Evaluation Report

Non CBI

Valley Comfort Systems, Inc. (Blaze King)

25 Series

Report Number: 0142WN020E

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

Product Testing & Certification

www.omni-test.com

Document Edition # 000 (04/03/24)

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 Fireplace Insert, Catalytic Type.

Non CBI

Valley Comfort Systems, Inc. (Blaze King)

Model(s): Sirocco SC25 Insert, Ashford 25 Insert, Boxer 24 Freestanding

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: 02/27/24 - 03/04/24

Report Date: April 4, 2024

Report Number: 0142WN020E
Project Number: 0142WN020E

** 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 4, 2024

TABLE OF CONTENTS

TABLE OF CONTENTS

Continued

1. INTRODUCTION

1.1 Purpose of Test Program

The Valley Comfort Systems, Inc. (Blaze King) 25 series Wood-Fired Fireplace Insert, 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 2104008230) 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 #2142. OMNI representative Riley Tiegs, Tony Tong and Ken Morgan conducted the certification testing and completed all testing by 03/04/24. 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 :	**0.74**	grams per hour
Weighted Average Efficiency (HHV) :	**78.7**	percent

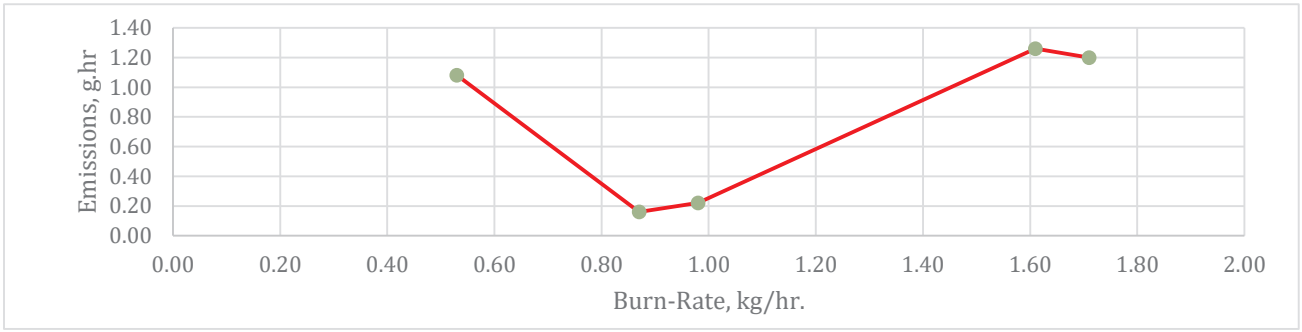


Figure 1 - Emissions Plot by Burn-Rate

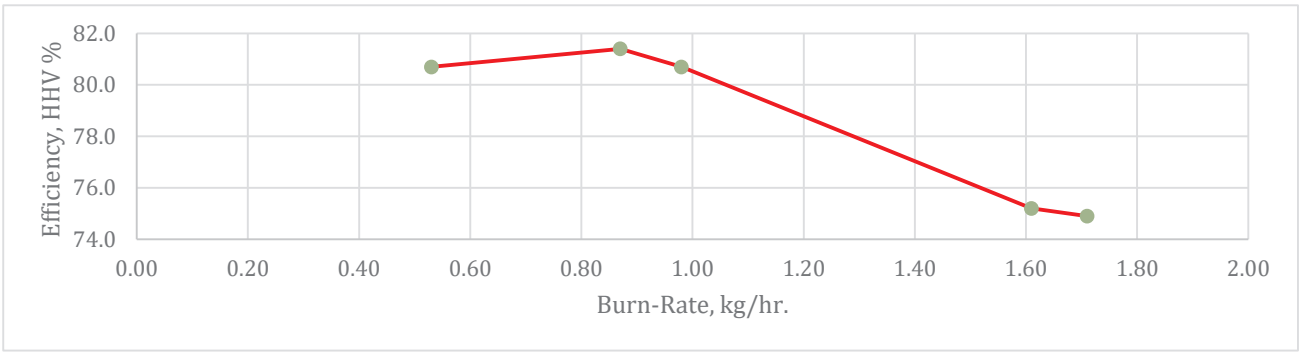


Figure 2 - Efficiency Plot (HHV) by Burn-Rate

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 25 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 25 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 C for a copy of this alternate method.

2.2 Description of Appliance Under Test

The Valley Comfort Systems, Inc. (Blaze King) 25 Series are variable burn-rate catalytic appliances consisting of the model variants Sirocco SC25 Insert, Ashford 25 Insert and Boxer 24 Freestanding. The model evaluated in this report was the Sirocco SC25 Insert. The insert variants utilize a factory installed convection fan, whereas it is an optional accessory on the the Boxer 24 free-standing unit. Therefore, tests used in the weighted average emissions were conducted with the convection fan in operation and with an additional fan-confirmation test with the fan not operating was conducted in order to accomodate the optionality of the convection fan on for the free-standing Boxer variant.

Type

Insert Models: Wood-Fired Fireplace Insert, Catalytic, EPA SCC code 2104008230

Free-Standing Model : 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 is mildly trapezoidal (side walls widen at the from by 11°) and has a usable volume of 2.159 ft^3.

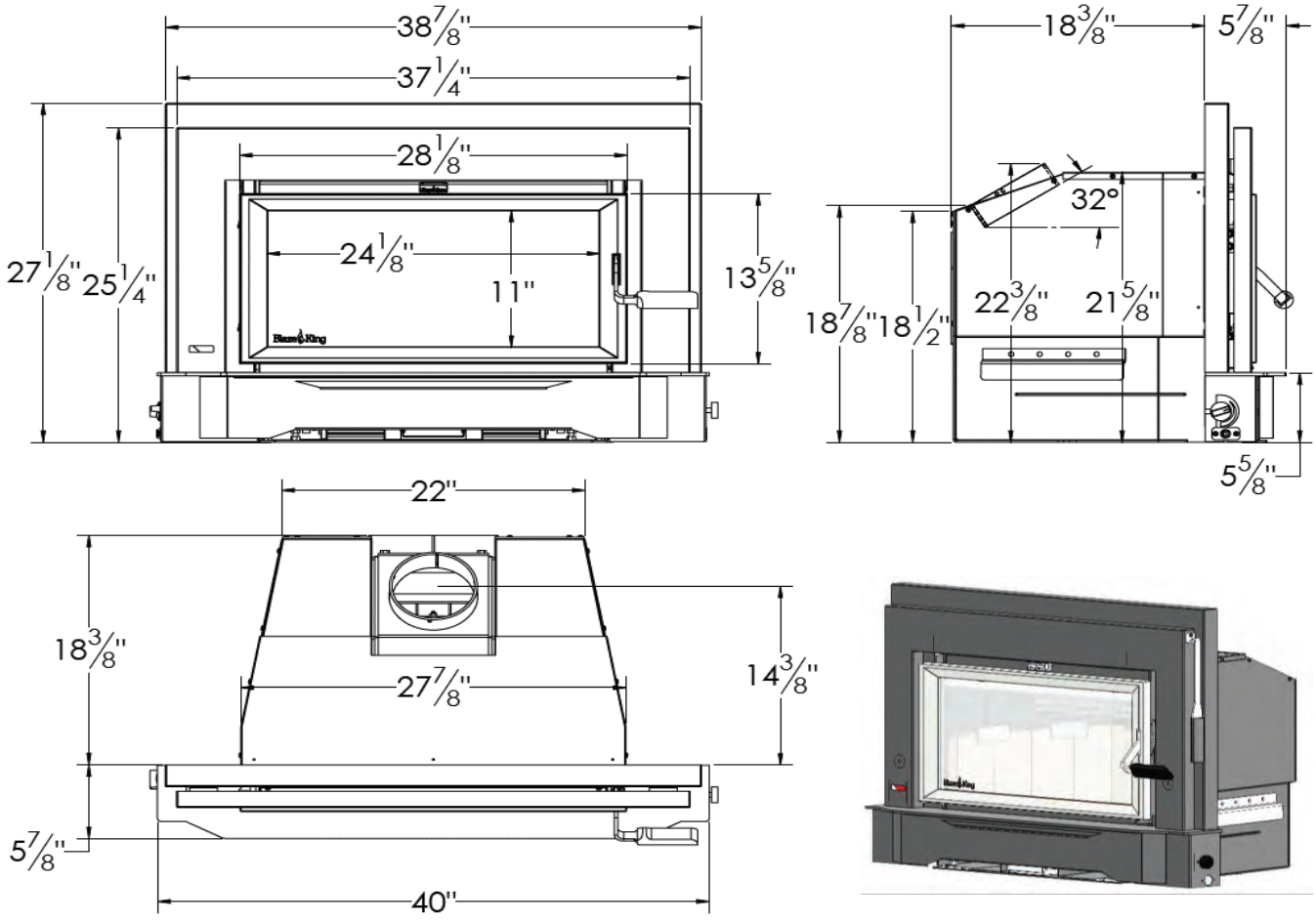


Figure 3 - Tested Model Sirocco SC25 Over-all Dimensions

Materials of Construction

The 25 series wood heaters are constructed primarily of mild steel. The firebox is lined with firebrick that measures various sizes with the largest at 1.25 x 4.5 x 9". The feed door has a 24.25" x 11.5" glass panel and 7/8" rope gasket.

Air Introduction System

Primary air enters the appliance through a rectangular opening located in the front of the unit near the bottom. Air is controlled through this opening by a rotating flap that is operated by a rod extending out the left side of the appliance near the front. The rotating flap is further controlled by a Bi-metallic spring that closes the flap as the spring is heated. Primary air is channeled to the rear of the firebox, and up the back. It then enters the firebox and is channeled forward through two round tubes 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.

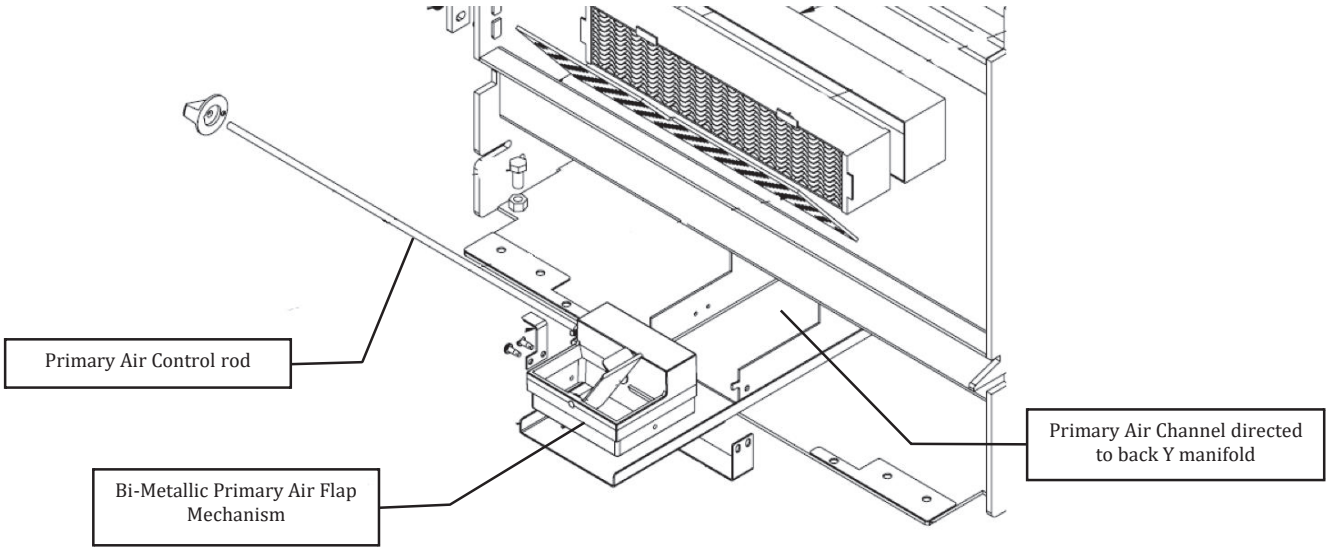


Figure 4 - Relative location of Primary Air Control

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.

Combustor:
A metal combustor measuring 2.48" X 13" x 2" 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:
The 6" diameter flue outlet is located in the rear of the unit; it is mounted at a 30 degree angle.

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:

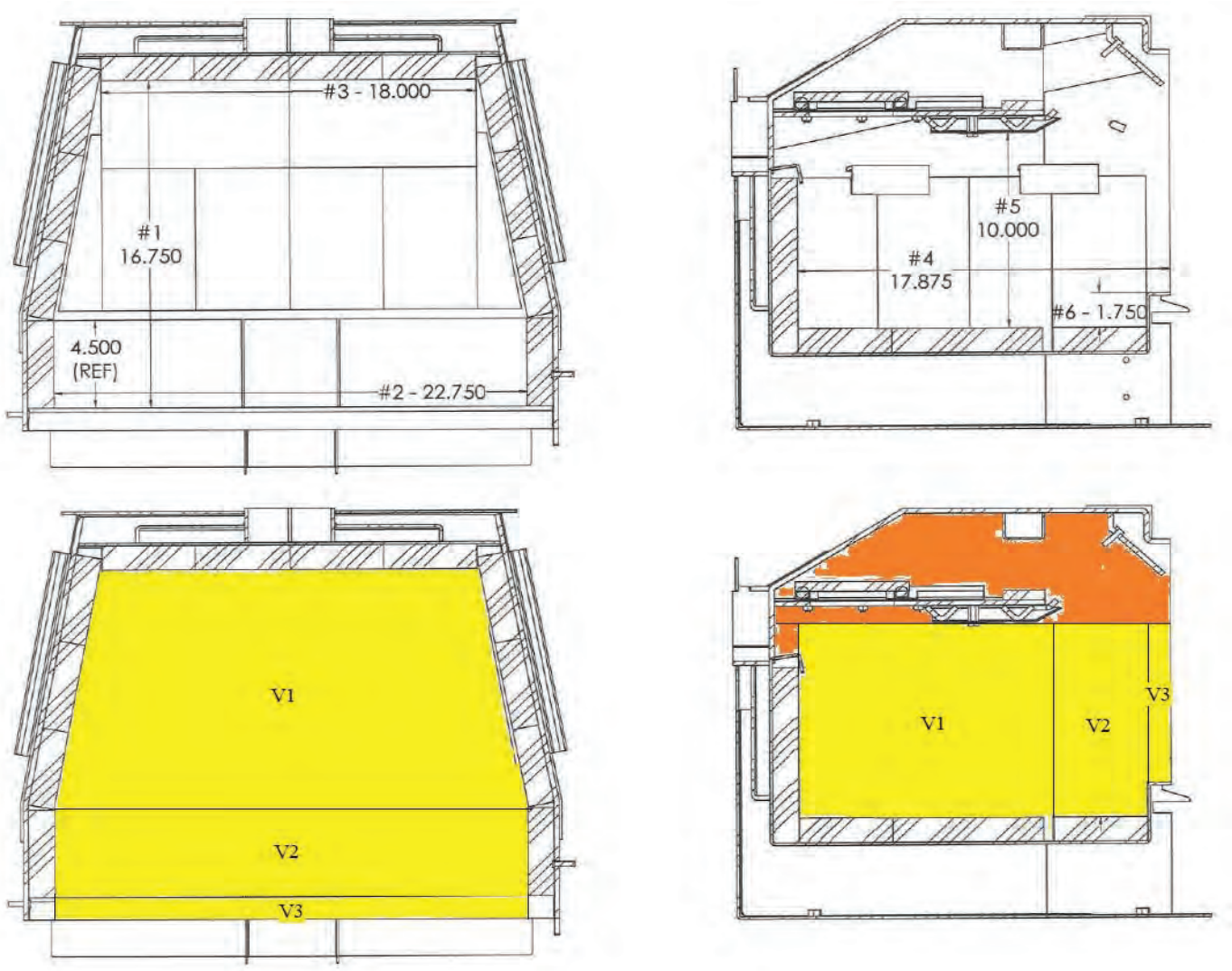


Figure 5 - Fire Box Volume

Firebox Volume Calculation

$V1 = [(22.75 + 18.0) / 2] \times (16.75 - 4.5) \times 10.0 = 2495.9375 \text{ in}^3$

$V2 = 4.5 \times 22.75 \times 10.0 = 1023.75 \text{ in}^3$

$V3 = (17.875) \times 22.75 \times (10.0 - 1.75) = 211.4844 \text{ in}^3$

$VT = V1 + V2 + V3 = 3731.1719 \text{ in}^3 = 2.159 \text{ ft}^3$

Model Variant: Boxer 24 (BX24)

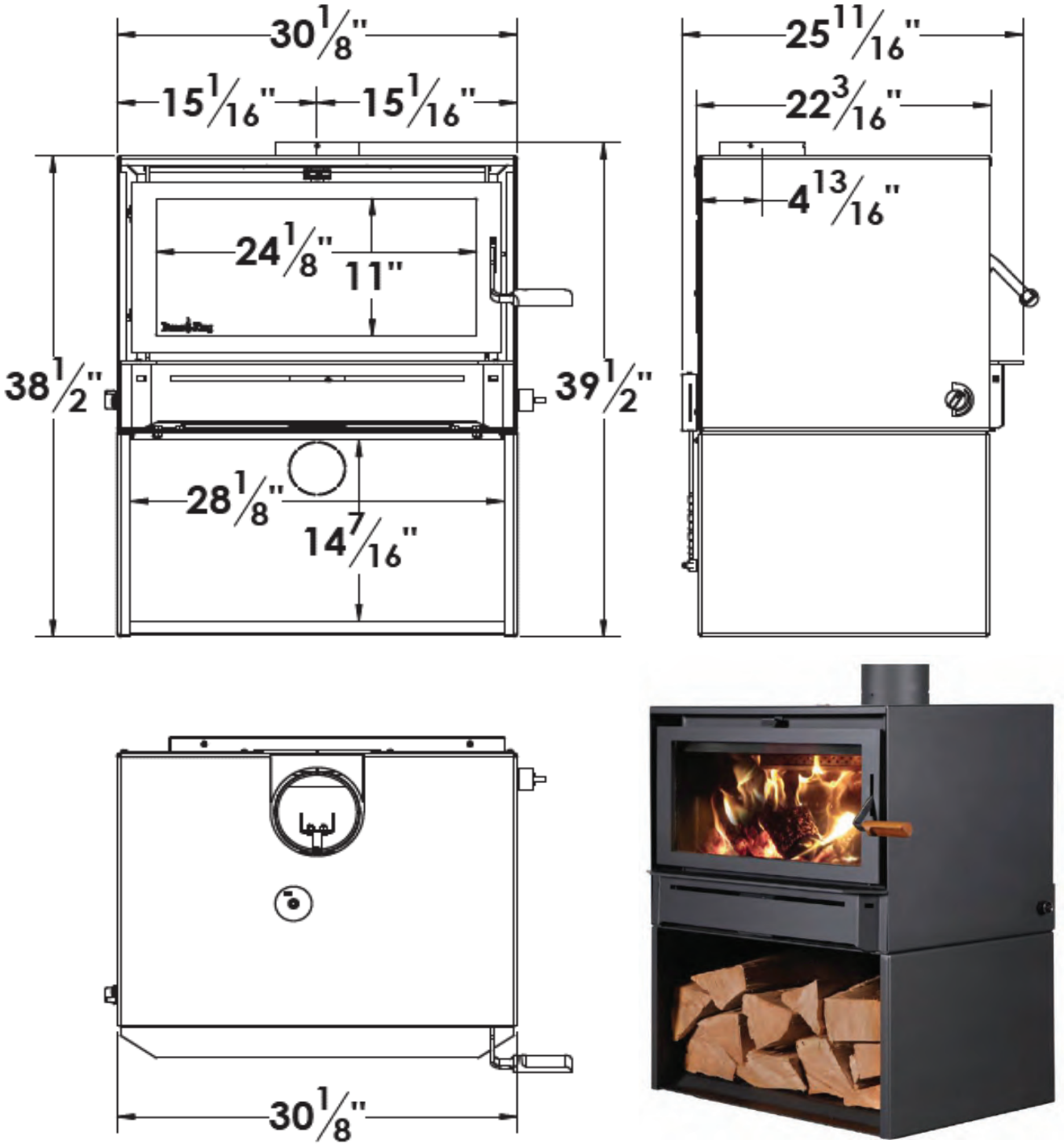


Figure 6 - Over-all Dimensions of model variant BX24

Model Variant: Ashford 25 Insert (AF25)

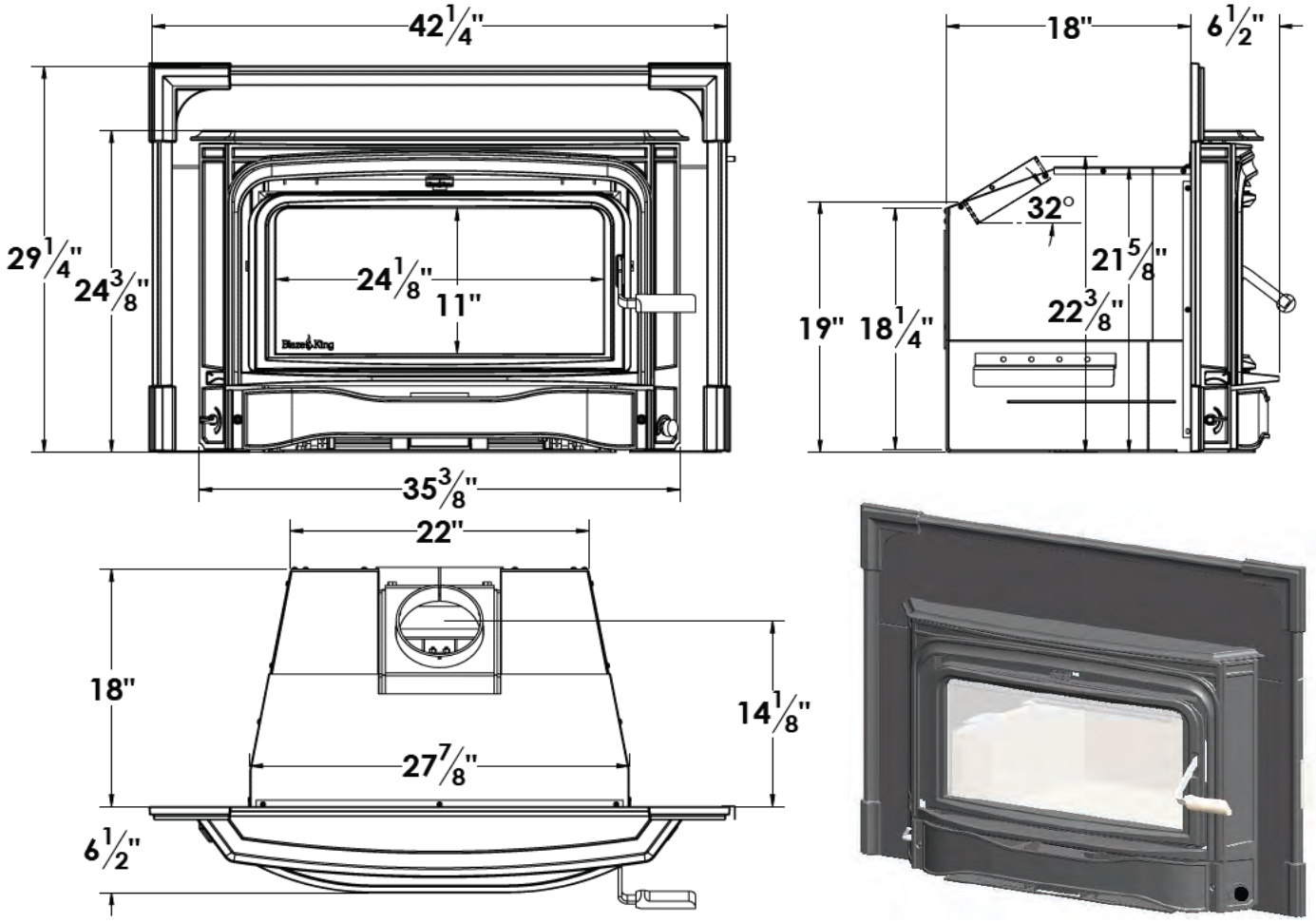


Figure 7 - Over-all Dimensions of model variant AF25

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.

Figure 8 - Appliance installed in test structure and general over-view of work area

Figure 9 - A 30° elbow was required by this appliance

Figure 10 - Close-up of Appliance installed in test booth

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 2/26/24 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.

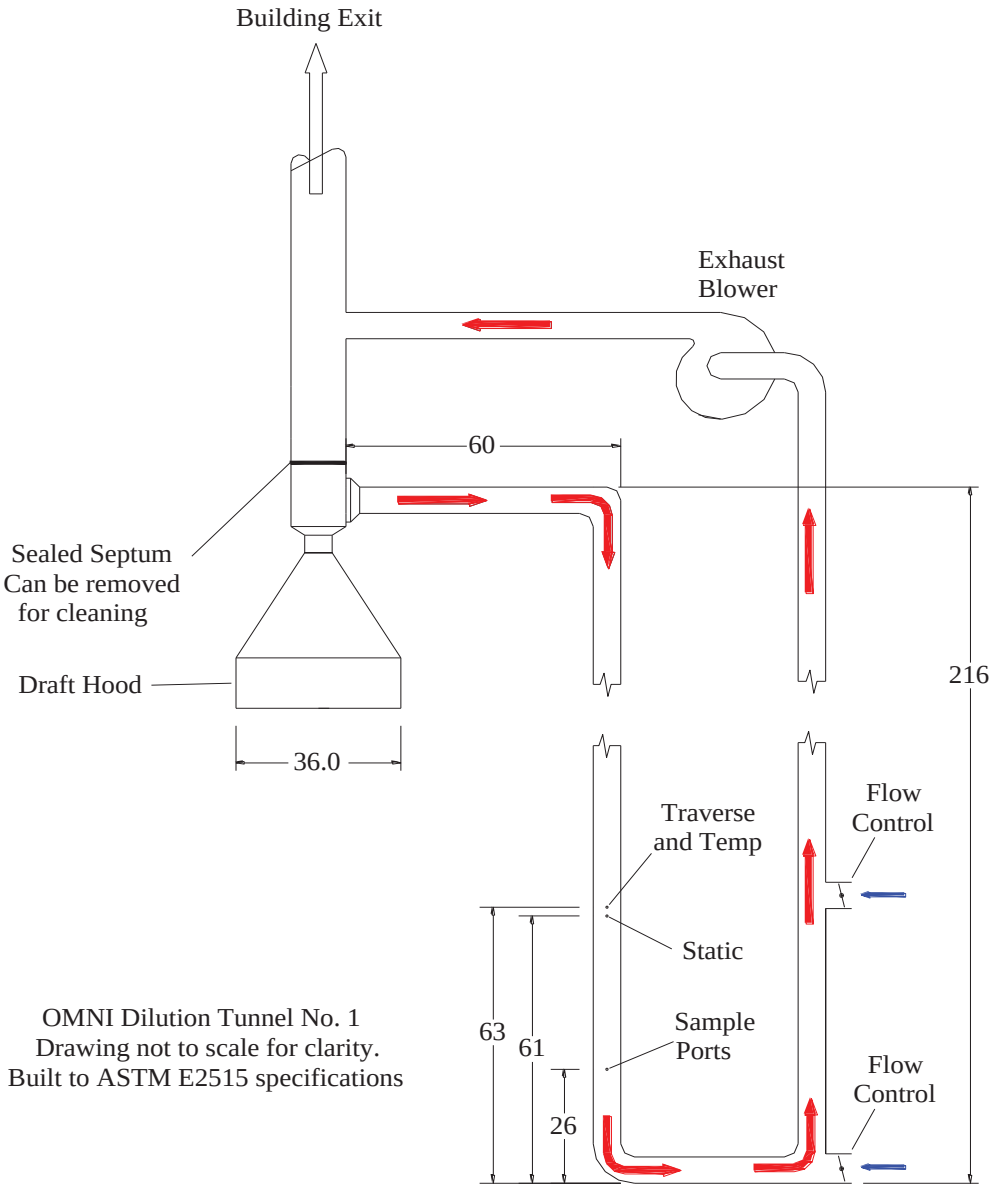


Figure 11 - Dilution Tunnel at OMNI-Test Laboratories Portland, Oregon Facility

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.

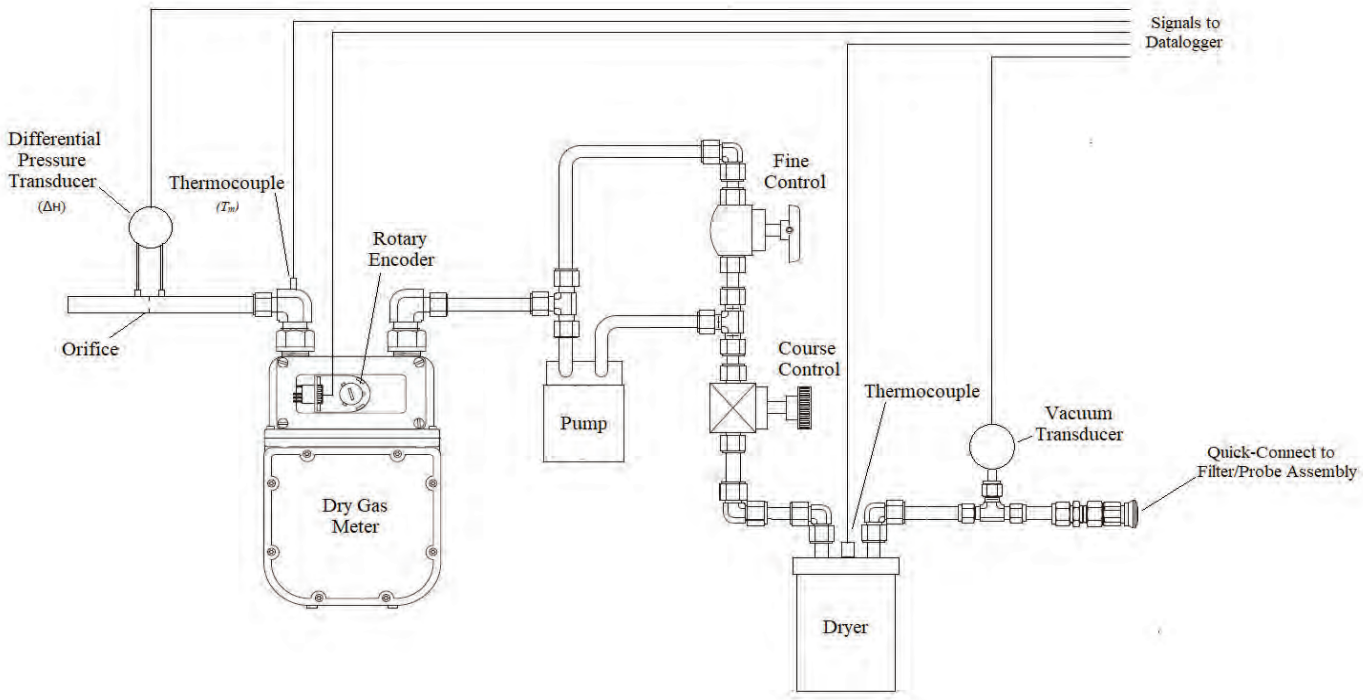


Figure 12 - Sampling System (typical) Used At OMNI-Test Laboratories

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.

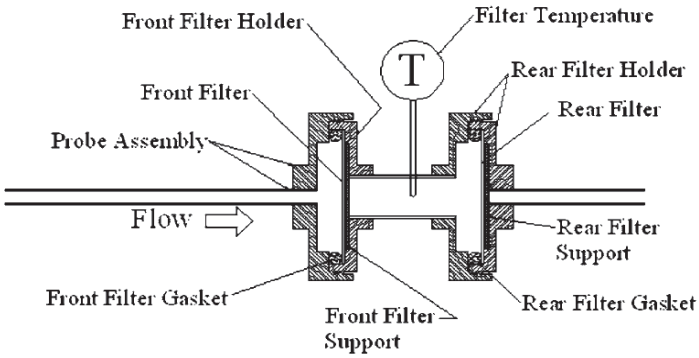


Figure 13 - Sample Probe Assembly as specified in ASTM E2515-11

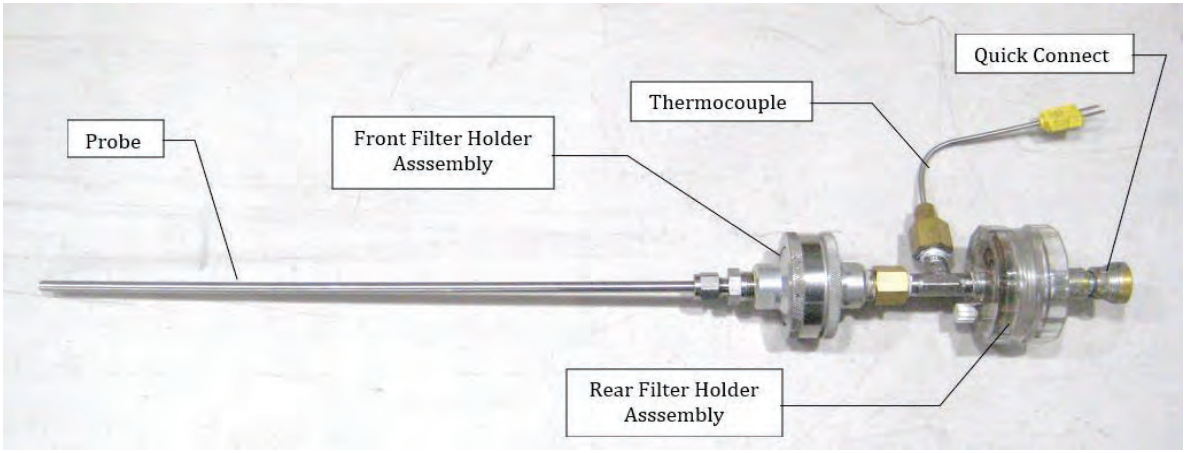


Figure 14 - Sample Probe used by OMNI

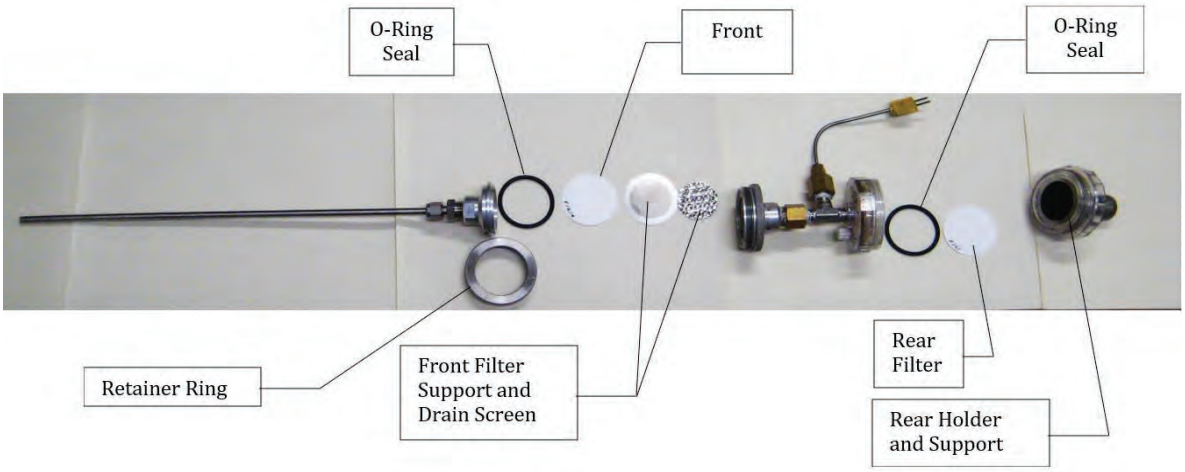


Figure 15 - Exploded View of Sample Probe Assembly used by OMNI

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.

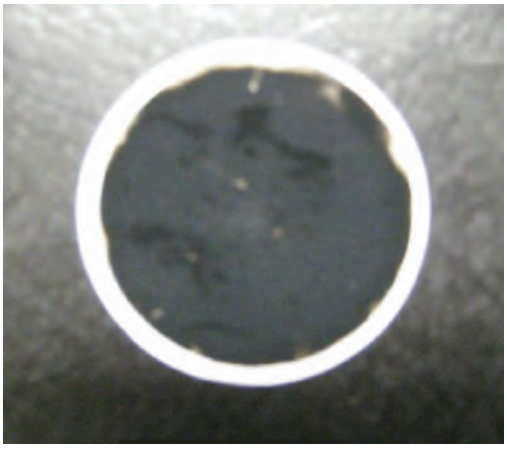


Figure 16 - Effective facial area of sample filter (file photo, not from the evaluation in this report)

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.

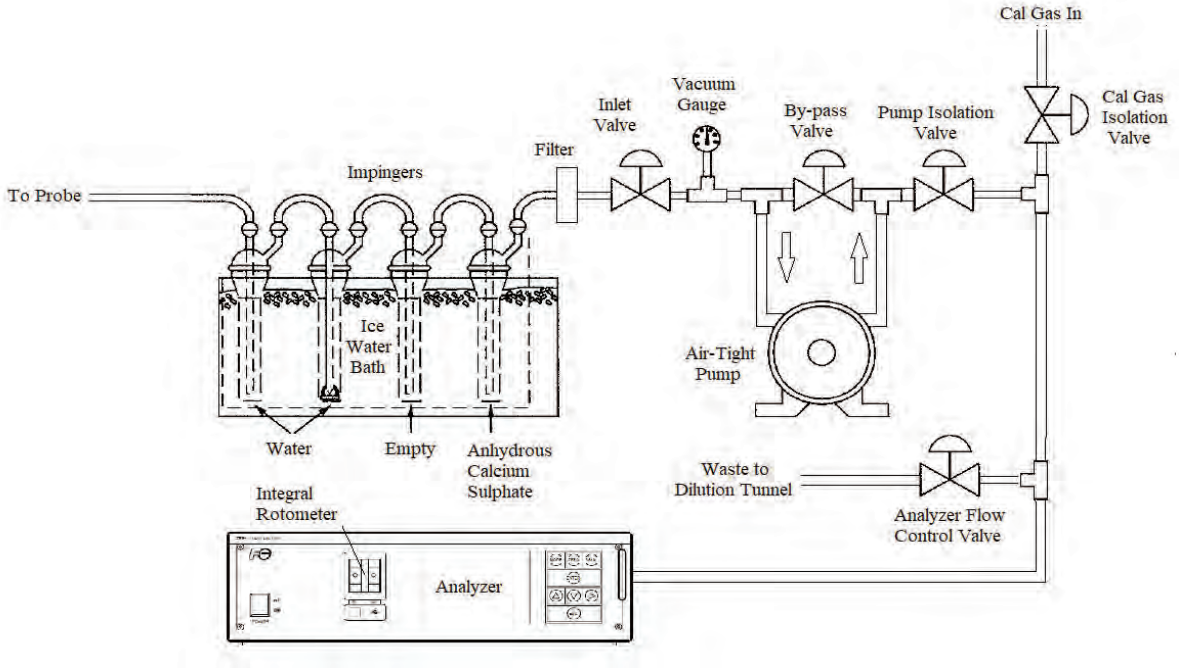


Figure 17 - Flue Gas Measurement System

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.

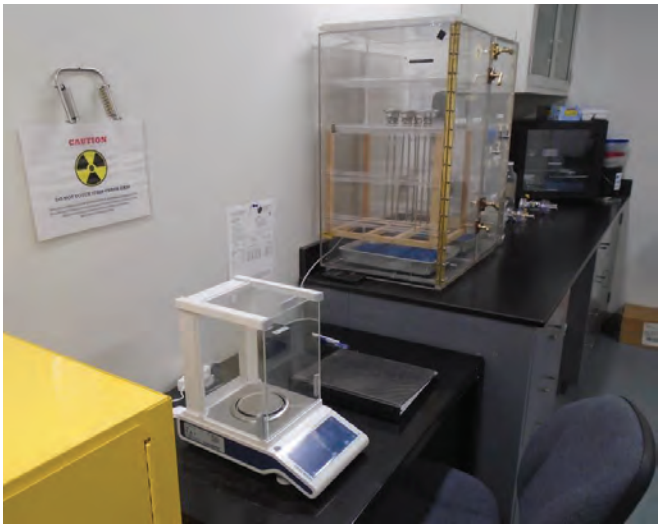


Figure 18 - Analytical Scale and Desiccator

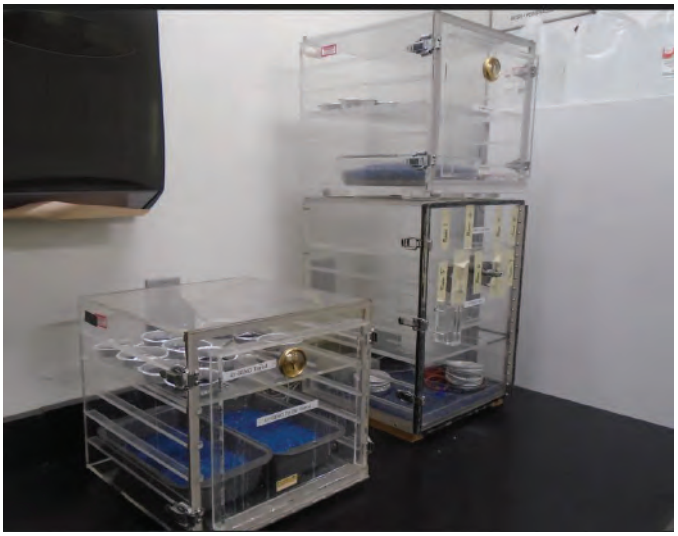


Figure 19 - Additional Desiccators

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 20 - Typical of all stampings on the fuel lot

Figure 21 - 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 SC 25 EPA Test Burn Instructions

The following literature shall be used as a guideline when operating a Blaze King SC 25 during an ASTM E2780 and E2515 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 until fire is well established
- once loading door is closed and combustor temperature begins to climb, close the bypass door, turn fan on to high
- once load has burned down to 1.5-2.0 lbs, use the bypass handle to grab the side of the bypass latch to pull the rod outward and open bypass door and then loading door, 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
- close bypass, position the bypass handle on the center of the bypass latch and push inward
- prepare to load preburn.

Preburn Load

- when ready to load preburn, open bypass door then loading door and place 4(12inch) pieces onto coal bed in a front-to-back orientation (North-South), evenly spaced. Then place 4(17inch) 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) + 2.0	-2° (92° CCW)
II	(0.25 x TLW) + 3.6	10° (80° CCW)
III	(0.25 x TLW) + 8.2	35°
IV	n/a	0°
Fan Confirmation	(0.25 x TLW) + 3.9	20°

- 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, using the bypass handle, open bypass door, then loading door, load test fuel (three 2x4's and two 4x4's). 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.	Date	Category	BR, kg/hr.	ER. g/hr.	First Hour	ER, g/hr.	First Hour	HHV	LHV	Included in WA? (1 = yes))
3	2/29/2024	1	0.53	1.08	0.26	1.08	0.26	80.7	87.3	1
2	2/28/2024	2	0.87	0.16	0.39	0.16	0.39	81.4	88.0	1
1	2/27/2024	2	0.98	0.22	0.26	0.22	0.26	80.7	87.2	1
5	3/1/2024	3	1.61	1.26	1.89	1.26	1.89	75.2	81.3	1
4	3/1/2024	3	1.71	1.20	2.14	1.20	2.14	74.9	81.0	1
6	3/4/2024	2	1.01	0.24	0.13	0.24	0.13	80.5	87.0	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 %
3	0.53	1.08	0.2724	0.2942	0.2942	21.9827	23.7805	15.43
2	0.87	0.16	0.2816	0.0451	0.0451	22.9222	24.7808	15.95
1	0.98	0.22	0.5326	0.1172	0.1172	42.9808	46.4427	30.16
5	1.61	1.26	0.4842	0.6101	0.6101	36.4118	39.3655	27.42
4	1.71	1.20	0.1950	0.2340	0.2340	14.6055	15.7950	11.04
Sums			1.7658	1.3005	1.3005	138.9031	150.1645	100.00
				ER, g/hr. Uncorrected	ER, g/hr. Corrected	HHV, %	LHV, %	
Weighted Averages (ΣkE / Σk)				**0.74**	**0.74**	**78.7**	**85.0**	

[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*
3	0.53	9957	8038	1.52	24.30	0.21
2	0.87	16278	13254	0.20	3.23	0.05
1	0.98	18476	14910	1.11	17.77	0.29
5	1.61	30244	22749	0.87	12.99	0.35
4	1.71	32140	24085	0.39	5.79	0.17
6	1.01	18902	15208	1.22	19.56	0.33
			Average of All runs	0.89	13.94	0.23
			Average of runs included in Weighed Average Only	0.82	12.82	0.21

[1] Based on a calorific value of 8516.77 Btu/dry pound. (Source: CSA B415.1:22 for Douglas Fir)
Run 6 was a fan confirmation test and is 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	69	68	30.17	30.10	42	40	0	0
2	71	71	29.83	29.63	41	39	11	16
3	70	71	29.58	29.59	36	35	16	15
4	69	72	29.57	29.48	33	32	0	0
5	72	72	29.48	29.28	32	31	15	6
6	72	72	29.99	29.93	32	32	8	13

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	8	12.1	22.44	3.4
2	8	13.7	22.11	3.8
3	8	12.4	22.6	3.6
4	8	13.4	22.33	3.3
5	8	12.5	22.37	3.1
6	8	12.5	20.91	3.5

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	15.8	13.00	17.71	21.52	18.0	27.60	7.32	3	2	E/W
2	15.8	13.01	17.63	21.41	18.0	28.08	7.32	3	2	E/W
3	15.8	13.00	17.71	21.52	18.0	28.05	7.32	3	2	E/W
4	15.6	12.88	17.44	21.13	18.0	27.84	7.23	3	2	E/W
5	15.4	12.77	17.08	20.60	18.0	27.35	7.13	3	2	E/W
6	15.8	13.04	17.45	21.14	18.0	27.86	7.32	3	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	360	18.822	213.78	80.0
2	409	18.908	210.58	83.4
3	668	18.700	209.24	78.2
4	205	19.236	207.19	98.7
5	216	19.204	205.62	98.5
6	353	18.929	211.11	86.8

Table 8 - Appliance Average Surface Temperature Data

Run No.	*Beginning*	*Ending*	*Δ T*
1	419	334	85.6
2	305	309	4.2
3	264	335	70.4
4	433	326	107.4
5	413	348	65.4
6	422	408	14.2

4. Discussion

4.1 The Test Series - Date started February 26, 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 because one of the model variants in this series is offered with a convection fan as an option. An additional test run (test run 3) was required due to test run 2 exceeding category I, and so a total of six test runs were performed. The dilution tunnel was cleaned on February 26, 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 25 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 22 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.

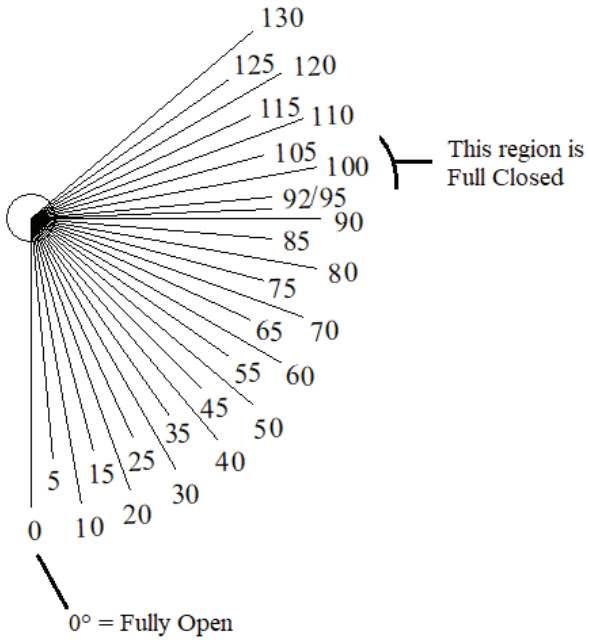


Figure 22 - Primary Air Control Setting Scale used for testing

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 3, 4, 5 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 0.4 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 three 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.

3. Control Air Settings - Run 1 was ran at 85° from full open, which was in between the initially targeted categories I and II with prescribed settings of 92° and 80°, respectively. This was suggested by the manufacturer representative in order to better gauge what adjustments for altitude may become necessary for subsequent tests.

4.2 - Individual Test Run Narratives

Run 1 - February 27, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, the preburn charge weighing 12.1 lb. was placed within the fire chamber and allowed to burn at full intensity. With a weight of 6.5 pounds remaining, the primary air control was adjusted to the test setting and the convection fan speed control was adjusted to a medium-low range. At this moment, datalogging of the pre-burn was also imitated. The pre-burn lasted 60 minutes resulting in a suitable coal bed weight of 3.4 lb. No anomalies occurred during the pre-burn.

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 20 seconds.
Door:	Fuel loading door closed at 40 seconds.
Primary Air:	85° from CCW from full open position. (Refer to Figure 22)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Med-Low for duration of test.

Figure 23 - Run 1 - Test Fuel

Figure 24 - 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 360 minutes from the start of the test and a resulting dry burn-rate of 0.98 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 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 - February 28, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, the preburn charge weighing 13.7 lb. was placed within the fire chamber and allowed to burn at full intensity. With a weight of 6.0 pounds remaining, the primary air control was adjusted to the test setting and the convection fan speed control was adjusted it's lowest setting. At this moment, datalogging of the pre-burn was also initiated. At 47 minutes, 0.4 lb. of coals were removed due to the very slow decrease in weight. This was done in accordance with ASTM E2780 clause 9.5.3 and 15 minutes lapsed between this adjustment and ending of preburn with a suitable coal bed weight of 3.8 pounds. No other anomalies occurred during the pre-burn.

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:	92° from CCW from full open position. (Refer to Figure 22)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Low for duration of test.

Figure 25 - Run 2 - Test Fuel

Figure 26 - 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 409 minutes from the start of the test and a resulting burn-rate of 0.87 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 I burn-rate, but resulted in a category II. Although this test run was not needed for category fulfillment, it 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 - February 29, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, a preburn charge of 12.4 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 lowest 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 0.3 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 68 minutes the pre-burn was ended with a suitable coal bed of 3.6 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 45 seconds.
Door:	Fuel loading door closed at 48 seconds.
Primary Air:	100° from CCW from full open position. (Refer to Figure 22)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Low for duration of test.

Figure 27 - Run 3 - Test Fuel

Figure 28 - Run 3 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 668 minutes from the start of the test and a resulting burn-rate of 0.53 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 I, which was fulfilled. During the pre-test, 0.3 lb. was added to the over-all weight of the appliance due to adding the flue gas probe as the continuous analyzer bias check had not yet been performed prior to scooping and zeroing of the system scale. Technicians were mindful of the over-stated scale reading and were careful to end the pre-burn with a valid mass percentage of coal bed. This offset in measured weight was also noted on the printed-out data presented in this report. No other 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. This test run is considered valid and appropriate for inclusion in the weighted average for this test series.

Run 4 - March 1, 2024

With both the primary air and convection fan controls adjusted to their highest respective settings, a preburn charge of 13.4 lb. was placed within the fire chamber and allowed to burn at full intensity. 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 0.3 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 80 minutes the pre-burn was ended with a suitable coal bed of 3.3 lb. (3.6 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 60 seconds.
Primary Air:	0° (Fully Open - Refer to Figure 22)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, High for duration of test.

Figure 29 - Run 4 - Test Fuel

'**Figure 30** - 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 205 minutes from the start of the test and a resulting burn-rate of 1.71 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. During the pre-test, 0.3 lb. was added to the over-all weight of the appliance due to adding the flue gas probe as the continuous analyzer bias check had not yet been performed prior to scooping and zeroing of the system scale. Technicians were mindful of the over-stated scale reading and were careful to end the pre-burn with a valid mass percentage of coal bed. This offset in measured weight was also noted on the printed-out data presented in this report. No other 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. This test run is considered valid and appropriate for inclusion in the weighted average for this test series.

Run 5 - March 1, 2024

With the primary air control set at 55° from full open and the convection fan control adjusted to it's high setting, the preburn charge of 12.5 pounds was allowed to burn until a weight of 9.0 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. 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 3.1 lb. (3.2 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 45 seconds.
Door:	Fuel loading door closed at 45 seconds.
Primary Air:	35° from CCW from full open position. (Refer to Figure 22)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	On, Med-High for duration of test.

Figure 31 - Run 5 - Test Fuel

Figure 32 - 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. At 170 minutes, the computer managing the datalogging equioment was inadvertantly reset when the attending technician's knee bumped against the computer's reset switch. Fortunately, the computer and datalogging were re-established before the next 10-minute interval thus not jeopardizing the 10 minute proportionality requirements. Because of this, the data was analyzed using 10 -minute intervals. The full 1-minute interval data (less missing 9 minutes) are presented in Appendix D. The test continued without further incident until it ended with zero mass remaining on the scale at 216 minutes from the start of the test and a resulting burn-rate of 1.61 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. During the pre-test, 0.1 lb. was added to the over-all weight of the appliance due to adding the flue gas probe as the continuous analyzer bias check had not yet been performed prior to scooping and zeroing of the system scale. Technicians were mindful of the over-stated scale reading and were careful to end the pre-burn with a valid mass percentage of coal bed. This offset in measured weight was also noted on the printed-out data presented in this report. No other 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. This test run is considered valid and appropriate for inclusion in the weighted average for this test series.

Run 6 - March 4, 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, the preburn charge was placed within the fire chamber and allowed to burn at full intensity. With a weight of 8.0 pounds remaining, the primary air control was adjusted to the test 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 0.4 lb. to the scale. This was taken into account when determining the coal bed weight at the end of the preburn. At 69 minutes the pre-burn was ended with a suitable coal bed of 3.5 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 40 seconds.
Door:	Fuel loading door closed at 40 seconds.
Primary Air:	70° from CCW from full open position. (Refer to Figure 22)
Secondary Air:	N/A - Appliance has none.
Convection Fan:	OFF - Fan Confirmation Test.

Figure 33 - Run 1 - Test Fuel

Figure 34 - Run 1 - 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 353 minutes from the start of the test and a resulting burn-rate of 1.01 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, which was fulfilled. During the pre-test, 0.4 lb. was added to the over-all weight of the appliance due to adding the flue gas probe as the continuous analyzer bias check had not yet been performed prior to scooping and zeroing of the system scale. Technicians were mindful of the over-stated scale reading and were careful to end the pre-burn with a valid mass percentage of coal bed. This offset in measured weight was also noted on the printed-out data presented in this report. No other 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. 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. Each subsequent test run is in the above format is added

3. Reagent Tares

Run 1 Test Data

Test Date: 2/27/2024
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model SC 25

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Project No.: 0142WN020E
Tracking No.: 2142
Run: 1
Test Date: 02/27/24

Burn-Rate Result

0.98 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	1.32	1.32	0.26	0.26
Emission Rate, g/hr	**0.22**	0.22	**0.26**	0.26
Emissions Factor, g/kg	0.22	0.22	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		78.9	80.0
Average Tunnel Gas Velocity (vs), feet/second		18.890	18.822
Average Tunnel Gas Flow Rate(Qsd)	DSCF/hr	12916.0	12826.8
	DSCF/min	215.3	213.8
Average Delta p, in. H2O		0.122	0.121
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	360

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	57.703	57.928	57.705	9.616	57.703	57.928	57.705	9.616
Average Gas Meter Temperature, °F	79	77	76	63	79	77	76	63
Total Sample Volume (V_{mstd}), DSCF	57.775	58.475	57.948	9.981	57.775	58.475	57.948	9.981
Total Particulates (mn), mg - m_n	0.0	1.0	1.0	0.2	0.0	1.0	1.0	0.2
Particulate Concentration (C_s - C_r) g/DSCF	0.00000	0.00002	0.00002	0.00002	0.00000	0.00002	0.00002	0.00002
Total Particulate Emissions (ET), grams	n/a	1.32	1.33	0.26	n/a	1.32	1.33	0.26
Particulate Emission Rate, g/hr	n/a	0.22	0.22	0.26	n/a	0.22	0.22	0.26
Emissions Factor, g/kg	n/a	0.22	0.22	n/a	n/a	0.22	0.22	n/a
Difference, ET from Average ET, grams	n/a	-0.01	0.01	n/a	n/a	-0.01	0.01	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	66	68	67	✓
Filter Face Velocity, fpm	< 30	8.68	8.73	8.68	✓
Dryer Exit Temperature, °F	< 80	59	50	49	✓
Tunnel Velocity, fpm	>800	1,133	1,129		✓
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	0.1	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		66		✓
Ambient Temp, °F	< 90		70		✓
Trains A and B Precision	(*A*) < 7.5%		0.45%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.00		✓
Stove Surface ΔT	<= 125 °F		86		✓
Room Air Velocity	< 50 fpm		0		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	1
Test Date:	2/27/2024

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: SC25
Date: 02/27/24
Run: 1
Control #: 2142
Test Duration: 360
Output Category: II

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	80.7%	87.2%
Combustion Efficiency	99.1%	99.1%
Heat Transfer Efficiency	81%	88.0%

Output Rate (kJ/h)	15,717	14,910	**(Btu/h)**
Burn Rate (kg/h)	0.98	2.17	**(lb/h)**
Input (kJ/h)	19,477	18,476	**(Btu/h)**

Test Load Weight (dry kg)	5.90	13.00	**dry lb**
MC wet (%)	17.71		
MC dry (%)	21.52		
Particulate (g)	1.32		
CO (g)	105		
Test Duration (h)	6.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.01	1.11
g/kg Dry Fuel	0.22	17.77
g/h	0.22	17.47
lb/MM Btu Output	0.03	2.58

Air/Fuel Ratio (A/F)	11.91

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

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	SC25				
Date:	2/27/2024		**Temp. Units**	F	(F or C)
Run:	1		**Weight Units**	lb	(kg or lb)
Control #:	2142				
Test Duration:	360				
Output Category:	II		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.71		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	15.80		**%C**	48.73	
Burn Rate (dry kg/h):	0.98		**%H**	6.87	
Total Particulate Emissions:	1.32 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.09**	**9.27**	**#DIV/0!**	**241.22**	**68.38**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	15.80	0.32	1.04		263.0	67.0
1	15.60	0.29	0.92		286.0	67.0
2	15.60	0.03	4.95		243.0	67.0
3	15.60	0.00	4.21		224.0	67.0
4	15.50	0.00	3.70		217.0	67.0
5	15.50	0.00	3.50		212.0	67.0
6	15.50	0.00	3.45		208.0	67.0
7	15.50	0.00	3.42		205.0	67.0
8	15.40	0.00	3.52		203.0	67.0
9	15.40	0.00	3.76		202.0	67.0
10	15.40	0.00	4.00		200.0	67.0
11	15.30	0.00	4.19		199.0	67.0
12	15.30	0.00	4.45		199.0	66.0
13	15.30	0.00	4.63		199.0	66.0
14	15.20	0.00	4.74		199.0	66.0
15	15.20	0.01	5.00		199.0	66.0
16	15.20	0.01	5.19		199.0	66.0
17	15.10	0.01	5.33		200.0	66.0
18	15.10	0.01	5.39		200.0	66.0
19	15.00	0.01	5.51		199.0	66.0
20	15.00	0.01	5.57		200.0	66.0
21	14.90	0.01	5.74		200.0	66.0
22	14.90	0.01	5.82		201.0	66.0
23	14.90	0.01	5.93		204.0	66.0
24	14.80	0.01	5.71		204.0	66.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	14.80	0.01	5.90		203.0	66.0
26	14.70	0.01	6.24		203.0	66.0
27	14.70	0.01	6.55		205.0	66.0
28	14.60	0.01	6.76		207.0	66.0
29	14.60	0.01	7.12		207.0	66.0
30	14.50	0.01	7.33		208.0	66.0
31	14.40	0.01	7.46		210.0	66.0
32	14.40	0.01	7.54		211.0	66.0
33	14.30	0.01	7.65		212.0	66.0
34	14.30	0.01	7.67		213.0	66.0
35	14.20	0.01	7.70		214.0	66.0
36	14.20	0.01	7.82		216.0	66.0
37	14.10	0.01	7.91		216.0	66.0
38	14.10	0.01	8.05		217.0	66.0
39	14.00	0.01	8.25		217.0	66.0
40	14.00	0.01	8.61		220.0	66.0
41	13.90	0.01	8.92		221.0	66.0
42	13.80	0.01	8.75		221.0	66.0
43	13.80	0.01	8.66		221.0	66.0
44	13.70	0.01	8.79		221.0	66.0
45	13.70	0.01	8.83		221.0	66.0
46	13.60	0.01	8.60		223.0	66.0
47	13.60	0.01	8.61		224.0	66.0
48	13.50	0.01	8.71		224.0	66.0
49	13.40	0.01259	8.89		224	66
50	13.40	0.01	8.92		224	66
51	13.30	0.01	9		223	66
52	13.30	0.01	9.08		225	66
53	13.20	0.01	9.21		225	66
54	13.20	0.01	9.18		226	66
55	13.10	0.01	9.36		227	66
56	13.00	0.01	9.31		227	67
57	13.00	0.01	9.42		227	67
58	12.90	0.01	9.57		227	67
59	12.90	0.01	9.66		227	67
60	12.80	0.01	9.65		228	67
61	12.80	0.01	9.68		227	67
62	12.70	0.01	9.85		228	67
63	12.70	0.01	9.96		229	67
64	12.60	0.02	10.02		231	67
65	12.50	0.02	9.96		233	67

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	12.40	0.02	10.09		236	67
67	12.40	0.03	10.09		235	67
68	12.30	0.03	10.27		238	67
69	12.30	0.03	10.38		242	67
70	12.20	0.04	10.46		246	67
71	12.20	0.04	10.61		249	67
72	12.10	0.04	10.79		254	67
73	12.00	0.06	10.97		259	67
74	11.90	0.07	11.17		265	67
75	11.90	0.12	11.15		269	67
76	11.80	0.21	11.48		275	67
77	11.70	0.21	11.64		280	67
78	11.60	0.28	12.09		287	67
79	11.50	0.73	12.01		288	67
80	11.50	1.71	12.31		294	67
81	11.30	1.87	12		295	67
82	11.30	0.98	12.29		294	67
83	11.20	0.2	12.18		294	67
84	11.10	0.02	11.2		292	67
85	11.00	0.00653	10.73		290	67
86	10.90	0.00495	9.53		287	68
87	10.90	0.00624	9.32		285	68
88	10.80	0.00504	9.75		284	68
89	10.70	0.00504	9.85		284	68
90	10.70	0.00599	9.99		284	68
91	10.60	0.05	10.78		284	68
92	10.50	0.35	11.52		285	68
93	10.40	1.52	11.89		289	68
94	10.30	1.74	12.02		293	68
95	10.20	1.81	11.85		295	68
96	10.10	1.94	11.94		295	68
97	10.00	2.07	12.1		298	68
98	9.90	2.19	12.15		300	68
99	9.80	2.1	12.09		300	68
100	9.70	1.44	12.18		298	68
101	9.60	1.02	12.16		298	68
102	9.50	0.91	12.12		300	68
103	9.40	0.84	12.23		298	68
104	9.40	0.79	12.21		299	68
105	9.30	0.68	12.21		299	69
106	9.20	0.6	12		299	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	9.10	0.95	12.55		303	69
108	9.00	0.4	11.83		301	69
109	8.90	0.04	11.77		299	69
110	8.80	0.01	11.39		298	69
111	8.70	0.00757	11.13		297	69
112	8.70	0.00679	10.99		295	69
113	8.60	0.00709	10.7		294	69
114	8.50	0.00595	10.59		291	69
115	8.40	0.00456	10.23		289	69
116	8.40	0.00459	10.02		286	69
117	8.30	0.00488	9.76		285	69
118	8.30	0.00492	9.59		284	69
119	8.20	0.00527	9.42		282	69
120	8.10	0.00534	9.19		281	69
121	8.10	0.00585	9.15		279	69
122	8.00	0.00602	8.96		278	69
123	8.00	0.00848	9.74		276	69
124	7.90	0.00935	9.97		278	69
125	7.90	0.00971	10.17		279	69
126	7.80	0.00951	10.43		278	69
127	7.70	0.00916	10.61		278	69
128	7.70	0.00909	10.87		278	69
129	7.60	0.01087	10.79		278	69
130	7.60	0.01123	11.12		280	69
131	7.50	0.01	11.24		279	69
132	7.50	0.01	11.42		278	69
133	7.40	0.02	11.55		278	69
134	7.30	0.01	11.59		281	69
135	7.30	0.02	11.75		281	69
136	7.20	0.02	11.79		281	69
137	7.10	0.03	11.86		282	69
138	7.10	0.04	11.92		282	69
139	7.00	0.04	11.93		282	69
140	6.90	0.04	11.94		282	69
141	6.90	0.03	11.91		281	69
142	6.80	0.03	11.92		281	69
143	6.70	0.02	12.02		282	69
144	6.70	0.01	11.79		282	69
145	6.60	0.01	11.94		283	69
146	6.50	0.01534	11.89		282	69
147	6.50	0.01	11.87		281	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	6.40	0.01	11.85		280	69
149	6.40	0.01	11.76		280	69
150	6.30	0.01	11.7		280	69
151	6.20	0.01	11.63		280	69
152	6.20	0.01334	11.59		280	69
153	6.10	0.0124	11.51		280	69
154	6.10	0.01541	11.44		280	69
155	6.00	0.00757	11.14		279	69
156	5.90	0.0075	11.2		280	69
157	5.90	0.00712	11.2		279	69
158	5.80	0.00686	11.14		278	69
159	5.80	0.00647	11.16		279	69
160	5.70	0.00666	11.13		278	69
161	5.70	0.00699	11.2		278	69
162	5.60	0.00796	11.14		277	69
163	5.50	0.00958	11.19		276	69
164	5.50	0.0134	11.26		275	69
165	5.40	0.00957	11.24		276	69
166	5.40	0.00679	11.32		276	69
167	5.30	0.00686	11.33		276	70
168	5.30	0.00721	11.21		277	70
169	5.20	0.00702	11.1		278	69
170	5.10	0.00692	10.93		278	69
171	5.10	0.00683	10.81		277	70
172	5.00	0.00679	10.89		277	70
173	5.00	0.00673	10.82		276	70
174	4.90	0.0066	10.68		275	70
175	4.90	0.00653	10.35		275	70
176	4.80	0.00602	9.68		274	70
177	4.80	0.00614	10.44		273	70
178	4.70	0.00624	10.51		273	70
179	4.70	0.00618	10.39		272	70
180	4.60	0.00621	10.59		272	70
181	4.60	0.00631	10.59		270	70
182	4.50	0.00621	10.5		269	70
183	4.50	0.00624	10.43		269	70
184	4.40	0.00624	10.3		268	70
185	4.40	0.00589	9.79		267	70
186	4.30	0.00566	9.72		267	70
187	4.30	0.00559	9.78		267	70
188	4.20	0.00547	10.05		268	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	4.20	0.00547	10.21		268	70
190	4.10	0.00547	10.24		266	70
191	4.10	0.00553	10.22		266	70
192	4.10	0.00559	10.09		264	70
193	4.00	0.00572	10.61		264	70
194	4.00	0.00589	10.5		262	69
195	3.90	0.00582	10.59		262	70
196	3.90	0.00579	10.5		263	69
197	3.80	0.00572	10.52		262	69
198	3.80	0.00589	10.63		261	69
199	3.70	0.00582	10.75		262	70
200	3.70	0.00559	10.83		261	70
201	3.60	0.00602	10.55		261	70
202	3.60	0.00592	10.74		260	70
203	3.50	0.00595	10.65		259	70
204	3.50	0.00592	10.71		259	70
205	3.40	0.00621	11.06		258	70
206	3.40	0.00634	11.04		259	70
207	3.30	0.0066	11.09		257	70
208	3.30	0.00666	11.17		257	70
209	3.30	0.0066	11.02		258	70
210	3.20	0.00611	10.94		261	70
211	3.20	0.00669	11.04		258	70
212	3.10	0.00673	10.96		257	70
213	3.10	0.00692	11.07		257	70
214	3.00	0.00721	11.11		257	70
215	3.00	0.00757	11.12		257	70
216	3.00	0.00819	11.16		257	70
217	2.90	0.00916	11.25		257	70
218	2.90	0.01	11.38		257	70
219	2.80	0.03	11.55		259	70
220	2.80	0.06	11.62		260	70
221	2.70	0.12	11.63		261	70
222	2.70	0.15	11.72		261	70
223	2.60	0.13	11.7		261	70
224	2.60	0.1	11.55		260	70
225	2.50	0.08	11.5		260	70
226	2.50	0.05	11.28		261	70
227	2.50	0.02	11.05		261	70
228	2.40	0.01606	10.79		260	70
229	2.40	0.00951	10.52		259	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	2.40	0.00796	10.33		259	70
231	2.30	0.00751	10.17		257	70
232	2.30	0.00715	10.16		258	70
233	2.30	0.00676	10.07		256	70
234	2.20	0.00653	9.91		257	70
235	2.20	0.00634	9.77		255	70
236	2.20	0.00624	9.69		255	70
237	2.10	0.00411	10.74		253	70
238	2.10	0.00368	10.61		254	70
239	2.10	0.00375	10.33		252	70
240	2.00	0.00359	10.13		251	70
241	2.00	0.00385	10.19		248	70
242	2.00	0.00385	9.97		247	70
243	1.90	0.00372	9.65		247	70
244	1.90	0.00346	9.59		245	70
245	1.90	0.00352	9.51		244	70
246	1.90	0.00362	9.51		242	70
247	1.90	0.00365	9.29		240	70
248	1.80	0.00375	9.39		238	70
249	1.80	0.00385	9.41		237	70
250	1.80	0.00385	9.22		236	70
251	1.80	0.00391	9.17		234	70
252	1.70	0.00391	9.17		233	70
253	1.70	0.00372	8.93		232	69
254	1.70	0.00395	8.96		231	70
255	1.70	0.00411	9		229	69
256	1.70	0.00404	8.95		228	69
257	1.60	0.00401	8.86		226	70
258	1.60	0.00407	8.98		225	69
259	1.60	0.00385	8.88		226	69
260	1.60	0.00398	8.9		226	70
261	1.60	0.00414	8.91		225	70
262	1.50	0.00407	8.92		224	69
263	1.50	0.00433	8.85		224	69
264	1.50	0.00472	8.82		222	69
265	1.50	0.00449	8.75		221	69
266	1.50	0.00582	8.69		221	69
267	1.40	0.00693	8.65		220	69
268	1.40	0.0066	8.68		219	69
269	1.40	0.00738	8.57		220	69
270	1.40	0.00738	8.56		219	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	1.40	0.0077	8.61		217	69
272	1.40	0.00744	8.47		217	69
273	1.30	0.00589	8.51		216	69
274	1.30	0.00578	8.45		214	69
275	1.30	0.00381	8.99		215	69
276	1.30	0.00349	8.89		213	69
277	1.30	0.00355	8.82		213	69
278	1.30	0.00294	8.88		212	69
279	1.20	0.00251	8.67		212	69
280	1.20	0.00245	8.57		211	69
281	1.20	0.00249	8.5		209	69
282	1.20	0.00252	8.5		208	69
283	1.20	0.00216	8.35		208	69
284	1.20	0.0022	8.28		208	69
285	1.10	0.00223	8.19		207	69
286	1.10	0.00255	8.13		206	69
287	1.10	0.00275	8.11		205	69
288	1.10	0.00278	8.02		204	69
289	1.10	0.00285	8.04		205	68
290	1.00	0.00285	8.04		203	68
291	1.00	0.00285	7.95		204	68
292	1.00	0.00291	7.93		203	68
293	1.00	0.00297	7.85		202	68
294	1.00	0.00285	7.9		202	68
295	1.00	0.00304	7.86		202	68
296	1.00	0.00307	7.89		201	68
297	1.00	0.00317	7.83		202	68
298	0.90	0.0032	7.72		200	68
299	0.90	0.00323	7.66		200	68
300	0.90	0.00333	7.79		200	68
301	0.90	0.00336	7.78		200	68
302	0.90	0.00339	7.71		199	68
303	0.90	0.00365	7.68		200	68
304	0.80	0.00352	7.58		199	68
305	0.80	0.00365	7.65		199	68
306	0.80	0.00352	7.64		200	68
307	0.80	0.00358	7.63		199	68
308	0.80	0.00375	7.59		199	68
309	0.80	0.00375	7.52		198	68
310	0.80	0.00381	7.57		199	68
311	0.80	0.00391	7.54		198	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	0.80	0.00395	7.46		198	68
313	0.70	0.00391	7.51		198	68
314	0.70	0.00401	7.5		197	68
315	0.70	0.00398	7.47		198	68
316	0.70	0.00404	7.41		197	68
317	0.70	0.00355	7.59		197	68
318	0.70	0.0033	7.71		198	68
319	0.70	0.00333	7.68		196	68
320	0.60	0.00323	7.68		195	68
321	0.60	0.0033	7.67		196	68
322	0.60	0.00326	7.67		195	68
323	0.60	0.0033	7.71		195	68
324	0.60	0.00326	7.67		194	68
325	0.60	0.00336	7.67		194	68
326	0.60	0.00333	7.59		194	68
327	0.50	0.00333	7.58		194	68
328	0.50	0.00339	7.57		195	68
329	0.50	0.00333	7.55		194	68
330	0.50	0.00352	7.55		194	68
331	0.50	0.00346	7.53		194	68
332	0.50	0.00352	7.56		194	68
333	0.50	0.00385	7.8		193	68
334	0.40	0.00378	7.71		194	68
335	0.40	0.00395	7.59		193	68
336	0.40	0.00424	7.5		194	68
337	0.40	0.00391	7.43		194	68
338	0.40	0.00404	7.57		194	68
339	0.40	0.00414	7.46		194	68
340	0.40	0.00385	7.3		195	68
341	0.30	0.00362	7.21		194	68
342	0.30	0.00375	7.17		192	68
343	0.30	0.00372	7.15		193	68
344	0.30	0.00381	7.25		193	68
345	0.30	0.00381	7.19		194	68
346	0.30	0.00385	7.15		193	68
347	0.30	0.00395	7.28		194	68
348	0.20	0.00407	7.28		194	68
349	0.20	0.0042	7.29		193	68
350	0.20	0.00449	7.28		194	68
351	0.20	0.00443	7.24		193	68
352	0.20	0.00456	7.17		193	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	0.20	0.00462	7.1		194	68
354	0.20	0.00456	7		192	68
355	0.20	0.00489	6.95		192	68
356	0.10	0.00479	6.86		192	68
357	0.10	0.00482	6.75		192	68
358	0.10	0.00495	6.63		193	68
359	0.10	0.00492	6.62		192	68
360	0.00	0.00475	6.48		193	68

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : SC 25
Tracking No. : 2142
Project No. : 0142WN020E
Test Date : 2/27/2024
Run No. : 1

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.159** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 15.113 lb.
Minimum Fuel Weight : 13.60 lb.
Maximum Fuel Weight : 16.62 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	2.10	2x4	18.00	22.1	22.4	24.3	22.9	1.71	0.0547		2.1		1.71
2	2.00	2x4	17.75	20.6	20.2	19.6	20.1	1.66	0.0539		2.0		1.66
3	1.60	2x4	17.75	19.1	21.2	21.3	20.5	1.33	0.0539		1.6		1.33
4	3.80	4x4	17.75	22.1	22.4	20.1	21.5	3.13	0.1258	3.8		3.13	
5	4.50	4x4	18.00	22.6	25.6	21.2	23.1	3.65	0.1276	4.5		3.65	
6													
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
21.5	21.8	12.2	22.3					
20.5	24.0	16.1	14.9					
14.2	18.2	18.4	18.4					
10.6	18.3	24.5	18.0					

Avg : 18.4

Assembled Crib Fuel Load with Spacers Attached

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.30	2x4		2.3000
2	2.50	2x4		2.5000
3	2.10	2x4		2.1000
4	4.10	4x4	4.10	
5	4.80	4x4	4.80	
6				
7				
8				
9				

Combined Mass of 4 x 4s 8.9 lb
Combined Mass of 2 x 4s 6.9 lb

Total Wet Mass of Fuel Load **15.8** 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	3	5.7	4.70	7.32	6.02	27.60	33.66	21.52	17.71
4 x 4	2	8.3	6.78						
Spacers	16	1.8	1.52						
Totals		15.8	13.00						

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 Pieces Moisture, % db
Measured	15.8	7.32	27.60	44	21.7
Required	13.6 - 16.6	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.:	2142
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WN020E
Model:	SC 25	Test Date:	2/27/2024

Dilution 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 *	0.066	61	0.257
X2	25.0	0.00	0.094	61	0.307
X3	75.0	0.00	0.100	61	0.316
X4	93.3	-0.5 *	0.074	61	0.272
Y1	6.7	0.5 *	0.070	61	0.265
Y2	25.0	0.00	0.100	61	0.316
Y3	75.0	0.00	0.088	61	0.297
Y4	93.3	-0.5 *	0.048	61	0.219
Center	50.0	0.00	0.120	61	0.346

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	30.1405882	in HG

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

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 18.4337$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 22.7216$$

$$F_P = V_{strav} / V_{scent} = 0.811$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 14.955\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	10:30	16:30
Barometric Pressure, in. Hg	30.17	30.10
Room Air Velocity, fpm	0	0
Room Air Temperature, °F	69	68
Room Relative Humidity, %	42.0	40.0
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

Dilution Tunnel

Date last cleaned	2/26/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

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

2 Create a smoking condition during start of pre-burn activities and using adequate lighting pointed upward and around 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 dilution tunnel flow turned-off, observe the flue draft gauge while turning the dilution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducement is occurring. Determine the cause (i.e. flue chimney too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 1

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E
Test Date: 2/27/24
Beginning Clock Time: 8:54

Coal Bed Range (lb):	3.2 (min)	4.0 (max)

Preburn Fuel Data

4 pieces @ 17 inches
4 pieces @ 12 inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

23.3	19.2	20.4	23.2	24.6	23.5	20
25.3						

Avg Preburn Moisture (% DB): **22.44**

			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	13.4	-0.082	503	171	179	395	358	746	321	479	66
1	13.3	-0.084	503	181	182	390	354	784	322	462	66
2	13.3	-0.085	506	185	185	385	353	838	323	468	66
3	13.1	-0.085	512	187	188	382	354	874	325	475	66
4	12.9	-0.085	520	188	191	378	355	890	326	480	66
5	12.7	-0.086	527	189	193	376	357	897	328	483	66
6	12.5	-0.086	535	189	195	373	360	904	330	483	66
7	12.4	-0.086	543	189	197	371	362	916	332	483	66
8	12.2	-0.086	552	190	199	369	363	931	335	487	66
9	12	-0.086	560	190	200	367	365	939	336	487	66
10	11.8	-0.089	569	190	201	368	368	977	339	496	66
11	11.5	-0.089	580	190	202	368	368	996	342	506	66
12	11.2	-0.089	591	190	202	367	368	1006	344	508	66
13	10.9	-0.089	603	191	202	366	368	1025	346	511	66
14	10.7	-0.088	616	191	203	365	368	1019	349	512	66
15	10.5	-0.089	626	191	203	364	368	1019	350	511	66
16	10.3	-0.089	635	192	202	365	369	1014	353	509	66
17	10.1	-0.089	642	192	201	365	369	1020	354	508	66
18	9.9	-0.089	650	192	201	367	370	1050	356	511	66
19	9.7	-0.09	659	192	200	369	371	1071	358	515	66
20	9.5	-0.09	668	192	199	372	372	1073	361	518	66
21	9.3	-0.09	676	192	199	375	375	1072	363	515	67
22	9.1	-0.088	682	192	198	377	379	1042	366	512	67
23	8.9	-0.087	685	192	197	379	381	1027	367	504	67
24	8.7	-0.087	687	191	197	382	384	1035	368	503	67
25	8.5	-0.087	690	191	196	385	388	1046	370	504	67
26	8.3	-0.087	694	191	196	386	392	1059	372	504	67
27	8.2	-0.086	698	191	196	389	395	1067	374	505	67
28	8	-0.087	703	191	196	392	398	1064	376	505	67
29	7.8	-0.087	706	190	195	396	401	1061	378	504	68
30	7.6	-0.087	708	190	195	401	404	1059	380	501	68
31	7.4	-0.086	712	190	195	406	407	1071	382	499	68
32	7.2	-0.086	716	190	194	411	410	1082	384	500	68
33	7	-0.087	720	190	194	416	414	1085	387	499	68
34	6.9	-0.086	724	189	194	421	419	1083	389	498	69
35	6.7	-0.087	728	189	194	427	424	1083	392	498	69
36	6.5	-0.087	730	189	194	432	429	1083	395	496	69
37	6.3	-0.079	731	190	195	438	431	1052	397	443	69
38	6.2	-0.078	729	189	196	442	430	1024	397	407	69
39	6.1	-0.075	727	190	197	445	427	1015	397	386	69
40	6	-0.071	725	190	198	445	424	1001	396	372	69
41	5.9	-0.072	721	191	199	444	422	986	395	361	70
42	5.8	-0.071	716	192	199	442	421	972	394	354	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	5.7	-0.069	711	193	200	442	419	965	393	347	70
44	5.7	-0.07	706	193	200	442	418	958	392	344	70
45	5.6	-0.069	701	194	201	441	416	952	391	341	70
46	5.5	-0.067	696	194	201	441	415	946	389	338	70
47	5.4	-0.066	691	194	201	440	414	941	388	335	70
48	5.3	-0.066	687	195	202	439	414	937	387	332	69
49	5.3	-0.066	683	195	202	439	412	930	386	328	70
50	5.2	-0.065	678	195	202	439	411	922	385	326	69
51	5.1	-0.065	673	195	202	439	409	914	384	323	69
52	5.1	-0.064	669	195	201	439	407	912	382	318	69
53	5	-0.065	666	195	201	439	405	928	381	319	69
54	4.9	-0.064	663	195	201	438	404	927	380	317	69
55	4.9	-0.061	660	195	201	437	403	938	379	318	69
56	4.8	-0.064	658	194	200	436	401	945	378	316	69
57	4.8	-0.063	657	194	200	435	399	951	377	314	69
58	4.7	-0.063	655	194	200	434	397	938	376	309	69
59	4.7	-0.063	652	193	199	433	395	929	374	304	69
60	4.6	-0.062	650	193	199	432	392	937	373	304	69
61	4.6	-0.062	648	193	199	431	390	939	372	302	69
62	4.5	-0.062	645	193	198	429	387	938	370	300	69
63	4.5	-0.062	643	192	198	428	386	927	369	300	69
64	4.4	-0.06	639	192	197	427	384	916	368	297	69
65	4.4	-0.061	635	192	197	426	383	920	367	296	69
66	4.3	-0.06	632	192	197	424	382	914	365	293	69
67	4.3	-0.061	629	192	197	423	381	917	364	293	69
68	4.3	-0.062	627	191	196	421	379	916	363	291	69
69	4.2	-0.059	624	191	196	420	378	913	362	292	69
70	4.2	-0.06	622	191	196	418	376	901	361	289	69
71	4.1	-0.059	618	191	196	415	375	891	359	287	69
72	4.1	-0.058	614	190	195	413	374	888	357	286	68
73	4	-0.059	610	190	195	411	373	886	356	284	68
74	4	-0.058	606	190	195	409	371	884	354	282	68
75	4	-0.057	602	190	195	407	370	882	353	282	68
76	3.9	-0.058	599	190	195	405	369	880	352	279	68
77	3.9	-0.057	596	190	194	403	367	876	350	278	68
78	3.9	-0.057	592	190	194	401	367	871	349	275	68
79	3.8	-0.056	589	190	194	399	366	866	348	275	68
80	3.8	-0.056	585	189	194	397	365	862	346	274	68
81	3.8	-0.056	582	189	194	395	364	858	345	272	68
82	3.7	-0.056	583	190	194	393	364	852	345	271	68
83	3.7	-0.055	592	191	194	392	362	844	346	271	68
84	3.7	-0.054	595	192	196	391	362	838	347	270	68
85	3.6	-0.054	597	194	198	390	362	832	348	265	68
86	3.6	-0.053	598	196	200	390	363	826	349	263	68
87	3.6	-0.053	598	198	202	390	364	821	350	258	68
88	3.5	-0.053	598	201	204	390	364	816	351	255	68
89	3.5	-0.051	598	203	206	392	366	809	353	251	68
90	3.5	-0.051	596	205	208	393	367	798	354	248	68
91	3.5	-0.05	594	206	209	395	369	789	355	244	68
92	3.4	-0.049	592	208	211	396	370	780	355	239	68
93	3.4	-0.049	589	211	212	396	371	773	356	234	68
94	3.4	-0.048	586	213	214	397	372	767	356	231	68
95	3.4	-0.047	583	214	215	398	373	762	357	228	68
96	3.4	-0.048	580	216	216	398	374	756	357	224	67

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 min
Recording Interval: 1 min

Test Date: 2/27/24

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 @	17.2	in. Hg
Post-Test	0	cfm @	23.61	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		15.8	**57.928**	**0.161**	**1.28**	**76.7**	**1.90**	**68.04**	**49.76**	**68.38**	**100.0**	**80.0**	**0.121**	**0.347**	**18.82**
Minimum	0.0	0.0	0.000	0.148	1.17	67	1.83	63	38	66	96.3	72	0.118	0.344	18.57
Max	15.8	0.2	57.928	0.163	1.30	79	1.92	69	54	70	102.6	112	0.124	0.352	19.38
0	15.8		0.000		1.17	67	1.83	63	40	67		109	0.118	0.344	19.38
1	15.6	0.2	0.148	0.148	1.30	67	1.90	64	38	67	96.3	112	0.122	0.349	19.30
2	15.6	0.0	0.308	0.160	1.29	67	1.91	64	38	67	102.6	88	0.121	0.348	19.24
3	15.6	0.0	0.468	0.160	1.29	67	1.90	64	38	67	100.9	83	0.120	0.346	18.91
4	15.5	0.1	0.627	0.159	1.29	68	1.87	64	38	67	100.6	81	0.121	0.348	18.85
5	15.5	0.0	0.787	0.160	1.28	68	1.89	65	38	67	101.0	80	0.121	0.348	18.86
6	15.5	0.0	0.946	0.159	1.28	68	1.88	65	38	67	100.1	79	0.122	0.349	18.89
7	15.5	0.0	1.106	0.160	1.27	68	1.86	65	38	67	100.5	79	0.122	0.349	18.92
8	15.4	0.1	1.264	0.158	1.26	68	1.86	65	38	67	99.1	79	0.122	0.349	18.92
9	15.4	0.0	1.422	0.158	1.27	68	1.84	65	38	67	99.1	78	0.122	0.349	18.91
10	15.4	0.0	1.581	0.159	1.26	68	1.84	65	38	67	99.6	78	0.122	0.349	18.90
11	15.3	0.1	1.740	0.159	1.26	68	1.84	65	39	67	99.7	78	0.122	0.349	18.90
12	15.3	0.0	1.897	0.157	1.26	68	1.84	65	39	66	98.2	78	0.124	0.352	18.98
13	15.3	0.0	2.056	0.159	1.26	68	1.84	65	39	66	99.5	78	0.120	0.346	18.90
14	15.2	0.1	2.215	0.159	1.26	68	1.84	65	39	66	99.9	78	0.122	0.349	18.82
15	15.2	0.0	2.372	0.157	1.25	68	1.84	65	39	66	98.6	77	0.121	0.348	18.85
16	15.2	0.0	2.530	0.158	1.26	69	1.84	65	40	66	99.0	77	0.122	0.349	18.84
17	15.1	0.1	2.689	0.159	1.25	69	1.84	65	40	66	99.5	77	0.122	0.349	18.88
18	15.1	0.0	2.847	0.158	1.25	69	1.84	66	40	66	98.9	77	0.121	0.348	18.84
19	15.0	0.1	3.005	0.158	1.26	69	1.88	66	40	66	99.0	77	0.122	0.349	18.84
20	15.0	0.0	3.165	0.160	1.30	69	1.92	66	40	66	100.2	77	0.121	0.348	18.84
21	14.9	0.1	3.327	0.162	1.29	69	1.91	66	40	66	101.4	77	0.123	0.351	18.88
22	14.9	0.0	3.487	0.160	1.28	70	1.92	66	41	66	99.8	77	0.122	0.349	18.92
23	14.9	0.0	3.647	0.160	1.29	70	1.91	66	41	66	99.9	77	0.120	0.346	18.80
24	14.8	0.1	3.807	0.160	1.29	70	1.91	66	41	66	100.1	77	0.123	0.351	18.84
25	14.8	0.0	3.968	0.161	1.29	70	1.91	66	41	66	100.4	77	0.122	0.349	18.92
26	14.7	0.1	4.129	0.161	1.29	70	1.92	66	41	66	100.3	77	0.122	0.349	18.88
27	14.7	0.0	4.290	0.161	1.29	70	1.92	66	41	66	100.4	77	0.122	0.349	18.88
28	14.6	0.1	4.450	0.160	1.29	70	1.91	66	42	66	99.7	77	0.123	0.351	18.92
29	14.6	0.0	4.610	0.160	1.30	71	1.91	66	42	66	99.5	77	0.122	0.349	18.92
30	14.5	0.1	4.771	0.161	1.29	71	1.91	66	42	66	100.2	77	0.122	0.349	18.88
31	14.4	0.1	4.932	0.161	1.29	71	1.91	66	42	66	100.4	77	0.121	0.348	18.84
32	14.4	0.0	5.093	0.161	1.29	71	1.91	66	42	66	100.6	77	0.121	0.348	18.80
33	14.3	0.1	5.253	0.160	1.28	71	1.91	66	42	66	100.0	77	0.121	0.348	18.80
34	14.3	0.0	5.413	0.160	1.29	71	1.91	66	42	66	99.9	77	0.122	0.349	18.84
35	14.2	0.1	5.574	0.161	1.29	72	1.91	66	42	66	100.4	77	0.121	0.348	18.84
36	14.2	0.0	5.735	0.161	1.29	72	1.91	66	43	66	100.3	77	0.122	0.349	18.84
37	14.1	0.1	5.896	0.161	1.29	72	1.91	66	43	66	100.2	77	0.122	0.349	18.88
38	14.1	0.0	6.057	0.161	1.28	72	1.91	66	43	66	100.1	77	0.122	0.349	18.88
39	14.0	0.1	6.217	0.160	1.29	72	1.91	66	43	66	99.4	77	0.122	0.349	18.88
40	14.0	0.0	6.377	0.160	1.29	72	1.91	66	43	66	99.4	77	0.122	0.349	18.88

