60-EP
Serial Number:	606001
OMNI Tracking No.:	OMNI-00336
Calibrated Orifice:	☐ Yes

Average Gas Meter y Factor	Orifice Meter dH@
1.011	N/A

Calibration Date:	09/18/23	
Calibrated by:	Tony Tong	
Calibration Frequency:	Six Month	
Next Calibration Due:	3/18/2024	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.06	"Hg
Signature/Date:	Tony Tong	09/19/2023

Previous Calibration Comparision

Date	4/27/2023	Acceptable Deviation (5%)	Deviation
y Factor	1.015	0.05075	0.004
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.002
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00330	
	Calib. Date	13-Apr-23	
	Calib. Value	1.0017	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	1.93	0.96	0.75
Initial Reference Meter	401.417	406.87	412.46
Final Reference Meter	406.732	412.324	417.96
Initial DGM	0	0	0
Final DGM	5.292	5.483	5.528
Temp. Ref. Meter (°F), Tr	77.9	78.4	78.3
Temperature DGM (°F), Td	83.0	86.0	88.0
Time (min)	24.0	34.0	38.0
Net Volume Ref. Meter, Vr	5.315	5.454	5.500
Net Volume DGM, Vd	5.292	5.483	5.528
Gas Meter y Factor =	**1.011**	**1.008**	**1.013**
Gas Meter y Factor Deviation (from avg.)	0.000	0.002	0.002
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|
** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]
** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer (ΔP)

Maximum Range: 0 – 1" H_2O ID Number: OMNI-00336

Calibration Instrument: Digital Manometer ID Number: OMNI-00633

Date: 09/18/2023 By: Tony Tong

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference | Input – Response |	% Error of Full Span*
0-20% Max. Range 0.0 – 0.2	0.096	0.100	0.004	0.4
20-40% Max. Range 0.2– 0.4	0.258	0.262	0.004	0.4
40-60% Max. Range 0.4 – 0.6	0.462	0.467	0.005	0.5
60-80% Max. Range 0.6 – 0.8	0.735	0.742	0.007	0.7
80-100% Max. Range 0.8 – 1.0	0.961	0.969	0.008	0.8

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: Tony Tong Date: 09/19/2023

Reviewed by: _____ Date: _____

Temperature Calibration
EPA Method 28 R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
E 1	National Instruments Logger	00335, 00336

Reference Meter Number: 00373	Calibration Due Date: 10/23/2023

Calibration Performed By:	Date:	Ambient Temperature(F°):	Barometric Pressure(inHg):
Tony Tong	09/18/2023	75.2	30.09

Input Temp (°F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	1	1	1	1	1	0	0
100	101	101	101	101	101	100	100
300	301	301	301	301	301	300	300
500	501	501	501	501	501	500	500
700	701	701	701	701	701	700	700
1000	1001	1001	1001	1001	1001	1001	1001
1500	1501	1501	1501	1501	1501	1501	1501
2000	2002	2002	2002	2001	2002	2001	2001

Input (°F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	0	0	0	0	0	1	1	1	0
100	100	100	100	100	100	100	101	101	100
300	300	300	300	300	300	301	301	300	300
500	500	500	500	500	500	501	501	501	500
700	700	700	700	700	700	701	701	701	700
1000	1001	1001	1001	1001	1001	1001	1001	1001	1001
1500	1501	1501	1501	1501	1501	1501	1501	1501	1501
2000	2001	2001	2001	2001	2001	2002	2002	2001	2001

Technician Signature: Tony Tong Date: 09/19/2023

Reviewed By:_____ Date: _____

Thermal Metering System Calibration
Y Factor

Manufacturer:	Apex
Model:	XC-60-EP
Serial Number:	702003
OMNI Tracking No.:	OMNI-00371
Calibrated Orifice:	☐ Yes

Previous Calibration Comparision

Date	4/27/2023	Acceptable Deviation (5%)	Deviation
y Factor	1.014	0.0507	0.001
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.006
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Average Gas Meter y Factor	Orifice Meter dH@
1.015	N/A

Calibration Date:	09/14/23	
Calibrated by:	Tony Tong	
Calibration Frequency:	Six Month	
Next Calibration Due:	3/14/2024	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.08	"Hg
Signature/Date:	Tony Tong	/ 9/14/2023

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00330	
	Calib. Date	13-Apr-23	
	Calib. Value	1.0017	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	3.17	2.20	1.00
Initial Reference Meter	343.578	349.273	354.856
Final Reference Meter	349.022	354.658	360.486
Initial DGM	0	0	0
Final DGM	5.329	5.318	5.604
Temp. Ref. Meter (°F), Tr	76.2	76.1	76.7
Temperature DGM (°F), Td	79.0	79.0	80.0
Time (min)	27.0	33.0	52.0
Net Volume Ref. Meter, Vr	5.444	5.385	5.630
Net Volume DGM, Vd	5.329	5.318	5.604
Gas Meter y Factor =	**1.021**	**1.014**	**1.010**
Gas Meter y Factor Deviation (from avg.)	0.006	0.001	0.005
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|
** 2. y = [Vr x (y factor (ref)) x (Pb + (Pr/ 13.6)) x (Td + 460)]/ [Vd x (Pb + (Pd / 13.6)) x (Tr + 460)]
** 3. dH@ = 0.0317 x Pd / (Pb (Td + 460)) x [(Tr + 460) x time) / Vr]^2

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer (Draft)

Maximum Range: 0 – 1" H_2O ID Number: OMNI-00371

Calibration Instrument: Digital Manometer ID Number: OMNI-00633

Date: 09/13/2023 By: Tony Tong

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference | Input – Response |	% Error of Full Span*
0-20% Max. Range 0.0 – 0.2	0.083	0.081	0.002	0.2
20-40% Max. Range 0.2– 0.4	0.239	0.238	0.001	0.1
40-60% Max. Range 0.4 – 0.6	0.452	0.455	0.003	0.3
60-80% Max. Range 0.6 – 0.8	0.726	0.729	0.003	0.3
80-100% Max. Range 0.8 – 1.0	0.942	0.948	0.006	0.6

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: Tony Tong Date: 09/14/2023

Reviewed by: _____ Date: _____

Temperature Calibration
EPA Method 28 R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
E 1	National Instruments Logger	00371, 00372

Reference Meter Number: 00373	Calibration Due Date: 10/23/2023

Calibration Performed By:	Date:	Ambient Temperature(F°):	Barometric Pressure(inHg):
Tony Tong	09/13/2023	79.9	30.10

Input Temp (°F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	0	1	0	0	0	1	1
100	100	101	100	100	100	101	101
300	300	300	300	300	300	301	301
500	500	500	500	500	500	501	501
700	700	700	700	700	700	701	701
1000	1000	1000	1000	1000	1000	1001	1001
1500	1500	1502	1500	1501	1500	1501	1501
2000	2000	2000	2001	2000	2001	2001	2001

Input (°F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	1	1	1	1	1	0	0	0	1
100	101	101	101	101	101	100	100	100	101
300	301	301	301	301	301	300	300	300	301
500	501	501	501	501	501	500	500	500	501
700	701	701	701	701	701	700	700	700	701
1000	1001	1001	1001	1001	1001	1000	1000	1000	1001
1500	1501	1501	1501	1501	1501	1500	1500	1500	1501
2000	2001	2001	2001	2001	2001	2000	2000	2000	2001

Technician Signature: Tony Tong Date: 09/14/2023

Reviewed By:_____ Date: _____

Thermal Metering System Calibration
Y Factor

Manufacturer:	Apex
Model:	XC-60-EP
Serial Number:	702004
OMNI Tracking No.:	OMNI-00372
Calibrated Orifice:	☐ Yes

Average Gas Meter y Factor	Orifice Meter dH@
1.011	N/A

Calibration Date:	09/14/23	
Calibrated by:	Tony Tong	
Calibration Frequency:	Six Month	
Next Calibration Due:	3/14/2024	
Instrument Range:	1.000	cfm
Standard Temp.:	68	oF
Standard Press.:	29.92	"Hg
Barometric Press., Pb:	30.05	"Hg
Signature/Date:	Tony Tong	/09/14/2023

Previous Calibration Comparision

Date	5/1/2023	Acceptable Deviation (5%)	Deviation
y Factor	1.012	0.0506	0.001
Acceptance	Acceptable		

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.004
Acceptable dH@ Deviation	N/A
Maximum dH@ Deviation	N/A
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	OMNI-00330	
	Calib. Date	13-Apr-23	
	Calib. Value	1.0017	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Reference Meter Pressure ("H2O), Pr	0.00	0.00	0.00
DGM Pressure ("H2O), Pd	2.50	1.70	0.75
Initial Reference Meter	360.788	366.597	373.258
Final Reference Meter	366.285	373.11	379.564
Initial DGM	0	0	0
Final DGM	5.431	6.452	6.293
Temp. Ref. Meter (°F), Tr	77.0	77.6	78.0
Temperature DGM (°F), Td	80.0	81.0	81.0
Time (min)	28.0	41.0	64.0
Net Volume Ref. Meter, Vr	5.497	6.513	6.306
Net Volume DGM, Vd	5.431	6.452	6.293
Gas Meter y Factor =	**1.013**	**1.013**	**1.008**
Gas Meter y Factor Deviation (from avg.)	0.002	0.002	0.004
Orifice dH@	**N/A**	**N/A**	**N/A**
Orifice dH@ Deviation (from avg.)	N/A	N/A	N/A

where:

1. Deviation = |Average value for all runs - current run value|
** 2. $y = [Vr \times (y\ factor\ (ref)) \times (Pb + (Pr/13.6)) \times (Td + 460)] / [Vd \times (Pb + (Pd/13.6)) \times (Tr + 460)]$
** 3. $dH@ = 0.0317 \times Pd / (Pb\ (Td + 460)) \times [\ (Tr + 460) \times time) / Vr\ ]^2$

* Reference calibration is traceable to NIST through NIST Test # 40674, Kimble ASTM E1272, or NIST traceable laboratory

** Equations come from EPA Method 5

The uncertainty of measurement is ±0.14 ft^3/min. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

DIFFERENTIAL PRESSURE GAUGE CALIBRATION DATA SHEET

Instrument to be calibrated: Pressure Transducer (ΔP)

Maximum Range: 0 – 1" H_2O ID Number: OMNI-00372

Calibration Instrument: Digital Manometer ID Number: OMNI-00633

Date: 09/13/2023 By: Tony Tong

This form is to be used only in conjunction with Standard Procedure C-SPC.

Range of Calibration Point ("WC)	Digital Manometer Input ("WC)	Pressure Gauge Response ("WC)	Difference | Input – Response |	% Error of Full Span*
0-20% Max. Range 0.0 – 0.2	0.104	0.105	0.001	0.1
20-40% Max. Range 0.2– 0.4	0.252	0.254	0.002	0.2
40-60% Max. Range 0.4 – 0.6	0.519	0.524	0.005	0.5
60-80% Max. Range 0.6 – 0.8	0.662	0.669	0.007	0.7
80-100% Max. Range 0.8 – 1.0	0.957	0.967	0.010	1.0

*Acceptable tolerance is 4%.

The uncertainty of measurement is ±0.4" WC. This is based on the reference standard having a TAR (Test Accuracy Ratio) of at least 4:1.