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Date: 2/27/24

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: 10:30
Test Length: 360 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	17.2	in. Hg
Post-Test	0	cfm @	23.61	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	13.9	0.1	6.538	0.161	1.29	72	1.91	66	43	66	100.2	77	0.121	0.348	18.84
42	13.8	0.1	6.700	0.162	1.28	73	1.91	66	43	66	100.7	77	0.123	0.351	18.88
43	13.8	0.0	6.861	0.161	1.29	73	1.91	67	43	66	99.7	77	0.123	0.351	18.96
44	13.7	0.1	7.021	0.160	1.29	73	1.91	67	44	66	98.9	77	0.123	0.351	18.96
45	13.7	0.0	7.182	0.161	1.29	73	1.91	67	44	66	99.6	77	0.122	0.349	18.92
46	13.6	0.1	7.343	0.161	1.29	73	1.91	67	44	66	99.8	77	0.122	0.349	18.88
47	13.6	0.0	7.504	0.161	1.30	73	1.91	67	44	66	99.8	77	0.123	0.351	18.92
48	13.5	0.1	7.665	0.161	1.29	73	1.92	67	44	66	99.6	77	0.123	0.351	18.96
49	13.4	0.1	7.826	0.161	1.28	73	1.91	67	44	66	99.5	78	0.123	0.351	18.97
50	13.4	0.0	7.987	0.161	1.29	73	1.91	67	44	66	99.6	78	0.123	0.351	18.98
51	13.3	0.1	8.147	0.160	1.29	74	1.91	67	44	66	99.0	78	0.122	0.349	18.94
52	13.3	0.0	8.309	0.162	1.29	74	1.91	67	44	66	100.4	78	0.121	0.348	18.86
53	13.2	0.1	8.470	0.161	1.28	74	1.91	67	45	66	100.0	77	0.121	0.348	18.81
54	13.2	0.0	8.631	0.161	1.28	74	1.90	67	45	66	100.0	78	0.122	0.349	18.85
55	13.1	0.1	8.792	0.161	1.28	74	1.90	67	45	66	99.9	78	0.122	0.349	18.90
56	13.0	0.1	8.952	0.160	1.28	74	1.90	67	45	67	99.1	78	0.123	0.351	18.94
57	13.0	0.0	9.112	0.160	1.28	74	1.90	67	45	67	98.9	78	0.123	0.351	18.98
58	12.9	0.1	9.273	0.161	1.28	74	1.91	67	45	67	99.6	78	0.121	0.348	18.90
59	12.9	0.0	9.434	0.161	1.28	74	1.91	67	45	67	99.8	78	0.123	0.351	18.90
60	12.8	0.1	9.594	0.160	1.28	74	1.90	67	45	67	99.2	78	0.121	0.348	18.90
61	12.8	0.0	9.754	0.160	1.28	74	1.90	67	45	67	99.3	78	0.122	0.349	18.86
62	12.7	0.1	9.914	0.160	1.28	74	1.89	67	45	67	99.5	78	0.120	0.346	18.82
63	12.7	0.0	10.075	0.161	1.29	75	1.90	67	45	67	100.2	78	0.121	0.348	18.78
64	12.6	0.1	10.237	0.162	1.28	75	1.90	67	45	67	100.7	78	0.121	0.348	18.82
65	12.5	0.1	10.397	0.160	1.28	75	1.90	67	46	67	99.3	78	0.122	0.349	18.86
66	12.4	0.1	10.557	0.160	1.27	75	1.90	67	46	67	99.1	78	0.122	0.349	18.90
67	12.4	0.0	10.717	0.160	1.28	75	1.90	67	46	67	99.1	78	0.121	0.348	18.86
68	12.3	0.1	10.878	0.161	1.28	75	1.90	67	46	67	99.8	78	0.122	0.349	18.86
69	12.3	0.0	11.040	0.162	1.27	75	1.90	67	46	67	100.3	78	0.122	0.349	18.90
70	12.2	0.1	11.200	0.160	1.28	75	1.89	67	46	67	99.1	78	0.121	0.348	18.86
71	12.2	0.0	11.360	0.160	1.28	75	1.90	67	46	67	99.3	78	0.121	0.348	18.82
72	12.1	0.1	11.520	0.160	1.28	75	1.90	67	46	67	99.4	79	0.122	0.349	18.87
73	12.0	0.1	11.681	0.161	1.28	75	1.90	67	46	67	99.8	79	0.122	0.349	18.92
74	11.9	0.1	11.843	0.162	1.27	75	1.90	67	46	67	100.4	79	0.121	0.348	18.88
75	11.9	0.0	12.003	0.160	1.28	75	1.89	67	46	67	99.4	79	0.121	0.348	18.84
76	11.8	0.1	12.164	0.161	1.27	75	1.90	67	46	67	100.2	80	0.121	0.348	18.85
77	11.7	0.1	12.324	0.160	1.28	75	1.90	67	46	67	99.7	80	0.120	0.346	18.82
78	11.6	0.1	12.485	0.161	1.28	75	1.90	67	46	67	100.3	80	0.122	0.349	18.86
79	11.5	0.1	12.646	0.161	1.27	76	1.90	67	46	67	100.1	81	0.121	0.348	18.90
80	11.5	0.0	12.807	0.161	1.28	76	1.90	67	46	67	99.9	81	0.122	0.349	18.91
81	11.3	0.2	12.967	0.160	1.27	76	1.91	67	47	67	99.3	81	0.121	0.348	18.91
82	11.3	0.0	13.127	0.160	1.28	76	1.90	68	47	67	99.4	81	0.121	0.348	18.87
83	11.2	0.1	13.288	0.161	1.28	76	1.90	68	47	67	100.2	81	0.120	0.346	18.83
84	11.1	0.1	13.448	0.160	1.28	76	1.90	68	47	67	99.5	82	0.123	0.351	18.92

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 min
Recording Interval: 1 min

Test Date: 2/27/24

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 @	17.2	in. Hg
Post-Test	0	cfm @	23.61	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	11.0	0.1	13.610	0.162	1.27	76	1.90	68	47	67	100.6	81	0.120	0.346	18.92
86	10.9	0.1	13.771	0.161	1.27	76	1.90	68	47	68	100.1	81	0.121	0.348	18.83
87	10.9	0.0	13.931	0.160	1.27	76	1.90	68	47	68	99.6	81	0.121	0.348	18.87
88	10.8	0.1	14.091	0.160	1.28	76	1.90	68	47	68	99.5	81	0.121	0.348	18.87
89	10.7	0.1	14.252	0.161	1.28	76	1.91	68	47	68	100.0	81	0.122	0.349	18.91
90	10.7	0.0	14.414	0.162	1.28	76	1.90	68	47	68	100.4	81	0.122	0.349	18.95
91	10.6	0.1	14.574	0.160	1.28	76	1.90	68	47	68	99.4	81	0.119	0.345	18.83
92	10.5	0.1	14.735	0.161	1.28	76	1.90	68	47	68	100.5	82	0.121	0.348	18.80
93	10.4	0.1	14.895	0.160	1.28	76	1.90	68	47	68	99.9	82	0.120	0.346	18.85
94	10.3	0.1	15.056	0.161	1.28	76	1.90	68	47	68	100.5	82	0.120	0.346	18.81
95	10.2	0.1	15.217	0.161	1.28	76	1.90	68	47	68	100.5	82	0.121	0.348	18.85
96	10.1	0.1	15.378	0.161	1.27	76	1.91	68	47	68	100.4	82	0.120	0.346	18.85
97	10.0	0.1	15.539	0.161	1.27	76	1.91	68	48	68	100.6	83	0.120	0.346	18.82
98	9.9	0.1	15.699	0.160	1.28	76	1.90	68	48	68	100.1	83	0.120	0.346	18.83
99	9.8	0.1	15.859	0.160	1.28	77	1.90	68	48	68	99.9	83	0.121	0.348	18.87
100	9.7	0.1	16.020	0.161	1.28	77	1.90	68	48	68	100.1	83	0.122	0.349	18.95
101	9.6	0.1	16.182	0.162	1.27	77	1.90	68	48	68	100.6	83	0.120	0.346	18.91
102	9.5	0.1	16.343	0.161	1.28	77	1.90	68	48	68	100.2	83	0.121	0.348	18.87
103	9.4	0.1	16.503	0.160	1.28	77	1.90	68	48	68	99.6	83	0.121	0.348	18.91
104	9.4	0.0	16.663	0.160	1.27	77	1.90	68	48	68	99.5	83	0.121	0.348	18.91
105	9.3	0.1	16.824	0.161	1.28	77	1.90	68	48	69	100.1	83	0.121	0.348	18.91
106	9.2	0.1	16.985	0.161	1.27	77	1.90	68	48	69	100.0	83	0.122	0.349	18.95
107	9.1	0.1	17.146	0.161	1.28	77	1.90	68	48	69	100.1	84	0.120	0.346	18.92
108	9.0	0.1	17.307	0.161	1.27	77	1.91	68	48	69	100.4	83	0.120	0.346	18.84
109	8.9	0.1	17.468	0.161	1.28	77	1.91	68	48	69	100.5	84	0.121	0.348	18.88
110	8.8	0.1	17.628	0.160	1.28	77	1.90	68	48	69	99.5	83	0.122	0.349	18.96
111	8.7	0.1	17.789	0.161	1.27	77	1.91	68	48	69	100.0	83	0.120	0.346	18.91
112	8.7	0.0	17.951	0.162	1.28	77	1.90	68	48	69	100.9	83	0.120	0.346	18.83
113	8.6	0.1	18.111	0.160	1.27	77	1.90	69	48	69	99.9	83	0.120	0.346	18.83
114	8.5	0.1	18.272	0.161	1.27	77	1.90	69	48	69	100.5	83	0.120	0.346	18.83
115	8.4	0.1	18.432	0.160	1.28	77	1.90	69	48	69	99.9	83	0.120	0.346	18.83
116	8.4	0.0	18.593	0.161	1.28	77	1.90	69	48	69	100.4	83	0.121	0.348	18.87
117	8.3	0.1	18.755	0.162	1.28	77	1.91	69	48	69	101.0	83	0.119	0.345	18.83
118	8.3	0.0	18.916	0.161	1.27	77	1.90	69	48	69	100.5	83	0.121	0.348	18.83
119	8.2	0.1	19.077	0.161	1.27	77	1.90	69	49	69	100.3	83	0.121	0.348	18.91
120	8.1	0.1	19.237	0.160	1.27	77	1.90	69	49	69	99.6	83	0.120	0.346	18.87
121	8.1	0.0	19.397	0.160	1.28	77	1.90	69	49	69	99.9	83	0.119	0.345	18.79
122	8.0	0.1	19.559	0.162	1.27	77	1.90	69	49	69	101.3	83	0.120	0.346	18.79
123	8.0	0.0	19.720	0.161	1.28	77	1.90	69	49	69	100.5	83	0.121	0.348	18.87
124	7.9	0.1	19.881	0.161	1.27	77	1.90	69	49	69	100.2	83	0.121	0.348	18.91
125	7.9	0.0	20.041	0.160	1.28	77	1.90	69	49	69	99.7	83	0.119	0.345	18.83
126	7.8	0.1	20.202	0.161	1.28	77	1.90	69	49	69	100.7	82	0.119	0.345	18.74
127	7.7	0.1	20.363	0.161	1.28	77	1.90	69	49	69	100.8	82	0.119	0.345	18.73
128	7.7	0.0	20.525	0.162	1.28	77	1.90	69	49	69	101.4	82	0.120	0.346	18.77

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 min
Recording Interval: 1 min

Test Date: 2/27/24

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 @	17.2	in. Hg
Post-Test	0	cfm @	23.61	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	7.6	0.1	20.686	0.161	1.27	77	1.90	69	49	69	100.5	82	0.120	0.346	18.81
130	7.6	0.0	20.847	0.161	1.28	78	1.90	69	49	69	100.2	82	0.121	0.348	18.85
131	7.5	0.1	21.007	0.160	1.27	78	1.90	69	49	69	99.4	82	0.120	0.346	18.85
132	7.5	0.0	21.168	0.161	1.28	78	1.90	69	49	69	100.2	82	0.119	0.345	18.77
133	7.4	0.1	21.329	0.161	1.27	78	1.90	69	49	69	100.3	82	0.121	0.348	18.81
134	7.3	0.1	21.490	0.161	1.28	78	1.90	69	49	69	100.0	82	0.121	0.348	18.89
135	7.3	0.0	21.651	0.161	1.28	78	1.90	69	49	69	99.9	83	0.121	0.348	18.90
136	7.2	0.1	21.812	0.161	1.27	78	1.90	69	49	69	100.0	83	0.120	0.346	18.87
137	7.1	0.1	21.973	0.161	1.28	78	1.90	69	49	69	100.3	83	0.119	0.345	18.79
138	7.1	0.0	22.134	0.161	1.28	78	1.90	69	49	69	100.5	83	0.120	0.346	18.79
139	7.0	0.1	22.295	0.161	1.28	78	1.89	69	49	69	100.4	83	0.120	0.346	18.83
140	6.9	0.1	22.456	0.161	1.27	78	1.89	69	49	69	100.4	83	0.119	0.345	18.79
141	6.9	0.0	22.617	0.161	1.27	78	1.90	69	49	69	100.6	83	0.119	0.345	18.75
142	6.8	0.1	22.778	0.161	1.27	78	1.90	69	49	69	100.5	83	0.121	0.348	18.83
143	6.7	0.1	22.938	0.160	1.27	78	1.90	69	49	69	99.6	83	0.120	0.346	18.87
144	6.7	0.0	23.099	0.161	1.28	78	1.89	69	49	69	100.0	83	0.122	0.349	18.91
145	6.6	0.1	23.261	0.162	1.28	78	1.90	69	49	69	100.6	83	0.119	0.345	18.87
146	6.5	0.1	23.422	0.161	1.28	78	1.91	69	50	69	100.3	83	0.120	0.346	18.79
147	6.5	0.0	23.583	0.161	1.27	78	1.90	69	50	69	100.4	83	0.120	0.346	18.83
148	6.4	0.1	23.744	0.161	1.28	78	1.90	69	50	69	100.3	83	0.120	0.346	18.83
149	6.4	0.0	23.904	0.160	1.27	78	1.90	69	50	69	99.6	83	0.121	0.348	18.87
150	6.3	0.1	24.065	0.161	1.28	78	1.90	69	50	69	100.2	83	0.119	0.345	18.83
151	6.2	0.1	24.227	0.162	1.27	78	1.90	69	50	69	101.1	83	0.120	0.346	18.79
152	6.2	0.0	24.388	0.161	1.28	78	1.89	69	50	69	100.4	83	0.120	0.346	18.83
153	6.1	0.1	24.549	0.161	1.27	78	1.90	69	50	69	100.2	83	0.121	0.348	18.87
154	6.1	0.0	24.710	0.161	1.28	78	1.90	69	50	69	100.0	83	0.121	0.348	18.91
155	6.0	0.1	24.871	0.161	1.28	78	1.90	69	50	69	99.8	83	0.122	0.349	18.95
156	5.9	0.1	25.032	0.161	1.27	78	1.90	69	50	69	99.7	83	0.121	0.348	18.95
157	5.9	0.0	25.194	0.162	1.28	78	1.90	69	50	69	100.3	83	0.122	0.349	18.95
158	5.8	0.1	25.355	0.161	1.27	78	1.90	69	50	69	99.7	83	0.121	0.348	18.95
159	5.8	0.0	25.515	0.160	1.27	78	1.90	69	50	69	99.2	83	0.121	0.348	18.91
160	5.7	0.1	25.676	0.161	1.28	78	1.89	69	51	69	100.0	83	0.120	0.346	18.87
161	5.7	0.0	25.837	0.161	1.27	78	1.90	69	51	69	100.0	83	0.122	0.349	18.91
162	5.6	0.1	25.998	0.161	1.27	78	1.90	69	51	69	99.8	83	0.121	0.348	18.95
163	5.5	0.1	26.160	0.162	1.28	78	1.90	69	51	69	100.5	83	0.120	0.346	18.87
164	5.5	0.0	26.321	0.161	1.27	78	1.90	69	51	69	100.0	83	0.122	0.349	18.91
165	5.4	0.1	26.481	0.160	1.27	78	1.90	69	51	69	99.5	83	0.118	0.344	18.83
166	5.4	0.0	26.643	0.162	1.27	78	1.90	69	51	69	101.1	83	0.121	0.348	18.79
167	5.3	0.1	26.803	0.160	1.28	78	1.90	69	51	70	99.6	83	0.121	0.348	18.91
168	5.3	0.0	26.965	0.162	1.28	78	1.90	69	51	70	100.4	83	0.122	0.349	18.95
169	5.2	0.1	27.126	0.161	1.28	78	1.89	69	51	69	99.8	83	0.120	0.346	18.91
170	5.1	0.1	27.287	0.161	1.27	78	1.90	69	51	69	100.2	83	0.119	0.345	18.79
171	5.1	0.0	27.448	0.161	1.28	78	1.90	69	51	70	100.4	83	0.121	0.348	18.83
172	5.0	0.1	27.609	0.161	1.28	78	1.90	69	51	70	100.2	83	0.120	0.346	18.87

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 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 @	17.2	in. Hg
Post-Test	0	cfm @	23.61	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	5.0	0.0	27.770	0.161	1.28	78	1.90	69	51	70	100.1	83	0.121	0.348	18.87
174	4.9	0.1	27.931	0.161	1.28	78	1.90	69	51	70	100.2	83	0.119	0.345	18.83
175	4.9	0.0	28.093	0.162	1.28	78	1.90	69	52	70	100.9	83	0.121	0.348	18.83
176	4.8	0.1	28.254	0.161	1.27	78	1.90	69	52	70	100.3	83	0.119	0.345	18.83
177	4.8	0.0	28.415	0.161	1.27	78	1.90	69	52	70	100.4	83	0.120	0.346	18.79
178	4.7	0.1	28.575	0.160	1.28	78	1.90	69	52	70	99.8	82	0.119	0.345	18.78
179	4.7	0.0	28.736	0.161	1.28	78	1.90	69	52	70	100.4	82	0.120	0.346	18.77
180	4.6	0.1	28.898	0.162	1.28	78	1.90	69	52	70	100.9	82	0.121	0.348	18.85
181	4.6	0.0	29.060	0.162	1.27	78	1.90	69	52	70	100.6	82	0.120	0.346	18.85
182	4.5	0.1	29.221	0.161	1.27	78	1.89	69	52	70	100.1	82	0.120	0.346	18.81
183	4.5	0.0	29.381	0.160	1.27	78	1.90	69	52	70	99.5	82	0.121	0.348	18.85
184	4.4	0.1	29.542	0.161	1.27	78	1.90	69	52	70	100.0	82	0.120	0.346	18.85
185	4.4	0.0	29.703	0.161	1.28	78	1.90	69	52	70	100.3	82	0.118	0.344	18.73
186	4.3	0.1	29.865	0.162	1.28	78	1.90	69	52	70	101.4	82	0.119	0.345	18.69
187	4.3	0.0	30.027	0.162	1.27	78	1.90	69	52	70	101.3	82	0.120	0.346	18.77
188	4.2	0.1	30.188	0.161	1.27	78	1.90	69	52	70	100.3	82	0.120	0.346	18.81
189	4.2	0.0	30.348	0.160	1.27	78	1.90	69	52	70	99.6	82	0.120	0.346	18.81
190	4.1	0.1	30.509	0.161	1.28	78	1.90	69	52	70	100.2	82	0.120	0.346	18.81
191	4.1	0.0	30.670	0.161	1.28	78	1.90	69	52	70	100.1	82	0.121	0.348	18.85
192	4.1	0.0	30.832	0.162	1.28	78	1.90	69	52	70	100.5	82	0.121	0.348	18.89
193	4.0	0.1	30.994	0.162	1.28	78	1.90	69	52	70	100.6	82	0.119	0.345	18.81
194	4.0	0.0	31.155	0.161	1.27	78	1.90	69	52	69	100.1	82	0.122	0.349	18.85
195	3.9	0.1	31.315	0.160	1.27	78	1.90	69	52	70	99.3	82	0.120	0.346	18.89
196	3.9	0.0	31.476	0.161	1.28	78	1.90	69	53	69	100.0	82	0.120	0.346	18.81
197	3.8	0.1	31.637	0.161	1.28	78	1.90	69	53	69	100.2	82	0.120	0.346	18.81
198	3.8	0.0	31.799	0.162	1.28	78	1.90	69	53	69	100.9	82	0.120	0.346	18.81
199	3.7	0.1	31.961	0.162	1.28	78	1.90	69	53	70	100.8	82	0.121	0.348	18.85
200	3.7	0.0	32.122	0.161	1.27	78	1.90	69	53	70	100.0	82	0.120	0.346	18.85
201	3.6	0.1	32.283	0.161	1.27	78	1.90	69	53	70	100.0	82	0.121	0.348	18.85
202	3.6	0.0	32.444	0.161	1.28	78	1.90	69	53	70	99.9	82	0.121	0.348	18.89
203	3.5	0.1	32.605	0.161	1.28	78	1.90	69	53	70	99.7	82	0.122	0.349	18.93
204	3.5	0.0	32.767	0.162	1.28	78	1.89	69	53	70	100.4	82	0.119	0.345	18.85
205	3.4	0.1	32.928	0.161	1.27	78	1.90	69	53	70	100.1	81	0.121	0.348	18.80
206	3.4	0.0	33.089	0.161	1.27	78	1.90	69	53	70	100.3	82	0.118	0.344	18.76
207	3.3	0.1	33.250	0.161	1.28	78	1.90	69	53	70	100.6	82	0.120	0.346	18.73
208	3.3	0.0	33.411	0.161	1.28	79	1.90	69	53	70	100.4	82	0.120	0.346	18.81
209	3.3	0.0	33.572	0.161	1.27	79	1.90	69	53	70	99.9	82	0.121	0.348	18.85
210	3.2	0.1	33.734	0.162	1.28	79	1.90	69	53	70	100.3	82	0.122	0.349	18.93
211	3.2	0.0	33.895	0.161	1.28	79	1.90	69	53	70	99.5	82	0.120	0.346	18.89
212	3.1	0.1	34.056	0.161	1.27	79	1.90	69	53	70	99.8	82	0.120	0.346	18.81
213	3.1	0.0	34.217	0.161	1.28	79	1.90	69	53	70	100.1	81	0.119	0.345	18.76
214	3.0	0.1	34.378	0.161	1.28	79	1.90	69	53	70	100.1	82	0.121	0.348	18.80
215	3.0	0.0	34.539	0.161	1.28	79	1.90	69	53	70	99.9	82	0.121	0.348	18.89
216	3.0	0.0	34.701	0.162	1.28	79	1.90	69	53	70	100.4	81	0.119	0.345	18.80

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 min
Recording Interval: 1 min

Test Date: 2/27/24

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

Sample Train Leak Checks

Pre-test 0 cfm @ 17.2 in. Hg
Post-Test 0 cfm @ 23.61 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	2.9	0.1	34.862	0.161	1.28	79	1.91	69	53	70	99.9	81	0.121	0.348	18.80
218	2.9	0.0	35.023	0.161	1.27	79	1.91	69	53	70	99.7	81	0.121	0.348	18.87
219	2.8	0.1	35.184	0.161	1.28	79	1.90	69	53	70	99.6	81	0.120	0.346	18.83
220	2.8	0.0	35.345	0.161	1.28	79	1.90	69	53	70	100.0	81	0.119	0.345	18.76
221	2.7	0.1	35.506	0.161	1.28	79	1.90	69	53	70	100.2	81	0.120	0.346	18.76
222	2.7	0.0	35.668	0.162	1.28	79	1.90	69	53	70	100.5	81	0.122	0.349	18.87
223	2.6	0.1	35.830	0.162	1.28	79	1.90	69	53	70	100.1	81	0.121	0.348	18.91
224	2.6	0.0	35.991	0.161	1.27	79	1.90	69	53	70	99.5	81	0.120	0.346	18.83
225	2.5	0.1	36.152	0.161	1.28	79	1.90	69	53	70	99.9	81	0.120	0.346	18.80
226	2.5	0.0	36.313	0.161	1.27	79	1.90	69	53	70	99.9	82	0.121	0.348	18.84
227	2.5	0.0	36.474	0.161	1.28	79	1.90	69	53	70	99.8	82	0.121	0.348	18.89
228	2.4	0.1	36.636	0.162	1.28	79	1.90	69	53	70	100.3	81	0.120	0.346	18.84
229	2.4	0.0	36.798	0.162	1.28	78	1.90	69	53	70	100.5	81	0.120	0.346	18.80
230	2.4	0.0	36.959	0.161	1.27	79	1.90	69	53	70	100.0	81	0.120	0.346	18.80
231	2.3	0.1	37.120	0.161	1.27	79	1.90	69	53	70	100.2	82	0.118	0.344	18.73
232	2.3	0.0	37.281	0.161	1.28	79	1.90	69	53	70	100.6	82	0.119	0.345	18.69
233	2.3	0.0	37.442	0.161	1.28	78	1.90	69	53	70	100.7	82	0.119	0.345	18.73
234	2.2	0.1	37.603	0.161	1.28	79	1.90	69	54	70	100.4	82	0.121	0.348	18.81
235	2.2	0.0	37.766	0.163	1.28	78	1.90	69	53	70	101.4	82	0.119	0.345	18.81
236	2.2	0.0	37.927	0.161	1.28	78	1.89	69	54	70	100.4	81	0.119	0.345	18.73
237	2.1	0.1	38.088	0.161	1.27	79	1.90	69	54	70	100.3	82	0.121	0.348	18.80
238	2.1	0.0	38.249	0.161	1.27	79	1.90	69	54	70	100.1	82	0.119	0.345	18.81
239	2.1	0.0	38.410	0.161	1.28	79	1.90	69	54	70	100.2	82	0.120	0.346	18.77
240	2.0	0.1	38.571	0.161	1.28	79	1.90	69	54	70	100.2	82	0.120	0.346	18.81
241	2.0	0.0	38.733	0.162	1.27	79	1.90	69	54	70	100.7	81	0.119	0.345	18.76
242	2.0	0.0	38.894	0.161	1.28	79	1.90	69	54	70	100.2	81	0.119	0.345	18.72
243	1.9	0.1	39.055	0.161	1.27	79	1.90	69	54	70	100.1	81	0.122	0.349	18.83
244	1.9	0.0	39.216	0.161	1.27	79	1.89	69	54	70	99.7	81	0.119	0.345	18.83
245	1.9	0.0	39.377	0.161	1.28	79	1.90	69	54	70	100.1	81	0.119	0.345	18.72
246	1.9	0.0	39.539	0.162	1.28	79	1.91	69	54	70	101.0	81	0.119	0.345	18.72
247	1.9	0.0	39.701	0.162	1.27	79	1.90	69	54	70	100.8	81	0.121	0.348	18.80
248	1.8	0.1	39.862	0.161	1.28	79	1.90	69	54	70	99.7	81	0.121	0.348	18.87
249	1.8	0.0	40.023	0.161	1.27	79	1.90	69	54	70	99.9	81	0.118	0.344	18.76
250	1.8	0.0	40.184	0.161	1.27	79	1.89	69	54	70	100.3	81	0.120	0.346	18.72
251	1.8	0.0	40.345	0.161	1.28	79	1.90	69	54	70	100.0	81	0.122	0.349	18.87
252	1.7	0.1	40.506	0.161	1.28	79	1.90	69	54	70	99.3	80	0.122	0.349	18.94
253	1.7	0.0	40.668	0.162	1.27	79	1.90	69	54	69	99.8	80	0.120	0.346	18.86
254	1.7	0.0	40.830	0.162	1.28	79	1.90	69	54	70	100.2	80	0.121	0.348	18.82
255	1.7	0.0	40.991	0.161	1.27	79	1.89	69	54	69	99.5	80	0.122	0.349	18.89
256	1.7	0.0	41.152	0.161	1.28	79	1.90	69	54	69	99.1	80	0.122	0.349	18.93
257	1.6	0.1	41.313	0.161	1.28	79	1.90	69	54	70	99.2	80	0.120	0.346	18.86
258	1.6	0.0	41.474	0.161	1.28	79	1.90	69	54	69	99.6	80	0.121	0.348	18.82
259	1.6	0.0	41.636	0.162	1.27	79	1.90	69	54	69	100.3	80	0.120	0.346	18.82
260	1.6	0.0	41.797	0.161	1.28	79	1.90	69	54	70	99.9	80	0.119	0.345	18.74

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 min
Recording Interval: 1 min

Test Date: 2/27/24

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 @ 17.2 in. Hg
Post-Test 0 cfm @ 23.61 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	41.959	0.162	1.27	79	1.90	69	54	70	100.7	80	0.120	0.346	18.74
262	1.5	0.1	42.120	0.161	1.28	79	1.89	69	54	69	100.0	80	0.120	0.346	18.78
263	1.5	0.0	42.280	0.160	1.28	79	1.90	69	54	69	99.1	80	0.121	0.348	18.82
264	1.5	0.0	42.442	0.162	1.28	79	1.90	69	54	69	100.3	80	0.120	0.346	18.82
265	1.5	0.0	42.604	0.162	1.27	79	1.90	69	54	69	100.4	80	0.120	0.346	18.78
266	1.5	0.0	42.765	0.161	1.28	79	1.89	69	54	69	99.9	80	0.120	0.346	18.78
267	1.4	0.1	42.926	0.161	1.27	79	1.90	69	54	69	100.1	80	0.118	0.344	18.70
268	1.4	0.0	43.087	0.161	1.28	79	1.90	69	54	69	100.3	80	0.120	0.346	18.70
269	1.4	0.0	43.248	0.161	1.28	79	1.90	69	54	69	100.0	80	0.121	0.348	18.82
270	1.4	0.0	43.410	0.162	1.28	79	1.90	69	54	69	100.2	80	0.121	0.348	18.86
271	1.4	0.0	43.571	0.161	1.28	79	1.90	69	54	69	99.7	80	0.119	0.345	18.78
272	1.4	0.0	43.733	0.162	1.28	79	1.89	69	54	69	100.5	79	0.120	0.346	18.73
273	1.3	0.1	43.894	0.161	1.27	79	1.90	69	54	69	99.9	79	0.120	0.346	18.76
274	1.3	0.0	44.055	0.161	1.28	79	1.89	69	54	69	99.8	79	0.120	0.346	18.76
275	1.3	0.0	44.216	0.161	1.27	79	1.90	69	54	69	99.8	79	0.120	0.346	18.76
276	1.3	0.0	44.377	0.161	1.28	79	1.90	69	54	69	99.8	79	0.120	0.346	18.76
277	1.3	0.0	44.539	0.162	1.28	79	1.89	69	54	69	100.6	79	0.118	0.344	18.68
278	1.3	0.0	44.701	0.162	1.28	79	1.90	69	54	69	101.0	79	0.118	0.344	18.60
279	1.2	0.1	44.862	0.161	1.27	79	1.90	69	54	69	100.4	79	0.120	0.346	18.68
280	1.2	0.0	45.023	0.161	1.27	79	1.90	69	54	69	100.0	79	0.120	0.346	18.76
281	1.2	0.0	45.184	0.161	1.27	79	1.90	69	54	69	99.9	79	0.119	0.345	18.72
282	1.2	0.0	45.346	0.162	1.28	79	1.89	68	54	69	100.5	79	0.121	0.348	18.76
283	1.2	0.0	45.507	0.161	1.27	79	1.90	68	54	69	99.6	79	0.121	0.348	18.84
284	1.2	0.0	45.669	0.162	1.28	79	1.90	68	54	69	100.0	79	0.121	0.348	18.84
285	1.1	0.1	45.831	0.162	1.28	79	1.89	68	54	69	100.1	79	0.120	0.346	18.80
286	1.1	0.0	45.992	0.161	1.27	79	1.89	68	53	69	99.7	79	0.120	0.346	18.76
287	1.1	0.0	46.153	0.161	1.28	79	1.90	68	54	69	99.6	78	0.121	0.348	18.79
288	1.1	0.0	46.314	0.161	1.28	79	1.90	68	54	69	99.6	78	0.119	0.345	18.74
289	1.1	0.0	46.476	0.162	1.28	78	1.90	68	54	68	100.5	78	0.120	0.346	18.70
290	1.0	0.1	46.637	0.161	1.27	78	1.89	68	54	68	100.0	78	0.120	0.346	18.74
291	1.0	0.0	46.799	0.162	1.28	78	1.89	68	54	68	100.6	78	0.119	0.345	18.70
292	1.0	0.0	46.961	0.162	1.28	78	1.89	68	53	68	100.7	78	0.120	0.346	18.70
293	1.0	0.0	47.122	0.161	1.28	78	1.90	68	54	68	99.9	78	0.121	0.348	18.78
294	1.0	0.0	47.283	0.161	1.27	78	1.90	68	54	68	99.6	78	0.121	0.348	18.82
295	1.0	0.0	47.444	0.161	1.28	78	1.90	68	53	68	99.5	78	0.121	0.348	18.82
296	1.0	0.0	47.606	0.162	1.28	78	1.90	68	53	68	100.1	78	0.121	0.348	18.82
297	1.0	0.0	47.768	0.162	1.28	78	1.90	68	53	68	100.2	78	0.120	0.346	18.78
298	0.9	0.1	47.929	0.161	1.28	78	1.90	68	53	68	99.9	78	0.119	0.345	18.70
299	0.9	0.0	48.091	0.162	1.27	78	1.90	68	53	68	100.9	78	0.118	0.344	18.63
300	0.9	0.0	48.252	0.161	1.28	78	1.89	68	53	68	100.3	78	0.121	0.348	18.70
301	0.9	0.0	48.413	0.161	1.28	78	1.90	68	53	68	99.9	78	0.120	0.346	18.78
302	0.9	0.0	48.574	0.161	1.28	78	1.90	68	53	68	99.9	78	0.119	0.345	18.70
303	0.9	0.0	48.736	0.162	1.27	78	1.89	68	53	68	100.9	78	0.118	0.344	18.63
304	0.8	0.1	48.898	0.162	1.28	78	1.90	68	53	68	101.0	78	0.120	0.346	18.66

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 min
Recording Interval: 1 min

Test Date: 2/27/24

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 @	17.2	in. Hg
Post-Test	0	cfm @	23.61	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	0.8	0.0	49.059	0.161	1.27	78	1.89	68	53	68	100.2	78	0.119	0.345	18.70
306	0.8	0.0	49.220	0.161	1.28	78	1.89	68	53	68	100.0	78	0.121	0.348	18.74
307	0.8	0.0	49.381	0.161	1.28	78	1.90	68	53	68	99.9	78	0.119	0.345	18.74
308	0.8	0.0	49.542	0.161	1.28	78	1.90	68	53	68	99.8	78	0.122	0.349	18.78
309	0.8	0.0	49.704	0.162	1.28	78	1.89	68	53	68	100.1	78	0.121	0.348	18.86
310	0.8	0.0	49.866	0.162	1.28	78	1.90	68	53	68	100.1	78	0.120	0.346	18.78
311	0.8	0.0	50.027	0.161	1.27	78	1.90	68	53	68	99.9	78	0.119	0.345	18.70
312	0.8	0.0	50.188	0.161	1.28	78	1.90	68	53	68	100.0	78	0.121	0.348	18.74
313	0.7	0.1	50.349	0.161	1.28	78	1.89	68	53	68	99.9	78	0.119	0.345	18.74
314	0.7	0.0	50.510	0.161	1.28	78	1.89	68	53	68	100.2	78	0.118	0.344	18.63
315	0.7	0.0	50.672	0.162	1.28	78	1.89	68	53	68	100.9	78	0.121	0.348	18.70
316	0.7	0.0	50.834	0.162	1.28	78	1.90	68	53	68	100.5	78	0.120	0.346	18.78
317	0.7	0.0	50.995	0.161	1.27	78	1.90	68	53	68	99.7	78	0.121	0.348	18.78
318	0.7	0.0	51.155	0.160	1.27	78	1.89	68	53	68	98.9	78	0.121	0.348	18.82
319	0.7	0.0	51.316	0.161	1.28	78	1.90	68	53	68	99.7	78	0.119	0.345	18.74
320	0.6	0.1	51.478	0.162	1.28	78	1.89	68	53	68	100.7	78	0.119	0.345	18.66
321	0.6	0.0	51.639	0.161	1.28	78	1.90	68	53	68	100.2	78	0.120	0.346	18.70
322	0.6	0.0	51.801	0.162	1.28	78	1.90	68	53	68	100.4	78	0.122	0.349	18.82
323	0.6	0.0	51.962	0.161	1.27	78	1.90	68	53	68	99.5	78	0.120	0.346	18.82
324	0.6	0.0	52.123	0.161	1.27	78	1.89	68	53	68	99.7	78	0.120	0.346	18.74
325	0.6	0.0	52.284	0.161	1.28	78	1.90	68	53	68	99.8	78	0.121	0.348	18.78
326	0.6	0.0	52.445	0.161	1.28	78	1.89	68	53	68	99.6	78	0.121	0.348	18.82
327	0.5	0.1	52.606	0.161	1.27	78	1.90	68	53	68	99.5	78	0.121	0.348	18.82
328	0.5	0.0	52.768	0.162	1.28	78	1.90	68	53	68	100.2	78	0.120	0.346	18.78
329	0.5	0.0	52.930	0.162	1.27	78	1.90	68	53	68	100.3	77	0.120	0.346	18.73
330	0.5	0.0	53.090	0.160	1.27	78	1.89	68	53	68	98.9	77	0.122	0.349	18.80
331	0.5	0.0	53.251	0.161	1.27	78	1.90	68	53	68	99.6	77	0.118	0.344	18.73
332	0.5	0.0	53.413	0.162	1.27	78	1.89	68	53	68	100.5	77	0.121	0.348	18.69
333	0.5	0.0	53.574	0.161	1.28	78	1.90	68	53	68	99.8	77	0.120	0.346	18.76
334	0.4	0.1	53.736	0.162	1.28	78	1.90	68	53	68	100.4	77	0.119	0.345	18.69
335	0.4	0.0	53.897	0.161	1.27	78	1.90	68	53	68	100.1	77	0.119	0.345	18.65
336	0.4	0.0	54.058	0.161	1.27	79	1.90	68	53	68	99.8	76	0.121	0.348	18.72
337	0.4	0.0	54.219	0.161	1.27	79	1.90	68	53	68	99.5	76	0.119	0.345	18.71
338	0.4	0.0	54.380	0.161	1.28	78	1.89	68	53	68	99.7	76	0.120	0.346	18.67
339	0.4	0.0	54.541	0.161	1.28	79	1.89	68	53	68	99.7	76	0.120	0.346	18.71
340	0.4	0.0	54.703	0.162	1.27	79	1.89	68	53	68	100.1	76	0.120	0.346	18.71
341	0.3	0.1	54.864	0.161	1.27	79	1.90	68	54	68	99.3	75	0.121	0.348	18.74
342	0.3	0.0	55.025	0.161	1.27	79	1.90	68	54	68	99.1	75	0.121	0.348	18.77
343	0.3	0.0	55.186	0.161	1.27	79	1.89	68	54	68	99.0	75	0.121	0.348	18.77
344	0.3	0.0	55.347	0.161	1.27	79	1.89	68	54	68	99.0	74	0.120	0.346	18.72
345	0.3	0.0	55.508	0.161	1.27	79	1.89	68	54	68	99.4	74	0.118	0.344	18.60
346	0.3	0.0	55.670	0.162	1.27	79	1.89	68	54	68	100.2	74	0.121	0.348	18.63
347	0.3	0.0	55.831	0.161	1.28	79	1.90	68	54	68	99.3	73	0.119	0.345	18.66
348	0.2	0.1	55.992	0.161	1.27	79	1.89	68	54	68	99.2	74	0.122	0.349	18.70

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:30
Test Length: 360 min
Recording Interval: 1 min

Test Date: 2/27/24

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 @ 17.2 in. Hg
Post-Test 0 cfm @ 23.61 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	0.2	0.0	56.153	0.161	1.27	79	1.89	68	54	68	99.0	74	0.120	0.346	18.75
350	0.2	0.0	56.314	0.161	1.27	79	1.90	68	54	68	98.8	73	0.122	0.349	18.74
351	0.2	0.0	56.475	0.161	1.27	79	1.90	68	54	68	98.9	73	0.119	0.345	18.69
352	0.2	0.0	56.638	0.163	1.27	79	1.89	68	54	68	100.3	73	0.121	0.348	18.66
353	0.2	0.0	56.799	0.161	1.28	79	1.89	68	54	68	98.9	73	0.122	0.349	18.77
354	0.2	0.0	56.960	0.161	1.27	79	1.90	68	54	68	98.7	73	0.120	0.346	18.73
355	0.2	0.0	57.121	0.161	1.27	79	1.89	68	54	68	99.0	73	0.120	0.346	18.66
356	0.1	0.1	57.282	0.161	1.27	79	1.89	68	54	68	99.0	73	0.122	0.349	18.73
357	0.1	0.0	57.443	0.161	1.27	79	1.90	67	54	68	98.9	73	0.119	0.345	18.69
358	0.1	0.0	57.605	0.162	1.27	79	1.89	67	54	68	99.9	72	0.119	0.345	18.57
359	0.1	0.0	57.766	0.161	1.27	79	1.90	67	54	68	99.5	73	0.120	0.346	18.61
360	0.0	0.1	57.928	0.162	1.27	79	1.90	67	54	68	99.9	72	0.120	0.346	18.65

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)*
Tot / Avg	**57.705**	**0.160**	**0.98**	**76.5**	**2.15**	**67.29**	**48.73**	**100.0**	**527.0**	**190.1**	**185.2**	**321.0**	**335.3**	**822.3**	**85.6**
Minimum	0.000	0.145	0.93	68	2.00	63	37	94.5	405	164	164	257	264	669	267
Max	57.705	0.162	0.99	79	2.20	68	54	102.1	608	249	223	395	383	977	352
0	0.000		0.93	68	2.00	63	40		577	201	218	395	370	750	352
1	0.145	0.145	1.00	68	2.10	64	37	94.5	569	219	220	385	362	722	351
2	0.304	0.159	1.00	68	2.10	64	37	102.1	559	221	221	378	356	698	347
3	0.464	0.160	1.00	68	2.10	64	37	101.1	552	223	222	372	351	708	344
4	0.623	0.159	0.99	68	2.10	64	37	100.8	546	222	222	366	346	722	340
5	0.781	0.158	0.99	68	2.10	64	37	100.1	541	220	222	361	342	723	337
6	0.940	0.159	0.98	68	2.10	64	37	100.4	536	224	223	355	338	717	335
7	1.098	0.158	0.98	68	2.10	64	37	99.5	530	226	222	351	334	708	333
8	1.257	0.159	0.98	68	2.10	64	37	100.1	525	227	222	346	330	699	330
9	1.415	0.158	0.97	68	2.10	65	37	99.4	520	229	222	342	326	692	328
10	1.573	0.158	0.97	68	2.10	65	37	99.4	514	229	222	338	323	687	325
11	1.731	0.158	0.97	68	2.10	65	37	99.4	509	230	221	334	319	685	323
12	1.888	0.157	0.97	68	2.10	65	38	98.5	505	231	221	330	316	685	321
13	2.047	0.159	0.97	68	2.10	65	38	99.8	500	232	220	326	313	687	318
14	2.204	0.157	0.97	68	2.10	65	38	98.9	497	233	219	323	310	689	316
15	2.362	0.158	0.97	69	2.10	65	38	99.5	493	234	219	320	307	691	315
16	2.521	0.159	0.96	69	2.10	65	38	99.9	491	234	218	316	305	693	313
17	2.678	0.157	0.97	69	2.10	65	38	98.6	488	235	217	313	302	696	311
18	2.837	0.159	0.97	69	2.10	65	38	99.8	486	236	216	310	299	699	309
19	2.994	0.157	0.97	69	2.10	65	38	98.7	485	236	216	307	297	701	308
20	3.153	0.159	0.99	69	2.10	65	39	99.9	484	237	215	305	295	704	307
21	3.313	0.160	0.98	70	2.10	65	39	100.4	483	231	215	302	293	707	305
22	3.472	0.159	0.99	70	2.10	65	39	99.4	482	228	214	300	290	709	303
23	3.632	0.160	0.99	70	2.10	65	39	100.3	481	225	213	297	288	714	301
24	3.791	0.159	0.98	70	2.10	65	39	99.8	481	223	213	295	287	716	300
25	3.950	0.159	0.99	70	2.10	65	39	99.5	480	220	212	293	285	716	298
26	4.110	0.160	0.99	70	2.10	65	39	100.1	480	223	211	291	283	718	298
27	4.270	0.160	0.98	70	2.10	65	39	100.2	480	222	211	289	281	722	297
28	4.429	0.159	0.99	71	2.10	66	40	99.3	480	219	210	287	280	730	295
29	4.589	0.160	0.99	71	2.10	66	40	99.8	481	217	209	285	278	739	294
30	4.748	0.159	0.99	71	2.10	66	40	99.2	483	215	209	283	277	749	293
31	4.907	0.159	0.99	71	2.10	66	40	99.4	485	215	208	281	275	759	293
32	5.068	0.161	0.98	71	2.10	66	40	100.9	489	220	208	280	274	768	294
33	5.227	0.159	0.99	71	2.10	66	40	99.8	492	228	207	278	273	775	296
34	5.386	0.159	0.99	72	2.10	66	40	99.6	496	228	206	276	272	780	296
35	5.547	0.161	0.98	72	2.10	66	41	100.6	500	230	206	275	271	783	296
36	5.705	0.158	0.99	72	2.10	66	41	98.7	504	241	205	274	269	786	299
37	5.865	0.160	0.99	72	2.10	66	41	99.9	507	246	205	273	269	788	300
38	6.026	0.161	0.99	72	2.10	66	41	100.4	511	245	204	272	268	791	300
39	6.185	0.159	0.98	72	2.10	66	41	99.2	515	247	204	270	267	795	301
40	6.344	0.159	0.99	72	2.10	66	41	99.2	519	247	203	269	266	800	301

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)
41	6.505	0.161	0.99	73	2.10	66	41	100.4	523	248	202	269	266	807	302
42	6.664	0.159	0.98	73	2.10	66	41	99.1	528	249	202	268	265	818	302
43	6.823	0.159	0.98	73	2.10	66	42	98.8	533	249	201	267	265	826	303
44	6.984	0.161	0.99	73	2.10	66	42	99.8	538	248	201	267	265	830	304
45	7.143	0.159	0.99	73	2.10	66	42	98.7	543	249	200	266	265	832	305
46	7.303	0.160	0.99	73	2.10	66	42	99.5	547	247	200	266	264	835	305
47	7.464	0.161	0.99	73	2.10	66	42	100.1	551	248	199	265	264	834	305
48	7.623	0.159	0.99	73	2.10	66	42	98.7	554	247	199	265	264	834	306
49	7.783	0.160	0.99	73	2.10	66	42	99.3	556	247	199	265	264	835	306
50	7.943	0.160	0.98	73	2.10	66	42	99.3	559	247	198	265	264	837	307
51	8.103	0.160	0.99	74	2.10	66	42	99.3	562	247	198	265	264	839	307
52	8.263	0.160	0.99	74	2.10	66	42	99.5	564	248	198	264	265	841	308
53	8.423	0.160	0.99	74	2.10	66	43	99.7	567	248	197	265	265	842	308
54	8.583	0.160	0.99	74	2.10	66	43	99.8	570	248	197	265	265	845	309
55	8.743	0.160	0.99	74	2.10	66	43	99.6	572	248	197	265	265	848	309
56	8.904	0.161	0.98	74	2.10	66	43	100.0	575	248	197	265	265	849	310
57	9.063	0.159	0.99	74	2.10	66	43	98.6	578	248	196	265	266	851	311
58	9.223	0.160	0.99	74	2.10	66	43	99.3	580	247	196	265	266	853	311
59	9.384	0.161	0.99	74	2.10	66	43	100.1	583	247	196	266	267	856	312
60	9.543	0.159	0.99	74	2.10	66	43	98.9	585	247	196	266	267	858	312
61	9.704	0.161	0.99	74	2.10	66	43	100.2	588	247	196	266	267	860	313
62	9.865	0.161	0.99	74	2.10	66	43	100.4	591	247	196	267	268	863	314
63	10.024	0.159	0.98	75	2.10	66	43	99.3	593	247	196	267	268	866	314
64	10.184	0.160	0.99	75	2.10	66	43	99.8	586	247	196	267	269	868	313
65	10.345	0.161	0.99	75	2.10	66	44	100.2	582	245	194	267	270	870	312
66	10.505	0.160	0.99	75	2.10	66	44	99.4	579	242	192	267	270	873	310
67	10.665	0.160	0.99	75	2.10	66	44	99.4	578	239	190	266	270	877	309
68	10.826	0.161	0.99	75	2.10	66	44	100.1	577	232	188	266	270	881	307
69	10.986	0.160	0.98	75	2.10	66	44	99.4	577	233	185	265	269	887	306
70	11.146	0.160	0.99	75	2.10	66	44	99.4	577	229	183	264	269	894	304
71	11.306	0.160	0.99	75	2.10	66	44	99.6	578	225	181	263	268	902	303
72	11.467	0.161	0.99	75	2.10	67	44	100.3	580	221	180	262	267	912	302
73	11.627	0.160	0.99	75	2.10	67	44	99.5	582	210	178	261	267	922	300
74	11.787	0.160	0.99	75	2.10	67	44	99.5	585	202	177	260	266	932	298
75	11.948	0.161	0.99	75	2.10	67	44	100.3	589	193	175	259	266	943	296
76	12.108	0.160	0.99	75	2.10	67	44	99.9	594	186	174	258	265	953	295
77	12.268	0.160	0.99	75	2.10	67	44	100.0	598	182	173	257	265	965	295
78	12.429	0.161	0.99	75	2.10	67	45	100.6	604	179	172	257	265	977	295
79	12.589	0.160	0.99	76	2.10	67	45	99.8	607	177	171	258	266	957	296
80	12.749	0.160	0.99	76	2.10	67	45	99.6	608	175	170	260	269	927	296
81	12.910	0.161	0.98	76	2.10	67	45	100.2	607	174	169	263	272	904	297
82	13.069	0.159	0.98	76	2.10	67	45	99.1	605	173	168	265	275	889	297
83	13.230	0.161	0.99	76	2.10	67	45	100.5	603	172	168	268	279	895	298
84	13.391	0.161	0.99	76	2.10	67	45	100.5	600	171	167	270	281	907	298

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)
85	13.551	0.160	0.99	76	2.10	67	45	99.7	598	171	167	272	284	907	298
86	13.710	0.159	0.99	76	2.10	67	45	99.2	595	170	167	274	285	907	298
87	13.871	0.161	0.99	76	2.10	67	45	100.5	592	169	166	274	286	915	297
88	14.032	0.161	0.98	76	2.10	67	45	100.4	589	169	166	274	288	911	297
89	14.192	0.160	0.99	76	2.10	67	45	99.7	584	168	166	274	291	901	297
90	14.352	0.160	0.99	76	2.10	67	45	99.5	581	168	165	274	292	896	296
91	14.513	0.161	0.99	76	2.10	67	45	100.3	579	167	165	274	292	901	295
92	14.673	0.160	0.99	76	2.10	67	45	100.2	578	167	165	275	292	908	295
93	14.833	0.160	0.99	76	2.10	67	45	100.2	579	166	165	276	293	911	296
94	14.994	0.161	0.99	76	2.20	67	45	100.8	580	166	165	277	294	911	296
95	15.154	0.160	0.99	76	2.10	67	45	100.2	581	166	165	278	294	913	297
96	15.314	0.160	0.99	76	2.20	67	46	100.1	583	166	164	280	295	917	298
97	15.475	0.161	0.99	76	2.10	67	46	100.9	585	165	165	282	297	915	299
98	15.635	0.160	0.99	76	2.20	67	46	100.4	587	165	164	284	298	911	300
99	15.795	0.160	0.99	76	2.20	67	46	100.3	587	165	164	285	301	907	300
100	15.956	0.161	0.99	76	2.10	67	46	100.6	588	165	164	287	304	906	302
101	16.116	0.160	0.98	76	2.10	67	46	99.9	589	165	164	289	308	910	303
102	16.276	0.160	0.99	77	2.10	67	46	100.0	591	165	164	290	312	919	304
103	16.437	0.161	0.99	77	2.20	67	46	100.5	593	164	164	291	316	926	306
104	16.598	0.161	0.98	77	2.20	67	46	100.4	596	165	164	292	320	930	307
105	16.757	0.159	0.99	77	2.20	67	46	99.2	598	165	165	292	324	932	309
106	16.918	0.161	0.99	77	2.20	67	46	100.3	599	170	165	293	328	935	311
107	17.079	0.161	0.99	77	2.20	67	46	100.4	601	175	165	297	333	937	314
108	17.238	0.159	0.99	77	2.20	68	46	99.4	600	176	165	301	337	932	316
109	17.398	0.160	0.99	77	2.20	68	46	100.2	599	179	165	304	340	934	317
110	17.560	0.162	0.99	77	2.20	68	46	101.1	596	179	165	307	343	925	318
111	17.719	0.159	0.98	77	2.10	68	46	99.1	594	181	165	310	346	917	319
112	17.880	0.161	0.99	77	2.20	68	46	100.6	591	181	166	313	348	910	320
113	18.041	0.161	0.99	77	2.20	68	46	100.9	589	181	166	315	350	903	320
114	18.201	0.160	0.99	77	2.10	68	46	100.2	586	181	166	318	352	897	321
115	18.361	0.160	0.99	77	2.10	68	46	100.2	584	181	166	321	353	892	321
116	18.522	0.161	0.99	77	2.20	68	46	100.8	581	181	166	323	354	889	321
117	18.682	0.160	0.98	77	2.20	68	46	100.1	578	180	166	325	355	886	321
118	18.842	0.160	0.99	77	2.10	68	46	100.2	576	180	166	326	356	884	321
119	19.003	0.161	0.99	77	2.20	68	47	100.6	574	180	166	327	357	882	321
120	19.163	0.160	0.98	77	2.20	68	47	99.9	572	180	166	328	357	881	321
121	19.323	0.160	0.99	77	2.20	68	47	100.2	570	179	166	329	357	880	320
122	19.484	0.161	0.99	77	2.10	68	47	101.1	568	179	167	329	357	879	320
123	19.645	0.161	0.98	77	2.10	68	47	100.9	566	179	167	329	356	884	319
124	19.805	0.160	0.98	77	2.10	68	47	99.9	566	179	167	330	355	896	319
125	19.965	0.160	0.98	77	2.20	68	47	100.0	566	179	167	330	355	908	319
126	20.126	0.161	0.98	77	2.10	68	47	101.0	567	179	167	330	354	918	319
127	20.286	0.160	0.99	77	2.20	68	47	100.5	568	178	167	330	353	925	319
128	20.446	0.160	0.99	77	2.20	68	47	100.5	570	178	167	330	353	925	320

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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	20.608	0.162	0.99	77	2.20	68	47	101.5	571	178	167	330	353	925	320
130	20.767	0.159	0.99	77	2.20	68	47	99.4	572	178	167	330	352	926	320
131	20.927	0.160	0.99	77	2.10	68	47	99.9	573	178	167	331	352	927	320
132	21.088	0.161	0.99	77	2.10	68	47	100.8	575	177	167	331	352	929	320
133	21.249	0.161	0.98	77	2.20	68	47	100.9	576	177	167	332	352	931	321
134	21.409	0.160	0.99	77	2.10	68	47	99.9	577	177	167	332	352	933	321
135	21.569	0.160	0.99	77	2.20	68	47	99.8	579	177	167	333	352	935	322
136	21.730	0.161	0.98	78	2.20	68	47	100.5	580	177	167	334	352	935	322
137	21.890	0.160	0.99	78	2.10	68	47	100.0	582	176	168	335	353	936	323
138	22.050	0.160	0.99	78	2.10	68	47	100.3	584	176	168	336	353	937	323
139	22.211	0.161	0.98	78	2.20	68	47	100.8	585	176	168	338	354	939	324
140	22.371	0.160	0.98	78	2.20	68	47	100.1	587	176	168	339	355	940	325
141	22.531	0.160	0.99	78	2.20	68	47	100.4	588	176	169	340	356	940	326
142	22.693	0.162	0.99	78	2.20	68	47	101.5	589	176	169	341	357	940	326
143	22.853	0.160	0.99	78	2.20	68	47	99.9	590	176	169	342	358	941	327
144	23.013	0.160	0.99	78	2.20	68	47	99.7	592	175	169	343	359	941	328
145	23.174	0.161	0.99	78	2.20	68	48	100.4	592	175	170	345	360	940	328
146	23.334	0.160	0.98	78	2.20	68	48	100.0	593	175	170	346	362	939	329
147	23.494	0.160	0.99	78	2.20	68	48	100.1	594	175	170	347	363	939	330
148	23.655	0.161	0.99	78	2.20	68	48	100.7	594	175	170	348	364	939	330
149	23.816	0.161	0.98	78	2.20	68	48	100.6	594	175	170	348	365	939	330
150	23.976	0.160	0.98	78	2.20	68	48	99.9	594	175	171	349	366	939	331
151	24.136	0.160	0.98	78	2.20	68	48	100.1	594	174	171	350	367	939	331
152	24.297	0.161	0.99	78	2.20	68	48	100.8	594	174	171	350	368	938	331
153	24.457	0.160	0.99	78	2.10	68	48	99.9	595	173	172	351	369	939	332
154	24.617	0.160	0.99	78	2.20	68	48	99.7	594	173	172	351	370	941	332
155	24.779	0.162	0.98	78	2.20	68	49	100.8	595	172	172	352	371	938	332
156	24.938	0.159	0.99	78	2.20	68	49	98.8	594	172	173	352	372	934	333
157	25.099	0.161	0.99	78	2.20	68	49	100.0	594	172	173	353	373	930	333
158	25.260	0.161	0.99	78	2.20	68	49	100.0	593	172	173	353	374	927	333
159	25.420	0.160	0.98	78	2.20	68	49	99.5	592	171	174	353	375	925	333
160	25.580	0.160	0.99	78	2.20	68	49	99.7	591	171	174	353	376	924	333
161	25.741	0.161	0.98	78	2.20	68	49	100.4	590	171	174	353	376	924	333
162	25.901	0.160	0.98	78	2.20	68	49	99.5	588	171	175	354	377	923	333
163	26.061	0.160	0.98	78	2.20	68	49	99.6	588	171	175	354	378	921	333
164	26.222	0.161	0.99	78	2.20	68	50	100.4	587	171	176	354	379	920	333
165	26.383	0.161	0.98	78	2.10	68	50	100.5	586	171	176	354	379	919	333
166	26.543	0.160	0.98	78	2.20	68	50	100.1	585	171	176	355	380	922	333
167	26.703	0.160	0.99	78	2.20	68	50	99.9	584	171	177	355	380	925	333
168	26.864	0.161	0.98	78	2.20	68	50	100.1	584	171	177	356	379	928	333
169	27.024	0.160	0.99	78	2.20	68	50	99.5	584	171	177	358	380	928	334
170	27.185	0.161	0.98	78	2.20	68	50	100.6	583	172	178	359	379	928	334
171	27.346	0.161	0.98	78	2.10	68	50	100.8	583	172	178	360	379	927	334
172	27.505	0.159	0.98	78	2.20	68	50	99.3	582	172	178	360	379	926	334

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)
173	27.666	0.161	0.98	78	2.20	68	50	100.5	581	172	179	361	379	924	334
174	27.827	0.161	0.98	78	2.20	68	50	100.6	580	172	179	362	378	923	334
175	27.987	0.160	0.98	78	2.20	68	51	100.0	579	172	180	362	378	920	334
176	28.147	0.160	0.99	78	2.20	68	51	100.0	577	172	180	362	378	916	334
177	28.308	0.161	0.99	78	2.10	68	51	100.8	575	173	180	363	378	912	334
178	28.469	0.161	0.98	78	2.10	68	51	100.8	573	173	181	363	377	911	333
179	28.629	0.160	0.98	78	2.20	68	51	100.1	571	173	181	364	377	909	333
180	28.789	0.160	0.99	78	2.20	68	51	100.0	570	173	181	364	377	908	333
181	28.950	0.161	0.98	78	2.20	68	51	100.4	569	173	182	364	377	906	333
182	29.110	0.160	0.98	78	2.20	68	51	99.8	567	173	182	364	376	905	332
183	29.271	0.161	0.98	78	2.20	68	51	100.5	566	174	182	365	376	904	333
184	29.432	0.161	0.98	78	2.20	68	51	100.4	564	174	183	365	376	903	332
185	29.592	0.160	0.99	78	2.20	68	51	100.1	563	174	183	364	377	900	332
186	29.752	0.160	0.99	78	2.20	68	51	100.5	561	174	183	364	377	896	332
187	29.913	0.161	0.98	78	2.20	68	51	101.0	558	174	184	364	377	891	331
188	30.074	0.161	0.98	78	2.20	68	51	100.7	556	174	184	363	377	889	331
189	30.234	0.160	0.99	78	2.20	68	51	100.0	554	174	184	363	378	887	331
190	30.394	0.160	0.99	78	2.20	68	52	100.0	552	175	184	363	378	886	330
191	30.555	0.161	0.98	78	2.20	68	52	100.5	551	175	185	363	378	885	330
192	30.715	0.160	0.98	78	2.20	68	52	99.6	549	175	185	363	378	884	330
193	30.876	0.161	0.98	78	2.20	68	52	100.4	548	175	185	363	377	882	330
194	31.037	0.161	0.98	78	2.20	68	52	100.5	547	175	185	363	377	882	329
195	31.197	0.160	0.99	78	2.20	68	52	99.6	546	175	185	364	376	881	329
196	31.358	0.161	0.99	78	2.20	68	52	100.4	546	175	186	363	376	880	329
197	31.519	0.161	0.99	78	2.20	68	52	100.6	546	176	186	364	376	880	330
198	31.679	0.160	0.98	78	2.20	68	52	100.0	545	176	186	364	376	880	329
199	31.839	0.160	0.99	78	2.20	68	52	99.8	545	176	186	364	375	879	329
200	32.000	0.161	0.98	78	2.20	68	52	100.4	545	176	186	364	375	878	329
201	32.161	0.161	0.98	78	2.20	68	52	100.4	545	176	187	364	375	877	329
202	32.321	0.160	0.99	78	2.20	68	52	99.6	545	176	187	364	375	878	329
203	32.481	0.160	0.98	78	2.20	68	52	99.4	544	176	187	365	375	879	329
204	32.643	0.162	0.98	78	2.20	68	52	100.8	544	176	188	365	374	879	329
205	32.803	0.160	0.98	78	2.20	68	52	99.8	545	176	188	365	375	877	330
206	32.963	0.160	0.98	78	2.20	68	52	100.0	545	176	188	365	375	877	330
207	33.125	0.162	0.98	78	2.20	68	52	101.5	546	177	188	365	375	878	330
208	33.284	0.159	0.98	78	2.20	68	52	99.5	547	177	188	365	375	880	330
209	33.445	0.161	0.98	78	2.20	68	52	100.5	548	177	188	365	376	880	331
210	33.606	0.161	0.98	78	2.20	68	52	100.2	549	177	188	365	376	880	331
211	33.767	0.161	0.98	78	2.20	68	52	100.1	549	177	188	365	376	879	331
212	33.926	0.159	0.99	78	2.20	68	52	99.1	550	177	189	365	377	878	332
213	34.087	0.161	0.99	78	2.20	68	52	100.6	551	177	189	365	377	879	332
214	34.248	0.161	0.98	78	2.20	68	53	100.6	552	177	189	365	377	881	332
215	34.408	0.160	0.98	78	2.20	68	53	99.8	553	177	189	365	378	883	332
216	34.569	0.161	0.99	78	2.20	68	53	100.3	554	178	189	364	378	885	333

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)
217	34.730	0.161	0.98	78	2.20	68	53	100.5	556	178	189	364	378	888	333
218	34.890	0.160	0.98	78	2.20	68	53	99.7	558	178	189	364	379	891	334
219	35.050	0.160	0.99	78	2.20	68	53	99.5	560	178	189	364	379	896	334
220	35.212	0.162	0.99	79	2.20	68	53	101.0	562	178	189	364	380	901	335
221	35.372	0.160	0.98	79	2.20	68	53	99.9	564	178	190	364	380	904	335
222	35.532	0.160	0.99	79	2.20	68	53	99.6	566	178	190	364	381	908	336
223	35.693	0.161	0.99	78	2.20	68	53	99.9	569	179	190	365	381	912	337
224	35.854	0.161	0.99	78	2.20	68	53	100.1	571	179	190	365	381	914	337
225	36.015	0.161	0.98	78	2.20	68	53	100.4	573	179	190	366	382	915	338
226	36.175	0.160	0.99	78	2.10	68	53	99.8	574	179	190	366	382	915	338
227	36.336	0.161	0.98	78	2.20	68	53	100.3	575	179	190	366	383	912	339
228	36.497	0.161	0.98	78	2.20	68	53	100.2	576	179	191	367	383	908	339
229	36.657	0.160	0.99	78	2.20	68	53	99.7	577	179	191	367	382	902	339
230	36.819	0.162	0.98	78	2.20	68	53	101.1	576	179	191	367	382	896	339
231	36.979	0.160	0.98	78	2.20	68	53	100.1	575	180	191	367	382	891	339
232	37.139	0.160	0.98	78	2.20	68	53	100.5	574	180	191	366	382	888	339
233	37.300	0.161	0.99	78	2.20	68	53	101.1	573	180	192	365	381	886	338
234	37.461	0.161	0.98	78	2.20	68	53	100.8	571	180	192	364	381	883	338
235	37.621	0.160	0.98	78	2.20	68	53	100.0	569	180	192	364	380	880	337
236	37.782	0.161	0.98	78	2.20	68	53	100.7	567	180	192	363	380	877	336
237	37.943	0.161	0.98	78	2.20	68	53	100.7	564	180	192	362	379	872	335
238	38.103	0.160	0.98	78	2.20	68	53	100.0	561	180	193	362	378	866	335
239	38.264	0.161	0.98	78	2.20	68	53	100.7	558	180	193	363	377	861	334
240	38.425	0.161	0.98	78	2.20	68	53	100.7	555	181	193	363	377	857	334
241	38.586	0.161	0.98	78	2.20	68	53	100.6	552	181	193	364	377	853	333
242	38.746	0.160	0.99	78	2.20	68	53	100.2	549	181	193	364	376	849	333
243	38.907	0.161	0.98	78	2.20	68	53	100.6	546	181	193	364	376	845	332
244	39.068	0.161	0.98	78	2.20	68	53	100.3	543	181	193	364	375	837	331
245	39.228	0.160	0.98	78	2.20	68	53	100.0	540	181	193	363	375	830	330
246	39.388	0.160	0.98	78	2.10	68	53	100.3	537	182	193	363	374	825	330
247	39.550	0.162	0.98	78	2.20	68	53	101.3	533	182	193	363	374	821	329
248	39.710	0.160	0.98	78	2.20	68	53	99.7	530	182	193	362	373	817	328
249	39.870	0.160	0.98	78	2.20	68	53	99.8	527	182	193	361	373	814	327
250	40.032	0.162	0.98	78	2.20	68	53	101.4	524	182	194	361	372	812	327
251	40.192	0.160	0.98	78	2.20	68	53	99.9	521	183	194	360	371	809	326
252	40.352	0.160	0.98	78	2.20	68	53	99.2	519	183	194	360	370	807	325
253	40.513	0.161	0.98	78	2.20	68	53	99.7	517	183	194	359	369	805	324
254	40.674	0.161	0.98	78	2.20	68	53	100.1	515	183	194	359	369	802	324
255	40.835	0.161	0.98	78	2.20	68	53	100.0	513	183	194	358	368	800	323
256	40.995	0.160	0.98	78	2.20	68	53	99.0	511	184	194	357	367	799	323
257	41.156	0.161	0.98	78	2.20	68	53	99.8	509	184	194	357	366	797	322
258	41.316	0.160	0.98	78	2.20	68	53	99.5	507	184	194	356	365	793	321
259	41.477	0.161	0.99	78	2.20	68	53	100.2	505	184	194	355	364	790	320
260	41.639	0.162	0.98	78	2.20	68	53	101.0	504	185	194	354	363	788	320

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)
261	41.799	0.160	0.98	78	2.20	68	53	100.0	502	185	194	354	362	786	319
262	41.959	0.160	0.98	79	2.20	68	53	99.8	501	185	194	353	361	785	319
263	42.120	0.161	0.98	78	2.20	68	53	100.2	500	185	194	352	360	783	318
264	42.281	0.161	0.98	78	2.20	68	53	100.2	499	185	194	352	359	781	318
265	42.441	0.160	0.98	78	2.20	68	53	99.7	497	185	194	351	358	779	317
266	42.601	0.160	0.98	78	2.20	68	53	99.8	496	186	194	350	357	778	317
267	42.763	0.162	0.98	78	2.20	68	53	101.2	495	186	193	349	356	776	316
268	42.923	0.160	0.98	78	2.20	68	53	100.2	494	186	193	348	355	774	315
269	43.083	0.160	0.99	79	2.20	68	53	99.8	493	186	193	347	354	772	315
270	43.245	0.162	0.99	79	2.20	68	53	100.5	491	186	193	346	353	770	314
271	43.405	0.160	0.98	79	2.10	68	53	99.4	490	186	193	346	352	768	313
272	43.565	0.160	0.99	79	2.20	68	53	99.6	490	187	193	345	351	767	313
273	43.726	0.161	0.98	79	2.10	68	53	100.2	488	187	193	344	350	765	312
274	43.887	0.161	0.98	79	2.10	68	53	100.1	487	187	193	343	350	763	312
275	44.047	0.160	0.98	78	2.10	68	53	99.6	486	187	193	343	348	761	311
276	44.208	0.161	0.98	78	2.20	68	53	100.3	485	187	192	341	348	756	311
277	44.369	0.161	0.98	78	2.10	68	53	100.5	484	187	192	340	347	753	310
278	44.529	0.160	0.98	78	2.10	68	53	100.3	482	187	192	339	347	751	309
279	44.690	0.161	0.98	78	2.20	68	53	100.9	480	187	192	338	347	747	309
280	44.852	0.162	0.98	78	2.20	68	53	101.1	478	187	191	337	346	741	308
281	45.012	0.160	0.98	78	2.20	68	53	99.8	476	187	191	336	346	737	307
282	45.172	0.160	0.98	78	2.20	68	53	99.8	473	187	191	335	346	733	306
283	45.333	0.161	0.98	78	2.10	68	54	100.1	471	186	191	334	347	728	306
284	45.494	0.161	0.98	78	2.20	68	54	99.9	468	186	190	333	347	725	305
285	45.654	0.160	0.98	78	2.20	68	53	99.4	466	186	190	331	347	722	304
286	45.815	0.161	0.98	78	2.20	68	53	100.2	463	186	190	330	347	719	303
287	45.976	0.161	0.98	78	2.10	68	54	100.1	461	186	189	329	347	718	302
288	46.137	0.161	0.98	78	2.10	68	54	100.1	459	186	189	328	347	717	302
289	46.297	0.160	0.98	78	2.10	68	54	99.7	457	186	188	327	347	716	301
290	46.459	0.162	0.98	78	2.10	68	54	100.9	455	186	188	326	347	715	300
291	46.619	0.160	0.98	78	2.20	67	54	99.7	454	186	188	324	347	714	300
292	46.780	0.161	0.98	78	2.10	67	54	100.4	452	186	188	323	347	713	299
293	46.941	0.161	0.99	78	2.20	67	53	100.2	450	185	187	322	347	712	298
294	47.102	0.161	0.98	78	2.20	67	54	99.9	449	185	187	321	346	711	298
295	47.263	0.161	0.98	78	2.10	67	53	99.8	447	185	187	320	346	710	297
296	47.423	0.160	0.99	78	2.20	67	53	99.2	446	185	186	319	346	708	296
297	47.585	0.162	0.98	78	2.20	67	53	100.5	445	185	186	317	346	707	296
298	47.745	0.160	0.98	78	2.20	67	53	99.6	444	185	186	316	345	707	295
299	47.906	0.161	0.99	78	2.20	67	53	100.6	442	185	186	315	345	706	295
300	48.067	0.161	0.98	78	2.10	67	53	100.6	441	185	185	314	344	706	294
301	48.228	0.161	0.97	78	2.20	67	53	100.2	440	185	185	313	343	705	293
302	48.388	0.160	0.98	78	2.20	67	53	99.6	439	185	185	312	343	705	293
303	48.549	0.161	0.98	78	2.10	67	53	100.6	438	185	185	311	343	704	292
304	48.710	0.161	0.98	78	2.20	67	53	100.7	437	184	184	310	342	703	291

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)
305	48.870	0.160	0.98	78	2.20	67	53	99.9	436	184	184	309	342	702	291
306	49.031	0.161	0.98	78	2.10	67	53	100.3	435	184	184	307	341	702	290
307	49.192	0.161	0.98	78	2.20	67	53	100.2	434	184	184	307	340	700	290
308	49.353	0.161	0.98	78	2.10	67	53	100.1	434	184	183	305	340	700	289
309	49.513	0.160	0.98	78	2.20	67	53	99.2	433	184	183	305	340	699	289
310	49.674	0.161	0.98	78	2.20	67	53	99.8	432	184	183	304	339	699	288
311	49.835	0.161	0.98	78	2.20	67	53	100.2	431	184	183	303	339	699	288
312	49.995	0.160	0.98	78	2.10	67	53	99.7	431	184	182	302	338	698	287
313	50.155	0.160	0.98	78	2.10	67	53	99.6	430	184	182	301	338	698	287
314	50.317	0.162	0.98	78	2.20	67	53	101.1	429	184	182	300	337	698	286
315	50.477	0.160	0.98	78	2.20	67	53	100.0	429	183	181	299	336	697	286
316	50.637	0.160	0.98	78	2.20	68	53	99.6	428	183	181	298	336	697	285
317	50.799	0.162	0.98	78	2.10	68	53	100.6	428	183	181	298	335	695	285
318	50.959	0.160	0.98	78	2.20	68	54	99.3	427	183	181	297	334	691	284
319	51.119	0.160	0.98	78	2.10	68	53	99.4	426	183	181	296	333	687	284
320	51.280	0.161	0.98	78	2.10	68	53	100.4	425	183	180	296	332	685	283
321	51.441	0.161	0.98	78	2.10	68	53	100.5	424	183	180	295	331	683	283
322	51.601	0.160	0.98	78	2.20	68	53	99.5	423	183	180	295	331	682	282
323	51.762	0.161	0.98	78	2.20	68	53	99.8	421	183	180	295	330	681	282
324	51.923	0.161	0.98	78	2.20	68	54	100.0	421	183	180	294	329	681	281
325	52.083	0.160	0.98	78	2.20	68	54	99.5	420	182	179	293	328	681	280
326	52.244	0.161	0.98	78	2.20	68	54	99.9	419	182	179	293	328	680	280
327	52.405	0.161	0.98	78	2.20	68	54	99.8	418	182	179	293	327	680	280
328	52.565	0.160	0.98	78	2.20	68	54	99.3	418	182	179	292	326	679	279
329	52.725	0.160	0.98	78	2.10	68	54	99.4	417	182	179	292	326	678	279
330	52.886	0.161	0.98	78	2.20	68	54	99.9	416	182	178	291	325	678	278
331	53.047	0.161	0.98	78	2.10	68	54	99.9	415	182	178	291	324	677	278
332	53.207	0.160	0.98	78	2.10	68	54	99.6	415	182	178	290	324	677	278
333	53.368	0.161	0.98	78	2.10	68	54	100.1	414	181	178	290	323	677	277
334	53.529	0.161	0.97	78	2.10	68	54	100.1	414	181	178	289	322	678	277
335	53.689	0.160	0.98	78	2.20	68	54	99.8	414	181	178	289	322	678	277
336	53.850	0.161	0.98	78	2.20	68	54	100.3	414	181	178	289	321	679	277
337	54.011	0.161	0.98	78	2.10	68	54	100.0	414	181	177	289	320	679	276
338	54.171	0.160	0.98	78	2.20	68	54	99.5	414	181	177	288	319	679	276
339	54.331	0.160	0.98	78	2.10	68	54	99.5	414	180	177	287	318	679	275
340	54.493	0.162	0.98	78	2.10	68	54	100.6	413	180	177	287	317	679	275
341	54.653	0.160	0.97	78	2.10	68	54	99.2	413	180	177	287	316	677	275
342	54.813	0.160	0.98	78	2.20	68	54	99.0	413	180	177	286	315	675	274
343	54.974	0.161	0.98	78	2.10	68	54	99.5	412	180	176	286	314	673	274
344	55.135	0.161	0.97	78	2.10	68	54	99.5	411	180	176	286	312	672	273
345	55.295	0.160	0.98	78	2.10	68	54	99.3	411	180	176	285	311	671	273
346	55.455	0.160	0.98	78	2.20	67	54	99.5	410	180	176	285	310	671	272
347	55.617	0.162	0.98	78	2.20	67	54	100.5	409	180	176	285	309	670	272
348	55.777	0.160	0.98	78	2.10	67	54	99.1	409	180	176	284	309	670	272

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 360 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.9 in. Hg
Post-Test 0 cfm @ 17.16 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)
349	55.937	0.160	0.98	79	2.20	67	54	98.8	408	180	176	284	308	670	271
350	56.099	0.162	0.98	79	2.10	67	54	99.8	408	180	175	283	307	670	271
351	56.259	0.160	0.98	78	2.10	67	54	98.7	408	180	175	282	306	670	270
352	56.419	0.160	0.98	79	2.20	67	54	98.9	407	181	175	282	305	672	270
353	56.580	0.161	0.98	78	2.10	67	54	99.3	407	181	175	281	304	672	270
354	56.741	0.161	0.97	79	2.20	67	54	99.1	407	181	175	281	303	673	269
355	56.901	0.160	0.98	78	2.10	67	54	98.8	407	180	174	280	302	673	269
356	57.062	0.161	0.98	78	2.10	67	54	99.5	407	180	174	280	301	673	268
357	57.223	0.161	0.98	78	2.10	67	54	99.4	407	180	174	279	300	672	268
358	57.383	0.160	0.98	78	2.20	67	54	99.2	407	180	174	279	299	671	268
359	57.544	0.161	0.98	78	2.20	67	54	100.0	406	180	174	279	298	670	267
360	57.705	0.161	0.98	78	2.10	67	54	99.8	405	180	173	278	297	669	267

Train C - First Hour Particulate Sampling

Run: 1
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 10:30
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 2/27/24

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 @ 23.5 in. Hg
Post-Test 0 cfm @ 17.82 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	**9.616**	**0.160**	**2.23**	**63.2**	**-1.98**	**64.8**	**59.4**	**99.8**
Minimum	0.000	0.139	2.12	62	-2.28	62	56	90.0
Max	9.616	0.162	2.29	65	-1.68	66	60	102.7
0	0.000		2.19	62	-1.79	62	56	
1	0.139	0.139	2.29	62	-1.93	63	57	90.0
2	0.300	0.161	2.25	62	-1.80	63	57	102.7
3	0.462	0.162	2.22	62	-1.81	63	58	101.8
4	0.621	0.159	2.22	62	-1.75	63	58	100.3
5	0.781	0.160	2.20	62	-2.16	63	58	100.7
6	0.941	0.160	2.19	62	-2.02	64	58	100.5
7	1.099	0.158	2.19	62	-1.69	64	59	99.0
8	1.258	0.159	2.18	62	-1.79	64	59	99.5
9	1.416	0.158	2.14	62	-2.13	64	59	98.9
10	1.574	0.158	2.16	62	-1.68	64	59	98.8
11	1.733	0.159	2.15	62	-2.13	64	59	99.5
12	1.890	0.157	2.15	62	-1.91	64	59	98.0
13	2.048	0.158	2.14	63	-1.71	64	59	98.5
14	2.205	0.157	2.15	63	-2.20	64	59	98.2
15	2.362	0.157	2.12	63	-2.20	64	59	98.2
16	2.519	0.157	2.14	63	-1.74	64	59	98.1
17	2.676	0.157	2.13	63	-1.88	64	59	98.0
18	2.837	0.161	2.26	63	-1.93	64	59	100.5
19	2.999	0.162	2.25	63	-2.11	65	59	101.2
20	3.160	0.161	2.25	63	-1.84	65	59	100.6
21	3.322	0.162	2.25	63	-1.77	65	59	101.1
22	3.483	0.161	2.26	63	-2.26	65	59	100.2
23	3.644	0.161	2.27	63	-2.27	65	60	100.4
24	3.806	0.162	2.25	63	-1.75	65	60	101.2
25	3.967	0.161	2.25	63	-1.87	65	59	100.3
26	4.129	0.162	2.26	63	-1.80	65	60	100.8
27	4.290	0.161	2.24	63	-1.99	65	60	100.3
28	4.452	0.162	2.26	63	-2.17	65	60	100.8
29	4.614	0.162	2.24	63	-1.82	65	60	100.7
30	4.775	0.161	2.24	63	-1.80	65	60	100.1
31	4.937	0.162	2.26	63	-2.24	65	60	101.0
32	5.098	0.161	2.25	63	-1.84	65	60	100.5

Train C - First Hour Particulate Sampling

Run: 1 **Test Date:** 2/27/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time: 60 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 23.5 in. Hg
Post-Test 0 cfm @ 17.82 in. Hg

Elapsed Time (min)	**Train C Sampling System**							
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*
33	5.259	0.161	2.25	63	-2.28	65	60	100.6
34	5.421	0.162	2.24	63	-2.17	65	60	101.1
35	5.582	0.161	2.25	63	-1.82	65	60	100.4
36	5.744	0.162	2.23	64	-1.90	65	60	100.9
37	5.905	0.161	2.24	64	-1.77	65	60	100.1
38	6.066	0.161	2.26	64	-1.97	65	60	99.9
39	6.228	0.162	2.22	64	-1.89	65	60	100.5
40	6.390	0.162	2.25	64	-1.95	65	60	100.5
41	6.551	0.161	2.25	64	-2.20	65	60	100.0
42	6.712	0.161	2.24	64	-2.22	65	60	100.0
43	6.873	0.161	2.22	64	-2.28	65	60	99.6
44	7.035	0.162	2.25	64	-1.77	65	60	100.0
45	7.196	0.161	2.24	64	-2.24	65	60	99.5
46	7.357	0.161	2.25	64	-1.80	66	60	99.7
47	7.518	0.161	2.25	64	-2.27	66	60	99.7
48	7.680	0.162	2.24	64	-1.95	66	60	100.1
49	7.841	0.161	2.24	64	-1.79	66	60	99.4
50	8.003	0.162	2.25	64	-2.18	66	60	100.0
51	8.164	0.161	2.24	64	-1.79	66	60	99.5
52	8.325	0.161	2.24	64	-1.85	66	60	99.7
53	8.487	0.162	2.25	64	-1.90	66	60	100.6
54	8.648	0.161	2.25	64	-2.05	66	60	100.0
55	8.809	0.161	2.25	64	-2.00	66	60	99.8
56	8.971	0.162	2.24	64	-1.97	66	60	100.2
57	9.132	0.161	2.25	64	-2.21	66	60	99.4
58	9.294	0.162	2.23	64	-2.19	66	60	100.0
59	9.455	0.161	2.25	65	-2.24	66	60	99.5
60	9.616	0.161	2.25	65	-2.26	66	60	99.4

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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 (%)*
Tot / Avg	**57.703**	**0.160**	**1.71**	**66.0**	**-2.04**	**241.22**	**-0.052**	**185.2**	**0.08**	**9.27**
Minimum	0.000	0.149	1.52	63	-2.20	192.00	-0.066	21.6	0.00	0.92
Max	57.703	0.162	1.75	68	-1.80	303.00	-0.041	1040.0	2.19	12.55
0	0.000		1.27	63	-1.80	263	-0.048	1040.0	0.32	1.04
1	0.149	0.149	1.52	63	-1.90	286	-0.050	1040.0	0.29	0.92
2	0.305	0.156	1.56	63	-1.80	243	-0.051	287.8	0.00	4.95
3	0.464	0.159	1.70	63	-2.10	224	-0.051	48.2	0.00	4.21
4	0.623	0.159	1.68	63	-2.10	217	-0.051	39.4	0.00	3.70
5	0.782	0.159	1.67	63	-1.90	212	-0.050	35.2	0.00	3.50
6	0.939	0.157	1.67	63	-2.10	208	-0.050	33.9	0.00	3.45
7	1.096	0.157	1.66	63	-2.00	205	-0.050	33.6	0.00	3.42
8	1.253	0.157	1.64	63	-1.90	203	-0.049	33.6	0.00	3.52
9	1.410	0.157	1.65	63	-1.80	202	-0.049	36.2	0.00	3.76
10	1.566	0.156	1.64	63	-2.10	200	-0.048	37.5	0.00	4.00
11	1.722	0.156	1.64	63	-1.80	199	-0.048	40.1	0.00	4.19
12	1.878	0.156	1.63	63	-2.10	199	-0.049	44.0	0.00	4.45
13	2.033	0.155	1.63	63	-1.90	199	-0.048	46.2	0.00	4.63
14	2.188	0.155	1.62	63	-1.90	199	-0.048	49.1	0.00	4.74
15	2.343	0.155	1.62	63	-1.90	199	-0.048	52.3	0.00	5.00
16	2.498	0.155	1.62	63	-2.10	199	-0.048	56.9	0.00	5.19
17	2.653	0.155	1.62	63	-1.80	200	-0.048	60.1	0.00	5.33
18	2.809	0.156	1.75	63	-2.10	200	-0.048	62.1	0.00	5.39
19	2.967	0.158	1.69	63	-2.10	199	-0.048	64.7	0.00	5.51
20	3.126	0.159	1.70	63	-2.10	200	-0.048	67.6	0.00	5.57
21	3.286	0.160	1.69	63	-1.90	200	-0.048	70.8	0.00	5.74
22	3.445	0.159	1.69	63	-2.10	201	-0.048	73.4	0.00	5.82
23	3.603	0.158	1.70	63	-2.10	204	-0.049	74.0	0.00	5.93
24	3.762	0.159	1.69	63	-1.90	204	-0.049	70.5	0.00	5.71
25	3.921	0.159	1.70	63	-2.00	203	-0.048	73.7	0.00	5.90
26	4.080	0.159	1.68	63	-2.10	203	-0.049	77.9	0.00	6.24
27	4.238	0.158	1.69	63	-2.10	205	-0.049	82.8	0.00	6.55
28	4.397	0.159	1.70	63	-1.90	207	-0.049	87.3	0.00	6.76
29	4.556	0.159	1.69	63	-2.10	207	-0.050	90.9	0.00	7.12
30	4.714	0.158	1.69	63	-2.10	208	-0.050	93.2	0.00	7.33
31	4.874	0.160	1.72	63	-2.20	210	-0.050	94.4	0.00	7.46
32	5.034	0.160	1.72	63	-2.00	211	-0.050	94.5	0.00	7.54