Technician signature: Tony Tong Date: 09/14/2023

Reviewed by: _____ Date: _____

Temperature Calibration
EPA Method 28 R, ASTM 2515

Booth:	Temperature Monitor Type:	Equipment Number:
E 1	National Instruments Logger	00371, 00372

Reference Meter Number: 00373	Calibration Due Date: 10/23/2023

Calibration Performed By:	Date:	Ambient Temperature(F°):	Barometric Pressure(inHg):
Tony Tong	09/13/2023	79.9	30.10

Input Temp (°F)	Ambient	Meter A	Meter B	Filter A	Filter B	Tunnel	FB Interior
0	0	1	0	0	0	1	1
100	100	101	100	100	100	101	101
300	300	300	300	300	300	301	301
500	500	500	500	500	500	501	501
700	700	700	700	700	700	701	701
1000	1000	1000	1000	1000	1000	1001	1001
1500	1500	1502	1500	1501	1500	1501	1501
2000	2000	2000	2001	2000	2001	2001	2001

Input (°F)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Imp A	Imp B	Cat	Stack
0	1	1	1	1	1	0	0	0	1
100	101	101	101	101	101	100	100	100	101
300	301	301	301	301	301	300	300	300	301
500	501	501	501	501	501	500	500	500	501
700	701	701	701	701	701	700	700	700	701
1000	1001	1001	1001	1001	1001	1000	1000	1000	1001
1500	1501	1501	1501	1501	1501	1500	1500	1500	1501
2000	2001	2001	2001	2001	2001	2000	2000	2000	2001

Technician Signature: Tony Tong Date: 09/14/2023

Reviewed By:_____ Date: _____

Certificate of Calibration

Certificate Number: 804038

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

PO: 1223/230454
Order Date: 10/16/2023
Authorized By: N/A

Property #: OMNI-00715
User: N/A
Department: N/A
Make: Control Company
Model: 6530
Serial #: 221461542
Description: Thermohygrometer / Barometer
Procedure: 403406
Accuracy: ±3%RH, ±.4°C(0.8°F), ±4mbar

Calibrated on: 11/07/2023
*Recommended Due: 05/07/2024
Environment: 23 °C 40 % RH
* As Received: Within Tolerance
* As Returned: Within Tolerance
Action Taken: Calibrated
Technician: 40

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
925A	RH Systems	CGS-240	Humidity Generator	02/22/2024	789080
847A	Fluke	RPM4	Reference Pressure Monitor	06/01/2024	787534

Measurement Data

Parameter / Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = ✓
Humidity								
	10	%	10.0010	7.001	13.001	0.999	11.000 %	6E-01 ✓
	50	%	50.0020	47.002	53.002	1.002	49.000 %	6E-01 ✓
	80	%	80.0	77	83	3	77 %	6E-01 ✓
Temperature								
	10	℃	10.0010	9.601	10.401	0.101	9.900 ℃	7.5E-02 ✓
	30	℃	30.0010	29.601	30.401	0.201	29.800 ℃	7.5E-02 ✓
	60	℃	59.9910	59.591	60.391	0.291	59.700 ℃	7.5E-02 ✓
Barometer								
		inHg	29.926200	29.80808	30.04432	0.02380	29.95000 inHg	1.8E-01 ✓

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to the SI through an NMI such as but not limited to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by ILAC G8:2019. Unless otherwise stated, a test uncertainty ratio (TUR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above.

Reviewer

3 Issued 11/08/2023 Rev # 15

Inspector

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

A2LA ACCREDITED
CERTIFICATE #1550.01

OMNI-Test Laboratories, Inc.
13327 NE Airport Way
Portland, OR 97230

Report Number: OMNE03MKW-04072230810

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	EXCELL	MTW-150K	MKW-04072	OMNI-00353	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
kg	0.05	QC033	8/10/23	N/A	8/2028

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 50 / Tol: 0.20	Test Wt: HB44 / Tol: HB44	Test Wt: 20 / Tol: 0.1	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 25.6°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
150	150.05	150.05	0.029
100	100.05	100.05	0.029
50	50.00	50.00	0.029
25	25.00	25.00	0.029
10	10.00	10.00	0.029
5	5.00	5.00	0.029

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	7/18/22	7/2024	20221688
Avoirdupois Weight	Rice Lake	10lb to 0.001lb	95473	9/13/22	9/2023	20221504

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

8/23 - Cleaned & leveled. Converted weight from lbs to kg. RH = 40%

Report prepared/reviewed by: RB **Date:** 8-14-23

Technician: D.Oudeans
Signature: R. Bartha For D. oudeans

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 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.

Quality Control Services
Report of Service and Calibration

2340 S.E. 11TH AVENUE
PORTLAND, OR 97214
PHONE 503-236-2712

74414

Sold To OMNI-Test Laboratories, Inc. PT ID: OMNE03 P.O. No: 230442
Address PO Box 301367 Contact: Michael Castillo
City Portland, OR 97294 Phone: 503-643-3788
Ship To 13327 NE Airport Way Portland, OR 97230 Email: mcastillo@omni-test.com

No	Item	Make	Model	Serial Number	Location	Contact	Rate	Date Svc'd 2023	Tech	Cust ID
1	Balance	Mettler	MS104TS	B729400181	Lab	Michael Castillo	$180.00	6/10	M	OMNI-00637
2	Scale	EXCELL	MTW-150K	MKW-04072	Lab	Michael Castillo	$180.00	6/10	K	OMNI-00353

Service / Calibration Documentation Requirements
- ☐ Certificate of Calibration
- ☐ Calibration with Data
- ☒ A2LA Certificate

Received By: _____ Date: _____

Comments: #2. Needs 5 yr cycle & 350lb max

Certificate of Calibration

Certificate Number: 791395

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

PO: 230427
Order Date: 03/30/2023
Authorized By: N/A

Property #: OMNI-00274
User: N/A
Department: N/A
Make: Rice Lake
Model: 10 Lbs. (Class F)
Serial #: OMNI-00274
Description: Mass
Procedure: DCN 500901
Accuracy: Class F (±450mg)

Calibrated on: 04/07/2023
*Recommended Due: 04/07/2028
Environment: 20 °C 44 % RH
* As Received: Within Tolerance
* As Returned: Within Tolerance
Action Taken: Calibrated
Technician: 175

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Received and returned with no case.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
550A	And (A&D) Co.	HP-30K	Analytical Balance, 30Kg	02/07/2024	785492
92A	Rice Lake	1oz to 10 lbs (Class F)	Mass Set,	11/18/2023	759449

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After							Accredited = ✓
Mass							
10 Lbs.	g	4535.9240	4535.474	4536.374	0.324	4535.600 g	3.6E-01 ✓

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 04/07/2023 Rev # 15

Inspector

SCALE WEIGHT CALIBRATION DATA SHEET

Weight to be calibrated: 10 lbs

ID Number: OMNI-00132

Reference Standard Weight: 10 lbs

ID Number: OMNI-00255

Scale Used: MTW-150K

ID Number: OMNI-00353

Date: 02/15/2023 By: Tony Tong

Standard Weight (A) (Lb.)	Weight Verified (B) (Lb.)	Difference (A – B)	Error (%)
10.0	10.0	0.0	0.0

Acceptable tolerance is 1%.

This calibration is traceable to NIST using calibrated standard weight.

Technician signature: Tony Tong Date: 02/15/2023

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

A2LA ACCREDITED
CERTIFICATE #1550.01

OMNI-Test Laboratories, Inc.
13327 NE Airport Way
Portland, OR 97230

Report Number: OMNE03005547230907

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Weigh-Tronix	WI-127 1000x0.1lb	005547	OMNI-00185	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.1	QC033	9/7/23	9/1/22	9/2024

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 250 Tol: 0.4	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.2	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 23.4°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	1000.3	1000.2	0.05
700	700.2	700.1	0.05
500	500.2	500.1	0.05
200	200.1	200.0	0.05
100	100.1	100.0	0.05
50	50.1	50.0	0.05

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	7/18/22	7/2024	20221688

Permanent Information Concerning this Equipment:
Old s/n 21676

Comments/Information Concerning this Calibration
9/23 RH= 47.4%

Report prepared/reviewed by: R. B. **Date:** 9-7-23 **Technician:** R. Butcher
Signature: R. Butcher

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 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.

Member: National Conference of Standards Laboratories and Weights & Measures

PT ID: OMNE03

CALIBRATED BY TRANSCAT CERTIFICATE OF CALIBRATION

Customer: OMNI-TEST LABORATORIES INC
13327 NE AIRPORT WAY
PORTLAND, OR 97230

PO Number: 230453

ANAB ACCREDITED ISO/IEC 17025 CALIBRATION AND DIMENSIONAL MEASUREMENT ANAB AC-2489.08

Certificate/SO Number: 19-E6W3O-20-1 Revision 0

Manufacturer: Troemner/Talboys
Model Number: 100 g - 200 mg
Description: Weight Set, 8 Pcs, Class F
Serial Number: 47883
ID: OMNI-00283A

As-Found: In Tolerance
As-Left: In Tolerance

Issue Date: Oct 24, 2023
Calibration Date: Oct 24, 2023
Due Date: Oct 24, 2028

Calibrated To: Manufacturer Specification
Calibration Procedure: 6-AC11601-3

099

Transcat Calibration Laboratories have been audited and found in compliance with ISO/IEC 17025:2017. Accredited calibrations performed within the Lab Scope of Accreditation are indicated by the presence of the Accrediting Body Logo and Certificate Number. Any measurements on an accredited calibration not covered by the Lab Scope of Accreditation are listed in the notes section of the certificate. SCC, NRC, CLAS or ANAB do not guarantee the accuracy of an individual calibration by accredited laboratories.

Transcat calibrations, as applicable, are performed in compliance with the requirements of the Transcat Quality Manual QAC-P01-000, the customer Purchase Order and/or Quality Agreement requirements, ISO 9001:2015, ANSI/NCSL Z540.1-1994 (R2002), and ISO 10012:2003, as applicable. When specified contractually, the requirements of ISO TS16949:2009, 10CFR21, 10CFR50 App. B, ASME NQA-1:2012, and ANSI/NCSL Z540.3-2006 (R2013) are also covered.

Complete records of work performed are maintained by Transcat and are available for inspection. Laboratory standards used in the performance of this calibration are listed on this certificate.

Transcat documents the traceability of measurements to the SI units through the National Institute of Standards and Technology(NIST), or the National Research Council of Canada (NRC), or other national measurement institutes (NMI) that are signatories to the CIPM Mutual Recognition Arrangement, or accepted fundamental and/or natural physical constants, or by the use of specified methods, consensus standards or ratio type measurements. Documentation supporting traceability information is available for review upon written request at a Transcat facility. The measured quantity and the measurement uncertainty are required for further dissemination of traceability.

Uncertainties are reported with a coverage factor k=2, providing a level of confidence of approximately 95%. All calibrations have been performed using processes having a TUR of 4:1 or better (3:1 for mass calibrations), unless otherwise noted. The Test Uncertainty Ratio (TUR) is calculated in accordance with NCSL International RP-18. For mass calibrations: Conventional mass referenced to 8.0 g/cm³.

The results in this report relate only to the item calibrated or tested. Recorded calibration data is valid at the time of calibration within the stated uncertainties at the environmental conditions noted. The determination of compliance to the specification is specific to the model/serial no./ID no. referenced above based on the tolerances shown; these tolerances are either the original equipment manufacturers (OEM's) warranted specifications or the client's requested specifications. Any number of factors can cause a unit to drift out of tolerance at any time following its calibration. Limitations on the uses of this instrument are detailed in the OEM's operating instructions. This certificate may not be reproduced except in full, without the written approval of Transcat. Additional information, if applicable may be included on separate report(s).

CALIBRATED BY TRANSCAT CERTIFICATE OF CALIBRATION

Customer: OMNI-TEST LABORATORIES INC
13327 NE AIRPORT WAY
PORTLAND, OR 97230

PO Number: 230453

ANAB ACCREDITED ISO/IEC 17025 CALIBRATION AND DIMENSIONAL MEASUREMENT ANAB AC-2489.08

Certificate/SO Number: 19-E6W3O-20-1 Revision 0

As Found/As Left Data

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	OOT	Cal Process Uncertainty (k=2; ±)	Measurement Uncertainty (k=2; ±)	Units	TUR
Test Environment Ambient Temperature - W1										
Ambient Temperature					20.000 °C					
Test Environment Ambient Relative Humidity - W1										
Relative Humidity					40.00 %RH					
Test Environment Barometric Pressure - W1										
Barometric Presssure					29.751 "Hg@0°C					
Mass Measurement - W1	100.0000g	±(0.02 g)	99.9800	100.0200	99.9982 g		0.00025	0.00025	g	80.0 : 1
Mass Measurement - W2	50.0000g	±(0.01 g)	49.9900	50.0100	49.9994 g		0.00015	0.00015	g	66.7 : 1
Mass Measurement - W3	20.0000g	±(0.004 g)	19.9960	20.0040	20.0010 g		0.000087	0.000087	g	46.0 : 1
Mass Measurement - W4	10.0000g	±(0.002 g)	9.9980	10.0020	9.9998 g		0.000062	0.000062	g	32.3 : 1
Mass Measurement - W5	5.000000g	±(0.001501 g)	4.998499	5.001501	4.999870 g		0.000045	0.000045	g	33.4 : 1
Mass Measurement - W6	2.000000g	±(0.001122 g)	1.998878	2.001122	2.000407 g		0.000032	0.000032	g	35.1 : 1
Mass Measurement - W7	1.00000g	±(0.0009 g)	0.99910	1.00090	1.00011 g		0.000025	0.000025	g	36.0 : 1
Mass Measurement - W8	200.0000mg	±(0.5395 mg)	199.4605	200.5395	200.0602 mg		0.0047	0.0047	mg	100.0 : 1

CALIBRATED BY TRANSCAT CERTIFICATE OF CALIBRATION

Customer: OMNI-TEST LABORATORIES INC
13327 NE AIRPORT WAY
PORTLAND, OR 97230

PO Number: 230453

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 CALIBRATION AND DIMENSIONAL MEASUREMENT ANAB AC-2489.08

ilac-MRA

Certificate/SO Number: 19-E6W3O-20-1 Revision 0

Field not applicable.

662

Date Received: October 13, 2023
Service Level : R9

Customer Number: 1-599076-000

CALIBRATED BY TRANSCAT CERTIFICATE OF CALIBRATION

Customer: OMNI-TEST LABORATORIES INC
13327 NE AIRPORT WAY
PORTLAND, OR 97230

PO Number: 230453

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 CALIBRATION AND DIMENSIONAL MEASUREMENT
ANAB AC-2489.08

Certificate/SO Number: 19-E6W3O-20-1 Revision 0

Traceable Standards

Asset	Manufacturer	Model Number	Description	Cal Date	Due Date	Traceability Number	Use
19-321	Fluke	2626-H	Hygro-Thermometer, Probe,	31-May-23	31-Mar-24	19-&19-321-22-1	AF/AL
19-Mass3	Transcat	Echelon III	Transfer Mass Standard Set	23-Oct-23	23-Nov-23	19-&19-Mass3-99-1	AF/AL
19-P100	Troemner	7210-1	Weight Set, 5 kg to 1 g, Class 1	4-Oct-23	31-Oct-24	19-&19-P100-19-1	AF/AL
19-P126	Druck Inc.	DPI 740 (22 to 34 inHg)	Barometer	22-Mar-23	31-Mar-24	19-&19-P126-17-1	AF/AL
19-P129	Mettler Toledo	XPE2004SC	Comparator Balance	25-Oct-22	31-Oct-23	19-&19-P129-15-1	AF/AL
19-P142	Mettler Toledo	UMX5	Micro Balance	25-Oct-22	31-Oct-23	19-&19-P142-13-1	AF/AL

563

The use of the standard is defined as: AF - used for as-found readings, AL - used for as-left readings.

Environmental Data

Temperature	Relative Humidity	Temp / RH Asset	Lab Area	Lab Description
68.80°F /20.44°C	40.20%	19-321	E2C	Echelon II (10 kg)

Decision Rule

When compliance statements are present, they are reported without factoring in the effects of uncertainty and comply with the guidelines as follows: The acceptance zone is defined as: less than or equal to the high limit, and/or greater than or equal to the low limit. The rejection zones are defined as greater than the high limit and/or less than the low limit. Single measurement results in the acceptance zone are identified as in-tolerance. Single measurement results in the rejection zone are identified as out-of-tolerance (OOT). When all measurement results are in the acceptance zone for repeated measurements, for the same characteristic, the test is identified as in-tolerance. For repeated characteristic measurements, a single measurement result in the rejection zone, will cause the test to be identified as out-of-tolerance (OOT). Data rejection for cause, (outliers) is permitted after the â€œDetermining and Verifying Out Of Tolerance(OOT) and/or Op Fail Readingsâ€□ procedure outlined in this document has been completed and the anomalous reading cannot be repeated, and the anomalous reading does not represent the system under test. Statements of conformity are binary.

CALIBRATED BY TRANSCAT CERTIFICATE OF CALIBRATION

Customer: OMNI-TEST LABORATORIES INC
13327 NE AIRPORT WAY
PORTLAND, OR 97230

PO Number: 230453

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 CALIBRATION AND DIMENSIONAL MEASUREMENT ANAB AC-2489.08

ilac-MRA

Certificate/SO Number: 19-E6W3O-20-1 Revision 0

Legend

Topic	Description
Accuracy	UUT specification that establishes expected tolerances and a time limit (calibration interval) over which the instrument is expected to hold these tolerances
As Found	Initial measurement results
As Left	Measurement results after adjustment and/or repair
Blank Data Field	Test is not applicable for the UUT
Cal Process Uncertainty (CPU)	The uncertainty of calibration process for the reported measurement result
Calibration Date	Indicates the date that the calibration was completed
Cover Factor (k)	A measure of uncertainty that defines an interval about the measurement result
Due Date	Indicates the end of the calibration cycle as requested by the customer
Issue Date	Indicates the date that the calibration has passed the Data Review Process and was signed by an authorized signatory or the date that a revision to the original certificate has been issued
Low / High Limits	Establishes UUT acceptable performance limits for the test measurement
Measurement Uncertainty	The dispersion of the values attributed to a measured quantity
OOA	Out of Acceptance (#)
OOT	Out of Tolerance (*)
Setpoints	Measurement target values
Traceability	Unbroken chain of comparisons relating an instrument's measurements to a known standard(s)
Traceability Number	Unique identifier(s) used to document traceability of calibration standards
TUR	Test Uncertainty Ratio, ratio of the tolerance or specification of the test measurement in relation to the uncertainty in measurement results
UUT	Unit Under test

CALIBRATED BY TRANSCAT CERTIFICATE OF CALIBRATION

Customer: OMNI-TEST LABORATORIES INC
13327 NE AIRPORT WAY
PORTLAND, OR 97230

PO Number: 230453

ANAB ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 CALIBRATION AND DIMENSIONAL MEASUREMENT ANAB AC-2489.08

ilac-MRA

Certificate/SO Number: 19-E6W3O-20-1 Revision 0

665

Calibrated At:
1503 E Orangethorpe Ave
Fullerton, CA 92831

Facility Responsible:
1503 E Orangethorpe Ave
Fullerton, CA 92831
800-828-1470

Calibrated By:
Electronically Signed By:
Vianey Manriquez

Vianey Manriquez	Oct 24, 2023
Calibration Technician	07:33:18 -04:00

Reviewed By:
Electronically Signed By:
Cody Viers for

Mathew Bundy	Oct 24, 2023
Lab Manager	10:58:21 -04:00

Unit Barcode: 0900B531163

Date Received: October 13, 2023
Service Level : R9

Customer Number: 1-599076-000

TRANSCAT®
CALIBRATION SERVICES • TEST & MEASUREMENT INSTRUMENTS

Received 10/30/23
Jamie Castillo

Packing List

Page 1
Print 10/24/23
Order 10/10/23
Request 10/10/23
Whse 19

Purchase Order: 230453
Order Nbr: E6W3O/00

Ship To: OMNI-TEST LABORATORIES INC
13327 NE AIRPORT WAY
PORTLAND OR 97230
UNITED STATES

Contact: MICHAEL CASTILLO
Shipping Method: UPS Ground
Misc Note:

Co/Cust #01/0000599076

Item Number/Description	Qty Order	Qty Ship	Qty B/O	U/M	
Carrier: UPS Ground					
This order was from quote: HL72D					
PM0202-9-O	1.000	1.000	.000	EA	20
Cal-TROEMNER/TALBOYS Mdl:UNKNOWN (PM0202),Weight Set					
S/N:47883 UNIT ID:-OMNI-00283A-					
CAL CYC:60Months					
WEIGHTS CALIBRATED SHOWING A PRECISION OF 4 DECIMAL PLACES 60					
MTH CASE TORN 200MG/1G/2G/5G/10G/20G/50G/100G Accessory: 1 Case					

* COMPLETE *

PCKE

Certificate of Calibration

Certificate Number: 788484

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

PO: 230420
Order Date: 02/16/2023
Authorized By: N/A

Property #: OMNI-00410
User: N/A
Department: N/A
Make: Dwyer
Model: 1430
Serial #: OMNI-00410
Description: Microtector
Procedure: 500908
Accuracy: ±0.00025" WC

Calibrated on: 04/06/2023
*Recommended Due: 04/06/2024
Environment: 19 °C 37 % RH
* As Received: Limited
* As Returned: Limited
Action Taken: Calibrated
Technician: 111

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Previous limitation of the micrometer head calibrated only, continued. Unit was received and returned in a case.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
913A	Starrett	SS88.A1	Gage Block Set, 88 Pieces	07/29/2023	776002

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After							Accredited = ✓
Length							
	Inch	0.1300	0.129	0.131	0.000	0.130 Inch	2.5E-05 ✓
	Inch	0.3850	0.384	0.386	0.000	0.385 Inch	2.5E-05 ✓
	Inch	0.6150	0.614	0.616	0.000	0.615 Inch	2.5E-05 ✓
	Inch	0.8700	0.869	0.871	0.000	0.870 Inch	2.5E-05 ✓
	Inch	1.0000	0.999	1.001	0.000	1.000 Inch	2.5E-05 ✓

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 04/07/2023 Rev # 15

Inspector

Certificate of Calibration

Certificate Number: 804330

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

PO: 1261/230455
Order Date: 10/19/2023
Authorized By: N/A

Property #: OMNI 00431
User: N/A
Department: N/A
Make: Delmhorst
Model: MCS-1
Serial #: OMNI 00431
Description: Moisture Calibrator
Procedure: Raw Data
Accuracy: Raw Data

Calibrated on: 10/28/2023
*Recommended Due: 10/28/2024
Environment: 23 °C 40 % RH
* As Received: Other - See Remarks
* As Returned: Other - See Remarks
Action Taken: Calibrated
Technician: 40

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Data is provided for your determination of acceptability.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
582A	Fluke	8508A	8 1/2 Reference Mtr	08/01/2024	796619

Measurement Data

Parameter / Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = ✓
Resistance								
12 %		MOhm	120.00000	0.0000	0.0000	0.4842	120.4842 MOhm	5.7E-01 ✓
22 %		MOhm	1.100000	0.00000	0.00000	0.00056	1.10056 MOhm	5.7E-01 ✓

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to the SI through an NMI such as but not limited to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by ILAC G8:2019. Unless otherwise stated, a test uncertainty ratio (TUR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above.