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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	5.193	0.159	1.71	63	-2.00	212	-0.050	98.7	0.00	7.65
34	5.354	0.161	1.72	63	-2.20	213	-0.050	98.3	0.00	7.67
35	5.514	0.160	1.72	63	-2.20	214	-0.051	98.3	0.00	7.70
36	5.673	0.159	1.71	63	-2.00	216	-0.051	99.3	0.00	7.82
37	5.833	0.160	1.71	64	-2.00	216	-0.051	98.7	0.00	7.91
38	5.993	0.160	1.71	64	-1.90	217	-0.051	99.9	0.00	8.05
39	6.153	0.160	1.70	64	-1.90	217	-0.051	102.9	0.00	8.25
40	6.313	0.160	1.71	64	-2.10	220	-0.052	108.0	0.00	8.61
41	6.473	0.160	1.72	64	-2.00	221	-0.051	107.7	0.00	8.92
42	6.632	0.159	1.71	64	-1.90	221	-0.052	103.2	0.00	8.75
43	6.792	0.160	1.71	64	-1.90	221	-0.052	112.9	0.00	8.66
44	6.952	0.160	1.72	64	-2.10	221	-0.052	125.6	0.01	8.79
45	7.112	0.160	1.71	64	-2.00	221	-0.052	118.1	0.00	8.83
46	7.272	0.160	1.71	64	-2.20	223	-0.053	118.4	0.00	8.60
47	7.432	0.160	1.72	64	-2.20	224	-0.052	111.3	0.00	8.61
48	7.592	0.160	1.72	64	-2.00	224	-0.051	116.0	0.00	8.71
49	7.751	0.159	1.71	64	-1.90	224	-0.052	125.9	0.00	8.89
50	7.912	0.161	1.72	64	-1.90	224	-0.052	140.5	0.01	8.92
51	8.072	0.160	1.72	64	-1.90	223	-0.052	132.5	0.01	9.00
52	8.231	0.159	1.71	64	-2.00	225	-0.052	163.8	0.01	9.08
53	8.391	0.160	1.72	64	-2.10	225	-0.052	156.0	0.01	9.21
54	8.552	0.161	1.72	64	-2.10	226	-0.053	136.3	0.01	9.18
55	8.711	0.159	1.71	64	-1.90	227	-0.053	158.3	0.01	9.36
56	8.871	0.160	1.71	64	-1.90	227	-0.053	140.1	0.01	9.31
57	9.031	0.160	1.72	64	-2.00	227	-0.052	157.6	0.01	9.42
58	9.191	0.160	1.71	64	-2.10	227	-0.052	139.8	0.01	9.57
59	9.351	0.160	1.70	64	-1.90	227	-0.052	159.9	0.01	9.66
60	9.511	0.160	1.71	64	-2.20	228	-0.052	147.9	0.01	9.65
61	9.672	0.161	1.72	64	-2.20	227	-0.052	148.3	0.01	9.68
62	9.831	0.159	1.71	64	-2.10	228	-0.053	176.4	0.01	9.85
63	9.992	0.161	1.72	64	-1.90	229	-0.053	201.8	0.01	9.96
64	10.152	0.160	1.72	65	-2.10	231	-0.053	241.5	0.02	10.02
65	10.312	0.160	1.71	65	-2.00	233	-0.053	258.7	0.02	9.96
66	10.472	0.160	1.72	65	-2.00	236	-0.053	353.8	0.02	10.09
67	10.632	0.160	1.72	65	-2.00	235	-0.054	353.2	0.03	10.09
68	10.793	0.161	1.71	65	-1.90	238	-0.054	356.7	0.03	10.27

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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 (%)*
69	10.952	0.159	1.72	65	-2.00	242	-0.055	404.6	0.03	10.38
70	11.113	0.161	1.72	65	-2.00	246	-0.055	450.3	0.04	10.46
71	11.273	0.160	1.72	65	-1.90	249	-0.056	458.7	0.04	10.61
72	11.433	0.160	1.72	65	-2.20	254	-0.057	418.2	0.04	10.79
73	11.594	0.161	1.72	65	-2.20	259	-0.057	693.7	0.06	10.97
74	11.754	0.160	1.72	65	-2.00	265	-0.058	890.4	0.07	11.17
75	11.914	0.160	1.71	65	-2.20	269	-0.059	1040.0	0.12	11.15
76	12.074	0.160	1.71	65	-2.20	275	-0.060	1040.0	0.21	11.48
77	12.234	0.160	1.72	65	-2.00	280	-0.060	1040.0	0.21	11.64
78	12.394	0.160	1.71	65	-2.00	287	-0.061	1040.0	0.28	12.09
79	12.555	0.161	1.71	65	-1.90	288	-0.061	1040.0	0.73	12.01
80	12.715	0.160	1.72	65	-1.90	294	-0.064	1040.0	1.71	12.31
81	12.875	0.160	1.72	65	-1.90	295	-0.064	1040.0	1.87	12.00
82	13.035	0.160	1.71	65	-2.00	294	-0.064	1040.0	0.98	12.29
83	13.196	0.161	1.72	65	-2.20	294	-0.064	1040.0	0.20	12.18
84	13.356	0.160	1.71	65	-2.10	292	-0.063	499.6	0.02	11.20
85	13.516	0.160	1.71	65	-1.90	290	-0.063	65.3	0.00	10.73
86	13.676	0.160	1.71	65	-2.10	287	-0.061	49.5	0.00	9.53
87	13.836	0.160	1.72	65	-2.20	285	-0.061	62.4	0.00	9.32
88	13.997	0.161	1.72	65	-2.20	284	-0.061	50.4	0.00	9.75
89	14.157	0.160	1.72	65	-1.90	284	-0.061	50.4	0.00	9.85
90	14.318	0.161	1.72	65	-1.90	284	-0.061	59.9	0.00	9.99
91	14.478	0.160	1.72	65	-1.90	284	-0.061	438.6	0.05	10.78
92	14.638	0.160	1.71	65	-2.20	285	-0.062	1040.0	0.35	11.52
93	14.798	0.160	1.72	65	-2.20	289	-0.062	1040.0	1.52	11.89
94	14.959	0.161	1.73	65	-2.00	293	-0.064	1040.0	1.74	12.02
95	15.119	0.160	1.72	65	-2.00	295	-0.063	1040.0	1.81	11.85
96	15.280	0.161	1.72	65	-2.10	295	-0.064	1040.0	1.94	11.94
97	15.440	0.160	1.72	65	-2.20	298	-0.065	1040.0	2.07	12.10
98	15.601	0.161	1.72	65	-1.90	300	-0.065	1040.0	2.19	12.15
99	15.761	0.160	1.71	65	-2.10	300	-0.065	1040.0	2.10	12.09
100	15.922	0.161	1.72	65	-2.00	298	-0.063	1040.0	1.44	12.18
101	16.082	0.160	1.73	66	-2.20	298	-0.063	1040.0	1.02	12.16
102	16.242	0.160	1.71	66	-2.20	300	-0.062	1040.0	0.91	12.12
103	16.403	0.161	1.72	66	-1.90	298	-0.063	1040.0	0.84	12.23
104	16.563	0.160	1.72	66	-2.10	299	-0.062	1040.0	0.79	12.21

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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	16.724	0.161	1.72	66	-2.00	299	-0.061	1040.0	0.68	12.21
106	16.884	0.160	1.71	66	-1.90	299	-0.066	1040.0	0.60	12.00
107	17.045	0.161	1.72	66	-1.90	303	-0.065	1040.0	0.95	12.55
108	17.205	0.160	1.72	66	-1.90	301	-0.065	1040.0	0.40	11.83
109	17.365	0.160	1.71	66	-1.90	299	-0.064	565.9	0.04	11.77
110	17.526	0.161	1.72	66	-2.10	298	-0.064	226.0	0.01	11.39
111	17.686	0.160	1.72	66	-2.20	297	-0.064	75.7	0.00	11.13
112	17.847	0.161	1.72	66	-1.90	295	-0.063	67.9	0.00	10.99
113	18.007	0.160	1.72	66	-2.00	294	-0.063	70.9	0.00	10.70
114	18.168	0.161	1.72	66	-2.20	291	-0.061	59.5	0.00	10.59
115	18.328	0.160	1.72	66	-1.90	289	-0.062	45.6	0.00	10.23
116	18.489	0.161	1.71	66	-2.10	286	-0.062	45.9	0.00	10.02
117	18.649	0.160	1.72	66	-2.10	285	-0.061	48.8	0.00	9.76
118	18.810	0.161	1.72	66	-2.10	284	-0.061	49.2	0.00	9.59
119	18.970	0.160	1.72	66	-2.00	282	-0.060	52.7	0.00	9.42
120	19.130	0.160	1.72	66	-2.10	281	-0.060	53.4	0.00	9.19
121	19.292	0.162	1.72	66	-2.00	279	-0.060	58.5	0.00	9.15
122	19.452	0.160	1.72	66	-2.10	278	-0.059	60.2	0.00	8.96
123	19.612	0.160	1.71	66	-1.90	276	-0.060	84.8	0.00	9.74
124	19.773	0.161	1.72	66	-2.10	278	-0.060	93.5	0.00	9.97
125	19.933	0.160	1.73	66	-2.00	279	-0.059	97.1	0.00	10.17
126	20.094	0.161	1.72	66	-2.00	278	-0.060	95.1	0.00	10.43
127	20.254	0.160	1.72	66	-2.20	278	-0.059	91.6	0.00	10.61
128	20.415	0.161	1.72	66	-2.10	278	-0.058	90.9	0.00	10.87
129	20.575	0.160	1.72	66	-2.10	278	-0.058	108.7	0.00	10.79
130	20.736	0.161	1.71	66	-2.10	280	-0.059	112.3	0.00	11.12
131	20.896	0.160	1.72	66	-2.00	279	-0.060	150.5	0.01	11.24
132	21.056	0.160	1.72	66	-2.00	278	-0.058	173.2	0.01	11.42
133	21.217	0.161	1.72	66	-2.10	278	-0.060	230.2	0.02	11.55
134	21.377	0.160	1.71	66	-2.20	281	-0.059	203.0	0.01	11.59
135	21.539	0.162	1.72	66	-2.00	281	-0.059	240.2	0.02	11.75
136	21.699	0.160	1.72	66	-1.90	281	-0.060	304.0	0.02	11.79
137	21.859	0.160	1.71	66	-2.10	282	-0.059	387.2	0.03	11.86
138	22.020	0.161	1.72	66	-2.10	282	-0.059	438.8	0.04	11.92
139	22.180	0.160	1.72	66	-2.10	282	-0.059	455.2	0.04	11.93
140	22.341	0.161	1.72	66	-2.20	282	-0.060	472.4	0.04	11.94

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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	22.501	0.160	1.71	66	-2.00	281	-0.061	365.3	0.03	11.91
142	22.662	0.161	1.72	66	-1.90	281	-0.060	329.3	0.03	11.92
143	22.822	0.160	1.72	66	-1.90	282	-0.059	331.5	0.02	12.02
144	22.983	0.161	1.71	66	-2.10	282	-0.059	228.9	0.01	11.79
145	23.143	0.160	1.72	66	-2.00	283	-0.059	174.2	0.01	11.94
146	23.303	0.160	1.72	66	-2.00	282	-0.059	153.4	0.00	11.89
147	23.464	0.161	1.72	66	-2.00	281	-0.058	189.1	0.01	11.87
148	23.624	0.160	1.71	66	-2.10	280	-0.060	228.9	0.01	11.85
149	23.785	0.161	1.72	66	-2.10	280	-0.060	160.9	0.01	11.76
150	23.946	0.161	1.72	66	-1.90	280	-0.059	199.8	0.01	11.70
151	24.106	0.160	1.71	66	-2.20	280	-0.059	174.5	0.01	11.63
152	24.266	0.160	1.72	66	-2.20	280	-0.059	133.4	0.00	11.59
153	24.427	0.161	1.72	66	-2.10	280	-0.060	124.0	0.00	11.51
154	24.587	0.160	1.72	66	-2.20	280	-0.059	154.1	0.00	11.44
155	24.748	0.161	1.71	66	-2.10	279	-0.059	75.7	0.00	11.14
156	24.909	0.161	1.72	66	-2.10	280	-0.059	75.0	0.00	11.20
157	25.069	0.160	1.72	66	-2.10	279	-0.059	71.2	0.00	11.20
158	25.229	0.160	1.71	66	-2.10	278	-0.060	68.6	0.00	11.14
159	25.390	0.161	1.72	66	-2.10	279	-0.059	64.7	0.00	11.16
160	25.550	0.160	1.72	66	-2.20	278	-0.059	66.6	0.00	11.13
161	25.711	0.161	1.72	66	-2.10	278	-0.058	69.9	0.00	11.20
162	25.871	0.160	1.71	66	-2.00	277	-0.059	79.6	0.00	11.14
163	26.032	0.161	1.72	66	-1.90	276	-0.059	95.8	0.00	11.19
164	26.193	0.161	1.72	66	-1.90	275	-0.058	134.0	0.00	11.26
165	26.353	0.160	1.71	66	-2.20	276	-0.059	95.7	0.00	11.24
166	26.513	0.160	1.72	66	-2.00	276	-0.058	67.9	0.00	11.32
167	26.674	0.161	1.72	66	-2.20	276	-0.059	68.6	0.00	11.33
168	26.834	0.160	1.72	66	-2.10	277	-0.059	72.1	0.00	11.21
169	26.994	0.160	1.71	66	-2.20	278	-0.060	70.2	0.00	11.10
170	27.155	0.161	1.72	66	-1.90	278	-0.058	69.2	0.00	10.93
171	27.316	0.161	1.72	66	-2.00	277	-0.059	68.3	0.00	10.81
172	27.476	0.160	1.71	66	-2.20	277	-0.059	67.9	0.00	10.89
173	27.637	0.161	1.72	67	-2.20	276	-0.058	67.3	0.00	10.82
174	27.797	0.160	1.72	66	-2.00	275	-0.058	66.0	0.00	10.68
175	27.958	0.161	1.72	66	-2.20	275	-0.058	65.3	0.00	10.35
176	28.118	0.160	1.71	67	-2.10	274	-0.058	60.2	0.00	9.68

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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	28.279	0.161	1.72	67	-2.10	273	-0.058	61.4	0.00	10.44
178	28.440	0.161	1.72	67	-2.00	273	-0.056	62.4	0.00	10.51
179	28.600	0.160	1.71	67	-2.20	272	-0.056	61.8	0.00	10.39
180	28.760	0.160	1.71	67	-2.00	272	-0.058	62.1	0.00	10.59
181	28.921	0.161	1.72	67	-2.20	270	-0.058	63.1	0.00	10.59
182	29.082	0.161	1.72	67	-2.10	269	-0.057	62.1	0.00	10.50
183	29.242	0.160	1.71	67	-2.00	269	-0.056	62.4	0.00	10.43
184	29.403	0.161	1.72	67	-2.00	268	-0.058	62.4	0.00	10.30
185	29.564	0.161	1.71	67	-1.90	267	-0.058	58.9	0.00	9.79
186	29.724	0.160	1.71	67	-2.10	267	-0.055	56.6	0.00	9.72
187	29.885	0.161	1.71	67	-2.10	267	-0.056	55.9	0.00	9.78
188	30.045	0.160	1.72	67	-2.00	268	-0.057	54.7	0.00	10.05
189	30.206	0.161	1.71	67	-2.10	268	-0.057	54.7	0.00	10.21
190	30.367	0.161	1.72	67	-1.90	266	-0.057	54.7	0.00	10.24
191	30.527	0.160	1.72	67	-2.10	266	-0.056	55.3	0.00	10.22
192	30.688	0.161	1.72	67	-2.00	264	-0.055	55.9	0.00	10.09
193	30.849	0.161	1.71	67	-1.90	264	-0.057	57.2	0.00	10.61
194	31.009	0.160	1.72	67	-2.00	262	-0.056	58.9	0.00	10.50
195	31.170	0.161	1.72	67	-2.00	262	-0.056	58.2	0.00	10.59
196	31.332	0.162	1.72	67	-2.20	263	-0.057	57.9	0.00	10.50
197	31.491	0.159	1.72	67	-1.90	262	-0.056	57.2	0.00	10.52
198	31.652	0.161	1.72	67	-1.90	261	-0.057	58.9	0.00	10.63
199	31.813	0.161	1.73	67	-2.20	262	-0.058	58.2	0.00	10.75
200	31.974	0.161	1.72	67	-2.20	261	-0.055	55.9	0.00	10.83
201	32.134	0.160	1.72	67	-2.10	261	-0.054	60.2	0.00	10.55
202	32.295	0.161	1.72	67	-1.90	260	-0.056	59.2	0.00	10.74
203	32.456	0.161	1.72	67	-1.90	259	-0.056	59.5	0.00	10.65
204	32.616	0.160	1.71	67	-1.90	259	-0.056	59.2	0.00	10.71
205	32.777	0.161	1.72	67	-2.20	258	-0.056	62.1	0.00	11.06
206	32.938	0.161	1.72	67	-1.90	259	-0.055	63.4	0.00	11.04
207	33.099	0.161	1.72	67	-2.10	257	-0.055	66.0	0.00	11.09
208	33.259	0.160	1.71	67	-2.20	257	-0.055	66.6	0.00	11.17
209	33.420	0.161	1.72	67	-2.20	258	-0.055	66.0	0.00	11.02
210	33.581	0.161	1.71	67	-2.10	261	-0.054	61.1	0.00	10.94
211	33.741	0.160	1.71	67	-2.10	258	-0.055	66.9	0.00	11.04
212	33.902	0.161	1.71	67	-2.00	257	-0.055	67.3	0.00	10.96

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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 (%)*
213	34.063	0.161	1.72	67	-2.10	257	-0.055	69.2	0.00	11.07
214	34.224	0.161	1.72	67	-2.20	257	-0.054	72.1	0.00	11.11
215	34.384	0.160	1.71	67	-2.20	257	-0.054	75.7	0.00	11.12
216	34.545	0.161	1.72	67	-2.10	257	-0.055	81.9	0.00	11.16
217	34.705	0.160	1.72	67	-2.00	257	-0.055	91.6	0.00	11.25
218	34.866	0.161	1.71	67	-1.90	257	-0.055	205.0	0.01	11.38
219	35.027	0.161	1.72	67	-2.10	259	-0.056	404.1	0.03	11.55
220	35.188	0.161	1.73	67	-2.20	260	-0.056	719.3	0.06	11.62
221	35.349	0.161	1.72	67	-1.90	261	-0.054	1040.0	0.12	11.63
222	35.509	0.160	1.72	67	-2.00	261	-0.055	1040.0	0.15	11.72
223	35.670	0.161	1.73	67	-2.10	261	-0.055	1040.0	0.13	11.70
224	35.831	0.161	1.72	67	-2.10	260	-0.054	1040.0	0.10	11.55
225	35.993	0.162	1.72	67	-2.20	260	-0.054	1029.6	0.08	11.50
226	36.153	0.160	1.71	67	-2.20	261	-0.056	591.2	0.05	11.28
227	36.314	0.161	1.72	67	-2.00	261	-0.056	372.9	0.02	11.05
228	36.475	0.161	1.72	67	-2.10	260	-0.054	160.6	0.00	10.79
229	36.636	0.161	1.71	67	-2.20	259	-0.054	95.1	0.00	10.52
230	36.796	0.160	1.72	67	-2.00	259	-0.055	79.6	0.00	10.33
231	36.958	0.162	1.72	67	-2.00	257	-0.054	75.1	0.00	10.17
232	37.119	0.161	1.72	67	-2.00	258	-0.054	71.5	0.00	10.16
233	37.279	0.160	1.72	67	-2.20	256	-0.053	67.6	0.00	10.07
234	37.440	0.161	1.72	67	-2.20	257	-0.053	65.3	0.00	9.91
235	37.601	0.161	1.72	67	-1.90	255	-0.053	63.4	0.00	9.77
236	37.762	0.161	1.72	67	-2.10	255	-0.052	62.4	0.00	9.69
237	37.922	0.160	1.72	67	-2.00	253	-0.053	41.1	0.00	10.74
238	38.083	0.161	1.73	67	-2.20	254	-0.053	36.8	0.00	10.61
239	38.244	0.161	1.72	67	-2.10	252	-0.053	37.5	0.00	10.33
240	38.405	0.161	1.72	67	-2.00	251	-0.053	35.9	0.00	10.13
241	38.566	0.161	1.72	67	-2.20	248	-0.053	38.5	0.00	10.19
242	38.727	0.161	1.72	67	-1.90	247	-0.052	38.5	0.00	9.97
243	38.888	0.161	1.71	67	-2.10	247	-0.052	37.2	0.00	9.65
244	39.048	0.160	1.71	67	-1.90	245	-0.051	34.6	0.00	9.59
245	39.209	0.161	1.71	67	-1.90	244	-0.051	35.2	0.00	9.51
246	39.370	0.161	1.72	67	-1.90	242	-0.051	36.2	0.00	9.51
247	39.532	0.162	1.71	67	-1.90	240	-0.050	36.5	0.00	9.29
248	39.692	0.160	1.71	67	-1.90	238	-0.050	37.5	0.00	9.39

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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	39.853	0.161	1.72	67	-1.90	237	-0.050	38.5	0.00	9.41
250	40.013	0.160	1.73	67	-2.10	236	-0.050	38.5	0.00	9.22
251	40.175	0.162	1.72	67	-2.10	234	-0.050	39.1	0.00	9.17
252	40.335	0.160	1.72	67	-2.00	233	-0.050	39.1	0.00	9.17
253	40.496	0.161	1.72	67	-2.10	232	-0.050	37.2	0.00	8.93
254	40.657	0.161	1.73	67	-2.00	231	-0.049	39.5	0.00	8.96
255	40.818	0.161	1.72	67	-2.00	229	-0.049	41.1	0.00	9.00
256	40.978	0.160	1.71	67	-2.20	228	-0.048	40.4	0.00	8.95
257	41.139	0.161	1.72	67	-2.00	226	-0.049	40.1	0.00	8.86
258	41.301	0.162	1.72	67	-2.00	225	-0.048	40.7	0.00	8.98
259	41.461	0.160	1.71	67	-1.90	226	-0.048	38.5	0.00	8.88
260	41.622	0.161	1.72	67	-1.90	226	-0.048	39.8	0.00	8.90
261	41.782	0.160	1.72	67	-2.00	225	-0.048	41.4	0.00	8.91
262	41.943	0.161	1.71	67	-1.90	224	-0.048	40.7	0.00	8.92
263	42.104	0.161	1.72	67	-2.10	224	-0.048	43.3	0.00	8.85
264	42.265	0.161	1.72	67	-1.90	222	-0.047	47.2	0.00	8.82
265	42.426	0.161	1.72	67	-2.20	221	-0.047	44.9	0.00	8.75
266	42.586	0.160	1.71	67	-1.90	221	-0.047	58.2	0.00	8.69
267	42.747	0.161	1.71	67	-2.00	220	-0.047	69.3	0.00	8.65
268	42.908	0.161	1.72	67	-2.20	219	-0.047	66.0	0.00	8.68
269	43.069	0.161	1.72	67	-2.20	220	-0.046	73.8	0.00	8.57
270	43.229	0.160	1.72	67	-2.10	219	-0.046	73.8	0.00	8.56
271	43.390	0.161	1.72	67	-2.00	217	-0.047	77.0	0.00	8.61
272	43.551	0.161	1.73	67	-1.90	217	-0.046	74.4	0.00	8.47
273	43.712	0.161	1.72	67	-2.00	216	-0.046	58.9	0.00	8.51
274	43.872	0.160	1.72	67	-2.20	214	-0.046	57.8	0.00	8.45
275	44.034	0.162	1.72	67	-2.00	215	-0.046	38.1	0.00	8.99
276	44.195	0.161	1.71	67	-1.90	213	-0.045	34.9	0.00	8.89
277	44.355	0.160	1.71	67	-2.00	213	-0.046	35.5	0.00	8.82
278	44.516	0.161	1.71	67	-1.90	212	-0.045	29.4	0.00	8.88
279	44.677	0.161	1.72	67	-1.90	212	-0.046	25.1	0.00	8.67
280	44.838	0.161	1.71	67	-2.20	211	-0.045	24.5	0.00	8.57
281	44.999	0.161	1.71	67	-1.90	209	-0.045	24.9	0.00	8.50
282	45.160	0.161	1.72	67	-1.90	208	-0.045	25.2	0.00	8.50
283	45.320	0.160	1.73	67	-1.90	208	-0.045	21.6	0.00	8.35
284	45.482	0.162	1.72	67	-2.00	208	-0.045	22.0	0.00	8.28

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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 (%)*
285	45.642	0.160	1.72	67	-1.90	207	-0.045	22.3	0.00	8.19
286	45.804	0.162	1.72	67	-1.90	206	-0.045	25.5	0.00	8.13
287	45.965	0.161	1.73	67	-2.00	205	-0.045	27.5	0.00	8.11
288	46.125	0.160	1.72	67	-2.00	204	-0.044	27.8	0.00	8.02
289	46.286	0.161	1.71	67	-1.90	205	-0.045	28.5	0.00	8.04
290	46.448	0.162	1.73	67	-1.90	203	-0.045	28.5	0.00	8.04
291	46.609	0.161	1.71	67	-2.20	204	-0.044	28.5	0.00	7.95
292	46.769	0.160	1.72	67	-1.90	203	-0.044	29.1	0.00	7.93
293	46.930	0.161	1.72	67	-1.90	202	-0.044	29.7	0.00	7.85
294	47.092	0.162	1.73	67	-2.20	202	-0.044	28.5	0.00	7.90
295	47.253	0.161	1.72	67	-2.10	202	-0.043	30.4	0.00	7.86
296	47.414	0.161	1.72	67	-2.20	201	-0.044	30.7	0.00	7.89
297	47.575	0.161	1.73	67	-1.90	202	-0.043	31.7	0.00	7.83
298	47.735	0.160	1.73	67	-2.00	200	-0.043	32.0	0.00	7.72
299	47.897	0.162	1.72	67	-2.20	200	-0.043	32.3	0.00	7.66
300	48.057	0.160	1.72	67	-2.20	200	-0.043	33.3	0.00	7.79
301	48.218	0.161	1.73	67	-2.20	200	-0.043	33.6	0.00	7.78
302	48.379	0.161	1.72	67	-1.90	199	-0.043	33.9	0.00	7.71
303	48.540	0.161	1.71	67	-2.00	200	-0.043	36.5	0.00	7.68
304	48.701	0.161	1.71	67	-1.90	199	-0.043	35.2	0.00	7.58
305	48.862	0.161	1.72	67	-1.90	199	-0.043	36.5	0.00	7.65
306	49.023	0.161	1.71	67	-2.20	200	-0.043	35.2	0.00	7.64
307	49.183	0.160	1.71	67	-2.00	199	-0.043	35.8	0.00	7.63
308	49.344	0.161	1.71	67	-1.90	199	-0.043	37.5	0.00	7.59
309	49.504	0.160	1.72	67	-2.00	198	-0.043	37.5	0.00	7.52
310	49.665	0.161	1.71	67	-1.90	199	-0.042	38.1	0.00	7.57
311	49.825	0.160	1.72	67	-2.00	198	-0.043	39.1	0.00	7.54
312	49.987	0.162	1.72	67	-2.00	198	-0.042	39.5	0.00	7.46
313	50.147	0.160	1.72	67	-2.20	198	-0.042	39.1	0.00	7.51
314	50.308	0.161	1.71	67	-2.00	197	-0.042	40.1	0.00	7.50
315	50.468	0.160	1.72	67	-2.20	198	-0.043	39.8	0.00	7.47
316	50.629	0.161	1.72	67	-2.00	197	-0.042	40.4	0.00	7.41
317	50.791	0.162	1.72	67	-2.20	197	-0.043	35.5	0.00	7.59
318	50.950	0.159	1.72	67	-2.20	198	-0.042	33.0	0.00	7.71
319	51.111	0.161	1.72	67	-1.90	196	-0.042	33.3	0.00	7.68
320	51.272	0.161	1.72	67	-2.20	195	-0.041	32.3	0.00	7.68

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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 (%)*
321	51.433	0.161	1.72	67	-2.20	196	-0.042	33.0	0.00	7.67
322	51.593	0.160	1.71	67	-2.20	195	-0.042	32.6	0.00	7.67
323	51.754	0.161	1.72	67	-2.20	195	-0.041	33.0	0.00	7.71
324	51.915	0.161	1.72	67	-2.10	194	-0.041	32.6	0.00	7.67
325	52.076	0.161	1.71	67	-1.90	194	-0.041	33.6	0.00	7.67
326	52.236	0.160	1.71	67	-2.00	194	-0.041	33.3	0.00	7.59
327	52.397	0.161	1.72	67	-2.00	194	-0.041	33.3	0.00	7.58
328	52.558	0.161	1.71	67	-2.00	195	-0.042	33.9	0.00	7.57
329	52.718	0.160	1.72	67	-2.00	194	-0.041	33.3	0.00	7.55
330	52.879	0.161	1.72	67	-2.00	194	-0.041	35.2	0.00	7.55
331	53.040	0.161	1.72	67	-1.90	194	-0.042	34.6	0.00	7.53
332	53.200	0.160	1.71	67	-2.10	194	-0.042	35.2	0.00	7.56
333	53.361	0.161	1.71	67	-2.20	193	-0.042	38.5	0.00	7.80
334	53.522	0.161	1.72	67	-1.90	194	-0.042	37.8	0.00	7.71
335	53.683	0.161	1.72	67	-2.00	193	-0.042	39.5	0.00	7.59
336	53.843	0.160	1.72	67	-1.90	194	-0.042	42.4	0.00	7.50
337	54.004	0.161	1.72	67	-2.20	194	-0.042	39.1	0.00	7.43
338	54.165	0.161	1.72	67	-2.00	194	-0.042	40.4	0.00	7.57
339	54.326	0.161	1.72	67	-1.90	194	-0.042	41.4	0.00	7.46
340	54.486	0.160	1.72	67	-2.10	195	-0.042	38.5	0.00	7.30
341	54.648	0.162	1.72	67	-1.90	194	-0.042	36.2	0.00	7.21
342	54.809	0.161	1.72	67	-2.10	192	-0.042	37.5	0.00	7.17
343	54.969	0.160	1.71	67	-2.00	193	-0.042	37.2	0.00	7.15
344	55.130	0.161	1.72	67	-2.10	193	-0.043	38.1	0.00	7.25
345	55.291	0.161	1.72	67	-2.00	194	-0.043	38.1	0.00	7.19
346	55.452	0.161	1.72	67	-1.90	193	-0.043	38.5	0.00	7.15
347	55.612	0.160	1.71	68	-2.20	194	-0.043	39.5	0.00	7.28
348	55.773	0.161	1.72	68	-2.00	194	-0.043	40.7	0.00	7.28
349	55.934	0.161	1.72	68	-1.90	193	-0.043	42.0	0.00	7.29
350	56.095	0.161	1.71	67	-2.20	194	-0.043	44.9	0.00	7.28
351	56.255	0.160	1.72	68	-2.20	193	-0.043	44.3	0.00	7.24
352	56.417	0.162	1.72	68	-2.00	193	-0.043	45.6	0.00	7.17
353	56.578	0.161	1.72	68	-2.00	194	-0.043	46.2	0.00	7.10
354	56.738	0.160	1.71	68	-1.90	192	-0.043	45.6	0.00	7.00
355	56.899	0.161	1.72	68	-2.00	192	-0.043	48.9	0.00	6.95
356	57.060	0.161	1.72	68	-2.00	192	-0.043	47.9	0.00	6.86

Train D - Ambient Background and Flue Gas Data

Run: 1 **Test Date:** 2/27/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:30
Total Sampling Time 360 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 (%)*
357	57.221	0.161	1.72	68	-2.10	192	-0.043	48.2	0.00	6.75
358	57.381	0.160	1.71	68	-2.10	193	-0.043	49.5	0.00	6.63
359	57.542	0.161	1.72	68	-1.90	192	-0.043	49.2	0.00	6.62
360	57.703	0.161	1.72	68	-2.20	193	-0.044	47.5	0.00	6.48

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Tracking No.:	2142
Project No.:	0142WN020E
Run No.:	1
Test Date:	2/27/24

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

Train A

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	2/27/2024 @16:50	Filter	F168/A	248.1	247.2	0.9	0.9
Probe catch*	2/27/2024 @16:50	Probe	38	114149.4	114149.3	0.1	0.1
ilter seals catch*	2/27/2024 @16:50	Seals	S654	3455.6	3455.6	0.0	0.0
				Total Particulate, mg:		**1.0**	**1.0**

Train B

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	2/27/2024 @16:50	Filter	F169/A	247.8	246.8	1.0	1.0
Probe catch*	2/27/2024 @16:50	Probe	78	117460.6	117460.6	0.0	0.0
ilter seals catch*	2/27/2024 @16:50	Seals	S656	3464.0	3464.0	0.0	0.0
			Sub-Total	Total Particulate, mg:		**1.0**	**1.0**

Train C - *First Hour*

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	2/27/2024 @16:50	Filter	F167/A	246.9	246.7	0.2	0.2
Probe catch*	2/27/2024 @16:50	Probe	22	114340.0	114340.0	0.0	0.0
ilter seals catch*	2/27/2024 @16:50	Seals	S644	3387.5	3387.5	0.0	0.0
				Total Particulate, mg:		**0.2**	**0.2**

Train D - *Ambient Background*

Sample Component	Date / Time in Desiccator	Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*	2/27/2024 @16:50	Filter	F221	125.2	125.2	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 appropriately 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:	SC 25
Project Number:	0142WN020E
Run Number:	1
Test Date:	2/27/2024

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

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

OMNI-Test Laboratories, Inc. **ASTM E2779 Pellet Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 1

Model: SC25-1 Tracking Number: 2142 Date: 02/27/2024

Test Crew: RT TT KN

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

85° CCW From Full Open

(Full open @ 0°)

Secondary: N/A

Tertiary/Pilot: N/A

Fan: Medium Low

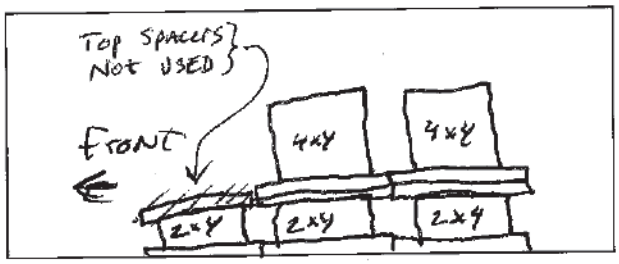
Duration of test

Preburn Notes

Time	Notes
0755	12.0 lbs of kindling and ignition
0850	Preburn fuel was loaded
0928	At 6.5/6s air setting set to test setting
1028	~~Co~~ Preburn was stopped at 3.0 lbs

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Used to load fuel

Fuel loaded by: ZA see

Door closed at: ZA see

Primary air: At test setting - No adjustments were made.

Notes:

Time	Notes
1029	Test start
1129	first hour sampling stopped (ENDED)
1629	

Technician Signature: RT Date: 02/27/2024

OMNI-Test Laboratories, Inc. **ASTM E2779 Pellet Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 1

Model: SC 25 Tracking Number: 2142 Date: 02/27/2024

Test Crew: R. Tiegs, T. Tong, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: ~~10:30~~ 10:29 K

Stop Time: 16:29

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Booth #: 1

PRE-TEST

Sample Train Leak Check:

A: 0.000 @ 17.12 "Hg

B: 0.000 @ 18.9 "Hg

A_1 0.000 @ 23.5 "Hg

POST-TEST

A_1 0.000 @ 23.61 "Hg

A 0.000 @ 17.16 "Hg

B 0.000 @ 17.82 "Hg

Calibrations: Span Gas CO_2: 16.84 % CO: 4.38 %

CO: 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	8:43	8:44	1634	1636
CO_2	0.00	16.83	0.01	16.76
CO	0.00	4.39	0	4.35

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

Scale Audit (lbs): Initial: 20.0 Final: 20.0

Pitot Tube Leak Test: Initial: ✓ Final: ✓

Stack Diameter (in): 6

Induced Draft: Norm

% Smoke Capture: 100%

Flue Pipe Cleaned Prior to First Test in Series:

Date: 02/26/24 Initials: RD

	Initial	Middle	Ending
P_b (in/Hg)	30.17		30.10
RH (%)	42		40
Ambient (°F)	69		68

Tunnel Traverse			
	Microtector Reading	dP (in H_2O)	T(°F)
1	.033	.066	61
2	.047	.094	61
3	.050	.100	61
4	.037	.074	61
5	.035	.070	61
6	.050	.100	61
7	.044	.088	61
8	.024	.048	61
Center:			
	.060	0.120	61

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
−0.4	−0.4

Background Filter Volume: ~~57.709~~ K 57.703

Technician Signature: K. Morgan

Date: 2/27/24

OMNI-Test Laboratories, Inc. **ASTM E2779 Pellet Heater Run Sheets**

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 1

Model: SC 25 Tracking Number: 2142 Date: 02/27/2024

Test Crew: R. TIEGS, 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

Cal Value (2) = 22% Actual Reading 22

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	17 in	23.3	7	12 in	20.0
2	17 in	19.2	8	12 in	25.3
3	17 in	20.4	9	in	
4	17 in	23.7	10	in	
5	12 in	24.6	11	in	
6	12 in	25.5	12	in	

Total Pre-Burn Fuel Weight: 12.1 Pre-Burn Fuel Average Moisture: 22.44 % db

Time (clock): 0830 Room Temperature (F): 61 Initials: RT

Test Fuel

Firebox Volume (ft³): 2.159 Test Fuel Piece Length (in): 18", 17.75"

Load Weight Range (lb): 13.6 - 16.6 Total Wet Fuel Load Weight (lb): 15.8

Fuel Type & Amount: 2 x 4: 3 4 x 4: 2

Weight (with spacers): 7.0 Weight (with spacers): 8.8

Piece:	Weight (lbs):	Moisture Readings (%DB):				Fuel Type:
1	2.3 / 2.1	22.1	22.4	24.3		2x4 18"
2	2.5 / 2.0	20.6	20.2	19.6		2x4 17.75"
3	2.2 / 1.6	21.2	19.1	21.3		2x4 ~~17.75"~~ 18.0"
4	4.1 / 3.8	22.4	22.1	20.1		4x4 17.75"
5	4.8 / 4.5	25.6	22.6	21.2		4x4 18"
6						
7						

Spacer Moisture Readings (%DB)

21.5	21.8	12.2	22.3				
20.5	24.0	16.1	14.9				
14.2	18.2	18.4	~~18.4~~ RT				
10.6	18.3	24.5	~~18~~ RT				

Time (clock): 0943 Room Temperature (F): 63 Initials: RT

Technician Signature: Date: 2/27/24

0.98 @ 0.22 l/min

OMNI-Test Laboratories, Inc.

ASTM E2779 Pellet Heater Run Sheets

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 1

Model: SC 25 Tracking Number: 2142 Date: 02/27/2024

Test Crew: T. Tong, R. Tieys, K. Morgan

OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: Tony Tong

Date/Time in Dessicator: 02/27/24 16:50

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	02/28/24	02/29/24			
R/H %:	11.5	11.8			
Temp:	71.3	70.5			
200 mg Audit:	200.1	200.1			
2 g Audit:	2000.1	2000.2			
100 g Audit:	99997.8	99997.8			
Initials:	RT	ET			

Filters are in PAIRS

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	
A (First Hour)	Front Filter	F167/A	246.7	246.9	246.9				K
	Rear Filter								
	Probe	22	114340.0	114340.0	114340.0				K
	O-Ring Set	S644	3387.5	3387.5	3387.5				K
A	Front Filter	F168/A	247.2	248.0	248.1				K
	Rear Filter								
	Probe	38	114149.3	114149.3	114149.4				K
	O-Ring Set	S654	3455.6	3455.6	3455.6				K
B	Front Filter	F169/A	246.8	248.0	247.8				K
	Rear Filter								
	Probe	78	117460.6	117460.6	117460.6				K
	O-Ring Set	S656	3464.0 3464.0	3464.0	3464.0				K
BG	Filter	F22/	125.2	125.2	125.2				K

Technician Signature: K. Morgan Date: 2/29/24

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	1

Sample calculations of each equation used in the referenced 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	18.37	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	1.8	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 moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.416	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	14.95	Traverse Worksheet
θ	- Duration of test, min	360	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	30.14	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

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

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	57.928	57.705	9.616	57.703
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	0.98	2.23	1.71
T_m	- Temperature of Dry Gas Meter, °F	76.7	76.5	63.2	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.1	0.0	0.0	n/a
m_f	- mass of particulate matter from filters, mg	0.9	1.0	0.2	0.0
m_g	- mass of particulate matter from filter seals, mg	0.0	0.0	0.0	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.1	0.0	0.0	n/a
m_f	- mass of particulate matter from filters, mg	0.9	1.0	0.2	n/a
m_g	- mass of particulate matter from filter seals, mg	0.0	0.0	0.0	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 = 18.37 %, dry basis
M_{Swb} = 1.8 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((1.8 x 0.4536) (100 / (100 + 18.37))

M_{Sdb} = **0.690** 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} = 14 lb.
FM_{CPn} = 21.65 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 14 x 0.4536 x (100 / (100 + 21.6533333333333))

M_{Cdb} = **5.22** 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} = 11.51 lb
V_C = 0.416 ft^3

D_{Cdb} = 11.51 / 0.416

D_{Cdb} = **27.67** 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} = 0.690
M_{Cdb} = 5.22

M_{FTAdb} = 0.69 + 5.22

M_{FTAdb} = **5.91** kg

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

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

Sample Calculation:

M_{FTAdb} = 5.910
θ = 360

BR = (60 x 5.91) / 360

BR = **0.98** 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 = 0.8113

$\Delta P^{1/2}_{AVG}$ = 0.3472

$T_{S\,(avg)}$ = 540.0416

Pbar = 30.1350

Pg = -0.4000

Ps = 30.1056

V_S = 0.811 x 85.49 x 0.99 x 0.347 x √ [(540 / (30.11 x 28.78)]

V_S = **18.822** ft/sec

(First Hour of Test)

F_P = 0.8113

$\Delta P^{1/2}_{AVG}$ = 0.3490

$T_{S\,(avg)}$ = 538.8689

Pbar = 30.1700

Pg = -0.4000

Ps = 30.1406

V_S = 0.811 x 85.49 x 0.99 x 0.349 x √ [(539 / (30.14 x 28.78)]

V_S = **18.890** 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 = 30.11
$T_{s(avg)}$ = 540
Vs = 18.82

Qstd = 3600 x (1 - 0.02) x 18.822 x 0.19635 x (528 / 540) x (30.11 / 29.92)

Qstd = **12826.8** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 30.14
$T_{s(avg)}$ = 539
Vs = 18.890

Qstd = 3600 x (1 - 0.02) x 18.89 x 0.1963 x (528 / 539) x (30.14 / 29.92)

Qstd = **12916.0** 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

$$V_{m(std)} = 17.64 \times 57.928 \times 1.016 \times \frac{(30.14 + \frac{1.28}{13.6})}{(76.7 + 460)}$$

$V_{m(std)}$ = **58.475** dscf

Train B

$$V_{m(std)} = 17.64 \times 57.705 \times 1.011 \times \frac{(30.14 + \frac{0.98}{13.6})}{(76 + 460)}$$

$V_{m(std)}$ = **57.948** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.62 \times 1.015 \times \frac{(\underline{30.17} + \frac{2.23}{13.6})}{(63.2 + 460)}$$

$V_{m(std)}$ = **9.981** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 57.70 \times 1.011 \times \frac{(\underline{30.14} + \frac{1.71}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **57.775** 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 = 0.1 + 0.9 + 0.0

m_n = **1.0** mg

Train B

m_n = 0.0 + 1.0 + 0.0

m_n = **1.0** mg

Train C (1st hour)

m_n = 0.0 + 0.2 + 0

m_n = **0.2** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 0.1 + 0.9 + 0.0

m_n = **1.0** mg

Train B

m_n = 0.0 + 1.0 + 0.0

m_n = **1.0** mg

Train C (1st hour)

m_n = 0.0 + 0.2 + 0

m_n = **0.2** 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

$$C_s = 0.001 \times \frac{1.0}{58.48}$$

C_s = **0.000017** g/dscf

Train B

$$C_s = 0.001 \times \frac{1.0}{57.95}$$

C_s = **0.0000173** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.2}{9.98}$$

Cs = **0.000020** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{57.78}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{1.0}{58.48}$$

C_s = **0.000017** g/dscf

Train B

$$C_s = 0.001 \times \frac{1.0}{57.95}$$

C_s = **0.0000173** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.2}{9.98}$$

Cs = **0.000020** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{57.78}$$

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 = (0.000017 - 0.000000) x 12826.8 x 360 / 60

E_T = **1.32** g

Train B

E_T = (0.000017 - 0.000000) x 12826.8 x 360 / 60

E_T = **1.33** g

First Hour

E_T = (0.000020 - 0.000000) x 12916.0 x 60 / 60

E_T = 0.26 g

Trains A and B Average

E = **1.32** g

Sample calculations (Corrected)

Train A

E_T = (0.000017 - 0.000000) x 12826.8 x 360 / 60

E_T = **1.32** g

Train B

E_T = (0.000017 - 0.000000) x 12826.8 x 360 / 60

E_T = **1.33** g

First Hour

E_T = (0.000020 - 0.000000) x 12916.0 x 60 / 60

E_T = **0.26** g

Trains A and B Average

E_T = **1.32** 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 = 1.32 g

θ = 360 min

PM_R = 60 x (1.32 / 360)

PM_R = **0.22** g/hr

Train B

E_T = 1.33 g

θ = 360 min

PM_R = 60 x (1.33 / 360)

PM_R = **0.22** g/hr

A and B Average

E_T = **0.22** g/hr

First Hour

E_T = 0.26 g

θ = 60 min

PM_R = 60 x (0.26 / 60)

PM_R = **0.26** g/hr

Sample Calculation (Corrected)

Train A

E_T = 1.32 g

θ = 360 min

PM_R = 60 x (1.32 / 360)

PM_R = **0.22** g/hr

Train B

E_T = 1.33 g

θ = 360 min

PM_R = 60 x (1.33 / 360)

PM_R = **0.22** g/hr

A and B Average

E_T = **0.22** g

First Hour

E_T = 0.26 g

θ = 60 min

PM_R = 60 x (0.26 / 60)

PM_R = **0.26** 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 = 1.32 g
M_{FTAdb} = 5.91 kg
PM_F = 1.32 / 5.91
PM_F = **0.22** g/kg

Train B

E_T = 1.33 g
M_{FTAdb} = 5.91 kg
PM_F = 1.33 / 5.91
PM_F = **0.22** g/kg

Sample Calculation (Corrected)

Train A

E_T = 1.32 g
M_{FTAdb} = 5.91 kg
PM_F = 1.32 / 5.91
PM_F = **0.22** g/kg

Train B

E_T = 1.33 g
M_{FTAdb} = 5.91 kg
PM_F = 1.33 / 5.91
PM_F = **0.22** 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	360	360	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	0.161
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	57.928	57.705	9.616
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	19.271	19.271	19.271
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	18.823	18.823	18.907
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	527.0	528.0	522.0
T_m	=	Absolute average dry gas meter temperature, ^oR	536.7	536.5	523.2
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	560.0	560.0	560.0
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	540.0	540.0	538.9

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

Train A PR = $\left(\frac{360 \text{ x } 0.16 \text{ x } 18.823 \text{ x } 537 \text{ x } 560}{1 \text{ x } 57.928 \text{ x } 19.271 \text{ x } 527 \text{ x } 540}\right)$ X 100 = 102.6 %

Train B PR = $\left(\frac{360 \text{ x } 0.159 \text{ x } 18.823 \text{ x } 536 \text{ x } 560}{1 \text{ x } 57.705 \text{ x } 19.271 \text{ x } 528 \text{ x } 540}\right)$ X 100 = 102.1 %

Train B PR = $\left(\frac{60 \text{ x } 0.161 \text{ x } 18.907 \text{ x } 523 \text{ x } 560}{1 \text{ x } 9.616 \text{ x } 19.271 \text{ x } 522 \text{ x } 539}\right)$ X 100 = 102.7 %

Run 2 Test Data

Test Date:	2/28/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	SC 25

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Project No.: 0142WN020E
Tracking No.: 2142
Run: 2
Test Date: 02/28/24

Burn-Rate Result

0.87 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	1.07	1.07	0.39	0.39
Emission Rate, g/hr	**0.16**	0.16	**0.39**	0.39
Emissions Factor, g/kg	0.18	0.18	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		83.1	83.4
Average Tunnel Gas Velocity (vs), feet/second		18.934	18.892
Average Tunnel Gas Flow Rate(Qsd)	DSCF/hr	12700.1	12623.4
	DSCF/min	211.7	210.4
Average Delta p, in. H2O		0.118	0.117
Tunnel Static Pressure, in. H2O		0.000	0.000
Total Time of Test, Min		60	409

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	65.909	65.784	65.607	9.585	65.909	65.784	65.607	9.585
Average Gas Meter Temperature, °F	79	81	81	69	79	81	81	69
Total Sample Volume (V_{mstd}), DSCF	65.426	64.881	64.111	9.678	65.426	64.881	64.111	9.678
Total Particulates (mn), mg - m_n	0.0	0.6	1.0	0.3	0.0	0.6	1.0	0.3
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00001	0.00002	0.00003	0.00000	0.00001	0.00002	0.00003
Total Particulate Emissions (ET), grams	n/a	0.80	1.34	0.39	n/a	0.80	1.34	0.39
Particulate Emission Rate, g/hr	n/a	0.12	0.20	0.39	n/a	0.12	0.20	0.39
Emissions Factor, g/kg	n/a	0.13	0.23	n/a	n/a	0.13	0.23	n/a
Difference, ET from Average ET, grams	n/a	-0.27	0.27	n/a	n/a	-0.27	0.27	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	72	✓
Filter Face Velocity, fpm	< 30	8.84	8.84	8.73	✓
Dryer Exit Temperature, °F	< 80	64	51	52	✓
Tunnel Velocity, fpm	>800	1,136	1,133		✓
First Hour Leakage	0.006	0.000			✓
Train A Leakage Rate	0.006		0.001		✓
Train B Leakage Rate	0.006			0.001	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.1	0.1	0.1	✓
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		70		✓
Ambient Temp, °F	< 90		72		✓
Trains A and B Precision	(*A*) < 7.5%		25.56%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.09		✓
Stove Surface ΔT	<= 125 °F		4		✓
Room Air Velocity	< 50 fpm		16		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	2
Test Date:	2/28/2024

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: SC 25
Date: 02/28/24
Run: 2
Control #: 2142
Test Duration: 409
Output Category: II

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	81.4%	88.0%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	82%	88.4%

Output Rate (kJ/h)	13,972	13,254	**(Btu/h)**
Burn Rate (kg/h)	0.87	1.91	**(lb/h)**
Input (kJ/h)	17,160	16,278	**(Btu/h)**

Test Load Weight (dry kg)	5.90	13.01	**dry lb**
MC wet (%)	17.63		
MC dry (%)	21.40		
Particulate (g)	1.07		
CO (g)	19		
Test Duration (h)	6.82		

Emissions	**Particulate**	**CO**
g/MJ Output	0.01	0.20
g/kg Dry Fuel	0.18	3.23
g/h	0.16	2.80
lb/MM Btu Output	0.03	0.47

Air/Fuel Ratio (A/F)	12.87

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

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	SC 25				
Date:	2/28/2024		**Temp. Units**	F	(F or C)
Run:	2		**Weight Units**	lb	(kg or lb)
Control #:	2142				
Test Duration:	409				
Output Category:	II		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.63		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	15.80		**%C**	48.73	
Burn Rate (dry kg/h):	0.87		**%H**	6.87	
Total Particulate Emissions:	1.07 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.01**	**8.59**	**#DIV/0!**	**235.07**	**71.43**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	15.80	0.23	0.65		229.0	71.0
1	15.70	0.25	0.46		224.0	71.0
2	15.70	0.22	3.09		206.0	71.0
3	15.70	0.00	3.66		198.0	71.0
4	15.70	0.00	3.60		196.0	71.0
5	15.60	0.00	3.71		195.0	71.0
6	15.60	0.00	3.81		196.0	71.0
7	15.60	0.00	4.00		196.0	71.0
8	15.60	0.00	4.29		196.0	71.0
9	15.50	0.00	4.77		197.0	71.0
10	15.50	0.00	5.14		198.0	70.0
11	15.50	0.00	5.58		199.0	70.0
12	15.40	0.00	6.05		203.0	70.0
13	15.40	0.00	6.30		204.0	70.0
14	15.30	0.00	6.57		207.0	70.0
15	15.30	0.00	6.79		209.0	70.0
16	15.30	0.00	6.73		212.0	70.0
17	15.20	0.00	6.93		213.0	70.0
18	15.20	0.00	7.37		217.0	70.0
19	15.10	0.00	8.75		221.0	70.0
20	15.00	0.00	8.28		224.0	70.0
21	15.00	0.00	7.99		227.0	70.0
22	14.90	0.00	8.04		230.0	70.0
23	14.90	0.00	7.72		231.0	70.0
24	14.80	0.00	7.65		232.0	70.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	14.80	0.00	7.75		233.0	70.0
26	14.70	0.00	8.04		234.0	70.0
27	14.70	0.00	8.21		235.0	70.0
28	14.60	0.00	8.43		236.0	70.0
29	14.50	0.00	8.69		238.0	70.0
30	14.50	0.00	8.91		239.0	70.0
31	14.40	0.00	8.76		241.0	70.0
32	14.30	0.00	8.82		242.0	70.0
33	14.30	0.00	8.67		242.0	70.0
34	14.20	0.00	8.63		245.0	70.0
35	14.10	0.00	9.31		247.0	70.0
36	14.10	0.00	9.63		248.0	70.0
37	14.00	0.00	9.67		250.0	70.0
38	13.90	0.00	9.59		251.0	70.0
39	13.90	0.00	9.55		253.0	70.0
40	13.80	0.00	9.45		254.0	70.0
41	13.80	0.00	9.38		254.0	70.0
42	13.70	0.00	9.34		254.0	70.0
43	13.60	0.00	9.37		254.0	70.0
44	13.60	0.00	9.38		253.0	70.0
45	13.50	0.00	9.36		253.0	71.0
46	13.40	0.00	9.36		253.0	71.0
47	13.40	0.00	9.35		252.0	71.0
48	13.30	0.00	9.39		252.0	71.0
49	13.30	0	9.49		252	71
50	13.20	0	9.45		252	71
51	13.10	0	9.39		253	71
52	13.10	0	9.41		254	71
53	13.00	0	9.48		253	71
54	12.90	0	9.65		254	71
55	12.90	0	9.87		255	71
56	12.80	0	9.73		255	71
57	12.70	0	9.69		255	71
58	12.70	0.00022	10.13		255	71
59	12.60	0.00035	10.28		255	71
60	12.50	0	9.73		254	71
61	12.50	0	9.81		254	71
62	12.40	0	9.97		253	71
63	12.40	0	9.79		252	71
64	12.30	0	9.71		252	71
65	12.20	0	9.66		251	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	12.20	0	9.55		250	71
67	12.10	0.00022	9.46		249	71
68	12.10	0.00022	9.49		248	71
69	12.00	0.00026	9.49		249	71
70	12.00	0.00026	9.45		249	71
71	11.90	0.00042	9.44		248	71
72	11.90	0.00058	9.47		248	71
73	11.80	0.00084	9.47		248	71
74	11.70	0.00097	9.56		248	71
75	11.70	0.00107	9.38		248	71
76	11.70	0.00132	9.45		249	71
77	11.60	0.00168	9.49		249	71
78	11.50	0.00197	9.52		250	71
79	11.50	0.00268	9.7		250	71
80	11.40	0.00298	9.82		251	71
81	11.40	0.00282	9.82		251	71
82	11.30	0.00518	10.07		252	71
83	11.30	0.00304	10.16		253	71
84	11.20	0.0043	10.36		254	71
85	11.20	0.00809	10.22		254	71
86	11.10	0.00569	10.22		255	71
87	11.00	0.00754	10.37		256	71
88	11.00	0.00556	10.35		257	71
89	10.90	0.00482	10.33		258	71
90	10.90	0.00484	10.33		259	71
91	10.80	0.00515	10.37		260	71
92	10.70	0.00372	10.26		260	71
93	10.70	0.00317	10.1		259	71
94	10.60	0.00262	9.87		259	71
95	10.60	0.0023	9.79		259	71
96	10.50	0.0021	9.62		258	71
97	10.50	0.00181	9.47		257	71
98	10.40	0.0011	9.27		256	71
99	10.40	0.00132	9.24		254	71
100	10.30	0.0012	9.2		253	71
101	10.30	0.0011	9.06		251	71
102	10.30	0.0009	8.99		250	71
103	10.20	0.00094	8.87		249	71
104	10.20	0.0012	8.86		248	72
105	10.10	0.00175	8.98		247	72
106	10.10	0.00181	8.98		246	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	10.00	0.002	9.02		246	72
108	10.00	0.00204	9.08		246	72
109	9.90	0.00226	9.12		245	72
110	9.90	0.00246	9.23		246	72
111	9.90	0.00288	9.31		245	72
112	9.80	0.00372	9.4		246	72
113	9.80	0.00388	9.49		245	72
114	9.70	0.00414	9.61		246	71
115	9.70	0.0045	9.64		246	71
116	9.60	0.00262	9.37		246	72
117	9.60	0.00262	9.34		246	72
118	9.50	0.00259	9.28		247	72
119	9.50	0.00246	9.4		247	72
120	9.40	0.00385	9.43		246	71
121	9.40	0.00236	9.41		246	71
122	9.30	0.00194	9.4		246	72
123	9.30	0.00178	9.35		246	72
124	9.20	0.00171	9.41		245	72
125	9.20	0.00175	9.53		245	72
126	9.10	0.0022	9.56		245	72
127	9.10	0.00207	9.47		245	72
128	9.00	0.00239	9.56		245	72
129	9.00	0.00304	9.66		245	72
130	9.00	0.00388	9.68		245	71
131	8.90	0.00443	9.62		245	72
132	8.90	0.00508	9.64		246	72
133	8.80	0.00747	9.78		246	72
134	8.80	0.00803	9.86		247	72
135	8.70	0.00881	9.75		247	72
136	8.70	0.00748	9.77		248	72
137	8.60	0.00583	9.7		249	72
138	8.60	0.00625	9.82		249	71
139	8.50	0.00417	9.71		248	71
140	8.50	0.00278	9.66		249	71
141	8.40	0.00269	9.63		248	72
142	8.40	0.00213	9.65		248	72
143	8.30	0.00188	9.5		247	72
144	8.30	0.00188	9.55		248	72
145	8.20	0.00217	9.56		247	72
146	8.20	0.0021	9.82		248	72
147	8.20	0.0021	10		248	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	8.10	0.00204	9.94		247	72
149	8.10	0.00204	9.96		248	72
150	8.00	0.00191	9.97		248	72
151	8.00	0.00197	9.97		248	72
152	7.90	0.00175	9.89		248	72
153	7.90	0.00194	9.93		248	71
154	7.80	0.00197	9.98		248	72
155	7.80	0.00162	10.01		248	71
156	7.70	0.00142	10		249	72
157	7.70	0.00129	9.97		249	72
158	7.60	0.00126	10.02		250	72
159	7.60	0.001	9.97		250	72
160	7.50	0.00129	10.02		250	72
161	7.50	0.00123	9.95		250	72
162	7.40	0.00129	10.04		251	72
163	7.40	0.00103	10		252	72
164	7.40	0.00107	10.05		252	72
165	7.30	0.00103	10.03		251	72
166	7.30	0.00116	10.13		252	72
167	7.20	0.00139	10.14		252	72
168	7.20	0.001	10.14		252	72
169	7.10	0.001	10.16		252	72
170	7.10	0.00084	10.12		251	72
171	7.00	0.00074	10.04		251	72
172	7.00	0.00078	10.05		251	72
173	6.90	0.00061	10.1		250	72
174	6.90	0.00051	10.02		251	72
175	6.80	0.00064	9.94		251	72
176	6.80	0.00148	10.08		250	72
177	6.70	0.00155	10.22		250	72
178	6.70	0.00161	10.36		251	72
179	6.70	0.00162	10.45		251	72
180	6.60	0.00078	10.61		251	72
181	6.60	0.00107	10.74		251	72
182	6.50	0.00078	10.79		251	72
183	6.50	0.00223	10.9		251	72
184	6.40	0.00226	11.05		251	72
185	6.30	0.00395	11.02		251	72
186	6.30	0.00349	11.06		252	72
187	6.30	0.00161	10.82		253	72
188	6.20	0.0023	10.89		253	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	6.10	0.00974	11.12		253	72
190	6.10	0.05	10.71		255	72
191	6.10	0.00411	10.5		255	72
192	6.00	0.00113	10.27		255	72
193	6.00	0.00064	10.13		254	72
194	5.90	0.00058	10.06		254	72
195	5.90	0.00042	9.97		254	72
196	5.80	0.00045	9.95		253	72
197	5.80	0.00068	9.91		253	72
198	5.70	0.00068	9.9		251	72
199	5.70	0.00045	9.95		251	72
200	5.60	0.00136	10.03		251	72
201	5.60	0.00087	9.92		250	72
202	5.50	0.00071	9.92		250	72
203	5.50	0.00091	10.01		250	72
204	5.50	0.00113	9.98		250	72
205	5.40	0.00142	9.96		249	71
206	5.40	0.00223	10.01		249	71
207	5.30	0.00074	10.03		249	71
208	5.30	0.00042	9.98		248	71
209	5.20	0.001	10.13		248	71
210	5.20	0	9.78		251	71
211	5.10	0.43	12.06		253	71
212	5.00	0.4	11.58		256	72
213	5.00	0.06	11.06		256	71
214	4.90	0.04	11.1		257	72
215	4.90	0.00997	10.56		256	72
216	4.80	0	10.31		256	72
217	4.80	0	10.13		255	71
218	4.80	0	9.99		254	72
219	4.70	0	9.91		251	72
220	4.70	0	9.82		250	72
221	4.60	0	9.71		249	72
222	4.60	0	9.67		248	72
223	4.60	0	9.54		246	72
224	4.50	0	9.54		245	72
225	4.50	0	9.52		244	72
226	4.40	0	9.39		242	72
227	4.40	0	9.32		241	72
228	4.40	0	9.3		240	72
229	4.30	0	9.3		239	72

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	9.13		237	72
231	4.30	0	9.19		237	72
232	4.20	0	9.01		235	72
233	4.20	0	8.97		234	72
234	4.20	0	8.78		233	72
235	4.20	0	8.65		231	72
236	4.10	0	8.51		230	72
237	4.10	0	8.47		229	72
238	4.10	0	8.4		228	72
239	4.10	0	8.4		227	72
240	4.00	0	8.35		226	72
241	4.00	0	8.29		226	72
242	4.00	0	8.21		224	72
243	4.00	0	8.21		222	72
244	3.90	0	8.13		220	72
245	3.90	0	8.04		220	72
246	3.90	0	8.05		218	72
247	3.90	0	7.97		216	72
248	3.90	0	7.9		215	72
249	3.80	0	7.8		215	72
250	3.80	0	7.73		214	72
251	3.80	0	7.67		213	72
252	3.80	0	7.7		212	72
253	3.80	0	7.62		212	72
254	3.70	0	7.57		211	72
255	3.70	0	7.53		210	72
256	3.70	0	7.45		209	72
257	3.70	0	7.47		208	72
258	3.70	0	7.39		208	72
259	3.70	0	7.93		207	72
260	3.60	0	7.98		206	72
261	3.60	0	7.93		205	72
262	3.60	0	7.87		204	72
263	3.60	0	7.88		203	72
264	3.60	0	7.86		202	72
265	3.50	0	7.75		202	72
266	3.50	0	7.67		202	72
267	3.50	0	7.64		202	72
268	3.50	0	7.67		202	72
269	3.50	0.00003	7.63		201	72
270	3.40	0	7.66		200	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	3.40	0.00013	7.63		200	72
272	3.40	0.00026	7.65		200	72
273	3.40	0	7.5		199	72
274	3.40	0	7.42		199	72
275	3.40	0	7.39		198	72
276	3.30	0	7.29		198	72
277	3.30	0	7.33		198	72
278	3.30	0	7.34		198	72
279	3.30	0	7.26		197	72
280	3.30	0	7.23		197	72
281	3.30	0	7.23		197	72
282	3.20	0	7.19		196	72
283	3.20	0	7.17		196	72
284	3.20	0	7.1		195	72
285	3.20	0	7.11		195	72
286	3.20	0	7.1		194	72
287	3.20	0	7.09		194	72
288	3.10	0	7.14		194	72
289	3.10	0	7.13		194	72
290	3.10	0	7.08		194	72
291	3.10	0	7.07		194	72
292	3.10	0	7.01		194	72
293	3.00	0	7		194	72
294	3.00	0	6.91		194	72
295	3.00	0	6.94		195	72
296	3.00	0	6.9		195	72
297	3.00	0	6.9		195	72
298	3.00	0.00003	6.95		194	72
299	2.90	0	6.97		194	72
300	2.90	0	6.95		194	72
301	2.90	0.00035	6.95		194	72
302	2.90	0.00068	7		195	72
303	2.90	0.00035	6.6		194	72
304	2.90	0.00052	6.51		196	72
305	2.80	0.00126	6.58		196	72
306	2.80	0.00142	6.56		197	72
307	2.80	0.00155	6.56		197	71
308	2.80	0.00168	6.53		197	72
309	2.80	0.00152	6.46		198	72
310	2.80	0.00145	6.46		198	71
311	2.70	0.00178	6.49		198	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	2.70	0.00162	6.55		198	72
313	2.70	0.00181	6.6		200	72
314	2.70	0.00185	6.6		200	72
315	2.70	0.00204	6.65		202	72
316	2.60	0.002	6.62		202	72
317	2.60	0.002	6.58		203	71
318	2.60	0.0022	6.65		202	71
319	2.60	0.00249	6.66		204	71
320	2.50	0.00236	6.77		205	71
321	2.50	0.00242	6.77		206	71
322	2.50	0.00252	6.81		206	70
323	2.50	0.00223	6.75		207	70
324	2.50	0.00207	6.82		207	70
325	2.40	0.00239	6.82		208	70
326	2.40	0.00239	6.93		208	70
327	2.40	0.00214	6.87		209	70
328	2.40	0.00204	6.67		210	70
329	2.40	0.00207	6.62		209	70
330	2.30	0.00204	6.58		210	70
331	2.30	0.00197	6.55		210	70
332	2.30	0.00204	6.52		210	70
333	2.30	0.00207	6.58		211	71
334	2.30	0.00217	6.44		210	71
335	2.20	0.00191	6.26		211	71
336	2.20	0.00213	6.36		211	71
337	2.20	0.0023	6.36		211	71
338	2.20	0.00217	6.41		212	71
339	2.10	0.0023	6.5		212	71
340	2.10	0.00236	6.57		212	71
341	2.10	0.00255	6.66		213	71
342	2.10	0.00259	6.8		214	71
343	2.10	0.00269	6.84		214	71
344	2.00	0.00285	7.01		216	71
345	2.00	0.00295	7.01		217	71
346	2.00	0.00307	7.08		218	71
347	2.00	0.0034	7.15		219	71
348	1.90	0.00359	7.23		219	71
349	1.90	0.00389	7.36		220	71
350	1.90	0.00427	7.49		222	71
351	1.90	0.00417	7.53		223	71
352	1.80	0.0044	7.62		225	71

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	1.80	0.00447	7.62		226	71
354	1.80	0.00463	7.77		228	71
355	1.70	0.00511	7.93		230	71
356	1.70	0.00534	8.01		231	71
357	1.70	0.00583	7.99		232	71
358	1.70	0.00647	8.16		234	71
359	1.60	0.007	8.32		235	71
360	1.60	0.00719	8.66		236	71
361	1.60	0.00725	8.78		237	71
362	1.50	0.00738	8.92		238	71
363	1.50	0.00748	8.99		241	71
364	1.50	0.00761	9.03		242	71
365	1.40	0.00744	9.12		244	71
366	1.40	0.00754	9.16		246	71
367	1.40	0.0078	9.23		248	71
368	1.30	0.00751	9.19		249	72
369	1.30	0.00757	9.21		250	71
370	1.20	0.00735	9.29		252	71
371	1.20	0.00715	9.22		253	71
372	1.20	0.00712	9.27		254	71
373	1.10	0.00693	9.29		255	71
374	1.10	0.0068	9.3		256	72
375	1.10	0.0067	9.24		256	72
376	1.00	0.0068	9.17		257	71
377	1.00	0.00657	9.19		257	72
378	1.00	0.00638	9.08		258	72
379	0.90	0.00618	9		259	72
380	0.90	0.00635	8.93		259	72
381	0.90	0.00599	8.91		259	72
382	0.80	0.00524	8.71		259	72
383	0.80	0.00508	8.58		260	72
384	0.80	0.00453	8.4		260	72
385	0.70	0.0044	8.26		259	72
386	0.70	0.00434	8.28		259	72
387	0.70	0.00583	8.3		258	72
388	0.70	0.00566	8.4		259	72
389	0.60	0.0056	8.36		259	72
390	0.60	0.00544	8.35		259	72
391	0.60	0.00537	8.28		259	72
392	0.50	0.00537	8.3		260	72
393	0.50	0.00515	8.25		261	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
394	0.50	0.00499	8.23		261	72
395	0.50	0.00489	8.23		261	72
396	0.40	0.00482	8.23		261	72
397	0.40	0.00479	8.26		261	72
398	0.40	0.0045	8.25		261	71
399	0.30	0.00453	8.18		261	72
400	0.30	0.00437	8.18		260	72
401	0.30	0.00414	8.11		261	72
402	0.30	0.00408	8.04		260	72
403	0.20	0.00379	8.07		259	72
404	0.20	0.00369	8.03		259	72
405	0.20	0.00365	8.03		259	72
406	0.20	0.00359	8.14		258	71
407	0.10	0.00349	8.01		258	71
408	0.10	0.00323	7.95		258	71
409	0.00	0.00317	7.93		257	71

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : SC 25
Tracking No. : 2142
Project No. : 0142WN020E
Test Date : 2/28/2024
Run No. : 2

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.159** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 15.113 lb.
Minimum Fuel Weight : 13.60 lb.
Maximum Fuel Weight : 16.62 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	17.75	20.6	19.5	19.5	19.9	1.50	0.0539		1.8		1.50
2	1.90	2x4	18.00	22.4	19.5	21.9	21.3	1.57	0.0547		1.9		1.57
3	1.80	2x4	18.00	20.8	20.5	21.6	21.0	1.49	0.0547		1.8		1.49
4	4.20	4x4	17.75	21.9	20.6	23.8	22.1	3.44	0.1258	4.2		3.44	
5	4.50	4x4	18.00	19.7	24.2	20.5	21.5	3.70	0.1276	4.5		3.70	
6													
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
23.8	24.3	18.4	17.7	24.4	21.9	23.3	24.6	
22.8	24.7	18.7	19.0	23.8	22.5			

Avg : 22.1

Assembled Crib Fuel Load with Spacers Attatched

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.20	2x4		2.2000
2	2.30	2x4		2.3000
3	2.00	2x4		2.0000
4	4.50	4x4	4.50	
5	4.80	4x4	4.80	
6				
7				
8				
9				

Combined Mass of 4 x 4s 9.3 lb
Combined Mass of 2 x 4s 6.5 lb

Total Wet Mass of Fuel Load **15.8** 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	3	5.5	4.56	7.32	6.03	28.08	34.07	21.44	17.65
4 x 4	2	8.7	7.14						
Spacers	14	1.6	1.31						
Totals		15.8	13.01						

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	15.8	7.32	28.08	41	21.1
Required	13.6 - 16.6	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.:	2142
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WN020E
Model:	SC 25	Test Date:	2/28/2024

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 *	0.080	108	0.283
X2	25.0	0.00	0.096	108	0.310
X3	75.0	0.00	0.096	107	0.310
X4	93.3	-0.5 *	0.052	107	0.228
Y1	6.7	0.5 *	0.062	107	0.249
Y2	25.0	0.00	0.092	107	0.303
Y3	75.0	0.00	0.082	107	0.286
Y4	93.3	-0.5 *	0.048	107	0.219
Center	50.0	0.00	0.112	108	0.335

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	29.8005882	in HG

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

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 18.8278$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 23.0503$$

$$F_P = V_{strav} / V_{scent} = 0.817$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 15.379\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	11:18	18:07
Barometric Pressure, in. Hg	29.83	29.63
Room Air Velocity, fpm	11	16
Room Air Temperature, °F	71	71
Room Relative Humidity, %	41.0	39.0
Platform Scale Audit, lb.	10.0	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	2/26/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O		

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: SC 25
Tracking No.: 2142
Project No.: 0142WN020E
Test Date: 2/28/24
Beginning Clock Time: _____

Coal Bed Range (lb):	3.2 (min)	4.0 (max)

Preburn Fuel Data

4 pieces @ 12 inches
4 pieces @ 17 inches
_____ pieces @ _____ inches

Fuel Moisture Readings (% DB):

19.2	22.7					
23.4	22.8					
20.5	23.1					
22						
23.2						

Avg Preburn Moisture (% DB): **22.11**

			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	6	-0.075	699	204	207	499	480	1003	418	460	75
1	5.9	-0.07	700	201	209	499	476	971	417	389	75
2	5.8	-0.068	698	200	211	495	470	944	415	351	75
3	5.7	-0.065	696	201	213	491	465	931	413	328	75
4	5.6	-0.065	692	204	215	488	460	924	412	312	75
5	5.6	-0.063	689	206	217	485	455	921	410	300	75
6	5.5	-0.061	686	207	218	483	452	915	409	291	75
7	5.4	-0.06	683	209	219	480	448	907	408	283	75
8	5.4	-0.06	680	210	220	477	444	903	406	277	75
9	5.3	-0.059	677	211	220	474	441	907	405	276	75
10	5.3	-0.059	675	213	221	469	437	926	403	271	75
11	5.2	-0.059	675	217	221	463	433	962	402	268	75
12	5.1	-0.058	678	220	222	458	429	978	401	268	74
13	5.1	-0.058	680	222	222	452	426	983	400	266	74
14	5	-0.056	682	222	221	447	422	982	399	263	74
15	5	-0.055	683	223	221	442	418	978	397	260	74
16	5	-0.054	682	224	221	437	415	971	396	256	74
17	5	-0.053	680	224	221	432	412	963	394	254	74
18	4.9	-0.053	678	224	221	427	409	956	392	251	74
19	4.9	-0.052	674	224	220	422	406	949	389	249	73
20	4.9	-0.052	670	224	220	418	403	943	387	247	73
21	4.8	-0.052	666	224	220	414	401	936	385	245	73
22	4.8	-0.051	661	224	219	410	399	931	383	243	73
23	4.8	-0.05	656	224	219	407	397	927	381	241	73
24	4.8	-0.049	652	224	218	404	394	922	378	240	73
25	4.7	-0.05	647	224	218	400	392	916	376	236	73
26	4.7	-0.049	643	224	218	398	390	910	375	235	72
27	4.7	-0.049	638	224	218	395	388	902	373	234	73
28	4.7	-0.049	632	224	217	392	387	894	370	232	73
29	4.7	-0.048	627	224	217	389	385	886	368	230	72
30	4.6	-0.047	621	224	217	387	383	878	366	228	73
31	4.6	-0.047	615	224	217	384	382	870	364	226	73
32	4.6	-0.047	609	224	216	382	380	863	362	226	73
33	4.6	-0.046	603	224	216	379	378	856	360	224	72
34	4.6	-0.046	597	224	216	377	377	850	358	223	72
35	4.6	-0.046	591	231	215	375	375	845	357	222	73
36	4.5	-0.046	586	231	215	372	372	839	355	221	72
37	4.5	-0.045	581	231	215	369	370	834	353	220	72
38	4.5	-0.045	576	231	215	367	368	832	351	220	72
39	4.5	-0.045	572	231	215	365	367	830	350	219	72
40	4.4	-0.045	568	231	215	364	365	828	349	218	72
41	4.4	-0.045	564	231	214	363	364	822	347	218	72
42	4.4	-0.044	561	232	214	361	362	817	346	218	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	4.4	-0.045	557	232	214	360	361	811	345	216	72
44	4.4	-0.044	553	232	214	359	359	804	343	216	72
45	4.4	-0.044	549	232	213	357	358	799	342	215	72
46	4.4	-0.043	545	232	213	356	357	792	341	214	72
47	4.4	-0.043	541	233	212	355	355	787	339	213	71
48	7.5	-0.082	538	233	212	352	353	790	338	337	71
49	3.9	-0.046	531	219	212	351	352	712	333	288	72
50	3.9	-0.045	523	219	211	349	350	706	330	250	71
51	3.9	-0.045	515	219	211	347	349	705	328	232	71
52	3.9	-0.044	508	219	210	346	348	700	326	223	71
53	3.9	-0.044	501	219	210	344	346	693	324	217	71
54	3.9	-0.043	495	218	209	342	345	685	322	213	71
55	3.9	-0.043	489	218	209	341	344	678	320	210	71
56	3.4	-0.042	483	220	208	339	343	671	319	207	71
57	3.9	-0.042	478	220	208	338	341	665	317	205	71
58	3.8	-0.042	473	221	207	336	340	659	315	203	71
59	3.8	-0.041	467	219	207	335	339	655	313	200	71
60	3.8	-0.041	463	219	206	333	337	650	312	199	71
61	3.8	-0.04	458	218	206	332	336	646	310	197	71
62	3.8	-0.04	454	216	205	330	335	642	308	196	71
63	3.8	-0.04	451	215	205	329	333	639	307	194	71

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Test Date: 2/28/24

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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		8.3	**65.784**	**0.161**	**1.24**	**81.4**	**1.87**	**72.38**	**50.71**	**71.43**	**100.0**	**83.4**	**0.117**	**0.343**	**18.89**
Minimum	0.0	-7.4	0.000	0.156	0.56	73	1.82	68	43	70	98.2	80	0.114	0.338	18.67
Max	15.7	0.1	65.784	0.165	1.30	83	1.91	73	52	72	102.8	105	0.121	0.348	19.31
0	8.3		0.000		0.56	73	1.82	68	50	71		105	0.115	0.339	19.31
1	15.7	-7.4	0.156	0.156	1.30	73	1.89	69	44	71	100.4	104	0.119	0.345	19.22
2	15.7	0.0	0.318	0.162	1.29	73	1.89	70	43	71	102.8	87	0.119	0.345	19.22
3	15.7	0.0	0.479	0.161	1.29	73	1.88	70	43	71	100.9	84	0.118	0.344	19.01
4	15.7	0.0	0.639	0.160	1.28	73	1.88	70	43	71	100.8	83	0.116	0.341	18.86
5	15.6	0.1	0.800	0.161	1.27	73	1.88	70	43	71	101.9	82	0.117	0.342	18.80
6	15.6	0.0	0.962	0.162	1.27	73	1.87	70	43	71	102.4	82	0.118	0.344	18.87
7	15.6	0.0	1.122	0.160	1.27	73	1.87	70	43	71	100.8	81	0.117	0.342	18.86
8	15.6	0.0	1.282	0.160	1.26	73	1.87	70	43	71	100.6	81	0.120	0.346	18.93
9	15.5	0.1	1.442	0.160	1.27	74	1.87	70	43	71	100.1	81	0.119	0.345	19.01
10	15.5	0.0	1.602	0.160	1.26	74	1.86	70	44	70	99.9	81	0.119	0.345	18.97
11	15.5	0.0	1.763	0.161	1.25	74	1.86	70	44	70	100.7	81	0.118	0.344	18.93
12	15.4	0.1	1.923	0.160	1.26	74	1.86	70	44	70	100.2	81	0.119	0.345	18.93
13	15.4	0.0	2.083	0.160	1.25	74	1.86	70	44	70	100.2	81	0.118	0.344	18.93
14	15.3	0.1	2.242	0.159	1.26	74	1.86	71	44	70	99.6	81	0.119	0.345	18.93
15	15.3	0.0	2.402	0.160	1.26	74	1.85	71	44	70	100.2	81	0.118	0.344	18.93
16	15.3	0.0	2.562	0.160	1.25	75	1.85	71	45	70	100.3	81	0.117	0.342	18.85
17	15.2	0.1	2.722	0.160	1.25	75	1.86	71	45	70	100.4	81	0.118	0.344	18.85
18	15.2	0.0	2.881	0.159	1.25	75	1.86	71	45	70	99.7	81	0.118	0.344	18.89
19	15.1	0.1	3.040	0.159	1.25	75	1.86	71	45	70	99.4	81	0.120	0.346	18.97
20	15.0	0.1	3.201	0.161	1.24	75	1.85	71	45	70	100.3	81	0.119	0.345	19.01
21	15.0	0.0	3.361	0.160	1.27	75	1.88	71	46	70	99.8	81	0.118	0.344	18.93
22	14.9	0.1	3.522	0.161	1.28	75	1.88	71	46	70	100.8	82	0.118	0.344	18.90
23	14.9	0.0	3.683	0.161	1.27	76	1.88	71	46	70	100.7	81	0.119	0.345	18.94
24	14.8	0.1	3.845	0.162	1.27	76	1.87	71	46	70	100.9	82	0.120	0.346	19.02
25	14.8	0.0	4.006	0.161	1.28	76	1.87	71	46	70	100.2	82	0.118	0.344	18.99
26	14.7	0.1	4.168	0.162	1.26	76	1.87	71	46	70	101.1	82	0.119	0.345	18.95
27	14.7	0.0	4.329	0.161	1.28	76	1.88	71	47	70	100.4	82	0.119	0.345	18.99
28	14.6	0.1	4.490	0.161	1.27	76	1.88	71	47	70	100.5	82	0.117	0.342	18.91
29	14.5	0.1	4.652	0.162	1.27	77	1.88	71	47	70	101.4	82	0.118	0.344	18.87
30	14.5	0.0	4.813	0.161	1.28	77	1.87	71	47	70	100.7	82	0.118	0.344	18.91
31	14.4	0.1	4.974	0.161	1.27	77	1.87	71	47	70	100.4	82	0.120	0.346	18.99
32	14.3	0.1	5.137	0.163	1.27	77	1.87	71	47	70	101.4	82	0.118	0.344	18.99
33	14.3	0.0	5.298	0.161	1.27	77	1.88	71	47	70	100.1	82	0.120	0.346	18.99
34	14.2	0.1	5.459	0.161	1.27	77	1.88	71	48	70	100.1	82	0.118	0.344	18.99
35	14.1	0.1	5.620	0.161	1.27	77	1.88	71	48	70	100.3	82	0.119	0.345	18.95
36	14.1	0.0	5.781	0.161	1.27	77	1.88	72	48	70	100.4	83	0.118	0.344	18.96
37	14.0	0.1	5.943	0.162	1.27	78	1.88	72	48	70	101.0	83	0.119	0.345	18.97
38	13.9	0.1	6.105	0.162	1.28	78	1.88	72	48	70	100.9	83	0.118	0.344	18.97
39	13.9	0.0	6.267	0.162	1.26	78	1.88	72	48	70	100.7	83	0.121	0.348	19.05
40	13.8	0.1	6.429	0.162	1.26	78	1.87	72	48	70	100.3	83	0.120	0.346	19.13

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.11	in. Hg
Post-Test	0.001	cfm @	17.5	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	13.8	0.0	6.590	0.161	1.27	78	1.88	72	48	70	99.7	83	0.118	0.344	19.01
42	13.7	0.1	6.751	0.161	1.27	78	1.88	72	48	70	100.3	83	0.118	0.344	18.93
43	13.6	0.1	6.913	0.162	1.27	78	1.87	72	48	70	100.9	83	0.120	0.346	19.01
44	13.6	0.0	7.074	0.161	1.27	78	1.88	72	48	70	100.1	83	0.118	0.344	19.01
45	13.5	0.1	7.237	0.163	1.27	78	1.88	72	49	71	101.3	83	0.120	0.346	19.01
46	13.4	0.1	7.398	0.161	1.27	79	1.87	72	49	71	100.0	83	0.118	0.344	19.01
47	13.4	0.0	7.560	0.162	1.26	79	1.88	72	49	71	100.7	83	0.118	0.344	18.93
48	13.3	0.1	7.721	0.161	1.27	79	1.87	72	49	71	100.3	83	0.118	0.344	18.93
49	13.3	0.0	7.883	0.162	1.27	79	1.88	72	49	71	100.9	83	0.118	0.344	18.93
50	13.2	0.1	8.044	0.161	1.27	79	1.88	72	49	71	100.2	83	0.119	0.345	18.97
51	13.1	0.1	8.206	0.162	1.27	79	1.88	72	49	71	100.7	83	0.118	0.344	18.97
52	13.1	0.0	8.369	0.163	1.27	79	1.88	72	49	71	101.4	83	0.118	0.344	18.93
53	13.0	0.1	8.531	0.162	1.27	79	1.87	72	49	71	100.8	83	0.119	0.345	18.97
54	12.9	0.1	8.692	0.161	1.26	79	1.88	72	49	71	99.9	83	0.120	0.346	19.05
55	12.9	0.0	8.854	0.162	1.26	79	1.87	72	49	71	100.2	84	0.120	0.346	19.10
56	12.8	0.1	9.015	0.161	1.26	79	1.87	72	49	71	99.9	84	0.117	0.342	18.98
57	12.7	0.1	9.176	0.161	1.26	79	1.86	72	49	71	100.5	84	0.117	0.342	18.86
58	12.7	0.0	9.337	0.161	1.26	80	1.86	72	50	71	100.5	84	0.119	0.345	18.94
59	12.6	0.1	9.499	0.162	1.26	80	1.87	72	50	71	100.6	84	0.119	0.345	19.02
60	12.5	0.1	9.659	0.160	1.25	80	1.87	72	50	71	99.3	84	0.118	0.344	18.98
61	12.5	0.0	9.820	0.161	1.25	80	1.87	72	50	71	100.1	84	0.118	0.344	18.94
62	12.4	0.1	9.981	0.161	1.26	80	1.87	72	50	71	100.2	84	0.118	0.344	18.94
63	12.4	0.0	10.142	0.161	1.26	80	1.87	72	50	71	100.2	84	0.118	0.344	18.94
64	12.3	0.1	10.304	0.162	1.26	80	1.86	72	50	71	100.9	84	0.117	0.342	18.90
65	12.2	0.1	10.465	0.161	1.26	80	1.87	72	50	71	100.5	84	0.117	0.342	18.86
66	12.2	0.0	10.626	0.161	1.25	80	1.86	72	50	71	100.6	84	0.117	0.342	18.86
67	12.1	0.1	10.787	0.161	1.25	80	1.86	72	50	71	100.4	84	0.119	0.345	18.94
68	12.1	0.0	10.948	0.161	1.26	80	1.86	72	50	71	100.1	84	0.118	0.344	18.98
69	12.0	0.1	11.109	0.161	1.26	80	1.87	72	50	71	100.1	84	0.118	0.344	18.94
70	12.0	0.0	11.271	0.162	1.26	80	1.86	72	50	71	100.8	84	0.118	0.344	18.94
71	11.9	0.1	11.433	0.162	1.25	80	1.87	72	50	71	100.7	84	0.119	0.345	18.98
72	11.9	0.0	11.594	0.161	1.25	80	1.86	72	50	71	100.0	84	0.118	0.344	18.98
73	11.8	0.1	11.754	0.160	1.26	80	1.87	72	50	71	99.6	84	0.117	0.342	18.90
74	11.7	0.1	11.915	0.161	1.26	80	1.87	72	50	71	100.1	84	0.121	0.348	19.02
75	11.7	0.0	12.077	0.162	1.26	80	1.86	72	50	71	100.3	84	0.118	0.344	19.06
76	11.7	0.0	12.238	0.161	1.26	81	1.87	72	50	71	99.8	84	0.118	0.344	18.94
77	11.6	0.1	12.400	0.162	1.25	81	1.87	72	50	71	100.8	84	0.116	0.341	18.86
78	11.5	0.1	12.562	0.162	1.25	81	1.87	72	50	71	101.2	84	0.117	0.342	18.82
79	11.5	0.0	12.722	0.160	1.26	81	1.86	72	50	71	99.8	84	0.118	0.344	18.90
80	11.4	0.1	12.884	0.162	1.26	81	1.86	72	50	71	100.7	84	0.118	0.344	18.94
81	11.4	0.0	13.045	0.161	1.25	81	1.87	72	50	71	100.1	84	0.117	0.342	18.90
82	11.3	0.1	13.206	0.161	1.26	81	1.87	72	50	71	100.2	84	0.118	0.344	18.90
83	11.3	0.0	13.369	0.163	1.26	81	1.87	72	50	71	101.6	84	0.116	0.341	18.86
84	11.2	0.1	13.530	0.161	1.25	81	1.87	72	50	71	100.7	84	0.116	0.341	18.78