Reviewer

3 Issued 10/30/2023 Rev # 15

Inspector

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

A2LA ACCREDITED
CERTIFICATE #1550.01

OMNI-Test Laboratories, Inc.
13327 NE Airport Way
Portland, OR 97230

Report Number: OMNE03B729400181240208

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Mettler	MS104TS	B729400181	OMNI-00637	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
g	0.0001	qcs012	2/8/24	8/10/23	8/2024

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 50 Tol: 0.0001
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 20x4 Tol: 0.0001
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0001

1. 99.9999	5. 99.9999	9. 100.0000
2. 99.9999	6. 100.0000	10. 100.0000
3. 100.0000	7. 100.0000	Result
4. 100.0000	8. 99.9999	0.00005

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 18.3°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
100	99.9999	100.0000	0.00016
80	80.0003	80.0000	0.00016
50	50.0002	50.0001	0.00015
20	20.0001	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	10 kg to 1 mg	D123	6/15/23	6/2024	20231316

Permanent Information Concerning this Equipment:

Comments/Info Concerning this Calibration:
2/24 - Cleaned, leveled, & adjusted span. RH = 42%

Report prepared/reviewed by: _____ **Date:** 2-8-24 **Technician:** D.Oudeans **Signature:** D. Oudeans

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. Results relate only to the item(s) tested. Unless otherwise noted, statements of conformity do not include measurement

Certificate of Calibration

Certificate Number: 806340

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

Omni-Test Laboratories
13327 NE Airport Way
Portland, OR 97230

PO: 230462
Order Date: 11/30/2023
Authorized By: N/A

Property #: OMNI-00730
User: N/A
Department: N/A
Make: Starrett
Model: TX34-16ME
Serial #: 23275596
Description: Tape Measure, 16'/5m
Procedure: 500614
Accuracy: ±1 Division

Calibrated on: 12/06/2023
*Recommended Due: 12/06/2028
Environment: 20 °C 48 % RH
* As Received: Within Tolerance
* As Returned: Within Tolerance
Action Taken: Calibrated
Technician: 175

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
591A	Mitutoyo	PH-3500	Optical Comparator	09/19/2024	801238

Measurement Data

Parameter / Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = ✓
Length								
1-2" (16ths)		Inch	1.00000	0.9375	1.0625	0.0005	1.0005 Inch	3.6E-02 ✓
191-192" (16ths)		Inch	1.00000	0.9375	1.0625	0.0005	1.0005 Inch	3.6E-02 ✓
1-2" (32nds)		Inch	1.000000	0.96875	1.03125	0.00050	0.99950 Inch	1.8E-02 ✓
191-192" (32nds)		Inch	1.000000	0.96875	1.03125	0.00000	1.00000 Inch	1.8E-02 ✓

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to the SI through an NMI such as but not limited to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by ILAC G8:2019. Unless otherwise stated, a test uncertainty ratio (TUR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above.

Reviewer

3 Issued 12/07/2023 Rev # 15

Inspector

VWR Temperature Hygrometer Calibration Procedure and Data Sheet

Frequency: Annually

Step 1: Locate NIST traceable standard.

Step 2: Place unit to be calibrated, tracking No. OMNI-00733 , inside OMNI desiccate box on the same shelf with the NIST traceable standard.

Step 3: After a period of not less than four hours record the temperature and humidity of both units in the spaces provided below.

Step 4: If the unit to be calibrated matches the NIST standard within ± 4%, it is acceptable. If not, the unit needs to be sent to a repair company or replaced.

Verification Data:

Date: 02/06/2024 Technician: _____

Time in desiccate: 11:00 Recording time: 15:30

NIST Standard Temperature: 69.9 °F NIST Standard Humidity Reading%: 11.9

Test Unit Temperature Reading: 69.7 °F Test Unit Humidity Reading%: 16.5

Test unit OMNI- _____ is _____or was not ___ within acceptable limits.

Technician Signature: Tony Tong

Comments: Humidity difference between the meter under test and NIST standard is 4.6%, Which falls out of the range of ±4%. This is within the manufacturer's +/- 5%.

INNOCAL®
INNOVATIVE CALIBRATION SOLUTIONS

625 East Bunker Court
Vernon Hills, Illinois 60061
PH: 866-466-6225
Fax: 847-327-2993
www.innocalsolutions.com

NIST Traceable
Calibration Report

REPORT NUMBER
1736899

Reference Number: MUB556001
PO Number: MUB556001

Cole-Parmer
625 E Bunker Ct
Vernon Hills, IL 60061-1844 United States

ilac-MRA A2LA ACCREDITED
CERT #1746.01

Manufacturer:	Digi-Sense	**Calibration Date**	10/06/2023
Model Number:	20250-16	**Calibration Due Date**	
Description:	Air Velocity, Hot Wire Anemometer	**Condition As Found:**	Initial Calibration
Asset Number:	CP242626	**Condition As Left:**	In Tolerance, No adjustment
Serial Number:	230544726		
Procedure:	DS Digi-Sense 20250-16		

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. Recommended calibration due date is 12 months from date of purchase

Standards Used

Standard ID	Manufacturer	Model Number	Description	Cal Date	Due Date
CP105914	Fluke Corporation	1551A EX	Temperature, Stik Thermometer	8/22/2023	8/31/2024
CP105979	Kanomax	X5602	Air Velocity, Wind Tunnel, Open Jet	6/06/2023	6/30/2024

Calibration Data

Function Tested	Nominal / Reference Value	Measured Value	OOT	Calibration Tolerance *g = Guard Banding Applied*	TUR	EMU
Air Velocity Accuracy	5.00 m/s					
As Found & As Left	5.00	4.92		4.74 to 5.26 m/s	6.2:1	± 0.042 m/s
	10.00 m/s					
As Found & As Left	10.00	9.95		9.49 to 10.51 m/s	11:1	± 0.045 m/s
	15.00 m/s					
As Found & As Left	15.00	15.13		14.24 to 15.76 m/s	8.1:1	± 0.094 m/s
	20.00 m/s					
As Found & As Left	20.00	19.86		18.99 to 21.01 m/s	8.1:1	± 0.12 m/s
	25.00 m/s					
As Found & As Left	25.00	25.00		23.74 to 26.26 m/s	8.1:1	± 0.16 m/s
Temperature Accuracy	25.0 °C					
As Found & As Left	25.0	25.1		24.0 to 26.0 °C	13:1	± 0.077 °C

Temperature: 22 °C
Humidity: 61 %RH
Rpt. No.: 1736899

Calibration Performed By:		Quality Reviewer:	
Mike Kuzmanich	Metrologist	Szplit, Tony	10/6/2023
Name	Title	Name	Date

Making our world more productive

received 5/1/2023

DocNumber: 538868

Linde Gas & Equipment Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22023

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

LGEPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062-9547

Certificate Issuance Date: 04/25/2023
Linde Order Number: 72420798
Part Number: NI CD17CO8E-AS
Customer PO Number: 80429067

Fill Date: 04/19/2023
Lot Number: 70086310907
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 1300 psig 99 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date: 04/25/2031		NIST Traceable
Cylinder Number: CC474450		Expanded Uncertainty
16.86 %	Carbon dioxide	± 0.10 %
4.37 %	Carbon monoxide	± 0.03 %
16.99 %	Oxygen	± 0.05 %
Balance	Nitrogen	

Certification Information:

Certification Date: 04/25/2023 Term: 96 Months Expiration Date: 04/25/2031

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

CO responses have been corrected for O2 interference. 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: 17 %
Certified Concentration: 16.86 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 04/21/2023

First Analysis Data:						Date	04/25/2023
Z:	0	R:	19.34	C:	16.87	Conc:	16.86
R:	19.35	Z:	0	C:	16.87	Conc:	16.86
Z:	0	C:	16.87	R:	19.38	Conc:	16.86
UOM:	%			Mean Test Assay:			16.86 %

Reference Standard: Type / Cylinder #: NTRM / CC725981
Concentration / Uncertainty: 19.34 % ±0.03 %
Expiration Date: 01/12/2027
Traceable to: SRM # / Sample # / Cylinder #: NTRM / 190701 / CC725973
SRM Concentration / Uncertainty: 19.34% / ±0.031%
SRM Expiration Date: 01/12/2027

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

2. Component: Carbon monoxide

Requested Concentration: 4.25 %
Certified Concentration: 4.37 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 04/21/2023

First Analysis Data:						Date	04/25/2023
Z:	0	R:	7.81	C:	4.39	Conc:	4.38
R:	7.84	Z:	0	C:	4.37	Conc:	4.36
Z:	0	C:	4.36	R:	7.82	Conc:	4.35
UOM:	%			Mean Test Assay:			4.37 %

Reference Standard: Type / Cylinder #: GMIS / CC187322
Concentration / Uncertainty: 7.81 % ±0.04 %
Expiration Date: 04/03/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2642a / 51-D-23 / FF23106
SRM Concentration / Uncertainty: 7.859% / ±0.039%
SRM Expiration Date: 07/15/2019

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

3. Component: Oxygen

Requested Concentration: 17 %
Certified Concentration: 16.99 %
Instrument Used: Siemens Oxymat 6E S/N 7MB20211AA000CA1
Analytical Method: Paramagnetic
Last Multipoint Calibration: 04/21/2023

First Analysis Data:						Date	04/25/2023
Z:	0	R:	20.9	C:	16.98	Conc:	16.98
R:	20.89	Z:	0	C:	16.99	Conc:	16.99
Z:	0	C:	16.99	R:	20.91	Conc:	16.99
UOM:	%			Mean Test Assay:			16.99 %

Reference Standard: Type / Cylinder #: GMIS / ND29287
Concentration / Uncertainty: 20.90 % ±0.02 %
Expiration Date: 09/01/2028
Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331
SRM Concentration / Uncertainty: 20.863% / ±0.021%
SRM Expiration Date: 08/23/2021

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

Analyzed By: Courtney Zielke

Certified By: Ying Yu

PRAXAIR
Making our planet more productive

Received
11/2/2021

Praxair Distribution. Inc.
5700 S. Alameda Street
Los Angeles, CA 90058
Tel: 323-585-2154
Fax: 714-542-6689