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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	11.2	0.0	13.691	0.161	1.25	81	1.86	72	50	71	100.7	84	0.118	0.344	18.86
86	11.1	0.1	13.852	0.161	1.25	81	1.87	72	50	71	100.2	84	0.118	0.344	18.94
87	11.0	0.1	14.013	0.161	1.26	81	1.87	72	51	71	100.1	84	0.117	0.342	18.90
88	11.0	0.0	14.174	0.161	1.25	81	1.86	72	51	71	100.3	84	0.117	0.342	18.86
89	10.9	0.1	14.336	0.162	1.26	81	1.86	72	51	71	101.0	84	0.118	0.344	18.90
90	10.9	0.0	14.498	0.162	1.25	81	1.87	72	51	71	100.7	84	0.118	0.344	18.94
91	10.8	0.1	14.659	0.161	1.26	81	1.87	72	51	71	100.1	84	0.117	0.342	18.90
92	10.7	0.1	14.820	0.161	1.25	81	1.87	72	51	71	100.3	85	0.118	0.344	18.91
93	10.7	0.0	14.981	0.161	1.26	81	1.87	72	51	71	100.2	85	0.118	0.344	18.96
94	10.6	0.1	15.142	0.161	1.25	81	1.87	73	51	71	100.0	84	0.118	0.344	18.95
95	10.6	0.0	15.304	0.162	1.26	81	1.87	73	51	71	100.7	84	0.117	0.342	18.90
96	10.5	0.1	15.466	0.162	1.25	81	1.87	73	51	71	100.7	84	0.119	0.345	18.94
97	10.5	0.0	15.628	0.162	1.25	81	1.87	73	51	71	100.5	84	0.118	0.344	18.98
98	10.4	0.1	15.788	0.160	1.25	81	1.87	73	51	71	99.4	84	0.117	0.342	18.90
99	10.4	0.0	15.950	0.162	1.26	81	1.87	73	51	71	100.8	84	0.118	0.344	18.90
100	10.3	0.1	16.111	0.161	1.26	81	1.87	73	51	71	100.1	84	0.118	0.344	18.94
101	10.3	0.0	16.273	0.162	1.26	81	1.87	73	51	71	100.6	84	0.118	0.344	18.94
102	10.3	0.0	16.435	0.162	1.26	81	1.87	73	51	71	100.6	84	0.118	0.344	18.94
103	10.2	0.1	16.596	0.161	1.23	81	1.85	73	51	71	100.0	84	0.118	0.344	18.94
104	10.2	0.0	16.756	0.160	1.23	81	1.85	73	51	72	99.3	84	0.119	0.345	18.98
105	10.1	0.1	16.916	0.160	1.23	81	1.85	73	51	72	99.2	84	0.118	0.344	18.98
106	10.1	0.0	17.076	0.160	1.24	81	1.85	73	51	72	99.4	84	0.117	0.342	18.90
107	10.0	0.1	17.237	0.161	1.23	81	1.86	73	51	72	100.2	84	0.118	0.344	18.90
108	10.0	0.0	17.398	0.161	1.24	81	1.85	73	51	72	100.4	84	0.115	0.339	18.82
109	9.9	0.1	17.557	0.159	1.23	82	1.85	73	51	72	99.3	84	0.118	0.344	18.82
110	9.9	0.0	17.717	0.160	1.24	82	1.86	73	51	72	99.5	84	0.118	0.344	18.94
111	9.9	0.0	17.878	0.161	1.24	82	1.85	73	51	72	99.8	84	0.118	0.344	18.94
112	9.8	0.1	18.039	0.161	1.23	82	1.85	72	51	72	99.7	84	0.119	0.345	18.98
113	9.8	0.0	18.199	0.160	1.23	82	1.85	72	51	72	99.0	84	0.118	0.344	18.98
114	9.7	0.1	18.359	0.160	1.24	82	1.85	73	51	71	98.9	84	0.120	0.346	19.02
115	9.7	0.0	18.519	0.160	1.24	82	1.86	73	51	71	99.0	84	0.116	0.341	18.94
116	9.6	0.1	18.679	0.160	1.24	82	1.86	73	51	72	99.5	84	0.117	0.342	18.82
117	9.6	0.0	18.840	0.161	1.24	82	1.86	73	51	72	100.4	84	0.117	0.342	18.86
118	9.5	0.1	19.001	0.161	1.23	82	1.86	73	51	72	100.2	84	0.117	0.342	18.86
119	9.5	0.0	19.160	0.159	1.23	82	1.85	73	51	72	98.9	84	0.118	0.344	18.90
120	9.4	0.1	19.320	0.160	1.24	82	1.86	73	51	71	99.2	84	0.119	0.345	18.98
121	9.4	0.0	19.481	0.161	1.24	82	1.86	73	51	71	99.6	84	0.118	0.344	18.98
122	9.3	0.1	19.642	0.161	1.24	82	1.85	72	51	72	99.9	84	0.116	0.341	18.86
123	9.3	0.0	19.802	0.160	1.23	82	1.85	72	51	72	99.4	84	0.120	0.346	18.94
124	9.2	0.1	19.961	0.159	1.23	82	1.85	72	51	72	98.4	84	0.118	0.344	19.02
125	9.2	0.0	20.121	0.160	1.23	82	1.86	72	51	72	99.1	84	0.117	0.342	18.90
126	9.1	0.1	20.282	0.161	1.24	82	1.85	72	51	72	99.9	84	0.119	0.345	18.94
127	9.1	0.0	20.443	0.161	1.23	82	1.86	72	51	72	99.7	84	0.118	0.344	18.98
128	9.0	0.1	20.603	0.160	1.23	82	1.86	72	51	72	99.1	84	0.118	0.344	18.94

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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	9.0	0.0	20.763	0.160	1.24	82	1.86	72	51	72	99.1	84	0.119	0.345	18.98
130	9.0	0.0	20.923	0.160	1.23	82	1.85	72	51	71	99.0	84	0.118	0.344	18.98
131	8.9	0.1	21.084	0.161	1.24	82	1.85	72	51	72	99.9	84	0.116	0.341	18.86
132	8.9	0.0	21.244	0.160	1.23	82	1.86	72	51	72	99.6	84	0.118	0.344	18.86
133	8.8	0.1	21.404	0.160	1.23	82	1.85	72	51	72	99.2	84	0.120	0.346	19.02
134	8.8	0.0	21.564	0.160	1.23	82	1.86	72	51	72	98.8	84	0.118	0.344	19.02
135	8.7	0.1	21.724	0.160	1.23	82	1.86	72	51	72	98.9	84	0.119	0.345	18.98
136	8.7	0.0	21.885	0.161	1.23	82	1.86	72	51	72	99.6	84	0.118	0.344	18.98
137	8.6	0.1	22.046	0.161	1.23	82	1.85	72	51	72	99.8	84	0.117	0.342	18.90
138	8.6	0.0	22.205	0.159	1.23	82	1.85	72	51	71	99.0	84	0.116	0.341	18.82
139	8.5	0.1	22.365	0.160	1.24	82	1.86	72	51	71	99.8	84	0.117	0.342	18.82
140	8.5	0.0	22.525	0.160	1.23	82	1.85	72	51	71	99.6	84	0.118	0.344	18.90
141	8.4	0.1	22.687	0.162	1.23	82	1.85	72	51	72	100.6	84	0.118	0.344	18.94
142	8.4	0.0	22.847	0.160	1.23	82	1.85	72	51	72	99.3	84	0.117	0.342	18.90
143	8.3	0.1	23.006	0.159	1.23	82	1.85	72	51	72	98.8	84	0.118	0.344	18.90
144	8.3	0.0	23.166	0.160	1.24	82	1.86	72	51	72	99.4	84	0.117	0.342	18.90
145	8.2	0.1	23.327	0.161	1.23	82	1.85	72	51	72	100.0	84	0.118	0.344	18.90
146	8.2	0.0	23.488	0.161	1.22	82	1.85	72	51	72	100.0	84	0.117	0.342	18.90
147	8.2	0.0	23.648	0.160	1.23	82	1.85	72	51	72	99.6	84	0.116	0.341	18.82
148	8.1	0.1	23.808	0.160	1.23	82	1.86	72	51	72	99.7	84	0.118	0.344	18.86
149	8.1	0.0	23.968	0.160	1.23	82	1.85	72	51	72	99.4	84	0.118	0.344	18.94
150	8.0	0.1	24.128	0.160	1.24	82	1.86	72	51	72	99.2	84	0.118	0.344	18.94
151	8.0	0.0	24.289	0.161	1.23	82	1.86	72	51	72	99.9	84	0.117	0.342	18.90
152	7.9	0.1	24.449	0.160	1.23	82	1.86	72	51	72	99.5	84	0.117	0.342	18.86
153	7.9	0.0	24.609	0.160	1.23	82	1.85	72	51	71	99.6	84	0.117	0.342	18.86
154	7.8	0.1	24.769	0.160	1.23	82	1.85	72	51	72	99.7	84	0.116	0.341	18.82
155	7.8	0.0	24.930	0.161	1.23	82	1.85	72	51	71	100.5	84	0.117	0.342	18.82
156	7.7	0.1	25.090	0.160	1.23	82	1.86	72	51	72	99.7	84	0.117	0.342	18.86
157	7.7	0.0	25.250	0.160	1.23	82	1.86	72	51	72	99.4	84	0.119	0.345	18.94
158	7.6	0.1	25.410	0.160	1.23	82	1.86	73	51	72	99.0	84	0.119	0.345	19.02
159	7.6	0.0	25.570	0.160	1.24	82	1.86	72	51	72	99.0	85	0.118	0.344	18.99
160	7.5	0.1	25.731	0.161	1.23	82	1.85	73	51	72	99.8	85	0.118	0.344	18.96
161	7.5	0.0	25.891	0.160	1.23	82	1.85	72	51	72	99.5	85	0.116	0.341	18.88
162	7.4	0.1	26.051	0.160	1.24	82	1.86	73	51	72	99.9	85	0.116	0.341	18.80
163	7.4	0.0	26.211	0.160	1.23	82	1.86	73	51	72	99.9	84	0.118	0.344	18.87
164	7.4	0.0	26.371	0.160	1.23	82	1.86	73	51	72	99.5	85	0.118	0.344	18.95
165	7.3	0.1	26.532	0.161	1.23	82	1.86	73	51	72	99.9	85	0.118	0.344	18.96
166	7.3	0.0	26.692	0.160	1.24	82	1.86	73	51	72	99.5	85	0.116	0.341	18.88
167	7.2	0.1	26.852	0.160	1.23	82	1.86	73	51	72	99.7	84	0.118	0.344	18.87
168	7.2	0.0	27.012	0.160	1.23	82	1.85	73	51	72	99.4	85	0.119	0.345	18.99
169	7.1	0.1	27.172	0.160	1.23	82	1.86	73	51	72	99.3	85	0.116	0.341	18.92
170	7.1	0.0	27.333	0.161	1.23	82	1.86	73	51	72	100.3	85	0.117	0.342	18.84
171	7.0	0.1	27.494	0.161	1.23	82	1.85	73	51	72	100.6	85	0.116	0.341	18.84
172	7.0	0.0	27.653	0.159	1.23	82	1.86	73	51	72	99.2	85	0.118	0.344	18.88

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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	6.9	0.1	27.813	0.160	1.23	82	1.86	73	51	72	99.7	85	0.116	0.341	18.88
174	6.9	0.0	27.973	0.160	1.24	82	1.85	73	51	72	99.8	85	0.117	0.342	18.84
175	6.8	0.1	28.135	0.162	1.23	82	1.86	73	51	72	101.2	85	0.116	0.341	18.84
176	6.8	0.0	28.295	0.160	1.23	82	1.85	73	51	72	99.9	85	0.117	0.342	18.84
177	6.7	0.1	28.455	0.160	1.23	82	1.86	73	51	72	99.8	85	0.117	0.342	18.88
178	6.7	0.0	28.614	0.159	1.24	82	1.86	73	51	72	99.2	85	0.116	0.341	18.84
179	6.7	0.0	28.775	0.161	1.24	82	1.86	73	51	72	100.8	85	0.115	0.339	18.76
180	6.6	0.1	28.936	0.161	1.24	82	1.86	73	51	72	100.8	85	0.118	0.344	18.84
181	6.6	0.0	29.096	0.160	1.23	82	1.86	73	51	72	99.8	85	0.116	0.341	18.88
182	6.5	0.1	29.256	0.160	1.23	82	1.86	73	51	72	99.7	85	0.118	0.344	18.88
183	6.5	0.0	29.416	0.160	1.23	82	1.86	73	51	72	99.6	85	0.117	0.342	18.92
184	6.4	0.1	29.576	0.160	1.24	82	1.86	73	51	72	99.5	85	0.118	0.344	18.92
185	6.3	0.1	29.737	0.161	1.23	82	1.86	73	51	72	100.0	85	0.118	0.344	18.96
186	6.3	0.0	29.897	0.160	1.23	82	1.86	73	51	72	99.4	85	0.117	0.342	18.92
187	6.3	0.0	30.057	0.160	1.23	82	1.86	73	51	72	99.6	85	0.117	0.342	18.88
188	6.2	0.1	30.217	0.160	1.23	82	1.86	73	51	72	99.7	85	0.117	0.342	18.88
189	6.1	0.1	30.378	0.161	1.23	82	1.85	73	51	72	100.2	85	0.118	0.344	18.92
190	6.1	0.0	30.538	0.160	1.24	82	1.86	73	51	72	99.6	85	0.116	0.341	18.88
191	6.1	0.0	30.698	0.160	1.23	82	1.87	73	51	72	99.5	85	0.120	0.346	18.96
192	6.0	0.1	30.858	0.160	1.23	82	1.86	73	51	72	99.2	85	0.117	0.342	19.00
193	6.0	0.0	31.018	0.160	1.23	82	1.86	73	51	72	99.5	85	0.116	0.341	18.84
194	5.9	0.1	31.179	0.161	1.22	82	1.86	73	51	72	100.7	85	0.116	0.341	18.80
195	5.9	0.0	31.339	0.160	1.23	82	1.86	73	51	72	99.9	85	0.118	0.344	18.88
196	5.8	0.1	31.499	0.160	1.23	82	1.86	73	51	72	99.6	85	0.117	0.342	18.92
197	5.8	0.0	31.659	0.160	1.23	82	1.86	73	51	72	99.6	85	0.117	0.342	18.88
198	5.7	0.1	31.819	0.160	1.24	82	1.86	73	51	72	99.5	85	0.119	0.345	18.96
199	5.7	0.0	31.980	0.161	1.23	83	1.86	73	52	72	99.7	85	0.118	0.344	19.00
200	5.6	0.1	32.141	0.161	1.22	83	1.86	73	51	72	99.6	85	0.118	0.344	18.96
201	5.6	0.0	32.300	0.159	1.23	83	1.85	73	52	72	98.4	84	0.118	0.344	18.95
202	5.5	0.1	32.460	0.160	1.23	83	1.86	73	52	72	99.1	84	0.117	0.342	18.90
203	5.5	0.0	32.620	0.160	1.23	82	1.85	73	52	72	99.3	84	0.118	0.344	18.90
204	5.5	0.0	32.782	0.162	1.24	82	1.86	73	51	72	100.5	83	0.118	0.344	18.94
205	5.4	0.1	32.942	0.160	1.23	82	1.86	72	52	71	99.2	83	0.117	0.342	18.89
206	5.4	0.0	33.102	0.160	1.23	82	1.86	72	52	71	99.4	83	0.117	0.342	18.85
207	5.3	0.1	33.262	0.160	1.23	82	1.85	72	52	71	99.4	83	0.118	0.344	18.89
208	5.3	0.0	33.422	0.160	1.23	82	1.86	72	52	71	99.0	83	0.120	0.346	19.01
209	5.2	0.1	33.584	0.162	1.23	82	1.86	72	52	71	100.1	84	0.117	0.342	18.98
210	5.2	0.0	33.744	0.160	1.23	82	1.86	72	52	71	99.3	84	0.117	0.342	18.86
211	5.1	0.1	33.904	0.160	1.23	82	1.86	72	52	71	99.5	84	0.118	0.344	18.90
212	5.0	0.1	34.064	0.160	1.23	82	1.86	72	52	72	99.4	84	0.117	0.342	18.90
213	5.0	0.0	34.224	0.160	1.24	82	1.86	72	52	71	99.7	85	0.116	0.341	18.83
214	4.9	0.1	34.385	0.161	1.23	82	1.86	72	52	72	100.8	85	0.115	0.339	18.76
215	4.9	0.0	34.546	0.161	1.23	82	1.86	72	52	72	100.9	85	0.117	0.342	18.80
216	4.8	0.1	34.705	0.159	1.23	82	1.86	72	52	72	99.3	85	0.117	0.342	18.88

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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	4.8	0.0	34.865	0.160	1.23	82	1.86	72	52	71	99.7	85	0.117	0.342	18.88
218	4.8	0.0	35.026	0.161	1.24	82	1.86	72	52	72	100.1	85	0.119	0.345	18.96
219	4.7	0.1	35.187	0.161	1.23	82	1.86	72	52	72	99.8	85	0.118	0.344	19.00
220	4.7	0.0	35.347	0.160	1.23	82	1.86	72	52	72	99.2	85	0.118	0.344	18.96
221	4.6	0.1	35.507	0.160	1.23	82	1.86	72	52	72	99.4	85	0.117	0.342	18.92
222	4.6	0.0	35.667	0.160	1.24	82	1.86	72	52	72	99.6	85	0.117	0.342	18.88
223	4.6	0.0	35.828	0.161	1.23	82	1.86	72	52	72	100.2	85	0.118	0.344	18.92
224	4.5	0.1	35.988	0.160	1.24	82	1.86	72	52	72	99.4	85	0.118	0.344	18.96
225	4.5	0.0	36.148	0.160	1.23	82	1.86	72	52	72	99.5	85	0.116	0.341	18.88
226	4.4	0.1	36.308	0.160	1.23	82	1.86	72	52	72	99.9	85	0.116	0.341	18.80
227	4.4	0.0	36.468	0.160	1.23	82	1.86	72	52	72	100.0	85	0.117	0.342	18.84
228	4.4	0.0	36.629	0.161	1.24	82	1.86	72	52	72	100.4	85	0.117	0.342	18.88
229	4.3	0.1	36.790	0.161	1.23	82	1.86	73	52	72	100.4	85	0.116	0.341	18.84
230	4.3	0.0	36.950	0.160	1.23	82	1.86	73	52	72	99.8	85	0.118	0.344	18.88
231	4.3	0.0	37.110	0.160	1.24	82	1.86	73	52	72	99.6	85	0.117	0.342	18.92
232	4.2	0.1	37.270	0.160	1.23	82	1.85	73	52	72	99.6	85	0.117	0.342	18.88
233	4.2	0.0	37.431	0.161	1.24	82	1.86	73	52	72	100.4	85	0.116	0.341	18.84
234	4.2	0.0	37.591	0.160	1.23	82	1.86	73	52	72	100.0	85	0.116	0.341	18.80
235	4.2	0.0	37.751	0.160	1.23	82	1.86	73	52	72	100.0	84	0.117	0.342	18.83
236	4.1	0.1	37.910	0.159	1.23	82	1.86	73	52	72	99.1	84	0.117	0.342	18.86
237	4.1	0.0	38.071	0.161	1.23	82	1.86	73	52	72	100.4	84	0.116	0.341	18.82
238	4.1	0.0	38.232	0.161	1.23	82	1.86	73	52	72	100.6	84	0.116	0.341	18.78
239	4.1	0.0	38.392	0.160	1.22	82	1.85	73	52	72	99.9	84	0.117	0.342	18.82
240	4.0	0.1	38.551	0.159	1.23	82	1.86	73	52	72	99.1	84	0.117	0.342	18.86
241	4.0	0.0	38.711	0.160	1.23	82	1.86	73	52	72	99.6	84	0.117	0.342	18.86
242	4.0	0.0	38.872	0.161	1.23	82	1.86	73	52	72	100.2	84	0.117	0.342	18.86
243	4.0	0.0	39.033	0.161	1.23	82	1.86	73	52	72	100.4	84	0.116	0.341	18.82
244	3.9	0.1	39.193	0.160	1.22	82	1.86	73	52	72	99.7	84	0.118	0.344	18.86
245	3.9	0.0	39.352	0.159	1.23	82	1.86	73	52	72	98.9	84	0.117	0.342	18.90
246	3.9	0.0	39.512	0.160	1.23	82	1.86	73	52	72	99.7	83	0.115	0.339	18.77
247	3.9	0.0	39.673	0.161	1.23	82	1.86	73	52	72	100.7	83	0.116	0.341	18.73
248	3.9	0.0	39.834	0.161	1.23	82	1.86	73	52	72	100.4	83	0.119	0.345	18.89
249	3.8	0.1	39.994	0.160	1.23	82	1.86	73	52	72	99.1	83	0.118	0.344	18.97
250	3.8	0.0	40.153	0.159	1.23	82	1.86	73	51	72	98.4	83	0.118	0.344	18.93
251	3.8	0.0	40.313	0.160	1.23	82	1.86	73	51	72	99.2	83	0.117	0.342	18.89
252	3.8	0.0	40.474	0.161	1.23	82	1.85	73	52	72	99.7	83	0.120	0.346	18.97
253	3.8	0.0	40.634	0.160	1.23	82	1.86	73	51	72	99.0	83	0.116	0.341	18.93
254	3.7	0.1	40.794	0.160	1.22	82	1.86	73	51	72	99.4	83	0.117	0.342	18.81
255	3.7	0.0	40.954	0.160	1.23	82	1.86	73	52	72	99.7	83	0.116	0.341	18.81
256	3.7	0.0	41.114	0.160	1.23	82	1.86	73	51	72	99.7	83	0.117	0.342	18.81
257	3.7	0.0	41.275	0.161	1.22	82	1.86	73	51	72	100.3	83	0.117	0.342	18.85
258	3.7	0.0	41.436	0.161	1.23	82	1.86	73	51	72	100.3	83	0.116	0.341	18.81
259	3.7	0.0	41.596	0.160	1.22	82	1.86	73	51	72	99.6	83	0.118	0.344	18.85
260	3.6	0.1	41.755	0.159	1.23	82	1.86	73	51	72	98.6	82	0.118	0.344	18.92

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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	3.6	0.0	41.916	0.161	1.23	82	1.86	73	51	72	99.7	83	0.118	0.344	18.92
262	3.6	0.0	42.077	0.161	1.23	83	1.86	73	52	72	99.5	82	0.119	0.345	18.96
263	3.6	0.0	42.237	0.160	1.23	83	1.86	73	51	72	98.6	83	0.119	0.345	19.00
264	3.6	0.0	42.397	0.160	1.23	83	1.86	73	52	72	98.6	82	0.118	0.344	18.96
265	3.5	0.1	42.557	0.160	1.23	83	1.86	73	51	72	98.8	82	0.117	0.342	18.87
266	3.5	0.0	42.717	0.160	1.23	83	1.86	73	51	72	99.3	82	0.116	0.341	18.79
267	3.5	0.0	42.879	0.162	1.23	83	1.86	73	51	72	100.6	82	0.118	0.344	18.83
268	3.5	0.0	43.039	0.160	1.22	83	1.86	73	51	72	99.0	82	0.118	0.344	18.91
269	3.5	0.0	43.199	0.160	1.23	83	1.85	73	51	72	98.8	82	0.118	0.344	18.91
270	3.4	0.1	43.358	0.159	1.23	83	1.86	73	51	72	98.2	82	0.118	0.344	18.91
271	3.4	0.0	43.519	0.161	1.22	83	1.86	73	51	72	99.6	82	0.117	0.342	18.87
272	3.4	0.0	43.680	0.161	1.22	83	1.86	73	51	72	99.7	82	0.118	0.344	18.87
273	3.4	0.0	43.840	0.160	1.23	83	1.86	73	51	72	99.2	82	0.116	0.341	18.83
274	3.4	0.0	44.001	0.161	1.28	83	1.90	73	51	72	99.9	82	0.118	0.344	18.83
275	3.4	0.0	44.165	0.164	1.28	83	1.90	73	51	72	101.5	82	0.118	0.344	18.91
276	3.3	0.1	44.328	0.163	1.28	83	1.91	73	51	72	100.8	82	0.117	0.342	18.87
277	3.3	0.0	44.492	0.164	1.29	83	1.91	73	51	72	101.6	82	0.117	0.342	18.83
278	3.3	0.0	44.655	0.163	1.28	83	1.91	73	51	72	101.2	82	0.116	0.341	18.79
279	3.3	0.0	44.819	0.164	1.28	83	1.91	73	51	72	101.9	82	0.118	0.344	18.83
280	3.3	0.0	44.983	0.164	1.28	83	1.91	73	51	72	101.7	82	0.116	0.341	18.83
281	3.3	0.0	45.146	0.163	1.29	83	1.91	73	51	72	101.1	82	0.118	0.344	18.83
282	3.2	0.1	45.310	0.164	1.28	83	1.90	73	51	72	101.5	82	0.118	0.344	18.91
283	3.2	0.0	45.475	0.165	1.29	83	1.91	73	51	72	102.1	82	0.116	0.341	18.83
284	3.2	0.0	45.639	0.164	1.28	83	1.91	73	51	72	101.7	82	0.118	0.344	18.83
285	3.2	0.0	45.802	0.163	1.28	83	1.91	73	51	72	100.9	82	0.118	0.344	18.91
286	3.2	0.0	45.966	0.164	1.28	83	1.91	73	51	72	101.2	82	0.119	0.345	18.95
287	3.2	0.0	46.130	0.164	1.28	83	1.91	73	51	72	101.3	82	0.116	0.341	18.87
288	3.1	0.1	46.293	0.163	1.28	83	1.90	73	51	72	101.2	82	0.116	0.341	18.75
289	3.1	0.0	46.457	0.164	1.28	83	1.90	73	52	72	102.0	82	0.118	0.344	18.83
290	3.1	0.0	46.620	0.163	1.28	83	1.90	73	51	72	100.9	82	0.118	0.344	18.91
291	3.1	0.0	46.784	0.164	1.29	83	1.91	73	52	72	101.1	81	0.119	0.345	18.94
292	3.1	0.0	46.948	0.164	1.28	83	1.91	73	52	72	101.0	81	0.118	0.344	18.93
293	3.0	0.1	47.111	0.163	1.28	83	1.90	73	52	72	100.6	82	0.118	0.344	18.90
294	3.0	0.0	47.275	0.164	1.28	83	1.91	73	52	72	101.5	82	0.116	0.341	18.83
295	3.0	0.0	47.439	0.164	1.28	83	1.90	73	52	72	101.9	82	0.117	0.342	18.79
296	3.0	0.0	47.602	0.163	1.28	83	1.90	73	52	72	101.1	82	0.118	0.344	18.87
297	3.0	0.0	47.766	0.164	1.28	83	1.90	73	52	72	101.4	82	0.118	0.344	18.91
298	3.0	0.0	47.929	0.163	1.28	83	1.90	73	52	72	101.0	82	0.115	0.339	18.79
299	2.9	0.1	48.094	0.165	1.28	83	1.91	73	52	72	102.7	82	0.117	0.342	18.75
300	2.9	0.0	48.258	0.164	1.27	83	1.91	73	52	72	102.1	82	0.116	0.341	18.79
301	2.9	0.0	48.422	0.164	1.28	83	1.91	73	52	72	102.0	82	0.117	0.342	18.79
302	2.9	0.0	48.585	0.163	1.28	83	1.90	73	52	72	101.2	82	0.117	0.342	18.83
303	2.9	0.0	48.749	0.164	1.28	83	1.90	73	52	72	101.6	82	0.118	0.344	18.87
304	2.9	0.0	48.912	0.163	1.28	83	1.91	73	52	72	101.1	82	0.115	0.339	18.79

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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	2.8	0.1	49.076	0.164	1.28	83	1.90	73	52	72	102.0	82	0.118	0.344	18.79
306	2.8	0.0	49.239	0.163	1.28	83	1.91	73	52	72	101.3	82	0.115	0.339	18.79
307	2.8	0.0	49.403	0.164	1.28	83	1.91	73	52	71	102.1	82	0.117	0.342	18.75
308	2.8	0.0	49.566	0.163	1.28	83	1.90	73	52	72	101.5	81	0.115	0.339	18.74
309	2.8	0.0	49.730	0.164	1.28	83	1.90	73	52	72	102.0	81	0.118	0.344	18.77
310	2.8	0.0	49.893	0.163	1.28	83	1.91	73	52	71	101.0	82	0.118	0.344	18.90
311	2.7	0.1	50.057	0.164	1.28	83	1.90	73	52	72	101.4	82	0.117	0.342	18.87
312	2.7	0.0	50.221	0.164	1.28	83	1.91	73	52	72	101.7	82	0.116	0.341	18.79
313	2.7	0.0	50.384	0.163	1.28	83	1.91	73	52	72	101.2	82	0.118	0.344	18.83
314	2.7	0.0	50.548	0.164	1.28	83	1.91	73	52	72	101.6	82	0.117	0.342	18.87
315	2.7	0.0	50.712	0.164	1.28	83	1.90	73	52	72	101.5	82	0.118	0.344	18.87
316	2.6	0.1	50.876	0.164	1.28	83	1.91	73	52	72	101.6	81	0.116	0.341	18.82
317	2.6	0.0	51.040	0.164	1.28	83	1.90	73	52	71	101.6	81	0.118	0.344	18.81
318	2.6	0.0	51.204	0.164	1.29	83	1.91	73	52	71	101.5	81	0.117	0.342	18.85
319	2.6	0.0	51.367	0.163	1.28	83	1.90	72	52	71	100.9	81	0.117	0.342	18.81
320	2.5	0.1	51.531	0.164	1.27	83	1.90	72	52	71	101.6	81	0.117	0.342	18.81
321	2.5	0.0	51.695	0.164	1.28	83	1.90	72	52	71	101.5	81	0.118	0.344	18.85
322	2.5	0.0	51.858	0.163	1.22	83	1.86	72	52	70	100.7	81	0.118	0.344	18.89
323	2.5	0.0	52.018	0.160	1.22	83	1.85	72	52	70	98.9	81	0.117	0.342	18.85
324	2.5	0.0	52.178	0.160	1.23	83	1.85	72	52	70	99.2	81	0.116	0.341	18.77
325	2.4	0.1	52.339	0.161	1.22	83	1.86	72	52	70	100.0	81	0.117	0.342	18.77
326	2.4	0.0	52.499	0.160	1.23	83	1.85	72	52	70	99.3	81	0.117	0.342	18.81
327	2.4	0.0	52.659	0.160	1.23	83	1.85	72	52	70	99.2	81	0.117	0.342	18.81
328	2.4	0.0	52.819	0.160	1.23	83	1.85	72	52	70	99.1	82	0.118	0.344	18.86
329	2.4	0.0	52.979	0.160	1.23	83	1.86	72	52	70	99.1	81	0.116	0.341	18.82
330	2.3	0.1	53.140	0.161	1.23	83	1.86	72	52	70	99.8	82	0.118	0.344	18.82
331	2.3	0.0	53.301	0.161	1.22	83	1.86	72	52	70	99.7	82	0.118	0.344	18.91
332	2.3	0.0	53.460	0.159	1.22	83	1.85	72	52	70	98.2	82	0.118	0.344	18.91
333	2.3	0.0	53.620	0.160	1.22	82	1.86	72	52	71	99.4	82	0.114	0.338	18.75
334	2.3	0.0	53.780	0.160	1.22	82	1.85	72	52	71	100.1	82	0.116	0.341	18.67
335	2.2	0.1	53.941	0.161	1.22	82	1.86	72	52	71	100.6	82	0.117	0.342	18.79
336	2.2	0.0	54.101	0.160	1.22	83	1.85	72	52	71	99.6	82	0.116	0.341	18.79
337	2.2	0.0	54.261	0.160	1.22	83	1.86	72	52	71	99.5	82	0.117	0.342	18.79
338	2.2	0.0	54.421	0.160	1.22	83	1.85	72	52	71	99.3	82	0.118	0.344	18.87
339	2.1	0.1	54.581	0.160	1.23	83	1.86	72	52	71	99.0	82	0.117	0.342	18.87
340	2.1	0.0	54.742	0.161	1.22	83	1.85	72	52	71	99.9	82	0.116	0.341	18.79
341	2.1	0.0	54.902	0.160	1.22	82	1.86	72	52	71	99.5	82	0.118	0.344	18.83
342	2.1	0.0	55.061	0.159	1.22	82	1.86	72	52	71	98.6	82	0.118	0.344	18.91
343	2.1	0.0	55.221	0.160	1.22	82	1.86	72	52	71	99.0	82	0.118	0.344	18.91
344	2.0	0.1	55.382	0.161	1.21	82	1.86	72	52	71	99.7	82	0.117	0.342	18.87
345	2.0	0.0	55.542	0.160	1.22	83	1.86	72	52	71	99.2	82	0.117	0.342	18.83
346	2.0	0.0	55.702	0.160	1.22	83	1.86	72	52	71	99.4	82	0.116	0.341	18.79
347	2.0	0.0	55.861	0.159	1.22	83	1.86	72	52	71	98.9	82	0.117	0.342	18.79
348	1.9	0.1	56.021	0.160	1.22	83	1.86	72	52	71	99.4	82	0.117	0.342	18.83

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test 0 cfm @ 17.11 in. Hg
Post-Test 0.001 cfm @ 17.5 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	1.9	0.0	56.183	0.162	1.23	83	1.86	72	52	71	100.3	82	0.119	0.345	18.91
350	1.9	0.0	56.342	0.159	1.22	83	1.85	72	52	71	98.3	83	0.117	0.342	18.92
351	1.9	0.0	56.502	0.160	1.22	83	1.86	72	52	71	99.1	82	0.117	0.342	18.84
352	1.8	0.1	56.662	0.160	1.23	83	1.86	72	52	71	99.5	83	0.115	0.339	18.76
353	1.8	0.0	56.822	0.160	1.23	83	1.86	72	52	71	99.7	83	0.118	0.344	18.81
354	1.8	0.0	56.983	0.161	1.22	83	1.86	72	52	71	100.1	83	0.116	0.341	18.85
355	1.7	0.1	57.142	0.159	1.22	83	1.85	72	52	71	98.8	83	0.117	0.342	18.81
356	1.7	0.0	57.302	0.160	1.22	83	1.86	72	52	71	99.5	83	0.117	0.342	18.85
357	1.7	0.0	57.462	0.160	1.22	83	1.85	72	52	71	99.2	83	0.118	0.344	18.89
358	1.7	0.0	57.623	0.161	1.22	83	1.86	72	52	71	99.8	83	0.117	0.342	18.89
359	1.6	0.1	57.783	0.160	1.23	83	1.85	73	52	71	99.4	83	0.116	0.341	18.81
360	1.6	0.0	57.942	0.159	1.22	83	1.86	73	52	71	98.8	83	0.118	0.344	18.85
361	1.6	0.0	58.102	0.160	1.23	83	1.85	73	52	71	99.1	83	0.118	0.344	18.93
362	1.5	0.1	58.262	0.160	1.23	83	1.85	73	52	71	98.9	83	0.118	0.344	18.93
363	1.5	0.0	58.423	0.161	1.22	83	1.86	73	52	71	99.7	83	0.117	0.342	18.89
364	1.5	0.0	58.583	0.160	1.21	83	1.86	73	52	71	99.2	84	0.118	0.344	18.90
365	1.4	0.1	58.742	0.159	1.22	83	1.86	73	52	71	98.8	84	0.115	0.339	18.82
366	1.4	0.0	58.902	0.160	1.23	83	1.86	73	52	71	99.9	84	0.116	0.341	18.74
367	1.4	0.0	59.062	0.160	1.22	83	1.86	73	52	71	99.9	84	0.117	0.342	18.82
368	1.3	0.1	59.223	0.161	1.22	83	1.85	73	52	72	100.3	84	0.116	0.341	18.82
369	1.3	0.0	59.382	0.159	1.22	83	1.86	73	52	71	99.0	84	0.117	0.342	18.82
370	1.2	0.1	59.542	0.160	1.22	83	1.86	73	52	71	99.7	84	0.116	0.341	18.82
371	1.2	0.0	59.702	0.160	1.22	83	1.86	73	52	71	99.6	84	0.118	0.344	18.86
372	1.2	0.0	59.863	0.161	1.22	83	1.85	73	52	71	99.9	84	0.118	0.344	18.94
373	1.1	0.1	60.023	0.160	1.22	83	1.86	73	52	71	99.1	84	0.117	0.342	18.90
374	1.1	0.0	60.182	0.159	1.22	83	1.86	73	52	72	98.8	85	0.117	0.342	18.87
375	1.1	0.0	60.342	0.160	1.22	83	1.85	73	52	72	99.7	85	0.116	0.341	18.84
376	1.0	0.1	60.502	0.160	1.22	83	1.86	73	52	71	99.6	84	0.118	0.344	18.87
377	1.0	0.0	60.663	0.161	1.22	83	1.86	73	52	72	100.1	84	0.115	0.339	18.82
378	1.0	0.0	60.823	0.160	1.22	83	1.86	73	52	72	99.8	85	0.117	0.342	18.79
379	0.9	0.1	60.982	0.159	1.22	83	1.86	73	52	72	99.1	85	0.117	0.342	18.88
380	0.9	0.0	61.142	0.160	1.22	83	1.85	73	52	72	99.5	85	0.117	0.342	18.88
381	0.9	0.0	61.303	0.161	1.22	83	1.86	73	52	72	100.2	85	0.117	0.342	18.88
382	0.8	0.1	61.463	0.160	1.21	83	1.87	73	52	72	99.5	84	0.117	0.342	18.87
383	0.8	0.0	61.622	0.159	1.22	83	1.86	73	52	72	98.8	84	0.117	0.342	18.86
384	0.8	0.0	61.782	0.160	1.22	83	1.86	73	52	72	99.3	84	0.118	0.344	18.90
385	0.7	0.1	61.942	0.160	1.22	83	1.85	73	52	72	99.4	84	0.115	0.339	18.82
386	0.7	0.0	62.103	0.161	1.21	83	1.86	73	52	72	100.3	84	0.118	0.344	18.82
387	0.7	0.0	62.263	0.160	1.22	83	1.85	73	52	72	99.6	84	0.116	0.341	18.86
388	0.7	0.0	62.423	0.160	1.22	83	1.86	73	52	72	99.4	83	0.118	0.344	18.86
389	0.6	0.1	62.582	0.159	1.22	83	1.86	73	52	72	98.5	83	0.118	0.344	18.93
390	0.6	0.0	62.742	0.160	1.22	83	1.86	73	52	72	99.1	83	0.116	0.341	18.85
391	0.6	0.0	62.903	0.161	1.23	83	1.86	73	52	72	100.1	83	0.117	0.342	18.81
392	0.5	0.1	63.063	0.160	1.22	83	1.86	73	52	72	99.4	83	0.118	0.344	18.89

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 2
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:18
Test Length: 409 min
Recording Interval: 1 min

Test Date: 2/28/24

Meter Box Y Regression Offset: 1.015
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.015
Sampling Box ID: 335

Sample Train Leak Checks

Pre-test	0	cfm @	17.11	in. Hg
Post-Test	0.001	cfm @	17.5	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	0.5	0.0	63.222	0.159	1.22	83	1.86	73	52	72	98.5	83	0.117	0.342	18.89
394	0.5	0.0	63.382	0.160	1.22	83	1.86	73	52	72	99.3	82	0.116	0.341	18.80
395	0.5	0.0	63.543	0.161	1.22	83	1.86	73	52	72	100.2	82	0.116	0.341	18.75
396	0.4	0.1	63.703	0.160	1.22	83	1.86	73	52	72	99.7	82	0.116	0.341	18.75
397	0.4	0.0	63.863	0.160	1.22	83	1.86	73	52	72	99.5	82	0.118	0.344	18.83
398	0.4	0.0	64.022	0.159	1.22	83	1.86	73	52	71	98.7	82	0.115	0.339	18.79
399	0.3	0.1	64.182	0.160	1.22	83	1.85	73	52	72	99.5	82	0.118	0.344	18.79
400	0.3	0.0	64.343	0.161	1.22	83	1.86	73	52	72	99.8	82	0.118	0.344	18.91
401	0.3	0.0	64.503	0.160	1.21	83	1.86	73	52	72	98.8	82	0.118	0.344	18.91
402	0.3	0.0	64.663	0.160	1.22	83	1.86	73	52	72	98.7	81	0.119	0.345	18.94
403	0.2	0.1	64.823	0.160	1.22	83	1.85	73	52	72	98.7	81	0.116	0.341	18.85
404	0.2	0.0	64.983	0.160	1.22	83	1.86	73	52	72	99.0	81	0.119	0.345	18.85
405	0.2	0.0	65.143	0.160	1.22	83	1.86	73	52	72	99.0	81	0.116	0.341	18.85
406	0.2	0.0	65.303	0.160	1.22	83	1.86	72	52	71	99.2	81	0.117	0.342	18.77
407	0.1	0.1	65.463	0.160	1.22	83	1.86	72	52	71	99.2	81	0.118	0.344	18.85
408	0.1	0.0	65.623	0.160	1.22	83	1.86	72	52	71	98.8	80	0.118	0.344	18.88
409	0.0	0.1	65.784	0.161	1.21	83	1.87	72	52	71	99.3	80	0.118	0.344	18.87

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)*
Tot / Avg	**65.607**	**0.160**	**0.96**	**81.2**	**2.10**	**71.61**	**51.95**	**100.0**	**482.5**	**198.2**	**172.0**	**276.6**	**314.3**	**605.5**	**4.2**
Minimum	0.000	0.146	0.51	73	2.00	69	45	94.2	390	180	150	230	245	497	258
Max	65.607	0.163	0.98	83	2.10	72	54	102.4	544	236	219	346	399	682	323
0	0.000		0.51	73	2.00	69	50		447	220	205	324	328	497	305
1	0.146	0.146	1.00	73	2.10	70	45	94.2	441	234	206	315	320	578	303
2	0.307	0.161	0.99	73	2.10	70	45	102.4	432	234	204	309	315	534	299
3	0.467	0.160	0.99	73	2.10	70	45	100.5	425	236	203	303	309	527	295
4	0.626	0.159	0.98	73	2.10	70	45	100.5	418	234	202	297	304	525	291
5	0.786	0.160	0.98	73	2.10	70	45	101.5	412	224	200	291	299	521	285
6	0.945	0.159	0.98	74	2.10	70	45	100.6	407	225	198	286	294	515	282
7	1.104	0.159	0.98	74	2.10	70	45	100.3	403	220	197	282	290	511	278
8	1.263	0.159	0.97	74	2.10	70	45	100.0	399	220	195	277	286	509	275
9	1.422	0.159	0.97	74	2.10	70	45	99.6	395	218	194	273	282	507	272
10	1.581	0.159	0.97	73	2.10	70	45	99.6	393	218	192	269	279	507	270
11	1.740	0.159	0.96	73	2.10	70	45	99.9	391	219	191	265	275	508	268
12	1.898	0.158	0.97	73	2.10	70	45	99.4	390	224	189	261	272	512	267
13	2.057	0.159	0.97	74	2.10	70	45	99.9	391	231	188	257	269	519	267
14	2.215	0.158	0.96	74	2.10	70	45	99.2	392	226	186	254	266	526	265
15	2.374	0.159	0.97	74	2.10	70	45	99.8	395	226	185	251	264	531	264
16	2.533	0.159	0.96	74	2.10	70	45	100.0	397	224	183	248	261	533	263
17	2.691	0.158	0.96	74	2.10	70	45	99.6	399	224	182	246	259	536	262
18	2.850	0.159	0.95	74	2.10	70	45	100.1	402	220	181	243	257	539	261
19	3.008	0.158	0.96	75	2.10	70	45	99.1	405	218	179	242	255	545	260
20	3.166	0.158	0.96	75	2.10	70	46	98.7	409	217	178	240	254	550	260
21	3.325	0.159	0.95	75	2.10	70	46	99.4	413	216	177	239	252	553	259
22	3.483	0.158	0.96	75	2.10	70	46	99.2	416	215	176	237	251	556	259
23	3.642	0.159	0.96	76	2.10	70	46	99.7	419	214	174	236	250	558	259
24	3.800	0.158	0.96	76	2.10	70	46	98.6	422	214	173	235	249	559	259
25	3.958	0.158	0.96	76	2.10	70	46	98.6	424	213	172	234	248	559	258
26	4.117	0.159	0.96	76	2.10	71	47	99.4	426	213	171	233	247	561	258
27	4.277	0.160	1.00	76	2.10	71	47	100.0	428	214	170	232	246	563	258
28	4.438	0.161	0.99	76	2.10	71	47	100.8	430	214	169	231	246	567	258
29	4.600	0.162	1.00	76	2.10	71	47	101.7	432	214	168	231	245	571	258
30	4.761	0.161	0.99	77	2.10	71	47	101.0	435	214	167	231	245	575	258
31	4.922	0.161	0.99	77	2.10	71	47	100.6	437	213	166	231	245	579	258
32	5.083	0.161	1.00	77	2.10	71	47	100.4	440	213	166	231	245	581	259
33	5.245	0.162	0.99	77	2.10	71	48	101.0	443	213	165	231	245	583	259
34	5.406	0.161	0.99	77	2.10	71	48	100.4	445	212	164	230	245	586	259
35	5.567	0.161	0.99	77	2.10	71	48	100.5	448	212	163	230	245	588	260
36	5.729	0.162	0.99	77	2.10	71	48	101.3	451	212	162	230	245	594	260
37	5.890	0.161	0.99	78	2.10	71	48	100.6	455	212	162	230	246	599	261
38	6.050	0.160	0.99	78	2.10	71	48	99.9	459	211	161	231	246	603	262
39	6.212	0.162	0.99	78	2.10	71	48	100.9	463	211	160	231	247	606	262
40	6.374	0.162	0.99	78	2.10	71	48	100.5	467	211	160	231	247	608	263

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)
41	6.534	0.160	0.99	78	2.10	71	48	99.4	470	210	159	232	248	608	264
42	6.695	0.161	0.99	78	2.10	71	49	100.5	473	210	159	232	249	608	265
43	6.857	0.162	0.99	78	2.10	71	49	101.1	475	209	158	232	249	608	265
44	7.019	0.162	0.99	78	2.10	71	49	100.9	476	208	157	233	250	609	265
45	7.180	0.161	0.99	78	2.10	71	49	100.3	477	208	157	233	251	609	265
46	7.341	0.161	0.99	79	2.10	71	49	100.2	479	207	157	234	252	609	266
47	7.503	0.162	0.99	79	2.10	71	49	100.9	479	207	156	234	253	609	266
48	7.664	0.161	0.99	79	2.10	71	49	100.5	480	207	156	235	254	609	266
49	7.825	0.161	0.99	79	2.10	71	49	100.5	481	206	155	235	256	610	267
50	7.986	0.161	0.99	79	2.10	71	49	100.4	482	205	155	236	257	612	267
51	8.149	0.163	0.99	79	2.10	71	49	101.6	483	205	155	236	260	612	268
52	8.309	0.160	0.99	79	2.10	71	50	99.8	484	205	154	237	262	613	268
53	8.471	0.162	0.99	79	2.10	71	50	101.0	485	205	154	238	264	613	269
54	8.632	0.161	0.99	79	2.10	71	50	100.1	486	204	154	238	266	613	270
55	8.794	0.162	0.99	79	2.10	71	50	100.5	487	204	153	239	268	614	270
56	8.955	0.161	0.98	79	2.10	71	50	100.1	488	204	153	240	270	616	271
57	9.115	0.160	0.98	79	2.10	71	50	100.1	489	204	153	241	272	617	272
58	9.276	0.161	0.98	79	2.10	71	50	100.8	490	203	153	242	275	618	273
59	9.436	0.160	0.98	79	2.10	71	50	99.8	491	203	153	243	277	617	273
60	9.597	0.161	0.98	80	2.10	71	50	100.2	493	202	152	244	279	616	274
61	9.758	0.161	0.98	80	2.10	71	50	100.3	496	202	152	244	280	619	275
62	9.919	0.161	0.97	80	2.10	71	50	100.4	498	204	152	245	281	622	276
63	10.079	0.160	0.98	80	2.10	71	50	99.8	499	204	152	246	282	625	277
64	10.240	0.161	0.98	80	2.10	71	51	100.5	502	204	152	246	282	627	277
65	10.401	0.161	0.98	80	2.10	71	51	100.7	504	204	152	247	283	628	278
66	10.562	0.161	0.98	80	2.10	71	51	100.9	505	204	151	247	283	627	278
67	10.723	0.161	0.99	80	2.10	71	51	100.6	507	203	151	248	283	629	278
68	10.885	0.162	0.98	80	2.10	71	51	100.9	507	203	151	248	284	630	279
69	11.045	0.160	0.98	80	2.10	71	51	99.7	508	203	151	248	284	630	279
70	11.205	0.160	0.98	80	2.10	71	51	99.8	508	203	151	248	284	630	279
71	11.367	0.162	0.98	80	2.10	71	51	100.9	508	203	151	249	284	630	279
72	11.528	0.161	0.98	80	2.10	71	51	100.2	508	202	151	249	285	630	279
73	11.689	0.161	0.98	80	2.10	71	51	100.4	508	202	151	249	285	632	279
74	11.850	0.161	0.98	80	2.10	71	51	100.3	508	201	151	249	285	633	279
75	12.011	0.161	0.98	80	2.10	71	51	99.9	508	201	151	249	285	634	279
76	12.172	0.161	0.98	80	2.10	71	51	100.1	509	201	150	249	285	638	279
77	12.332	0.160	0.98	80	2.10	71	51	100.0	510	200	150	249	286	640	279
78	12.494	0.162	0.98	80	2.10	71	51	101.6	511	200	150	249	286	643	279
79	12.655	0.161	0.98	81	2.10	71	51	100.8	512	200	150	249	286	644	279
80	12.816	0.161	0.98	81	2.10	71	51	100.3	513	200	150	249	287	645	280
81	12.977	0.161	0.98	81	2.10	71	51	100.3	514	200	150	249	287	648	280
82	13.139	0.162	0.98	81	2.10	71	51	101.1	516	199	150	249	288	651	280
83	13.299	0.160	0.98	81	2.10	71	51	99.9	518	199	150	249	288	654	281
84	13.460	0.161	0.98	81	2.10	71	51	100.9	519	199	150	249	288	656	281

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)
85	13.621	0.161	0.98	81	2.10	71	51	100.9	522	199	150	249	289	659	282
86	13.782	0.161	0.98	81	2.10	71	51	100.5	524	199	150	249	289	660	282
87	13.943	0.161	0.98	81	2.10	71	51	100.3	527	199	150	249	290	664	283
88	14.104	0.161	0.98	81	2.10	71	51	100.6	529	199	150	250	291	666	284
89	14.266	0.162	0.98	81	2.10	71	51	101.2	531	199	150	250	291	668	284
90	14.426	0.160	0.97	81	2.10	71	51	99.7	534	198	150	250	292	671	285
91	14.587	0.161	0.98	81	2.10	71	51	100.3	536	198	151	251	293	671	286
92	14.748	0.161	0.98	81	2.10	71	51	100.5	538	198	151	251	294	672	286
93	14.910	0.162	0.98	81	2.10	71	52	101.1	539	198	151	251	294	672	287
94	15.070	0.160	0.98	81	2.10	71	52	99.6	540	198	151	252	295	671	287
95	15.231	0.161	0.98	81	2.10	71	52	100.3	540	198	151	252	296	670	287
96	15.393	0.162	0.98	81	2.10	71	52	101.0	541	198	151	252	297	669	288
97	15.554	0.161	0.97	81	2.10	71	52	100.1	540	198	151	253	298	666	288
98	15.715	0.161	0.98	81	2.10	71	52	100.2	539	198	151	253	299	663	288
99	15.876	0.161	0.98	81	2.10	71	52	100.5	537	198	151	253	300	659	288
100	16.038	0.162	0.98	81	2.10	71	52	101.0	535	198	151	254	301	656	288
101	16.198	0.160	0.98	81	2.10	71	52	99.6	532	198	152	254	302	653	288
102	16.359	0.161	0.98	81	2.10	71	52	100.2	530	198	152	254	303	650	287
103	16.521	0.162	0.98	81	2.10	71	52	100.9	527	198	152	254	304	647	287
104	16.682	0.161	0.97	81	2.10	71	52	100.1	524	198	152	254	305	644	287
105	16.843	0.161	0.98	81	2.10	71	52	100.0	522	198	152	254	306	642	286
106	17.003	0.160	0.98	81	2.10	72	52	99.6	520	198	152	255	306	641	286
107	17.166	0.163	0.97	81	2.10	72	52	101.7	518	198	152	255	306	640	286
108	17.326	0.160	0.98	81	2.10	72	52	100.0	516	198	152	255	307	639	286
109	17.487	0.161	0.98	81	2.10	72	52	100.9	515	198	152	255	307	638	285
110	17.649	0.162	0.98	81	2.10	72	52	101.2	514	198	152	256	307	638	285
111	17.810	0.161	0.97	81	2.10	72	52	100.2	514	198	153	256	307	639	286
112	17.971	0.161	0.97	81	2.10	72	52	100.1	514	198	153	256	307	641	286
113	18.132	0.161	0.98	81	2.10	72	52	100.0	513	198	153	256	307	642	285
114	18.294	0.162	0.97	81	2.10	72	52	100.5	514	197	153	256	307	643	285
115	18.455	0.161	0.97	81	2.10	72	52	100.0	514	196	153	257	308	644	286
116	18.615	0.160	0.98	81	2.10	72	52	99.9	515	196	153	257	308	645	286
117	18.777	0.162	0.98	82	2.10	72	52	101.3	515	195	153	257	308	646	286
118	18.938	0.161	0.98	82	2.10	72	52	100.5	516	194	153	257	309	646	286
119	19.099	0.161	0.98	82	2.10	72	52	100.4	516	194	153	257	309	645	286
120	19.260	0.161	0.98	82	2.10	72	52	100.1	517	193	154	257	309	646	286
121	19.422	0.162	0.98	82	2.10	72	52	100.5	517	192	154	257	309	645	286
122	19.583	0.161	0.97	82	2.10	72	52	100.2	517	191	154	257	310	643	286
123	19.744	0.161	0.97	82	2.10	72	52	100.3	516	190	154	257	310	642	285
124	19.905	0.161	0.98	82	2.10	72	52	99.8	516	190	154	258	310	641	286
125	20.067	0.162	0.97	82	2.10	72	52	100.6	515	189	154	258	311	640	285
126	20.227	0.160	0.98	82	2.10	72	52	99.5	515	189	155	258	311	640	286
127	20.388	0.161	0.98	82	2.10	72	52	100.0	514	189	154	259	312	639	286
128	20.550	0.162	0.98	82	2.10	72	52	100.6	514	189	155	259	312	639	286

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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	20.712	0.162	0.97	82	2.10	72	52	100.6	514	190	155	260	313	640	286
130	20.872	0.160	0.97	82	2.10	72	52	99.2	513	189	155	260	313	640	286
131	21.033	0.161	0.98	82	2.10	72	52	100.2	513	188	155	260	314	641	286
132	21.195	0.162	0.97	82	2.10	72	52	101.1	513	186	155	260	315	642	286
133	21.356	0.161	0.97	82	2.10	72	52	100.1	513	186	155	261	316	643	286
134	21.517	0.161	0.97	82	2.10	72	52	99.6	514	186	156	261	316	645	287
135	21.678	0.161	0.98	82	2.10	72	52	99.7	515	185	156	261	317	647	287
136	21.840	0.162	0.97	82	2.10	72	52	100.5	516	185	156	261	318	648	287
137	22.001	0.161	0.98	82	2.10	72	52	100.1	516	185	156	261	319	649	287
138	22.162	0.161	0.98	82	2.10	72	52	100.5	516	184	156	262	320	649	288
139	22.324	0.162	0.98	82	2.10	72	52	101.3	517	184	157	262	320	649	288
140	22.485	0.161	0.97	82	2.10	72	52	100.5	517	184	157	262	321	649	288
141	22.645	0.160	0.97	82	2.10	72	52	99.5	517	185	157	263	322	649	289
142	22.806	0.161	0.98	82	2.10	72	52	100.2	517	185	157	263	323	649	289
143	22.968	0.162	0.97	82	2.10	72	52	100.9	517	186	158	263	324	649	290
144	23.129	0.161	0.97	82	2.10	72	52	100.3	517	185	158	263	326	649	290
145	23.290	0.161	0.98	82	2.10	72	52	100.3	517	185	158	264	327	649	290
146	23.451	0.161	0.98	82	2.10	72	52	100.3	517	185	158	264	328	649	290
147	23.613	0.162	0.97	82	2.10	72	52	101.1	517	185	159	265	331	649	291
148	23.773	0.160	0.97	82	2.10	72	52	100.0	516	185	159	265	333	650	292
149	23.934	0.161	0.98	82	2.10	72	52	100.3	517	185	159	265	335	650	292
150	24.097	0.163	0.97	82	2.10	72	52	101.3	517	185	159	266	336	651	293
151	24.257	0.160	0.97	82	2.10	72	52	99.5	517	185	159	266	339	651	293
152	24.418	0.161	0.98	82	2.10	72	52	100.4	517	185	160	266	340	651	294
153	24.579	0.161	0.98	82	2.10	72	52	100.5	518	186	160	266	342	651	294
154	24.741	0.162	0.97	82	2.10	72	52	101.2	518	186	160	267	344	652	295
155	24.901	0.160	0.97	82	2.10	72	52	100.1	519	186	160	267	345	653	295
156	25.062	0.161	0.98	82	2.10	72	53	100.6	520	186	161	268	346	655	296
157	25.224	0.162	0.97	82	2.10	72	52	100.9	520	186	161	268	347	656	296
158	25.385	0.161	0.97	82	2.10	72	53	99.8	521	186	161	268	348	656	297
159	25.546	0.161	0.97	82	2.10	72	53	99.8	522	186	161	269	349	657	297
160	25.707	0.161	0.98	82	2.10	72	53	100.1	523	186	162	269	350	658	298
161	25.869	0.162	0.97	82	2.10	72	53	101.0	524	186	162	270	351	659	299
162	26.030	0.161	0.97	82	2.10	72	53	100.8	525	186	162	270	352	659	299
163	26.191	0.161	0.98	82	2.10	72	53	100.7	526	186	162	270	352	660	299
164	26.353	0.162	0.98	82	2.10	72	53	100.9	527	186	162	271	353	660	300
165	26.514	0.161	0.97	82	2.10	72	53	100.2	527	186	163	272	354	661	300
166	26.675	0.161	0.97	82	2.10	72	53	100.4	528	186	163	272	355	661	301
167	26.836	0.161	0.97	82	2.10	72	53	100.5	529	186	163	272	355	661	301
168	26.998	0.162	0.97	82	2.10	72	53	100.8	530	186	164	273	356	661	302
169	27.158	0.160	0.97	82	2.10	72	53	99.6	530	186	164	273	357	661	302
170	27.319	0.161	0.98	82	2.10	72	53	100.6	531	186	164	274	357	660	302
171	27.481	0.162	0.97	82	2.10	72	53	101.4	531	186	164	275	358	660	303
172	27.642	0.161	0.97	82	2.10	72	53	100.7	532	186	164	275	359	659	303

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)
173	27.803	0.161	0.97	82	2.10	72	53	100.6	532	186	165	276	360	658	304
174	27.964	0.161	0.97	82	2.10	72	53	100.7	532	186	165	276	360	658	304
175	28.126	0.162	0.97	82	2.10	72	53	101.4	531	187	165	277	361	659	304
176	28.287	0.161	0.97	82	2.10	72	53	100.8	532	187	166	278	362	660	305
177	28.448	0.161	0.97	82	2.10	72	53	100.7	532	187	166	278	363	661	305
178	28.609	0.161	0.98	82	2.10	72	53	100.7	532	187	166	279	364	662	306
179	28.771	0.162	0.97	82	2.10	72	53	101.6	532	187	166	279	365	662	306
180	28.932	0.161	0.98	82	2.10	72	53	101.0	532	187	166	280	367	662	306
181	29.093	0.161	0.98	82	2.10	72	53	100.7	532	187	167	280	370	662	307
182	29.255	0.162	0.97	82	2.10	72	53	101.2	532	187	167	281	372	662	308
183	29.416	0.161	0.97	82	2.10	72	53	100.5	533	187	167	281	374	663	308
184	29.577	0.161	0.97	82	2.10	72	53	100.4	534	187	167	282	376	665	309
185	29.738	0.161	0.97	82	2.10	72	53	100.3	534	187	168	282	378	668	310
186	29.900	0.162	0.97	82	2.10	72	53	100.9	536	187	168	283	379	671	311
187	30.061	0.161	0.97	82	2.10	72	53	100.5	537	187	168	284	381	672	311
188	30.222	0.161	0.97	82	2.10	72	53	100.6	539	187	169	284	382	674	312
189	30.383	0.161	0.97	82	2.10	72	53	100.5	541	188	169	285	383	678	313
190	30.545	0.162	0.97	82	2.10	72	53	101.1	542	188	169	286	386	682	314
191	30.706	0.161	0.97	82	2.10	72	53	100.4	543	188	170	286	387	682	315
192	30.867	0.161	0.97	82	2.10	72	53	100.0	543	188	170	287	389	680	315
193	31.029	0.162	0.97	82	2.10	72	53	101.0	544	188	170	288	391	677	316
194	31.190	0.161	0.97	82	2.10	72	53	100.9	543	188	170	288	392	675	316
195	31.351	0.161	0.97	82	2.10	72	53	100.8	542	188	170	289	393	673	316
196	31.512	0.161	0.97	82	2.10	72	53	100.5	540	188	171	289	394	670	316
197	31.674	0.162	0.97	82	2.10	72	53	101.1	539	188	171	290	395	668	317
198	31.834	0.160	0.97	82	2.10	72	53	99.7	538	188	171	291	395	666	317
199	31.995	0.161	0.97	82	2.10	72	53	100.0	537	188	171	292	396	664	317
200	32.157	0.162	0.97	82	2.10	72	53	100.7	536	188	172	292	396	663	317
201	32.318	0.161	0.97	82	2.10	72	53	100.1	535	187	172	293	397	662	317
202	32.479	0.161	0.97	82	2.10	72	53	100.1	534	187	172	294	397	661	317
203	32.640	0.161	0.98	82	2.10	72	53	100.3	534	188	172	295	397	660	317
204	32.802	0.162	0.97	82	2.10	72	53	100.7	533	188	172	296	397	659	317
205	32.963	0.161	0.97	82	2.10	72	53	100.0	533	188	172	297	397	659	317
206	33.124	0.161	0.97	82	2.10	72	53	100.3	533	188	173	297	397	658	318
207	33.286	0.162	0.97	82	2.10	72	53	100.9	532	188	173	298	398	658	318
208	33.448	0.162	0.97	82	2.10	72	53	100.5	532	189	173	298	398	658	318
209	33.609	0.161	0.97	82	2.10	72	53	99.7	532	189	173	299	399	658	318
210	33.770	0.161	0.97	82	2.10	72	53	100.2	532	190	174	300	398	658	319
211	33.931	0.161	0.97	82	2.10	72	53	100.4	532	190	174	304	396	663	319
212	34.093	0.162	0.97	82	2.10	71	53	100.9	534	190	174	307	394	669	320
213	34.254	0.161	0.97	82	2.10	71	53	100.6	535	190	174	311	392	672	320
214	34.413	0.159	0.90	82	2.00	71	53	99.8	538	190	174	314	390	674	321
215	34.574	0.161	0.96	82	2.10	72	53	101.1	540	190	175	317	388	674	322
216	34.733	0.159	0.95	82	2.10	72	53	99.5	541	190	175	320	387	673	323

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)
217	34.893	0.160	0.96	82	2.10	72	53	100.0	541	191	175	322	385	670	323
218	35.054	0.161	0.96	82	2.10	72	53	100.4	541	191	175	325	383	666	323
219	35.214	0.160	0.96	82	2.10	72	53	99.4	541	191	175	328	382	661	323
220	35.374	0.160	0.96	82	2.10	72	53	99.4	540	191	175	331	380	657	323
221	35.535	0.161	0.95	82	2.10	72	53	100.3	538	191	175	333	378	653	323
222	35.694	0.159	0.95	82	2.10	72	53	99.2	537	191	175	334	377	649	323
223	35.854	0.160	0.95	82	2.10	72	53	99.8	535	191	175	336	376	646	323
224	36.015	0.161	0.96	82	2.10	72	53	100.3	534	191	175	338	375	643	323
225	36.174	0.159	0.96	82	2.10	72	53	99.1	532	192	175	339	373	640	322
226	36.334	0.160	0.95	82	2.10	72	53	100.2	529	192	175	340	372	637	322
227	36.495	0.161	0.95	82	2.10	72	53	100.9	527	192	175	341	371	634	321
228	36.654	0.159	0.95	82	2.10	72	53	99.4	526	192	175	342	370	632	321
229	36.814	0.160	0.96	82	2.10	72	53	100.1	524	192	175	343	369	629	321
230	36.975	0.161	0.96	82	2.10	72	53	100.7	522	192	175	343	368	625	320
231	37.134	0.159	0.95	82	2.10	72	53	99.2	519	192	175	344	368	622	320
232	37.294	0.160	0.95	82	2.10	72	53	99.8	517	192	175	345	366	619	319
233	37.455	0.161	0.95	82	2.10	72	53	100.7	515	192	175	345	366	616	319
234	37.614	0.159	0.95	82	2.10	72	53	99.6	512	192	175	345	365	614	318
235	37.774	0.160	0.95	82	2.10	72	53	100.2	510	192	175	346	364	611	317
236	37.935	0.161	0.96	82	2.10	72	53	100.6	508	192	175	346	363	609	317
237	38.094	0.159	0.95	82	2.10	72	53	99.3	506	193	175	346	362	607	316
238	38.254	0.160	0.95	82	2.10	72	53	100.2	503	193	176	345	361	605	316
239	38.415	0.161	0.95	82	2.10	72	53	100.8	501	193	176	345	360	602	315
240	38.574	0.159	0.95	82	2.10	72	53	99.3	498	193	176	345	359	600	314
241	38.733	0.159	0.95	82	2.10	72	53	99.2	496	193	176	344	358	598	313
242	38.894	0.161	0.95	82	2.10	72	53	100.5	493	193	176	344	357	595	313
243	39.054	0.160	0.95	82	2.10	72	53	100.0	491	194	176	343	356	592	312
244	39.213	0.159	0.95	82	2.10	72	53	99.3	488	194	176	343	355	590	311
245	39.374	0.161	0.95	82	2.10	72	53	100.4	486	194	176	342	353	587	310
246	39.534	0.160	0.95	82	2.10	72	53	99.9	483	194	176	342	352	585	309
247	39.693	0.159	0.95	82	2.10	72	53	99.7	481	194	176	341	351	583	309
248	39.854	0.161	0.96	82	2.10	72	53	100.6	478	195	177	340	350	581	308
249	40.014	0.160	0.95	82	2.10	72	53	99.3	476	195	177	339	349	579	307
250	40.173	0.159	0.95	82	2.10	72	53	98.6	474	195	177	338	348	578	306
251	40.333	0.160	0.95	82	2.10	72	53	99.5	473	195	177	337	347	576	306
252	40.493	0.160	0.95	82	2.10	72	53	99.3	471	195	177	336	346	575	305
253	40.652	0.159	0.95	82	2.10	72	53	98.6	469	196	177	334	345	574	304
254	40.813	0.161	0.95	82	2.10	72	53	100.3	468	196	177	333	344	572	304
255	40.973	0.160	0.95	82	2.10	72	53	100.0	466	196	177	331	343	570	303
256	41.132	0.159	0.95	82	2.10	72	53	99.4	465	196	177	330	342	569	302
257	41.293	0.161	0.95	82	2.10	72	53	100.5	463	196	177	329	341	568	301
258	41.452	0.159	0.95	82	2.10	72	53	99.3	462	197	177	327	340	567	301
259	41.612	0.160	0.95	82	2.10	72	53	99.9	460	197	178	328	339	565	300
260	41.772	0.160	0.95	82	2.10	72	53	99.5	458	197	177	329	338	563	300

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)
261	41.932	0.160	0.95	82	2.10	72	53	99.3	457	197	177	329	337	561	299
262	42.091	0.159	0.95	82	2.10	72	53	98.6	455	197	177	329	336	560	299
263	42.252	0.161	0.95	82	2.10	72	53	99.6	453	198	177	329	335	558	298
264	42.412	0.160	0.95	82	2.10	72	53	99.0	451	198	177	329	334	557	298
265	42.571	0.159	0.95	82	2.10	72	53	98.6	450	198	177	329	333	556	297
266	42.732	0.161	0.95	82	2.10	72	53	100.3	448	198	177	328	332	555	297
267	42.892	0.160	0.95	82	2.10	72	53	99.8	447	198	177	328	331	554	296
268	43.051	0.159	0.95	82	2.10	72	53	98.8	446	198	177	327	330	553	296
269	43.211	0.160	0.95	82	2.10	72	53	99.3	445	198	177	327	329	552	295
270	43.371	0.160	0.95	82	2.10	72	53	99.3	444	198	177	326	328	551	295
271	43.530	0.159	0.95	82	2.10	72	53	98.7	443	198	176	326	327	551	294
272	43.691	0.161	0.95	82	2.10	72	53	100.1	442	198	176	325	326	551	293
273	43.851	0.160	0.94	82	2.10	72	53	99.6	442	199	176	324	325	553	293
274	44.010	0.159	0.95	82	2.10	72	53	99.1	441	199	176	324	324	551	293
275	44.170	0.160	0.95	82	2.10	72	53	99.5	440	199	176	323	323	548	292
276	44.331	0.161	0.95	82	2.10	72	53	100.0	439	199	176	322	322	546	292
277	44.490	0.159	0.95	82	2.10	72	53	98.9	438	199	176	321	321	544	291
278	44.650	0.160	0.95	82	2.10	72	53	99.8	437	199	176	320	320	543	290
279	44.810	0.160	0.95	82	2.10	72	53	99.8	436	199	175	319	319	542	290
280	44.969	0.159	0.95	82	2.10	72	53	99.1	435	199	175	317	318	541	289
281	45.130	0.161	0.95	82	2.10	72	53	100.3	434	199	175	316	318	539	288
282	45.290	0.160	0.95	82	2.10	72	53	99.5	433	199	175	315	317	538	288
283	45.449	0.159	0.95	82	2.10	72	53	98.8	432	199	175	314	316	537	287
284	45.610	0.161	0.95	82	2.10	72	53	100.3	431	199	175	312	315	535	286
285	45.770	0.160	0.95	82	2.10	72	53	99.5	430	199	174	311	315	534	286
286	45.929	0.159	0.95	82	2.10	72	53	98.5	429	199	174	310	314	533	285
287	46.090	0.161	0.95	82	2.10	72	53	99.9	428	199	174	309	313	531	285
288	46.250	0.160	0.94	82	2.10	72	53	99.8	427	199	174	308	313	531	284
289	46.410	0.160	0.95	82	2.10	72	53	99.9	425	199	174	306	312	530	283
290	46.570	0.160	0.95	82	2.10	72	53	99.5	424	199	174	305	311	530	283
291	46.730	0.160	0.95	83	2.10	72	53	99.0	423	199	174	305	311	529	282
292	46.890	0.160	0.95	83	2.10	72	53	98.7	422	199	174	304	310	528	282
293	47.050	0.160	0.95	83	2.10	72	53	98.9	421	199	174	303	309	528	281
294	47.210	0.160	0.94	83	2.10	72	53	99.3	420	199	173	302	308	527	280
295	47.370	0.160	0.95	83	2.10	72	53	99.6	419	199	173	301	308	527	280
296	47.529	0.159	0.95	83	2.10	72	53	98.9	418	199	173	300	307	526	279
297	47.690	0.161	0.95	83	2.10	72	53	99.8	418	199	173	299	307	526	279
298	47.850	0.160	0.95	83	2.10	72	53	99.4	417	198	173	298	306	526	278
299	48.009	0.159	0.95	83	2.10	72	53	99.2	416	198	173	297	305	526	278
300	48.170	0.161	0.95	83	2.10	72	53	100.4	415	198	173	296	305	527	277
301	48.329	0.159	0.95	83	2.10	72	53	99.1	415	198	173	295	304	527	277
302	48.489	0.160	0.95	83	2.10	72	53	99.6	415	198	173	294	303	528	277
303	48.650	0.161	0.95	83	2.10	72	53	100.0	415	198	173	293	302	529	276
304	48.809	0.159	0.95	83	2.10	72	53	98.9	415	198	173	291	302	530	276

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)
305	48.969	0.160	0.95	83	2.10	72	53	99.7	415	198	173	290	301	530	275
306	49.130	0.161	0.95	83	2.10	72	53	100.3	415	198	173	288	300	530	275
307	49.289	0.159	0.95	83	2.10	72	53	99.2	415	198	173	287	299	531	274
308	49.449	0.160	0.95	83	2.10	72	53	99.9	415	198	173	285	298	531	274
309	49.610	0.161	0.95	83	2.10	72	53	100.3	415	198	172	283	298	531	273
310	49.769	0.159	0.95	83	2.10	72	53	98.7	416	197	172	282	297	531	273
311	49.929	0.160	0.95	83	2.10	72	53	99.2	416	196	172	280	296	530	272
312	50.090	0.161	0.95	83	2.10	72	53	100.1	416	196	172	279	296	530	272
313	50.249	0.159	0.95	83	2.10	72	53	99.0	416	196	172	277	296	531	271
314	50.409	0.160	0.95	83	2.10	72	53	99.4	417	196	172	276	295	531	271
315	50.569	0.160	0.95	83	2.10	72	53	99.3	417	196	172	275	295	531	271
316	50.729	0.160	0.95	83	2.10	72	53	99.3	417	195	172	274	295	532	271
317	50.889	0.160	0.95	83	2.10	72	53	99.4	417	194	172	272	295	533	270
318	51.049	0.160	0.95	83	2.10	72	53	99.3	418	194	172	271	294	533	270
319	51.209	0.160	0.95	83	2.10	72	53	99.3	418	196	172	270	294	534	270
320	51.369	0.160	0.95	83	2.10	72	53	99.4	418	196	172	269	294	535	270
321	51.530	0.161	0.95	83	2.10	72	54	99.9	419	196	172	268	294	536	270
322	51.690	0.160	0.95	83	2.10	71	54	99.1	419	196	172	267	294	536	270
323	51.850	0.160	0.95	83	2.10	71	54	99.1	420	195	172	266	294	537	269
324	52.011	0.161	0.94	83	2.10	71	54	100.0	420	194	172	265	294	537	269
325	52.170	0.159	0.95	83	2.10	71	54	99.0	420	196	172	265	294	536	269
326	52.330	0.160	0.95	83	2.10	71	54	99.5	421	198	172	264	295	536	270
327	52.491	0.161	0.95	83	2.10	71	54	100.0	420	198	172	263	295	536	270
328	52.651	0.160	0.94	82	2.10	71	53	99.5	420	198	172	263	294	536	269
329	52.810	0.159	0.95	82	2.10	71	53	98.9	420	196	173	262	294	536	269
330	52.971	0.161	0.95	82	2.10	71	53	100.3	420	193	173	261	293	535	268
331	53.131	0.160	0.94	82	2.10	71	53	99.5	420	192	173	261	293	535	268
332	53.291	0.160	0.95	82	2.10	71	53	99.3	419	189	173	260	293	534	267
333	53.451	0.160	0.95	82	2.10	71	53	99.7	419	189	173	259	292	534	266
334	53.612	0.161	0.94	82	2.10	71	53	100.9	419	190	173	258	291	534	266
335	53.771	0.159	0.94	82	2.10	71	53	99.6	419	192	173	258	291	533	267
336	53.931	0.160	0.95	82	2.10	71	53	99.9	418	196	173	257	290	532	267
337	54.092	0.161	0.95	82	2.10	71	53	100.5	418	197	173	256	289	532	267
338	54.251	0.159	0.95	82	2.10	71	53	99.1	418	198	174	255	288	532	267
339	54.411	0.160	0.95	82	2.10	71	53	99.5	418	197	174	255	288	532	266
340	54.572	0.161	0.94	82	2.10	71	53	100.3	417	194	174	254	287	532	265
341	54.731	0.159	0.95	82	2.10	71	53	99.2	418	194	174	253	286	533	265
342	54.891	0.160	0.95	82	2.10	71	53	99.5	418	192	174	253	286	534	265
343	55.052	0.161	0.95	82	2.10	71	53	99.9	418	190	175	252	286	535	264
344	55.211	0.159	0.95	82	2.10	71	53	98.7	419	187	175	251	285	537	263
345	55.371	0.160	0.95	82	2.10	72	53	99.6	420	189	175	251	285	539	264
346	55.532	0.161	0.94	82	2.10	72	53	100.4	421	192	176	251	285	541	265
347	55.691	0.159	0.94	82	2.10	72	53	99.3	422	192	176	250	284	543	265
348	55.851	0.160	0.95	82	2.10	72	53	99.8	424	189	176	250	284	545	265

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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)*
349	56.012	0.161	0.95	82	2.10	72	53	100.1	425	187	177	250	284	547	265
350	56.171	0.159	0.94	82	2.10	72	53	98.7	427	184	177	250	284	549	264
351	56.331	0.160	0.95	82	2.10	72	53	99.5	429	182	178	250	284	552	265
352	56.492	0.161	0.95	82	2.10	72	53	100.6	431	181	178	250	284	555	265
353	56.651	0.159	0.95	82	2.10	72	53	99.5	433	182	179	250	284	558	266
354	56.811	0.160	0.95	82	2.10	72	53	99.9	435	181	179	250	284	560	266
355	56.972	0.161	0.94	82	2.10	72	53	100.5	438	181	180	250	284	564	267
356	57.131	0.159	0.94	82	2.10	72	53	99.3	440	181	181	250	284	566	267
357	57.291	0.160	0.95	82	2.10	72	53	99.7	443	180	181	251	284	570	268
358	57.451	0.160	0.95	82	2.10	72	53	99.6	446	180	182	251	285	573	269
359	57.611	0.160	0.95	82	2.10	72	53	99.8	449	180	183	251	285	576	270
360	57.771	0.160	0.95	82	2.10	72	53	99.9	451	181	183	252	285	581	270
361	57.931	0.160	0.94	82	2.10	72	54	99.6	455	181	184	252	285	586	271
362	58.090	0.159	0.95	82	2.10	72	53	98.7	458	183	185	253	286	591	273
363	58.250	0.160	0.94	82	2.10	72	54	99.5	462	189	185	253	287	595	275
364	58.411	0.161	0.94	83	2.10	72	53	100.2	465	194	186	254	287	600	277
365	58.570	0.159	0.94	83	2.10	72	53	99.1	469	195	187	255	288	605	279
366	58.730	0.160	0.95	83	2.10	72	53	100.1	473	197	188	255	289	609	280
367	58.890	0.160	0.95	83	2.10	72	53	100.1	476	203	189	256	289	613	283
368	59.050	0.160	0.95	83	2.10	72	53	99.9	480	208	190	257	290	616	285
369	59.209	0.159	0.95	83	2.10	72	54	99.3	483	210	191	258	291	619	287
370	59.370	0.161	0.94	83	2.10	72	54	100.5	486	209	192	259	292	623	288
371	59.529	0.159	0.95	83	2.10	72	54	99.2	489	209	193	259	293	625	289
372	59.689	0.160	0.95	83	2.10	72	54	99.5	492	209	194	260	294	628	290
373	59.850	0.161	0.95	83	2.10	72	54	100.0	495	212	195	261	295	630	292
374	60.009	0.159	0.94	83	2.10	72	54	99.0	498	210	196	262	296	632	292
375	60.169	0.160	0.95	83	2.10	72	54	99.9	500	210	197	263	297	635	293
376	60.330	0.161	0.95	83	2.10	72	54	100.4	503	210	198	264	298	636	295
377	60.489	0.159	0.95	83	2.10	72	54	99.1	504	209	199	264	299	638	295
378	60.649	0.160	0.95	83	2.10	72	54	100.1	506	209	200	265	300	639	296
379	60.809	0.160	0.94	83	2.10	72	54	100.0	508	209	201	266	301	640	297
380	60.969	0.160	0.95	83	2.10	72	54	99.8	509	209	202	267	302	641	298
381	61.128	0.159	0.95	83	2.10	72	54	99.1	510	209	203	267	303	641	298
382	61.289	0.161	0.94	83	2.10	72	54	100.3	511	210	204	268	304	641	299
383	61.448	0.159	0.95	83	2.10	72	54	99.0	512	210	204	269	305	640	300
384	61.608	0.160	0.95	83	2.10	72	54	99.6	512	210	205	270	306	639	301
385	61.769	0.161	0.94	83	2.10	72	54	100.3	512	211	206	271	307	638	301
386	61.928	0.159	0.95	83	2.10	72	54	99.3	512	211	207	271	307	636	302
387	62.088	0.160	0.95	83	2.10	72	54	99.8	512	212	208	273	307	635	302
388	62.249	0.161	0.94	83	2.10	72	54	100.2	511	212	208	274	307	636	302
389	62.408	0.159	0.94	83	2.10	72	54	98.7	511	213	209	275	307	636	303
390	62.567	0.159	0.95	83	2.10	72	54	98.8	511	213	210	276	307	636	303
391	62.728	0.161	0.94	83	2.10	72	54	100.3	510	214	210	277	307	637	304
392	62.887	0.159	0.94	83	2.10	72	54	99.0	510	214	211	278	308	636	304

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 2 **Test Date:** 2/28/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.006
Meter Box Y Regression Slope: 0
Meter Box Dynamic Y: 1.006
Sampling Box ID: 336

Test Start Time: 11:18
Total Sampling Time: 409 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.36 in. Hg
Post-Test 0.001 cfm @ 19.5 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	63.047	0.160	0.94	83	2.10	72	54	99.4	509	214	212	279	308	636	304
394	63.208	0.161	0.94	83	2.10	72	54	100.1	509	214	212	279	308	636	304
395	63.367	0.159	0.95	83	2.10	72	54	99.2	509	214	213	280	308	636	305
396	63.527	0.160	0.94	83	2.10	72	54	99.9	509	215	213	281	308	636	305
397	63.687	0.160	0.94	83	2.10	72	54	99.7	508	215	214	282	309	636	306
398	63.847	0.160	0.94	83	2.10	72	54	99.6	508	216	214	283	309	636	306
399	64.006	0.159	0.95	83	2.10	72	54	99.1	508	216	214	284	309	636	306
400	64.167	0.161	0.94	83	2.10	72	54	100.0	508	216	215	284	309	635	306
401	64.326	0.159	0.94	83	2.10	72	54	98.5	507	216	216	285	309	634	307
402	64.486	0.160	0.94	83	2.10	72	54	98.9	507	216	216	286	310	634	307
403	64.647	0.161	0.94	83	2.10	72	54	99.6	507	216	216	287	310	633	307
404	64.806	0.159	0.95	83	2.10	72	54	98.6	506	216	217	288	310	632	307
405	64.966	0.160	0.94	83	2.10	72	54	99.2	506	217	217	289	310	631	308
406	65.127	0.161	0.94	83	2.10	72	54	100.0	505	217	218	290	310	631	308
407	65.286	0.159	0.94	83	2.10	72	54	98.8	505	217	218	291	310	630	308
408	65.446	0.160	0.95	83	2.10	72	54	99.0	504	217	219	292	311	629	309
409	65.607	0.161	0.95	83	2.10	72	54	99.5	504	218	219	293	311	628	309

Train C - First Hour Particulate Sampling

Run: 2
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 11:18
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 2/28/24

Meter Box Y Regression Offset: 1.01
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.010
Sample Box ID: 371

Sample Train Leak Checks
Pre-test 0 cfm @ 23.32 in. Hg
Post-Test 0 cfm @ 23.28 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	**9.585**	**0.160**	**2.15**	**69.2**	**-2.04**	**69.9**	**64.0**	**99.8**
Minimum	0.000	0.156	2.02	68	-2.32	68	64	97.2
Max	9.585	0.165	2.26	70	-1.74	71	64	102.5
0	0.000		2.08	68	-2.18	68	64	
1	0.159	0.159	2.21	68	-1.87	69	64	102.1
2	0.320	0.161	2.20	68	-1.91	69	64	102.0
3	0.480	0.160	2.17	68	-2.26	69	64	100.1
4	0.640	0.160	2.17	68	-1.91	69	64	100.7
5	0.801	0.161	2.16	68	-2.03	69	64	101.7
6	0.959	0.158	2.15	68	-2.19	69	64	99.7
7	1.119	0.160	2.14	68	-1.75	69	64	100.7
8	1.277	0.158	2.13	68	-1.74	69	64	99.2
9	1.436	0.159	2.12	69	-1.82	69	64	99.3
10	1.594	0.158	2.12	69	-2.22	69	64	98.5
11	1.753	0.159	2.11	69	-1.80	69	64	99.3
12	1.910	0.157	2.12	69	-2.10	69	64	98.1
13	2.068	0.158	2.10	69	-1.80	69	64	98.8
14	2.225	0.157	2.10	69	-1.93	69	64	98.1
15	2.383	0.158	2.10	69	-1.98	69	64	98.7
16	2.541	0.158	2.07	69	-2.12	69	64	99.0
17	2.698	0.157	2.08	69	-2.14	70	64	98.5
18	2.855	0.157	2.09	69	-2.10	70	64	98.4
19	3.012	0.157	2.09	69	-1.89	70	64	98.1
20	3.170	0.158	2.07	69	-2.16	70	64	98.4
21	3.326	0.156	2.09	69	-2.12	70	64	97.2
22	3.484	0.158	2.09	69	-1.89	70	64	98.9
23	3.642	0.158	2.07	69	-1.74	70	64	98.8
24	3.798	0.156	2.09	69	-2.22	70	64	97.3
25	3.956	0.158	2.09	69	-1.82	70	64	98.4
26	4.113	0.157	2.09	69	-2.09	70	64	98.0
27	4.271	0.158	2.08	69	-2.21	70	64	98.6
28	4.427	0.156	2.09	69	-1.74	70	64	97.4
29	4.585	0.158	2.08	69	-1.89	70	64	99.0
30	4.743	0.158	2.07	69	-1.88	70	64	99.0
31	4.899	0.156	2.08	69	-2.11	70	64	97.4
32	5.057	0.158	2.09	69	-2.22	70	64	98.5

Train C - First Hour Particulate Sampling

Run: 2
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 11:18
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 2/28/24

Meter Box Y Regression Offset: 1.01
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.010
Sample Box ID: 371

Sample Train Leak Checks
Pre-test 0 cfm @ 23.32 in. Hg
Post-Test 0 cfm @ 23.28 in. Hg

Elapsed Time (min)	**Train C Sampling System**							
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*
33	5.214	0.157	2.09	69	-2.18	70	64	97.8
34	5.371	0.157	2.07	69	-2.24	70	64	97.8
35	5.528	0.157	2.09	69	-2.23	70	64	97.9
36	5.685	0.157	2.08	69	-1.88	70	64	98.1
37	5.843	0.158	2.08	69	-2.13	70	64	98.7
38	6.000	0.157	2.08	69	-2.24	70	64	98.1
39	6.157	0.157	2.08	69	-2.10	70	64	97.9
40	6.315	0.158	2.02	69	-1.86	70	64	98.1
41	6.480	0.165	2.24	69	-2.17	70	64	102.5
42	6.643	0.163	2.25	70	-2.10	70	64	101.7
43	6.806	0.163	2.26	70	-1.95	70	64	101.6
44	6.970	0.164	2.25	70	-2.03	70	64	102.0
45	7.134	0.164	2.23	70	-2.29	70	64	102.0
46	7.297	0.163	2.25	70	-2.23	70	64	101.3
47	7.461	0.164	2.26	70	-1.90	70	64	102.2
48	7.625	0.164	2.25	70	-2.17	70	64	102.4
49	7.788	0.163	2.26	70	-2.03	70	64	101.7
50	7.952	0.164	2.26	70	-1.85	71	64	102.2
51	8.116	0.164	2.25	70	-1.98	71	64	102.1
52	8.280	0.164	2.26	70	-2.02	71	64	102.2
53	8.443	0.163	2.26	70	-2.32	71	64	101.6
54	8.608	0.165	2.26	70	-2.08	71	64	102.5
55	8.771	0.163	2.26	70	-2.10	71	64	101.0
56	8.934	0.163	2.26	70	-2.32	71	64	101.3
57	9.098	0.164	2.23	70	-2.09	71	64	102.5
58	9.260	0.162	2.24	70	-1.85	71	64	101.4
59	9.423	0.163	2.23	70	-2.11	71	64	101.6
60	9.585	0.162	2.19	70	-2.18	71	64	100.8

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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 (%)*
Tot / Avg	**65.909**	**0.161**	**1.69**	**71.1**	**-2.15**	**235.07**	**-0.050**	**36.4**	**0.00**	**8.59**
Minimum	0.000	0.158	1.64	69	-2.30	194.00	-0.056	0.0	0.00	0.46
Max	65.909	0.164	1.73	72	-2.00	261.00	-0.040	1040.0	0.43	12.06
0	0.000		1.47	69	-2.10	229	-0.040	1040.0	0.23	0.65
1	0.158	0.158	1.67	69	-2.10	224	-0.042	1040.0	0.25	0.46
2	0.318	0.160	1.67	69	-2.00	206	-0.042	1040.0	0.22	3.09
3	0.477	0.159	1.65	69	-2.00	198	-0.043	0.0	0.00	3.66
4	0.636	0.159	1.71	69	-2.00	196	-0.044	0.0	0.00	3.60
5	0.798	0.162	1.70	69	-2.00	195	-0.044	0.0	0.00	3.71
6	0.959	0.161	1.70	69	-2.00	196	-0.044	0.0	0.00	3.81
7	1.120	0.161	1.69	69	-2.10	196	-0.044	0.0	0.00	4.00
8	1.280	0.160	1.69	69	-2.10	196	-0.044	0.0	0.00	4.29
9	1.441	0.161	1.69	69	-2.00	197	-0.045	0.0	0.00	4.77
10	1.601	0.160	1.68	69	-2.00	198	-0.045	0.0	0.00	5.14
11	1.761	0.160	1.67	69	-2.00	199	-0.045	0.0	0.00	5.58
12	1.921	0.160	1.68	69	-2.20	203	-0.046	0.0	0.00	6.05
13	2.081	0.160	1.66	69	-2.00	204	-0.046	1.9	0.00	6.30
14	2.240	0.159	1.66	69	-2.30	207	-0.046	1.3	0.00	6.57
15	2.400	0.160	1.67	69	-2.30	209	-0.047	0.0	0.00	6.79
16	2.559	0.159	1.66	69	-2.20	212	-0.048	0.0	0.00	6.73
17	2.718	0.159	1.66	69	-2.10	213	-0.048	0.0	0.00	6.93
18	2.877	0.159	1.66	69	-2.30	217	-0.048	0.0	0.00	7.37
19	3.037	0.160	1.65	69	-2.00	221	-0.049	14.2	0.00	8.75
20	3.195	0.158	1.65	69	-2.00	224	-0.050	0.0	0.00	8.28
21	3.354	0.159	1.66	69	-2.10	227	-0.050	0.0	0.00	7.99
22	3.513	0.159	1.64	69	-2.20	230	-0.051	0.0	0.00	8.04
23	3.671	0.158	1.65	69	-2.00	231	-0.051	0.0	0.00	7.72
24	3.831	0.160	1.66	69	-2.20	232	-0.051	0.0	0.00	7.65
25	3.989	0.158	1.65	69	-2.20	233	-0.051	0.0	0.00	7.75
26	4.148	0.159	1.64	69	-2.10	234	-0.051	0.0	0.00	8.04
27	4.307	0.159	1.66	69	-2.10	235	-0.051	0.0	0.00	8.21
28	4.466	0.159	1.65	69	-2.10	236	-0.052	0.0	0.00	8.43
29	4.624	0.158	1.65	69	-2.00	238	-0.052	14.8	0.00	8.69
30	4.783	0.159	1.64	69	-2.00	239	-0.052	27.5	0.00	8.91
31	4.941	0.158	1.64	69	-2.20	241	-0.053	5.8	0.00	8.76
32	5.100	0.159	1.65	69	-2.00	242	-0.053	25.5	0.00	8.82

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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	5.259	0.159	1.64	69	-2.20	242	-0.053	1.0	0.00	8.67
34	5.417	0.158	1.65	69	-2.00	245	-0.054	0.3	0.00	8.63
35	5.576	0.159	1.65	69	-2.20	247	-0.054	0.0	0.00	9.31
36	5.735	0.159	1.64	69	-2.10	248	-0.054	0.6	0.00	9.63
37	5.893	0.158	1.64	69	-2.00	250	-0.054	1.0	0.00	9.67
38	6.052	0.159	1.65	69	-2.00	251	-0.055	1.9	0.00	9.59
39	6.211	0.159	1.64	69	-2.20	253	-0.055	2.9	0.00	9.55
40	6.369	0.158	1.65	70	-2.30	254	-0.055	0.6	0.00	9.45
41	6.529	0.160	1.68	70	-2.20	254	-0.055	0.0	0.00	9.38
42	6.692	0.163	1.73	70	-2.00	254	-0.055	0.0	0.00	9.34
43	6.854	0.162	1.72	70	-2.00	254	-0.054	0.0	0.00	9.37
44	7.017	0.163	1.72	70	-2.00	253	-0.054	0.0	0.00	9.38
45	7.180	0.163	1.73	70	-2.10	253	-0.054	0.0	0.00	9.36
46	7.342	0.162	1.73	70	-2.00	253	-0.054	0.0	0.00	9.36
47	7.505	0.163	1.73	70	-2.10	252	-0.054	0.0	0.00	9.35
48	7.668	0.163	1.72	70	-2.30	252	-0.054	0.0	0.00	9.39
49	7.830	0.162	1.72	70	-2.30	252	-0.054	0.0	0.00	9.49
50	7.993	0.163	1.73	70	-2.00	252	-0.055	0.0	0.00	9.45
51	8.155	0.162	1.73	70	-2.10	253	-0.054	0.0	0.00	9.39
52	8.319	0.164	1.73	70	-2.00	254	-0.055	0.0	0.00	9.41
53	8.481	0.162	1.72	70	-2.10	253	-0.055	0.0	0.00	9.48
54	8.644	0.163	1.72	70	-2.30	254	-0.055	0.0	0.00	9.65
55	8.806	0.162	1.73	70	-2.00	255	-0.055	0.0	0.00	9.87
56	8.969	0.163	1.73	70	-2.30	255	-0.054	0.0	0.00	9.73
57	9.133	0.164	1.73	70	-2.30	255	-0.055	0.0	0.00	9.69
58	9.293	0.160	1.69	70	-2.00	255	-0.054	2.2	0.00	10.13
59	9.455	0.162	1.69	70	-2.00	255	-0.055	3.5	0.00	10.28
60	9.616	0.161	1.70	70	-2.00	254	-0.054	0.0	0.00	9.73
61	9.778	0.162	1.69	70	-2.00	254	-0.055	0.0	0.00	9.81
62	9.938	0.160	1.69	70	-2.00	253	-0.054	0.0	0.00	9.97
63	10.100	0.162	1.70	70	-2.10	252	-0.054	0.0	0.00	9.79
64	10.261	0.161	1.70	70	-2.20	252	-0.054	0.0	0.00	9.71
65	10.423	0.162	1.70	70	-2.10	251	-0.053	0.0	0.00	9.66
66	10.583	0.160	1.69	70	-2.00	250	-0.053	0.0	0.00	9.55
67	10.745	0.162	1.69	70	-2.10	249	-0.054	2.2	0.00	9.46
68	10.906	0.161	1.70	70	-2.20	248	-0.052	2.2	0.00	9.49

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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 (%)*
69	11.068	0.162	1.69	70	-2.20	249	-0.053	2.6	0.00	9.49
70	11.228	0.160	1.69	70	-2.20	249	-0.053	2.6	0.00	9.45
71	11.390	0.162	1.70	70	-2.10	248	-0.053	4.2	0.00	9.44
72	11.551	0.161	1.70	70	-2.20	248	-0.053	5.8	0.00	9.47
73	11.712	0.161	1.69	70	-2.00	248	-0.053	8.4	0.00	9.47
74	11.873	0.161	1.69	70	-2.00	248	-0.053	9.7	0.00	9.56
75	12.034	0.161	1.70	70	-2.00	248	-0.053	10.7	0.00	9.38
76	12.196	0.162	1.70	70	-2.00	249	-0.053	13.2	0.00	9.45
77	12.357	0.161	1.69	70	-2.20	249	-0.053	16.8	0.00	9.49
78	12.518	0.161	1.69	70	-2.30	250	-0.053	19.7	0.00	9.52
79	12.680	0.162	1.70	70	-2.00	250	-0.053	26.8	0.00	9.70
80	12.841	0.161	1.70	70	-2.30	251	-0.053	29.8	0.00	9.82
81	13.002	0.161	1.69	70	-2.00	251	-0.053	28.2	0.00	9.82
82	13.163	0.161	1.69	70	-2.10	252	-0.053	51.8	0.00	10.07
83	13.325	0.162	1.70	70	-2.10	253	-0.054	30.4	0.00	10.16
84	13.486	0.161	1.70	70	-2.30	254	-0.054	43.0	0.00	10.36
85	13.647	0.161	1.69	71	-2.00	254	-0.054	80.9	0.00	10.22
86	13.808	0.161	1.69	70	-2.10	255	-0.054	56.9	0.00	10.22
87	13.970	0.162	1.70	70	-2.30	256	-0.055	75.4	0.00	10.37
88	14.131	0.161	1.70	71	-2.00	257	-0.055	55.6	0.00	10.35
89	14.292	0.161	1.69	71	-2.30	258	-0.054	48.2	0.00	10.33
90	14.453	0.161	1.69	71	-2.30	259	-0.055	48.4	0.00	10.33
91	14.615	0.162	1.70	71	-2.20	260	-0.054	51.5	0.00	10.37
92	14.776	0.161	1.70	71	-2.10	260	-0.055	37.2	0.00	10.26
93	14.938	0.162	1.69	71	-2.20	259	-0.055	31.7	0.00	10.10
94	15.099	0.161	1.69	71	-2.10	259	-0.054	26.2	0.00	9.87
95	15.260	0.161	1.69	71	-2.30	259	-0.054	23.0	0.00	9.79
96	15.422	0.162	1.69	71	-2.10	258	-0.054	21.0	0.00	9.62
97	15.583	0.161	1.68	71	-2.00	257	-0.054	18.1	0.00	9.47
98	15.744	0.161	1.69	71	-2.10	256	-0.054	11.0	0.00	9.27
99	15.906	0.162	1.70	71	-2.10	254	-0.054	13.2	0.00	9.24
100	16.067	0.161	1.70	71	-2.10	253	-0.054	12.0	0.00	9.20
101	16.228	0.161	1.69	71	-2.20	251	-0.054	11.0	0.00	9.06
102	16.389	0.161	1.69	71	-2.00	250	-0.053	9.0	0.00	8.99
103	16.551	0.162	1.69	71	-2.00	249	-0.053	9.4	0.00	8.87
104	16.712	0.161	1.70	71	-2.20	248	-0.053	12.0	0.00	8.86

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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	16.874	0.162	1.69	71	-2.20	247	-0.053	17.5	0.00	8.98
106	17.035	0.161	1.69	71	-2.10	246	-0.053	18.1	0.00	8.98
107	17.196	0.161	1.70	71	-2.00	246	-0.052	20.0	0.00	9.02
108	17.358	0.162	1.68	71	-2.10	246	-0.052	20.4	0.00	9.08
109	17.519	0.161	1.68	71	-2.30	245	-0.052	22.6	0.00	9.12
110	17.680	0.161	1.69	71	-2.10	246	-0.052	24.6	0.00	9.23
111	17.842	0.162	1.69	71	-2.00	245	-0.052	28.8	0.00	9.31
112	18.003	0.161	1.69	71	-2.20	246	-0.052	37.2	0.00	9.40
113	18.164	0.161	1.69	71	-2.20	245	-0.052	38.8	0.00	9.49
114	18.325	0.161	1.69	71	-2.10	246	-0.052	41.4	0.00	9.61
115	18.487	0.162	1.70	71	-2.00	246	-0.053	45.0	0.00	9.64
116	18.649	0.162	1.69	71	-2.00	246	-0.053	26.2	0.00	9.37
117	18.810	0.161	1.69	71	-2.30	246	-0.052	26.2	0.00	9.34
118	18.971	0.161	1.69	71	-2.00	247	-0.053	25.9	0.00	9.28
119	19.133	0.162	1.70	71	-2.30	247	-0.052	24.6	0.00	9.40
120	19.294	0.161	1.70	71	-2.00	246	-0.053	38.5	0.00	9.43
121	19.455	0.161	1.68	71	-2.20	246	-0.052	23.6	0.00	9.41
122	19.617	0.162	1.69	71	-2.10	246	-0.053	19.4	0.00	9.40
123	19.778	0.161	1.69	71	-2.00	246	-0.053	17.8	0.00	9.35
124	19.940	0.162	1.69	71	-2.30	245	-0.052	17.1	0.00	9.41
125	20.101	0.161	1.69	71	-2.00	245	-0.053	17.5	0.00	9.53
126	20.262	0.161	1.69	71	-2.10	245	-0.052	22.0	0.00	9.56
127	20.424	0.162	1.70	71	-2.30	245	-0.052	20.7	0.00	9.47
128	20.585	0.161	1.69	71	-2.20	245	-0.052	23.9	0.00	9.56
129	20.747	0.162	1.69	71	-2.00	245	-0.052	30.4	0.00	9.66
130	20.908	0.161	1.69	71	-2.10	245	-0.053	38.8	0.00	9.68
131	21.069	0.161	1.70	71	-2.20	245	-0.053	44.3	0.00	9.62
132	21.231	0.162	1.70	71	-2.30	246	-0.052	50.8	0.00	9.64
133	21.392	0.161	1.69	71	-2.30	246	-0.053	74.7	0.00	9.78
134	21.553	0.161	1.69	71	-2.10	247	-0.053	80.3	0.00	9.86
135	21.715	0.162	1.69	71	-2.00	247	-0.053	88.1	0.00	9.75
136	21.876	0.161	1.69	71	-2.30	248	-0.053	74.8	0.00	9.77
137	22.037	0.161	1.68	71	-2.30	249	-0.053	58.3	0.00	9.70
138	22.199	0.162	1.69	71	-2.00	249	-0.053	62.5	0.00	9.82
139	22.360	0.161	1.69	71	-2.30	248	-0.053	41.7	0.00	9.71
140	22.522	0.162	1.70	71	-2.00	249	-0.053	27.8	0.00	9.66

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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	22.683	0.161	1.68	71	-2.10	248	-0.053	26.9	0.00	9.63
142	22.844	0.161	1.69	71	-2.00	248	-0.053	21.3	0.00	9.65
143	23.006	0.162	1.69	71	-2.30	247	-0.053	18.8	0.00	9.50
144	23.167	0.161	1.69	71	-2.00	248	-0.052	18.8	0.00	9.55
145	23.328	0.161	1.69	71	-2.30	247	-0.053	21.7	0.00	9.56
146	23.489	0.161	1.69	71	-2.30	248	-0.053	21.0	0.00	9.82
147	23.651	0.162	1.69	71	-2.20	248	-0.052	21.0	0.00	10.00
148	23.812	0.161	1.68	71	-2.20	247	-0.052	20.4	0.00	9.94
149	23.973	0.161	1.69	71	-2.00	248	-0.053	20.4	0.00	9.96
150	24.135	0.162	1.69	71	-2.20	248	-0.053	19.1	0.00	9.97
151	24.296	0.161	1.69	71	-2.20	248	-0.053	19.7	0.00	9.97
152	24.458	0.162	1.69	71	-2.20	248	-0.052	17.5	0.00	9.89
153	24.619	0.161	1.69	71	-2.10	248	-0.053	19.4	0.00	9.93
154	24.780	0.161	1.69	71	-2.00	248	-0.052	19.7	0.00	9.98
155	24.942	0.162	1.69	71	-2.00	248	-0.053	16.2	0.00	10.01
156	25.103	0.161	1.69	71	-2.30	249	-0.053	14.2	0.00	10.00
157	25.264	0.161	1.69	71	-2.20	249	-0.053	12.9	0.00	9.97
158	25.425	0.161	1.69	71	-2.30	250	-0.053	12.6	0.00	10.02
159	25.587	0.162	1.69	71	-2.00	250	-0.053	10.0	0.00	9.97
160	25.748	0.161	1.69	71	-2.20	250	-0.053	12.9	0.00	10.02
161	25.909	0.161	1.68	71	-2.30	250	-0.053	12.3	0.00	9.95
162	26.070	0.161	1.68	71	-2.00	251	-0.053	12.9	0.00	10.04
163	26.232	0.162	1.69	71	-2.20	252	-0.053	10.3	0.00	10.00
164	26.393	0.161	1.68	71	-2.30	252	-0.053	10.7	0.00	10.05
165	26.554	0.161	1.68	71	-2.10	251	-0.053	10.3	0.00	10.03
166	26.715	0.161	1.68	71	-2.00	252	-0.054	11.6	0.00	10.13
167	26.877	0.162	1.69	71	-2.20	252	-0.053	13.9	0.00	10.14
168	27.038	0.161	1.69	71	-2.30	252	-0.053	10.0	0.00	10.14
169	27.198	0.160	1.68	71	-2.30	252	-0.053	10.0	0.00	10.16
170	27.360	0.162	1.69	71	-2.10	251	-0.053	8.4	0.00	10.12
171	27.521	0.161	1.69	71	-2.20	251	-0.053	7.4	0.00	10.04
172	27.683	0.162	1.68	71	-2.20	251	-0.053	7.8	0.00	10.05
173	27.844	0.161	1.68	71	-2.30	250	-0.053	6.1	0.00	10.10
174	28.005	0.161	1.69	71	-2.10	251	-0.053	5.1	0.00	10.02
175	28.166	0.161	1.69	71	-2.00	251	-0.053	6.4	0.00	9.94
176	28.328	0.162	1.69	71	-2.10	250	-0.053	14.8	0.00	10.08

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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	28.489	0.161	1.68	71	-2.20	250	-0.053	15.5	0.00	10.22
178	28.650	0.161	1.69	71	-2.10	251	-0.053	16.1	0.00	10.36
179	28.811	0.161	1.69	71	-2.10	251	-0.054	16.2	0.00	10.45
180	28.973	0.162	1.68	71	-2.20	251	-0.054	7.8	0.00	10.61
181	29.134	0.161	1.69	71	-2.10	251	-0.053	10.7	0.00	10.74
182	29.295	0.161	1.69	71	-2.00	251	-0.054	7.8	0.00	10.79
183	29.456	0.161	1.69	71	-2.30	251	-0.052	22.3	0.00	10.90
184	29.618	0.162	1.69	71	-2.00	251	-0.054	22.6	0.00	11.05
185	29.779	0.161	1.68	71	-2.20	251	-0.054	39.5	0.00	11.02
186	29.940	0.161	1.69	71	-2.30	252	-0.054	34.9	0.00	11.06
187	30.101	0.161	1.69	71	-2.30	253	-0.053	16.1	0.00	10.82
188	30.263	0.162	1.69	71	-2.20	253	-0.054	23.0	0.00	10.89
189	30.424	0.161	1.69	71	-2.30	253	-0.054	97.4	0.00	11.12
190	30.585	0.161	1.69	71	-2.00	255	-0.054	473.6	0.05	10.71
191	30.747	0.162	1.69	71	-2.10	255	-0.054	41.1	0.00	10.50
192	30.908	0.161	1.69	71	-2.00	255	-0.054	11.3	0.00	10.27
193	31.069	0.161	1.68	71	-2.30	254	-0.053	6.4	0.00	10.13
194	31.230	0.161	1.69	71	-2.00	254	-0.054	5.8	0.00	10.06
195	31.392	0.162	1.69	71	-2.30	254	-0.053	4.2	0.00	9.97
196	31.553	0.161	1.69	71	-2.10	253	-0.054	4.5	0.00	9.95
197	31.714	0.161	1.69	71	-2.00	253	-0.054	6.8	0.00	9.91
198	31.876	0.162	1.69	71	-2.00	251	-0.053	6.8	0.00	9.90
199	32.037	0.161	1.69	71	-2.00	251	-0.054	4.5	0.00	9.95
200	32.199	0.162	1.69	71	-2.00	251	-0.053	13.6	0.00	10.03
201	32.360	0.161	1.69	71	-2.20	250	-0.053	8.7	0.00	9.92
202	32.522	0.162	1.70	71	-2.10	250	-0.055	7.1	0.00	9.92
203	32.683	0.161	1.70	71	-2.30	250	-0.053	9.1	0.00	10.01
204	32.846	0.163	1.70	71	-2.10	250	-0.055	11.3	0.00	9.98
205	33.007	0.161	1.69	71	-2.10	249	-0.055	14.2	0.00	9.96
206	33.168	0.161	1.69	71	-2.20	249	-0.055	22.3	0.00	10.01
207	33.330	0.162	1.70	71	-2.30	249	-0.053	7.4	0.00	10.03
208	33.492	0.162	1.69	71	-2.00	248	-0.053	4.2	0.00	9.98
209	33.653	0.161	1.68	71	-2.00	248	-0.054	10.0	0.00	10.13
210	33.815	0.162	1.69	71	-2.30	251	-0.053	0.0	0.00	9.78
211	33.976	0.161	1.69	71	-2.30	253	-0.054	1040.0	0.43	12.06
212	34.138	0.162	1.68	71	-2.30	256	-0.056	1040.0	0.40	11.58

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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 (%)
213	34.299	0.161	1.68	71	-2.20	256	-0.055	853.9	0.06	11.06
214	34.460	0.161	1.69	71	-2.10	257	-0.054	501.5	0.04	11.10
215	34.622	0.162	1.69	71	-2.00	256	-0.054	99.7	0.00	10.56
216	34.783	0.161	1.69	71	-2.30	256	-0.055	0.0	0.00	10.31
217	34.944	0.161	1.68	71	-2.10	255	-0.054	0.0	0.00	10.13
218	35.105	0.161	1.68	71	-2.20	254	-0.055	0.0	0.00	9.99
219	35.267	0.162	1.69	71	-2.00	251	-0.053	0.0	0.00	9.91
220	35.428	0.161	1.69	71	-2.20	250	-0.053	0.0	0.00	9.82
221	35.589	0.161	1.68	71	-2.30	249	-0.053	0.0	0.00	9.71
222	35.750	0.161	1.69	71	-2.10	248	-0.052	0.0	0.00	9.67
223	35.911	0.161	1.69	71	-2.30	246	-0.051	0.0	0.00	9.54
224	36.073	0.162	1.69	71	-2.30	245	-0.052	0.0	0.00	9.54
225	36.234	0.161	1.68	71	-2.30	244	-0.052	0.0	0.00	9.52
226	36.395	0.161	1.68	71	-2.20	242	-0.052	0.0	0.00	9.39
227	36.556	0.161	1.69	71	-2.30	241	-0.051	0.0	0.00	9.32
228	36.718	0.162	1.69	71	-2.30	240	-0.051	0.0	0.00	9.30
229	36.879	0.161	1.68	71	-2.10	239	-0.051	0.0	0.00	9.30
230	37.040	0.161	1.69	71	-2.30	237	-0.051	0.0	0.00	9.13
231	37.201	0.161	1.69	71	-2.30	237	-0.050	0.0	0.00	9.19
232	37.363	0.162	1.69	71	-2.30	235	-0.050	0.0	0.00	9.01
233	37.524	0.161	1.69	71	-2.20	234	-0.049	0.0	0.00	8.97
234	37.685	0.161	1.69	71	-2.30	233	-0.049	0.0	0.00	8.78
235	37.846	0.161	1.69	71	-2.20	231	-0.049	0.0	0.00	8.65
236	38.007	0.161	1.69	71	-2.30	230	-0.049	0.0	0.00	8.51
237	38.168	0.161	1.68	71	-2.20	229	-0.048	0.0	0.00	8.47
238	38.330	0.162	1.69	71	-2.20	228	-0.048	0.0	0.00	8.40
239	38.491	0.161	1.69	71	-2.30	227	-0.048	0.0	0.00	8.40
240	38.652	0.161	1.68	71	-2.30	226	-0.048	0.0	0.00	8.35
241	38.813	0.161	1.68	71	-2.00	226	-0.048	0.0	0.00	8.29
242	38.975	0.162	1.69	71	-2.10	224	-0.048	0.0	0.00	8.21
243	39.136	0.161	1.69	71	-2.10	222	-0.047	0.0	0.00	8.21
244	39.297	0.161	1.68	71	-2.00	220	-0.047	0.0	0.00	8.13
245	39.458	0.161	1.69	71	-2.10	220	-0.047	0.0	0.00	8.04
246	39.619	0.161	1.69	71	-2.10	218	-0.046	0.0	0.00	8.05
247	39.781	0.162	1.69	71	-2.30	216	-0.046	0.0	0.00	7.97
248	39.942	0.161	1.68	71	-2.10	215	-0.046	0.0	0.00	7.90

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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	40.103	0.161	1.68	72	-2.30	215	-0.046	0.0	0.00	7.80
250	40.264	0.161	1.69	72	-2.30	214	-0.045	0.0	0.00	7.73
251	40.426	0.162	1.68	72	-2.30	213	-0.046	0.0	0.00	7.67
252	40.587	0.161	1.68	72	-2.10	212	-0.045	0.0	0.00	7.70
253	40.748	0.161	1.69	72	-2.10	212	-0.045	0.0	0.00	7.62
254	40.909	0.161	1.69	72	-2.30	211	-0.045	0.0	0.00	7.57
255	41.071	0.162	1.69	72	-2.20	210	-0.045	0.0	0.00	7.53
256	41.231	0.160	1.68	72	-2.20	209	-0.045	0.0	0.00	7.45
257	41.393	0.162	1.68	72	-2.20	208	-0.045	0.0	0.00	7.47
258	41.554	0.161	1.69	72	-2.30	208	-0.045	0.0	0.00	7.39
259	41.716	0.162	1.68	72	-2.20	207	-0.044	0.0	0.00	7.93
260	41.877	0.161	1.68	72	-2.20	206	-0.044	0.0	0.00	7.98
261	42.038	0.161	1.69	72	-2.10	205	-0.044	0.0	0.00	7.93
262	42.199	0.161	1.69	72	-2.30	204	-0.044	0.0	0.00	7.87
263	42.361	0.162	1.69	72	-2.10	203	-0.044	0.0	0.00	7.88
264	42.522	0.161	1.68	72	-2.00	202	-0.043	0.0	0.00	7.86
265	42.683	0.161	1.68	72	-2.20	202	-0.043	0.0	0.00	7.75
266	42.844	0.161	1.69	72	-2.10	202	-0.043	0.0	0.00	7.67
267	43.006	0.162	1.69	72	-2.30	202	-0.043	0.0	0.00	7.64
268	43.167	0.161	1.68	72	-2.30	202	-0.043	0.0	0.00	7.67
269	43.328	0.161	1.69	72	-2.30	201	-0.043	0.3	0.00	7.63
270	43.489	0.161	1.69	72	-2.00	200	-0.043	0.0	0.00	7.66
271	43.651	0.162	1.69	72	-2.30	200	-0.043	1.3	0.00	7.63
272	43.811	0.160	1.68	72	-2.20	200	-0.043	2.6	0.00	7.65
273	43.973	0.162	1.69	72	-2.10	199	-0.043	0.0	0.00	7.50
274	44.134	0.161	1.69	72	-2.20	199	-0.042	0.0	0.00	7.42
275	44.296	0.162	1.69	72	-2.10	198	-0.042	0.0	0.00	7.39
276	44.456	0.160	1.68	72	-2.20	198	-0.043	0.0	0.00	7.29
277	44.618	0.162	1.69	72	-2.20	198	-0.042	0.0	0.00	7.33
278	44.779	0.161	1.69	72	-2.20	198	-0.042	0.0	0.00	7.34
279	44.941	0.162	1.68	72	-2.00	197	-0.042	0.0	0.00	7.26
280	45.102	0.161	1.69	72	-2.10	197	-0.042	0.0	0.00	7.23
281	45.263	0.161	1.69	72	-2.00	197	-0.042	0.0	0.00	7.23
282	45.424	0.161	1.69	72	-2.30	196	-0.042	0.0	0.00	7.19
283	45.586	0.162	1.69	72	-2.20	196	-0.042	0.0	0.00	7.17
284	45.747	0.161	1.68	72	-2.00	195	-0.042	0.0	0.00	7.10

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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 (%)*
285	45.908	0.161	1.69	72	-2.20	195	-0.042	0.0	0.00	7.11
286	46.070	0.162	1.69	72	-2.20	194	-0.042	0.0	0.00	7.10
287	46.231	0.161	1.68	72	-2.10	194	-0.042	0.0	0.00	7.09
288	46.392	0.161	1.69	72	-2.00	194	-0.042	0.0	0.00	7.14
289	46.554	0.162	1.69	72	-2.20	194	-0.042	0.0	0.00	7.13
290	46.715	0.161	1.69	72	-2.00	194	-0.042	0.0	0.00	7.08
291	46.876	0.161	1.68	72	-2.30	194	-0.042	0.0	0.00	7.07
292	47.037	0.161	1.68	72	-2.20	194	-0.042	0.0	0.00	7.01
293	47.199	0.162	1.68	72	-2.30	194	-0.042	0.0	0.00	7.00
294	47.360	0.161	1.68	72	-2.30	194	-0.042	0.0	0.00	6.91
295	47.521	0.161	1.68	72	-2.30	195	-0.042	0.0	0.00	6.94
296	47.682	0.161	1.69	72	-2.00	195	-0.042	0.0	0.00	6.90
297	47.844	0.162	1.69	72	-2.30	195	-0.042	0.0	0.00	6.90
298	48.005	0.161	1.69	72	-2.00	194	-0.042	0.3	0.00	6.95
299	48.166	0.161	1.68	72	-2.10	194	-0.042	0.0	0.00	6.97
300	48.327	0.161	1.68	72	-2.10	194	-0.042	0.0	0.00	6.95
301	48.489	0.162	1.69	72	-2.20	194	-0.042	3.5	0.00	6.95
302	48.650	0.161	1.68	72	-2.10	195	-0.042	6.8	0.00	7.00
303	48.811	0.161	1.68	72	-2.20	194	-0.043	3.5	0.00	6.60
304	48.973	0.162	1.69	72	-2.10	196	-0.043	5.2	0.00	6.51
305	49.134	0.161	1.68	72	-2.10	196	-0.043	12.6	0.00	6.58
306	49.296	0.162	1.68	72	-2.00	197	-0.043	14.2	0.00	6.56
307	49.457	0.161	1.68	72	-2.20	197	-0.043	15.5	0.00	6.56
308	49.618	0.161	1.68	72	-2.10	197	-0.043	16.8	0.00	6.53
309	49.780	0.162	1.68	72	-2.10	198	-0.043	15.2	0.00	6.46
310	49.941	0.161	1.68	72	-2.30	198	-0.043	14.5	0.00	6.46
311	50.102	0.161	1.68	72	-2.30	198	-0.043	17.8	0.00	6.49
312	50.263	0.161	1.68	72	-2.10	198	-0.043	16.2	0.00	6.55
313	50.425	0.162	1.69	72	-2.00	200	-0.043	18.1	0.00	6.60
314	50.586	0.161	1.67	72	-2.10	200	-0.044	18.5	0.00	6.60
315	50.747	0.161	1.68	72	-2.00	202	-0.044	20.4	0.00	6.65
316	50.909	0.162	1.69	72	-2.30	202	-0.044	20.0	0.00	6.62
317	51.071	0.162	1.70	72	-2.10	203	-0.045	20.0	0.00	6.58
318	51.232	0.161	1.70	72	-2.30	202	-0.045	22.0	0.00	6.65
319	51.394	0.162	1.68	72	-2.00	204	-0.045	24.9	0.00	6.66
320	51.555	0.161	1.69	72	-2.20	205	-0.045	23.6	0.00	6.77

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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 (%)
321	51.717	0.162	1.70	72	-2.10	206	-0.045	24.2	0.00	6.77
322	51.879	0.162	1.70	72	-2.00	206	-0.045	25.2	0.00	6.81
323	52.041	0.162	1.69	72	-2.30	207	-0.046	22.3	0.00	6.75
324	52.202	0.161	1.68	72	-2.10	207	-0.045	20.7	0.00	6.82
325	52.364	0.162	1.69	72	-2.10	208	-0.045	23.9	0.00	6.82
326	52.525	0.161	1.69	72	-2.30	208	-0.045	23.9	0.00	6.93
327	52.687	0.162	1.69	72	-2.30	209	-0.046	21.4	0.00	6.87
328	52.848	0.161	1.68	72	-2.20	210	-0.045	20.4	0.00	6.67
329	53.009	0.161	1.69	72	-2.10	209	-0.046	20.7	0.00	6.62
330	53.171	0.162	1.69	72	-2.30	210	-0.045	20.4	0.00	6.58
331	53.332	0.161	1.69	72	-2.20	210	-0.045	19.7	0.00	6.55
332	53.493	0.161	1.69	72	-2.20	210	-0.046	20.4	0.00	6.52
333	53.655	0.162	1.69	72	-2.30	211	-0.046	20.7	0.00	6.58
334	53.816	0.161	1.69	72	-2.20	210	-0.046	21.7	0.00	6.44
335	53.978	0.162	1.69	72	-2.30	211	-0.046	19.1	0.00	6.26
336	54.139	0.161	1.68	72	-2.00	211	-0.046	21.3	0.00	6.36
337	54.300	0.161	1.69	72	-2.30	211	-0.046	23.0	0.00	6.36
338	54.461	0.161	1.69	72	-2.00	212	-0.045	21.7	0.00	6.41
339	54.623	0.162	1.68	72	-2.10	212	-0.046	23.0	0.00	6.50
340	54.784	0.161	1.68	72	-2.30	212	-0.046	23.6	0.00	6.57
341	54.945	0.161	1.69	72	-2.20	213	-0.046	25.5	0.00	6.66
342	55.106	0.161	1.69	72	-2.10	214	-0.046	25.9	0.00	6.80
343	55.268	0.162	1.68	72	-2.10	214	-0.046	26.9	0.00	6.84
344	55.429	0.161	1.68	72	-2.00	216	-0.046	28.5	0.00	7.01
345	55.590	0.161	1.69	72	-2.00	217	-0.046	29.5	0.00	7.01
346	55.751	0.161	1.69	72	-2.00	218	-0.047	30.7	0.00	7.08
347	55.912	0.161	1.68	72	-2.10	219	-0.047	34.0	0.00	7.15
348	56.073	0.161	1.69	72	-2.30	219	-0.047	35.9	0.00	7.23
349	56.235	0.162	1.69	72	-2.20	220	-0.047	38.9	0.00	7.36
350	56.396	0.161	1.69	72	-2.10	222	-0.047	42.7	0.00	7.49
351	56.557	0.161	1.68	72	-2.30	223	-0.048	41.7	0.00	7.53
352	56.718	0.161	1.68	72	-2.10	225	-0.048	44.0	0.00	7.62
353	56.879	0.161	1.69	72	-2.30	226	-0.048	44.7	0.00	7.62
354	57.041	0.162	1.67	72	-2.30	228	-0.048	46.3	0.00	7.77
355	57.201	0.160	1.68	72	-2.00	230	-0.049	51.1	0.00	7.93
356	57.362	0.161	1.68	72	-2.20	231	-0.049	53.4	0.00	8.01

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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 (%)*
357	57.524	0.162	1.68	72	-2.30	232	-0.049	58.3	0.00	7.99
358	57.685	0.161	1.68	72	-2.30	234	-0.050	64.7	0.00	8.16
359	57.846	0.161	1.68	72	-2.00	235	-0.049	70.0	0.00	8.32
360	58.007	0.161	1.69	72	-2.20	236	-0.050	71.9	0.00	8.66
361	58.168	0.161	1.69	72	-2.30	237	-0.050	72.5	0.00	8.78
362	58.329	0.161	1.68	72	-2.30	238	-0.050	73.8	0.00	8.92
363	58.490	0.161	1.68	72	-2.10	241	-0.051	74.8	0.00	8.99
364	58.651	0.161	1.69	72	-2.20	242	-0.051	76.1	0.00	9.03
365	58.812	0.161	1.69	72	-2.30	244	-0.052	74.4	0.00	9.12
366	58.974	0.162	1.68	72	-2.00	246	-0.052	75.4	0.00	9.16
367	59.134	0.160	1.68	72	-2.10	248	-0.052	78.0	0.00	9.23
368	59.296	0.162	1.69	72	-2.10	249	-0.052	75.1	0.00	9.19
369	59.457	0.161	1.69	72	-2.10	250	-0.052	75.7	0.00	9.21
370	59.618	0.161	1.69	72	-2.00	252	-0.053	73.5	0.00	9.29
371	59.779	0.161	1.68	72	-2.10	253	-0.053	71.5	0.00	9.22
372	59.941	0.162	1.68	72	-2.30	254	-0.053	71.2	0.00	9.27
373	60.102	0.161	1.68	72	-2.30	255	-0.054	69.3	0.00	9.29
374	60.263	0.161	1.68	72	-2.30	256	-0.053	68.0	0.00	9.30
375	60.424	0.161	1.68	72	-2.30	256	-0.054	67.0	0.00	9.24
376	60.585	0.161	1.69	72	-2.20	257	-0.054	68.0	0.00	9.17
377	60.747	0.162	1.69	72	-2.10	257	-0.054	65.7	0.00	9.19
378	60.908	0.161	1.68	72	-2.20	258	-0.054	63.8	0.00	9.08
379	61.069	0.161	1.68	72	-2.10	259	-0.054	61.8	0.00	9.00
380	61.230	0.161	1.69	72	-2.30	259	-0.054	63.5	0.00	8.93
381	61.392	0.162	1.68	72	-2.10	259	-0.054	59.9	0.00	8.91
382	61.553	0.161	1.68	72	-2.10	259	-0.054	52.4	0.00	8.71
383	61.714	0.161	1.68	72	-2.30	260	-0.055	50.8	0.00	8.58
384	61.875	0.161	1.69	72	-2.10	260	-0.055	45.3	0.00	8.40
385	62.037	0.162	1.69	72	-2.00	259	-0.054	44.0	0.00	8.26
386	62.197	0.160	1.68	72	-2.20	259	-0.054	43.4	0.00	8.28
387	62.359	0.162	1.68	72	-2.10	258	-0.055	58.3	0.00	8.30
388	62.520	0.161	1.69	72	-2.20	259	-0.055	56.6	0.00	8.40
389	62.682	0.162	1.68	72	-2.30	259	-0.055	56.0	0.00	8.36
390	62.842	0.160	1.68	72	-2.00	259	-0.055	54.4	0.00	8.35
391	63.004	0.162	1.69	72	-2.20	259	-0.055	53.7	0.00	8.28
392	63.165	0.161	1.69	72	-2.30	260	-0.055	53.7	0.00	8.30

Train D - Ambient Background and Flue Gas Data

Run: 2 **Test Date:** 2/28/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Meter Box Y Regression Offset: 1.016
Meter Box Y Regression Factor: 0
Meter Box Dynamic Y: 1.016
Sample Box ID: 372

Test Start Time: 11:18
Total Sampling Time 409 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	63.327	0.162	1.69	72	-2.10	261	-0.055	51.5	0.00	8.25
394	63.488	0.161	1.68	72	-2.00	261	-0.055	49.9	0.00	8.23
395	63.649	0.161	1.68	72	-2.10	261	-0.056	48.9	0.00	8.23
396	63.810	0.161	1.69	72	-2.00	261	-0.056	48.2	0.00	8.23
397	63.972	0.162	1.69	72	-2.00	261	-0.056	47.9	0.00	8.26
398	64.133	0.161	1.68	72	-2.00	261	-0.056	45.0	0.00	8.25
399	64.294	0.161	1.69	72	-2.10	261	-0.055	45.3	0.00	8.18
400	64.456	0.162	1.69	72	-2.30	260	-0.056	43.7	0.00	8.18
401	64.618	0.162	1.69	72	-2.30	261	-0.056	41.4	0.00	8.11
402	64.778	0.160	1.68	72	-2.20	260	-0.055	40.8	0.00	8.04
403	64.940	0.162	1.68	72	-2.20	259	-0.056	37.9	0.00	8.07
404	65.101	0.161	1.69	72	-2.30	259	-0.055	36.9	0.00	8.03
405	65.263	0.162	1.69	72	-2.30	259	-0.055	36.5	0.00	8.03
406	65.424	0.161	1.68	72	-2.10	258	-0.056	35.9	0.00	8.14
407	65.586	0.162	1.69	72	-2.00	258	-0.056	34.9	0.00	8.01
408	65.747	0.161	1.69	72	-2.20	258	-0.055	32.3	0.00	7.95
409	65.909	0.162	1.68	72	-2.20	257	-0.055	31.7	0.00	7.93

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Tracking No.:	2142
Project No.:	0142WN020E
Run No.:	2
Test Date:	2/28/24

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	2/28/24 @ 18:19	Filter	F171/A	246.5	246.0	0.5	0.5
Probe catch*	2/28/24 @ 18:19	Probe	21	114390.5	114390.4	0.1	0.1
ilter seals catch*	2/28/24 @ 18:19	Seals	S660	3409.1	3409.1	0.0	0.0
				Total Particulate, mg:		**0.6**	**0.6**

Train B

Sample Component	Date / Time in Dessicator	Reagent	Filter, Probe or Dish #	Weights			
				Final, mg	Tare, mg	Particulate, mg	
						Uncorrected	Corrected
FilterPairs	2/28/24 @ 18:19	Filter	F172/A	247.6	246.8	0.8	0.8
Probe catch*	2/28/24 @ 18:19	Probe	68	116880.2	116880.1	0.1	0.1
ilter seals catch*	2/28/24 @ 18:19	Seals	S661	3401.1	3401.0	0.1	0.1
			Sub-Total	Total Particulate, mg:		**1.0**	**1.0**

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	2/28/24 @ 18:19	Filter	F170/A	246.0	245.9	0.1	0.1
Probe catch*	2/28/24 @ 18:19	Probe	13	114321.8	114321.7	0.1	0.1
ilter seals catch*	2/28/24 @ 18:19	Seals	S645	3339.6	3339.5	0.1	0.1
				Total Particulate, mg:		**0.3**	**0.3**

Train D - *Ambient Background*

Sample Component	Date / Time in Dessicator	Reagent	Filter # or	Weights		
				Final, mg	Tare, mg	Particulate, mg
Filter catch*	2/28/24 @ 18:19	Filter	F222	120.2	120.5	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:	SC 25
Project Number:	0142WN020E
Run Number:	2
Test Date:	2/28/2024

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**

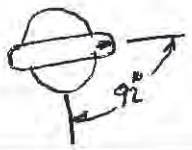
Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 2
Model: SC 25 Tracking Number: 2142 Date: 02/28/2024
Test Crew: T. Tong, K. Morgan
OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

Closed 92° from full open



Secondary: N/A

Tertiary/Pilot: N/A

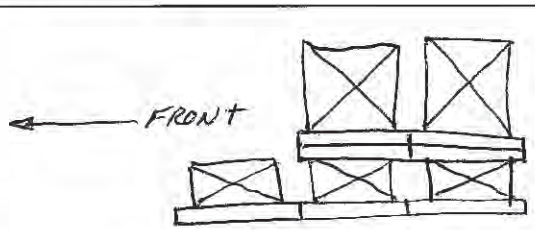
Fan: Rheostat on Low
Duration of test
@ 89 VAC

Preburn Notes

Time	Notes
0	Closed from 0° (Full open) to 92°
07	taking 0.4 lb. off (Removed 0.4 lb. coals)

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Open for 35 sec.
Fuel loaded by: 3:15 sec.
Door closed at: 4:0 sec.
Primary air: No adjustment

Notes: No adjustment to the fan

Time	Notes
11:18	Test started
12:18	First hour sampling ended

Technician Signature: Tony Tong Date: 02/28/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 2

Model: SC 25 Tracking Number: 2142 Date: 02/28/2024

Test Crew: T. Tardy K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 11:18 Booth #: 1

Stop Time: 18:07

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Sample Train Leak Check:

Before A: 0.000 @ 17.11 "Hg
B: 2.000 @ 18.36 "Hg
A, 0.000 @ 23.32 "Hg

After A: 0.001 @ 17.5 "Hg
B: 0.001 @ 17.5 "Hg
A, 0.000 @ 23.28 "Hg

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

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	9:40	9:41	6:19	6:16
CO_2	0.00	16.86	0.00	16.16
CO	0.00	4.39	-0.10	4.226
CO	2.0	485	-52	423

Air Velocity (ft/min): Initial: 11 Final: ~~650~~ 16 K

Scale Audit (lbs): Initial: 10 Final: 20.6

Pitot Tube Leak Test: Initial: good Final: good

Stack Diameter (in): 6

Induced Draft: 0.400

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 2/26/24 Initials: T.T.

	Initial	Middle	Ending
P_b (in/Hg)	29.83		29.63
RH (%)	41		39
Ambient (°F)	71		71

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
.040	.080	108
.048	.096	108
.048	.096	107
.026	.052	107
.031	.062	107
.046	.092	107
.041	.082	107
.024	.048	107
Center:		
.086	.112	108

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-.40	-0.40

Background Filter Volume:

Technician Signature: Tony Tardy Date: 2/28/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 2

Model: SC 25 Tracking Number: 2142 Date: 02/28/2024

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 12.1

Cal Value (2) = 22% Actual Reading 22.1

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	12 in	19.2	7	17 in	22.8
2	12 in	23.4	8	17 in	23.1
3	12 in	20.5	9	____ in	____
4	12 in	22.0	10	____ in	____
5	17 in	23.2	11	____ in	____
6	17 in	22.7	12	____ in	____

Total Pre-Burn Fuel Weight: 13.7 Pre-Burn Fuel Average Moisture: 22.11

Time (clock): 9:15 Room Temperature (F): 74 Initials: TT

Test Fuel

Firebox Volume (ft³): ~~2.52~~ 2.16

Load Weight Range (lb): ~~(15.9, 19.4)~~ (13.6, 16.6)

Test Fuel Piece Length (in): 17¾, 18

Total Wet Fuel Load Weight (lb): ~~15.8~~ (3.26, 4.0)

Fuel Type & Amount: 2 x 4: 3 4 x 4: 2

Weight (with spacers): 6.6 Weight (with spacers): 9.2

Piece:	Weight (lbs):	Moisture Readings (%DB):				Fuel Type:	
1	2.2	20.6	19.5	19.5	2x4	17¾
2	~~2.5~~ 2.3	22.4	19.5	21.9	2x4	18
3	2.0	20.8	20.5	21.6	2x4	18
4	4.5	21.9	20.6	23.8	4x4	17¾
5	4.8	19.7	24.2	20.5	4x4	18
6						
7						

without spacers: 1.8, 1.9, 1.8, 4.2, 4.5

WB 17.65

5.9 Kg/day

Spacer Moisture Readings (%DB)

23.8	24.3	18.4	17.7	24.4	21.9	23.3	24.6
22.8	24.7	18.7	19.0	23.8	22.5		

Time (clock): 9:30 Room Temperature (F): 74 Initials:

Technician Signature: Tony Tong Date: 02/28/24

6,816? hrs 6:48 0.87 Kg/hr

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 2

Model: SC 25 Tracking Number: 2142 Date: 02/28/2024

Test Crew: T. Tong, K. Morgan

OMNI Equipment ID Numbers:

ASTM E2515 Lab Sheet

Assembled By:

T. Tong

Date/Time in Dessicator:

18:19 02/28/24

Filters weighed in Pairs

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
	Date/Time: 08:58 → 3/04/24	Date/Time: 3/05/24 0700	Date/Time:	Date/Time:	Date/Time:
	R/H %: 15.4	R/H %: 16.7	R/H %:	R/H %:	R/H %:
	Temp: 69.3	Temp: 68.5	Temp:	Temp:	Temp:
	200 mg Audit: 200.1	200 mg Audit: 200.1	200 mg Audit:	200 mg Audit:	200 mg Audit:
	2 g Audit: 2000.3 mg	2 g Audit: 2000.3	2 g Audit:	2 g Audit:	2 g Audit:
	100 g Audit: 99997.9	100 g Audit 99997.8	100 g Audit	100 g Audit	100 g Audit
	Initials: JK	Initials: JK	Initials:	Initials:	Initials:

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	
A (First Hour)	Front Filter	F170/A	245.9	245.9	246.0				✓
	Rear Filter								
	Probe	13	114321.7	114321.6	114321.8				✓
	O-Ring Set	S645	3339.5	3339.6	3339.6				✓
A	Front Filter	F171/A	246.0	246.5	246.5				✓
	Rear Filter								
	Probe	21	~~114389.5~~ 114390.4	114390.6	114390.5				✓
	O-Ring Set	S660	3409.1	3409.0	3409.0				✓
B	Front Filter	F172/A	246.8	247.4	247.6				✓
	Rear Filter								
	Probe	68	116880.1	116880.2	116880.2				✓
	O-Ring Set	S661	3401.0	3401.3	3401.1				✓
BG	Filter	F222	120.5	120.1	120.2				✓

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

Equations and Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	2

Sample calculations of each equation used in the referenced 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	22.14	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 moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.417	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	15.38	Traverse Worksheet
θ	- Duration of test, min	409	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	29.73	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

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

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	65.784	65.607	9.585	65.909
Y	Dry gas meter calibration factor	1.015	1.006	1.010	1.016
ΔH	- Average pressure differential across the orifice meter, in. H_2O	1.24	0.96	2.15	1.69
T_m	- Temperature of Dry Gas Meter, °F	81.4	81.2	69.2	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.1	0.1	0.1	n/a
m_f	- mass of particulate matter from filters, mg	0.5	0.8	0.1	0.0
m_g	- mass of particulate matter from filter seals, mg	0.0	0.1	0.1	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.1	0.1	0.1	n/a
m_f	- mass of particulate matter from filters, mg	0.5	0.8	0.1	n/a
m_g	- mass of particulate matter from filter seals, mg	0.0	0.1	0.1	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 = 22.14 %, dry basis
M_{Swb} = 1.6 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((1.6 x 0.4536) (100 / (100 + 22.14))

M_{Sdb} = **0.594** 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} = 14.2 lb.
FM_{CPn} = 21.13 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 14.2 x 0.4536 x (100 / (100 + 21.1333333333333))

M_{Cdb} = **5.32** 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} = 11.72 lb
V_C = 0.417 ft^3

D_{Cdb} = 11.72 / 0.417

D_{Cdb} = **28.13** 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} = 0.594
M_{Cdb} = 5.32

M_{FTAdb} = 0.594 + 5.32

M_{FTAdb} = **5.91** kg

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

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

Sample Calculation:

M_{FTAdb} = 5.912
θ = 409

BR = (60 x 5.912) / 409

BR = **0.87** 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 = 0.8168

$\Delta P^{1/2}_{AVG}$ = 0.3428

$T_{S\,(avg)}$ = 543.3634

Pbar = 29.7300

Pg = -0.4000

Ps = 29.7006

V_S = 0.817 x 85.49 x 0.99 x 0.343 x √ [(543 / (29.7 x 28.78)]

V_S = **18.892** ft/sec

(First Hour of Test)

F_P = 0.8168

$\Delta P^{1/2}_{AVG}$ = 0.3442

$T_{S\,(avg)}$ = 543.1148

Pbar = 29.8300

Pg = -0.4000

Ps = 29.8006

V_S = 0.817 x 85.49 x 0.99 x 0.344 x √ [(543 / (29.8 x 28.78)]

V_S = **18.934** 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 = 29.70
$T_{s(avg)}$ = 543
Vs = 18.89

Qstd = 3600 x (1 - 0.02) x 18.892 x 0.19635 x (528 / 543) x (29.7 / 29.92)

Qstd = **12623.4** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 29.80
$T_{s(avg)}$ = 543
Vs = 18.934

Qstd = 3600 x (1 - 0.02) x 18.934 x 0.1963 x (528 / 543) x (29.8 / 29.92)

Qstd = **12700.1** 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

$$V_{m(std)} = 17.64 \times 65.784 \times 1.015 \times \frac{\left(29.73 + \frac{1.24}{13.6}\right)}{(81.4 + 460)}$$

$V_{m(std)}$ = **64.881** dscf

Train B

$$V_{m(std)} = 17.64 \times 65.607 \times 1.006 \times \frac{\left(29.73 + \frac{0.96}{13.6}\right)}{(81 + 460)}$$

$V_{m(std)}$ = **64.111** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.59 \times 1.010 \times \frac{\left(\underline{29.83} + \frac{2.15}{13.6}\right)}{(69.2 + 460)}$$

$V_{m(std)}$ = **9.678** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 65.91 \times 1.016 \times \frac{\left(\underline{29.73} + \frac{1.69}{13.6}\right)}{(79.0 + 460)}$$

$V_{m(std)}$ = **65.426** 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 = 0.1 + 0.5 + 0.0

m_n = **0.6** mg

Train B

m_n = 0.1 + 0.8 + 0.1

m_n = **1.0** mg

Train C (1st hour)

m_n = 0.1 + 0.1 + 0.1

m_n = **0.3** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 0.1 + 0.5 + 0.0

m_n = **0.6** mg

Train B

m_n = 0.1 + 0.8 + 0.1

m_n = **1.0** mg

Train C (1st hour)

m_n = 0.1 + 0.1 + 0.1

m_n = **0.3** 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

$$C_s = 0.001 \times \frac{0.6}{64.88}$$

C_s = **0.000009** g/dscf

Train B

$$C_s = 0.001 \times \frac{1.0}{64.11}$$

C_s = **0.0000156** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.3}{9.68}$$

Cs = **0.000031** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{65.43}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{0.6}{64.88}$$

C_s = **0.000009** g/dscf

Train B

$$C_s = 0.001 \times \frac{1.0}{64.11}$$

C_s = **0.0000156** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.3}{9.68}$$

Cs = **0.000031** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{65.43}$$

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 = (0.000009 - 0.000000) x 12623.4 x 409 / 60

E_T = **0.80** g

Train B

E_T = (0.000016 - 0.000000) x 12623.4 x 409 / 60

E_T = **1.34** g

First Hour

E_T = (0.000031 - 0.000000) x 12700.1 x 60 / 60

E_T = 0.39 g

Trains A and B Average

E = **1.07** g

Sample calculations (Corrected)

Train A

E_T = (0.000009 - 0.000000) x 12623.4 x 409 / 60

E_T = **0.80** g

Train B

E_T = (0.000016 - 0.000000) x 12623.4 x 409 / 60

E_T = **1.34** g

First Hour

E_T = (0.000031 - 0.000000) x 12700.1 x 60 / 60

E_T = **0.39** g

Trains A and B Average

E_T = **1.07** 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 = 0.80 g

θ = 409 min

PM_R = 60 x (0.80 / 409)

PM_R = **0.12** g/hr

Train B

E_T = 1.34 g

θ = 409 min

PM_R = 60 x (1.34 / 409)

PM_R = **0.20** g/hr

A and B Average

E_T = **0.16** g/hr

First Hour

E_T = 0.39 g

θ = 60 min

PM_R = 60 x (0.39 / 60)

PM_R = **0.39** g/hr

Sample Calculation (Corrected)

Train A

E_T = 0.80 g

θ = 409 min

PM_R = 60 x (0.80 / 409)

PM_R = **0.12** g/hr

Train B

E_T = 1.34 g

θ = 409 min

PM_R = 60 x (1.34 / 409)

PM_R = **0.20** g/hr

A and B Average

E_T = **0.16** g

First Hour

E_T = 0.39 g

θ = 60 min

PM_R = 60 x (0.39 / 60)

PM_R = **0.39** 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 = 0.80 g
M_{FTAdb} = 5.91 kg
PM_F = 0.80 / 5.91
PM_F = **0.13** g/kg

Train B

E_T = 1.34 g
M_{FTAdb} = 5.91 kg
PM_F = 1.34 / 5.91
PM_F = **0.23** g/kg

Sample Calculation (Corrected)

Train A

E_T = 0.80 g
M_{FTAdb} = 5.91 kg
PM_F = 0.80 / 5.91
PM_F = **0.13** g/kg

Train B

E_T = 1.34 g
M_{FTAdb} = 5.91 kg
PM_F = 1.34 / 5.91
PM_F = **0.23** 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	409	409	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	0.161
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	65.784	65.607	9.585
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	19.221	19.221	19.221
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	18.892	18.892	18.971
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	533.0	533.0	528.0
T_m	=	Absolute average dry gas meter temperature, ^oR	541.4	541.2	529.2
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	555.5	555.5	555.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	543.4	543.4	543.1

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

Train A PR = $\left(\frac{409 \text{ x } 0.162 \text{ x } 18.892 \text{ x } 541 \text{ x } 556}{1 \text{ x } 65.784 \text{ x } 19.221 \text{ x } 533 \text{ x } 543}\right)$ X 100 = 102.8 %

Train B PR = $\left(\frac{409 \text{ x } 0.161 \text{ x } 18.892 \text{ x } 541 \text{ x } 556}{1 \text{ x } 65.607 \text{ x } 19.221 \text{ x } 533 \text{ x } 543}\right)$ X 100 = 102.4 %

Train B PR = $\left(\frac{60 \text{ x } 0.161 \text{ x } 18.971 \text{ x } 529 \text{ x } 556}{1 \text{ x } 9.585 \text{ x } 19.221 \text{ x } 528 \text{ x } 543}\right)$ X 100 = 102.0 %

Run 3 Test Data

Test Date:	2/29/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	SC 25

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Project No.: 0142WN020E
Tracking No.: 2142
Run: 3
Test Date: 02/29/24

Burn-Rate Result

0.53 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	12.04	12.04	0.26	0.26
Emission Rate, g/hr	**1.08**	1.08	**0.26**	0.26
Emissions Factor, g/kg	2.04	2.04	n/a	n/a

Dilution Tunnel Flow Parameters

	First Hour	Duration of Test
Average Tunnel Temperature, °F	78.8	78.2
Average Tunnel Gas Velocity (vs), feet/second	18.773	18.700
Average Tunnel Gas Flow Rate(Qsd), DSCF/hr	12587.6	12554.2
Average Delta p, in. H2O	0.118	0.117
Tunnel Static Pressure, in. H2O	-0.400	-0.400
Total Time of Test, Min	60	668

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	106.930	107.731	107.700	9.715	106.930	107.731	107.700	9.715
Average Gas Meter Temperature, °F	79	81	81	71	79	81	81	71
Total Sample Volume (V_{mstd}), DSCF	105.100	105.897	105.308	9.743	105.100	105.897	105.308	9.743
Total Particulates (mn), mg - m_n	0.0	9.2	9.0	0.2	0.0	9.2	9.0	0.2
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00009	0.00009	0.00002	0.00000	0.00009	0.00009	0.00002
Total Particulate Emissions (ET), grams	n/a	12.14	11.95	0.26	n/a	12.14	11.95	0.26
Particulate Emission Rate, g/hr	n/a	1.09	1.07	0.26	n/a	1.09	1.07	0.26
Emissions Factor, g/kg	n/a	2.06	2.02	n/a	n/a	2.06	2.02	n/a
Difference, ET from Average ET, grams	n/a	0.10	-0.10	n/a	n/a	0.10	-0.10	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	71	70	70	✓
Filter Face Velocity, fpm	< 30	9.21	8.89	8.78	✓
Dryer Exit Temperature, °F	< 80	65	47	49	✓
Tunnel Velocity, fpm	>800	1,126	1,122		✓
First Hour Leakage Rate	0.006	0.000			✓
Train A Leakage Rate	0.006		0.002		✓
Train B Leakage Rate	0.006			0.001	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.2	0.1	0.1	✓
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		67		✓
Ambient Temp, °F	< 90		71		✓
Trains A and B Precision	(*A*) < 7.5%		0.82%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.03		✓
Stove Surface ΔT	<= 125 °F		70		✓
Room Air Velocity	< 50 fpm		16		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	3
Test Date:	2/29/2024

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: SC25
Date: 02/29/24
Run: 3
Control #: 2142
Test Duration: 668
Output Category: 1

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	80.7%	87.3%
Combustion Efficiency	99.1%	99.1%
Heat Transfer Efficiency	81%	88.0%

Output Rate (kJ/h)	8,474	8,038	**(Btu/h)**
Burn Rate (kg/h)	0.53	1.17	**(lb/h)**
Input (kJ/h)	10,497	9,957	**(Btu/h)**

Test Load Weight (dry kg)	5.90	13.00	**dry lb**
MC wet (%)	17.71		
MC dry (%)	21.52		
Particulate (g)	12.04		
CO (g)	143		
Test Duration (h)	11.13		

Emissions	Particulate	CO
g/MJ Output	0.13	1.52
g/kg Dry Fuel	2.04	24.30
g/h	1.08	12.87
lb/MM Btu Output	0.30	3.53

Air/Fuel Ratio (A/F)	18.70

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

VERSION:	**2.4**	**4/15/2010**			
Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	SC25				
Date:	2/29/2024		**Temp. Units**	F	(F or C)
Run:	3		**Weight Units**	lb	(kg or lb)
Control #:	2142				
Test Duration:	668				
Output Category:	1				

			Fuel Data		
				D. Fir	
Wood Moisture (% wet):	17.71		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	15.80		**%C**	48.73	
Burn Rate (dry kg/h):	0.53		**%H**	6.87	
Total Particulate Emissions:	12.04	g	**%O**	43.9	
			%Ash	0.5	

Averages	**0.09**	**5.56**	**#DIV/0!**	**168.77**	**69.76**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	15.80	0.20	0.51		189.0	70.0
1	15.60	0.13	0.43		194.0	70.0
2	15.50	0.45	1.55		172.0	70.0
3	15.50	0.24	2.34		160.0	70.0
4	15.50	0.01	2.61		155.0	70.0
5	15.50	0.00	2.50		151.0	70.0
6	15.50	0.00	2.46		150.0	70.0
7	15.50	0.00	2.56		148.0	70.0
8	15.50	0.00	2.66		146.0	70.0
9	15.40	0.00	2.81		146.0	70.0
10	15.40	0.00	2.95		146.0	70.0
11	15.40	0.00	3.16		145.0	70.0
12	15.40	0.00	3.40		146.0	70.0
13	15.40	0.00	3.68		146.0	70.0
14	15.40	0.01	3.83		146.0	70.0
15	15.40	0.01	4.02		147.0	70.0
16	15.30	0.01	4.10		147.0	70.0
17	15.30	0.01	4.31		148.0	70.0
18	15.30	0.01	4.42		148.0	70.0
19	15.30	0.01	4.60		150.0	70.0
20	15.30	0.01	4.75		152.0	70.0
21	15.20	0.01	4.79		150.0	70.0
22	15.20	0.01	4.84		152.0	70.0
23	15.20	0.01	4.89		154.0	70.0
24	15.20	0.01	5.03		155.0	70.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	15.10	0.01	5.08		155.0	70.0
26	15.10	0.01	5.17		157.0	70.0
27	15.10	0.01	5.19		157.0	70.0
28	15.10	0.01	5.25		159.0	70.0
29	15.00	0.01	5.20		159.0	70.0
30	15.00	0.01	5.21		160.0	70.0
31	15.00	0.01	5.22		159.0	70.0
32	15.00	0.01	5.25		161.0	70.0
33	14.90	0.01	5.29		164.0	70.0
34	14.90	0.01	5.38		163.0	70.0
35	14.90	0.01	5.45		163.0	70.0
36	14.90	0.01	5.40		164.0	70.0
37	14.80	0.01	5.45		166.0	70.0
38	14.80	0.01	5.44		166.0	70.0
39	14.80	0.01	5.44		167.0	70.0
40	14.80	0.01	5.44		168.0	70.0
41	14.70	0.01	5.44		168.0	70.0
42	14.70	0.01	5.47		168.0	70.0
43	14.70	0.01	5.49		168.0	70.0
44	14.70	0.01	5.49		169.0	70.0
45	14.60	0.01	5.49		169.0	70.0
46	14.60	0.01	5.54		170.0	70.0
47	14.60	0.01	5.58		170.0	70.0
48	14.60	0.01	5.58		172.0	70.0
49	14.50	0.01	5.61		170	70
50	14.50	0.01	5.75		171	70
51	14.50	0.01	5.79		172	70
52	14.40	0.01	5.77		171	70
53	14.40	0.01	5.83		172	70
54	14.40	0.01	5.83		173	70
55	14.40	0.01	5.77		172	70
56	14.30	0.01	5.78		173	70
57	14.30	0.01	5.68		174	70
58	14.30	0.01	5.83		174	70
59	14.30	0.01	5.81		175	70
60	14.20	0.01	5.86		175	70
61	14.20	0.01	5.83		174	70
62	14.20	0.01	5.91		177	70
63	14.10	0.01	5.97		176	70
64	14.10	0.01	6.01		176	70
65	14.10	0.01	6		176	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	14.10	0.01	6.04		177	70
67	14.00	0.01	6.07		178	70
68	14.00	0.01	6.07		178	70
69	14.00	0.01	6.03		179	70
70	14.00	0.01	6.06		180	70
71	13.90	0.01	6.1		181	70
72	13.90	0.01	6.14		180	70
73	13.90	0.01	6.14		180	70
74	13.90	0.01	6.25		180	70
75	13.80	0.01	5.88		179	70
76	13.80	0.01	5.7		179	70
77	13.80	0.01	5.59		179	70
78	13.80	0.01	5.6		180	70
79	13.70	0.01	5.6		179	70
80	13.70	0.01	5.57		178	70
81	13.70	0.01	5.56		178	70
82	13.70	0.01	5.59		179	70
83	13.60	0.01	5.58		178	70
84	13.60	0.01	5.63		178	71
85	13.60	0.01	5.64		178	70
86	13.60	0.01	5.65		177	70
87	13.50	0.01	5.62		176	70
88	13.50	0.01	5.6		175	70
89	13.50	0.01	5.65		175	70
90	13.50	0.01	5.71		175	70
91	13.40	0.01	5.69		175	70
92	13.40	0.01	5.5		174	70
93	13.40	0.01	5.56		175	70
94	13.40	0.01	5.55		173	70
95	13.40	0.01	5.59		174	70
96	13.30	0.01	5.6		173	70
97	13.30	0.01	5.63		174	70
98	13.30	0.01	5.6		174	70
99	13.20	0.01	5.66		173	70
100	13.20	0.01	5.76		174	70
101	13.20	0.01	5.71		174	70
102	13.20	0.01	5.77		173	70
103	13.20	0.01	5.77		173	70
104	13.10	0.01	5.77		173	70
105	13.10	0.01	5.61		172	70
106	13.10	0.01	5.52		171	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	13.10	0.01	5.53		174	70
108	13.00	0.01	5.53		174	70
109	13.00	0.01	5.57		174	70
110	13.00	0.01	5.58		173	70
111	13.00	0.01	5.52		172	70
112	12.90	0.01	5.44		172	70
113	12.90	0.01	5.34		172	70
114	12.90	0.01	5.4		171	70
115	12.90	0.01	5.36		171	70
116	12.80	0.01	5.31		171	70
117	12.80	0.01	5.33		170	70
118	12.80	0.01	5.34		170	70
119	12.80	0.01	5.33		169	70
120	12.80	0.01	5.34		169	70
121	12.70	0.01	5.28		168	70
122	12.70	0.01	5.38		169	70
123	12.70	0.01	5.36		169	70
124	12.70	0.01	5.32		169	70
125	12.70	0.01	5.38		170	70
126	12.60	0.01	5.34		169	70
127	12.60	0.01	5.27		170	70
128	12.60	0.00731	5.27		169	70
129	12.60	0.01	5.31		169	70
130	12.60	0.01	5.3		168	70
131	12.50	0.01	5.27		167	70
132	12.50	0.01	5.33		166	70
133	12.50	0.01	5.31		166	70
134	12.50	0.01	5.34		167	70
135	12.40	0.01	5.4		166	70
136	12.40	0.01	5.37		167	70
137	12.40	0.01	5.4		166	70
138	12.40	0.01	5.3		165	70
139	12.30	0.01	5.38		165	70
140	12.30	0.01	5.31		166	70
141	12.30	0.00725	5.25		166	70
142	12.30	0.00722	5.25		166	70
143	12.30	0.00718	5.22		165	70
144	12.20	0.00735	5.22		166	70
145	12.20	0.00709	5.22		165	70
146	12.20	0.0068	5.22		164	70
147	12.20	0.00683	5.22		165	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	12.20	0.00677	5.18		163	70
149	12.10	0.0068	5.21		162	70
150	12.10	0.00667	5.2		163	70
151	12.10	0.00654	5.16		161	70
152	12.10	0.00657	5.18		161	70
153	12.10	0.00647	5.2		162	70
154	12.00	0.00651	5.23		161	70
155	12.00	0.0066	5.29		161	70
156	12.00	0.00654	5.31		161	70
157	12.00	0.0066	5.36		161	70
158	12.00	0.00667	5.42		161	70
159	11.90	0.0068	5.54		161	70
160	11.90	0.00693	5.68		161	70
161	11.90	0.01	6.34		161	71
162	11.90	0.01	5.76		160	70
163	11.80	0.01	5.8		161	70
164	11.80	0.01	6.1		160	70
165	9.60	0.01	6.06		161	70
166	11.80	0.01	5.92		159	70
167	11.80	0.01	6.05		160	70
168	11.70	0.01	6.08		162	70
169	11.70	0.01	6.09		161	70
170	11.70	0.01	6.1		161	70
171	11.60	0.01	6.1		162	70
172	11.60	0.01	6.03		162	70
173	11.60	0.00735	5.88		162	70
174	11.60	0.00712	5.89		163	70
175	11.50	0.00738	5.88		162	70
176	11.50	0.0067	5.86		163	70
177	11.50	0.00651	5.84		162	70
178	11.50	0.00634	5.86		162	70
179	11.50	0.00621	6.01		162	70
180	11.40	0.00599	6.07		163	70
181	11.40	0.00631	6.15		163	70
182	11.40	0.0056	6.21		163	71
183	11.30	0.00547	6.3		163	71
184	11.30	0.00521	6.25		162	71
185	11.30	0.00466	6.32		163	71
186	11.30	0.00511	6.27		164	70
187	11.20	0.00473	6.3		165	71
188	11.20	0.00489	6.36		165	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	11.20	0.00473	6.31		165	70
190	11.20	0.00427	6.35		164	70
191	11.10	0.00427	6.31		164	70
192	11.10	0.00459	6.36		164	70
193	11.10	0.00434	6.19		163	70
194	11.10	0.00434	6.26		164	70
195	11.10	0.00427	6.17		164	70
196	11.00	0.00421	6.14		165	70
197	11.00	0.00417	6.08		166	70
198	11.00	0.00414	6.01		165	70
199	10.90	0.00411	6.05		166	71
200	10.90	0.00414	6		165	71
201	10.90	0.00417	5.95		164	70
202	10.90	0.00408	5.69		165	70
203	10.90	0.00382	5.68		166	70
204	10.80	0.00359	5.63		165	71
205	10.80	0.00352	5.63		165	71
206	10.80	0.00372	5.68		165	71
207	10.80	0.00375	5.73		165	70
208	10.80	0.00375	5.7		163	71
209	10.70	0.00369	5.68		163	71
210	10.70	0.00365	5.63		162	71
211	10.70	0.00362	5.49		162	71
212	10.70	0.00349	5.25		161	71
213	10.70	0.0034	5.23		161	71
214	10.70	0.00343	5.18		160	71
215	10.60	0.00336	5.14		159	71
216	10.60	0.0034	5.09		158	71
217	10.60	0.0034	5.14		157	71
218	10.60	0.00336	5.28		157	71
219	10.60	0.00272	6.12		157	71
220	10.50	0.00246	5.68		155	71
221	10.50	0.00301	5.03		155	71
222	10.50	0.00327	5.12		154	70
223	10.50	0.00327	5.17		153	70
224	10.50	0.00336	5.22		152	71
225	10.50	0.00343	5.23		151	71
226	10.50	0.00346	5.18		150	71
227	10.40	0.00362	5.21		149	71
228	10.40	0.00365	5.26		149	71
229	10.40	0.00379	5.34		149	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	10.40	0.00382	5.29		148	71
231	10.40	0.00382	5.34		148	70
232	10.40	0.00372	5.38		148	70
233	10.40	0.00375	5.29		148	70
234	10.30	0.00372	5.34		148	71
235	10.30	0.00375	5.32		147	70
236	10.30	0.00365	5.29		148	71
237	10.30	0.00379	5.42		148	70
238	10.20	0.00349	6.39		151	70
239	10.20	0.00346	9.3		152	70
240	10.20	0.00356	8.65		153	71
241	10.10	0.00346	6.7		156	71
242	10.10	0.00359	7.17		159	70
243	10.10	0.00379	6.76		159	70
244	10.00	0.00392	6.57		161	70
245	10.00	0.00365	6.29		161	70
246	10.00	0.00437	6.32		161	70
247	10.00	0.00469	6.47		163	71
248	9.90	0.00515	6.47		163	70
249	9.90	0.0057	6.29		163	70
250	9.90	0.0056	6.36		163	70
251	9.90	0.0054	6.38		165	70
252	9.80	0.0055	6.56		164	70
253	9.80	0.0056	6.53		165	71
254	9.80	0.00566	6.55		165	70
255	9.80	0.0055	6.52		165	71
256	9.80	0.00524	6.47		166	71
257	9.70	0.00521	6.36		164	71
258	9.70	0.00511	6.22		165	71
259	9.70	0.00544	6.38		165	71
260	9.70	0.00583	6.61		166	70
261	9.60	0.00612	6.92		167	69
262	9.60	0.00599	6.99		167	68
263	9.60	0.00686	7.19		167	68
264	9.50	0.00673	8.5		168	68
265	9.50	0.00489	8.61		170	67
266	9.50	0.0043	7.94		172	67
267	9.40	0.00395	7.53		172	68
268	9.40	0.00375	7.32		173	68
269	9.40	0.00362	7.34		173	68
270	9.40	0.00336	7.28		172	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	9.30	0.0033	7.27		171	68
272	9.30	0.00317	7.09		169	68
273	9.30	0.0033	7.08		168	69
274	9.20	0.00346	6.81		168	68
275	9.20	0.00336	6.62		166	69
276	9.20	0.00336	6.59		165	69
277	9.20	0.0034	6.61		164	69
278	9.20	0.00333	6.53		162	69
279	9.10	0.00327	6.51		161	69
280	9.10	0.00343	6.5		159	69
281	9.10	0.00395	6.59		156	69
282	9.10	0.00414	6.66		154	69
283	9.10	0.00401	6.6		153	69
284	9.10	0.00414	6.56		152	69
285	9.00	0.00401	6.58		152	69
286	9.00	0.00405	6.53		151	69
287	9.00	0.00414	6.49		151	69
288	9.00	0.00424	6.53		150	69
289	9.00	0.00466	6.66		149	69
290	8.90	0.00515	6.88		149	69
291	8.90	0.00544	7.03		148	70
292	8.90	0.00579	7.23		147	70
293	8.90	0.00602	7.36		147	69
294	8.90	0.00605	7.4		147	70
295	8.80	0.00602	7.31		147	70
296	8.80	0.00618	7.41		147	70
297	8.80	0.00634	7.4		147	70
298	8.80	0.0066	7.41		146	70
299	8.80	0.00657	7.32		147	70
300	8.70	0.0068	7.16		146	70
301	8.70	0.00683	7.09		144	70
302	8.70	0.00693	7.12		144	70
303	8.70	0.00709	7.03		144	70
304	8.70	0.00673	6.96		144	70
305	8.70	0.00644	6.85		144	70
306	8.60	0.00631	6.79		145	70
307	8.60	0.00641	6.63		144	70
308	8.60	0.00625	6.58		145	70
309	8.60	0.00722	6.54		142	70
310	8.60	0.00728	6.47		142	70
311	8.60	0.00686	6.36		141	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	8.60	0.00712	6.3		142	70
313	8.50	0.00728	6.25		143	70
314	8.50	0.00744	6.27		141	70
315	8.50	0.00725	6.31		141	70
316	8.50	0.00728	6.32		141	70
317	8.50	0.00686	6.19		140	70
318	8.50	0.00719	6.17		140	70
319	8.40	0.00803	6.05		139	70
320	8.40	0.0076	5.92		138	70
321	8.40	0.0056	5.75		139	70
322	8.40	0.00586	5.69		139	70
323	8.40	0.00602	5.69		139	70
324	8.40	0.00651	5.64		138	70
325	8.40	0.00631	5.58		136	70
326	8.40	0.00703	5.61		136	70
327	8.30	0.00722	5.58		135	70
328	8.30	0.00751	5.52		134	70
329	8.30	0.00735	5.56		135	70
330	8.30	0.00712	5.49		134	70
331	8.30	0.00793	5.38		135	70
332	8.30	0.00767	5.27		134	70
333	8.30	0.00777	5.33		134	70
334	8.30	0.00803	5.32		133	70
335	8.30	0.01	5.45		133	70
336	8.20	0.01	5.45		131	70
337	8.20	0.01	5.43		131	70
338	8.20	0.01	5.37		130	70
339	8.20	0.01	5.36		130	70
340	8.20	0.01	5.31		130	70
341	8.20	0.01	5.34		129	70
342	8.20	0.01	5.27		129	70
343	8.20	0.01	5.28		129	70
344	8.20	0.01	5.25		129	70
345	8.10	0.01	5.31		128	70
346	8.10	0.01	5.32		127	70
347	8.10	0.01	5.27		126	70
348	8.10	0.01	5.3		127	70
349	8.10	0.01	5.28		126	70
350	8.10	0.01	5.23		126	70
351	8.10	0.01	5.17		125	70
352	8.10	0.01	5.18		125	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	8.10	0.01	5.01		125	70
354	8.10	0.00773	4.84		125	70
355	8.10	0.0078	4.83		124	70
356	8.00	0.00803	4.8		126	70
357	8.00	0.00796	4.8		126	70
358	8.00	0.01	4.83		127	70
359	8.00	0.00829	4.85		128	70
360	8.00	0.01	4.84		130	70
361	8.00	0.01	4.73		130	70
362	8.00	0.00819	4.75		129	70
363	8.00	0.01	4.73		129	70
364	8.00	0.00806	4.67		128	70
365	7.90	0.00806	4.66		129	70
366	7.90	0.00819	4.69		130	70
367	7.90	0.008	4.64		130	70
368	7.90	0.01	4.61		129	70
369	7.90	0.00783	4.54		129	70
370	7.90	0.00773	4.49		129	70
371	7.90	0.00751	4.49		129	70
372	7.90	0.01	5.17		128	70
373	7.90	0.01	5.54		129	70
374	7.90	0.01	5.66		129	70
375	7.80	0.01	5.73		129	70
376	7.80	0.01	5.7		128	70
377	7.80	0.01	5.64		129	70
378	7.80	0.01	5.58		129	70
379	7.80	0.01	5.63		130	70
380	7.80	0.01	5.63		131	70
381	7.80	0.01	5.58		131	70
382	7.70	0.01	5.5		130	70
383	7.70	0.01	5.54		130	70
384	7.70	0.01	5.53		132	70
385	7.70	0.01	5.47		132	70
386	7.70	0.008	5.31		133	70
387	7.70	0.00764	5.29		134	70
388	7.70	0.00703	5.21		134	70
389	7.70	0.0069	5.14		134	70
390	7.60	0.0066	5.04		133	70
391	7.60	0.00631	4.96		134	70
392	7.60	0.00579	4.81		133	70
393	7.60	0.00576	4.84		133	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
394	7.60	0.00556	4.71		134	70
395	7.60	0.00554	4.68		133	70
396	7.60	0.00541	4.67		134	70
397	7.60	0.00524	4.58		133	70
398	7.50	0.00547	4.63		132	70
399	7.50	0.00537	4.65		133	70
400	7.50	0.00518	4.69		133	70
401	7.50	0.00516	4.64		133	70
402	7.50	0.0045	4.51		134	69
403	7.50	0.00459	4.49		134	70
404	7.50	0.00459	4.47		133	70
405	7.50	0.00466	4.49		135	70
406	7.50	0.00463	4.36		135	69
407	7.50	0.00453	4.27		134	69
408	7.40	0.0045	4.1		134	70
409	7.40	0.00401	3.92		135	70
410	7.40	0.00395	3.81		136	69
411	7.40	0.00369	3.62		136	69
412	7.40	0.00389	3.63		138	69
413	7.40	0.00395	3.6		137	69
414	7.40	0.00392	3.59		138	69
415	7.40	0.00385	3.53		138	69
416	7.40	0.00388	3.47		138	69
417	7.40	0.00392	3.46		138	69
418	7.40	0.00388	3.44		137	69
419	7.30	0.00398	3.42		138	70
420	7.30	0.00401	3.36		139	69
421	7.30	0.00401	3.31		139	69
422	7.30	0.00405	3.23		140	69
423	7.30	0.00395	3.14		141	69
424	7.30	0.00388	3.09		141	69
425	7.30	0.00382	3		141	69
426	7.30	0.00382	2.94		141	70
427	7.30	0.00382	2.88		140	69
428	7.30	0.00382	2.86		141	69
429	7.30	0.00379	2.81		140	69
430	7.30	0.00375	2.74		140	69
431	7.30	0.00369	2.9		139	69
432	7.30	0.00398	3.08		139	69
433	7.30	0.00411	3.11		140	69
434	7.20	0.00385	3.05		140	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
435	7.20	0.00382	3.06		140	69
436	7.20	0.00375	3.05		141	69
437	7.20	0.00369	3.08		140	69
438	7.20	0.00356	3.03		140	69
439	7.20	0.00356	3.05		140	69
440	7.20	0.00349	2.98		139	69
441	7.20	0.00356	2.97		139	69
442	7.20	0.00359	3		140	69
443	7.20	0.00365	2.98		140	69
444	7.20	0.00365	2.95		140	69
445	7.20	0.00365	2.96		141	69
446	7.20	0.00372	2.96		140	69
447	7.10	0.00372	3.03		140	69
448	7.10	0.00362	2.94		140	69
449	7.10	0.00356	2.87		142	69
450	7.10	0.00346	2.83		143	69
451	7.10	0.00359	2.84		144	69
452	7.10	0.00359	2.83		144	69
453	7.10	0.00359	2.78		145	69
454	7.10	0.00359	2.79		146	69
455	7.10	0.00382	2.85		145	69
456	7.10	0.00411	2.96		145	69
457	7.10	0.00417	3		144	69
458	7.10	0.00417	2.98		143	69
459	7.00	0.00401	2.9		143	69
460	7.00	0.00385	2.82		144	69
461	7.00	0.00382	2.79		145	69
462	7.00	0.00392	2.81		145	69
463	7.00	0.00401	2.85		144	69
464	7.00	0.00395	2.7		145	69
465	7.00	0.00388	2.62		145	69
466	7.00	0.00411	2.6		145	69
467	7.00	0.00453	2.6		146	69
468	7.00	0.00486	2.59		146	69
469	7.00	0.00531	2.52		148	69
470	7.00	0.00654	2.51		149	69
471	7.00	0.01	2.5		149	69
472	6.90	0.02	2.51		150	69
473	6.90	0.07	2.51		150	69
474	6.90	0.15	2.45		149	69
475	6.90	0.22	2.42		148	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
476	6.90	0.27	2.39		147	69
477	6.90	0.3	2.37		145	69
478	6.90	0.33	2.34		145	69
479	6.90	0.36	2.31		143	69
480	6.90	0.37	2.27		142	69
481	6.90	0.4	2.26		141	69
482	6.90	0.43	2.29		139	69
483	6.90	0.47	2.38		139	69
484	6.90	0.51	2.48		137	69
485	6.90	0.54	2.56		137	69
486	6.80	0.57	2.65		137	69
487	6.80	0.65	2.91		137	69
488	6.80	0.68	3.05		137	69
489	6.80	0.69	3.11		137	69
490	6.80	0.67	3.18		137	69
491	6.80	0.63	3.23		138	69
492	6.80	0.59	3.22		138	69
493	6.80	0.55	3.27		139	69
494	6.80	0.51	3.27		140	69
495	6.70	0.47	3.33		141	69
496	6.70	0.44	3.44		143	69
497	6.70	0.29	4.32		145	69
498	6.70	0.13	4.98		147	69
499	6.70	0.11	4.57		148	69
500	6.70	0.1	4.37		148	69
501	6.60	0.1	4.75		148	69
502	6.60	0.07	5.18		147	69
503	6.60	0.07	4.64		148	69
504	6.60	0.06	4.23		148	69
505	6.60	0.05	4.08		149	69
506	6.60	0.07	3.68		149	69
507	6.60	0.09	3.46		147	69
508	6.50	0.11	3.29		148	69
509	6.50	0.13	3.2		151	69
510	6.50	0.15	3.16		151	69
511	6.50	0.17	3.36		152	69
512	6.50	0.18	3.51		152	69
513	6.50	0.18	3.57		152	69
514	6.50	0.18	3.57		154	69
515	6.50	0.18	3.42		154	69
516	6.50	0.2	3.36		154	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
517	6.40	0.22	3.3		157	69
518	6.40	0.23	3.25		157	69
519	6.40	0.23	3.05		158	69
520	6.40	0.25	3.01		158	69
521	6.40	0.25	3.15		157	69
522	6.40	0.28	2.94		157	69
523	6.40	0.31	2.84		157	69
524	6.40	0.34	2.81		154	69
525	6.40	0.37	2.75		153	69
526	6.40	0.39	2.68		153	69
527	6.30	0.44	2.55		152	69
528	6.30	0.45	2.46		151	69
529	6.30	0.48	2.51		144	69
530	6.30	0.52	2.67		139	69
531	6.30	0.52	2.48		135	69
532	6.30	0.52	2.29		132	69
533	6.30	0.5	2.15		129	69
534	6.30	0.5	2.05		128	69
535	6.30	0.5	1.94		127	69
536	6.30	0.49	1.85		125	69
537	6.30	0.49	1.64		157	69
538	6.30	1	1.2		140	69
539	6.20	0.94	5.39		131	69
540	6.20	0.74	5.69		126	70
541	6.20	0.73	5.38		123	69
542	6.20	0.8	5.32		121	69
543	6.20	0.79	5.25		120	70
544	6.20	0.85	5.23		120	69
545	6.10	0.86	4.9		120	69
546	6.10	0.91	4.86		119	69
547	6.10	0.98	4.56		119	69
548	6.10	0.89	4.42		123	69
549	6.10	0.71	5.09		126	69
550	6.00	0.66	5.08		131	69
551	6.00	0.61	4.92		136	69
552	6.00	0.54	5.32		139	69
553	5.90	0.44	5.3		143	69
554	5.90	0.34	5.31		147	69
555	5.90	0.3	5.61		152	69
556	5.90	0.24	5.67		157	69
557	5.80	0.21	5.5		164	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
558	5.80	0.18	5.23		171	69
559	5.80	0.16	5.08		176	69
560	5.70	0.15	4.96		181	69
561	5.70	0.16	5.04		185	69
562	5.70	0.16	5.05		187	69
563	5.70	0.16	4.88		190	69
564	5.60	0.15	4.78		193	69
565	5.60	0.15	4.89		194	69
566	5.60	0.16	5.02		196	69
567	5.50	0.16	4.94		197	69
568	5.50	0.17	4.92		199	69
569	5.50	0.14	4.55		204	69
570	5.50	0.22	5.18		194	69
571	5.40	0.23	5.25		191	69
572	5.40	0.23	5.34		191	69
573	5.40	0.24	5.29		191	69
574	5.40	0.23	5.3		192	69
575	5.30	0.22	4.97		193	69
576	5.30	0.19	4.88		195	69
577	5.30	0.14	5.06		197	69
578	5.30	0.15	4.77		198	69
579	5.20	0.16	4.77		198	69
580	5.20	0.16	4.51		196	69
581	5.20	0.18	4.73		196	69
582	5.10	0.19	5.23		196	69
583	5.10	0.19	4.53		197	69
584	5.10	0.17	4.79		197	69
585	5.10	0.15	4.79		198	69
586	5.00	0.16	4.53		199	69
587	5.00	0.18	4.1		224	69
588	4.90	0.19	6.78		238	69
589	4.90	0.33	7.52		221	69
590	4.90	0.37	7.32		211	69
591	4.80	0.36	7.47		207	70
592	4.80	0.36	7.51		205	69
593	4.70	0.34	7.47		205	70
594	4.70	0.27	7.33		206	69
595	4.60	0.22	7.12		207	69
596	4.60	0.27	6.97		208	69
597	4.50	0.29	7.71		210	70
598	4.50	0.28	7.93		216	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
599	4.40	0.33	8.28		219	70
600	4.30	0.25	8.87		226	69
601	4.30	0.22	9.6		232	69
602	4.20	0.17	10.11		241	70
603	4.10	0.1	10.52		252	69
604	4.00	0.06	10.56		261	70
605	4.00	0.05	10.64		270	70
606	3.90	0.05	11.07		278	69
607	3.80	0.12	12.06		285	70
608	3.70	0.81	13.34		298	70
609	3.60	1.39	12.75		305	70
610	3.50	0.7	13.27		307	70
611	3.40	0.14	12.1		309	70
612	3.30	0.02	10.84		308	70
613	3.20	0.00459	9.8		306	70
614	3.20	0.00207	8.76		303	70
615	3.10	0.00197	7.98		296	70
616	3.10	0.0022	7.65		292	70
617	3.00	0.00213	7.36		290	70
618	2.90	0.002	7.23		288	70
619	2.90	0.002	7.03		285	70
620	2.80	0.00181	6.89		283	70
621	2.80	0.00168	6.92		284	70
622	2.80	0.00185	7.06		282	70
623	2.70	0.00145	7.2		282	70
624	2.70	0.00132	7.41		280	70
625	2.60	0.0011	7.41		278	70
626	2.50	0.00152	8.98		280	70
627	2.50	0.00417	10.43		285	70
628	2.40	0.00453	10.33		289	70
629	2.30	0.0033	10.32		294	71
630	2.30	0.00333	10.5		296	70
631	2.20	0.00401	10.62		300	70
632	2.10	0.0056	10.77		304	70
633	2.00	0.01	10.82		305	70
634	2.00	0.02	11.04		305	70
635	1.90	0.03	11.02		309	70
636	1.80	0.08	10.99		312	71
637	1.70	0.12	11.01		313	70
638	1.60	0.17	11.04		316	70
639	1.60	0.1	11.13		318	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
640	1.50	0.16	11.1		321	71
641	1.40	0.21	11.15		322	71
642	1.30	0.28	11.34		323	71
643	1.30	0.4	11.56		324	71
644	1.20	0.46	11.73		324	71
645	1.10	0.37	11.9		324	71
646	1.00	0.31	11.9		322	71
647	1.00	0.48	12.06		303	71
648	0.90	0.38	11.94		290	71
649	0.80	0.64	11.51		285	71
650	0.80	0.58	11.53		282	71
651	0.70	0.51	11.49		283	71
652	0.70	0.26	11.43		282	71
653	0.60	0.06	10.73		281	71
654	0.60	0.02	9.72		278	71
655	0.50	0.01	9.72		274	71
656	0.50	0.00699	9.58		268	71
657	0.50	0.0054	9.53		266	71
658	0.40	0.00382	9.61		263	71
659	0.40	0.00343	9.38		262	71
660	0.30	0.00307	9.33		258	71
661	0.30	0.00265	9.28		256	71
662	0.30	0.00249	9.3		254	71
663	0.20	0.00233	9.23		251	71
664	0.20	0.0023	9.23		250	71
665	0.20	0.0023	9.14		248	71
666	0.10	0.00242	9.03		247	71
667	0.10	0.00239	8.95		244	71
668	0.00	0.00249	8.25		242	71

Stack Loss Efficiency

Manufacturer: Valley Comfort
Model: SC25
Date: 02/29/24
Run: 3
Control #: 2142
Test Duration: 668
Output Category: 1

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	80.7%	87.3%
Combustion Efficiency	99.1%	99.1%
Heat Transfer Efficiency	81%	88.0%

Output Rate (kJ/h)	8,474	8,038	**(Btu/h)**
Burn Rate (kg/h)	0.53	1.17	**(lb/h)**
Input (kJ/h)	10,497	9,957	**(Btu/h)**

Test Load Weight (dry kg)	5.90	13.00	**dry lb**
MC wet (%)	17.71		
MC dry (%)	21.52		
Particulate (g)	12.04		
CO (g)	143		
Test Duration (h)	11.13		