Customer & Order Information:

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD,
TUALATIN, OR 97062-9547

Praxair Order Number: **71690091**
Customer PO Number: **79688022**

Certificate Issuance Date: **5/18/2021**

Certification Date: **5/17/2021**
Lot Number: **70086112516**
Part Number: **NI CD15C5P-AS**
DocNumber: **399516**
Expiration Date: **5/13/2026**

CERTIFICATE OF ANALYSIS

Primary Standard

Component	Requested Concentration (Molar)	Certified Concentration (Molar)	Analytical Reference	Analytical Uncertainty
Carbon dioxide	**15 %**	**15.00 %**	**1**	**± 1 %**
Carbon monoxide	**500 ppm**	**501 ppm**	**1**	**± 1 %**
Nitrogen	**Balance**	**Balance**		

Cylinder Style: **AS**
Cylinder Pressure @ 70 F: **2000 psig**
Cylinder Volume: **150 ft3**
Valve Outlet Connection: **CGA 350**
Cylinder Number(s): **CC313045**

Fill Date: **5/5/2021**
Analysis Date: **5/13/2021**

Filling Method: **Gravimetric**

Analyst: **Amalia Real**

Approved Signer: **Ying Yu**

Key to Analytical Techniques:

Reference	Analytical Instrument - Analytical Principle
1	Mettler ID5 - Gravimetric Method

The gas calibration cylinder standard prepared by Praxair Distribution, Inc. is considered a certified standard. It is prepared by gravimetric, volumetric, or partial pressure techniques. The calibration standard provided is certified against Praxair Distribution, Inc. Reference Materials which are traceable to the International System of Units (SI) through either weights traceable to the National Institute of Standards and Technology (NIST) or Measurement Canada, or through NIST Standard Reference Materials or equivalent where available.

Note: All expressions for concentration (e.g., % or ppm) are for gas phase, by mole unless otherwise noted. Analytical uncertainty is expressed as a Relative % unless otherwise noted.

8.4 Appliance specimen Acquisition and Disposition.

The tested unit was sealed by OMNI-Test Laboratories after the completion of certification testing. This unit will be stored at the manufacturer's premises in the sealed state until 5 years after the certification testing at the following address:

Blaze King, Inc.
146 A Street
Walla Walla, WA 99362
USA

Sealed Unit - Rear View

Sealed Unit, Front View

Applied Ceramics Catalyst - Placed in Fire Chamber

Crating placed over sealed test specimen

9. References

U.S. EPA 40 CFR Part 60, Subpart AAA – "Standards of Performance for New Residential Wood Heaters"

ASTM E2515-11, "Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel", ASTM International, West Conshohocken, PA, 2011, www.astm.org

ASTM E2780-10 (2017) "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters", ASTM International, West Conshohocken, PA, 2011, www.astm.org

Mark's Standard Handbook for Mechanical Engineers, 9th edition (1986)

CSA B415.1:22 "Performance testing of solid-biofuel-burning heating appliance"

EPA Method 1 - Sample and Velocity Traverses for Stationary Sources

EPA Method 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)

EPA Method 5G - Particulate Matter Wood Heaters from a Dilution Tunnel

EPA Method 28R - Certification and Auditing of Wood Heaters

EPA Source Classification Codes (SCCs) - https://sor-scc-api.epa.gov/sccwebservices/sccsearch/

EPA Method 7E—Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure)

OMNI-Test Laboratories "Certification Test Report", report number 0142WS014E, November 2017, revised November 3, 2022

10. Appendices

Appendix A - (CBI Report Only)

Appendix B - Manufacturer's letter describing air control mechanism

Appendix C - ALT-154

Appendix D - Original 50 hours conditioning data

Appendix E - (CBI Report Only)

Appendix F - EPA 30-Day Notice

Appendix B

Manufacturer's communications regarding Bimetallic Control Mechanism

Low Burn Rate Justification

Completed by Ashnil Reddy
Product Development, Blaze King Ind.
December 14, 2016
Revised January 13, 2021

The two main components of a Blaze King thermostat are the damper blade and the bimetallic coil; they work in unison to produce a consistent heat output. The damper blade is controlled by a thermostat knob that can be positioned accordingly based on desired heat output. The bimetallic coil regulates the volume of intake combustion air by adjusting the damper blade angle based on its reaction with heat radiating off the unit. As the fire loses intensity and the unit radiates less heat, the bimetallic coil contracts and repositions the damper blade angle to allow more combustion air to stoke the fire so the unit can continue to radiate the desired heat output. As the fire gains intensity, the same procedure occurs in the opposite direction.

When preforming a 5G emission test run in the Low Burn Rate Category (<0.8kg/hr), Blaze King's target fuel consumption rate is 0.1lb of test fuel per 10 minute interval. To achieve this, the thermostat knob is positioned such that the damper blade is almost fully closed. If the blade is closed beyond this point, inadequate intake air would cause the burn to stall. This low burn rate is consistently achievable in a test lab environment given that external conditions are held constant. However, when burning in a real world environment, external conditions cannot be held constant which yields a much different low burn rate given the same thermostat knob setting as used in the test lab environment.

A great example of a real world inconsistency that would affect low burn rate is chimney draft. If the unit were installed with a chimney height of 20ft or greater, the increased draft associated with that chimney height could increase the velocity of combustion air into the unit and result in a faster burn rate given the same thermostat knob setting as used in the test lab. In this scenario, the operator would be able to turn the thermostat knob lower to account for the increased draft and maintain the low burn rate that was achieved in the test lab environment. If the consumer were to turn the thermostat knob too low, the fire would stall due to inadequate intake as previously mentioned. This proves that when the damper blade is closed within the thermostat, regardless of the thermostat knob position, the low burn rate achieved during emissions testing is no greater than the rate that an operator can achieve in real world use.

In compliment with this verbal justification is a data set obtained during inhouse testing. The goal of this test run was to determine the thermostat knob setting that would yield the lowest burn rate achievable. For this test, the thermostat knob was positioned to 80 degrees below fully open; the run subsequently failed due to fuel consumption stalling. It was later found that a thermostat knob setting positioned 76 degrees below fully open yielded the desired low burn rate.

Blaze King / Valley Comfort

Wood Heater Test Data - EPA Method 5G

Run:			
Manufacturer:	Blaze King		
Model:	PE32		
Tracking No.:			
Project No.:	Low Burn - Invalid Run Stalled		
Test Date:	02-Jul-18		
Beginning Clock Time:	00:00		
Recording Interval:	10	min	
Total Sampling Time:	890	min	
Burn Rate:	N/A	kg/hr	

Velocity Traverse Data									
	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5	Pt 6	Pt 7	Pt 8	
Initial dP									"H2O
Initial Temp									oF

Equipment Numbers: THERMOSTAT KNOB WAS CLOSED 80° FROM FULLY OPEN
NOTE: THERM KNOB WAS CLOSED 76° FROM FULLY OPEN FOR OFFICIAL EPA LOW BURN
TEST TERMINATED AT 890 MINS BECAUSE < 1 LB/MIN WEIGHT CHANGE FOR 30 MINUTES

PM Control Module:	BK-06	
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.56	lb/lb-mole
Dilution Tunnel H2O:	4.00	percent
Dilution Tunnel Static:	-0.680	"H2O
Pitot Tube Cp:	0.99	
Meter Box Y Factor:	0.988	
Barometric Pressure	Begin / Middle / End / Average: 0.00	"Hg

Signature/Date:

Tunnel Velocity:	#DIV/0!	ft/sec
Initial Tunnel Flow:	#DIV/0!	scfm
Average Tunnel Flow:	#DIV/0!	scfm
Tunnel Area:	0.196	ft2
Post-Test Leak Check:	00406	cfm@"Hg
Fuel Moisture (dry basis	22.3	%
Total Particulate:		mg
Filter Holder No.:		

	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
Elapsed Time	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac In. Hg	Dilution Tunnel Temp	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In H2O	Catalyst Temp
0	1.000					#DIV/0!	#DIV/0!		20.78		252.89	386.58	200.39	221.34	219.33		256.1	223.14			69.78		382.99
10	1.000	0.00					#DIV/0!	#DIV/0!	20.71	-0.07	234.17	360.64	175.17	191.65	188.9		230.1	199.55			69.95		444.57
20	1.000	0.00						#DIV/0!	20.56	-0.15	231.32	347.64	158.76	170.75	168.45		215.4	185.54			69.39		495.28
30	1.000	0.00						#DIV/0!	20.3	-0.26	246.05	347.92	150.46	159.71	158.64		212.6	183.97			69.39		580.11
40	1.000	0.00					#DIV/0!	#DIV/0!	19.76	-0.54	279.84	354.64	146.54	162.68	160.83		220.9	195.46			69.16		679.73
50	1.000	0.00					#DIV/0!	#DIV/0!	19.11	-0.65	299.51	361.25	147.38	172.2	170.41		230.2	203.97			69.67		685.51
60	1	0.00					#DIV/0!	#DIV/0!	18.42	-0.69	314.3	362.65	147.49	180.55	177.08		236.4	213.44			69.05		709.6
70	1.000	0.00					#DIV/0!	#DIV/0!	17.68	-0.74	341.14	366.3	149.85	186.27	182.46		245.2	225.43			68.88		765.74
80	1.000	0.00					#DIV/0!	#DIV/0!	16.94	-0.74	369.88	371.34	151.58	196.3	192.26		256.3	237.98			69.67		785.91
90	1.000	0.00					#DIV/0!	#DIV/0!	16.4	-0.54	360.36	369.27	151.7	200.5	199.83		256.3	235.46			69.78		735.15
100	1.000	0.00					#DIV/0!	#DIV/0!	15.87	-0.53	372.35	367.81	152.03	201.9	204.7		259.8	237.82			69.84		806.59
110	1.000	0.00					#DIV/0!	#DIV/0!	15.43	-0.44	400.25	368.59	151.75	200.39	200.28		264.3	244.6			70.45		856.18
120	1	0.00					#DIV/0!	#DIV/0!	14.85	-0.58	428.6	366.35	153.38	201.84	199.15		269.9	252.55			70.45		874.27
130	1.000	0.00					#DIV/0!	#DIV/0!	14.38	-0.47	434.21	364	154.39	206.21	201.45		272.1	255.75			70.62		854.44
140	1.000	0.00					#DIV/0!	#DIV/0!	13.94	-0.44	426.31	363.38	156.24	208.74	204.37		271.8	254.96			70.28		835.5
150	1.000	0.00					#DIV/0!	#DIV/0!	13.49	-0.45	427.43	365.4	157.97	213.16	207.45		274.3	255.91			71.12		846.99
160	1.000	0.00					#DIV/0!	#DIV/0!	13.03	-0.46	437.34	369.94	160.61	218.04	211.54		279.5	258.83			71.4		863.18
170	1.000	0.00					#DIV/0!	#DIV/0!	12.61	-0.42	442.72	374.81	164.47	223.64	215.24		284.2	261.97			71.63		855.34
180	1	0.00					#DIV/0!	#DIV/0!	12.19	-0.42	440.2	377.22	167.44	228.52	218.43		286.4	262.25			71.96		841.94
190	1.000	0.00					#DIV/0!	#DIV/0!	11.81	-0.38	437.4	377.22	171.08	231.32	220.17		287.4	262.36			72.02		841.55
200	1.000	0.00					#DIV/0!	#DIV/0!	11.4	-0.41	438.41	375.88	174.28	234.51	222.18		289.1	263.7			72.41		843.23
210	1.000	0.00					#DIV/0!	#DIV/0!	11.03	-0.37	434.6	372.18	177.3	235.91	224.71		288.9	263.53			72.58		830.91
220	1.000	0.00					#DIV/0!	#DIV/0!	10.67	-0.36	433.14	368.09	181.39	237.26	224.65		288.9	263.31			72.92		833.2
230	1.000	0.00					#DIV/0!	#DIV/0!	10.28	-0.39	441.77	364.78	186.49	238.49	226.95		291.7	265.5			73.03		852.2
240	1	0.00					#DIV/0!	#DIV/0!	9.89	-0.39	448.33	361.93	191.53	239.11	229.36		294.1	267.79			73.2		844.35
250	1.000	0.00					#DIV/0!	#DIV/0!	9.57	-0.32	437.29	355.76	195.57	237.7	231.82		291.6	266.9			73.48		806.14
260	1.000	0.00					#DIV/0!	#DIV/0!	9.31	-0.26	412.07	346.52	199.27	238.71	231.32		285.6	261.97			73.65		758.23
270	1.000	0.00					#DIV/0!	#DIV/0!	9.1	-0.21	383.67	336.88	200.44	236.14	229.36		277.3	255.3			73.98		706.35
280	1.000	0.00					#DIV/0!	#DIV/0!	8.92	-0.18	356.04	326.68	200.5	231.93	226.83		268.4	247.4			74.21		665.56