Emissions	Particulate	CO
g/MJ Output	0.13	1.52
g/kg Dry Fuel	2.04	24.30
g/h	1.08	12.87
lb/MM Btu Output	0.30	3.53

Air/Fuel Ratio (A/F)	18.70

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

VERSION:	**2.4**	**4/15/2010**			
Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	SC25				
Date:	2/29/2024		**Temp. Units**	F	(F or C)
Run:	3		**Weight Units**	lb	(kg or lb)
Control #:	2142				
Test Duration:	668				
Output Category:	1		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.71		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	15.80		**%C**	48.73	
Burn Rate (dry kg/h):	0.53		**%H**	6.87	
Total Particulate Emissions:	12.04 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.09**	**5.56**	**#DIV/0!**	**168.77**	**69.76**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	15.80	0.20	0.51		189.0	70.0
1	15.60	0.13	0.43		194.0	70.0
2	15.50	0.45	1.55		172.0	70.0
3	15.50	0.24	2.34		160.0	70.0
4	15.50	0.01	2.61		155.0	70.0
5	15.50	0.00	2.50		151.0	70.0
6	15.50	0.00	2.46		150.0	70.0
7	15.50	0.00	2.56		148.0	70.0
8	15.50	0.00	2.66		146.0	70.0
9	15.40	0.00	2.81		146.0	70.0
10	15.40	0.00	2.95		146.0	70.0
11	15.40	0.00	3.16		145.0	70.0
12	15.40	0.00	3.40		146.0	70.0
13	15.40	0.00	3.68		146.0	70.0
14	15.40	0.01	3.83		146.0	70.0
15	15.40	0.01	4.02		147.0	70.0
16	15.30	0.01	4.10		147.0	70.0
17	15.30	0.01	4.31		148.0	70.0
18	15.30	0.01	4.42		148.0	70.0
19	15.30	0.01	4.60		150.0	70.0
20	15.30	0.01	4.75		152.0	70.0
21	15.20	0.01	4.79		150.0	70.0
22	15.20	0.01	4.84		152.0	70.0
23	15.20	0.01	4.89		154.0	70.0
24	15.20	0.01	5.03		155.0	70.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	15.10	0.01	5.08		155.0	70.0
26	15.10	0.01	5.17		157.0	70.0
27	15.10	0.01	5.19		157.0	70.0
28	15.10	0.01	5.25		159.0	70.0
29	15.00	0.01	5.20		159.0	70.0
30	15.00	0.01	5.21		160.0	70.0
31	15.00	0.01	5.22		159.0	70.0
32	15.00	0.01	5.25		161.0	70.0
33	14.90	0.01	5.29		164.0	70.0
34	14.90	0.01	5.38		163.0	70.0
35	14.90	0.01	5.45		163.0	70.0
36	14.90	0.01	5.40		164.0	70.0
37	14.80	0.01	5.45		166.0	70.0
38	14.80	0.01	5.44		166.0	70.0
39	14.80	0.01	5.44		167.0	70.0
40	14.80	0.01	5.44		168.0	70.0
41	14.70	0.01	5.44		168.0	70.0
42	14.70	0.01	5.47		168.0	70.0
43	14.70	0.01	5.49		168.0	70.0
44	14.70	0.01	5.49		169.0	70.0
45	14.60	0.01	5.49		169.0	70.0
46	14.60	0.01	5.54		170.0	70.0
47	14.60	0.01	5.58		170.0	70.0
48	14.60	0.01	5.58		172.0	70.0
49	14.50	0.01	5.61		170	70
50	14.50	0.01	5.75		171	70
51	14.50	0.01	5.79		172	70
52	14.40	0.01	5.77		171	70
53	14.40	0.01	5.83		172	70
54	14.40	0.01	5.83		173	70
55	14.40	0.01	5.77		172	70
56	14.30	0.01	5.78		173	70
57	14.30	0.01	5.68		174	70
58	14.30	0.01	5.83		174	70
59	14.30	0.01	5.81		175	70
60	14.20	0.01	5.86		175	70
61	14.20	0.01	5.83		174	70
62	14.20	0.01	5.91		177	70
63	14.10	0.01	5.97		176	70
64	14.10	0.01	6.01		176	70
65	14.10	0.01	6		176	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	14.10	0.01	6.04		177	70
67	14.00	0.01	6.07		178	70
68	14.00	0.01	6.07		178	70
69	14.00	0.01	6.03		179	70
70	14.00	0.01	6.06		180	70
71	13.90	0.01	6.1		181	70
72	13.90	0.01	6.14		180	70
73	13.90	0.01	6.14		180	70
74	13.90	0.01	6.25		180	70
75	13.80	0.01	5.88		179	70
76	13.80	0.01	5.7		179	70
77	13.80	0.01	5.59		179	70
78	13.80	0.01	5.6		180	70
79	13.70	0.01	5.6		179	70
80	13.70	0.01	5.57		178	70
81	13.70	0.01	5.56		178	70
82	13.70	0.01	5.59		179	70
83	13.60	0.01	5.58		178	70
84	13.60	0.01	5.63		178	71
85	13.60	0.01	5.64		178	70
86	13.60	0.01	5.65		177	70
87	13.50	0.01	5.62		176	70
88	13.50	0.01	5.6		175	70
89	13.50	0.01	5.65		175	70
90	13.50	0.01	5.71		175	70
91	13.40	0.01	5.69		175	70
92	13.40	0.01	5.5		174	70
93	13.40	0.01	5.56		175	70
94	13.40	0.01	5.55		173	70
95	13.40	0.01	5.59		174	70
96	13.30	0.01	5.6		173	70
97	13.30	0.01	5.63		174	70
98	13.30	0.01	5.6		174	70
99	13.20	0.01	5.66		173	70
100	13.20	0.01	5.76		174	70
101	13.20	0.01	5.71		174	70
102	13.20	0.01	5.77		173	70
103	13.20	0.01	5.77		173	70
104	13.10	0.01	5.77		173	70
105	13.10	0.01	5.61		172	70
106	13.10	0.01	5.52		171	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	13.10	0.01	5.53		174	70
108	13.00	0.01	5.53		174	70
109	13.00	0.01	5.57		174	70
110	13.00	0.01	5.58		173	70
111	13.00	0.01	5.52		172	70
112	12.90	0.01	5.44		172	70
113	12.90	0.01	5.34		172	70
114	12.90	0.01	5.4		171	70
115	12.90	0.01	5.36		171	70
116	12.80	0.01	5.31		171	70
117	12.80	0.01	5.33		170	70
118	12.80	0.01	5.34		170	70
119	12.80	0.01	5.33		169	70
120	12.80	0.01	5.34		169	70
121	12.70	0.01	5.28		168	70
122	12.70	0.01	5.38		169	70
123	12.70	0.01	5.36		169	70
124	12.70	0.01	5.32		169	70
125	12.70	0.01	5.38		170	70
126	12.60	0.01	5.34		169	70
127	12.60	0.01	5.27		170	70
128	12.60	0.00731	5.27		169	70
129	12.60	0.01	5.31		169	70
130	12.60	0.01	5.3		168	70
131	12.50	0.01	5.27		167	70
132	12.50	0.01	5.33		166	70
133	12.50	0.01	5.31		166	70
134	12.50	0.01	5.34		167	70
135	12.40	0.01	5.4		166	70
136	12.40	0.01	5.37		167	70
137	12.40	0.01	5.4		166	70
138	12.40	0.01	5.3		165	70
139	12.30	0.01	5.38		165	70
140	12.30	0.01	5.31		166	70
141	12.30	0.00725	5.25		166	70
142	12.30	0.00722	5.25		166	70
143	12.30	0.00718	5.22		165	70
144	12.20	0.00735	5.22		166	70
145	12.20	0.00709	5.22		165	70
146	12.20	0.0068	5.22		164	70
147	12.20	0.00683	5.22		165	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	12.20	0.00677	5.18		163	70
149	12.10	0.0068	5.21		162	70
150	12.10	0.00667	5.2		163	70
151	12.10	0.00654	5.16		161	70
152	12.10	0.00657	5.18		161	70
153	12.10	0.00647	5.2		162	70
154	12.00	0.00651	5.23		161	70
155	12.00	0.0066	5.29		161	70
156	12.00	0.00654	5.31		161	70
157	12.00	0.0066	5.36		161	70
158	12.00	0.00667	5.42		161	70
159	11.90	0.0068	5.54		161	70
160	11.90	0.00693	5.68		161	70
161	11.90	0.01	6.34		161	71
162	11.90	0.01	5.76		160	70
163	11.80	0.01	5.8		161	70
164	11.80	0.01	6.1		160	70
165	9.60	0.01	6.06		161	70
166	11.80	0.01	5.92		159	70
167	11.80	0.01	6.05		160	70
168	11.70	0.01	6.08		162	70
169	11.70	0.01	6.09		161	70
170	11.70	0.01	6.1		161	70
171	11.60	0.01	6.1		162	70
172	11.60	0.01	6.03		162	70
173	11.60	0.00735	5.88		162	70
174	11.60	0.00712	5.89		163	70
175	11.50	0.00738	5.88		162	70
176	11.50	0.0067	5.86		163	70
177	11.50	0.00651	5.84		162	70
178	11.50	0.00634	5.86		162	70
179	11.50	0.00621	6.01		162	70
180	11.40	0.00599	6.07		163	70
181	11.40	0.00631	6.15		163	70
182	11.40	0.0056	6.21		163	71
183	11.30	0.00547	6.3		163	71
184	11.30	0.00521	6.25		162	71
185	11.30	0.00466	6.32		163	71
186	11.30	0.00511	6.27		164	70
187	11.20	0.00473	6.3		165	71
188	11.20	0.00489	6.36		165	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	11.20	0.00473	6.31		165	70
190	11.20	0.00427	6.35		164	70
191	11.10	0.00427	6.31		164	70
192	11.10	0.00459	6.36		164	70
193	11.10	0.00434	6.19		163	70
194	11.10	0.00434	6.26		164	70
195	11.10	0.00427	6.17		164	70
196	11.00	0.00421	6.14		165	70
197	11.00	0.00417	6.08		166	70
198	11.00	0.00414	6.01		165	70
199	10.90	0.00411	6.05		166	71
200	10.90	0.00414	6		165	71
201	10.90	0.00417	5.95		164	70
202	10.90	0.00408	5.69		165	70
203	10.90	0.00382	5.68		166	70
204	10.80	0.00359	5.63		165	71
205	10.80	0.00352	5.63		165	71
206	10.80	0.00372	5.68		165	71
207	10.80	0.00375	5.73		165	70
208	10.80	0.00375	5.7		163	71
209	10.70	0.00369	5.68		163	71
210	10.70	0.00365	5.63		162	71
211	10.70	0.00362	5.49		162	71
212	10.70	0.00349	5.25		161	71
213	10.70	0.0034	5.23		161	71
214	10.70	0.00343	5.18		160	71
215	10.60	0.00336	5.14		159	71
216	10.60	0.0034	5.09		158	71
217	10.60	0.0034	5.14		157	71
218	10.60	0.00336	5.28		157	71
219	10.60	0.00272	6.12		157	71
220	10.50	0.00246	5.68		155	71
221	10.50	0.00301	5.03		155	71
222	10.50	0.00327	5.12		154	70
223	10.50	0.00327	5.17		153	70
224	10.50	0.00336	5.22		152	71
225	10.50	0.00343	5.23		151	71
226	10.50	0.00346	5.18		150	71
227	10.40	0.00362	5.21		149	71
228	10.40	0.00365	5.26		149	71
229	10.40	0.00379	5.34		149	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	10.40	0.00382	5.29		148	71
231	10.40	0.00382	5.34		148	70
232	10.40	0.00372	5.38		148	70
233	10.40	0.00375	5.29		148	70
234	10.30	0.00372	5.34		148	71
235	10.30	0.00375	5.32		147	70
236	10.30	0.00365	5.29		148	71
237	10.30	0.00379	5.42		148	70
238	10.20	0.00349	6.39		151	70
239	10.20	0.00346	9.3		152	70
240	10.20	0.00356	8.65		153	71
241	10.10	0.00346	6.7		156	71
242	10.10	0.00359	7.17		159	70
243	10.10	0.00379	6.76		159	70
244	10.00	0.00392	6.57		161	70
245	10.00	0.00365	6.29		161	70
246	10.00	0.00437	6.32		161	70
247	10.00	0.00469	6.47		163	71
248	9.90	0.00515	6.47		163	70
249	9.90	0.0057	6.29		163	70
250	9.90	0.0056	6.36		163	70
251	9.90	0.0054	6.38		165	70
252	9.80	0.0055	6.56		164	70
253	9.80	0.0056	6.53		165	71
254	9.80	0.00566	6.55		165	70
255	9.80	0.0055	6.52		165	71
256	9.80	0.00524	6.47		166	71
257	9.70	0.00521	6.36		164	71
258	9.70	0.00511	6.22		165	71
259	9.70	0.00544	6.38		165	71
260	9.70	0.00583	6.61		166	70
261	9.60	0.00612	6.92		167	69
262	9.60	0.00599	6.99		167	68
263	9.60	0.00686	7.19		167	68
264	9.50	0.00673	8.5		168	68
265	9.50	0.00489	8.61		170	67
266	9.50	0.0043	7.94		172	67
267	9.40	0.00395	7.53		172	68
268	9.40	0.00375	7.32		173	68
269	9.40	0.00362	7.34		173	68
270	9.40	0.00336	7.28		172	68

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	9.30	0.0033	7.27		171	68
272	9.30	0.00317	7.09		169	68
273	9.30	0.0033	7.08		168	69
274	9.20	0.00346	6.81		168	68
275	9.20	0.00336	6.62		166	69
276	9.20	0.00336	6.59		165	69
277	9.20	0.0034	6.61		164	69
278	9.20	0.00333	6.53		162	69
279	9.10	0.00327	6.51		161	69
280	9.10	0.00343	6.5		159	69
281	9.10	0.00395	6.59		156	69
282	9.10	0.00414	6.66		154	69
283	9.10	0.00401	6.6		153	69
284	9.10	0.00414	6.56		152	69
285	9.00	0.00401	6.58		152	69
286	9.00	0.00405	6.53		151	69
287	9.00	0.00414	6.49		151	69
288	9.00	0.00424	6.53		150	69
289	9.00	0.00466	6.66		149	69
290	8.90	0.00515	6.88		149	69
291	8.90	0.00544	7.03		148	70
292	8.90	0.00579	7.23		147	70
293	8.90	0.00602	7.36		147	69
294	8.90	0.00605	7.4		147	70
295	8.80	0.00602	7.31		147	70
296	8.80	0.00618	7.41		147	70
297	8.80	0.00634	7.4		147	70
298	8.80	0.0066	7.41		146	70
299	8.80	0.00657	7.32		147	70
300	8.70	0.0068	7.16		146	70
301	8.70	0.00683	7.09		144	70
302	8.70	0.00693	7.12		144	70
303	8.70	0.00709	7.03		144	70
304	8.70	0.00673	6.96		144	70
305	8.70	0.00644	6.85		144	70
306	8.60	0.00631	6.79		145	70
307	8.60	0.00641	6.63		144	70
308	8.60	0.00625	6.58		145	70
309	8.60	0.00722	6.54		142	70
310	8.60	0.00728	6.47		142	70
311	8.60	0.00686	6.36		141	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	8.60	0.00712	6.3		142	70
313	8.50	0.00728	6.25		143	70
314	8.50	0.00744	6.27		141	70
315	8.50	0.00725	6.31		141	70
316	8.50	0.00728	6.32		141	70
317	8.50	0.00686	6.19		140	70
318	8.50	0.00719	6.17		140	70
319	8.40	0.00803	6.05		139	70
320	8.40	0.0076	5.92		138	70
321	8.40	0.0056	5.75		139	70
322	8.40	0.00586	5.69		139	70
323	8.40	0.00602	5.69		139	70
324	8.40	0.00651	5.64		138	70
325	8.40	0.00631	5.58		136	70
326	8.40	0.00703	5.61		136	70
327	8.30	0.00722	5.58		135	70
328	8.30	0.00751	5.52		134	70
329	8.30	0.00735	5.56		135	70
330	8.30	0.00712	5.49		134	70
331	8.30	0.00793	5.38		135	70
332	8.30	0.00767	5.27		134	70
333	8.30	0.00777	5.33		134	70
334	8.30	0.00803	5.32		133	70
335	8.30	0.01	5.45		133	70
336	8.20	0.01	5.45		131	70
337	8.20	0.01	5.43		131	70
338	8.20	0.01	5.37		130	70
339	8.20	0.01	5.36		130	70
340	8.20	0.01	5.31		130	70
341	8.20	0.01	5.34		129	70
342	8.20	0.01	5.27		129	70
343	8.20	0.01	5.28		129	70
344	8.20	0.01	5.25		129	70
345	8.10	0.01	5.31		128	70
346	8.10	0.01	5.32		127	70
347	8.10	0.01	5.27		126	70
348	8.10	0.01	5.3		127	70
349	8.10	0.01	5.28		126	70
350	8.10	0.01	5.23		126	70
351	8.10	0.01	5.17		125	70
352	8.10	0.01	5.18		125	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	8.10	0.01	5.01		125	70
354	8.10	0.00773	4.84		125	70
355	8.10	0.0078	4.83		124	70
356	8.00	0.00803	4.8		126	70
357	8.00	0.00796	4.8		126	70
358	8.00	0.01	4.83		127	70
359	8.00	0.00829	4.85		128	70
360	8.00	0.01	4.84		130	70
361	8.00	0.01	4.73		130	70
362	8.00	0.00819	4.75		129	70
363	8.00	0.01	4.73		129	70
364	8.00	0.00806	4.67		128	70
365	7.90	0.00806	4.66		129	70
366	7.90	0.00819	4.69		130	70
367	7.90	0.008	4.64		130	70
368	7.90	0.01	4.61		129	70
369	7.90	0.00783	4.54		129	70
370	7.90	0.00773	4.49		129	70
371	7.90	0.00751	4.49		129	70
372	7.90	0.01	5.17		128	70
373	7.90	0.01	5.54		129	70
374	7.90	0.01	5.66		129	70
375	7.80	0.01	5.73		129	70
376	7.80	0.01	5.7		128	70
377	7.80	0.01	5.64		129	70
378	7.80	0.01	5.58		129	70
379	7.80	0.01	5.63		130	70
380	7.80	0.01	5.63		131	70
381	7.80	0.01	5.58		131	70
382	7.70	0.01	5.5		130	70
383	7.70	0.01	5.54		130	70
384	7.70	0.01	5.53		132	70
385	7.70	0.01	5.47		132	70
386	7.70	0.008	5.31		133	70
387	7.70	0.00764	5.29		134	70
388	7.70	0.00703	5.21		134	70
389	7.70	0.0069	5.14		134	70
390	7.60	0.0066	5.04		133	70
391	7.60	0.00631	4.96		134	70
392	7.60	0.00579	4.81		133	70
393	7.60	0.00576	4.84		133	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
394	7.60	0.00556	4.71		134	70
395	7.60	0.00554	4.68		133	70
396	7.60	0.00541	4.67		134	70
397	7.60	0.00524	4.58		133	70
398	7.50	0.00547	4.63		132	70
399	7.50	0.00537	4.65		133	70
400	7.50	0.00518	4.69		133	70
401	7.50	0.00516	4.64		133	70
402	7.50	0.0045	4.51		134	69
403	7.50	0.00459	4.49		134	70
404	7.50	0.00459	4.47		133	70
405	7.50	0.00466	4.49		135	70
406	7.50	0.00463	4.36		135	69
407	7.50	0.00453	4.27		134	69
408	7.40	0.0045	4.1		134	70
409	7.40	0.00401	3.92		135	70
410	7.40	0.00395	3.81		136	69
411	7.40	0.00369	3.62		136	69
412	7.40	0.00389	3.63		138	69
413	7.40	0.00395	3.6		137	69
414	7.40	0.00392	3.59		138	69
415	7.40	0.00385	3.53		138	69
416	7.40	0.00388	3.47		138	69
417	7.40	0.00392	3.46		138	69
418	7.40	0.00388	3.44		137	69
419	7.30	0.00398	3.42		138	70
420	7.30	0.00401	3.36		139	69
421	7.30	0.00401	3.31		139	69
422	7.30	0.00405	3.23		140	69
423	7.30	0.00395	3.14		141	69
424	7.30	0.00388	3.09		141	69
425	7.30	0.00382	3		141	69
426	7.30	0.00382	2.94		141	70
427	7.30	0.00382	2.88		140	69
428	7.30	0.00382	2.86		141	69
429	7.30	0.00379	2.81		140	69
430	7.30	0.00375	2.74		140	69
431	7.30	0.00369	2.9		139	69
432	7.30	0.00398	3.08		139	69
433	7.30	0.00411	3.11		140	69
434	7.20	0.00385	3.05		140	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
435	7.20	0.00382	3.06		140	69
436	7.20	0.00375	3.05		141	69
437	7.20	0.00369	3.08		140	69
438	7.20	0.00356	3.03		140	69
439	7.20	0.00356	3.05		140	69
440	7.20	0.00349	2.98		139	69
441	7.20	0.00356	2.97		139	69
442	7.20	0.00359	3		140	69
443	7.20	0.00365	2.98		140	69
444	7.20	0.00365	2.95		140	69
445	7.20	0.00365	2.96		141	69
446	7.20	0.00372	2.96		140	69
447	7.10	0.00372	3.03		140	69
448	7.10	0.00362	2.94		140	69
449	7.10	0.00356	2.87		142	69
450	7.10	0.00346	2.83		143	69
451	7.10	0.00359	2.84		144	69
452	7.10	0.00359	2.83		144	69
453	7.10	0.00359	2.78		145	69
454	7.10	0.00359	2.79		146	69
455	7.10	0.00382	2.85		145	69
456	7.10	0.00411	2.96		145	69
457	7.10	0.00417	3		144	69
458	7.10	0.00417	2.98		143	69
459	7.00	0.00401	2.9		143	69
460	7.00	0.00385	2.82		144	69
461	7.00	0.00382	2.79		145	69
462	7.00	0.00392	2.81		145	69
463	7.00	0.00401	2.85		144	69
464	7.00	0.00395	2.7		145	69
465	7.00	0.00388	2.62		145	69
466	7.00	0.00411	2.6		145	69
467	7.00	0.00453	2.6		146	69
468	7.00	0.00486	2.59		146	69
469	7.00	0.00531	2.52		148	69
470	7.00	0.00654	2.51		149	69
471	7.00	0.01	2.5		149	69
472	6.90	0.02	2.51		150	69
473	6.90	0.07	2.51		150	69
474	6.90	0.15	2.45		149	69
475	6.90	0.22	2.42		148	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
476	6.90	0.27	2.39		147	69
477	6.90	0.3	2.37		145	69
478	6.90	0.33	2.34		145	69
479	6.90	0.36	2.31		143	69
480	6.90	0.37	2.27		142	69
481	6.90	0.4	2.26		141	69
482	6.90	0.43	2.29		139	69
483	6.90	0.47	2.38		139	69
484	6.90	0.51	2.48		137	69
485	6.90	0.54	2.56		137	69
486	6.80	0.57	2.65		137	69
487	6.80	0.65	2.91		137	69
488	6.80	0.68	3.05		137	69
489	6.80	0.69	3.11		137	69
490	6.80	0.67	3.18		137	69
491	6.80	0.63	3.23		138	69
492	6.80	0.59	3.22		138	69
493	6.80	0.55	3.27		139	69
494	6.80	0.51	3.27		140	69
495	6.70	0.47	3.33		141	69
496	6.70	0.44	3.44		143	69
497	6.70	0.29	4.32		145	69
498	6.70	0.13	4.98		147	69
499	6.70	0.11	4.57		148	69
500	6.70	0.1	4.37		148	69
501	6.60	0.1	4.75		148	69
502	6.60	0.07	5.18		147	69
503	6.60	0.07	4.64		148	69
504	6.60	0.06	4.23		148	69
505	6.60	0.05	4.08		149	69
506	6.60	0.07	3.68		149	69
507	6.60	0.09	3.46		147	69
508	6.50	0.11	3.29		148	69
509	6.50	0.13	3.2		151	69
510	6.50	0.15	3.16		151	69
511	6.50	0.17	3.36		152	69
512	6.50	0.18	3.51		152	69
513	6.50	0.18	3.57		152	69
514	6.50	0.18	3.57		154	69
515	6.50	0.18	3.42		154	69
516	6.50	0.2	3.36		154	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
517	6.40	0.22	3.3		157	69
518	6.40	0.23	3.25		157	69
519	6.40	0.23	3.05		158	69
520	6.40	0.25	3.01		158	69
521	6.40	0.25	3.15		157	69
522	6.40	0.28	2.94		157	69
523	6.40	0.31	2.84		157	69
524	6.40	0.34	2.81		154	69
525	6.40	0.37	2.75		153	69
526	6.40	0.39	2.68		153	69
527	6.30	0.44	2.55		152	69
528	6.30	0.45	2.46		151	69
529	6.30	0.48	2.51		144	69
530	6.30	0.52	2.67		139	69
531	6.30	0.52	2.48		135	69
532	6.30	0.52	2.29		132	69
533	6.30	0.5	2.15		129	69
534	6.30	0.5	2.05		128	69
535	6.30	0.5	1.94		127	69
536	6.30	0.49	1.85		125	69
537	6.30	0.49	1.64		157	69
538	6.30	1	1.2		140	69
539	6.20	0.94	5.39		131	69
540	6.20	0.74	5.69		126	70
541	6.20	0.73	5.38		123	69
542	6.20	0.8	5.32		121	69
543	6.20	0.79	5.25		120	70
544	6.20	0.85	5.23		120	69
545	6.10	0.86	4.9		120	69
546	6.10	0.91	4.86		119	69
547	6.10	0.98	4.56		119	69
548	6.10	0.89	4.42		123	69
549	6.10	0.71	5.09		126	69
550	6.00	0.66	5.08		131	69
551	6.00	0.61	4.92		136	69
552	6.00	0.54	5.32		139	69
553	5.90	0.44	5.3		143	69
554	5.90	0.34	5.31		147	69
555	5.90	0.3	5.61		152	69
556	5.90	0.24	5.67		157	69
557	5.80	0.21	5.5		164	69

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
558	5.80	0.18	5.23		171	69
559	5.80	0.16	5.08		176	69
560	5.70	0.15	4.96		181	69
561	5.70	0.16	5.04		185	69
562	5.70	0.16	5.05		187	69
563	5.70	0.16	4.88		190	69
564	5.60	0.15	4.78		193	69
565	5.60	0.15	4.89		194	69
566	5.60	0.16	5.02		196	69
567	5.50	0.16	4.94		197	69
568	5.50	0.17	4.92		199	69
569	5.50	0.14	4.55		204	69
570	5.50	0.22	5.18		194	69
571	5.40	0.23	5.25		191	69
572	5.40	0.23	5.34		191	69
573	5.40	0.24	5.29		191	69
574	5.40	0.23	5.3		192	69
575	5.30	0.22	4.97		193	69
576	5.30	0.19	4.88		195	69
577	5.30	0.14	5.06		197	69
578	5.30	0.15	4.77		198	69
579	5.20	0.16	4.77		198	69
580	5.20	0.16	4.51		196	69
581	5.20	0.18	4.73		196	69
582	5.10	0.19	5.23		196	69
583	5.10	0.19	4.53		197	69
584	5.10	0.17	4.79		197	69
585	5.10	0.15	4.79		198	69
586	5.00	0.16	4.53		199	69
587	5.00	0.18	4.1		224	69
588	4.90	0.19	6.78		238	69
589	4.90	0.33	7.52		221	69
590	4.90	0.37	7.32		211	69
591	4.80	0.36	7.47		207	70
592	4.80	0.36	7.51		205	69
593	4.70	0.34	7.47		205	70
594	4.70	0.27	7.33		206	69
595	4.60	0.22	7.12		207	69
596	4.60	0.27	6.97		208	69
597	4.50	0.29	7.71		210	70
598	4.50	0.28	7.93		216	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
599	4.40	0.33	8.28		219	70
600	4.30	0.25	8.87		226	69
601	4.30	0.22	9.6		232	69
602	4.20	0.17	10.11		241	70
603	4.10	0.1	10.52		252	69
604	4.00	0.06	10.56		261	70
605	4.00	0.05	10.64		270	70
606	3.90	0.05	11.07		278	69
607	3.80	0.12	12.06		285	70
608	3.70	0.81	13.34		298	70
609	3.60	1.39	12.75		305	70
610	3.50	0.7	13.27		307	70
611	3.40	0.14	12.1		309	70
612	3.30	0.02	10.84		308	70
613	3.20	0.00459	9.8		306	70
614	3.20	0.00207	8.76		303	70
615	3.10	0.00197	7.98		296	70
616	3.10	0.0022	7.65		292	70
617	3.00	0.00213	7.36		290	70
618	2.90	0.002	7.23		288	70
619	2.90	0.002	7.03		285	70
620	2.80	0.00181	6.89		283	70
621	2.80	0.00168	6.92		284	70
622	2.80	0.00185	7.06		282	70
623	2.70	0.00145	7.2		282	70
624	2.70	0.00132	7.41		280	70
625	2.60	0.0011	7.41		278	70
626	2.50	0.00152	8.98		280	70
627	2.50	0.00417	10.43		285	70
628	2.40	0.00453	10.33		289	70
629	2.30	0.0033	10.32		294	71
630	2.30	0.00333	10.5		296	70
631	2.20	0.00401	10.62		300	70
632	2.10	0.0056	10.77		304	70
633	2.00	0.01	10.82		305	70
634	2.00	0.02	11.04		305	70
635	1.90	0.03	11.02		309	70
636	1.80	0.08	10.99		312	71
637	1.70	0.12	11.01		313	70
638	1.60	0.17	11.04		316	70
639	1.60	0.1	11.13		318	70

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
640	1.50	0.16	11.1		321	71
641	1.40	0.21	11.15		322	71
642	1.30	0.28	11.34		323	71
643	1.30	0.4	11.56		324	71
644	1.20	0.46	11.73		324	71
645	1.10	0.37	11.9		324	71
646	1.00	0.31	11.9		322	71
647	1.00	0.48	12.06		303	71
648	0.90	0.38	11.94		290	71
649	0.80	0.64	11.51		285	71
650	0.80	0.58	11.53		282	71
651	0.70	0.51	11.49		283	71
652	0.70	0.26	11.43		282	71
653	0.60	0.06	10.73		281	71
654	0.60	0.02	9.72		278	71
655	0.50	0.01	9.72		274	71
656	0.50	0.00699	9.58		268	71
657	0.50	0.0054	9.53		266	71
658	0.40	0.00382	9.61		263	71
659	0.40	0.00343	9.38		262	71
660	0.30	0.00307	9.33		258	71
661	0.30	0.00265	9.28		256	71
662	0.30	0.00249	9.3		254	71
663	0.20	0.00233	9.23		251	71
664	0.20	0.0023	9.23		250	71
665	0.20	0.0023	9.14		248	71
666	0.10	0.00242	9.03		247	71
667	0.10	0.00239	8.95		244	71
668	0.00	0.00249	8.25		242	71

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : SC 25
Tracking No. : 2142
Project No. : 0142WN020E
Test Date : 2/29/2024
Run No. : 3

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.159** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 15.113 lb.
Minimum Fuel Weight : 13.60 lb.
Maximum Fuel Weight : 16.62 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	17.75	22.0	23.2	19.0	21.4	1.48	0.0539		1.8		1.48
2	1.80	2x4	18.00	20.4	20.0	21.9	20.8	1.49	0.0547		1.8		1.49
3	2.10	2x4	18.00	22.4	19.5	21.3	21.1	1.73	0.0547		2.1		1.73
4	4.10	4x4	17.75	19.5	23.8	24.2	22.5	3.35	0.1258	4.1		3.35	
5	4.40	4x4	18.00	19.2	21.9	22.0	21.0	3.64	0.1276	4.4		3.64	
6													
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
24.3	21.0	21.1	16.0	23.8	19.0	22.8	20.9	24.5
22.4	20.9	24.9	25.0	21.5				

Avg : 22.0

Assembled Crib Fuel Load with Spacers Attached

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.30	2x4		2.3000
2	2.20	2x4		2.2000
3	2.30	2x4		2.3000
4	4.40	4x4	4.40	
5	4.60	4x4	4.60	
6				
7				
8				
9				

Combined Mass of 4 x 4s 9.0 lb
Combined Mass of 2 x 4s 6.8 lb

Total Wet Mass of Fuel Load **15.8** 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	3	5.7	4.71	7.32	6.02	28.05	34.07	21.52	17.71
4 x 4	2	8.5	6.98						
Spacers	14	1.6	1.31						
Totals		15.8	13.00						

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 Pieces Moisture, % db
Measured	15.8	7.32	28.05	43	21.4
Required	13.6 - 16.6	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.:	2142
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WN020E
Model:	SC 25	Test Date:	2/29/2024

Dilution 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 *	0.060	80	0.245
X2	25.0	0.00	0.098	80	0.313
X3	75.0	0.00	0.100	80	0.316
X4	93.3	-0.5 *	0.072	80	0.268
Y1	6.7	0.5 *	0.060	80	0.245
Y2	25.0	0.00	0.090	80	0.300
Y3	75.0	0.00	0.086	80	0.293
Y4	93.3	-0.5 *	0.046	80	0.214
Center	50.0	0.00	0.114	80	0.338

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	29.5505882	in HG

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

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 18.5059$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 22.7704$$

$$F_P = V_{strav} / V_{scent} = 0.813$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 15.040\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	11:53	23:01
Barometric Pressure, in. Hg	29.58	29.59
Room Air Velocity, fpm	16	15
Room Air Temperature, °F	70	71
Room Relative Humidity, %	36.0	35.0
Platform Scale Audit, lb.	10.0	20.0

Leak Checks

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

See sampling box worksheets for sampling boxes

Dilution Tunnel

Date last cleaned	2/26/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

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

2 Create a smoking condition during start of pre-burn activates and using adequate lighting pointed upward and around 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 dilution tunnel flow turned-off, observe the flue draft gauge while turning the dilution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducement is occurring. Determine the cause (i.e. flue chimney too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 3

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E
Test Date: 2/29/24
Beginning Clock Time: 10:45

Coal Bed Range (lb):	3.2 (min)	4.0 (max)

Preburn Fuel Data

4 pieces @ 12 inches
4 pieces @ 17 inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

23.0	20.6					
23.8	21.0					
23.9						
22.6						
23.3						

Avg Preburn Moisture (% DB): **22.60**

			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	5.1	-0.071	700	218	217	556	458	1016	430	421	73
1	4.9	-0.069	697	217	220	546	454	969	427	332	73
2	4.9	-0.064	691	218	224	533	449	927	423	282	73
3	4.8	-0.063	684	212	227	522	443	894	418	251	73
4	4.8	-0.059	674	203	230	512	439	871	412	230	74
5	4.7	-0.058	663	204	233	502	435	854	407	215	73
6	4.7	-0.055	653	205	235	493	431	842	403	204	74
7	4.7	-0.054	644	207	236	484	427	840	400	196	74
8	4.6	-0.052	635	208	237	476	423	839	396	189	74
9	4.6	-0.051	627	210	238	468	419	835	392	182	73
10	4.6	-0.05	621	212	239	461	416	830	390	178	73
11	4.6	-0.049	614	213	239	453	412	824	386	174	73
12	4.6	-0.047	608	214	240	447	408	819	383	170	73
13	4.5	-0.047	602	215	240	440	404	814	380	167	73
14	4.5	-0.046	597	217	239	433	401	809	377	165	73
15	4.5	-0.045	591	218	239	427	397	804	374	162	73
16	4.5	-0.045	585	218	239	421	393	799	371	160	73
17	4.5	-0.044	580	218	238	415	389	793	368	158	73
18	4.4	-0.044	575	218	238	410	386	788	365	157	73
19	4.4	-0.043	570	220	237	404	382	783	363	155	72
20	4.4	-0.043	565	223	236	399	379	779	360	154	72
21	4.4	-0.043	560	226	235	394	375	773	358	153	72
22	4.4	-0.042	555	230	234	389	372	767	356	151	72
23	4.3	-0.041	551	235	233	384	368	761	354	149	72
24	4.3	-0.041	546	242	232	379	365	754	353	147	72
25	4.3	-0.04	542	241	232	374	361	749	350	144	72
26	4.3	-0.04	537	240	230	369	358	742	347	142	72
27	4.2	-0.039	533	240	229	365	354	737	344	141	72
28	4.2	-0.039	529	239	228	361	351	730	342	139	72
29	4.2	-0.038	525	239	227	356	348	725	339	138	72
30	4.2	-0.038	521	238	226	352	345	719	336	137	72
31	4.2	-0.038	517	237	225	348	342	711	334	136	72
32	4.2	-0.037	512	236	224	344	339	701	331	135	72
33	4.2	-0.036	507	235	223	341	336	692	328	133	72
34	4.2	-0.036	502	235	222	337	333	687	326	131	71
35	4.2	-0.035	496	234	221	333	330	676	323	129	72
36	4.2	-0.035	490	234	220	330	328	666	320	129	71
37	4.2	-0.035	484	233	219	326	325	655	317	128	71
38	4.2	-0.035	478	232	218	323	322	647	315	127	71
39	4.2	-0.034	472	232	217	319	320	636	312	127	71
40	4.2	-0.034	465	232	216	316	317	626	309	127	71
41	4.2	-0.034	458	231	215	313	314	618	306	126	71
42	4.2	-0.033	452	230	214	309	311	609	303	126	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	4.2	-0.034	445	228	212	306	309	602	300	126	71
44	4.2	-0.033	439	228	212	303	306	594	298	126	71
45	4.1	-0.033	433	227	211	300	304	588	295	125	70
46	4.1	-0.033	427	226	210	297	301	584	292	125	70
47	4.1	-0.033	422	225	208	294	299	580	290	125	70
48	4.1	-0.033	416	223	207	291	297	578	287	124	70
49	4.1	-0.033	412	222	206	288	295	575	285	125	70
50	4.1	-0.032	407	221	205	285	293	574	282	125	70
51	4.1	-0.032	403	220	205	283	291	575	280	125	70
52	4.1	-0.032	399	219	204	280	289	575	278	125	69
53	4.1	-0.032	396	219	203	278	287	575	277	125	70
54	4.1	-0.032	393	218	203	275	285	577	275	125	70
55	4.1	-0.031	391	217	202	273	284	579	273	124	70
56	4.1	-0.031	388	217	201	271	282	581	272	125	70
57	4.1	-0.032	386	216	201	268	281	584	270	127	71
58	4.1	-0.032	385	216	200	266	279	587	269	127	70
59	4.1	-0.032	384	215	200	264	278	591	268	129	70
60	4.1	-0.032	383	214	199	262	277	595	267	130	70
61	4	-0.032	382	214	199	261	276	600	266	131	69
62	4	-0.032	382	216	199	259	275	604	266	132	70
63	4	-0.032	382	216	199	257	274	608	266	132	70
64	4	-0.033	382	216	199	255	273	613	265	135	70
65	4	-0.033	382	217	199	254	272	617	265	135	70
66	4	-0.033	383	216	199	252	271	622	264	138	70
67	4	-0.033	383	216	199	251	270	626	264	137	70
68	3.9	-0.033	384	212	199	250	270	629	263	138	70

NOTE: Scale reading is 0.3 High due to addition of flue gas probe

Ending weight is actually 3.6 lb.

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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		15.8	**107.731**	**0.161**	**1.24**	**81.1**	**1.87**	**70.42**	**46.61**	**69.76**	**100.0**	**78.2**	**0.117**	**0.342**	**18.70**
Minimum	0.0	-2.2	0.000	0.159	0.81	73	1.69	68	40	67	97.6	75	0.113	0.336	18.52
Max	15.8	2.2	107.731	0.166	1.36	83	1.96	72	52	71	105.7	98	0.120	0.346	19.02
0	15.8		0.000		0.81	73	1.69	68	47	70		98	0.113	0.336	19.02
1	15.6	0.2	0.159	0.159	1.33	73	1.94	69	41	70	102.3	95	0.116	0.341	18.83
2	15.5	0.1	0.325	0.166	1.36	73	1.96	69	40	70	105.7	83	0.118	0.344	18.90
3	15.5	0.0	0.488	0.163	1.30	73	1.90	69	40	70	102.5	80	0.116	0.341	18.77
4	15.5	0.0	0.651	0.163	1.30	73	1.91	69	40	70	102.7	79	0.117	0.342	18.70
5	15.5	0.0	0.814	0.163	1.28	73	1.90	69	40	70	102.7	79	0.117	0.342	18.73
6	15.5	0.0	0.975	0.161	1.27	73	1.88	69	40	70	101.3	78	0.117	0.342	18.72
7	15.5	0.0	1.136	0.161	1.26	73	1.88	69	40	70	101.0	78	0.119	0.345	18.79
8	15.5	0.0	1.297	0.161	1.26	73	1.87	69	40	70	100.7	78	0.118	0.344	18.83
9	15.4	0.1	1.458	0.161	1.26	73	1.87	69	40	70	100.7	78	0.118	0.344	18.79
10	15.4	0.0	1.618	0.160	1.26	74	1.87	69	40	70	100.1	78	0.118	0.344	18.79
11	15.4	0.0	1.779	0.161	1.25	74	1.86	69	41	70	100.6	78	0.118	0.344	18.79
12	15.4	0.0	1.941	0.162	1.26	74	1.87	70	41	70	101.3	78	0.118	0.344	18.79
13	15.4	0.0	2.101	0.160	1.25	74	1.87	70	41	70	100.0	78	0.118	0.344	18.79
14	15.4	0.0	2.261	0.160	1.25	74	1.86	70	41	70	100.0	78	0.118	0.344	18.79
15	15.4	0.0	2.421	0.160	1.25	74	1.86	70	41	70	99.9	77	0.118	0.344	18.78
16	15.3	0.1	2.582	0.161	1.25	74	1.86	70	41	70	100.7	78	0.117	0.342	18.74
17	15.3	0.0	2.743	0.161	1.25	74	1.86	70	41	70	100.9	77	0.117	0.342	18.70
18	15.3	0.0	2.903	0.160	1.25	75	1.86	70	42	70	100.1	77	0.118	0.344	18.73
19	15.3	0.0	3.063	0.160	1.24	75	1.86	70	42	70	99.9	78	0.118	0.344	18.78
20	15.3	0.0	3.223	0.160	1.25	75	1.86	70	42	70	99.7	78	0.119	0.345	18.83
21	15.2	0.1	3.384	0.161	1.25	75	1.86	70	42	70	100.3	78	0.117	0.342	18.79
22	15.2	0.0	3.545	0.161	1.24	75	1.85	70	42	70	100.5	77	0.118	0.344	18.74
23	15.2	0.0	3.705	0.160	1.24	75	1.85	70	42	70	99.9	78	0.118	0.344	18.78
24	15.2	0.0	3.865	0.160	1.24	76	1.85	70	42	70	99.7	77	0.118	0.344	18.78
25	15.1	0.1	4.025	0.160	1.25	76	1.85	70	42	70	99.6	78	0.118	0.344	18.78
26	15.1	0.0	4.185	0.160	1.25	76	1.86	70	42	70	99.7	78	0.118	0.344	18.79
27	15.1	0.0	4.347	0.162	1.24	76	1.86	70	43	70	101.0	78	0.117	0.342	18.75
28	15.1	0.0	4.507	0.160	1.24	76	1.86	70	43	70	100.2	78	0.115	0.339	18.63
29	15.0	0.1	4.667	0.160	1.24	76	1.86	70	43	70	100.4	78	0.118	0.344	18.67
30	15.0	0.0	4.827	0.160	1.25	77	1.86	70	43	70	99.9	78	0.118	0.344	18.79
31	15.0	0.0	4.988	0.161	1.24	77	1.86	70	43	70	100.2	78	0.117	0.342	18.75
32	15.0	0.0	5.149	0.161	1.24	77	1.85	70	43	70	100.4	78	0.117	0.342	18.71
33	14.9	0.1	5.310	0.161	1.23	77	1.87	70	43	70	100.4	78	0.118	0.344	18.75
34	14.9	0.0	5.470	0.160	1.24	77	1.86	70	43	70	99.6	78	0.118	0.344	18.79
35	14.9	0.0	5.630	0.160	1.24	77	1.86	70	43	70	99.6	78	0.117	0.342	18.75
36	14.9	0.0	5.790	0.160	1.24	77	1.86	70	43	70	99.6	78	0.119	0.345	18.79
37	14.8	0.1	5.952	0.162	1.24	78	1.85	70	43	70	100.4	78	0.119	0.345	18.87
38	14.8	0.0	6.113	0.161	1.24	78	1.86	70	44	70	99.6	78	0.118	0.344	18.83
39	14.8	0.0	6.273	0.160	1.24	78	1.86	70	44	70	99.4	78	0.116	0.341	18.71
40	14.8	0.0	6.433	0.160	1.24	78	1.86	70	44	70	99.7	78	0.118	0.344	18.71

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	14.7	0.1	6.594	0.161	1.24	78	1.86	70	44	70	100.1	78	0.118	0.344	18.79
42	14.7	0.0	6.755	0.161	1.25	78	1.86	70	44	70	99.8	78	0.119	0.345	18.83
43	14.7	0.0	6.917	0.162	1.24	78	1.86	70	44	70	100.3	78	0.118	0.344	18.83
44	14.7	0.0	7.077	0.160	1.24	78	1.86	71	44	70	99.2	78	0.118	0.344	18.79
45	14.6	0.1	7.237	0.160	1.24	78	1.87	71	44	70	99.2	78	0.119	0.345	18.83
46	14.6	0.0	7.398	0.161	1.25	79	1.86	71	44	70	99.6	78	0.118	0.344	18.83
47	14.6	0.0	7.558	0.160	1.24	79	1.87	71	44	70	99.0	78	0.118	0.344	18.79
48	14.6	0.0	7.720	0.162	1.24	79	1.86	71	44	70	100.4	78	0.117	0.342	18.75
49	14.5	0.1	7.881	0.161	1.24	79	1.86	71	44	70	99.9	78	0.118	0.344	18.75
50	14.5	0.0	8.042	0.161	1.23	79	1.87	71	44	70	99.8	78	0.118	0.344	18.79
51	14.5	0.0	8.202	0.160	1.25	79	1.86	71	44	70	99.2	78	0.117	0.342	18.75
52	14.4	0.1	8.363	0.161	1.24	79	1.86	71	44	70	100.0	78	0.117	0.342	18.71
53	14.4	0.0	8.524	0.161	1.25	79	1.86	71	44	70	100.0	78	0.118	0.344	18.75
54	14.4	0.0	8.686	0.162	1.24	79	1.86	71	44	70	100.5	78	0.117	0.342	18.75
55	14.4	0.0	8.847	0.161	1.24	79	1.87	71	45	70	100.0	78	0.117	0.342	18.71
56	14.3	0.1	9.007	0.160	1.24	80	1.87	71	45	70	99.4	79	0.118	0.344	18.76
57	14.3	0.0	9.168	0.161	1.24	80	1.86	71	45	70	99.7	79	0.118	0.344	18.81
58	14.3	0.0	9.329	0.161	1.24	80	1.87	71	45	70	99.6	79	0.118	0.344	18.81
59	14.3	0.0	9.491	0.162	1.24	80	1.86	71	45	70	100.2	79	0.118	0.344	18.81
60	14.2	0.1	9.652	0.161	1.24	80	1.87	71	45	70	99.8	79	0.116	0.341	18.73
61	14.2	0.0	9.813	0.161	1.24	80	1.86	71	45	70	100.0	79	0.118	0.344	18.73
62	14.2	0.0	9.974	0.161	1.24	80	1.86	71	45	70	99.8	79	0.118	0.344	18.81
63	14.1	0.1	10.134	0.160	1.24	80	1.87	71	45	70	99.0	79	0.118	0.344	18.81
64	14.1	0.0	10.296	0.162	1.24	80	1.87	71	45	70	100.3	79	0.117	0.342	18.77
65	14.1	0.0	10.458	0.162	1.24	80	1.86	71	45	70	100.4	79	0.118	0.344	18.77
66	14.1	0.0	10.619	0.161	1.24	80	1.86	71	45	70	99.8	79	0.117	0.342	18.77
67	14.0	0.1	10.780	0.161	1.24	80	1.87	71	45	70	100.0	79	0.116	0.341	18.69
68	14.0	0.0	10.941	0.161	1.24	80	1.87	71	45	70	100.2	79	0.117	0.342	18.69
69	14.0	0.0	11.102	0.161	1.24	80	1.87	71	45	70	100.2	79	0.116	0.341	18.69
70	14.0	0.0	11.263	0.161	1.24	80	1.87	71	45	70	100.2	79	0.117	0.342	18.69
71	13.9	0.1	11.425	0.162	1.24	81	1.87	71	45	70	100.7	79	0.117	0.342	18.73
72	13.9	0.0	11.587	0.162	1.24	81	1.87	71	45	70	100.5	79	0.117	0.342	18.73
73	13.9	0.0	11.748	0.161	1.24	81	1.87	71	45	70	100.0	79	0.116	0.341	18.69
74	13.9	0.0	11.909	0.161	1.24	81	1.87	71	45	70	100.1	79	0.117	0.342	18.69
75	13.8	0.1	12.070	0.161	1.24	81	1.87	71	45	70	100.0	79	0.117	0.342	18.73
76	13.8	0.0	12.231	0.161	1.24	81	1.86	71	45	70	100.0	79	0.116	0.341	18.69
77	13.8	0.0	12.393	0.162	1.24	81	1.87	71	45	70	100.4	79	0.120	0.346	18.81
78	13.8	0.0	12.555	0.162	1.24	81	1.86	71	45	70	99.9	79	0.117	0.342	18.85
79	13.7	0.1	12.716	0.161	1.24	81	1.87	71	45	70	99.7	79	0.115	0.339	18.65
80	13.7	0.0	12.877	0.161	1.24	81	1.87	71	45	70	100.2	79	0.118	0.344	18.69
81	13.7	0.0	13.038	0.161	1.24	81	1.87	71	45	70	99.8	79	0.117	0.342	18.77
82	13.7	0.0	13.199	0.161	1.24	81	1.87	71	45	70	100.1	79	0.114	0.338	18.61
83	13.6	0.1	13.361	0.162	1.25	81	1.86	71	45	70	101.0	79	0.118	0.344	18.65
84	13.6	0.0	13.523	0.162	1.24	81	1.87	71	45	71	100.7	79	0.116	0.341	18.73

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	13.6	0.0	13.684	0.161	1.24	81	1.86	71	45	70	99.8	79	0.118	0.344	18.73
86	13.6	0.0	13.846	0.162	1.24	81	1.87	71	46	70	100.6	79	0.115	0.339	18.69
87	13.5	0.1	14.007	0.161	1.24	81	1.86	71	46	70	100.4	79	0.115	0.339	18.57
88	13.5	0.0	14.168	0.161	1.25	81	1.87	71	46	70	100.7	79	0.115	0.339	18.57
89	13.5	0.0	14.329	0.161	1.24	81	1.87	71	46	70	100.5	79	0.117	0.342	18.65
90	13.5	0.0	14.491	0.162	1.24	81	1.87	71	46	70	100.6	79	0.118	0.344	18.77
91	13.4	0.1	14.653	0.162	1.25	81	1.86	71	46	70	100.3	79	0.117	0.342	18.77
92	13.4	0.0	14.815	0.162	1.24	81	1.87	71	46	70	100.5	79	0.116	0.341	18.69
93	13.4	0.0	14.976	0.161	1.24	81	1.86	71	46	70	100.1	79	0.117	0.342	18.69
94	13.4	0.0	15.137	0.161	1.24	81	1.87	71	46	70	100.0	79	0.117	0.342	18.73
95	13.4	0.0	15.298	0.161	1.24	81	1.86	71	46	70	100.0	79	0.116	0.341	18.69
96	13.3	0.1	15.460	0.162	1.24	81	1.86	71	46	70	100.6	79	0.118	0.344	18.73
97	13.3	0.0	15.622	0.162	1.24	81	1.87	71	46	70	100.5	79	0.116	0.341	18.73
98	13.3	0.0	15.783	0.161	1.24	81	1.87	71	46	70	100.0	79	0.117	0.342	18.69
99	13.2	0.1	15.945	0.162	1.24	81	1.87	71	46	70	100.6	79	0.117	0.342	18.73
100	13.2	0.0	16.106	0.161	1.24	82	1.87	71	46	70	99.6	79	0.118	0.344	18.77
101	13.2	0.0	16.267	0.161	1.24	82	1.87	71	46	70	99.3	79	0.118	0.344	18.81
102	13.2	0.0	16.429	0.162	1.24	82	1.86	71	46	70	100.0	79	0.117	0.342	18.77
103	13.2	0.0	16.591	0.162	1.25	82	1.87	71	46	70	100.2	79	0.117	0.342	18.73
104	13.1	0.1	16.753	0.162	1.25	82	1.87	71	46	70	100.4	79	0.116	0.341	18.69
105	13.1	0.0	16.913	0.160	1.21	82	1.84	71	46	70	99.3	79	0.117	0.342	18.69
106	13.1	0.0	17.072	0.159	1.21	82	1.84	71	46	70	98.5	79	0.117	0.342	18.73
107	13.1	0.0	17.232	0.160	1.21	82	1.85	71	46	70	99.0	79	0.117	0.342	18.73
108	13.0	0.1	17.392	0.160	1.21	82	1.85	71	46	70	99.0	79	0.117	0.342	18.73
109	13.0	0.0	17.552	0.160	1.21	82	1.85	71	46	70	99.0	79	0.117	0.342	18.73
110	13.0	0.0	17.711	0.159	1.21	82	1.85	71	46	70	98.5	79	0.116	0.341	18.69
111	13.0	0.0	17.870	0.159	1.22	82	1.84	71	46	70	98.5	79	0.118	0.344	18.73
112	12.9	0.1	18.030	0.160	1.22	82	1.84	71	46	70	99.0	79	0.116	0.341	18.73
113	12.9	0.0	18.191	0.161	1.21	82	1.85	71	46	70	99.9	79	0.116	0.341	18.65
114	12.9	0.0	18.350	0.159	1.20	82	1.84	71	46	70	98.7	79	0.117	0.342	18.69
115	12.9	0.0	18.509	0.159	1.22	82	1.84	71	46	70	98.5	79	0.117	0.342	18.73
116	12.8	0.1	18.669	0.160	1.22	82	1.85	71	46	70	99.0	79	0.117	0.342	18.73
117	12.8	0.0	18.830	0.161	1.21	82	1.85	71	46	70	99.6	79	0.118	0.344	18.77
118	12.8	0.0	18.990	0.160	1.21	82	1.84	71	46	70	98.7	79	0.118	0.344	18.81
119	12.8	0.0	19.149	0.159	1.21	82	1.84	71	46	70	98.1	79	0.117	0.342	18.77
120	12.8	0.0	19.308	0.159	1.22	82	1.84	71	46	70	98.2	79	0.118	0.344	18.77
121	12.7	0.1	19.469	0.161	1.21	82	1.85	71	46	70	99.3	79	0.118	0.344	18.81
122	12.7	0.0	19.629	0.160	1.21	82	1.85	71	46	70	98.6	79	0.118	0.344	18.81
123	12.7	0.0	19.788	0.159	1.21	82	1.84	71	46	70	98.2	79	0.116	0.341	18.73
124	12.7	0.0	19.947	0.159	1.21	82	1.84	71	46	70	98.6	79	0.116	0.341	18.65
125	12.7	0.0	20.107	0.160	1.21	82	1.84	71	46	70	99.4	79	0.117	0.342	18.69
126	12.6	0.1	20.268	0.161	1.21	82	1.84	71	46	70	99.8	79	0.117	0.342	18.73
127	12.6	0.0	20.428	0.160	1.21	82	1.84	71	46	70	99.0	79	0.117	0.342	18.73
128	12.6	0.0	20.587	0.159	1.22	82	1.85	71	46	70	98.4	79	0.117	0.342	18.73

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	12.6	0.0	20.746	0.159	1.21	82	1.84	71	46	70	98.4	79	0.117	0.342	18.73
130	12.6	0.0	20.907	0.161	1.22	82	1.85	71	46	70	99.8	79	0.116	0.341	18.69
131	12.5	0.1	21.067	0.160	1.22	82	1.85	71	46	70	99.4	78	0.115	0.339	18.60
132	12.5	0.0	21.226	0.159	1.22	82	1.85	71	46	70	98.8	78	0.117	0.342	18.63
133	12.5	0.0	21.386	0.160	1.21	82	1.85	71	46	70	99.1	78	0.118	0.344	18.75
134	12.5	0.0	21.545	0.159	1.22	82	1.85	71	46	70	98.1	78	0.117	0.342	18.75
135	12.4	0.1	21.706	0.161	1.22	82	1.85	71	46	70	99.5	78	0.117	0.342	18.71
136	12.4	0.0	21.865	0.159	1.21	82	1.84	71	46	70	98.2	78	0.118	0.344	18.75
137	12.4	0.0	22.025	0.160	1.22	82	1.84	71	46	70	98.6	78	0.118	0.344	18.79
138	12.4	0.0	22.184	0.159	1.21	82	1.85	71	46	70	98.0	78	0.117	0.342	18.75
139	12.3	0.1	22.345	0.161	1.22	82	1.85	71	46	70	99.4	78	0.118	0.344	18.75
140	12.3	0.0	22.505	0.160	1.21	82	1.84	71	46	70	98.9	78	0.115	0.339	18.67
141	12.3	0.0	22.664	0.159	1.21	82	1.84	71	46	70	98.5	78	0.118	0.344	18.67
142	12.3	0.0	22.824	0.160	1.22	82	1.84	71	46	70	98.8	78	0.118	0.344	18.79
143	12.3	0.0	22.984	0.160	1.21	82	1.84	71	46	70	98.6	78	0.117	0.342	18.75
144	12.2	0.1	23.144	0.160	1.21	82	1.85	71	46	70	98.8	78	0.117	0.342	18.71
145	12.2	0.0	23.303	0.159	1.21	82	1.85	71	46	70	98.3	78	0.117	0.342	18.71
146	12.2	0.0	23.463	0.160	1.22	82	1.84	71	46	70	98.9	78	0.117	0.342	18.71
147	12.2	0.0	23.622	0.159	1.22	82	1.84	71	46	70	98.3	78	0.117	0.342	18.71
148	12.2	0.0	23.783	0.161	1.21	82	1.85	71	46	70	99.5	78	0.118	0.344	18.75
149	12.1	0.1	23.943	0.160	1.21	82	1.84	71	46	70	98.6	78	0.118	0.344	18.79
150	12.1	0.0	24.102	0.159	1.21	82	1.84	71	46	70	97.9	78	0.118	0.344	18.79
151	12.1	0.0	24.262	0.160	1.22	82	1.85	71	46	70	98.5	78	0.118	0.344	18.79
152	12.1	0.0	24.422	0.160	1.22	82	1.85	71	46	70	98.7	78	0.116	0.341	18.71
153	12.1	0.0	24.582	0.160	1.21	82	1.85	71	46	70	99.1	78	0.117	0.342	18.67
154	12.0	0.1	24.741	0.159	1.22	82	1.85	71	46	70	98.5	78	0.116	0.341	18.67
155	12.0	0.0	24.901	0.160	1.21	82	1.84	71	46	70	99.2	78	0.117	0.342	18.67
156	12.0	0.0	25.061	0.160	1.21	82	1.84	71	46	70	99.1	78	0.117	0.342	18.71
157	12.0	0.0	25.222	0.161	1.21	82	1.85	71	46	70	99.5	78	0.118	0.344	18.75
158	12.0	0.0	25.381	0.159	1.21	82	1.85	71	46	70	98.1	78	0.117	0.342	18.75
159	11.9	0.1	25.541	0.160	1.22	82	1.85	71	46	70	98.8	78	0.117	0.342	18.71
160	11.9	0.0	25.701	0.160	1.21	82	1.85	71	46	70	98.8	78	0.118	0.344	18.75
161	11.9	0.0	25.861	0.160	1.22	82	1.85	71	46	71	98.9	78	0.115	0.339	18.67
162	11.9	0.0	26.021	0.160	1.22	82	1.85	71	46	70	99.5	78	0.115	0.339	18.55
163	11.8	0.1	26.180	0.159	1.21	82	1.85	71	46	70	99.0	78	0.117	0.342	18.63
164	11.8	0.0	26.340	0.160	1.22	82	1.84	71	46	70	99.1	78	0.118	0.344	18.75
165	9.6	2.2	26.500	0.160	1.22	82	1.85	71	46	70	98.7	78	0.117	0.342	18.75
166	11.8	-2.2	26.660	0.160	1.22	82	1.85	71	46	70	98.8	78	0.117	0.342	18.71
167	11.8	0.0	26.820	0.160	1.21	82	1.85	71	46	70	98.8	78	0.118	0.344	18.75
168	11.7	0.1	26.979	0.159	1.21	82	1.85	71	46	70	98.0	78	0.118	0.344	18.79
169	11.7	0.0	27.139	0.160	1.22	82	1.84	71	46	70	98.6	78	0.117	0.342	18.75
170	11.7	0.0	27.299	0.160	1.22	82	1.84	71	46	70	98.8	78	0.117	0.342	18.71
171	11.6	0.1	27.459	0.160	1.22	82	1.85	71	46	70	98.9	78	0.117	0.342	18.71
172	11.6	0.0	27.618	0.159	1.21	82	1.84	71	46	70	98.4	78	0.116	0.341	18.67

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	11.6	0.0	27.778	0.160	1.22	82	1.84	71	46	70	99.2	78	0.117	0.342	18.67
174	11.6	0.0	27.938	0.160	1.22	82	1.84	71	46	70	98.9	78	0.118	0.344	18.75
175	11.5	0.1	28.098	0.160	1.22	82	1.85	71	46	70	98.7	78	0.117	0.342	18.75
176	11.5	0.0	28.258	0.160	1.21	82	1.85	71	46	70	98.8	78	0.117	0.342	18.71
177	11.5	0.0	28.417	0.159	1.21	82	1.84	71	46	70	98.4	78	0.116	0.341	18.67
178	11.5	0.0	28.577	0.160	1.21	82	1.85	71	46	70	99.2	78	0.117	0.342	18.67
179	11.5	0.0	28.738	0.161	1.21	82	1.85	71	46	70	99.6	78	0.118	0.344	18.75
180	11.4	0.1	28.898	0.160	1.21	82	1.85	71	46	70	98.6	78	0.118	0.344	18.79
181	11.4	0.0	29.057	0.159	1.22	82	1.84	71	46	70	98.1	78	0.116	0.341	18.71
182	11.4	0.0	29.217	0.160	1.22	82	1.85	71	46	71	99.1	78	0.117	0.342	18.67
183	11.3	0.1	29.377	0.160	1.22	82	1.85	71	46	71	99.2	78	0.116	0.341	18.67
184	11.3	0.0	29.537	0.160	1.22	82	1.85	71	46	71	99.2	78	0.117	0.342	18.67
185	11.3	0.0	29.697	0.160	1.22	82	1.85	71	46	71	98.9	78	0.118	0.344	18.75
186	11.3	0.0	29.856	0.159	1.22	82	1.84	71	46	70	98.1	78	0.117	0.342	18.75
187	11.2	0.1	30.016	0.160	1.22	82	1.85	71	46	71	98.7	78	0.118	0.344	18.75
188	11.2	0.0	30.177	0.161	1.21	82	1.85	71	46	70	99.5	78	0.116	0.341	18.71
189	11.2	0.0	30.337	0.160	1.22	82	1.85	71	46	70	99.1	78	0.117	0.342	18.67
190	11.2	0.0	30.496	0.159	1.22	82	1.85	71	46	70	98.3	78	0.118	0.344	18.75
191	11.1	0.1	30.656	0.160	1.21	82	1.85	71	46	70	98.8	78	0.116	0.341	18.71
192	11.1	0.0	30.816	0.160	1.22	82	1.85	71	46	70	99.1	78	0.117	0.342	18.67
193	11.1	0.0	30.976	0.160	1.22	82	1.85	71	46	70	99.1	78	0.117	0.342	18.71
194	11.1	0.0	31.136	0.160	1.21	82	1.84	71	46	70	99.2	78	0.115	0.339	18.63
195	11.1	0.0	31.295	0.159	1.21	82	1.85	71	46	70	98.6	78	0.118	0.344	18.67
196	11.0	0.1	31.455	0.160	1.21	82	1.84	71	46	70	98.8	78	0.118	0.344	18.79
197	11.0	0.0	31.616	0.161	1.21	82	1.85	71	46	70	99.3	78	0.117	0.342	18.75
198	11.0	0.0	31.775	0.159	1.20	82	1.85	71	46	70	98.3	78	0.116	0.341	18.67
199	10.9	0.1	31.935	0.160	1.21	82	1.85	71	46	71	99.1	78	0.118	0.344	18.71
200	10.9	0.0	32.095	0.160	1.22	82	1.85	71	46	71	98.7	78	0.118	0.344	18.79
201	10.9	0.0	32.255	0.160	1.22	82	1.84	71	46	70	98.7	78	0.116	0.341	18.71
202	10.9	0.0	32.415	0.160	1.21	82	1.85	71	46	70	99.2	78	0.116	0.341	18.63
203	10.9	0.0	32.574	0.159	1.22	82	1.85	71	46	70	98.6	78	0.117	0.342	18.67
204	10.8	0.1	32.734	0.160	1.22	82	1.85	71	47	71	98.9	78	0.118	0.344	18.75
205	10.8	0.0	32.894	0.160	1.22	82	1.85	71	46	71	98.6	78	0.118	0.344	18.79
206	10.8	0.0	33.055	0.161	1.21	82	1.85	71	46	71	99.4	78	0.116	0.341	18.71
207	10.8	0.0	33.214	0.159	1.21	82	1.85	71	46	70	98.5	78	0.116	0.341	18.63
208	10.8	0.0	33.374	0.160	1.22	82	1.85	71	46	71	99.4	78	0.116	0.341	18.63
209	10.7	0.1	33.533	0.159	1.22	82	1.85	71	47	71	98.8	78	0.116	0.341	18.63
210	10.7	0.0	33.694	0.161	1.22	82	1.84	71	46	71	99.9	78	0.117	0.342	18.67
211	10.7	0.0	33.854	0.160	1.22	82	1.84	71	47	71	99.1	78	0.117	0.342	18.71
212	10.7	0.0	34.014	0.160	1.21	82	1.84	71	47	71	98.9	78	0.117	0.342	18.71
213	10.7	0.0	34.173	0.159	1.22	82	1.84	71	46	71	98.3	78	0.117	0.342	18.71
214	10.7	0.0	34.333	0.160	1.22	82	1.85	71	46	71	98.8	78	0.118	0.344	18.75
215	10.6	0.1	34.494	0.161	1.22	82	1.85	71	46	71	99.3	78	0.118	0.344	18.79
216	10.6	0.0	34.653	0.159	1.21	83	1.85	71	46	71	97.9	78	0.117	0.342	18.75

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Date: 2/29/24

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: 11:53
Test Length: 668 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	10.6	0.0	34.813	0.160	1.21	82	1.84	71	46	71	98.8	78	0.117	0.342	18.71
218	10.6	0.0	34.972	0.159	1.22	82	1.84	71	46	71	98.3	78	0.117	0.342	18.71
219	10.6	0.0	35.132	0.160	1.22	82	1.85	71	46	71	99.1	78	0.116	0.341	18.67
220	10.5	0.1	35.293	0.161	1.22	82	1.84	71	46	71	99.7	78	0.118	0.344	18.71
221	10.5	0.0	35.452	0.159	1.21	82	1.85	71	46	71	98.2	78	0.117	0.342	18.75
222	10.5	0.0	35.612	0.160	1.21	82	1.85	71	46	70	98.7	78	0.118	0.344	18.75
223	10.5	0.0	35.772	0.160	1.21	82	1.85	71	46	70	98.8	78	0.116	0.341	18.71
224	10.5	0.0	35.933	0.161	1.21	82	1.85	71	46	71	99.7	78	0.117	0.342	18.67
225	10.5	0.0	36.092	0.159	1.21	83	1.85	71	46	71	98.3	78	0.117	0.342	18.71
226	10.5	0.0	36.252	0.160	1.22	83	1.85	71	46	71	98.8	78	0.117	0.342	18.71
227	10.4	0.1	36.411	0.159	1.21	83	1.85	71	47	71	97.9	78	0.119	0.345	18.79
228	10.4	0.0	36.572	0.161	1.21	83	1.84	71	47	71	98.9	77	0.117	0.342	18.78
229	10.4	0.0	36.732	0.160	1.22	83	1.85	71	47	70	98.3	77	0.118	0.344	18.73
230	10.4	0.0	36.892	0.160	1.22	83	1.85	71	47	71	98.5	77	0.117	0.342	18.73
231	10.4	0.0	37.051	0.159	1.21	82	1.85	71	46	70	98.1	77	0.116	0.341	18.65
232	10.4	0.0	37.211	0.160	1.22	82	1.85	71	46	70	99.1	77	0.117	0.342	18.65
233	10.4	0.0	37.372	0.161	1.22	82	1.84	71	46	70	99.5	77	0.118	0.344	18.73
234	10.3	0.1	37.532	0.160	1.22	82	1.85	71	46	71	98.8	78	0.116	0.341	18.70
235	10.3	0.0	37.691	0.159	1.21	82	1.85	71	46	70	98.3	77	0.118	0.344	18.70
236	10.3	0.0	37.851	0.160	1.22	82	1.85	71	46	71	98.7	77	0.117	0.342	18.73
237	10.3	0.0	38.011	0.160	1.22	82	1.85	71	46	70	98.6	77	0.118	0.344	18.73
238	10.2	0.1	38.171	0.160	1.21	82	1.84	71	46	70	98.5	77	0.118	0.344	18.77
239	10.2	0.0	38.331	0.160	1.21	82	1.85	71	46	70	98.5	78	0.118	0.344	18.78
240	10.2	0.0	38.491	0.160	1.21	82	1.85	71	46	71	98.7	78	0.117	0.342	18.75
241	10.1	0.1	38.651	0.160	1.21	82	1.85	71	46	71	98.9	78	0.116	0.341	18.67
242	10.1	0.0	38.811	0.160	1.21	82	1.85	71	46	70	99.1	78	0.118	0.344	18.71
243	10.1	0.0	38.971	0.160	1.21	82	1.85	71	46	70	98.8	78	0.117	0.342	18.75
244	10.0	0.1	39.131	0.160	1.22	82	1.85	71	46	70	98.9	78	0.116	0.341	18.67
245	10.0	0.0	39.290	0.159	1.22	82	1.85	71	46	70	98.4	78	0.118	0.344	18.71
246	10.0	0.0	39.450	0.160	1.22	82	1.85	71	46	70	98.9	78	0.116	0.341	18.71
247	10.0	0.0	39.611	0.161	1.21	82	1.85	71	47	71	99.8	78	0.116	0.341	18.63
248	9.9	0.1	39.770	0.159	1.21	82	1.84	71	47	70	98.8	78	0.116	0.341	18.63
249	9.9	0.0	39.930	0.160	1.22	82	1.85	71	46	70	99.3	78	0.117	0.342	18.67
250	9.9	0.0	40.090	0.160	1.22	82	1.85	71	47	70	99.1	78	0.117	0.342	18.71
251	9.9	0.0	40.250	0.160	1.22	82	1.85	71	47	70	98.9	78	0.117	0.342	18.71
252	9.8	0.1	40.410	0.160	1.22	82	1.85	71	47	70	98.9	78	0.117	0.342	18.71
253	9.8	0.0	40.570	0.160	1.21	82	1.85	71	47	71	99.1	78	0.116	0.341	18.67
254	9.8	0.0	40.729	0.159	1.22	82	1.85	71	47	70	98.5	78	0.117	0.342	18.67
255	9.8	0.0	40.889	0.160	1.22	82	1.85	71	47	71	99.1	78	0.117	0.342	18.71
256	9.8	0.0	41.050	0.161	1.22	82	1.85	71	47	71	99.6	78	0.117	0.342	18.71
257	9.7	0.1	41.210	0.160	1.21	82	1.85	71	47	71	98.9	78	0.117	0.342	18.71
258	9.7	0.0	41.369	0.159	1.21	82	1.84	71	47	71	98.3	78	0.117	0.342	18.71
259	9.7	0.0	41.529	0.160	1.22	82	1.85	71	47	71	98.8	78	0.118	0.344	18.75
260	9.7	0.0	41.689	0.160	1.21	82	1.84	71	47	70	98.7	77	0.117	0.342	18.74

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @ 16.85 in. Hg
Post-Test 0.002 cfm @ 18 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	9.6	0.1	41.849	0.160	1.22	82	1.84	71	47	69	98.7	76	0.117	0.342	18.69
262	9.6	0.0	42.009	0.160	1.22	82	1.85	71	47	68	98.5	76	0.119	0.345	18.76
263	9.6	0.0	42.169	0.160	1.23	82	1.84	70	47	68	98.3	75	0.117	0.342	18.75
264	9.5	0.1	42.329	0.160	1.22	82	1.84	70	47	68	98.3	75	0.118	0.344	18.70
265	9.5	0.0	42.490	0.161	1.22	82	1.84	70	47	67	99.3	75	0.115	0.339	18.62
266	9.5	0.0	42.651	0.161	1.22	82	1.84	69	47	67	99.7	76	0.117	0.342	18.59
267	9.4	0.1	42.810	0.159	1.22	82	1.84	69	47	68	98.2	76	0.119	0.345	18.76
268	9.4	0.0	42.970	0.160	1.22	82	1.84	69	47	68	98.3	76	0.117	0.342	18.76
269	9.4	0.0	43.130	0.160	1.22	82	1.84	69	47	68	98.6	77	0.117	0.342	18.69
270	9.4	0.0	43.292	0.162	1.22	82	1.85	69	47	68	100.0	77	0.118	0.344	18.73
271	9.3	0.1	43.452	0.160	1.22	82	1.84	69	47	68	98.5	77	0.118	0.344	18.77
272	9.3	0.0	43.611	0.159	1.22	82	1.85	69	47	68	97.8	77	0.118	0.344	18.77
273	9.3	0.0	43.771	0.160	1.22	81	1.84	69	46	69	98.5	77	0.118	0.344	18.77
274	9.2	0.1	43.931	0.160	1.22	81	1.85	69	46	68	98.8	77	0.116	0.341	18.69
275	9.2	0.0	44.092	0.161	1.22	81	1.85	69	46	69	99.8	77	0.117	0.342	18.65
276	9.2	0.0	44.252	0.160	1.21	81	1.84	69	46	69	99.0	77	0.118	0.344	18.73
277	9.2	0.0	44.411	0.159	1.22	81	1.85	69	46	69	98.2	77	0.117	0.342	18.73
278	9.2	0.0	44.571	0.160	1.22	81	1.85	69	46	69	98.9	77	0.117	0.342	18.69
279	9.1	0.1	44.732	0.161	1.22	81	1.84	69	46	69	99.9	78	0.115	0.339	18.62
280	9.1	0.0	44.892	0.160	1.21	81	1.85	69	46	69	99.7	77	0.115	0.339	18.54
281	9.1	0.0	45.051	0.159	1.22	81	1.85	70	46	69	99.3	77	0.115	0.339	18.53
282	9.1	0.0	45.211	0.160	1.22	81	1.84	70	46	69	99.9	77	0.115	0.339	18.53
283	9.1	0.0	45.371	0.160	1.22	81	1.85	70	46	69	99.8	77	0.116	0.341	18.57
284	9.1	0.0	45.532	0.161	1.22	81	1.85	70	46	69	100.2	77	0.116	0.341	18.61
285	9.0	0.1	45.691	0.159	1.21	81	1.85	70	46	69	98.8	77	0.116	0.341	18.61
286	9.0	0.0	45.851	0.160	1.22	81	1.84	70	46	69	99.4	77	0.117	0.342	18.65
287	9.0	0.0	46.010	0.159	1.22	81	1.84	70	46	69	98.6	77	0.116	0.341	18.65
288	9.0	0.0	46.171	0.161	1.22	81	1.85	70	46	69	99.8	77	0.118	0.344	18.69
289	9.0	0.0	46.331	0.160	1.22	81	1.85	70	46	69	99.1	77	0.115	0.339	18.65
290	8.9	0.1	46.490	0.159	1.22	81	1.85	70	46	69	98.8	77	0.116	0.341	18.57
291	8.9	0.0	46.650	0.160	1.22	81	1.85	70	46	70	99.6	77	0.116	0.341	18.61
292	8.9	0.0	46.810	0.160	1.22	81	1.85	70	46	70	99.4	77	0.117	0.342	18.65
293	8.9	0.0	46.971	0.161	1.22	81	1.84	70	46	69	99.8	77	0.117	0.342	18.69
294	8.9	0.0	47.130	0.159	1.21	81	1.84	70	46	70	98.6	77	0.115	0.339	18.61
295	8.8	0.1	47.290	0.160	1.22	81	1.84	70	46	70	99.5	77	0.117	0.342	18.61
296	8.8	0.0	47.449	0.159	1.22	81	1.85	70	46	70	98.7	77	0.116	0.341	18.65
297	8.8	0.0	47.610	0.161	1.22	81	1.85	70	46	70	99.9	77	0.117	0.342	18.65
298	8.8	0.0	47.770	0.160	1.22	81	1.84	70	46	70	99.1	77	0.117	0.342	18.69
299	8.8	0.0	47.929	0.159	1.21	81	1.85	70	46	70	98.4	77	0.117	0.342	18.69
300	8.7	0.1	48.088	0.159	1.22	81	1.84	70	46	70	98.3	77	0.118	0.344	18.73
301	8.7	0.0	48.248	0.160	1.22	81	1.85	70	46	70	98.8	77	0.117	0.342	18.73
302	8.7	0.0	48.409	0.161	1.21	81	1.85	70	46	70	99.6	77	0.117	0.342	18.69
303	8.7	0.0	48.568	0.159	1.21	81	1.84	70	46	70	98.4	77	0.117	0.342	18.69
304	8.7	0.0	48.728	0.160	1.21	81	1.85	70	46	70	98.9	77	0.118	0.344	18.73

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Date: 2/29/24

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: 11:53
Test Length: 668 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	8.7	0.0	48.887	0.159	1.22	81	1.85	70	46	70	98.2	77	0.117	0.342	18.73
306	8.6	0.1	49.048	0.161	1.22	81	1.85	70	46	70	99.4	77	0.118	0.344	18.73
307	8.6	0.0	49.208	0.160	1.21	81	1.85	70	46	70	98.7	77	0.118	0.344	18.77
308	8.6	0.0	49.367	0.159	1.22	81	1.85	70	46	70	98.1	77	0.117	0.342	18.73
309	8.6	0.0	49.527	0.160	1.22	81	1.84	70	46	70	98.8	77	0.118	0.344	18.73
310	8.6	0.0	49.687	0.160	1.22	81	1.85	70	46	70	98.8	77	0.117	0.342	18.73
311	8.6	0.0	49.847	0.160	1.21	82	1.85	70	46	70	98.8	77	0.117	0.342	18.69
312	8.6	0.0	50.006	0.159	1.22	82	1.85	70	46	70	98.2	77	0.117	0.342	18.69
313	8.5	0.1	50.166	0.160	1.22	82	1.85	70	46	70	98.8	77	0.118	0.344	18.73
314	8.5	0.0	50.325	0.159	1.22	82	1.85	70	46	70	98.0	77	0.117	0.342	18.73
315	8.5	0.0	50.486	0.161	1.21	82	1.84	70	46	70	99.4	77	0.117	0.342	18.69
316	8.5	0.0	50.646	0.160	1.21	82	1.85	70	46	70	98.8	77	0.118	0.344	18.73
317	8.5	0.0	50.805	0.159	1.22	82	1.85	70	46	70	98.0	77	0.117	0.342	18.73
318	8.5	0.0	50.965	0.160	1.22	82	1.85	70	46	70	98.9	77	0.116	0.341	18.65
319	8.4	0.1	51.125	0.160	1.21	82	1.84	70	46	70	99.2	77	0.116	0.341	18.61
320	8.4	0.0	51.285	0.160	1.22	82	1.85	70	46	70	99.2	77	0.117	0.342	18.65
321	8.4	0.0	51.444	0.159	1.22	82	1.84	70	46	70	98.3	77	0.117	0.342	18.69
322	8.4	0.0	51.604	0.160	1.22	82	1.85	70	46	70	98.9	77	0.117	0.342	18.69
323	8.4	0.0	51.764	0.160	1.22	82	1.84	70	46	70	98.8	77	0.118	0.344	18.73
324	8.4	0.0	51.924	0.160	1.22	82	1.84	70	46	70	98.5	77	0.118	0.344	18.77
325	8.4	0.0	52.084	0.160	1.21	82	1.85	70	46	70	98.5	77	0.117	0.342	18.73
326	8.4	0.0	52.243	0.159	1.21	82	1.85	70	46	70	98.0	77	0.118	0.344	18.73
327	8.3	0.1	52.403	0.160	1.22	82	1.84	70	46	70	98.6	76	0.117	0.342	18.73
328	8.3	0.0	52.563	0.160	1.22	82	1.85	70	46	70	98.7	77	0.117	0.342	18.69
329	8.3	0.0	52.723	0.160	1.22	82	1.85	70	46	70	99.0	77	0.116	0.341	18.65
330	8.3	0.0	52.882	0.159	1.21	82	1.85	71	46	70	98.7	77	0.115	0.339	18.57
331	8.3	0.0	53.042	0.160	1.21	82	1.84	71	46	70	99.3	77	0.118	0.344	18.65
332	8.3	0.0	53.202	0.160	1.22	82	1.84	70	46	70	98.7	76	0.118	0.344	18.77
333	8.3	0.0	53.362	0.160	1.22	82	1.85	70	46	70	98.5	77	0.117	0.342	18.73
334	8.3	0.0	53.522	0.160	1.21	82	1.85	71	46	70	98.7	76	0.117	0.342	18.69
335	8.3	0.0	53.681	0.159	1.21	82	1.85	70	46	70	98.2	76	0.116	0.341	18.64
336	8.2	0.1	53.841	0.160	1.22	82	1.84	71	46	70	99.0	76	0.117	0.342	18.64
337	8.2	0.0	54.002	0.161	1.21	82	1.85	70	46	70	99.6	76	0.116	0.341	18.64
338	8.2	0.0	54.161	0.159	1.21	82	1.84	70	46	70	98.4	76	0.117	0.342	18.64
339	8.2	0.0	54.321	0.160	1.21	82	1.85	71	46	70	99.0	76	0.116	0.341	18.64
340	8.2	0.0	54.480	0.159	1.22	82	1.85	71	46	70	98.4	76	0.117	0.342	18.64
341	8.2	0.0	54.640	0.160	1.22	82	1.85	71	46	70	98.9	76	0.117	0.342	18.68
342	8.2	0.0	54.801	0.161	1.21	82	1.85	71	46	70	99.2	76	0.119	0.345	18.76
343	8.2	0.0	54.960	0.159	1.22	82	1.85	71	46	70	97.6	76	0.118	0.344	18.80
344	8.2	0.0	55.119	0.159	1.22	82	1.85	71	46	70	97.7	76	0.117	0.342	18.72
345	8.1	0.1	55.279	0.160	1.21	82	1.84	71	46	70	98.7	76	0.117	0.342	18.68
346	8.1	0.0	55.440	0.161	1.21	82	1.85	71	46	70	99.3	76	0.118	0.344	18.72
347	8.1	0.0	55.600	0.160	1.21	82	1.85	71	46	70	98.5	76	0.118	0.344	18.76
348	8.1	0.0	55.759	0.159	1.21	82	1.85	71	46	70	97.7	76	0.118	0.344	18.76

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @ 16.85 in. Hg
Post-Test 0.002 cfm @ 18 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	8.1	0.0	55.919	0.160	1.21	82	1.84	71	46	70	98.6	76	0.116	0.341	18.68
350	8.1	0.0	56.079	0.160	1.22	82	1.84	71	46	70	99.0	76	0.116	0.341	18.60
351	8.1	0.0	56.239	0.160	1.22	82	1.84	71	46	70	99.1	76	0.117	0.342	18.64
352	8.1	0.0	56.399	0.160	1.21	82	1.85	71	46	70	99.0	76	0.116	0.341	18.64
353	8.1	0.0	56.558	0.159	1.22	82	1.85	71	46	70	98.3	76	0.118	0.344	18.68
354	8.1	0.0	56.718	0.160	1.21	82	1.85	71	46	70	98.7	76	0.117	0.342	18.72
355	8.1	0.0	56.879	0.161	1.21	82	1.85	71	46	70	99.1	76	0.119	0.345	18.76
356	8.0	0.1	57.039	0.160	1.21	82	1.84	70	46	70	98.2	76	0.118	0.344	18.80
357	8.0	0.0	57.198	0.159	1.22	82	1.85	70	46	70	97.6	76	0.118	0.344	18.76
358	8.0	0.0	57.357	0.159	1.21	82	1.85	71	46	70	97.8	76	0.117	0.342	18.72
359	8.0	0.0	57.518	0.161	1.22	82	1.85	71	46	70	99.2	76	0.118	0.344	18.72
360	8.0	0.0	57.678	0.160	1.22	82	1.85	71	46	70	98.5	76	0.118	0.344	18.76
361	8.0	0.0	57.837	0.159	1.21	82	1.85	71	46	70	97.9	76	0.116	0.341	18.68
362	8.0	0.0	57.997	0.160	1.22	82	1.85	71	46	70	98.8	76	0.118	0.344	18.68
363	8.0	0.0	58.157	0.160	1.22	82	1.85	71	46	70	98.8	76	0.116	0.341	18.68
364	8.0	0.0	58.318	0.161	1.22	82	1.85	71	46	70	99.5	76	0.117	0.342	18.64
365	7.9	0.1	58.477	0.159	1.21	82	1.84	71	46	70	98.4	76	0.116	0.341	18.64
366	7.9	0.0	58.637	0.160	1.22	82	1.85	71	46	70	98.8	76	0.119	0.345	18.72
367	7.9	0.0	58.796	0.159	1.22	82	1.84	71	46	70	97.7	76	0.118	0.344	18.80
368	7.9	0.0	58.957	0.161	1.21	82	1.85	71	46	70	98.9	76	0.118	0.344	18.76
369	7.9	0.0	59.117	0.160	1.22	82	1.84	71	46	70	98.5	76	0.117	0.342	18.72
370	7.9	0.0	59.276	0.159	1.22	82	1.85	71	46	70	97.9	76	0.118	0.344	18.72
371	7.9	0.0	59.436	0.160	1.22	82	1.84	71	46	70	98.5	76	0.118	0.344	18.76
372	7.9	0.0	59.596	0.160	1.22	82	1.85	71	46	70	98.3	76	0.118	0.344	18.76
373	7.9	0.0	59.756	0.160	1.21	82	1.84	71	46	70	98.5	76	0.117	0.342	18.72
374	7.9	0.0	59.916	0.160	1.21	82	1.85	70	46	70	98.7	76	0.117	0.342	18.68
375	7.8	0.1	60.075	0.159	1.21	82	1.85	70	46	70	98.1	76	0.117	0.342	18.68
376	7.8	0.0	60.235	0.160	1.22	82	1.84	71	46	70	98.9	76	0.116	0.341	18.64
377	7.8	0.0	60.395	0.160	1.22	82	1.84	70	46	70	98.9	76	0.118	0.344	18.68
378	7.8	0.0	60.555	0.160	1.22	82	1.85	71	46	70	98.6	76	0.118	0.344	18.76
379	7.8	0.0	60.715	0.160	1.21	82	1.84	71	46	70	98.7	76	0.115	0.339	18.64
380	7.8	0.0	60.874	0.159	1.22	82	1.85	71	47	70	98.6	76	0.116	0.341	18.56
381	7.8	0.0	61.034	0.160	1.22	82	1.84	70	46	70	99.1	76	0.118	0.344	18.68
382	7.7	0.1	61.195	0.161	1.22	82	1.85	70	46	70	99.3	76	0.117	0.342	18.72
383	7.7	0.0	61.354	0.159	1.21	82	1.84	70	47	70	98.3	76	0.115	0.339	18.60
384	7.7	0.0	61.514	0.160	1.21	82	1.85	71	47	70	99.1	76	0.118	0.344	18.64
385	7.7	0.0	61.679	0.165	1.24	82	1.87	71	46	70	101.9	76	0.117	0.342	18.72
386	7.7	0.0	61.841	0.162	1.26	82	1.88	70	46	70	99.9	76	0.117	0.342	18.68
387	7.7	0.0	62.004	0.163	1.26	82	1.89	70	47	70	100.7	76	0.116	0.341	18.64
388	7.7	0.0	62.167	0.163	1.27	82	1.88	70	46	70	100.7	76	0.118	0.344	18.68
389	7.7	0.0	62.330	0.163	1.27	82	1.89	70	46	70	100.4	76	0.118	0.344	18.76
390	7.6	0.1	62.493	0.163	1.26	82	1.89	70	46	70	100.4	76	0.116	0.341	18.68
391	7.6	0.0	62.656	0.163	1.26	82	1.89	70	46	70	100.9	76	0.115	0.339	18.56
392	7.6	0.0	62.819	0.163	1.26	82	1.88	70	46	70	101.2	76	0.117	0.342	18.60