Page 1

Blaze King / Valley Comfort

Wood Heater Test Data - EPA Method 5G

Run:	
Manufacturer:	Blaze King
Model:	PE32
Tracking No.:	
Project No.:	Low Burn - Invalid Run Stalled
Test Date:	02-Jul-18
Beginning Clock Time:	00:00
Recording Interval:	10 min.
Total Sampling Time:	890 min.
Burn Rate:	N/A kg/hr

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP									"H2O
Initial Temp									oF

Equipment Numbers: THERMOSTAT KNOB WAS CLOSED 80° FROM FULLY OPEN
NOTE: THERM KNOB WAS CLOSED 76° FROM FULLY OPEN FOR OFFICIAL EPA LOW BURN
TEST TERMINATED AT 890 MINS BECAUSE < 1 LB/MIN WEIGHT CHANGE FOR 30 MINUTES

PM Control Module:	BK-06	
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.56	lb/lb-mole
Dilution Tunnel H2O:	4.00	percent
Dilution Tunnel Static:	-0.680	"H2O
Pitot Tube Cp:	0.99	
Meter Box Y Factor:	0.988	
Barometric Pressure:	Begin / Middle / End / Average	0.00 "Hg

Signature/Date:

Tunnel Velocity:	#DIV/0!	ft/sec
Initial Tunnel Flow:	#DIV/0!	scfm
Average Tunnel Flow:	#DIV/0!	scfm
Tunnel Area:	0.196	ft2
Post-Test Leak Check:	[illegible]	cfm@"Hg
Fuel Moisture (dry basis):	22.3	%
Total Particulate:		mg
Filter Holder No.:		

	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
Elapsed Time	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In H2O	Catalyst Temp
290	1.000	0.00					#DIV/0!	#DIV/0!	8.75	-0.17	339.23	316.71	201.23	226.83	223.92		261.6	241.57			74.26		655.19
300	1	0.00					#DIV/0!	#DIV/0!	8.55	-0.2	336.43	307.01	204.09	222.86	222.63		258.6	240.17			74.37		672.56
310	1.000	0.00					#DIV/0!	#DIV/0!	8.33	-0.22	343.49	298.11	209.58	219.55	222.91		258.7	241.79			74.32		695.76
320	1.000	0.00					#DIV/0!	#DIV/0!	8.1	-0.23	353.24	290.21	213.33	217.25	226.11		260.0	243.87			74.54		716.21
330	1.000	0.00					#DIV/0!	#DIV/0!	7.84	-0.26	366.86	283.71	216.58	215.85	233.56		263.3	246.05			74.54		738.29
340	1.000	0.00					#DIV/0!	#DIV/0!	7.61	-0.23	372.01	278.94	218.82	215.29	240.62		265.1	247.62			74.82		740.58
350	1.000	0.00					#DIV/0!	#DIV/0!	7.38	-0.23	371.28	275.69	220.17	215.57	245.21		265.6	248.18			74.77		727.98
360	1	0.00					#DIV/0!	#DIV/0!	7.18	-0.2	359.4	273.79	219.66	215.63	248.85		263.5	246.05			75.05		695.25
370	1.000	0.00					#DIV/0!	#DIV/0!	7.03	-0.15	339.62	274.07	214.84	214.56	249.81		258.6	240.11			74.93		653.4
380	1.000	0.00					#DIV/0!	#DIV/0!	6.91	-0.12	323.54	276.42	209.13	212.83	249.69		254.3	233.5			74.93		633.62
390	1.000	0.00					#DIV/0!	#DIV/0!	6.76	-0.15	318.39	278.16	203.92	210.98	249.41		252.2	229.58			75.16		644.15
400	1.000	0.00					#DIV/0!	#DIV/0!	6.58	-0.18	326.29	279.84	200.44	210.36	251.26		253.6	229.3			75.27		681.64
410	1.000	0.00					#DIV/0!	#DIV/0!	6.37	-0.21	352.85	283.87	202.46	210.59	253.79		260.7	235.91			75.38		737
420	1	0.00					#DIV/0!	#DIV/0!	6.17	-0.2	357.61	288.69	205.49	213.27	259.61		264.9	241.18			75.44		722.82
430	1.000	0.00					#DIV/0!	#DIV/0!	6.01	-0.16	353.97	292.84	208.23	216.36	264.99		267.3	243.64			75.55		705.34
440	1.000	0.00					#DIV/0!	#DIV/0!	5.84	-0.17	345.9	295.42	208.23	217.81	267.79		267.0	243.2			75.61		684.22
450	1.000	0.00					#DIV/0!	#DIV/0!	5.71	-0.13	334.81	295.36	206.89	217.81	267.51		264.5	240.62			75.77		662.03
460	1.000	0.00					#DIV/0!	#DIV/0!	5.57	-0.14	325.67	293.79	203.75	216.41	264.32		260.8	237.03			75.89		645.22
470	1.000	0.00					#DIV/0!	#DIV/0!	5.47	-0.1	313.63	291.55	198.71	214.28	260.73		255.8	231.54			75.77		618.27
480	1	0.00					#DIV/0!	#DIV/0!	5.36	-0.11	303.54	288.36	193.89	210.53	256.42		250.5	225.55			75.83		609.64
490	1.000	0.00					#DIV/0!	#DIV/0!	5.23	-0.13	305	285.78	188.4	207.06	252.44		247.7	222.07			75.77		641.8
500	1.000	0.00					#DIV/0!	#DIV/0!	5.08	-0.15	307.86	287.18	187.67	205.49	251.04		247.8	221.85			75.83		637.93
510	1.000	0.00					#DIV/0!	#DIV/0!	4.98	-0.1	303.2	289.25	188.34	204.09	248.46		246.7	221.51			75.77		623.87
520	1.000	0.00					#DIV/0!	#DIV/0!	4.86	-0.12	297.43	289.25	187.05	202.01	243.53		243.9	219.83			75.77		619.28
530	1.000	0.00					#DIV/0!	#DIV/0!	4.74	-0.12	295.64	290.93	186.44	200.39	238.49		242.4	219.1			75.77		620.28
540	1	0.00					#DIV/0!	#DIV/0!	4.62	-0.12	293.4	293.68	184.53	199.15	233.22		240.8	217.76			75.55		617.76
550	1.000	0.00					#DIV/0!	#DIV/0!	4.49	-0.13	291.61	295.75	184.36	199.32	228.18		239.8	217.48			75.72		620.28
560	1.000	0.00					#DIV/0!	#DIV/0!	4.3	-0.19	303.88	298.16	184.92	202.01	223.64		242.5	221.34			75.55		668.25
570	1.000	0.00					#DIV/0!	#DIV/0!	4.09	-0.21	326.12	299.51	185.54	207.62	220.5		247.9	227.95			75.72		720.36

Page 2

Blaze King / Valley Comfort

Wood Heater Test Data - EPA Method 5G

Run:

Manufacturer:	Blaze King
Model:	PE32
Tracking No.:	
Project No.:	Low Burn - Invalid Run Stalled
Test Date:	02-Jul-18
Beginning Clock Time:	00:00
Recording Interval:	10 min.
Total Sampling Time:	890 min.
Burn Rate:	N/A kg/hr

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP									"H2O
Initial Temp.									oF

Equipment Numbers: THERMOSTAT KNOB WAS CLOSED 80° FROM FULLY OPEN
NOTE: THERM KNOB WAS CLOSED 76° FROM FULLY OPEN FOR OFFICIAL EPA LOW BURN
TEST TERMINATED AT 890 MINS BECAUSE < .1 LB/MIN WEIGHT CHANGE FOR 30 MINUTES

PM Control Module:	BK-06	
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.56	lb/lb-mole
Dilution Tunnel H2O:	4.00	percent
Dilution Tunnel Static:	-0.680	"H2O
Pitot Tube Cp:	0.99	
Meter Box Y Factor:	0.988	
Barometric Pressure:	Begin / Middle / End / Average	0.00 "Hg

Signature/Date:

Tunnel Velocity:	#DIV/0!	ft/sec.
Intial Tunnel Flow:	#DIV/0!	scfm
Average Tunnel Flow:	#DIV/0!	scfm
Tunnel Area:	0.196	ft2
Post-Test Leak Check:	.008@16	cfm@"Hg
Fuel Moisture (dry basis	22.3	%
Total Particulate:		mg
Filter Holder No.:		