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	7.6	0.0	62.982	0.163	1.26	82	1.89	70	47	70	100.8	76	0.117	0.342	18.68
394	7.6	0.0	63.144	0.162	1.26	82	1.88	70	47	70	99.9	76	0.118	0.344	18.72
395	7.6	0.0	63.307	0.163	1.26	82	1.89	70	47	70	100.3	76	0.118	0.344	18.76
396	7.6	0.0	63.470	0.163	1.27	82	1.89	70	47	70	100.4	76	0.116	0.341	18.68
397	7.6	0.0	63.633	0.163	1.27	82	1.89	70	47	70	100.7	76	0.117	0.342	18.64
398	7.5	0.1	63.795	0.162	1.26	82	1.88	70	47	70	100.2	76	0.116	0.341	18.64
399	7.5	0.0	63.959	0.164	1.26	82	1.89	70	47	70	101.5	76	0.117	0.342	18.64
400	7.5	0.0	64.122	0.163	1.26	82	1.89	70	47	70	100.7	75	0.117	0.342	18.67
401	7.5	0.0	64.285	0.163	1.27	82	1.89	70	47	70	100.7	76	0.116	0.341	18.63
402	7.5	0.0	64.448	0.163	1.26	82	1.88	70	47	69	100.9	75	0.116	0.341	18.59
403	7.5	0.0	64.611	0.163	1.26	82	1.89	70	47	70	100.8	75	0.117	0.342	18.62
404	7.5	0.0	64.774	0.163	1.26	82	1.88	70	47	70	100.6	76	0.118	0.344	18.71
405	7.5	0.0	64.936	0.162	1.27	82	1.88	70	47	70	100.1	76	0.114	0.338	18.60
406	7.5	0.0	65.099	0.163	1.27	82	1.89	70	47	69	101.2	76	0.117	0.342	18.56
407	7.5	0.0	65.262	0.163	1.26	82	1.89	70	47	69	101.1	76	0.116	0.341	18.64
408	7.4	0.1	65.425	0.163	1.26	82	1.89	70	47	70	100.8	75	0.117	0.342	18.63
409	7.4	0.0	65.588	0.163	1.26	82	1.89	70	47	70	100.7	75	0.116	0.341	18.62
410	7.4	0.0	65.751	0.163	1.27	82	1.89	70	47	69	100.7	75	0.117	0.342	18.62
411	7.4	0.0	65.914	0.163	1.27	82	1.89	70	47	69	100.7	76	0.117	0.342	18.67
412	7.4	0.0	66.077	0.163	1.26	82	1.88	70	47	69	100.4	76	0.119	0.345	18.76
413	7.4	0.0	66.240	0.163	1.26	82	1.88	70	47	69	100.3	75	0.115	0.339	18.67
414	7.4	0.0	66.403	0.163	1.26	82	1.88	70	47	69	100.7	76	0.118	0.344	18.63
415	7.4	0.0	66.566	0.163	1.26	82	1.89	70	47	69	100.7	76	0.116	0.341	18.68
416	7.4	0.0	66.729	0.163	1.26	82	1.89	70	47	69	100.8	76	0.116	0.341	18.60
417	7.4	0.0	66.891	0.162	1.26	82	1.88	70	47	69	100.2	76	0.118	0.344	18.68
418	7.4	0.0	67.054	0.163	1.27	82	1.88	70	47	69	100.6	76	0.116	0.341	18.68
419	7.3	0.1	67.217	0.163	1.26	82	1.88	70	47	70	100.8	76	0.116	0.341	18.60
420	7.3	0.0	67.380	0.163	1.27	82	1.88	70	47	69	101.0	75	0.116	0.341	18.59
421	7.3	0.0	67.543	0.163	1.26	82	1.88	70	47	69	101.1	76	0.115	0.339	18.55
422	7.3	0.0	67.707	0.164	1.25	82	1.89	70	47	69	101.8	76	0.117	0.342	18.60
423	7.3	0.0	67.870	0.163	1.26	82	1.89	70	47	69	100.9	76	0.116	0.341	18.64
424	7.3	0.0	68.033	0.163	1.26	82	1.89	70	47	69	100.8	76	0.117	0.342	18.64
425	7.3	0.0	68.196	0.163	1.26	82	1.88	70	47	69	100.8	76	0.116	0.341	18.64
426	7.3	0.0	68.358	0.162	1.26	82	1.89	70	47	70	100.3	76	0.116	0.341	18.60
427	7.3	0.0	68.521	0.163	1.26	82	1.89	70	47	69	101.1	76	0.116	0.341	18.60
428	7.3	0.0	68.683	0.162	1.26	82	1.88	70	47	69	100.4	76	0.116	0.341	18.60
429	7.3	0.0	68.846	0.163	1.27	82	1.88	70	47	69	100.9	76	0.117	0.342	18.64
430	7.3	0.0	69.009	0.163	1.26	82	1.89	70	47	69	100.6	76	0.118	0.344	18.72
431	7.3	0.0	69.172	0.163	1.26	82	1.89	70	47	69	100.5	76	0.116	0.341	18.68
432	7.3	0.0	69.336	0.164	1.25	82	1.89	70	47	69	101.3	76	0.117	0.342	18.64
433	7.3	0.0	69.499	0.163	1.26	82	1.89	70	47	69	101.1	76	0.114	0.338	18.56
434	7.2	0.1	69.662	0.163	1.27	82	1.89	70	47	69	101.4	76	0.116	0.341	18.52
435	7.2	0.0	69.824	0.162	1.25	82	1.89	70	47	69	100.6	76	0.116	0.341	18.60
436	7.2	0.0	69.987	0.163	1.26	82	1.89	70	47	69	101.2	76	0.115	0.339	18.56

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Date: 2/29/24

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: 11:53
Test Length: 668 min
Recording Interval: 1 min

Sample Train Leak Checks

Pre-test	0	cfm @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	7.2	0.0	70.150	0.163	1.26	82	1.89	70	47	69	101.3	76	0.116	0.341	18.56
438	7.2	0.0	70.313	0.163	1.27	82	1.88	70	47	69	101.1	76	0.117	0.342	18.64
439	7.2	0.0	70.475	0.162	1.26	82	1.88	70	47	69	100.2	76	0.116	0.341	18.64
440	7.2	0.0	70.638	0.163	1.27	82	1.89	70	47	69	100.7	76	0.118	0.344	18.68
441	7.2	0.0	70.801	0.163	1.26	82	1.88	70	47	69	100.4	76	0.118	0.344	18.76
442	7.2	0.0	70.964	0.163	1.27	82	1.89	70	47	69	100.2	75	0.117	0.342	18.71
443	7.2	0.0	71.128	0.164	1.27	82	1.89	70	47	69	101.2	76	0.116	0.341	18.63
444	7.2	0.0	71.291	0.163	1.27	82	1.88	70	47	69	101.0	76	0.116	0.341	18.60
445	7.2	0.0	71.454	0.163	1.26	82	1.89	70	47	69	100.9	76	0.117	0.342	18.64
446	7.2	0.0	71.616	0.162	1.26	82	1.89	70	47	69	100.0	75	0.117	0.342	18.67
447	7.1	0.1	71.779	0.163	1.26	82	1.89	70	47	69	100.5	75	0.117	0.342	18.66
448	7.1	0.0	71.942	0.163	1.26	82	1.89	70	47	69	100.7	75	0.115	0.339	18.58
449	7.1	0.0	72.105	0.163	1.26	82	1.89	70	47	69	100.9	76	0.118	0.344	18.63
450	7.1	0.0	72.267	0.162	1.26	82	1.88	70	47	69	100.1	76	0.116	0.341	18.68
451	7.1	0.0	72.430	0.163	1.26	82	1.88	70	47	69	100.8	76	0.116	0.341	18.60
452	7.1	0.0	72.593	0.163	1.26	82	1.89	70	47	69	100.8	76	0.118	0.344	18.68
453	7.1	0.0	72.756	0.163	1.26	82	1.89	70	47	69	100.5	76	0.117	0.342	18.72
454	7.1	0.0	72.920	0.164	1.26	82	1.89	70	47	69	101.3	76	0.115	0.339	18.60
455	7.1	0.0	73.083	0.163	1.26	82	1.89	70	47	69	100.9	76	0.118	0.344	18.64
456	7.1	0.0	73.246	0.163	1.27	82	1.89	70	47	69	100.7	76	0.116	0.341	18.68
457	7.1	0.0	73.408	0.162	1.26	82	1.88	70	47	69	100.1	76	0.117	0.342	18.64
458	7.1	0.0	73.571	0.163	1.26	82	1.89	70	47	69	100.7	75	0.117	0.342	18.67
459	7.0	0.1	73.734	0.163	1.26	82	1.89	70	47	69	100.5	75	0.117	0.342	18.66
460	7.0	0.0	73.896	0.162	1.26	82	1.88	70	47	69	100.0	76	0.117	0.342	18.67
461	7.0	0.0	74.059	0.163	1.27	82	1.88	70	47	69	100.9	76	0.115	0.339	18.60
462	7.0	0.0	74.222	0.163	1.26	82	1.88	70	47	69	101.1	76	0.117	0.342	18.60
463	7.0	0.0	74.385	0.163	1.26	82	1.89	70	47	69	100.8	76	0.117	0.342	18.68
464	7.0	0.0	74.549	0.164	1.26	82	1.88	70	47	69	101.2	76	0.117	0.342	18.68
465	7.0	0.0	74.712	0.163	1.26	82	1.89	70	47	69	100.8	76	0.115	0.339	18.60
466	7.0	0.0	74.874	0.162	1.27	82	1.88	70	47	69	100.5	76	0.116	0.341	18.56
467	7.0	0.0	75.037	0.163	1.25	82	1.88	70	47	69	100.9	76	0.118	0.344	18.68
468	7.0	0.0	75.200	0.163	1.26	81	1.89	70	47	69	100.7	76	0.116	0.341	18.68
469	7.0	0.0	75.363	0.163	1.26	82	1.89	70	47	69	100.7	76	0.118	0.344	18.68
470	7.0	0.0	75.526	0.163	1.27	82	1.88	70	47	69	100.4	76	0.118	0.344	18.76
471	7.0	0.0	75.688	0.162	1.27	81	1.89	70	47	69	99.9	76	0.116	0.341	18.68
472	6.9	0.1	75.851	0.163	1.27	81	1.89	70	47	69	100.9	76	0.117	0.342	18.64
473	6.9	0.0	76.014	0.163	1.26	82	1.88	70	47	69	100.8	76	0.117	0.342	18.68
474	6.9	0.0	76.177	0.163	1.27	82	1.88	70	47	69	100.6	76	0.117	0.342	18.68
475	6.9	0.0	76.341	0.164	1.27	81	1.89	70	47	69	101.2	76	0.118	0.344	18.72
476	6.9	0.0	76.504	0.163	1.27	81	1.88	70	47	69	100.6	76	0.117	0.342	18.72
477	6.9	0.0	76.667	0.163	1.26	81	1.89	70	47	69	100.7	76	0.117	0.342	18.68
478	6.9	0.0	76.830	0.163	1.26	81	1.88	70	47	69	100.8	76	0.117	0.342	18.68
479	6.9	0.0	76.992	0.162	1.27	81	1.89	70	47	69	100.3	76	0.116	0.341	18.64
480	6.9	0.0	77.155	0.163	1.26	81	1.89	70	47	69	101.0	76	0.117	0.342	18.64

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @ 16.85 in. Hg
Post-Test 0.002 cfm @ 18 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	6.9	0.0	77.318	0.163	1.26	81	1.88	70	47	69	101.1	76	0.115	0.339	18.60
482	6.9	0.0	77.480	0.162	1.27	81	1.89	70	47	69	100.7	76	0.116	0.341	18.56
483	6.9	0.0	77.643	0.163	1.26	81	1.89	70	47	69	101.2	76	0.117	0.342	18.64
484	6.9	0.0	77.806	0.163	1.27	81	1.88	70	47	69	101.0	76	0.116	0.341	18.64
485	6.9	0.0	77.970	0.164	1.27	81	1.89	70	47	69	101.6	76	0.117	0.342	18.64
486	6.8	0.1	78.133	0.163	1.25	81	1.89	70	47	69	100.9	76	0.117	0.342	18.68
487	6.8	0.0	78.296	0.163	1.26	81	1.88	70	47	69	100.8	76	0.117	0.342	18.68
488	6.8	0.0	78.459	0.163	1.27	81	1.89	70	47	69	100.7	76	0.118	0.344	18.72
489	6.8	0.0	78.621	0.162	1.26	81	1.89	70	47	69	100.2	76	0.115	0.339	18.64
490	6.8	0.0	78.784	0.163	1.26	81	1.89	70	47	69	101.3	76	0.115	0.339	18.52
491	6.8	0.0	78.947	0.163	1.26	81	1.88	70	47	69	101.6	76	0.116	0.341	18.56
492	6.8	0.0	79.109	0.162	1.26	81	1.88	70	47	69	100.6	76	0.117	0.342	18.64
493	6.8	0.0	79.272	0.163	1.26	81	1.89	70	47	69	100.9	76	0.117	0.342	18.68
494	6.8	0.0	79.435	0.163	1.26	81	1.88	70	47	69	101.0	76	0.115	0.339	18.60
495	6.7	0.1	79.598	0.163	1.27	81	1.88	70	47	69	101.1	76	0.118	0.344	18.64
496	6.7	0.0	79.762	0.164	1.26	81	1.89	70	47	69	101.4	76	0.117	0.342	18.72
497	6.7	0.0	79.925	0.163	1.26	81	1.89	70	47	69	100.8	76	0.116	0.341	18.64
498	6.7	0.0	80.087	0.162	1.27	81	1.88	70	47	69	100.3	76	0.118	0.344	18.68
499	6.7	0.0	80.250	0.163	1.26	81	1.89	70	47	69	100.7	76	0.117	0.342	18.72
500	6.7	0.0	80.413	0.163	1.26	81	1.89	70	47	69	100.7	76	0.117	0.342	18.68
501	6.6	0.1	80.576	0.163	1.26	81	1.88	70	47	69	100.8	76	0.117	0.342	18.68
502	6.6	0.0	80.738	0.162	1.27	81	1.88	70	47	69	100.3	76	0.116	0.341	18.64
503	6.6	0.0	80.901	0.163	1.27	81	1.88	70	47	69	100.9	76	0.118	0.344	18.68
504	6.6	0.0	81.064	0.163	1.27	81	1.88	70	47	69	100.7	76	0.117	0.342	18.72
505	6.6	0.0	81.227	0.163	1.26	81	1.88	70	47	69	100.8	76	0.116	0.341	18.64
506	6.6	0.0	81.390	0.163	1.27	81	1.89	70	47	69	101.2	76	0.115	0.339	18.56
507	6.6	0.0	81.554	0.164	1.27	81	1.88	70	47	69	102.0	76	0.117	0.342	18.60
508	6.5	0.1	81.716	0.162	1.27	81	1.89	70	47	69	100.6	76	0.115	0.339	18.60
509	6.5	0.0	81.879	0.163	1.26	81	1.89	70	47	69	101.2	76	0.117	0.342	18.60
510	6.5	0.0	82.042	0.163	1.26	81	1.89	70	47	69	101.0	76	0.117	0.342	18.68
511	6.5	0.0	82.204	0.162	1.27	81	1.88	70	47	69	100.1	76	0.118	0.344	18.72
512	6.5	0.0	82.367	0.163	1.26	81	1.88	70	47	69	100.6	76	0.117	0.342	18.72
513	6.5	0.0	82.530	0.163	1.26	81	1.88	70	47	69	100.8	76	0.116	0.341	18.64
514	6.5	0.0	82.693	0.163	1.26	81	1.89	70	47	69	101.0	76	0.117	0.342	18.64
515	6.5	0.0	82.856	0.163	1.26	81	1.89	70	47	69	101.0	76	0.116	0.341	18.64
516	6.5	0.0	83.019	0.163	1.27	81	1.88	70	47	69	101.1	76	0.116	0.341	18.60
517	6.4	0.1	83.182	0.163	1.27	81	1.89	70	47	69	101.3	76	0.115	0.339	18.56
518	6.4	0.0	83.345	0.163	1.26	81	1.89	70	47	69	101.5	76	0.116	0.341	18.56
519	6.4	0.0	83.508	0.163	1.27	81	1.89	70	47	69	101.2	76	0.117	0.342	18.64
520	6.4	0.0	83.671	0.163	1.26	81	1.89	70	47	69	100.9	76	0.117	0.342	18.68
521	6.4	0.0	83.834	0.163	1.26	81	1.88	70	47	69	100.9	76	0.116	0.341	18.64
522	6.4	0.0	83.996	0.162	1.26	81	1.88	70	47	69	100.4	76	0.117	0.342	18.64
523	6.4	0.0	84.159	0.163	1.27	81	1.89	70	47	69	101.0	76	0.116	0.341	18.64
524	6.4	0.0	84.322	0.163	1.26	81	1.89	70	47	69	101.1	76	0.116	0.341	18.60

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	6.4	0.0	84.485	0.163	1.27	81	1.89	70	47	69	101.2	76	0.116	0.341	18.60
526	6.4	0.0	84.648	0.163	1.27	81	1.89	69	47	69	101.1	76	0.117	0.342	18.64
527	6.3	0.1	84.811	0.163	1.26	81	1.88	69	47	69	100.9	76	0.117	0.342	18.68
528	6.3	0.0	84.974	0.163	1.26	81	1.89	69	47	69	100.9	76	0.116	0.341	18.64
529	6.3	0.0	85.137	0.163	1.27	81	1.89	69	47	69	101.0	76	0.117	0.342	18.64
530	6.3	0.0	85.300	0.163	1.27	81	1.89	69	47	69	100.8	75	0.117	0.342	18.67
531	6.3	0.0	85.463	0.163	1.26	81	1.89	69	47	69	100.8	76	0.117	0.342	18.67
532	6.3	0.0	85.625	0.162	1.26	81	1.89	69	47	69	100.2	76	0.117	0.342	18.68
533	6.3	0.0	85.788	0.163	1.27	81	1.89	69	47	69	100.5	75	0.119	0.345	18.75
534	6.3	0.0	85.951	0.163	1.26	81	1.89	69	47	69	100.3	75	0.117	0.342	18.74
535	6.3	0.0	86.114	0.163	1.26	81	1.88	69	47	69	100.6	75	0.116	0.341	18.62
536	6.3	0.0	86.277	0.163	1.26	81	1.88	69	47	69	100.9	75	0.117	0.342	18.62
537	6.3	0.0	86.440	0.163	1.26	81	1.89	69	47	69	101.3	80	0.116	0.341	18.66
538	6.3	0.0	86.603	0.163	1.27	81	1.88	69	47	69	101.3	76	0.116	0.341	18.63
539	6.2	0.1	86.766	0.163	1.27	81	1.89	69	47	69	101.0	76	0.117	0.342	18.64
540	6.2	0.0	86.929	0.163	1.26	81	1.88	69	47	70	100.7	75	0.118	0.344	18.71
541	6.2	0.0	87.092	0.163	1.26	81	1.89	69	47	69	100.5	75	0.117	0.342	18.70
542	6.2	0.0	87.255	0.163	1.26	81	1.88	69	47	69	100.8	75	0.115	0.339	18.58
543	6.2	0.0	87.417	0.162	1.26	81	1.89	69	47	70	100.6	75	0.116	0.341	18.54
544	6.2	0.0	87.580	0.163	1.26	81	1.88	69	48	69	101.0	75	0.118	0.344	18.66
545	6.1	0.1	87.742	0.162	1.26	81	1.88	69	48	69	100.1	75	0.116	0.341	18.66
546	6.1	0.0	87.905	0.163	1.26	81	1.89	69	48	69	100.9	75	0.116	0.341	18.58
547	6.1	0.0	88.068	0.163	1.27	81	1.89	69	48	69	100.9	75	0.118	0.344	18.66
548	6.1	0.0	88.231	0.163	1.27	81	1.89	69	48	69	100.6	75	0.117	0.342	18.70
549	6.1	0.0	88.395	0.164	1.26	81	1.89	69	48	69	101.1	75	0.118	0.344	18.70
550	6.0	0.1	88.558	0.163	1.26	81	1.88	69	48	69	100.6	75	0.116	0.341	18.66
551	6.0	0.0	88.721	0.163	1.27	81	1.89	69	48	69	101.0	76	0.116	0.341	18.59
552	6.0	0.0	88.883	0.162	1.26	81	1.89	69	48	69	100.6	76	0.116	0.341	18.60
553	5.9	0.1	89.045	0.162	1.26	81	1.88	69	48	69	100.6	76	0.116	0.341	18.60
554	5.9	0.0	89.208	0.163	1.27	81	1.89	69	48	69	101.2	76	0.116	0.341	18.60
555	5.9	0.0	89.371	0.163	1.26	81	1.89	69	48	69	101.2	76	0.116	0.341	18.60
556	5.9	0.0	89.534	0.163	1.27	81	1.89	69	48	69	100.9	76	0.119	0.345	18.72
557	5.8	0.1	89.696	0.162	1.26	81	1.88	69	48	69	99.9	76	0.117	0.342	18.76
558	5.8	0.0	89.859	0.163	1.26	81	1.89	69	48	69	100.6	77	0.118	0.344	18.73
559	5.8	0.0	90.023	0.164	1.26	81	1.88	69	48	69	101.4	77	0.116	0.341	18.69
560	5.7	0.1	90.185	0.162	1.26	81	1.89	69	48	69	100.4	77	0.117	0.342	18.65
561	5.7	0.0	90.348	0.163	1.26	81	1.88	69	48	69	101.1	77	0.116	0.341	18.65
562	5.7	0.0	90.511	0.163	1.26	81	1.89	69	48	69	101.1	78	0.118	0.344	18.70
563	5.7	0.0	90.673	0.162	1.26	81	1.88	69	48	69	100.5	78	0.115	0.339	18.67
564	5.6	0.1	90.836	0.163	1.26	81	1.89	69	48	69	101.3	78	0.117	0.342	18.63
565	5.6	0.0	90.998	0.162	1.27	81	1.89	69	48	69	100.7	78	0.116	0.341	18.67
566	5.6	0.0	91.161	0.163	1.27	81	1.89	69	48	69	101.3	78	0.116	0.341	18.63
567	5.5	0.1	91.324	0.163	1.27	81	1.89	70	48	69	101.5	78	0.115	0.339	18.59
568	5.5	0.0	91.487	0.163	1.27	81	1.89	70	48	69	101.7	79	0.116	0.341	18.60

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @ 16.85 in. Hg
Post-Test 0.002 cfm @ 18 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	5.5	0.0	91.650	0.163	1.26	81	1.89	70	48	69	101.5	79	0.117	0.342	18.69
570	5.5	0.0	91.813	0.163	1.26	81	1.89	70	48	69	101.2	78	0.116	0.341	18.68
571	5.4	0.1	91.975	0.162	1.27	81	1.90	70	48	69	100.7	78	0.116	0.341	18.63
572	5.4	0.0	92.138	0.163	1.26	81	1.89	70	48	69	101.4	78	0.116	0.341	18.63
573	5.4	0.0	92.300	0.162	1.26	81	1.90	70	48	69	100.8	78	0.116	0.341	18.63
574	5.4	0.0	92.463	0.163	1.26	81	1.89	70	48	69	101.2	78	0.118	0.344	18.71
575	5.3	0.1	92.625	0.162	1.26	81	1.89	70	48	69	100.5	78	0.115	0.339	18.67
576	5.3	0.0	92.788	0.163	1.26	81	1.89	70	48	69	101.3	79	0.118	0.344	18.68
577	5.3	0.0	92.951	0.163	1.26	81	1.89	70	48	69	101.1	79	0.117	0.342	18.77
578	5.3	0.0	93.114	0.163	1.25	81	1.89	70	48	69	101.1	79	0.116	0.341	18.69
579	5.2	0.1	93.277	0.163	1.26	81	1.89	70	48	69	101.4	79	0.116	0.341	18.65
580	5.2	0.0	93.440	0.163	1.27	81	1.89	70	48	69	101.3	78	0.117	0.342	18.68
581	5.2	0.0	93.602	0.162	1.26	81	1.89	70	48	69	100.4	79	0.118	0.344	18.76
582	5.1	0.1	93.765	0.163	1.26	81	1.89	70	48	69	101.0	79	0.116	0.341	18.73
583	5.1	0.0	93.927	0.162	1.26	81	1.89	70	48	69	100.6	79	0.117	0.342	18.69
584	5.1	0.0	94.090	0.163	1.26	81	1.89	70	48	69	101.4	79	0.115	0.339	18.65
585	5.1	0.0	94.252	0.162	1.26	81	1.89	70	48	69	101.0	79	0.116	0.341	18.61
586	5.0	0.1	94.415	0.163	1.26	81	1.89	70	48	69	101.6	79	0.116	0.341	18.65
587	5.0	0.0	94.577	0.162	1.27	81	1.89	70	48	69	100.9	81	0.117	0.342	18.71
588	4.9	0.1	94.741	0.164	1.27	81	1.89	70	48	69	102.2	82	0.116	0.341	18.73
589	4.9	0.0	94.904	0.163	1.26	81	1.89	70	48	69	101.6	80	0.116	0.341	18.68
590	4.9	0.0	95.066	0.162	1.26	81	1.89	70	49	69	101.1	80	0.115	0.339	18.63
591	4.8	0.1	95.228	0.162	1.26	81	1.89	70	49	70	101.1	80	0.117	0.342	18.67
592	4.8	0.0	95.391	0.163	1.26	81	1.89	70	49	69	101.5	80	0.116	0.341	18.71
593	4.7	0.1	95.553	0.162	1.26	81	1.89	70	49	70	100.7	80	0.118	0.344	18.75
594	4.7	0.0	95.716	0.163	1.26	81	1.89	70	49	69	101.3	80	0.115	0.339	18.71
595	4.6	0.1	95.878	0.162	1.26	81	1.90	70	49	69	101.0	80	0.116	0.341	18.63
596	4.6	0.0	96.041	0.163	1.26	81	1.89	70	49	69	101.8	80	0.115	0.339	18.63
597	4.5	0.1	96.204	0.163	1.25	81	1.89	70	49	70	101.9	80	0.115	0.339	18.59
598	4.5	0.0	96.367	0.163	1.26	81	1.90	70	49	70	101.9	80	0.116	0.341	18.63
599	4.4	0.1	96.529	0.162	1.26	81	1.90	70	49	70	101.1	80	0.116	0.341	18.67
600	4.3	0.1	96.691	0.162	1.25	81	1.89	70	49	69	101.0	81	0.117	0.342	18.71
601	4.3	0.0	96.853	0.162	1.26	81	1.90	70	49	69	100.9	81	0.116	0.341	18.72
602	4.2	0.1	97.016	0.163	1.26	81	1.90	70	49	70	101.6	81	0.116	0.341	18.68
603	4.1	0.1	97.178	0.162	1.26	81	1.90	70	49	69	101.2	82	0.116	0.341	18.69
604	4.0	0.1	97.340	0.162	1.26	81	1.90	70	49	70	101.2	82	0.116	0.341	18.70
605	4.0	0.0	97.503	0.163	1.26	81	1.90	70	49	70	102.0	83	0.115	0.339	18.67
606	3.9	0.1	97.666	0.163	1.26	81	1.89	70	49	69	102.1	83	0.116	0.341	18.68
607	3.8	0.1	97.828	0.162	1.25	81	1.90	70	49	70	101.6	84	0.115	0.339	18.69
608	3.7	0.1	97.991	0.163	1.26	81	1.90	71	49	70	102.4	85	0.115	0.339	18.66
609	3.6	0.1	98.153	0.162	1.25	81	1.90	71	49	70	101.8	85	0.116	0.341	18.71
610	3.5	0.1	98.315	0.162	1.25	81	1.90	71	49	70	101.4	86	0.118	0.344	18.84
611	3.4	0.1	98.476	0.161	1.26	81	1.90	71	49	70	100.5	86	0.116	0.341	18.85
612	3.3	0.1	98.639	0.163	1.26	81	1.90	71	50	70	102.0	86	0.116	0.341	18.77

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	3.2	0.1	98.801	0.162	1.26	81	1.90	71	50	70	101.4	86	0.117	0.342	18.81
614	3.2	0.0	98.964	0.163	1.26	81	1.90	71	50	70	102.1	86	0.115	0.339	18.77
615	3.1	0.1	99.127	0.163	1.25	81	1.90	71	50	70	102.3	86	0.116	0.341	18.73
616	3.1	0.0	99.289	0.162	1.25	81	1.90	71	50	70	101.6	86	0.117	0.342	18.81
617	3.0	0.1	99.451	0.162	1.25	81	1.90	71	50	70	101.4	86	0.115	0.339	18.77
618	2.9	0.1	99.613	0.162	1.26	81	1.90	71	50	70	101.5	86	0.117	0.342	18.77
619	2.9	0.0	99.775	0.162	1.25	81	1.90	71	50	70	101.4	86	0.116	0.341	18.81
620	2.8	0.1	99.938	0.163	1.26	81	1.89	71	50	70	102.2	86	0.115	0.339	18.73
621	2.8	0.0	100.100	0.162	1.26	81	1.90	71	50	70	101.8	86	0.116	0.341	18.73
622	2.8	0.0	100.262	0.162	1.26	81	1.90	71	50	70	101.8	86	0.115	0.339	18.73
623	2.7	0.1	100.426	0.164	1.26	81	1.90	71	50	70	103.1	86	0.115	0.339	18.69
624	2.7	0.0	100.588	0.162	1.26	81	1.90	71	50	70	102.0	86	0.115	0.339	18.69
625	2.6	0.1	100.750	0.162	1.25	81	1.90	71	50	70	101.9	86	0.116	0.341	18.73
626	2.5	0.1	100.912	0.162	1.25	81	1.89	71	50	70	101.6	86	0.117	0.342	18.81
627	2.5	0.0	101.075	0.163	1.26	81	1.90	71	51	70	101.8	86	0.117	0.342	18.85
628	2.4	0.1	101.237	0.162	1.25	81	1.90	71	51	70	101.2	86	0.116	0.341	18.81
629	2.3	0.1	101.399	0.162	1.26	81	1.91	71	51	71	101.4	86	0.116	0.341	18.77
630	2.3	0.0	101.561	0.162	1.26	81	1.90	71	51	70	101.5	87	0.117	0.342	18.82
631	2.2	0.1	101.724	0.163	1.26	81	1.90	71	51	70	102.2	87	0.115	0.339	18.79
632	2.1	0.1	101.887	0.163	1.26	81	1.91	71	51	70	102.4	87	0.116	0.341	18.75
633	2.0	0.1	102.049	0.162	1.26	81	1.90	71	51	70	101.8	87	0.116	0.341	18.79
634	2.0	0.0	102.211	0.162	1.25	81	1.90	71	51	70	101.6	87	0.116	0.341	18.79
635	1.9	0.1	102.373	0.162	1.26	81	1.90	71	51	70	101.6	87	0.116	0.341	18.79
636	1.8	0.1	102.536	0.163	1.26	81	1.90	71	51	71	102.5	87	0.114	0.338	18.71
637	1.7	0.1	102.698	0.162	1.26	81	1.90	72	51	70	102.0	88	0.117	0.342	18.75
638	1.6	0.1	102.860	0.162	1.26	81	1.90	72	51	70	101.9	88	0.115	0.339	18.80
639	1.6	0.0	103.022	0.162	1.26	81	1.91	72	51	70	101.8	88	0.116	0.341	18.76
640	1.5	0.1	103.186	0.164	1.26	81	1.90	72	51	71	103.0	88	0.117	0.342	18.84
641	1.4	0.1	103.348	0.162	1.26	81	1.90	72	51	71	101.4	88	0.117	0.342	18.88
642	1.3	0.1	103.510	0.162	1.25	81	1.90	72	51	71	101.5	89	0.116	0.341	18.85
643	1.3	0.0	103.672	0.162	1.26	81	1.91	72	51	71	101.9	89	0.115	0.339	18.78
644	1.2	0.1	103.834	0.162	1.25	81	1.90	72	51	71	102.0	89	0.116	0.341	18.78
645	1.1	0.1	103.996	0.162	1.26	81	1.90	72	51	71	101.9	89	0.116	0.341	18.82
646	1.0	0.1	104.158	0.162	1.26	81	1.90	72	51	71	101.8	89	0.116	0.341	18.82
647	1.0	0.0	104.321	0.163	1.26	81	1.91	72	51	71	102.1	87	0.118	0.344	18.88
648	0.9	0.1	104.484	0.163	1.25	81	1.90	72	51	71	101.7	87	0.117	0.342	18.91
649	0.8	0.1	104.646	0.162	1.26	81	1.90	72	52	71	101.2	86	0.115	0.339	18.78
650	0.8	0.0	104.808	0.162	1.25	81	1.90	72	52	71	101.6	86	0.116	0.341	18.73
651	0.7	0.1	104.971	0.163	1.25	81	1.90	72	52	71	102.4	86	0.115	0.339	18.73
652	0.7	0.0	105.133	0.162	1.26	81	1.91	72	52	71	101.7	86	0.117	0.342	18.77
653	0.6	0.1	105.295	0.162	1.25	81	1.90	72	52	71	101.4	86	0.116	0.341	18.81
654	0.6	0.0	105.457	0.162	1.26	81	1.90	72	52	71	101.7	86	0.114	0.338	18.69
655	0.5	0.1	105.619	0.162	1.26	81	1.90	72	52	71	102.1	86	0.115	0.339	18.65
656	0.5	0.0	105.782	0.163	1.26	81	1.90	72	52	71	102.4	85	0.117	0.342	18.76

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Test Length: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @	16.85	in. Hg
Post-Test	0.002	cfm @	18	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	0.5	0.0	105.945	0.163	1.25	81	1.90	72	52	71	102.0	85	0.116	0.341	18.79
658	0.4	0.1	106.107	0.162	1.26	81	1.91	72	52	71	101.5	85	0.115	0.339	18.71
659	0.4	0.0	106.270	0.163	1.25	81	1.90	72	52	71	102.4	85	0.115	0.339	18.67
660	0.3	0.1	106.432	0.162	1.25	81	1.90	72	52	71	101.6	84	0.117	0.342	18.74
661	0.3	0.0	106.594	0.162	1.26	81	1.90	72	52	71	101.3	85	0.116	0.341	18.78
662	0.3	0.0	106.756	0.162	1.26	81	1.90	72	52	71	101.0	84	0.119	0.345	18.86
663	0.2	0.1	106.918	0.162	1.26	81	1.90	72	52	71	100.5	84	0.118	0.344	18.94
664	0.2	0.0	107.081	0.163	1.26	81	1.89	72	52	71	101.2	84	0.116	0.341	18.82
665	0.2	0.0	107.244	0.163	1.26	81	1.90	71	52	71	101.8	84	0.116	0.341	18.73
666	0.1	0.1	107.407	0.163	1.25	81	1.90	71	52	71	102.1	84	0.115	0.339	18.69
667	0.1	0.0	107.569	0.162	1.25	81	1.90	71	52	71	101.7	84	0.115	0.339	18.65
668	0.0	0.1	107.731	0.162	1.26	81	1.90	71	52	71	101.5	83	0.117	0.342	18.73

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
Tot / Avg	**107.700**	**0.161**	**0.95**	**80.9**	**2.14**	**70.23**	**48.65**	**100.0**	**342.2**	**131.0**	**133.7**	**213.7**	**212.0**	**551.1**	**70.4**
Minimum	0.000	0.157	0.50	73	1.60	68	44	97.6	261	114	115	166	164	310	171
Max	107.700	0.164	0.98	82	2.20	72	54	103.1	611	224	227	351	422	997	348
0	0.000		0.50	73	1.60	68	49		385	224	200	247	266	444	264
1	0.157	0.157	0.99	73	2.10	69	44	101.0	383	181	201	242	261	574	254
2	0.319	0.162	0.99	73	2.10	69	44	103.1	376	184	201	238	257	552	251
3	0.480	0.161	0.98	73	2.10	69	44	101.2	369	185	200	234	253	537	248
4	0.643	0.163	0.98	73	2.10	69	44	102.7	362	184	199	231	250	532	245
5	0.804	0.161	0.97	73	2.10	69	44	101.4	356	184	198	228	246	532	242
6	0.965	0.161	0.96	73	2.10	69	44	101.3	351	184	197	225	243	532	240
7	1.125	0.160	0.96	73	2.10	69	44	100.4	346	184	195	222	240	530	237
8	1.287	0.162	0.96	73	2.10	69	44	101.3	341	183	193	219	237	526	235
9	1.447	0.160	0.96	73	2.10	69	44	100.1	336	183	191	216	234	522	232
10	1.607	0.160	0.96	73	2.10	69	44	100.2	332	183	189	214	231	520	230
11	1.769	0.162	0.96	74	2.10	69	44	101.3	328	182	187	211	228	518	227
12	1.929	0.160	0.96	74	2.10	70	44	100.0	325	182	185	209	226	518	225
13	2.088	0.159	0.96	74	2.10	70	44	99.4	322	181	183	207	223	520	223
14	2.249	0.161	0.96	74	2.10	70	44	100.6	320	180	181	204	221	524	221
15	2.410	0.161	0.95	74	2.10	70	44	100.6	319	179	178	202	219	528	219
16	2.569	0.159	0.96	74	2.10	70	44	99.4	318	178	177	200	217	533	218
17	2.730	0.161	0.95	74	2.10	70	44	100.9	317	177	175	198	215	539	216
18	2.890	0.160	0.95	74	2.10	70	44	100.2	317	176	173	196	213	544	215
19	3.050	0.160	0.95	75	2.10	70	44	100.0	318	175	171	195	211	549	214
20	3.210	0.160	0.95	75	2.10	70	44	99.7	318	175	169	193	209	555	213
21	3.371	0.161	0.94	75	2.10	70	45	100.3	319	174	167	191	208	559	212
22	3.531	0.160	0.95	75	2.10	70	45	99.8	320	173	165	190	206	563	211
23	3.691	0.160	0.95	75	2.10	70	45	99.9	322	172	164	188	204	567	210
24	3.852	0.161	0.95	75	2.10	70	45	100.4	323	171	162	187	203	570	209
25	4.012	0.160	0.95	76	2.10	70	45	99.7	324	170	160	186	202	574	208
26	4.172	0.160	0.95	76	2.10	70	45	99.6	326	168	159	185	201	578	208
27	4.333	0.161	0.95	76	2.10	70	45	100.4	328	167	158	183	199	581	207
28	4.493	0.160	0.95	76	2.10	70	45	100.2	329	166	156	182	198	584	206
29	4.653	0.160	0.95	76	2.10	70	45	100.4	331	165	155	181	197	587	206
30	4.814	0.161	0.95	76	2.10	70	45	100.6	332	164	154	180	196	589	205
31	4.974	0.160	0.95	77	2.10	70	45	99.6	334	163	152	179	196	590	205
32	5.134	0.160	0.95	77	2.10	70	46	99.8	335	161	151	178	195	592	204
33	5.295	0.161	0.95	77	2.10	70	46	100.4	336	160	150	177	194	593	203
34	5.456	0.161	0.94	77	2.10	70	46	100.2	338	159	149	177	193	594	203
35	5.616	0.160	0.95	77	2.10	70	46	99.5	339	158	148	176	193	596	203
36	5.776	0.160	0.95	77	2.10	70	46	99.5	340	157	147	175	192	599	202
37	5.937	0.161	0.95	77	2.10	70	46	99.9	341	156	146	174	192	601	202
38	6.097	0.160	0.95	78	2.10	70	46	99.0	342	155	145	174	191	603	201
39	6.258	0.161	0.95	78	2.10	70	46	100.0	344	154	144	173	191	605	201
40	6.419	0.161	0.95	78	2.10	70	46	100.3	345	154	143	173	191	606	201

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
41	6.579	0.160	0.95	78	2.10	70	46	99.5	346	153	142	172	191	607	201
42	6.740	0.161	0.95	78	2.10	70	46	99.8	347	152	142	172	190	608	201
43	6.901	0.161	0.95	78	2.10	70	46	99.7	347	151	141	171	190	609	200
44	7.061	0.160	0.94	78	2.10	70	46	99.1	349	151	140	171	190	610	200
45	7.221	0.160	0.95	78	2.10	70	46	99.1	349	150	139	170	190	611	200
46	7.382	0.161	0.95	78	2.10	70	46	99.7	350	149	139	170	190	613	200
47	7.544	0.162	0.94	78	2.10	70	46	100.4	351	148	138	170	190	614	199
48	7.704	0.160	0.95	79	2.10	70	47	99.3	352	148	137	169	190	615	199
49	7.864	0.160	0.95	79	2.10	70	47	99.3	353	147	137	169	191	616	199
50	8.026	0.162	0.95	79	2.10	71	47	100.4	354	147	136	169	191	618	199
51	8.186	0.160	0.95	79	2.10	71	47	99.2	354	146	136	168	191	620	199
52	8.347	0.161	0.95	79	2.10	71	47	100.0	355	145	135	168	191	622	199
53	8.508	0.161	0.95	79	2.10	71	47	100.0	356	145	135	168	192	625	199
54	8.669	0.161	0.95	79	2.10	71	47	99.9	357	144	134	168	192	627	199
55	8.829	0.160	0.95	79	2.10	71	47	99.4	358	144	133	167	192	629	199
56	8.990	0.161	0.95	79	2.10	71	47	100.1	359	143	133	167	192	630	199
57	9.151	0.161	0.95	79	2.10	71	47	99.9	361	143	133	167	193	632	199
58	9.312	0.161	0.95	79	2.10	71	47	99.8	361	142	132	167	193	633	199
59	9.473	0.161	0.95	79	2.10	71	47	99.8	362	142	132	167	194	634	199
60	9.634	0.161	0.95	80	2.10	71	47	99.9	363	141	131	167	194	635	199
61	9.795	0.161	0.95	80	2.10	71	47	100.0	364	141	131	166	195	636	199
62	9.956	0.161	0.95	80	2.10	71	47	99.8	365	140	130	166	195	636	199
63	10.117	0.161	0.95	80	2.10	71	47	99.6	366	140	130	166	196	638	200
64	10.278	0.161	0.95	80	2.10	71	47	99.7	367	140	130	166	196	639	200
65	10.439	0.161	0.95	80	2.10	71	47	99.8	368	139	129	166	197	640	200
66	10.600	0.161	0.95	80	2.10	71	47	99.8	369	139	129	166	198	642	200
67	10.762	0.162	0.95	80	2.10	71	47	100.6	370	138	129	166	198	643	200
68	10.923	0.161	0.95	80	2.10	71	47	100.2	371	138	128	166	199	644	200
69	11.084	0.161	0.95	80	2.10	71	47	100.2	372	138	128	166	199	645	201
70	11.244	0.160	0.95	80	2.10	71	47	99.6	373	137	128	166	200	646	201
71	11.407	0.163	0.95	80	2.10	71	47	101.4	374	137	127	166	200	647	201
72	11.567	0.160	0.95	80	2.10	71	47	99.4	375	137	127	166	201	648	201
73	11.728	0.161	0.95	80	2.10	71	48	100.1	376	136	127	166	202	650	201
74	11.890	0.162	0.95	80	2.10	71	48	100.9	377	136	127	166	202	651	202
75	12.051	0.161	0.95	81	2.10	71	48	100.0	378	136	126	166	203	652	202
76	12.212	0.161	0.95	81	2.10	71	48	99.9	379	135	126	167	203	651	202
77	12.373	0.161	0.95	81	2.10	71	48	99.7	379	135	126	167	203	649	202
78	12.535	0.162	0.95	81	2.10	71	48	99.9	379	135	126	167	204	645	202
79	12.695	0.160	0.95	81	2.10	71	48	99.1	379	135	125	167	204	642	202
80	12.856	0.161	0.95	81	2.10	71	48	100.2	378	135	125	167	205	639	202
81	13.018	0.162	0.95	81	2.10	71	48	100.5	377	134	125	167	205	636	202
82	13.179	0.161	0.95	81	2.10	71	48	100.1	377	134	125	167	205	633	202
83	13.340	0.161	0.95	81	2.10	71	48	100.4	376	134	125	167	206	631	202
84	13.501	0.161	0.95	81	2.10	71	48	100.1	375	134	124	167	206	630	201

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
85	13.663	0.162	0.95	81	2.10	71	48	100.5	374	134	124	167	206	628	201
86	13.824	0.161	0.95	81	2.10	71	48	99.9	373	134	124	167	206	627	201
87	13.985	0.161	0.95	81	2.10	71	48	100.4	372	134	124	167	207	626	201
88	14.146	0.161	0.95	81	2.10	71	48	100.7	372	133	124	167	207	625	201
89	14.308	0.162	0.95	81	2.10	71	48	101.1	371	133	124	167	207	624	200
90	14.469	0.161	0.95	81	2.10	71	48	99.9	370	133	124	167	208	623	200
91	14.630	0.161	0.95	81	2.10	71	48	99.6	370	133	123	167	208	623	200
92	14.791	0.161	0.95	81	2.10	71	48	99.8	369	133	123	167	208	622	200
93	14.953	0.162	0.95	81	2.10	71	48	100.7	368	133	123	167	208	621	200
94	15.114	0.161	0.95	81	2.10	71	48	99.9	368	133	123	167	208	620	200
95	15.275	0.161	0.95	81	2.10	71	48	99.9	368	133	123	167	209	619	200
96	15.437	0.162	0.95	81	2.10	71	48	100.6	367	133	123	167	209	617	200
97	15.598	0.161	0.95	81	2.10	71	48	99.8	366	132	123	167	209	617	199
98	15.759	0.161	0.95	81	2.10	71	48	99.9	366	132	123	167	209	616	199
99	15.920	0.161	0.95	81	2.10	71	48	99.9	365	132	123	167	210	616	199
100	16.082	0.162	0.95	81	2.10	71	48	100.4	365	132	123	167	210	616	199
101	16.243	0.161	0.95	81	2.10	71	48	99.5	364	132	122	168	210	616	199
102	16.404	0.161	0.95	81	2.10	71	48	99.5	364	132	122	167	211	616	199
103	16.566	0.162	0.95	81	2.10	71	48	100.4	364	132	122	167	211	617	199
104	16.728	0.162	0.95	81	2.10	71	48	100.6	364	132	122	168	211	618	199
105	16.887	0.159	0.93	81	2.10	71	48	98.8	363	132	122	168	211	618	199
106	17.047	0.160	0.93	81	2.10	71	48	99.3	363	132	122	167	212	618	199
107	17.207	0.160	0.93	81	2.10	71	48	99.2	363	132	122	167	212	617	199
108	17.366	0.159	0.93	81	2.10	71	48	98.6	363	132	122	167	212	616	199
109	17.526	0.160	0.93	81	2.10	71	48	99.2	362	132	122	167	212	615	199
110	17.686	0.160	0.92	81	2.10	71	48	99.3	362	132	122	167	212	614	199
111	17.845	0.159	0.93	81	2.10	71	48	98.7	361	132	122	167	213	614	199
112	18.005	0.160	0.93	81	2.10	71	48	99.2	361	132	122	167	213	613	199
113	18.165	0.160	0.93	81	2.10	71	48	99.4	360	132	122	167	213	612	199
114	18.324	0.159	0.93	81	2.10	71	48	98.9	360	132	122	167	213	610	199
115	18.484	0.160	0.93	81	2.10	71	48	99.3	359	132	122	167	213	608	199
116	18.644	0.160	0.93	81	2.10	71	48	99.2	358	132	122	167	214	606	199
117	18.803	0.159	0.93	81	2.10	71	48	98.5	357	132	122	167	214	605	198
118	18.964	0.161	0.93	81	2.10	71	48	99.5	356	132	122	167	214	603	198
119	19.124	0.160	0.93	82	2.10	71	48	98.8	356	132	122	167	214	602	198
120	19.283	0.159	0.93	82	2.10	71	48	98.2	355	132	122	167	214	602	198
121	19.443	0.160	0.93	82	2.10	71	48	98.7	354	132	122	167	214	601	198
122	19.603	0.160	0.93	82	2.10	71	48	98.6	353	132	122	167	214	600	198
123	19.762	0.159	0.93	82	2.10	71	48	98.2	352	132	122	167	214	599	197
124	19.922	0.160	0.93	82	2.10	71	48	99.2	351	132	122	167	214	598	197
125	20.082	0.160	0.92	82	2.10	71	48	99.4	350	132	122	167	214	597	197
126	20.241	0.159	0.93	82	2.10	71	48	98.5	350	132	122	167	214	595	197
127	20.402	0.161	0.93	82	2.10	71	48	99.7	349	132	122	167	214	594	197
128	20.561	0.159	0.93	82	2.10	71	48	98.4	348	132	122	167	214	592	197

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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	20.721	0.160	0.93	82	2.10	71	48	99.0	348	132	122	167	214	590	197
130	20.881	0.160	0.93	82	2.10	71	48	99.1	347	132	122	167	214	588	196
131	21.041	0.160	0.93	82	2.10	71	48	99.4	346	132	122	167	214	587	196
132	21.200	0.159	0.93	82	2.10	71	48	98.8	345	132	122	167	214	586	196
133	21.361	0.161	0.93	82	2.10	71	48	99.7	345	132	122	167	214	584	196
134	21.520	0.159	0.93	82	2.10	71	48	98.1	344	132	122	167	214	583	196
135	21.679	0.159	0.93	82	2.10	71	48	98.2	343	132	122	167	214	582	196
136	21.840	0.161	0.93	82	2.10	71	48	99.5	343	132	122	167	214	582	196
137	21.999	0.159	0.93	82	2.10	71	48	98.0	342	132	122	167	214	581	195
138	22.158	0.159	0.93	82	2.10	71	48	98.0	342	132	122	167	214	581	195
139	22.319	0.161	0.93	82	2.10	71	48	99.3	342	132	122	167	214	581	195
140	22.478	0.159	0.93	82	2.10	71	48	98.3	341	132	122	167	214	580	195
141	22.638	0.160	0.93	82	2.10	71	48	99.2	341	132	122	167	213	579	195
142	22.798	0.160	0.93	82	2.10	71	48	98.8	341	132	122	167	213	578	195
143	22.957	0.159	0.93	82	2.10	71	48	98.0	346	133	122	167	213	577	196
144	23.117	0.160	0.93	82	2.10	71	48	98.8	349	134	123	167	212	576	197
145	23.277	0.160	0.93	82	2.10	71	48	98.9	347	135	123	167	213	576	197
146	23.436	0.159	0.93	82	2.10	71	48	98.3	345	136	124	168	213	575	197
147	23.596	0.160	0.93	82	2.10	71	48	98.9	344	136	124	168	213	574	197
148	23.757	0.161	0.93	82	2.10	71	48	99.5	343	135	124	168	213	572	197
149	23.916	0.159	0.93	82	2.10	71	48	98.0	342	135	124	169	213	571	197
150	24.076	0.160	0.93	82	2.10	71	48	98.5	341	135	124	169	213	570	196
151	24.236	0.160	0.93	82	2.10	71	48	98.5	340	135	124	169	212	569	196
152	24.395	0.159	0.93	82	2.10	71	48	98.1	339	135	124	169	212	568	196
153	24.555	0.160	0.93	82	2.10	71	48	99.0	339	135	124	169	212	568	196
154	24.716	0.161	0.93	82	2.10	71	48	99.8	338	135	124	169	212	568	196
155	24.875	0.159	0.93	82	2.10	71	48	98.5	337	135	124	169	211	568	195
156	25.034	0.159	0.93	82	2.10	71	48	98.4	337	135	124	169	211	568	195
157	25.195	0.161	0.93	82	2.10	71	48	99.5	337	135	123	169	211	568	195
158	25.354	0.159	0.93	82	2.10	71	48	98.1	336	135	124	169	210	568	195
159	25.514	0.160	0.93	82	2.10	71	48	98.8	336	135	123	169	210	568	195
160	25.675	0.161	0.93	82	2.10	71	48	99.5	336	134	123	170	209	569	194
161	25.834	0.159	0.93	82	2.10	71	48	98.3	337	134	123	170	209	570	195
162	25.993	0.159	0.93	82	2.10	71	48	98.9	337	134	123	171	208	569	195
163	26.154	0.161	0.93	82	2.10	71	48	100.2	338	134	123	171	208	567	195
164	26.313	0.159	0.93	82	2.10	71	48	98.4	338	134	123	171	207	565	195
165	26.473	0.160	0.93	82	2.10	71	48	98.7	338	134	124	172	207	565	195
166	26.633	0.160	0.93	82	2.10	71	48	98.8	338	134	124	173	207	566	195
167	26.792	0.159	0.93	82	2.10	71	48	98.2	338	134	124	173	207	566	195
168	26.952	0.160	0.93	82	2.10	71	48	98.6	339	134	124	174	206	566	195
169	27.112	0.160	0.92	82	2.10	71	48	98.6	339	134	124	174	206	567	195
170	27.271	0.159	0.93	82	2.10	71	48	98.2	340	134	124	175	206	568	196
171	27.431	0.160	0.93	82	2.10	71	48	98.9	340	134	124	175	205	569	196
172	27.591	0.160	0.93	82	2.10	71	48	99.0	341	134	124	176	205	570	196

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
173	27.751	0.160	0.93	82	2.10	71	48	99.2	342	134	124	176	205	570	196
174	27.910	0.159	0.93	82	2.10	71	48	98.3	342	134	124	177	204	570	196
175	28.071	0.161	0.93	82	2.10	71	48	99.3	343	134	124	178	204	569	197
176	28.230	0.159	0.93	82	2.10	71	48	98.2	343	134	124	178	204	568	197
177	28.390	0.160	0.93	82	2.10	71	48	99.0	343	134	124	179	203	567	197
178	28.550	0.160	0.92	82	2.10	71	48	99.2	343	134	124	179	203	567	197
179	28.709	0.159	0.93	82	2.10	71	49	98.3	343	134	124	180	202	567	197
180	28.869	0.160	0.93	82	2.10	71	48	98.6	344	134	124	180	202	568	197
181	29.029	0.160	0.92	82	2.10	71	48	98.7	344	134	124	181	202	568	197
182	29.189	0.160	0.93	82	2.10	71	48	99.0	345	134	124	182	201	569	197
183	29.348	0.159	0.93	82	2.10	71	48	98.5	346	134	124	183	201	570	198
184	29.509	0.161	0.93	82	2.10	71	48	99.8	346	134	124	184	200	570	198
185	29.668	0.159	0.93	82	2.10	71	48	98.3	346	134	124	184	200	571	198
186	29.828	0.160	0.93	82	2.10	71	48	98.7	347	134	124	185	200	571	198
187	29.988	0.160	0.93	82	2.10	71	48	98.7	347	134	124	185	199	570	198
188	30.148	0.160	0.93	82	2.10	71	48	98.8	348	134	124	186	199	571	198
189	30.307	0.159	0.93	82	2.10	71	48	98.4	348	134	124	186	199	571	198
190	30.468	0.161	0.92	82	2.10	71	48	99.6	349	134	124	187	199	571	199
191	30.627	0.159	0.93	82	2.10	71	49	98.2	349	133	124	188	199	571	199
192	30.787	0.160	0.93	82	2.10	71	48	99.0	350	133	125	188	198	572	199
193	30.947	0.160	0.93	82	2.10	71	48	99.0	350	133	125	189	198	573	199
194	31.107	0.160	0.93	82	2.10	71	49	99.2	351	133	125	189	198	574	199
195	31.266	0.159	0.93	82	2.10	71	48	98.6	352	133	125	190	197	576	199
196	31.427	0.161	0.93	82	2.10	71	49	99.5	352	133	125	191	197	577	200
197	31.586	0.159	0.93	82	2.10	71	49	98.0	353	133	125	191	197	578	200
198	31.746	0.160	0.93	82	2.10	71	49	98.9	353	133	125	192	196	578	200
199	31.906	0.160	0.93	82	2.10	71	49	99.0	354	133	125	193	196	578	200
200	32.065	0.159	0.93	82	2.10	71	49	98.1	354	133	125	193	196	579	200
201	32.225	0.160	0.94	82	2.10	71	49	98.7	354	132	125	194	196	579	200
202	32.385	0.160	0.92	82	2.10	71	49	99.2	354	132	125	195	195	578	200
203	32.544	0.159	0.93	82	2.10	71	49	98.6	353	132	125	195	195	578	200
204	32.705	0.161	0.93	82	2.10	71	49	99.6	353	132	125	196	195	577	200
205	32.865	0.160	0.93	82	2.10	71	49	98.6	353	132	125	196	194	575	200
206	33.024	0.159	0.93	82	2.10	71	49	98.1	352	132	125	197	194	573	200
207	33.184	0.160	0.93	82	2.10	71	49	99.2	352	132	125	198	194	571	200
208	33.344	0.160	0.93	82	2.10	71	49	99.4	351	131	125	199	193	570	200
209	33.503	0.159	0.93	82	2.10	71	49	98.7	350	131	125	200	193	569	200
210	33.664	0.161	0.93	82	2.10	71	49	99.9	350	131	125	200	193	567	200
211	33.823	0.159	0.92	82	2.10	71	49	98.4	349	131	125	201	192	565	200
212	33.983	0.160	0.93	82	2.10	71	49	98.9	348	131	125	202	192	562	200
213	34.143	0.160	0.92	82	2.10	71	49	98.9	347	131	125	202	191	559	199
214	34.303	0.160	0.93	82	2.10	71	49	98.8	346	130	125	203	191	556	199
215	34.462	0.159	0.93	82	2.10	71	49	98.0	344	130	125	203	191	552	199
216	34.623	0.161	0.93	82	2.10	71	49	99.2	343	130	125	204	190	548	198

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
217	34.782	0.159	0.93	82	2.10	71	49	98.2	341	130	125	204	190	544	198
218	34.941	0.159	0.93	82	2.10	71	49	98.3	340	130	125	205	190	540	198
219	35.102	0.161	0.93	82	2.10	71	49	99.7	338	129	125	208	190	537	198
220	35.261	0.159	0.93	82	2.10	71	49	98.4	337	129	125	209	190	531	198
221	35.421	0.160	0.93	82	2.10	71	49	98.8	336	129	124	210	189	527	198
222	35.581	0.160	0.93	82	2.10	71	49	98.7	335	129	124	210	189	525	197
223	35.741	0.160	0.93	82	2.10	71	49	98.8	333	128	124	210	189	522	197
224	35.900	0.159	0.93	82	2.10	71	49	98.4	331	128	124	211	188	519	196
225	36.061	0.161	0.93	82	2.10	71	49	99.7	330	128	124	211	188	516	196
226	36.221	0.160	0.93	82	2.10	71	49	98.9	328	128	124	211	188	514	196
227	36.380	0.159	0.93	82	2.10	71	49	98.1	327	128	124	211	187	513	195
228	36.541	0.161	0.93	82	2.10	71	49	99.1	326	127	124	211	187	512	195
229	36.700	0.159	0.93	82	2.10	71	49	97.9	325	127	124	211	186	512	195
230	36.859	0.159	0.93	82	2.10	71	49	98.0	324	127	124	211	186	512	194
231	37.020	0.161	0.93	82	2.10	71	49	99.5	324	127	124	211	185	512	194
232	37.179	0.159	0.93	82	2.10	71	49	98.4	323	126	123	211	185	513	194
233	37.339	0.160	0.93	82	2.10	71	49	98.9	323	126	123	211	185	513	194
234	37.499	0.160	0.92	82	2.10	71	49	98.8	322	126	123	211	184	513	193
235	37.659	0.160	0.93	82	2.10	71	49	98.9	322	126	123	212	184	513	193
236	37.819	0.160	0.93	82	2.10	71	49	98.7	322	125	123	212	184	513	193
237	37.979	0.160	0.93	82	2.10	71	49	98.6	321	125	123	212	183	513	193
238	38.138	0.159	0.93	82	2.10	71	49	97.9	321	125	123	214	184	516	193
239	38.298	0.160	0.93	82	2.10	71	49	98.5	322	125	123	217	185	523	194
240	38.459	0.161	0.93	82	2.10	71	49	99.3	324	125	123	219	186	539	195
241	38.618	0.159	0.93	82	2.10	71	49	98.3	328	124	123	220	186	555	196
242	38.777	0.159	0.93	82	2.10	71	49	98.4	332	124	123	222	186	567	197
243	38.938	0.161	0.93	82	2.10	71	49	99.5	335	124	123	222	187	574	198
244	39.097	0.159	0.93	82	2.10	71	49	98.3	339	124	123	223	187	576	199
245	39.257	0.160	0.93	82	2.10	71	49	99.0	342	124	123	223	187	576	200
246	39.418	0.161	0.93	82	2.10	71	49	99.6	344	123	123	222	187	574	200
247	39.577	0.159	0.93	82	2.10	71	49	98.5	347	123	123	222	187	573	200
248	39.736	0.159	0.93	82	2.10	71	49	98.7	349	123	123	222	188	574	201
249	39.897	0.161	0.93	82	2.10	71	49	99.9	351	123	123	221	188	575	201
250	40.056	0.159	0.93	82	2.10	71	49	98.4	352	123	123	221	189	576	202
251	40.216	0.160	0.93	82	2.10	71	49	98.9	353	123	123	221	191	573	202
252	40.377	0.161	0.93	82	2.10	71	49	99.6	354	123	123	220	192	571	202
253	40.536	0.159	0.93	82	2.10	71	49	98.4	355	123	123	220	192	571	203
254	40.695	0.159	0.93	82	2.10	71	49	98.5	356	123	123	220	193	573	203
255	40.856	0.161	0.93	82	2.10	71	49	99.7	357	122	123	219	194	575	203
256	41.015	0.159	0.93	82	2.10	71	49	98.3	358	122	123	219	195	578	203
257	41.175	0.160	0.93	82	2.10	71	49	98.9	359	122	123	218	196	579	204
258	41.335	0.160	0.93	82	2.10	71	49	98.9	359	122	123	218	196	578	204
259	41.494	0.159	0.93	82	2.10	71	49	98.2	359	122	123	217	197	580	204
260	41.654	0.160	0.93	82	2.10	71	49	98.7	360	122	123	217	198	583	204

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
261	41.815	0.161	0.93	82	2.10	70	49	99.3	361	122	123	217	198	589	204
262	41.974	0.159	0.94	82	2.10	70	49	97.9	362	121	122	217	199	593	204
263	42.135	0.161	0.94	82	2.10	70	49	98.9	364	121	123	217	199	599	205
264	42.296	0.161	0.94	82	2.10	70	49	98.9	365	121	122	217	200	614	205
265	42.456	0.160	0.93	82	2.10	69	49	98.7	368	121	122	217	201	631	206
266	42.615	0.159	0.94	82	2.10	69	49	98.4	370	121	122	218	202	643	207
267	42.776	0.161	0.94	82	2.10	69	49	99.4	373	121	122	218	204	645	208
268	42.937	0.161	0.93	82	2.10	69	49	99.0	375	121	122	219	205	640	208
269	43.096	0.159	0.94	82	2.10	69	49	98.0	376	121	122	219	207	633	209
270	43.257	0.161	0.94	81	2.10	69	49	99.5	376	121	122	220	208	627	209
271	43.417	0.160	0.93	81	2.10	69	49	98.7	376	121	122	220	209	621	210
272	43.577	0.160	0.93	81	2.10	69	49	98.6	375	121	123	221	210	615	210
273	43.737	0.160	0.93	81	2.10	69	49	98.6	374	121	123	221	211	610	210
274	43.898	0.161	0.93	81	2.10	69	49	99.4	373	121	123	222	212	605	210
275	44.057	0.159	0.93	81	2.10	69	49	98.5	372	121	123	222	213	601	210
276	44.217	0.160	0.93	81	2.10	69	49	99.0	371	121	124	222	214	596	210
277	44.378	0.161	0.93	81	2.10	69	49	99.4	369	121	124	222	215	590	210
278	44.537	0.159	0.93	81	2.10	69	48	98.3	368	121	124	223	215	585	210
279	44.697	0.160	0.93	81	2.10	69	48	99.3	366	121	124	223	216	580	210
280	44.858	0.161	0.93	81	2.10	69	48	100.3	364	122	124	224	216	576	210
281	45.017	0.159	0.93	81	2.10	69	48	99.2	362	122	125	224	216	573	210
282	45.177	0.160	0.93	81	2.10	69	48	99.9	361	122	125	224	216	573	210
283	45.337	0.160	0.93	81	2.10	69	48	99.8	359	122	125	224	216	573	209
284	45.497	0.160	0.93	81	2.10	69	48	99.6	358	122	125	224	217	572	209
285	45.656	0.159	0.93	81	2.10	69	48	98.8	357	122	125	224	217	571	209
286	45.817	0.161	0.93	81	2.10	69	48	100.0	356	122	125	224	217	569	209
287	45.976	0.159	0.93	81	2.10	69	48	98.6	355	122	125	224	217	566	209
288	46.136	0.160	0.93	81	2.10	69	48	99.1	354	122	126	224	217	564	209
289	46.296	0.160	0.93	81	2.10	69	48	99.1	353	123	126	224	217	564	209
290	46.456	0.160	0.93	81	2.10	69	48	99.5	352	123	126	224	217	564	208
291	46.615	0.159	0.93	81	2.10	69	48	98.9	352	123	126	224	217	566	208
292	46.776	0.161	0.93	81	2.10	69	48	100.0	351	123	126	224	217	569	208
293	46.935	0.159	0.93	81	2.10	70	48	98.5	352	123	126	224	217	572	208
294	47.095	0.160	0.93	81	2.10	70	48	99.2	352	123	126	224	217	575	208
295	47.255	0.160	0.93	81	2.10	70	48	99.5	353	123	126	223	217	578	208
296	47.415	0.160	0.93	81	2.10	70	48	99.4	353	123	127	223	217	580	209
297	47.574	0.159	0.93	81	2.10	70	48	98.6	354	123	127	223	217	582	209
298	47.735	0.161	0.93	81	2.10	70	48	99.8	354	123	127	223	217	584	209
299	47.894	0.159	0.93	81	2.10	70	48	98.4	355	123	127	222	217	585	209
300	48.054	0.160	0.93	81	2.10	70	48	98.9	356	123	127	222	217	585	209
301	48.214	0.160	0.92	81	2.10	70	48	98.8	356	124	127	222	217	585	209
302	48.373	0.159	0.93	81	2.10	70	48	98.3	357	124	127	221	218	585	209
303	48.533	0.160	0.93	81	2.10	70	48	99.0	357	124	127	221	218	586	209
304	48.693	0.160	0.92	81	2.10	70	48	98.9	357	124	127	221	218	585	209

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
305	48.852	0.159	0.93	81	2.10	70	48	98.2	357	124	128	220	218	585	209
306	49.012	0.160	0.93	81	2.10	70	48	98.8	357	124	128	220	218	583	209
307	49.172	0.160	0.93	81	2.10	70	48	98.7	357	124	128	220	218	580	209
308	49.332	0.160	0.93	81	2.10	70	48	98.7	356	124	128	219	218	578	209
309	49.492	0.160	0.93	81	2.10	70	48	98.8	356	124	128	219	218	576	209
310	49.652	0.160	0.93	81	2.10	70	48	98.8	355	124	128	219	218	575	209
311	49.811	0.159	0.93	81	2.10	70	48	98.3	355	124	128	218	218	575	209
312	49.971	0.160	0.93	81	2.10	70	48	99.0	354	124	128	218	218	574	208
313	50.131	0.160	0.93	81	2.10	70	48	98.9	353	124	128	217	217	573	208
314	50.290	0.159	0.93	81	2.10	70	48	98.2	353	124	128	217	217	572	208
315	50.450	0.160	0.93	81	2.10	70	48	98.9	352	124	128	216	217	570	207
316	50.610	0.160	0.92	81	2.10	70	48	98.9	351	124	128	216	217	569	207
317	50.769	0.159	0.93	81	2.10	70	48	98.2	350	124	128	216	217	568	207
318	50.929	0.160	0.93	81	2.10	70	48	99.0	350	124	128	215	216	566	207
319	51.089	0.160	0.93	81	2.10	70	48	99.4	349	124	128	215	216	564	206
320	51.248	0.159	0.93	81	2.10	70	48	98.7	348	125	128	214	216	562	206
321	51.409	0.161	0.92	81	2.10	70	48	99.8	347	125	128	214	216	560	206
322	51.568	0.159	0.93	81	2.10	70	48	98.4	346	125	128	213	215	557	205
323	51.727	0.159	0.93	81	2.10	70	48	98.3	345	125	128	213	215	554	205
324	51.888	0.161	0.93	81	2.10	70	48	99.3	343	125	128	212	214	551	204
325	52.047	0.159	0.93	81	2.10	70	48	98.1	342	125	128	212	214	548	204
326	52.206	0.159	0.93	81	2.10	70	48	98.2	340	125	128	211	214	546	204
327	52.367	0.161	0.93	81	2.10	70	48	99.4	339	125	128	211	213	543	203
328	52.526	0.159	0.93	81	2.10	70	48	98.3	338	125	128	211	213	541	203
329	52.685	0.159	0.93	81	2.10	70	48	98.5	337	125	128	210	213	538	203
330	52.846	0.161	0.93	81	2.10	70	48	100.1	335	125	128	210	212	536	202
331	53.005	0.159	0.93	81	2.10	70	48	98.8	334	125	127	209	212	533	201
332	53.164	0.159	0.93	81	2.10	70	48	98.2	332	125	127	209	211	530	201
333	53.325	0.161	0.93	81	2.10	70	48	99.3	331	125	127	209	211	528	201
334	53.484	0.159	0.93	81	2.10	70	48	98.3	330	125	127	208	210	525	200
335	53.644	0.160	0.93	81	2.10	70	48	99.0	328	124	127	208	210	522	199
336	53.804	0.160	0.92	81	2.10	70	48	99.2	327	124	127	207	209	520	199
337	53.963	0.159	0.93	81	2.10	70	48	98.5	326	124	127	207	209	518	199
338	54.123	0.160	0.93	81	2.10	70	48	99.2	325	124	127	206	208	517	198
339	54.283	0.160	0.93	81	2.10	70	48	99.2	323	124	127	206	208	516	198
340	54.443	0.160	0.93	81	2.10	70	48	99.2	322	124	127	205	207	514	197
341	54.602	0.159	0.93	81	2.10	70	48	98.4	321	124	126	205	207	512	197
342	54.763	0.161	0.93	82	2.10	70	48	99.3	320	124	126	204	206	511	196
343	54.922	0.159	0.93	82	2.10	70	48	97.6	319	124	126	204	206	509	196
344	55.081	0.159	0.93	82	2.10	70	48	97.7	318	124	126	203	205	507	195
345	55.242	0.161	0.93	82	2.10	70	48	99.3	317	124	126	203	205	506	195
346	55.401	0.159	0.93	82	2.10	70	48	98.0	316	124	126	202	204	504	194
347	55.561	0.160	0.93	82	2.10	70	48	98.4	315	124	125	202	204	502	194
348	55.721	0.160	0.93	82	2.10	70	48	98.3	314	124	125	201	203	500	193

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
349	55.881	0.160	0.93	82	2.10	70	48	98.5	313	124	125	200	203	498	193
350	56.040	0.159	0.93	82	2.10	70	48	98.4	312	124	125	200	203	497	193
351	56.201	0.161	0.93	82	2.10	70	48	99.7	311	124	125	199	202	495	192
352	56.360	0.159	0.93	82	2.10	70	48	98.4	310	124	125	199	202	493	192
353	56.519	0.159	0.93	82	2.10	70	48	98.2	309	123	124	198	201	492	191
354	56.680	0.161	0.92	82	2.10	70	48	99.3	308	123	124	198	201	490	191
355	56.839	0.159	0.93	82	2.10	70	48	97.8	306	123	124	197	200	489	190
356	56.999	0.160	0.93	82	2.10	70	48	98.2	305	123	124	196	200	489	190
357	57.159	0.160	0.93	82	2.10	70	48	98.2	304	123	124	195	199	489	189
358	57.318	0.159	0.92	82	2.10	70	48	97.8	303	123	124	195	199	489	189
359	57.478	0.160	0.93	82	2.10	70	48	98.5	302	123	123	194	198	488	188
360	57.638	0.160	0.93	82	2.10	70	48	98.4	301	123	123	193	198	487	188
361	57.798	0.160	0.93	82	2.10	70	48	98.5	301	123	123	193	197	487	187
362	57.957	0.159	0.93	82	2.10	70	48	98.1	300	123	123	192	197	486	187
363	58.118	0.161	0.92	82	2.10	70	48	99.4	299	122	123	191	196	485	186
364	58.277	0.159	0.93	82	2.10	70	48	98.2	299	122	122	191	196	484	186
365	58.437	0.160	0.93	82	2.10	70	48	99.0	298	122	122	190	195	483	185
366	58.597	0.160	0.93	82	2.10	70	48	98.8	297	122	122	190	195	483	185
367	58.757	0.160	0.93	82	2.10	70	48	98.3	297	122	122	189	194	482	185
368	58.917	0.160	0.93	82	2.10	70	48	98.2	296	122	122	188	194	481	184
369	59.077	0.160	0.93	82	2.10	70	48	98.4	295	122	122	188	193	480	184
370	59.236	0.159	0.93	82	2.10	70	48	97.9	295	122	121	187	193	479	184
371	59.396	0.160	0.93	82	2.10	70	48	98.4	294	122	121	186	192	478	183
372	59.556	0.160	0.92	82	2.10	70	48	98.3	293	121	121	186	192	477	183
373	59.716	0.160	0.93	82	2.10	70	48	98.4	293	121	121	185	191	478	182
374	59.876	0.160	0.93	82	2.10	70	48	98.7	293	121	121	185	190	480	182
375	60.036	0.160	0.92	82	2.10	70	48	98.8	294	121	121	184	190	484	182
376	60.195	0.159	0.93	82	2.10	70	48	98.2	294	121	120	184	189	487	182
377	60.355	0.160	0.93	82	2.10	70	48	98.9	295	121	120	183	189	490	182
378	60.515	0.160	0.93	82	2.10	70	48	98.5	297	121	120	183	189	493	182
379	60.674	0.159	0.93	82	2.10	70	48	98.0	298	121	120	183	188	496	182
380	60.834	0.160	0.93	82	2.10	70	48	99.2	299	121	120	182	188	499	182
381	60.994	0.160	0.92	82	2.10	70	48	99.1	300	121	119	182	187	501	182
382	61.154	0.160	0.93	82	2.10	70	48	98.7	301	121	119	182	187	502	182
383	61.314	0.160	0.93	82	2.10	70	48	98.9	302	121	119	182	187	504	182
384	61.474	0.160	0.92	82	2.10	70	48	99.1	303	120	119	181	186	505	182
385	61.633	0.159	0.93	82	2.10	70	48	98.1	304	120	119	181	186	505	182
386	61.796	0.163	0.97	82	2.20	70	48	100.5	305	120	119	181	186	505	182
387	61.960	0.164	0.97	82	2.20	70	48	101.3	305	120	119	181	185	505	182
388	62.123	0.163	0.97	82	2.20	70	48	100.7	306	120	119	181	185	505	182
389	62.285	0.162	0.97	82	2.20	70	48	99.8	306	120	118	181	185	504	182
390	62.448	0.163	0.98	82	2.20	70	48	100.4	306	120	118	181	184	502	182
391	62.611	0.163	0.97	82	2.20	70	48	100.9	306	120	118	180	184	500	182
392	62.775	0.164	0.97	82	2.20	70	48	101.8	306	120	118	180	184	499	182

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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	62.938	0.163	0.97	82	2.20	70	49	100.8	305	120	118	180	183	496	181
394	63.101	0.163	0.97	82	2.20	70	48	100.5	305	120	118	180	183	495	181
395	63.264	0.163	0.97	82	2.20	70	48	100.3	304	120	118	180	183	492	181
396	63.427	0.163	0.97	82	2.20	70	48	100.4	303	120	118	180	182	490	181
397	63.591	0.164	0.98	82	2.20	70	48	101.3	302	119	118	179	182	488	180
398	63.754	0.163	0.97	82	2.20	70	48	100.8	301	119	118	179	182	486	180
399	63.916	0.162	0.97	82	2.20	70	48	100.2	300	119	118	179	181	484	179
400	64.079	0.163	0.97	82	2.20	70	48	100.6	299	119	117	179	181	482	179
401	64.242	0.163	0.97	82	2.20	70	48	100.7	299	119	117	179	180	482	179
402	64.406	0.164	0.97	82	2.20	70	48	101.5	298	119	117	178	180	482	178
403	64.569	0.163	0.97	82	2.20	70	48	100.8	297	119	117	178	180	482	178
404	64.732	0.163	0.97	82	2.20	70	48	100.6	297	119	117	178	179	481	178
405	64.895	0.163	0.97	82	2.20	70	48	100.7	296	119	117	178	179	480	178
406	65.058	0.163	0.97	82	2.20	70	49	101.2	295	119	117	178	179	479	178
407	65.221	0.163	0.97	82	2.20	70	48	101.0	295	119	117	178	178	478	177
408	65.385	0.164	0.97	82	2.20	70	48	101.4	294	119	117	177	178	477	177
409	65.547	0.162	0.97	82	2.20	70	49	100.1	293	119	117	177	178	476	177
410	65.710	0.163	0.97	82	2.20	70	49	100.7	292	119	117	177	177	474	176
411	65.873	0.163	0.98	82	2.20	70	49	100.7	291	119	116	177	177	473	176
412	66.037	0.164	0.97	82	2.20	70	49	101.0	290	118	116	176	176	471	175
413	66.200	0.163	0.97	82	2.20	70	49	100.3	289	118	116	176	176	468	175
414	66.363	0.163	0.97	81	2.20	70	49	100.8	288	118	116	176	176	466	175
415	66.526	0.163	0.97	81	2.20	70	49	100.9	286	118	116	175	175	465	174
416	66.689	0.163	0.97	82	2.20	70	49	100.9	285	118	116	175	175	463	174
417	66.852	0.163	0.97	82	2.20	70	49	100.8	284	118	116	175	174	462	173
418	67.016	0.164	0.97	81	2.20	70	49	101.3	282	118	116	174	174	461	173
419	67.179	0.163	0.97	81	2.20	70	49	101.0	281	118	116	174	174	460	173
420	67.341	0.162	0.97	82	2.20	70	49	100.4	280	118	115	174	173	459	172
421	67.504	0.163	0.97	81	2.20	70	49	101.2	278	117	115	173	173	458	171
422	67.668	0.164	0.97	81	2.10	70	49	102.0	283	118	115	173	172	457	172
423	67.831	0.163	0.97	81	2.20	70	49	101.1	284	119	116	173	172	456	173
424	67.994	0.163	0.97	81	2.20	70	49	101.0	285	119	116	173	172	454	173
425	68.156	0.162	0.97	81	2.10	70	49	100.4	285	120	117	174	172	452	174
426	68.320	0.164	0.97	81	2.10	70	49	101.7	286	121	118	174	172	450	174
427	68.483	0.163	0.97	81	2.20	70	49	101.2	286	122	118	175	172	447	175
428	68.646	0.163	0.97	81	2.20	70	49	101.2	286	123	119	175	172	444	175
429	68.809	0.163	0.97	81	2.20	70	49	101.1	286	124	120	175	172	442	175
430	68.972	0.163	0.97	81	2.20	70	49	100.8	286	124	120	176	172	439	176
431	69.135	0.163	0.97	81	2.20	70	49	100.7	285	125	121	176	172	435	176
432	69.298	0.163	0.98	81	2.20	70	49	100.9	286	125	121	176	172	432	176
433	69.461	0.163	0.97	81	2.10	70	49	101.2	286	126	122	176	173	430	177
434	69.624	0.163	0.97	81	2.10	70	49	101.6	286	127	122	177	173	430	177
435	69.787	0.163	0.97	81	2.20	70	49	101.4	286	127	123	177	173	429	177
436	69.950	0.163	0.97	81	2.20	70	49	101.3	287	128	123	177	173	429	178

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)*
437	70.113	0.163	0.97	81	2.10	70	49	101.4	283	128	124	177	173	428	177
438	70.276	0.163	0.97	81	2.20	70	49	101.2	281	127	123	177	174	427	176
439	70.439	0.163	0.97	81	2.20	70	49	101.0	280	127	123	177	174	427	176
440	70.602	0.163	0.97	81	2.20	70	49	100.9	277	126	122	177	173	426	175
441	70.765	0.163	0.97	81	2.10	70	49	100.6	276	125	121	176	173	426	174
442	70.929	0.164	0.97	81	2.20	70	49	101.0	274	125	121	176	172	426	174
443	71.092	0.163	0.97	81	2.20	70	49	100.7	277	125	120	175	172	426	174
444	71.254	0.162	0.97	81	2.20	70	49	100.5	278	125	120	175	171	427	174
445	71.417	0.163	0.97	81	2.20	70	49	101.1	279	125	120	175	171	427	174
446	71.580	0.163	0.97	81	2.10	70	49	100.8	276	125	121	174	170	428	173
447	71.744	0.164	0.97	81	2.10	70	49	101.3	274	125	121	174	170	427	173
448	71.907	0.163	0.97	81	2.10	70	49	100.9	274	125	120	174	170	428	173
449	72.069	0.162	0.97	81	2.20	70	49	100.5	277	125	120	174	169	430	173
450	72.232	0.163	0.97	81	2.20	70	49	100.9	278	125	120	174	169	431	173
451	72.396	0.164	0.97	81	2.20	70	49	101.6	275	125	120	173	169	430	172
452	72.559	0.163	0.97	81	2.20	70	49	101.0	276	125	120	173	168	429	172
453	72.722	0.163	0.97	81	2.20	70	49	100.7	277	125	120	173	168	429	173
454	72.885	0.163	0.97	81	2.20	70	49	100.9	278	125	121	173	168	429	173
455	73.048	0.163	0.97	81	2.20	70	49	101.1	278	126	121	174	168	429	173
456	73.211	0.163	0.97	81	2.20	70	49	100.9	274	126	121	174	168	428	173
457	73.375	0.164	0.97	81	2.10	70	49	101.5	272	125	121	174	167	428	172
458	73.538	0.163	0.97	81	2.20	70	49	100.8	271	125	120	174	167	429	171
459	73.700	0.162	0.97	81	2.20	70	49	100.1	270	124	119	174	167	429	171
460	73.863	0.163	0.97	81	2.10	70	49	100.8	273	124	119	174	166	430	171
461	74.026	0.163	0.97	81	2.20	70	49	101.0	274	124	119	174	166	431	171
462	74.190	0.164	0.97	81	2.20	70	49	101.9	270	124	119	174	166	430	171
463	74.353	0.163	0.97	81	2.20	70	49	101.0	272	123	119	174	165	429	171
464	74.515	0.162	0.97	81	2.20	70	49	100.2	273	124	119	174	165	430	171
465	74.678	0.163	0.97	81	2.10	70	49	101.0	274	124	119	174	164	430	171
466	74.841	0.163	0.97	81	2.20	70	49	101.3	274	124	119	174	164	429	171
467	75.005	0.164	0.97	81	2.20	70	49	101.7	274	125	120	175	164	428	172
468	75.168	0.163	0.97	81	2.20	70	49	100.8	275	125	120	175	164	427	172
469	75.331	0.163	0.97	81	2.20	70	49	100.8	275	125	120	175	164	426	172
470	75.494	0.163	0.98	81	2.20	70	49	100.6	275	125	121	176	164	426	172
471	75.657	0.163	0.97	81	2.20	70	49	100.6	275	126	121	176	164	425	172
472	75.821	0.164	0.97	81	2.20	70	49	101.5	275	126	121	177	164	424	173
473	75.984	0.163	0.97	81	2.20	70	49	100.9	275	126	121	177	164	424	173
474	76.146	0.162	0.97	81	2.20	70	49	100.2	275	126	122	178	164	422	173
475	76.309	0.163	0.97	81	2.20	70	49	100.7	275	126	122	178	164	421	173
476	76.472	0.163	0.97	81	2.10	70	49	100.6	276	127	122	179	164	420	174
477	76.636	0.164	0.97	81	2.20	70	49	101.3	276	127	123	180	164	419	174
478	76.799	0.163	0.96	81	2.20	70	49	100.8	276	127	123	180	164	418	174
479	76.962	0.163	0.97	81	2.20	70	49	100.9	276	127	123	181	164	416	174
480	77.124	0.162	0.97	81	2.20	70	49	100.4	277	127	123	182	165	414	175

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
481	77.288	0.164	0.97	81	2.20	70	49	101.7	276	127	123	182	165	411	175
482	77.451	0.163	0.97	81	2.20	70	49	101.3	276	127	124	183	165	409	175
483	77.614	0.163	0.97	81	2.20	70	49	101.2	276	127	124	183	165	407	175
484	77.777	0.163	0.97	81	2.20	70	49	101.0	276	127	124	184	165	406	175
485	77.940	0.163	0.97	81	2.20	70	49	101.0	276	127	124	184	165	405	175
486	78.103	0.163	0.97	81	2.10	70	49	100.9	276	127	124	185	165	404	175
487	78.266	0.163	0.97	81	2.20	70	49	100.8	276	127	125	186	165	404	176
488	78.429	0.163	0.96	81	2.20	70	49	100.7	277	127	125	186	165	405	176
489	78.592	0.163	0.97	81	2.20	70	49	100.8	277	127	125	187	166	408	176
490	78.755	0.163	0.97	81	2.10	70	49	101.3	278	127	125	188	166	411	177
491	78.918	0.163	0.97	81	2.20	70	49	101.6	280	127	125	189	166	415	177
492	79.082	0.164	0.97	81	2.20	70	49	101.9	281	127	125	189	166	420	178
493	79.244	0.162	0.97	81	2.20	70	49	100.3	282	127	125	190	166	425	178
494	79.407	0.163	0.97	81	2.20	70	49	101.0	284	127	125	191	166	429	179
495	79.570	0.163	0.97	81	2.10	70	49	101.1	285	127	126	192	166	434	179
496	79.733	0.163	0.97	81	2.20	70	49	100.8	287	127	126	192	167	439	180
497	79.897	0.164	0.97	81	2.20	70	49	101.4	289	127	126	195	167	445	181
498	80.059	0.162	0.97	81	2.20	70	49	100.3	291	127	126	198	168	446	182
499	80.222	0.163	0.97	81	2.10	70	49	100.7	290	127	126	201	168	441	182
500	80.385	0.163	0.97	81	2.20	70	49	100.7	289	127	126	204	169	432	183
501	80.548	0.163	0.97	81	2.20	70	49	100.8	287	126	126	207	170	426	183
502	80.712	0.164	0.97	81	2.20	70	49	101.5	286	125	125	211	171	420	184
503	80.875	0.163	0.97	81	2.20	70	49	100.9	285	124	124	213	171	417	183
504	81.037	0.162	0.97	81	2.20	69	49	100.1	284	123	123	215	171	415	183
505	81.200	0.163	0.97	81	2.20	70	49	100.8	283	122	122	216	171	412	183
506	81.363	0.163	0.97	81	2.20	69	49	101.2	282	122	121	217	171	410	183
507	81.527	0.164	0.97	81	2.20	70	49	102.0	281	121	121	217	171	409	182
508	81.690	0.163	0.97	81	2.10	70	49	101.2	280	120	120	216	170	410	181
509	81.852	0.162	0.97	81	2.20	69	49	100.6	278	119	119	215	170	410	180
510	82.015	0.163	0.97	81	2.20	70	49	101.0	277	119	119	215	169	411	180
511	82.178	0.163	0.97	81	2.20	69	49	100.7	275	118	118	214	169	411	179
512	82.342	0.164	0.97	81	2.10	69	49	101.2	274	117	118	213	168	411	178
513	82.505	0.163	0.97	81	2.20	69	49	100.8	273	117	117	213	168	411	178
514	82.668	0.163	0.97	81	2.20	69	49	101.0	271	116	117	212	167	411	177
515	82.830	0.162	0.97	81	2.10	69	49	100.4	270	115	116	212	167	411	176
516	82.994	0.164	0.97	81	2.20	69	49	101.7	269	115	116	212	167	410	176
517	83.158	0.164	0.97	81	2.20	69	49	102.0	273	115	115	212	166	411	176
518	83.320	0.162	0.97	81	2.20	69	49	100.8	274	115	116	212	166	411	177
519	83.483	0.163	0.97	81	2.20	69	49	101.2	276	115	116	212	166	411	177
520	83.646	0.163	0.97	81	2.20	69	49	100.9	277	115	117	213	166	409	178
521	83.809	0.163	0.97	81	2.20	69	49	100.9	278	116	117	214	166	404	178
522	83.973	0.164	0.97	81	2.20	69	49	101.6	279	116	118	215	166	397	179
523	84.136	0.163	0.96	81	2.20	69	49	101.0	280	116	118	216	167	389	179
524	84.298	0.162	0.97	81	2.20	69	49	100.5	277	117	119	216	167	383	179