	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
Elapsed Time	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
580	1.000	0.00					#DIV/0!	#DIV/0!	3.81	-0.28	359.24	301.97	187.72	216.75	220.11		257.2	237.48			75.27		789.44
590	1.000	0.00					#DIV/0!	#DIV/0!	3.5	-0.31	400.64	304.77	191.03	229.69	223.02		269.8	249.47			75.05		837.07
600	1	0.00					#DIV/0!	#DIV/0!	3.21	-0.29	415.04	305.89	194.45	243.03	226.11		276.9	256.19			75.44		815.72
610	1.000	0.00					#DIV/0!	#DIV/0!	2.98	-0.23	400.92	305.39	195.23	253.11	228.18		276.6	255.91			75.44		766.81
620	1.000	0.00					#DIV/0!	#DIV/0!	2.82	-0.16	374.25	302.81	193.5	260.96	227.23		271.8	251.1			75.44		707.92
630	1.000	0.00					#DIV/0!	#DIV/0!	2.7	-0.12	343.66	298.27	190.19	262.64	222.58		263.5	243.31			75.16		650.93
640	1.000	0.00					#DIV/0!	#DIV/0!	2.62	-0.08	320.41	292.61	184.98	261.52	217.08		255.3	235.24			75.1		621.29
650	1.000	0.00					#DIV/0!	#DIV/0!	2.5	-0.12	308.14	286.79	180.61	259.28	211.43		249.3	229.19			75.16		619.39
660	1	0.00					#DIV/0!	#DIV/0!	2.35	-0.15	292.78	281.97	179.1	263.87	209.02		245.3	226.33			74.77		578.77
670	1.000	0.00					#DIV/0!	#DIV/0!	2.2	-0.15	284.88	280.01	178.82	272.56	208.79		245.0	227.9			74.71		573.95
680	1.000	0.00					#DIV/0!	#DIV/0!	2.07	-0.13	280.46	279.17	179.71	276.7	208.4		244.9	230.76			74.37		556.69
690	1.000	0.00					#DIV/0!	#DIV/0!	1.94	-0.13	275.36	277.26	179.1	277.09	207.39		243.2	231.09			74.49		547.28
700	1.000	0.00					#DIV/0!	#DIV/0!	1.83	-0.11	270.93	274.63	176.91	274.91	206.83		240.8	227.95			74.15		539.26
710	1.000	0.00					#DIV/0!	#DIV/0!	1.73	-0.1	267.74	274.07	175.45	273.73	205.88		239.4	225.15			74.04		534.56
720	1	0.00					#DIV/0!	#DIV/0!	1.63	-0.1	268.52	273.4	172.65	266.22	203.47		236.9	222.97			73.98		560.97
730	1.000	0.00					#DIV/0!	#DIV/0!	1.53	-0.1	270.2	271.94	171.14	258.83	200.56		234.5	220.78			73.65		553.94
740	1.000	0.00					#DIV/0!	#DIV/0!	1.43	-0.1	268.97	270.31	169.35	253.28	199.15		232.2	218.82			73.59		552.26
750	1.000	0.00					#DIV/0!	#DIV/0!	1.32	-0.11	268.75	272.11	167.89	247.4	197.36		230.7	216.47			73.31		558.26
760	1.000	0.00					#DIV/0!	#DIV/0!	1.22	-0.1	266.95	273.45	166.38	242.75	195.74		229.1	214.68			73.2		554.95
770	1.000	0.00					#DIV/0!	#DIV/0!	1.12	-0.1	260.28	274.18	163.86	238.94	193.78		226.2	211.59			73.14		530.41
780	1	0.00					#DIV/0!	#DIV/0!	1.03	-0.09	259.22	275.36	160.61	232.72	189.74		223.5	208.12			72.69		550.47
790	1.000	0.00					#DIV/0!	#DIV/0!	0.93	-0.1	259.28	273.51	157.41	225.71	185.48		220.3	204.87			72.86		550.36
800	1.000	0.00					#DIV/0!	#DIV/0!	0.86	-0.07	253.95	272.11	154.11	219.94	181.67		216.4	200.39			72.58		532.6
810	1.000	0.00					#DIV/0!	#DIV/0!	0.82	-0.04	243.2	271.88	150.13	212.43	176.52		210.8	193.72			72.36		495.84
820	1.000	0.00					#DIV/0!	#DIV/0!	0.75	-0.07	230.59	268.8	145.14	204.65	170.92		204.0	186.44			72.08		473.6
830	1.000	0.00					#DIV/0!	#DIV/0!	0.72	-0.03	219.94	263.81	140.6	197.42	165.2		197.4	179.43			72.19		451.91
840	1	0.00					#DIV/0!	#DIV/0!	0.67	-0.05	210.47	257.82	136.46	190.75	159.43		191.0	172.99			71.96		432.24
850	1.000	0.00					#DIV/0!	#DIV/0!	0.64	-0.03	197.42	251.77	132.2	183.35	153.77		183.7	165.93			72.08		391.68
860	1.000	0.00					#DIV/0!	#DIV/0!	0.61	-0.03	172.2	245.32	128.05	174.5	147.83		173.6	154.72			71.74		279.22

Page 3

Blaze King / Valley Comfort

Wood Heater Test Data - EPA Method 5G

Run:	
Manufacturer:	Blaze King
Model:	PE32
Tracking No.:	
Project No.:	Low Burn - Invalid Run Stalled
Test Date:	02-Jul-18
Beginning Clock Time:	00:00
Recording Interval:	10 min.
Total Sampling Time:	890 min.
Burn Rate:	N/A kg/hr

Velocity Traverse Data	Pt.1	Pt.2	Pt.3	Pt.4	Pt.5	Pt.6	Pt.7	Pt.8	
Initial dP									"H2O
Initial Temp.									oF

Equipment Numbers: THERMOSTAT KNOB WAS CLOSED 80° FROM FULLY OPEN
NOTE: THERM KNOB WAS CLOSED 76° FROM FULLY OPEN FOR OFFICIAL EPA LOW BURN
TEST TERMINATED AT 890 MINS BECAUSE < .1 LB/MIN WEIGHT CHANGE FOR 30 MINUTES

PM Control Module:	BK-06	
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.56	lb/lb-mole
Dilution Tunnel H2O:	4.00	percent
Dilution Tunnel Static:	-0.680	"H2O
Pitot Tube Cp:	0.99	
Meter Box Y Factor:	0.988	

Barometric Pressure:	Begin	Middle	End	Average
				0.00 "Hg

Signature/Date:

Tunnel Velocity:	#DIV/0!	ft/sec.
Intial Tunnel Flow:	#DIV/0!	scfm
Average Tunnel Flow:	#DIV/0!	scfm
Tunnel Area:	0.196	ft2
Post-Test Leak Check:	[illegible]	cfm@"Hg
Fuel Moisture (dry basis	22.3	%
Total Particulate:		mg
Filter Holder No.:		

	Particulate Sampling Data								Fuel Weight, lb		Wood Heater Temperature Data, oF											Stack	
Elapsed Time	Gas Meter Cubic Feet	Sample Rate, cfm	Orifice dH	Meter oF	Meter Vac. In. Hg	Dilution Tunnel Temp.	Dilution Tunnel dP	Pro. Rate (10%)	Scale Reading	Weight Change	Firebox Top	Firebox Bottom	Firebox Back	Firebox Left	Firebox Right	Firebox Interior	Average Surface	Stack	Filter	Impinger exit	Ambient	Draft In. H2O	Catalyst Temp.
870	1.000	0.00					#DIV/0!	#DIV/0!	0.59	-0.02	156.01	238.04	123.46	164.92	141.39		164.8	145.08			71.63		248.18
880	1.000	0.00					#DIV/0!	#DIV/0!	0.59	0	145.08	229.52	119.25	156.07	135.62		157.1	137.13			71.29		226.78
890	1.000	0.00					#DIV/0!	#DIV/0!	0.59	0	136.4	219.55	115.11	147.77	129.73		149.7	130.35			71.4		210.31
Avg/Total	0.00	0.00	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!		-0.23	324.50	307.69	177.47	218.79	213.29		248.26	227.70			73.35		650.81

Page 4

Note To File

Subject: Low Burn Rate Justification

Parties: EPA Staff

Dr. Rafael Sanchez-OEECA

Robert (Bob) Scinta-OEECA

Steffan Johnson-OAQPS

Patrick Yellin-OEECA

Angelina Brashear-OAQPS

Mike Toney-OAQPS

Ashnil Reddy-Blaze King

Chris Neufeld-Blaze King

Background: On January 1, 2021, we received an email from Dr. Sanchez in which he comments that EPA had received an email expressing concern about the low burn rate on the PE32 test report. The email expressing concern was from ADEC.

EPA requested data to support the PE32 was in fact tested at the lowest burn rate possible. Data was submitted (attached) to EPA on January 13, 2021. Subsequently, EPA requested a virtual phone call with Blaze King's Ashnil Reddy and Chris Neufeld where we were to be asked questions related to the data. OAQPS was given the time to review the data and Low Burn Justification memorandum submitted 01/13/2021.

Blaze King and EPA conducted a virtual phone call. Present were all the parties cited in the header of this memorandum. Several questions were asked about the data and responded to by Ashnil Reddy. OEECA's Bob Scinta inquired of Steffan Johnson if he was satisfied that the Blaze King Princess 32 had in fact been tested at the lowest burn rate possible. Stef asked Angelina Brashear her opinion, having reviewed the supporting data and she commented she was. Stef then asked Mike Toney, having also reviewed the data, and he too acknowledged his support.

Stef then said that as far has he and his staff were concerned, the data a supporting document supported the PE32 had been tested at the lowest possible burn rate.

	Bob Scinta commented that as far as EPA was concerned, Blaze King had provided sufficient data for the agency to review and it was the decision of EPA that the PE32 had been tested at the lowest possible burn rate.
Update:	Dr. Rafael Sanchez called me (Chris Neufeld) and asked that we included the letter of Low Burn Justification with each test report for all our units that use out thermostat.
	This cover memo and supporting documents and data will be included in all CBI reports submitted to EPA

Appendix C

EPA ALT - 154

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Ken Morgan
Technical Services Director
OMNI-Test Laboratories, INC
Post Office Box 301367
Portland, Oregon, 97294

12/13/2023

Dear Mr. Morgan,

I am writing in response to your emails and letter dated November 20, 2023, requesting that the Environmental Protection Agency approve for use an alternative test method (ATM) for demonstrating compliance with New Source Performance Standard (NSPS) Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA). Specifically, the filter weighing procedures as outlined in ASTM E2515-11 to determine compliance for wood heaters under 40 CFR Part 60. The Office of Air Quality Planning and Standards, as the delegated authority, must make the determination on any major alternatives to test methods and procedures required under 40 CFR parts 59, 60, 61, 63, and 65. Your proposed alternative test method and our approval decisions are discussed below.

Your letter outlines concerns with the gravimetric analysis of the pair of filters used to capture particulate during each compliance test. Specifically, you state that the method suggests that weighing filters and filter assemblies in pairs will reduce measurement error, but that the method provides direction inconsistent with achieving error reduction.

As detailed in your letter ASTM E2515-11 section 9.4.4 states:

> *"9.4.4 Desiccate the filters, filter gaskets, and the probe assemblies at 20 +/- 5.6°C (68 +/- 10°F) and ambient pressure for at least 24 h. Weigh each component at intervals of not less than 6 h until a constant weight is achieved. Record results to the nearest 0.1 mg. During each weighing, the period for which the components are exposed to the laboratory environment shall be less than 2 min. The filter gaskets can be weighed in sets to be used in each filter holder and kept in an identified container at all times except during sampling and weighing. The filter holder assembly after the front filter need not be desiccated or weighed."*

As shown above, section 9.4.4 states that "...the filter gaskets may be weighed in pairs", however it does not say that you may do so for the filter tares.

In contrast, section 10.2.1 of ASTM E2515-11 states:

> *"10.2.1 Desiccate the filters and filter gaskets at 20 +/- 5.6°C (68 +/-10°F) and ambient pressure for at least 24 h. Weigh each component at intervals of at least 6 h until a constant weight is achieved. Report the results to the nearest 0.1 mg. Filters and filter gaskets may be weighed directly without a Petri dish. They may be weighed in pairs (front and back filters and front and back filter gaskets from same filter train) to reduce handling and weighing errors. During each weighing, the components shall not be exposed to the laboratory atmosphere for longer than 2 min. For the room air background sample filter and filter gasket, treat negative particulate catch weights as "zero" when determining total room air particulate weight in accordance with 10.2."*

Additionally, you point out that section 10.2.1 allows, during post-test analysis, the filters to be weighed in pairs. You also assert that not only does this section state that filters may be weighed in pairs, but it also expresses that it is advantageous to do in order to reduce handling and weighing errors.

Furthermore, during our recent discussions of this issue, you pointed out that since ASTM E2515-11 does not specify that filters may be weighed in pairs during pre-test processing, doing so would likely lead to concerns regarding whether proper procedures were being followed. Also,in response to our inquiry of whether ASTM E2515-11 could be followed as written, where one would weigh both filters independently during pre-test processing (clause 9.4.4) and in pairs during post-test processing (section 10.2.1), you point out that this defeats the intent of section 10.2.1 in that more measurements are being performed than necessary and this goes against the stated intent of reducing handling and weighing errors.

It is your opinion, given the language in ASTM E2515-11 discussed above, that the authors originally intended that both filter gaskets and filters should be weighed in pairs during both pre-test and post-test procedures in order to reduce such errors (as evidenced by the language in section 10.2.1). Based on this, you are asking for consideration and approval of an alternative test method that would allow pre-test processing (taring) of filters in pairs as is currently allowed for filter gaskets in section 9.4.4. As you state, you seek this alternative because the errors imposed by the extra weighing of independent filters can account for a very high degree of error on today's cleaner stoves where a ±0.1 mg of measured catch can mean ± 0.2 grams of emissions under ordinary conditions. In light of these circumstances, we agree that appropriate paired weighings must be done during both pre and post test weighings.

We have reviewed your request to perform the pre-test processing (taring) of filters in pairs as is currently allowed for filter gaskets in section 9.4.4 when conducting testing testing of wood heaters under Subpart AAA. This approval is contingent on the following conditions:

- All of the pieces of the filter and filter assemblies that are tared together during pre-test assessment must also be weighed together when the post-test gravimetric assessment is made and the results of these assessments must be recorded to the nearest 0.1 mg.

Please note that this alternative method approval is valid until such time that Subpart AAA and QQQQ are revised or replaced to require a different certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.A copy of this letter must be included in each certification test report where this alternative test method is utilized.

Since this alternative test method may be of interest to others performing testing as described in ASTM2515-11 on wood heaters subject to 40 CFR 60, Subpart AAA, we believe it is reasonable to make it broadly applicable. Therefore, we will post this letter as ALT-154 on the EPA website at *https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods* for use by other interested parties.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,

STEFFAN JOHNSON
Digitally signed by STEFFAN JOHNSON
Date: 2023.12.13 15:03:21 -05'00'

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Shannon Banner, EPA/OAQPS/SPPD
Lessard, Patrick, EPA/OAQPS/SPPD
Rafael Sanchez, EPA/OECA
Robert Scinta, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD
Mark Turner, EPA/OAQPS/SPPD
Richard Wayland, EPA/OAQPS/AQAD

Appendix D

Original Conditioning Data

OMNI-Test Laboratories, Inc.

Conditioning Data - ASTM E2780/ ASTM E2515

Manufacturer: Valley Comfort
Model: 30.2 Series
Tracking No.: BK-30-17
Project No.: 0142WS014E

Test Date: 8/7-24/2017
Technician: Charlie Bishop of Blaze King
Operation Category: II-III

Operated for 50 hours at a medium burn rate.

Elapsed Time (hr)	Fuel Addition Certification Catalyst (lbs)	Certification Catalyst Exit Temp (° F)	Fuel Addition Equivalent Catalyst (lbs)	Equivalent Catalyst Exit Temp (° F)
0	21.5	1108.2	27.7	1375.6
1		1446.3		1000.0
2		1155.7		1193.7
3		1315.2		1621.4
4		1144.8		1390.6
5		1027.2		1177.0
6		989.9		1199.7
7		732.5		1094.6
8		988.9		1014.5
9		1041.7		959.2
10		865.5		958.6
11		758.2		923.1
12		760.8		1033.9
13		705.8		953.5
14		658.1		840.0
15		864.5		755.0
16	22.2	1185.6		808.6
17		1231.3		728.7
18		973.1		1431.3
19		655.8		1626.1
20		1055.8		924.6
21		983.0		877.0
22		869.7		801.7
23		794.8		990.2
24		755.6	31.3	1332.5
25		504.8		1057.3
26		736.4		1153.6
27		929.4		894.2
28		847.5		884.8
29		679.5		1011.4
30		951.5		728.8
31		723.0		847.8
32		975.6		668.5
33		1820.7		811.0
34		976.1		762.6
35		470.8		714.2
36	18.9	1065.7		750.3
37		1548.1		775.2
38		1419.9		746.7
39		1211.8		686.5
40		1333.7		683.0
41		876.6		761.1
42		936.7		1149.0
43		1026.3		618.6
44		525.4		823.2
45		572.5		667.8
46		1458.4		669.8
47		1394.1		648.9
48		1825.0		662.9
49		1421.3		575.9
50		1164.0		565.7

Technician Signature:

Control No. P-SSAR-0003
27 of 748
Copy of 0142WS014E_Results-1

Appendix F

EPA 30 - Day Notice

Blaze King Inc.,
146 A Street
Walla Walla, WA 99362.
Phone (509) 522 2730,
Fax (509) 522 1701

February 15, 2024

Please consider this our notification of intent to test the wood heaters listed below, on the dates indicated.

30-Day Notification of Test

Manufacturer:	**EPA Approved Test Laboratory:**
Blaze King Industries, Inc.	OMNI-Test Laboratories, Inc.
146 A Street	13327 NE Airport Way
Walla Walla, Washington 99362	Portland, Oregon 97230
cneufeld@blazeking.com	atiegs@omni-test.com

3rd Party Certifier:

OMNI-Test Laboratories, Inc.

13327 NE Airport Way

Portland, Oregon 97230

atiegs@omni-test.com

Model Names/Model Numbers: Testing:	**Date of Scheduled**
Ashford 25/AF25, Sirocco 25/SC25, Boxer 24.1/BX24.1	February 26, 2024
Ashford 30.2/AF30.2, Sirocco 30.2/SC30.2, Chinook 30.2/CK30.2	March 4, 2024
Princess Insert 29/PI29	March 11, 2024
Ashford 20.2/AF20.2,Sirocco 20.2/SC20.2,Chinook 20.2/CK20.2	March 18, 2024

Chris Neufeld

Vice President

Blaze King Industries, Inc.

From: Chris Neufeld
To: Ken Morgan; John Steinert
Subject: FW: Expedited Testing Of Blaze King Woody Heaters
Date: Wednesday, April 3, 2024 5:34:28 AM
Attachments: 30 Day Notice Of Testing-PFS TECO-Updated.docx
30 Day Notice OMNI Updated.docx

Guys,

This is an email exchange between me and EPA's Patrick Yellin as it relates to the 30-day notice. You can see his offices approved the notices sent to their offices. I don't know if you need these.

From: Yellin, Patrick <Yellin.Patrick@epa.gov>
Sent: Wednesday, February 21, 2024 11:33 AM
To: Scinta, Robert <scinta.robert@epa.gov>; Sanchez, Rafael <Sanchez.Rafael@epa.gov>; Chris Neufeld <CNeufeld@Blazeking.com>; WoodHeaterReports <WoodHeaterReports@epa.gov>
Subject: FW: Expedited Testing Of Blaze King Woody Heaters

Hi Chris –

Yes, this is what we need for official record-keeping purposes. Thanks for updating and getting to us so quickly.

Cheers –
Patrick Yellin

From: Chris Neufeld <CNeufeld@Blazeking.com>
Sent: Wednesday, February 21, 2024 2:07 PM
To: Yellin, Patrick <Yellin.Patrick@epa.gov>
Cc: Sanchez, Rafael <Sanchez.Rafael@epa.gov>
Subject: RE: Expedited Testing Of Blaze King Woody Heaters

> **Caution:** This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Gentlemen,

I hope this is what you are needing.

Chris

From: Yellin, Patrick <Yellin.Patrick@epa.gov>
Sent: Wednesday, February 21, 2024 9:59 AM
To: Chris Neufeld <CNeufeld@Blazeking.com>

Subject: FW: Expedited Testing Of Blaze King Woody Heaters

Hi Chris –

This the latest version I have from you – if those are the most updated test dates, would you please update the consolidated 30 day notices in the 2 word documents (strike through dates) and put in the updated dates and send back to us (Bob, Rafael, myself and Woodheaterreports@epa.gov)

Thanks!
Patrick Yellin

From: Scinta, Robert <scinta.robert@epa.gov>
Sent: Monday, February 19, 2024 10:06 AM
To: Sebasco, Philip <Sebasco.Philip@epa.gov>; Lischinsky, Robert <Lischinsky.Robert@epa.gov>; Sanchez, Rafael <Sanchez.Rafael@epa.gov>
Cc: Schefski, Melissa (she/her/hers) <Schefski.Melissa@epa.gov>; Denton, Loren <Denton.Loren@epa.gov>; Yellin, Patrick <Yellin.Patrick@epa.gov>
Subject: FW: Expedited Testing Of Blaze King Woody Heaters

FYI

From: Chris Neufeld <CNeufeld@Blazeking.com>
Sent: Friday, February 16, 2024 7:18 PM
To: Scinta, Robert <scinta.robert@epa.gov>
Subject: Expedited Testing Of Blaze King Wood Heaters

> **Caution:** This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Robert Scinta, P.E.
Air Branch Supervisor
Monitoring, Assistance, and Media Programs Division
Office of Compliance, Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency

Mr. Scinta,

We were contacted by both PFS TECO and OMNI-Test of changes to our plan retesting of the (6) Blaze King wood heaters that are currently certified by EPA. As you know the certified labs are very busy and due to conflicts in their schedules, they have been able to accommodate our wood heater testing on the dates below.

PFS TECO Corporation

John Steinert has informed us the Princess 32 (PE32) will be tested the week of March 4th.
PFS TECO has also informed us the King 40 (KE40) will be tested the week of March 11th.

OMNI-TEST, Inc.

Alex Tiegs of OMNI-Test has informed testing of our units will begin Monday, February 26th.

OMNI-Test will test the Sirocco 25 (SC25) the week of Monday February 26th. (We make two additional models from the identical firebox, as per the current certificate. They are the Ashford 25 and Boxer 24.1)

OMNI-Test will test the Ashford 30.2 (AF30.2) the week of Monday March 4th. (We make two additional models from the identical firebox, as per the current certificate. They are the SC30.2 and CK30.2)

OMNI-Test will test the Princess Insert 29 (PI29) the week of Monday March 11th.

OMNI-Test will test the Ashford 20.2 (AF20.2) the week of March 18th. (We make two additional models from the identical firebox, as per the current certificate. They are the SC20.2 and CK20.2)

Thank you,

Chris Neufeld
Vice President
Blaze King Industries, Inc.

11. Revision History

Closure Date	Project # / CR ID #	Technician / Evaluator	Report Sect.	Report Item	Summary of Changes
4/9/2024	0142WN021E	R. Tiegs T. Tong K. Morgan	All	All	First Edition of Report