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
525	84.461	0.163	0.98	81	2.20	69	49	101.2	280	117	119	217	167	376	180
526	84.624	0.163	0.97	81	2.20	69	49	101.1	281	117	119	218	167	370	180
527	84.788	0.164	0.97	81	2.20	69	49	101.5	281	117	120	219	168	364	181
528	84.951	0.163	0.97	81	2.20	69	49	100.9	282	118	120	220	168	358	182
529	85.113	0.162	0.97	81	2.20	69	49	100.4	282	118	121	221	168	352	182
530	85.276	0.163	0.97	81	2.20	69	49	100.8	282	119	121	222	169	348	183
531	85.439	0.163	0.97	81	2.20	69	49	100.7	282	119	122	222	169	345	183
532	85.603	0.164	0.97	81	2.20	69	49	101.4	281	119	123	223	169	343	183
533	85.766	0.163	0.97	81	2.20	69	49	100.5	280	120	123	223	169	341	183
534	85.929	0.163	0.97	81	2.10	69	49	100.3	280	120	124	223	169	339	183
535	86.091	0.162	0.97	81	2.20	69	49	100.0	279	120	124	223	169	338	183
536	86.255	0.164	0.97	81	2.20	69	49	101.5	278	121	124	223	169	335	183
537	86.419	0.164	0.97	81	2.20	69	49	101.9	277	119	125	222	168	329	182
538	86.581	0.162	0.97	81	2.10	69	49	100.7	273	119	125	221	168	314	181
539	86.744	0.163	0.97	81	2.10	69	49	101.0	270	120	125	223	168	310	181
540	86.907	0.163	0.97	81	2.10	69	49	100.7	268	120	126	224	169	311	181
541	87.070	0.163	0.97	81	2.10	69	49	100.5	266	120	126	225	169	314	181
542	87.234	0.164	0.97	81	2.10	69	49	101.4	264	120	127	227	170	316	182
543	87.396	0.162	0.96	81	2.20	69	49	100.6	263	121	127	229	170	318	182
544	87.559	0.163	0.97	81	2.20	69	49	101.0	262	121	128	231	171	319	183
545	87.722	0.163	0.97	81	2.20	69	49	100.7	262	121	128	233	171	320	183
546	87.885	0.163	0.97	81	2.10	69	49	100.9	262	121	129	235	172	321	184
547	88.048	0.163	0.97	81	2.20	69	49	100.9	262	121	130	236	172	322	184
548	88.211	0.163	0.97	81	2.20	69	49	100.6	261	121	130	238	172	322	184
549	88.373	0.162	0.97	81	2.20	69	49	99.9	262	122	130	240	173	323	185
550	88.536	0.163	0.97	81	2.20	69	49	100.6	262	122	131	244	174	326	187
551	88.699	0.163	0.97	81	2.20	69	49	101.0	264	122	131	248	175	331	188
552	88.863	0.164	0.97	81	2.20	69	49	101.9	266	122	132	252	176	335	190
553	89.025	0.162	0.97	81	2.20	69	49	100.6	270	122	132	256	176	341	191
554	89.188	0.163	0.97	81	2.20	69	49	101.2	275	122	133	259	177	347	193
555	89.351	0.163	0.97	81	2.20	69	49	101.2	276	122	133	264	178	357	195
556	89.514	0.163	0.97	81	2.20	69	49	100.9	279	121	132	269	179	373	196
557	89.677	0.163	0.97	81	2.20	69	49	100.5	282	120	132	273	179	393	197
558	89.839	0.162	0.97	81	2.20	69	49	99.9	286	119	131	277	179	410	198
559	90.002	0.163	0.97	81	2.20	69	50	100.8	289	119	130	279	179	420	199
560	90.165	0.163	0.97	81	2.20	69	50	101.0	292	118	129	282	180	425	200
561	90.328	0.163	0.97	81	2.20	69	50	101.1	295	117	129	284	180	429	201
562	90.491	0.163	0.97	81	2.20	69	50	101.1	298	117	128	286	180	432	202
563	90.653	0.162	0.97	81	2.20	69	50	100.5	300	116	128	287	180	437	202
564	90.816	0.163	0.97	81	2.20	69	50	101.3	302	116	127	288	180	440	203
565	90.979	0.163	0.97	81	2.20	69	50	101.3	304	115	127	289	180	443	203
566	91.142	0.163	0.97	81	2.20	69	50	101.3	306	115	126	290	181	444	204
567	91.305	0.163	0.97	81	2.20	69	50	101.5	307	114	126	291	181	444	204
568	91.467	0.162	0.97	81	2.20	69	50	101.1	308	114	126	293	181	445	204

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
569	91.630	0.163	0.97	81	2.20	69	50	101.5	310	114	126	294	182	446	205
570	91.793	0.163	0.97	81	2.20	69	50	101.2	311	114	126	295	182	449	206
571	91.956	0.163	0.97	81	2.20	69	50	101.3	312	114	126	295	182	458	206
572	92.118	0.162	0.96	81	2.20	69	50	100.8	314	114	126	295	182	466	206
573	92.281	0.163	0.97	81	2.20	69	50	101.4	316	114	127	295	182	475	207
574	92.444	0.163	0.97	81	2.20	69	50	101.2	317	114	127	296	181	484	207
575	92.607	0.163	0.97	81	2.20	69	50	101.1	320	114	127	297	181	491	208
576	92.770	0.163	0.96	81	2.20	69	50	101.3	321	114	127	298	181	496	208
577	92.932	0.162	0.97	81	2.20	69	50	100.5	323	114	127	299	182	497	209
578	93.094	0.162	0.97	81	2.20	70	50	100.5	324	114	127	299	182	495	209
579	93.257	0.163	0.97	81	2.20	69	50	101.4	324	114	127	299	183	493	209
580	93.421	0.164	0.96	81	2.20	70	50	102.0	325	114	127	299	184	493	210
581	93.583	0.162	0.96	81	2.20	70	50	100.4	324	114	128	297	183	494	209
582	93.745	0.162	0.97	81	2.20	70	50	100.4	325	114	128	297	183	501	209
583	93.908	0.163	0.97	81	2.20	70	50	101.2	325	114	128	297	184	504	210
584	94.071	0.163	0.97	81	2.20	70	50	101.4	325	114	128	297	184	504	210
585	94.234	0.163	0.97	81	2.20	70	50	101.6	326	114	128	297	185	504	210
586	94.396	0.162	0.97	81	2.20	70	50	101.0	326	114	128	296	185	505	210
587	94.558	0.162	0.97	81	2.20	70	50	100.9	326	114	128	294	185	511	209
588	94.721	0.163	0.97	81	2.20	70	50	101.6	325	114	127	296	189	509	210
589	94.884	0.163	0.97	81	2.20	70	50	101.6	325	115	127	298	194	506	212
590	95.046	0.162	0.96	81	2.20	70	50	101.0	325	116	128	299	197	509	213
591	95.209	0.163	0.97	81	2.20	70	50	101.7	326	116	129	300	199	514	214
592	95.371	0.162	0.97	81	2.20	70	50	100.9	327	116	130	301	202	521	215
593	95.534	0.163	0.97	81	2.20	70	50	101.3	328	117	132	302	205	528	217
594	95.697	0.163	0.96	81	2.20	70	50	101.3	330	117	133	303	207	533	218
595	95.859	0.162	0.97	81	2.20	70	50	101.0	332	117	135	304	209	539	219
596	96.021	0.162	0.97	81	2.20	70	50	101.2	334	118	136	305	211	545	221
597	96.183	0.162	0.97	81	2.20	70	50	101.3	336	119	137	306	213	556	222
598	96.347	0.164	0.97	81	2.20	70	50	102.6	339	121	138	307	216	569	224
599	96.509	0.162	0.96	81	2.20	70	50	101.1	342	123	140	309	219	584	227
600	96.671	0.162	0.96	81	2.20	70	50	100.9	345	123	141	312	223	600	229
601	96.833	0.162	0.97	81	2.20	70	51	100.9	350	123	142	315	227	620	231
602	96.996	0.163	0.96	81	2.20	70	51	101.6	356	124	144	318	231	646	235
603	97.158	0.162	0.96	81	2.20	70	51	101.1	363	125	146	321	236	676	238
604	97.320	0.162	0.97	81	2.20	70	51	101.2	371	126	147	325	241	702	242
605	97.482	0.162	0.96	81	2.20	70	51	101.3	379	127	149	329	246	717	246
606	97.645	0.163	0.96	81	2.20	70	51	102.1	387	128	150	332	252	729	250
607	97.808	0.163	0.96	81	2.20	70	51	102.2	396	128	152	336	261	749	255
608	97.969	0.161	0.96	81	2.20	70	51	101.2	406	129	154	340	276	773	261
609	98.131	0.162	0.96	81	2.20	70	51	101.8	417	130	156	344	292	778	268
610	98.293	0.162	0.96	81	2.20	70	51	101.4	427	130	158	345	313	778	275
611	98.456	0.163	0.96	81	2.20	70	51	101.8	438	132	160	346	333	791	282
612	98.618	0.162	0.96	81	2.20	70	51	101.3	446	133	162	345	350	789	287

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3 **Test Date:** 2/29/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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)
613	98.780	0.162	0.96	81	2.20	70	51	101.4	453	134	164	344	364	777	292
614	98.942	0.162	0.97	81	2.20	70	51	101.4	458	135	166	342	373	762	295
615	99.105	0.163	0.96	81	2.20	70	51	102.3	461	135	167	340	377	750	296
616	99.267	0.162	0.96	81	2.20	71	51	101.5	462	135	169	338	381	745	297
617	99.428	0.161	0.96	81	2.20	71	51	100.8	463	135	170	335	383	744	297
618	99.590	0.162	0.96	81	2.20	71	51	101.5	463	134	171	333	382	744	297
619	99.753	0.163	0.96	81	2.20	71	51	102.1	463	133	172	330	379	746	295
620	99.916	0.163	0.96	81	2.20	71	51	102.2	463	134	172	328	377	748	295
621	100.077	0.161	0.96	81	2.20	71	52	101.1	464	134	173	325	373	750	294
622	100.239	0.162	0.96	81	2.20	71	52	101.8	464	135	173	323	372	750	293
623	100.402	0.163	0.97	81	2.20	71	52	102.5	463	136	174	320	371	745	293
624	100.565	0.163	0.96	81	2.20	71	52	102.6	462	137	174	318	371	741	292
625	100.726	0.161	0.96	81	2.20	71	52	101.2	461	137	175	317	372	736	292
626	100.888	0.162	0.96	81	2.20	71	52	101.5	460	138	175	316	373	737	292
627	101.051	0.163	0.96	81	2.20	71	52	101.8	460	139	175	316	378	753	294
628	101.214	0.163	0.96	81	2.20	71	52	101.8	463	140	176	315	381	774	295
629	101.375	0.161	0.96	81	2.20	71	52	100.8	466	142	176	315	385	791	297
630	101.537	0.162	0.96	81	2.20	71	52	101.5	470	143	177	315	389	801	299
631	101.699	0.162	0.96	81	2.20	71	52	101.5	475	144	179	315	392	808	301
632	101.863	0.164	0.96	81	2.20	71	52	103.0	480	144	180	315	396	813	303
633	102.024	0.161	0.95	81	2.20	71	52	101.1	485	145	182	316	399	819	305
634	102.186	0.162	0.96	81	2.20	71	52	101.6	490	146	184	317	403	825	308
635	102.348	0.162	0.97	81	2.20	71	52	101.6	495	146	185	318	407	832	310
636	102.511	0.163	0.96	81	2.20	71	52	102.5	501	147	187	320	408	841	313
637	102.673	0.162	0.96	81	2.20	71	52	102.0	507	148	189	321	407	852	314
638	102.835	0.162	0.96	81	2.20	71	52	101.9	513	148	191	323	407	858	316
639	102.997	0.162	0.96	81	2.20	71	52	101.8	520	149	194	325	407	864	319
640	103.159	0.162	0.96	81	2.20	71	53	101.7	525	149	196	327	408	867	321
641	103.322	0.163	0.96	81	2.20	71	53	102.0	531	149	198	329	408	868	323
642	103.483	0.161	0.96	81	2.20	71	53	100.8	536	150	200	331	409	869	325
643	103.645	0.162	0.96	81	2.20	71	53	101.8	540	150	202	334	411	870	327
644	103.808	0.163	0.96	81	2.20	71	53	102.7	544	151	205	338	414	871	330
645	103.970	0.162	0.96	81	2.20	71	53	101.9	548	151	207	342	417	872	333
646	104.132	0.162	0.96	81	2.20	72	53	101.8	550	152	209	347	420	873	336
647	104.294	0.162	0.96	81	2.20	71	53	101.5	553	153	212	349	421	871	338
648	104.456	0.162	0.96	81	2.20	71	53	101.0	555	154	215	351	422	877	339
649	104.619	0.163	0.96	81	2.20	71	53	101.9	559	155	217	349	416	914	339
650	104.781	0.162	0.96	81	2.20	71	53	101.6	569	156	219	347	411	963	340
651	104.943	0.162	0.96	81	2.20	71	53	101.8	581	157	220	345	407	988	342
652	105.105	0.162	0.96	81	2.20	71	53	101.7	594	158	221	344	403	997	344
653	105.268	0.163	0.96	81	2.20	71	53	102.1	604	159	223	345	401	990	346
654	105.430	0.162	0.96	81	2.20	71	53	101.7	610	160	223	344	399	958	347
655	105.591	0.161	0.96	81	2.20	71	53	101.5	611	161	224	344	398	928	348
656	105.753	0.162	0.96	81	2.20	71	53	101.8	608	162	224	344	397	907	347

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 11:53
Total Sampling Time: 668 min
Recording Interval: 1 min

Test Date: 2/29/24

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 cfm @ 17.93 in. Hg
Post-Test 0.001 cfm @ 17.5 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	105.916	0.163	0.96	81	2.20	71	53	101.9	604	163	225	344	396	892	346
658	106.078	0.162	0.96	81	2.20	71	53	101.4	598	164	225	344	395	882	345
659	106.240	0.162	0.96	81	2.20	71	53	101.8	592	164	225	344	395	874	344
660	106.402	0.162	0.97	81	2.20	71	53	101.6	585	165	226	344	394	865	343
661	106.565	0.163	0.96	81	2.20	71	53	101.9	579	166	226	344	393	858	342
662	106.728	0.163	0.96	81	2.20	71	53	101.6	573	167	226	344	393	852	341
663	106.889	0.161	0.96	81	2.20	71	53	99.9	567	168	226	344	392	848	339
664	107.051	0.162	0.96	81	2.20	71	53	100.6	562	169	226	344	392	845	339
665	107.213	0.162	0.96	81	2.20	71	54	101.1	556	170	226	344	391	843	337
666	107.376	0.163	0.96	81	2.20	71	54	102.1	552	170	227	344	390	840	337
667	107.538	0.162	0.96	81	2.20	71	54	101.7	548	171	227	344	390	837	336
668	107.700	0.162	0.96	81	2.20	71	54	101.5	543	172	227	343	389	834	335

Train C - First Hour Particulate Sampling

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 11:53
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @ 22.6 in. Hg
Post-Test 0 cfm @ 22.11 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	**9.715**	**0.162**	**2.17**	**70.9**	**-2.04**	**70.0**	**65.3**	**99.9**
Minimum	0.000	0.152	2.04	70	-2.32	68	65	94.3
Max	9.715	0.172	2.28	71	-1.74	71	66	108.0
0	0.000		2.10	70	-2.18	68	65	
1	0.158	0.158	2.23	70	-1.87	69	65	100.2
2	0.330	0.172	2.22	70	-1.91	69	65	108.0
3	0.482	0.152	2.19	70	-2.26	69	65	94.3
4	0.645	0.163	2.19	71	-1.91	69	65	101.2
5	0.806	0.161	2.18	71	-2.03	69	65	99.9
6	0.968	0.162	2.17	71	-2.19	69	65	100.4
7	1.135	0.167	2.16	71	-1.75	69	65	103.2
8	1.292	0.157	2.15	71	-1.74	69	65	96.7
9	1.454	0.162	2.14	71	-1.82	69	65	99.8
10	1.616	0.162	2.14	71	-2.22	69	65	99.9
11	1.780	0.164	2.13	71	-1.80	69	65	101.1
12	1.940	0.160	2.14	71	-2.10	70	65	98.6
13	2.102	0.162	2.12	71	-1.80	70	65	99.9
14	2.264	0.162	2.12	71	-1.93	70	65	99.8
15	2.426	0.162	2.12	71	-1.98	70	65	99.8
16	2.592	0.166	2.09	71	-2.12	70	65	102.3
17	2.750	0.158	2.10	71	-2.14	70	65	97.6
18	2.912	0.162	2.11	71	-2.10	70	65	100.0
19	3.074	0.162	2.11	71	-1.89	70	65	99.9
20	3.236	0.162	2.09	71	-2.16	70	65	99.7
21	3.398	0.162	2.11	71	-2.12	70	65	99.7
22	3.552	0.154	2.11	71	-1.89	70	65	94.9
23	3.722	0.170	2.09	71	-1.74	70	65	104.8
24	3.884	0.162	2.11	71	-2.22	70	65	99.7
25	4.046	0.162	2.11	71	-1.82	70	65	99.7
26	4.208	0.162	2.11	71	-2.09	70	65	99.8
27	4.370	0.162	2.10	71	-2.21	70	65	99.8
28	4.532	0.162	2.11	71	-1.74	70	65	100.2
29	4.694	0.162	2.10	71	-1.89	70	65	100.4
30	4.856	0.162	2.09	71	-1.88	70	65	100.0
31	5.018	0.162	2.10	71	-2.11	70	65	99.8
32	5.180	0.162	2.11	71	-2.22	70	65	100.0

Train C - First Hour Particulate Sampling

Run: 3
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 11:53
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 2/29/24

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 @ 22.6 in. Hg
Post-Test 0 cfm @ 22.11 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	5.342	0.162	2.11	71	-2.18	70	65	100.0
34	5.504	0.162	2.09	71	-2.24	70	65	99.8
35	5.666	0.162	2.11	71	-2.23	70	65	99.8
36	5.828	0.162	2.10	71	-1.88	70	65	99.8
37	5.990	0.162	2.10	71	-2.13	70	66	99.4
38	6.152	0.162	2.10	71	-2.24	70	66	99.3
39	6.314	0.162	2.10	71	-2.10	70	65	99.7
40	6.474	0.160	2.04	71	-1.86	70	65	98.8
41	6.640	0.166	2.26	71	-2.17	70	66	102.3
42	6.800	0.160	2.27	71	-2.10	70	66	98.3
43	6.959	0.159	2.28	71	-1.95	70	66	97.6
44	7.124	0.165	2.27	71	-2.03	70	66	101.3
45	7.286	0.162	2.25	71	-2.29	70	66	99.5
46	7.448	0.162	2.27	71	-2.23	70	65	99.4
47	7.610	0.162	2.28	71	-1.90	70	65	99.5
48	7.772	0.162	2.27	71	-2.17	70	65	99.7
49	7.934	0.162	2.28	71	-2.03	70	65	99.7
50	8.096	0.162	2.28	71	-1.85	71	65	99.6
51	8.258	0.162	2.27	71	-1.98	71	66	99.6
52	8.420	0.162	2.28	71	-2.02	71	66	99.8
53	8.582	0.162	2.28	71	-2.32	71	65	99.8
54	8.744	0.162	2.28	71	-2.08	71	66	99.7
55	8.906	0.162	2.28	71	-2.10	71	66	99.8
56	9.068	0.162	2.28	71	-2.32	71	66	99.9
57	9.225	0.157	2.25	71	-2.09	71	66	96.6
58	9.392	0.167	2.26	71	-1.85	71	66	102.7
59	9.554	0.162	2.26	71	-2.11	71	66	99.6
60	9.715	0.161	2.26	71	-2.18	71	66	99.2

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25

Tracking No.: 2142

Project No.: 0142WN020E

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: 11:53

Total Sampling Time 668 min

Recording Interval 1 min

Sample Train Leak Checks

Pre-test cfm @ in. Hg

Post-Test cfm @ in. Hg

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 (%)*
Tot / Avg	**106.930**	**0.160**	**1.64**	**71.1**	**-2.14**	**168.77**	**-0.043**	**291.7**	**0.08**	**5.56**
Minimum	0.000	0.152	1.43	69	-2.30	119.00	-0.074	11.0	0.00	0.43
Max	106.930	0.182	1.87	72	-2.00	324.00	-0.030	1040.0	1.39	13.34
0	0.000		1.43	69	-2.00	189	-0.041	1040.0	0.20	0.51
1	0.155	0.155	1.43	69	-2.10	194	-0.041	1040.0	0.13	0.43
2	0.310	0.155	1.43	69	-2.10	172	-0.040	1040.0	0.45	1.55
3	0.465	0.155	1.43	69	-2.10	160	-0.039	1040.0	0.24	2.34
4	0.620	0.155	1.43	69	-2.10	155	-0.039	133.5	0.01	2.61
5	0.775	0.155	1.43	69	-2.10	151	-0.039	39.5	0.00	2.50
6	0.930	0.155	1.43	69	-2.10	150	-0.039	35.5	0.00	2.46
7	1.085	0.155	1.43	69	-2.10	148	-0.039	35.2	0.00	2.56
8	1.240	0.155	1.43	69	-2.10	146	-0.039	34.6	0.00	2.66
9	1.395	0.155	1.43	69	-2.10	146	-0.038	36.9	0.00	2.81
10	1.550	0.155	1.43	69	-2.10	146	-0.038	38.5	0.00	2.95
11	1.705	0.155	1.43	69	-2.10	145	-0.038	40.5	0.00	3.16
12	1.860	0.155	1.43	69	-2.10	146	-0.038	43.0	0.00	3.40
13	2.015	0.155	1.43	69	-2.10	146	-0.038	46.9	0.00	3.68
14	2.170	0.155	1.43	69	-2.10	146	-0.039	51.5	0.00	3.83
15	2.325	0.155	1.43	70	-2.10	147	-0.039	53.4	0.00	4.02
16	2.480	0.155	1.43	69	-2.10	147	-0.039	56.9	0.00	4.10
17	2.635	0.155	1.43	70	-2.10	148	-0.039	61.5	0.00	4.31
18	2.790	0.155	1.43	69	-2.10	148	-0.040	64.1	0.00	4.42
19	2.945	0.155	1.43	70	-2.10	150	-0.040	67.0	0.00	4.60
20	3.100	0.155	1.43	70	-2.10	152	-0.040	67.6	0.01	4.75
21	3.255	0.155	1.43	70	-2.10	150	-0.040	70.9	0.01	4.79
22	3.410	0.155	1.43	70	-2.10	152	-0.040	73.5	0.01	4.84
23	3.565	0.155	1.43	70	-2.10	154	-0.040	76.0	0.01	4.89
24	3.720	0.155	1.43	70	-2.10	155	-0.040	80.0	0.01	5.03
25	3.875	0.155	1.43	70	-2.10	155	-0.041	82.9	0.01	5.08
26	4.030	0.155	1.43	70	-2.10	157	-0.041	86.7	0.01	5.17
27	4.185	0.155	1.43	70	-2.10	157	-0.041	86.7	0.01	5.19
28	4.340	0.155	1.43	70	-2.10	159	-0.041	89.4	0.01	5.25
29	4.495	0.155	1.43	70	-2.10	159	-0.042	91.0	0.01	5.20
30	4.650	0.155	1.43	70	-2.10	160	-0.042	90.7	0.01	5.21
31	4.805	0.155	1.43	70	-2.10	159	-0.042	90.3	0.01	5.22
32	4.960	0.155	1.43	70	-2.10	161	-0.042	88.7	0.01	5.25

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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	5.115	0.155	1.43	70	-2.10	164	-0.043	91.6	0.01	5.29
34	5.270	0.155	1.43	70	-2.10	163	-0.042	92.6	0.01	5.38
35	5.425	0.155	1.43	70	-2.10	163	-0.042	95.5	0.01	5.45
36	5.580	0.155	1.43	70	-2.10	164	-0.043	96.5	0.01	5.40
37	5.735	0.155	1.43	70	-2.10	166	-0.043	95.2	0.01	5.45
38	5.890	0.155	1.43	70	-2.10	166	-0.043	95.5	0.01	5.44
39	6.045	0.155	1.43	70	-2.10	167	-0.043	96.8	0.01	5.44
40	6.200	0.155	1.43	70	-2.10	168	-0.043	93.9	0.01	5.44
41	6.355	0.155	1.43	70	-2.10	168	-0.043	97.1	0.01	5.44
42	6.510	0.155	1.43	70	-2.10	168	-0.044	97.1	0.01	5.47
43	6.665	0.155	1.43	70	-2.10	168	-0.044	97.4	0.01	5.49
44	6.820	0.155	1.43	70	-2.10	169	-0.044	97.1	0.01	5.49
45	6.975	0.155	1.43	70	-2.10	169	-0.044	97.4	0.01	5.49
46	7.130	0.155	1.43	70	-2.10	170	-0.043	99.7	0.01	5.54
47	7.285	0.155	1.43	70	-2.10	170	-0.044	95.2	0.01	5.58
48	7.440	0.155	1.43	70	-2.10	172	-0.044	97.8	0.01	5.58
49	7.595	0.155	1.43	70	-2.10	170	-0.044	98.1	0.01	5.61
50	7.750	0.155	1.43	70	-2.10	171	-0.044	101.0	0.01	5.75
51	7.905	0.155	1.43	70	-2.10	172	-0.044	102.0	0.01	5.79
52	8.060	0.155	1.43	70	-2.10	171	-0.044	103.6	0.01	5.77
53	8.215	0.155	1.43	70	-2.10	172	-0.044	103.3	0.01	5.83
54	8.370	0.155	1.43	70	-2.10	173	-0.045	102.9	0.01	5.83
55	8.525	0.155	1.43	70	-2.10	172	-0.045	100.0	0.01	5.77
56	8.680	0.155	1.43	70	-2.10	173	-0.045	98.7	0.01	5.78
57	8.835	0.155	1.43	70	-2.10	174	-0.045	97.8	0.01	5.68
58	8.990	0.155	1.43	70	-2.10	174	-0.045	98.4	0.01	5.83
59	9.145	0.155	1.43	70	-2.10	175	-0.045	96.8	0.01	5.81
60	9.300	0.155	1.43	70	-2.10	175	-0.045	96.1	0.01	5.86
61	9.455	0.155	1.43	70	-2.10	174	-0.045	94.2	0.01	5.83
62	9.637	0.182	1.87	70	-2.30	177	-0.045	94.9	0.01	5.91
63	9.789	0.152	1.67	70	-2.10	176	-0.045	93.2	0.01	5.97
64	9.949	0.160	1.67	70	-2.10	176	-0.045	94.9	0.01	6.01
65	10.110	0.161	1.67	70	-2.00	176	-0.045	93.2	0.01	6.00
66	10.271	0.161	1.67	71	-2.20	177	-0.045	94.5	0.01	6.04
67	10.431	0.160	1.66	71	-2.30	178	-0.046	93.5	0.01	6.07
68	10.592	0.161	1.66	71	-2.00	178	-0.045	94.2	0.01	6.07

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
69	10.752	0.160	1.67	71	-2.00	179	-0.045	93.2	0.01	6.03
70	10.913	0.161	1.67	71	-2.00	180	-0.045	93.2	0.01	6.06
71	11.073	0.160	1.66	71	-2.20	181	-0.046	93.6	0.01	6.10
72	11.234	0.161	1.67	71	-2.20	180	-0.046	92.9	0.01	6.14
73	11.395	0.161	1.67	71	-2.30	180	-0.045	91.6	0.01	6.14
74	11.555	0.160	1.66	71	-2.10	180	-0.045	93.2	0.01	6.25
75	11.716	0.161	1.67	71	-2.20	179	-0.046	84.2	0.01	5.88
76	11.877	0.161	1.67	71	-2.20	179	-0.046	78.0	0.01	5.70
77	12.038	0.161	1.67	71	-2.30	179	-0.046	76.0	0.01	5.59
78	12.198	0.160	1.66	71	-2.10	180	-0.046	75.7	0.01	5.60
79	12.358	0.160	1.67	71	-2.10	179	-0.046	75.1	0.01	5.60
80	12.519	0.161	1.67	71	-2.30	178	-0.046	73.1	0.01	5.57
81	12.680	0.161	1.67	71	-2.00	178	-0.046	72.8	0.01	5.56
82	12.840	0.160	1.66	71	-2.20	179	-0.045	74.4	0.01	5.59
83	13.001	0.161	1.67	71	-2.10	178	-0.045	73.8	0.01	5.58
84	13.162	0.161	1.67	71	-2.30	178	-0.045	73.8	0.01	5.63
85	13.322	0.160	1.66	71	-2.20	178	-0.045	74.4	0.01	5.64
86	13.482	0.160	1.67	71	-2.20	177	-0.045	75.1	0.01	5.65
87	13.643	0.161	1.67	71	-2.20	176	-0.045	75.1	0.01	5.62
88	13.804	0.161	1.67	71	-2.20	175	-0.045	75.1	0.01	5.60
89	13.964	0.160	1.66	71	-2.10	175	-0.045	77.3	0.01	5.65
90	14.125	0.161	1.67	71	-2.00	175	-0.045	77.0	0.01	5.71
91	14.286	0.161	1.66	71	-2.00	175	-0.045	77.3	0.01	5.69
92	14.446	0.160	1.66	71	-2.00	174	-0.045	74.7	0.01	5.50
93	14.607	0.161	1.66	71	-2.20	175	-0.045	77.0	0.01	5.56
94	14.767	0.160	1.67	71	-2.00	173	-0.045	75.4	0.01	5.55
95	14.929	0.162	1.66	71	-2.30	174	-0.045	78.0	0.01	5.59
96	15.089	0.160	1.67	71	-2.00	173	-0.045	76.0	0.01	5.60
97	15.250	0.161	1.67	71	-2.00	174	-0.045	78.3	0.01	5.63
98	15.411	0.161	1.67	71	-2.00	174	-0.045	78.0	0.01	5.60
99	15.571	0.160	1.66	71	-2.20	173	-0.045	80.0	0.01	5.66
100	15.732	0.161	1.66	71	-2.10	174	-0.044	81.9	0.01	5.76
101	15.892	0.160	1.67	71	-2.30	174	-0.044	81.9	0.01	5.71
102	16.053	0.161	1.67	71	-2.30	173	-0.044	82.2	0.01	5.77
103	16.214	0.161	1.66	71	-2.00	173	-0.045	82.9	0.01	5.77
104	16.374	0.160	1.67	71	-2.20	173	-0.045	82.6	0.01	5.77

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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	16.535	0.161	1.68	71	-2.20	172	-0.045	78.3	0.01	5.61
106	16.696	0.161	1.66	71	-2.20	171	-0.045	79.0	0.01	5.52
107	16.856	0.160	1.66	71	-2.10	174	-0.045	78.3	0.01	5.53
108	17.016	0.160	1.66	71	-2.20	174	-0.045	79.0	0.01	5.53
109	17.177	0.161	1.66	71	-2.00	174	-0.045	78.3	0.01	5.57
110	17.337	0.160	1.66	71	-2.00	173	-0.045	77.7	0.01	5.58
111	17.497	0.160	1.66	71	-2.30	172	-0.044	76.4	0.01	5.52
112	17.658	0.161	1.66	71	-2.30	172	-0.044	75.4	0.01	5.44
113	17.818	0.160	1.66	71	-2.30	172	-0.045	74.8	0.01	5.34
114	17.978	0.160	1.65	71	-2.20	171	-0.044	76.0	0.01	5.40
115	18.138	0.160	1.67	71	-2.10	171	-0.044	75.1	0.01	5.36
116	18.299	0.161	1.66	71	-2.00	171	-0.044	73.1	0.01	5.31
117	18.459	0.160	1.66	71	-2.00	170	-0.044	75.4	0.01	5.33
118	18.620	0.161	1.66	71	-2.30	170	-0.044	75.1	0.01	5.34
119	18.780	0.160	1.66	71	-2.00	169	-0.044	75.1	0.01	5.33
120	18.940	0.160	1.65	71	-2.20	169	-0.044	74.4	0.01	5.34
121	19.100	0.160	1.65	71	-2.30	168	-0.044	74.8	0.01	5.28
122	19.261	0.161	1.67	71	-2.00	169	-0.044	76.0	0.01	5.38
123	19.421	0.160	1.65	71	-2.30	169	-0.043	75.4	0.01	5.36
124	19.582	0.161	1.66	71	-2.00	169	-0.044	74.4	0.01	5.32
125	19.743	0.161	1.66	71	-2.10	170	-0.043	76.0	0.01	5.38
126	19.903	0.160	1.65	71	-2.30	169	-0.043	76.0	0.01	5.34
127	20.063	0.160	1.65	72	-2.00	170	-0.043	74.8	0.01	5.27
128	20.223	0.160	1.67	72	-2.00	169	-0.044	73.1	0.00	5.27
129	20.384	0.161	1.66	71	-2.20	169	-0.043	73.8	0.01	5.31
130	20.544	0.160	1.65	72	-2.00	168	-0.043	75.1	0.01	5.30
131	20.705	0.161	1.65	71	-2.10	167	-0.043	74.1	0.01	5.27
132	20.865	0.160	1.66	71	-2.20	166	-0.043	76.0	0.01	5.33
133	21.026	0.161	1.65	72	-2.30	166	-0.043	75.1	0.01	5.31
134	21.186	0.160	1.65	72	-2.00	167	-0.043	77.0	0.01	5.34
135	21.346	0.160	1.66	72	-2.00	166	-0.043	76.0	0.01	5.40
136	21.507	0.161	1.66	71	-2.00	167	-0.043	76.7	0.01	5.37
137	21.667	0.160	1.66	72	-2.20	166	-0.043	76.7	0.01	5.40
138	21.828	0.161	1.65	71	-2.10	165	-0.043	75.4	0.01	5.30
139	21.988	0.160	1.66	71	-2.10	165	-0.043	75.1	0.01	5.38
140	22.149	0.161	1.66	71	-2.10	166	-0.043	73.8	0.01	5.31

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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	22.309	0.160	1.66	71	-2.20	166	-0.043	72.5	0.00	5.25
142	22.469	0.160	1.66	71	-2.20	166	-0.043	72.2	0.00	5.25
143	22.630	0.161	1.66	71	-2.20	165	-0.043	71.8	0.00	5.22
144	22.790	0.160	1.65	71	-2.10	166	-0.043	73.5	0.00	5.22
145	22.950	0.160	1.65	71	-2.30	165	-0.042	70.9	0.00	5.22
146	23.111	0.161	1.66	72	-2.30	164	-0.043	68.0	0.00	5.22
147	23.271	0.160	1.66	72	-2.20	165	-0.042	68.3	0.00	5.22
148	23.431	0.160	1.66	72	-2.20	163	-0.042	67.7	0.00	5.18
149	23.592	0.161	1.66	72	-2.10	162	-0.042	68.0	0.00	5.21
150	23.753	0.161	1.65	72	-2.10	163	-0.042	66.7	0.00	5.20
151	23.913	0.160	1.65	72	-2.30	161	-0.042	65.4	0.00	5.16
152	24.073	0.160	1.66	72	-2.20	161	-0.042	65.7	0.00	5.18
153	24.234	0.161	1.66	72	-2.10	162	-0.042	64.7	0.00	5.20
154	24.394	0.160	1.66	72	-2.10	161	-0.042	65.1	0.00	5.23
155	24.555	0.161	1.66	72	-2.00	161	-0.042	66.0	0.00	5.29
156	24.715	0.160	1.66	72	-2.20	161	-0.042	65.4	0.00	5.31
157	24.876	0.161	1.65	72	-2.10	161	-0.042	66.0	0.00	5.36
158	25.036	0.160	1.65	72	-2.10	161	-0.041	66.7	0.00	5.42
159	25.197	0.161	1.66	72	-2.30	161	-0.041	68.0	0.00	5.54
160	25.357	0.160	1.66	72	-2.10	161	-0.041	69.3	0.00	5.68
161	25.518	0.161	1.66	72	-2.20	161	-0.042	87.1	0.01	6.34
162	25.678	0.160	1.66	72	-2.20	160	-0.042	80.9	0.01	5.76
163	25.839	0.161	1.66	72	-2.10	161	-0.042	78.0	0.01	5.80
164	26.000	0.161	1.65	72	-2.10	160	-0.042	79.6	0.01	6.10
165	26.159	0.159	1.65	72	-2.20	161	-0.042	76.1	0.01	6.06
166	26.320	0.161	1.66	72	-2.30	159	-0.042	75.4	0.01	5.92
167	26.480	0.160	1.66	72	-2.20	160	-0.043	75.7	0.01	6.05
168	26.641	0.161	1.66	72	-2.20	162	-0.042	78.3	0.01	6.08
169	26.801	0.160	1.65	72	-2.00	161	-0.042	79.6	0.01	6.09
170	26.962	0.161	1.66	72	-2.30	161	-0.042	80.3	0.01	6.10
171	27.122	0.160	1.66	72	-2.30	162	-0.042	78.3	0.01	6.10
172	27.282	0.160	1.65	72	-2.00	162	-0.042	77.0	0.01	6.03
173	27.443	0.161	1.66	72	-2.00	162	-0.042	73.5	0.00	5.88
174	27.603	0.160	1.66	72	-2.00	163	-0.042	71.2	0.00	5.89
175	27.764	0.161	1.65	72	-2.00	162	-0.042	73.8	0.00	5.88
176	27.924	0.160	1.65	72	-2.10	163	-0.042	67.0	0.00	5.86

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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	28.085	0.161	1.66	72	-2.00	162	-0.042	65.1	0.00	5.84
178	28.245	0.160	1.66	72	-2.10	162	-0.042	63.4	0.00	5.86
179	28.405	0.160	1.66	72	-2.10	162	-0.042	62.1	0.00	6.01
180	28.566	0.161	1.66	72	-2.20	163	-0.043	59.9	0.00	6.07
181	28.727	0.161	1.66	72	-2.30	163	-0.042	63.1	0.00	6.15
182	28.887	0.160	1.66	72	-2.10	163	-0.043	56.0	0.00	6.21
183	29.047	0.160	1.66	72	-2.20	163	-0.043	54.7	0.00	6.30
184	29.208	0.161	1.67	72	-2.00	162	-0.043	52.1	0.00	6.25
185	29.369	0.161	1.66	72	-2.30	163	-0.043	46.6	0.00	6.32
186	29.529	0.160	1.65	72	-2.10	164	-0.043	51.1	0.00	6.27
187	29.690	0.161	1.67	72	-2.20	165	-0.042	47.3	0.00	6.30
188	29.850	0.160	1.66	72	-2.10	165	-0.043	48.9	0.00	6.36
189	30.011	0.161	1.66	72	-2.30	165	-0.043	47.3	0.00	6.31
190	30.171	0.160	1.66	72	-2.00	164	-0.043	42.7	0.00	6.35
191	30.332	0.161	1.66	72	-2.30	164	-0.043	42.7	0.00	6.31
192	30.493	0.161	1.65	72	-2.10	164	-0.043	45.9	0.00	6.36
193	30.653	0.160	1.66	72	-2.20	163	-0.043	43.4	0.00	6.19
194	30.813	0.160	1.67	72	-2.00	164	-0.043	43.4	0.00	6.26
195	30.974	0.161	1.66	72	-2.00	164	-0.043	42.7	0.00	6.17
196	31.135	0.161	1.66	72	-2.00	165	-0.043	42.1	0.00	6.14
197	31.295	0.160	1.66	72	-2.30	166	-0.043	41.7	0.00	6.08
198	31.456	0.161	1.66	72	-2.00	165	-0.043	41.4	0.00	6.01
199	31.617	0.161	1.66	72	-2.30	166	-0.043	41.1	0.00	6.05
200	31.777	0.160	1.66	72	-2.20	165	-0.043	41.4	0.00	6.00
201	31.937	0.160	1.66	72	-2.00	164	-0.043	41.7	0.00	5.95
202	32.098	0.161	1.67	72	-2.10	165	-0.043	40.8	0.00	5.69
203	32.258	0.160	1.66	72	-2.30	166	-0.043	38.2	0.00	5.68
204	32.419	0.161	1.66	72	-2.10	165	-0.043	35.9	0.00	5.63
205	32.580	0.161	1.66	72	-2.30	165	-0.043	35.2	0.00	5.63
206	32.741	0.161	1.66	72	-2.00	165	-0.043	37.2	0.00	5.68
207	32.901	0.160	1.66	72	-2.30	165	-0.042	37.5	0.00	5.73
208	33.061	0.160	1.67	72	-2.00	163	-0.042	37.5	0.00	5.70
209	33.222	0.161	1.67	72	-2.30	163	-0.042	36.9	0.00	5.68
210	33.382	0.160	1.66	72	-2.30	162	-0.042	36.5	0.00	5.63
211	33.543	0.161	1.66	72	-2.00	162	-0.042	36.2	0.00	5.49
212	33.704	0.161	1.67	72	-2.00	161	-0.042	34.9	0.00	5.25

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
213	33.864	0.160	1.67	72	-2.10	161	-0.042	34.0	0.00	5.23
214	34.025	0.161	1.66	72	-2.00	160	-0.041	34.3	0.00	5.18
215	34.185	0.160	1.67	72	-2.20	159	-0.041	33.6	0.00	5.14
216	34.345	0.160	1.67	72	-2.30	158	-0.041	34.0	0.00	5.09
217	34.506	0.161	1.66	72	-2.10	157	-0.040	34.0	0.00	5.14
218	34.667	0.161	1.66	72	-2.20	157	-0.041	33.6	0.00	5.28
219	34.828	0.161	1.67	72	-2.00	157	-0.041	27.2	0.00	6.12
220	34.989	0.161	1.67	72	-2.10	155	-0.040	24.6	0.00	5.68
221	35.149	0.160	1.66	72	-2.00	155	-0.040	30.1	0.00	5.03
222	35.309	0.160	1.67	72	-2.20	154	-0.040	32.7	0.00	5.12
223	35.470	0.161	1.67	72	-2.00	153	-0.040	32.7	0.00	5.17
224	35.631	0.161	1.67	72	-2.20	152	-0.039	33.6	0.00	5.22
225	35.791	0.160	1.66	72	-2.20	151	-0.039	34.3	0.00	5.23
226	35.952	0.161	1.67	72	-2.30	150	-0.039	34.6	0.00	5.18
227	36.113	0.161	1.65	72	-2.20	149	-0.039	36.2	0.00	5.21
228	36.273	0.160	1.66	72	-2.20	149	-0.038	36.5	0.00	5.26
229	36.434	0.161	1.66	72	-2.30	149	-0.038	37.9	0.00	5.34
230	36.595	0.161	1.66	72	-2.20	148	-0.038	38.2	0.00	5.29
231	36.756	0.161	1.67	72	-2.10	148	-0.038	38.2	0.00	5.34
232	36.916	0.160	1.66	72	-2.00	148	-0.039	37.2	0.00	5.38
233	37.076	0.160	1.67	72	-2.20	148	-0.038	37.5	0.00	5.29
234	37.237	0.161	1.67	72	-2.30	148	-0.038	37.2	0.00	5.34
235	37.398	0.161	1.66	72	-2.10	147	-0.038	37.5	0.00	5.32
236	37.559	0.161	1.66	72	-2.10	148	-0.038	36.5	0.00	5.29
237	37.720	0.161	1.67	72	-2.10	148	-0.038	37.9	0.00	5.42
238	37.880	0.160	1.66	72	-2.10	151	-0.039	34.9	0.00	6.39
239	38.041	0.161	1.66	72	-2.20	152	-0.040	34.6	0.00	9.30
240	38.201	0.160	1.67	72	-2.20	153	-0.041	35.6	0.00	8.65
241	38.362	0.161	1.67	72	-2.10	156	-0.042	34.6	0.00	6.70
242	38.523	0.161	1.66	72	-2.10	159	-0.041	35.9	0.00	7.17
243	38.683	0.160	1.67	72	-2.10	159	-0.042	37.9	0.00	6.76
244	38.844	0.161	1.67	72	-2.20	161	-0.043	39.2	0.00	6.57
245	39.005	0.161	1.67	72	-2.30	161	-0.042	36.5	0.00	6.29
246	39.165	0.160	1.66	72	-2.00	161	-0.042	43.7	0.00	6.32
247	39.326	0.161	1.67	72	-2.30	163	-0.042	46.9	0.00	6.47
248	39.487	0.161	1.67	72	-2.20	163	-0.042	51.5	0.00	6.47

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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	39.648	0.161	1.67	72	-2.10	163	-0.043	57.0	0.00	6.29
250	39.808	0.160	1.66	72	-2.10	163	-0.043	56.0	0.00	6.36
251	39.969	0.161	1.67	72	-2.10	165	-0.043	54.0	0.00	6.38
252	40.130	0.161	1.67	72	-2.30	164	-0.042	55.0	0.00	6.56
253	40.290	0.160	1.66	72	-2.10	165	-0.043	56.0	0.00	6.53
254	40.451	0.161	1.66	72	-2.00	165	-0.043	56.6	0.00	6.55
255	40.612	0.161	1.67	72	-2.10	165	-0.043	55.0	0.00	6.52
256	40.773	0.161	1.67	72	-2.10	166	-0.043	52.4	0.00	6.47
257	40.933	0.160	1.66	72	-2.30	164	-0.043	52.1	0.00	6.36
258	41.093	0.160	1.66	72	-2.00	165	-0.042	51.1	0.00	6.22
259	41.254	0.161	1.67	72	-2.30	165	-0.043	54.4	0.00	6.38
260	41.415	0.161	1.66	72	-2.30	166	-0.044	58.3	0.00	6.61
261	41.575	0.160	1.67	72	-2.00	167	-0.045	61.2	0.00	6.92
262	41.737	0.162	1.68	72	-2.10	167	-0.045	59.9	0.00	6.99
263	41.899	0.162	1.68	72	-2.20	167	-0.045	68.6	0.00	7.19
264	42.060	0.161	1.68	72	-2.30	168	-0.045	67.3	0.00	8.50
265	42.222	0.162	1.68	72	-2.00	170	-0.046	48.9	0.00	8.61
266	42.383	0.161	1.69	72	-2.30	172	-0.046	43.0	0.00	7.94
267	42.545	0.162	1.69	72	-2.00	172	-0.046	39.5	0.00	7.53
268	42.708	0.163	1.68	71	-2.00	173	-0.045	37.5	0.00	7.32
269	42.869	0.161	1.68	71	-2.00	173	-0.045	36.2	0.00	7.34
270	43.030	0.161	1.68	71	-2.10	172	-0.045	33.6	0.00	7.28
271	43.192	0.162	1.68	71	-2.30	171	-0.045	33.0	0.00	7.27
272	43.353	0.161	1.67	71	-2.30	169	-0.044	31.7	0.00	7.09
273	43.514	0.161	1.67	71	-2.00	168	-0.044	33.0	0.00	7.08
274	43.675	0.161	1.68	71	-2.30	168	-0.044	34.6	0.00	6.81
275	43.836	0.161	1.68	71	-2.00	166	-0.043	33.6	0.00	6.62
276	43.997	0.161	1.67	71	-2.20	165	-0.043	33.6	0.00	6.59
277	44.157	0.160	1.67	71	-2.10	164	-0.043	34.0	0.00	6.61
278	44.318	0.161	1.67	71	-2.20	162	-0.042	33.3	0.00	6.53
279	44.479	0.161	1.67	71	-2.20	161	-0.041	32.7	0.00	6.51
280	44.639	0.160	1.66	71	-2.00	159	-0.041	34.3	0.00	6.50
281	44.800	0.161	1.67	71	-2.00	156	-0.040	39.5	0.00	6.59
282	44.960	0.160	1.67	71	-2.30	154	-0.041	41.4	0.00	6.66
283	45.121	0.161	1.67	71	-2.10	153	-0.040	40.1	0.00	6.60
284	45.281	0.160	1.66	71	-2.20	152	-0.040	41.4	0.00	6.56

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
285	45.442	0.161	1.67	71	-2.10	152	-0.040	40.1	0.00	6.58
286	45.603	0.161	1.67	71	-2.10	151	-0.039	40.5	0.00	6.53
287	45.763	0.160	1.66	71	-2.10	151	-0.040	41.4	0.00	6.49
288	45.924	0.161	1.67	71	-2.20	150	-0.039	42.4	0.00	6.53
289	46.084	0.160	1.67	71	-2.30	149	-0.039	46.6	0.00	6.66
290	46.245	0.161	1.67	71	-2.30	149	-0.038	51.5	0.00	6.88
291	46.405	0.160	1.67	71	-2.00	148	-0.038	54.4	0.00	7.03
292	46.566	0.161	1.67	71	-2.10	147	-0.038	57.9	0.00	7.23
293	46.726	0.160	1.67	71	-2.10	147	-0.038	60.2	0.00	7.36
294	46.886	0.160	1.66	71	-2.20	147	-0.038	60.5	0.00	7.40
295	47.047	0.161	1.67	71	-2.10	147	-0.038	60.2	0.00	7.31
296	47.207	0.160	1.67	71	-2.30	147	-0.038	61.8	0.00	7.41
297	47.368	0.161	1.67	71	-2.00	147	-0.038	63.4	0.00	7.40
298	47.528	0.160	1.66	71	-2.10	146	-0.038	66.0	0.00	7.41
299	47.689	0.161	1.67	71	-2.30	147	-0.038	65.7	0.00	7.32
300	47.850	0.161	1.67	71	-2.00	146	-0.038	68.0	0.00	7.16
301	48.009	0.159	1.66	71	-2.00	144	-0.038	68.3	0.00	7.09
302	48.169	0.160	1.67	71	-2.10	144	-0.037	69.3	0.00	7.12
303	48.330	0.161	1.67	71	-2.30	144	-0.037	70.9	0.00	7.03
304	48.490	0.160	1.67	71	-2.00	144	-0.038	67.3	0.00	6.96
305	48.650	0.160	1.67	71	-2.30	144	-0.038	64.4	0.00	6.85
306	48.811	0.161	1.67	71	-2.00	145	-0.038	63.1	0.00	6.79
307	48.972	0.161	1.67	71	-2.10	144	-0.037	64.1	0.00	6.63
308	49.131	0.159	1.66	71	-2.30	145	-0.037	62.5	0.00	6.58
309	49.292	0.161	1.67	71	-2.30	142	-0.037	72.2	0.00	6.54
310	49.453	0.161	1.67	71	-2.00	142	-0.037	72.8	0.00	6.47
311	49.613	0.160	1.66	71	-2.30	141	-0.037	68.6	0.00	6.36
312	49.773	0.160	1.67	71	-2.10	142	-0.037	71.2	0.00	6.30
313	49.933	0.160	1.67	71	-2.00	143	-0.037	72.8	0.00	6.25
314	50.094	0.161	1.67	71	-2.10	141	-0.037	74.4	0.00	6.27
315	50.254	0.160	1.67	71	-2.20	141	-0.037	72.5	0.00	6.31
316	50.415	0.161	1.67	71	-2.10	141	-0.036	72.8	0.00	6.32
317	50.575	0.160	1.67	71	-2.00	140	-0.036	68.6	0.00	6.19
318	50.735	0.160	1.66	71	-2.10	140	-0.036	71.9	0.00	6.17
319	50.895	0.160	1.67	71	-2.20	139	-0.036	80.3	0.00	6.05
320	51.056	0.161	1.67	71	-2.20	138	-0.036	76.0	0.00	5.92

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25

Tracking No.: 2142

Project No.: 0142WN020E

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: 11:53

Total Sampling Time 668 min

Recording Interval 1 min

Sample Train Leak Checks

Pre-test ____ cfm @ ____ in. Hg

Post-Test ____ cfm @ ____ in. Hg

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 (%)*
321	51.216	0.160	1.66	71	-2.00	139	-0.036	56.0	0.00	5.75
322	51.376	0.160	1.67	71	-2.10	139	-0.036	58.6	0.00	5.69
323	51.537	0.161	1.67	71	-2.00	139	-0.036	60.2	0.00	5.69
324	51.698	0.161	1.66	71	-2.00	138	-0.036	65.1	0.00	5.64
325	51.857	0.159	1.66	71	-2.00	136	-0.036	63.1	0.00	5.58
326	52.018	0.161	1.67	71	-2.10	136	-0.036	70.3	0.00	5.61
327	52.178	0.160	1.66	71	-2.10	135	-0.035	72.2	0.00	5.58
328	52.339	0.161	1.66	71	-2.00	134	-0.035	75.1	0.00	5.52
329	52.499	0.160	1.66	71	-2.10	135	-0.035	73.5	0.00	5.56
330	52.659	0.160	1.67	71	-2.10	134	-0.035	71.2	0.00	5.49
331	52.820	0.161	1.67	71	-2.20	135	-0.035	79.3	0.00	5.38
332	52.980	0.160	1.66	71	-2.10	134	-0.035	76.7	0.00	5.27
333	53.140	0.160	1.66	71	-2.30	134	-0.034	77.7	0.00	5.33
334	53.301	0.161	1.66	71	-2.30	133	-0.035	80.3	0.00	5.32
335	53.461	0.160	1.66	71	-2.20	133	-0.034	83.2	0.01	5.45
336	53.621	0.160	1.66	71	-2.30	131	-0.034	85.8	0.01	5.45
337	53.781	0.160	1.67	71	-2.10	131	-0.034	86.4	0.01	5.43
338	53.942	0.161	1.66	71	-2.30	130	-0.034	87.4	0.01	5.37
339	54.102	0.160	1.66	71	-2.20	130	-0.034	85.8	0.01	5.36
340	54.263	0.161	1.67	71	-2.10	130	-0.034	85.5	0.01	5.31
341	54.424	0.161	1.66	71	-2.10	129	-0.034	86.1	0.01	5.34
342	54.584	0.160	1.66	71	-2.10	129	-0.033	86.4	0.01	5.27
343	54.744	0.160	1.67	71	-2.00	129	-0.033	87.1	0.01	5.28
344	54.905	0.161	1.67	71	-2.10	129	-0.033	86.1	0.01	5.25
345	55.065	0.160	1.66	71	-2.20	128	-0.033	87.1	0.01	5.31
346	55.225	0.160	1.66	71	-2.00	127	-0.033	87.7	0.01	5.32
347	55.386	0.161	1.67	71	-2.20	126	-0.032	87.7	0.01	5.27
348	55.547	0.161	1.67	71	-2.20	127	-0.033	88.1	0.01	5.30
349	55.707	0.160	1.66	71	-2.30	126	-0.032	88.7	0.01	5.28
350	55.867	0.160	1.67	71	-2.20	126	-0.033	86.4	0.01	5.23
351	56.028	0.161	1.67	71	-2.10	125	-0.032	85.5	0.01	5.17
352	56.188	0.160	1.66	71	-2.30	125	-0.032	85.2	0.01	5.18
353	56.348	0.160	1.66	71	-2.30	125	-0.032	82.4	0.01	5.01
354	56.509	0.161	1.67	71	-2.30	125	-0.032	77.3	0.00	4.84
355	56.670	0.161	1.67	71	-2.30	124	-0.033	78.0	0.00	4.83
356	56.830	0.160	1.66	71	-2.00	126	-0.033	80.3	0.00	4.80

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
357	56.990	0.160	1.67	71	-2.30	126	-0.033	79.6	0.00	4.80
358	57.151	0.161	1.66	71	-2.00	127	-0.033	81.3	0.01	4.83
359	57.311	0.160	1.66	71	-2.30	128	-0.033	82.9	0.00	4.85
360	57.472	0.161	1.66	71	-2.30	130	-0.033	83.2	0.01	4.84
361	57.632	0.160	1.67	71	-2.30	130	-0.033	81.3	0.01	4.73
362	57.793	0.161	1.67	71	-2.00	129	-0.033	81.9	0.00	4.75
363	57.953	0.160	1.66	71	-2.30	129	-0.033	81.6	0.01	4.73
364	58.114	0.161	1.67	71	-2.00	128	-0.033	80.6	0.00	4.67
365	58.275	0.161	1.66	71	-2.10	129	-0.033	80.6	0.00	4.66
366	58.435	0.160	1.66	71	-2.30	130	-0.033	81.9	0.00	4.69
367	58.596	0.161	1.66	71	-2.30	130	-0.033	80.0	0.00	4.64
368	58.756	0.160	1.67	71	-2.10	129	-0.033	80.3	0.01	4.61
369	58.917	0.161	1.66	71	-2.00	129	-0.033	78.3	0.00	4.54
370	59.077	0.160	1.66	71	-2.00	129	-0.033	77.3	0.00	4.49
371	59.238	0.161	1.67	71	-2.00	129	-0.033	75.1	0.00	4.49
372	59.398	0.160	1.67	71	-2.10	128	-0.033	88.7	0.01	5.17
373	59.559	0.161	1.66	71	-2.30	129	-0.033	100.7	0.01	5.54
374	59.719	0.160	1.66	71	-2.00	129	-0.033	106.2	0.01	5.66
375	59.880	0.161	1.67	71	-2.10	129	-0.033	108.1	0.01	5.73
376	60.041	0.161	1.65	71	-2.00	128	-0.033	107.5	0.01	5.70
377	60.201	0.160	1.66	71	-2.00	129	-0.033	106.5	0.01	5.64
378	60.361	0.160	1.67	71	-2.30	129	-0.034	105.9	0.01	5.58
379	60.522	0.161	1.67	71	-2.30	130	-0.034	106.5	0.01	5.63
380	60.683	0.161	1.66	71	-2.00	131	-0.034	105.2	0.01	5.63
381	60.843	0.160	1.66	71	-2.20	131	-0.034	103.3	0.01	5.58
382	61.004	0.161	1.67	71	-2.20	130	-0.034	100.4	0.01	5.50
383	61.165	0.161	1.66	71	-2.30	130	-0.034	98.1	0.01	5.54
384	61.325	0.160	1.66	71	-2.30	132	-0.034	92.9	0.01	5.53
385	61.485	0.160	1.67	71	-2.30	132	-0.035	84.5	0.01	5.47
386	61.646	0.161	1.67	71	-2.30	133	-0.035	80.0	0.00	5.31
387	61.806	0.160	1.66	72	-2.00	134	-0.035	76.4	0.00	5.29
388	61.967	0.161	1.66	72	-2.30	134	-0.034	70.3	0.00	5.21
389	62.128	0.161	1.67	72	-2.20	134	-0.035	69.0	0.00	5.14
390	62.289	0.161	1.67	72	-2.10	133	-0.035	66.0	0.00	5.04
391	62.449	0.160	1.66	72	-2.20	134	-0.035	63.1	0.00	4.96
392	62.609	0.160	1.67	72	-2.00	133	-0.035	57.9	0.00	4.81

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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	62.770	0.161	1.67	72	-2.30	133	-0.035	57.6	0.00	4.84
394	62.931	0.161	1.67	72	-2.20	134	-0.034	55.6	0.00	4.71
395	63.091	0.160	1.67	72	-2.20	133	-0.035	55.4	0.00	4.68
396	63.252	0.161	1.67	72	-2.20	134	-0.035	54.1	0.00	4.67
397	63.413	0.161	1.67	72	-2.20	133	-0.035	52.4	0.00	4.58
398	63.573	0.160	1.66	72	-2.10	132	-0.035	54.7	0.00	4.63
399	63.733	0.160	1.67	72	-2.00	133	-0.034	53.7	0.00	4.65
400	63.894	0.161	1.67	72	-2.20	133	-0.034	51.8	0.00	4.69
401	64.055	0.161	1.67	72	-2.00	133	-0.035	51.6	0.00	4.64
402	64.215	0.160	1.66	72	-2.20	134	-0.035	45.0	0.00	4.51
403	64.376	0.161	1.67	72	-2.20	134	-0.035	45.9	0.00	4.49
404	64.537	0.161	1.67	72	-2.00	133	-0.035	45.9	0.00	4.47
405	64.697	0.160	1.66	72	-2.20	135	-0.035	46.6	0.00	4.49
406	64.857	0.160	1.67	72	-2.10	135	-0.035	46.3	0.00	4.36
407	65.018	0.161	1.67	72	-2.00	134	-0.035	45.3	0.00	4.27
408	65.179	0.161	1.67	72	-2.00	134	-0.035	45.0	0.00	4.10
409	65.339	0.160	1.66	72	-2.30	135	-0.035	40.1	0.00	3.92
410	65.500	0.161	1.67	72	-2.30	136	-0.036	39.5	0.00	3.81
411	65.661	0.161	1.65	72	-2.20	136	-0.036	36.9	0.00	3.62
412	65.821	0.160	1.66	72	-2.00	138	-0.036	38.9	0.00	3.63
413	65.982	0.161	1.66	72	-2.10	137	-0.036	39.5	0.00	3.60
414	66.143	0.161	1.67	72	-2.10	138	-0.036	39.2	0.00	3.59
415	66.304	0.161	1.67	72	-2.00	138	-0.036	38.5	0.00	3.53
416	66.464	0.160	1.66	72	-2.30	138	-0.036	38.8	0.00	3.47
417	66.624	0.160	1.67	72	-2.30	138	-0.036	39.2	0.00	3.46
418	66.785	0.161	1.67	72	-2.00	137	-0.036	38.8	0.00	3.44
419	66.946	0.161	1.66	72	-2.30	138	-0.036	39.8	0.00	3.42
420	67.106	0.160	1.66	72	-2.00	139	-0.036	40.1	0.00	3.36
421	67.267	0.161	1.67	72	-2.30	139	-0.036	40.1	0.00	3.31
422	67.428	0.161	1.66	72	-2.20	140	-0.037	40.5	0.00	3.23
423	67.588	0.160	1.66	72	-2.10	141	-0.037	39.5	0.00	3.14
424	67.749	0.161	1.67	72	-2.30	141	-0.037	38.8	0.00	3.09
425	67.909	0.160	1.67	72	-2.10	141	-0.037	38.2	0.00	3.00
426	68.070	0.161	1.66	72	-2.00	141	-0.037	38.2	0.00	2.94
427	68.230	0.160	1.66	72	-2.10	140	-0.037	38.2	0.00	2.88
428	68.392	0.162	1.67	72	-2.20	141	-0.037	38.2	0.00	2.86

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
429	68.553	0.161	1.67	72	-2.20	140	-0.037	37.9	0.00	2.81
430	68.712	0.159	1.66	72	-2.10	140	-0.036	37.5	0.00	2.74
431	68.873	0.161	1.67	72	-2.00	139	-0.036	36.9	0.00	2.90
432	69.034	0.161	1.67	72	-2.30	139	-0.036	39.8	0.00	3.08
433	69.194	0.160	1.66	72	-2.20	140	-0.036	41.1	0.00	3.11
434	69.355	0.161	1.67	72	-2.20	140	-0.037	38.5	0.00	3.05
435	69.516	0.161	1.67	72	-2.20	140	-0.037	38.2	0.00	3.06
436	69.677	0.161	1.67	72	-2.00	141	-0.037	37.5	0.00	3.05
437	69.837	0.160	1.66	72	-2.10	140	-0.036	36.9	0.00	3.08
438	69.997	0.160	1.67	72	-2.00	140	-0.036	35.6	0.00	3.03
439	70.158	0.161	1.67	72	-2.10	140	-0.036	35.6	0.00	3.05
440	70.319	0.161	1.67	72	-2.00	139	-0.036	34.9	0.00	2.98
441	70.479	0.160	1.66	72	-2.30	139	-0.036	35.6	0.00	2.97
442	70.640	0.161	1.67	72	-2.10	140	-0.036	35.9	0.00	3.00
443	70.801	0.161	1.67	72	-2.20	140	-0.037	36.5	0.00	2.98
444	70.961	0.160	1.66	72	-2.20	140	-0.037	36.5	0.00	2.95
445	71.122	0.161	1.66	72	-2.00	141	-0.037	36.5	0.00	2.96
446	71.283	0.161	1.67	72	-2.20	140	-0.036	37.2	0.00	2.96
447	71.443	0.160	1.67	72	-2.10	140	-0.037	37.2	0.00	3.03
448	71.603	0.160	1.66	72	-2.30	140	-0.037	36.2	0.00	2.94
449	71.764	0.161	1.67	72	-2.30	142	-0.038	35.6	0.00	2.87
450	71.925	0.161	1.66	72	-2.30	143	-0.037	34.6	0.00	2.83
451	72.085	0.160	1.66	72	-2.30	144	-0.037	35.9	0.00	2.84
452	72.246	0.161	1.66	72	-2.10	144	-0.038	35.9	0.00	2.83
453	72.407	0.161	1.67	72	-2.10	145	-0.038	35.9	0.00	2.78
454	72.568	0.161	1.66	72	-2.20	146	-0.038	35.9	0.00	2.79
455	72.728	0.160	1.66	72	-2.30	145	-0.038	38.2	0.00	2.85
456	72.889	0.161	1.66	72	-2.20	145	-0.037	41.1	0.00	2.96
457	73.050	0.161	1.67	72	-2.10	144	-0.037	41.7	0.00	3.00
458	73.210	0.160	1.66	72	-2.10	143	-0.037	41.7	0.00	2.98
459	73.371	0.161	1.66	72	-2.00	143	-0.037	40.1	0.00	2.90
460	73.532	0.161	1.67	72	-2.00	144	-0.038	38.5	0.00	2.82
461	73.693	0.161	1.67	72	-2.30	145	-0.038	38.2	0.00	2.79
462	73.853	0.160	1.67	72	-2.30	145	-0.037	39.2	0.00	2.81
463	74.013	0.160	1.67	72	-2.20	144	-0.038	40.1	0.00	2.85
464	74.174	0.161	1.67	72	-2.30	145	-0.038	39.5	0.00	2.70

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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	74.335	0.161	1.67	72	-2.10	145	-0.038	38.8	0.00	2.62
466	74.495	0.160	1.67	72	-2.30	145	-0.038	41.1	0.00	2.60
467	74.656	0.161	1.67	72	-2.20	146	-0.039	45.3	0.00	2.60
468	74.817	0.161	1.67	72	-2.20	146	-0.039	48.6	0.00	2.59
469	74.978	0.161	1.66	72	-2.30	148	-0.039	53.1	0.00	2.52
470	75.139	0.161	1.66	72	-2.20	149	-0.039	65.4	0.00	2.51
471	75.300	0.161	1.67	72	-2.30	149	-0.039	97.8	0.01	2.50
472	75.460	0.160	1.67	72	-2.30	150	-0.039	195.3	0.02	2.51
473	75.621	0.161	1.66	72	-2.10	150	-0.039	685.9	0.07	2.51
474	75.781	0.160	1.67	72	-2.00	149	-0.039	1040.0	0.15	2.45
475	75.942	0.161	1.67	72	-2.00	148	-0.038	1040.0	0.22	2.42
476	76.103	0.161	1.66	72	-2.00	147	-0.038	1040.0	0.27	2.39
477	76.264	0.161	1.66	72	-2.00	145	-0.038	1040.0	0.30	2.37
478	76.425	0.161	1.67	72	-2.20	145	-0.037	1040.0	0.33	2.34
479	76.585	0.160	1.66	71	-2.00	143	-0.037	1040.0	0.36	2.31
480	76.746	0.161	1.66	71	-2.20	142	-0.037	1040.0	0.37	2.27
481	76.906	0.160	1.66	71	-2.20	141	-0.037	1040.0	0.40	2.26
482	77.067	0.161	1.67	71	-2.20	139	-0.037	1040.0	0.43	2.29
483	77.228	0.161	1.66	71	-2.20	139	-0.036	1040.0	0.47	2.38
484	77.388	0.160	1.67	71	-2.10	137	-0.036	1040.0	0.51	2.48
485	77.549	0.161	1.67	71	-2.30	137	-0.036	1040.0	0.54	2.56
486	77.710	0.161	1.67	71	-2.00	137	-0.036	1040.0	0.57	2.65
487	77.870	0.160	1.66	71	-2.30	137	-0.036	1040.0	0.65	2.91
488	78.031	0.161	1.66	71	-2.20	137	-0.036	1040.0	0.68	3.05
489	78.192	0.161	1.67	71	-2.00	137	-0.036	1040.0	0.69	3.11
490	78.353	0.161	1.67	71	-2.20	137	-0.036	1040.0	0.67	3.18
491	78.513	0.160	1.66	71	-2.20	138	-0.036	1040.0	0.63	3.23
492	78.673	0.160	1.67	71	-2.00	138	-0.037	1040.0	0.59	3.22
493	78.834	0.161	1.67	71	-2.10	139	-0.037	1040.0	0.55	3.27
494	78.995	0.161	1.66	71	-2.20	140	-0.037	1040.0	0.51	3.27
495	79.155	0.160	1.67	71	-2.00	141	-0.038	1040.0	0.47	3.33
496	79.316	0.161	1.67	71	-2.10	143	-0.038	1040.0	0.44	3.44
497	79.477	0.161	1.67	71	-2.00	145	-0.038	1040.0	0.29	4.32
498	79.637	0.160	1.66	71	-2.30	147	-0.039	1040.0	0.13	4.98
499	79.797	0.160	1.67	71	-2.00	148	-0.038	1040.0	0.11	4.57
500	79.958	0.161	1.67	71	-2.30	148	-0.038	1040.0	0.10	4.37

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
501	80.119	0.161	1.67	71	-2.00	148	-0.038	974.1	0.10	4.75
502	80.279	0.160	1.67	71	-2.20	147	-0.038	762.0	0.07	5.18
503	80.440	0.161	1.67	71	-2.00	148	-0.038	680.4	0.07	4.64
504	80.601	0.161	1.67	71	-2.00	148	-0.039	633.4	0.06	4.23
505	80.761	0.160	1.66	71	-2.20	149	-0.039	554.8	0.05	4.08
506	80.922	0.161	1.67	71	-2.10	149	-0.039	718.9	0.07	3.68
507	81.083	0.161	1.67	71	-2.10	147	-0.039	849.9	0.09	3.46
508	81.244	0.161	1.67	71	-2.00	148	-0.038	1040.0	0.11	3.29
509	81.404	0.160	1.66	71	-2.20	151	-0.039	1040.0	0.13	3.20
510	81.565	0.161	1.67	71	-2.10	151	-0.039	1040.0	0.15	3.16
511	81.726	0.161	1.66	71	-2.00	152	-0.039	1040.0	0.17	3.36
512	81.886	0.160	1.66	71	-2.30	152	-0.039	1040.0	0.18	3.51
513	82.047	0.161	1.66	71	-2.00	152	-0.039	1040.0	0.18	3.57
514	82.208	0.161	1.67	71	-2.30	154	-0.040	1040.0	0.18	3.57
515	82.369	0.161	1.66	71	-2.20	154	-0.040	1040.0	0.18	3.42
516	82.529	0.160	1.67	71	-2.10	154	-0.040	1040.0	0.20	3.36
517	82.689	0.160	1.67	71	-2.00	157	-0.040	1040.0	0.22	3.30
518	82.850	0.161	1.67	71	-2.10	157	-0.040	1040.0	0.23	3.25
519	83.011	0.161	1.67	71	-2.20	158	-0.040	1040.0	0.23	3.05
520	83.172	0.161	1.67	71	-2.20	158	-0.041	1040.0	0.25	3.01
521	83.333	0.161	1.67	71	-2.20	157	-0.040	1040.0	0.25	3.15
522	83.494	0.161	1.67	71	-2.00	157	-0.040	1040.0	0.28	2.94
523	83.654	0.160	1.66	71	-2.00	157	-0.040	1040.0	0.31	2.84
524	83.815	0.161	1.67	71	-2.10	154	-0.039	1040.0	0.34	2.81
525	83.975	0.160	1.67	71	-2.00	153	-0.040	1040.0	0.37	2.75
526	84.136	0.161	1.67	71	-2.10	153	-0.039	1040.0	0.39	2.68
527	84.297	0.161	1.67	71	-2.00	152	-0.040	1040.0	0.44	2.55
528	84.458	0.161	1.68	71	-2.00	151	-0.039	1040.0	0.45	2.46
529	84.619	0.161	1.66	71	-2.00	144	-0.036	1040.0	0.48	2.51
530	84.779	0.160	1.66	71	-2.10	139	-0.035	1040.0	0.52	2.67
531	84.940	0.161	1.66	71	-2.00	135	-0.035	1040.0	0.52	2.48
532	85.101	0.161	1.67	71	-2.30	132	-0.035	1040.0	0.52	2.29
533	85.262	0.161	1.67	71	-2.20	129	-0.034	1040.0	0.50	2.15
534	85.422	0.160	1.66	71	-2.00	128	-0.034	1040.0	0.50	2.05
535	85.582	0.160	1.67	71	-2.00	127	-0.034	1040.0	0.50	1.94
536	85.743	0.161	1.67	71	-2.00	125	-0.034	1040.0	0.49	1.85

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25

Tracking No.: 2142

Project No.: 0142WN020E

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: 11:53

Total Sampling Time 668 min

Recording Interval 1 min

Sample Train Leak Checks

Pre-test ____ cfm @ ____ in. Hg

Post-Test ____ cfm @ ____ in. Hg

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	85.904	0.161	1.67	71	-2.20	157	-0.043	1040.0	0.49	1.64
538	86.064	0.160	1.67	71	-2.10	140	-0.033	1040.0	1.00	1.20
539	86.225	0.161	1.67	71	-2.00	131	-0.030	1040.0	0.94	5.39
540	86.386	0.161	1.66	71	-2.30	126	-0.031	1040.0	0.74	5.69
541	86.547	0.161	1.66	71	-2.10	123	-0.032	1040.0	0.73	5.38
542	86.707	0.160	1.67	71	-2.00	121	-0.031	1040.0	0.80	5.32
543	86.868	0.161	1.68	71	-2.30	120	-0.032	1040.0	0.79	5.25
544	87.029	0.161	1.67	71	-2.20	120	-0.031	1040.0	0.85	5.23
545	87.189	0.160	1.67	71	-2.30	120	-0.031	1040.0	0.86	4.90
546	87.350	0.161	1.68	71	-2.10	119	-0.031	1040.0	0.91	4.86
547	87.511	0.161	1.67	71	-2.10	119	-0.032	1040.0	0.98	4.56
548	87.671	0.160	1.66	71	-2.00	123	-0.034	1040.0	0.89	4.42
549	87.832	0.161	1.67	71	-2.10	126	-0.033	1040.0	0.71	5.09
550	87.992	0.160	1.67	71	-2.30	131	-0.035	1040.0	0.66	5.08
551	88.153	0.161	1.67	71	-2.00	136	-0.036	1040.0	0.61	4.92
552	88.313	0.160	1.66	71	-2.00	139	-0.037	1040.0	0.54	5.32
553	88.474	0.161	1.67	71	-2.30	143	-0.038	1040.0	0.44	5.30
554	88.635	0.161	1.68	71	-2.00	147	-0.040	1040.0	0.34	5.31
555	88.796	0.161	1.67	71	-2.20	152	-0.040	1040.0	0.30	5.61
556	88.956	0.160	1.67	71	-2.30	157	-0.042	1040.0	0.24	5.67
557	89.117	0.161	1.67	71	-2.00	164	-0.044	1040.0	0.21	5.50
558	89.277	0.160	1.67	71	-2.00	171	-0.045	1040.0	0.18	5.23
559	89.438	0.161	1.67	71	-2.00	176	-0.045	1040.0	0.16	5.08
560	89.598	0.160	1.67	71	-2.30	181	-0.046	1040.0	0.15	4.96
561	89.759	0.161	1.68	71	-2.20	185	-0.047	1040.0	0.16	5.04
562	89.920	0.161	1.66	71	-2.00	187	-0.048	1040.0	0.16	5.05
563	90.080	0.160	1.66	71	-2.20	190	-0.048	1040.0	0.16	4.88
564	90.241	0.161	1.67	71	-2.30	193	-0.048	1040.0	0.15	4.78
565	90.401	0.160	1.67	71	-2.30	194	-0.049	1040.0	0.15	4.89
566	90.561	0.160	1.66	71	-2.10	196	-0.049	1040.0	0.16	5.02
567	90.722	0.161	1.67	71	-2.00	197	-0.049	1040.0	0.16	4.94
568	90.883	0.161	1.67	71	-2.20	199	-0.050	1040.0	0.17	4.92
569	91.043	0.160	1.66	71	-2.30	204	-0.048	1040.0	0.14	4.55
570	91.204	0.161	1.66	71	-2.00	194	-0.048	1040.0	0.22	5.18
571	91.365	0.161	1.67	71	-2.00	191	-0.048	1040.0	0.23	5.25
572	91.526	0.161	1.67	71	-2.20	191	-0.048	1040.0	0.23	5.34

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
573	91.686	0.160	1.66	71	-2.20	191	-0.049	1040.0	0.24	5.29
574	91.846	0.160	1.67	71	-2.20	192	-0.049	1040.0	0.23	5.30
575	92.007	0.161	1.67	71	-2.20	193	-0.050	1040.0	0.22	4.97
576	92.167	0.160	1.67	71	-2.30	195	-0.050	1040.0	0.19	4.88
577	92.328	0.161	1.66	71	-2.00	197	-0.050	1040.0	0.14	5.06
578	92.489	0.161	1.67	71	-2.00	198	-0.050	1040.0	0.15	4.77
579	92.649	0.160	1.66	71	-2.20	198	-0.050	1040.0	0.16	4.77
580	92.809	0.160	1.66	71	-2.00	196	-0.049	1040.0	0.16	4.51
581	92.970	0.161	1.67	71	-2.20	196	-0.050	1040.0	0.18	4.73
582	93.130	0.160	1.67	71	-2.20	196	-0.050	1040.0	0.19	5.23
583	93.291	0.161	1.66	71	-2.20	197	-0.050	1040.0	0.19	4.53
584	93.451	0.160	1.66	71	-2.20	197	-0.050	1040.0	0.17	4.79
585	93.612	0.161	1.67	71	-2.30	198	-0.050	1040.0	0.15	4.79
586	93.773	0.161	1.66	71	-2.20	199	-0.051	1040.0	0.16	4.53
587	93.933	0.160	1.66	71	-2.30	224	-0.057	1040.0	0.18	4.10
588	94.093	0.160	1.67	71	-2.20	238	-0.056	1040.0	0.19	6.78
589	94.254	0.161	1.67	71	-2.20	221	-0.052	1040.0	0.33	7.52
590	94.414	0.160	1.66	71	-2.00	211	-0.051	1040.0	0.37	7.32
591	94.575	0.161	1.66	71	-2.30	207	-0.052	1040.0	0.36	7.47
592	94.735	0.160	1.67	70	-2.10	205	-0.052	1040.0	0.36	7.51
593	94.896	0.161	1.66	71	-2.20	205	-0.052	1040.0	0.34	7.47
594	95.056	0.160	1.66	71	-2.00	206	-0.052	1040.0	0.27	7.33
595	95.216	0.160	1.67	71	-2.20	207	-0.053	1040.0	0.22	7.12
596	95.377	0.161	1.67	71	-2.00	208	-0.053	1040.0	0.27	6.97
597	95.538	0.161	1.66	71	-2.20	210	-0.055	1040.0	0.29	7.71
598	95.698	0.160	1.66	71	-2.10	216	-0.054	1040.0	0.28	7.93
599	95.859	0.161	1.67	70	-2.00	219	-0.056	1040.0	0.33	8.28
600	96.020	0.161	1.66	70	-2.00	226	-0.057	1040.0	0.25	8.87
601	96.180	0.160	1.66	70	-2.30	232	-0.059	1040.0	0.22	9.60
602	96.340	0.160	1.67	70	-2.00	241	-0.060	1040.0	0.17	10.11
603	96.501	0.161	1.67	70	-2.10	252	-0.063	1040.0	0.10	10.52
604	96.661	0.160	1.66	70	-2.00	261	-0.063	658.0	0.06	10.56
605	96.822	0.161	1.67	70	-2.20	270	-0.064	509.1	0.05	10.64
606	96.983	0.161	1.67	70	-2.00	278	-0.067	465.7	0.05	11.07
607	97.143	0.160	1.66	70	-2.20	285	-0.068	1040.0	0.12	12.06
608	97.303	0.160	1.67	70	-2.30	298	-0.070	1040.0	0.81	13.34

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
609	97.463	0.160	1.67	70	-2.10	305	-0.071	1040.0	1.39	12.75
610	97.624	0.161	1.67	70	-2.30	307	-0.071	1040.0	0.70	13.27
611	97.785	0.161	1.66	70	-2.30	309	-0.071	1040.0	0.14	12.10
612	97.945	0.160	1.66	70	-2.20	308	-0.070	308.0	0.02	10.84
613	98.105	0.160	1.67	70	-2.00	306	-0.071	45.9	0.00	9.80
614	98.266	0.161	1.66	70	-2.30	303	-0.069	20.7	0.00	8.76
615	98.426	0.160	1.67	70	-2.10	296	-0.069	19.7	0.00	7.98
616	98.586	0.160	1.67	70	-2.00	292	-0.068	22.0	0.00	7.65
617	98.747	0.161	1.67	70	-2.20	290	-0.068	21.3	0.00	7.36
618	98.907	0.160	1.66	70	-2.20	288	-0.068	20.0	0.00	7.23
619	99.068	0.161	1.66	70	-2.10	285	-0.067	20.0	0.00	7.03
620	99.228	0.160	1.67	70	-2.10	283	-0.067	18.1	0.00	6.89
621	99.389	0.161	1.67	70	-2.10	284	-0.068	16.8	0.00	6.92
622	99.549	0.160	1.67	70	-2.30	282	-0.067	18.5	0.00	7.06
623	99.710	0.161	1.67	70	-2.30	282	-0.066	14.5	0.00	7.20
624	99.870	0.160	1.67	70	-2.00	280	-0.066	13.2	0.00	7.41
625	100.030	0.160	1.66	70	-2.30	278	-0.066	11.0	0.00	7.41
626	100.191	0.161	1.66	70	-2.10	280	-0.067	15.2	0.00	8.98
627	100.351	0.160	1.67	70	-2.20	285	-0.066	41.7	0.00	10.43
628	100.512	0.161	1.66	70	-2.30	289	-0.068	45.3	0.00	10.33
629	100.672	0.160	1.67	70	-2.00	294	-0.069	33.0	0.00	10.32
630	100.833	0.161	1.67	70	-2.30	296	-0.069	33.3	0.00	10.50
631	100.994	0.161	1.67	71	-2.00	300	-0.070	40.1	0.00	10.62
632	101.154	0.160	1.66	70	-2.00	304	-0.070	56.0	0.00	10.77
633	101.314	0.160	1.66	70	-2.30	305	-0.071	78.0	0.01	10.82
634	101.475	0.161	1.67	70	-2.00	305	-0.071	272.4	0.02	11.04
635	101.635	0.160	1.66	70	-2.20	309	-0.071	207.6	0.03	11.02
636	101.795	0.160	1.67	70	-2.20	312	-0.071	553.3	0.08	10.99
637	101.956	0.161	1.67	70	-2.20	313	-0.072	1040.0	0.12	11.01
638	102.117	0.161	1.66	70	-2.30	316	-0.072	1040.0	0.17	11.04
639	102.277	0.160	1.66	70	-2.30	318	-0.072	1040.0	0.10	11.13
640	102.437	0.160	1.66	70	-2.20	321	-0.073	1040.0	0.16	11.10
641	102.598	0.161	1.67	70	-2.20	322	-0.073	1040.0	0.21	11.15
642	102.759	0.161	1.66	70	-2.00	323	-0.073	1040.0	0.28	11.34
643	102.919	0.160	1.67	70	-2.10	324	-0.073	1040.0	0.40	11.56
644	103.080	0.161	1.67	70	-2.00	324	-0.074	1040.0	0.46	11.73

Train D - Ambient Background and Flue Gas Data

Run: 3 **Test Date:** 2/29/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)

Model: SC 25 Meter Box Y Regression Offset: 1.011

Tracking No.: 2142 Meter Box Y Regression Factor: 0

Project No.: 0142WN020E Meter Box Dynamic Y: 1.011

Sample Box ID: 372

Test Start Time: 11:53 Sample Train Leak Checks

Total Sampling Time 668 min Pre-test cfm @ in. Hg

Recording Interval 1 min Post-Test cfm @ in. Hg

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 (%)
645	103.240	0.160	1.66	70	-2.10	324	-0.073	1040.0	0.37	11.90
646	103.401	0.161	1.66	70	-2.20	322	-0.070	1040.0	0.31	11.90
647	103.561	0.160	1.66	70	-2.30	303	-0.068	1040.0	0.48	12.06
648	103.721	0.160	1.67	70	-2.10	290	-0.068	1040.0	0.38	11.94
649	103.882	0.161	1.66	70	-2.30	285	-0.069	1040.0	0.64	11.51
650	104.042	0.160	1.67	70	-2.00	282	-0.068	1040.0	0.58	11.53
651	104.203	0.161	1.67	70	-2.30	283	-0.068	1040.0	0.51	11.49
652	104.364	0.161	1.66	70	-2.00	282	-0.068	1040.0	0.26	11.43
653	104.524	0.160	1.66	70	-2.20	281	-0.068	1040.0	0.06	10.73
654	104.684	0.160	1.66	70	-2.20	278	-0.066	234.8	0.02	9.72
655	104.845	0.161	1.67	70	-2.00	274	-0.066	137.1	0.01	9.72
656	105.005	0.160	1.66	70	-2.00	268	-0.065	69.9	0.00	9.58
657	105.165	0.160	1.67	70	-2.20	266	-0.065	54.0	0.00	9.53
658	105.326	0.161	1.67	70	-2.30	263	-0.064	38.2	0.00	9.61
659	105.487	0.161	1.66	70	-2.30	262	-0.063	34.3	0.00	9.38
660	105.647	0.160	1.66	70	-2.20	258	-0.063	30.7	0.00	9.33
661	105.807	0.160	1.67	70	-2.20	256	-0.062	26.5	0.00	9.28
662	105.968	0.161	1.67	70	-2.20	254	-0.061	24.9	0.00	9.30
663	106.128	0.160	1.66	70	-2.00	251	-0.061	23.3	0.00	9.23
664	106.289	0.161	1.67	70	-2.10	250	-0.061	23.0	0.00	9.23
665	106.450	0.161	1.67	70	-2.20	248	-0.061	23.0	0.00	9.14
666	106.610	0.160	1.66	70	-2.00	247	-0.061	24.2	0.00	9.03
667	106.770	0.160	1.66	70	-2.10	244	-0.060	23.9	0.00	8.95
668	106.930	0.160	1.67	70	-2.10	242	-0.059	24.9	0.00	8.25

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Tracking No.:	2142
Project No.:	0142WN020E
Run No.:	3
Test Date:	2/29/24

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

Train A

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights Final, mg	Tare, mg	Particulate, mg Uncorrected	Corrected
FilterPairs	2/27/24 @ 16:50	Filter	F174	255.7	246.6	9.1	9.1
Probe catch*	2/27/24 @ 16:50	Probe	23	114076.4	114076.3	0.1	0.1
ilter seals catch*	2/27/24 @ 16:50	Seals	S652	3374.6	3374.6	0.0	0.0
				Total Particulate, mg:		**9.2**	**9.2**

Train B

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights Final, mg	Tare, mg	Particulate, mg Uncorrected	Corrected
FilterPairs	2/27/24 @ 16:50	Filter	F175	256.5	247.6	8.9	8.9
Probe catch*	2/27/24 @ 16:50	Probe	24	114126.6	114126.5	0.1	0.1
ilter seals catch*	2/27/24 @ 16:50	Seals	S662	3322.1	3322.1	0.0	0.0
		Sub-Total		Total Particulate, mg:		**9.0**	**9.0**

Train C - *First Hour*

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights Final, mg	Tare, mg	Particulate, mg Uncorrected	Corrected
FilterPairs	2/27/24 @ 16:50	Filter	F173	246.7	246.7	0.0	0.0
Probe catch*	2/27/24 @ 16:50	Probe	3	116010.8	116010.6	0.2	0.2
ilter seals catch*	2/27/24 @ 16:50	Seals	S649	3307.9	3307.9	0.0	0.0
				Total Particulate, mg:		**0.2**	**0.2**

Train D - *Ambient Background*

Sample Component	Date / Time in Desiccator	Reagent	Filter # or	Weights Final, mg	Tare, mg	Particulate, mg
Filter catch*	2/27/24 @ 16:50	Filter	F223	120.5	120.5	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 appropriately 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:	SC 25
Project Number:	0142WN020E
Run Number:	3
Test Date:	2/29/2024

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

- Fuel Field Notes
- Velocity Traverse Field Notes
- Flue Gas Analyzer Calibration
- Supplementary Field Notes
- Gravimetric Tare Sheets

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 3

Model: SC 25 Tracking Number: 2142 Date: 02/29/2024

Test Crew: T, Tony, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

~~OPEN~~ ~~1K~~ ~~1K @ 100~~

CLosed 100° from full open

Secondary: N/A

Tertiary/Pilot: N/A

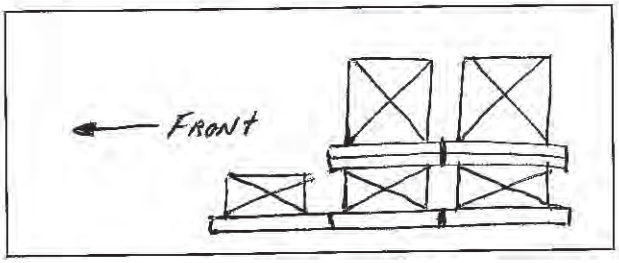
Fan: ON Low duration of test.

Preburn Notes

Time	Notes
9:46	Added 13.7 lbs
10:44	closed from 0° (fuel open) To 100° Fan to Low (90V)
23min	0.3 lbs added to weight due to braschaek
11:47	~~At 4.0 lbs~~ At 3.9 lbs, preburn was stopped

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Used to load fuel

Fuel loaded by: 45

Door closed at: 48

Primary air: At test setting

Notes: fan at at low duration of test

Time	Notes
11:53	Test started
12:53	First hour sampling ended
0849	fuel stir conducted at 6.3 lbs

Technician Signature: Tony Tony

Date: 02/29/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 3

Model: SC 25 Tracking Number: 2142 Date: 02/29/2024

Test Crew: T. Tong K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 11:53 Booth #: 1

Stop Time: 23:01

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Sample Train Leak Check: PRE-TEST

A: 0.000 @ 16.85 "Hg

B: 2.000 @ 17.93 "Hg

A1 0.000 @ 22.62 "Hg

Post-Test

A: 0.002 @ 18 "Hg

B: 0.001 @ 17.5 "Hg

A1 0.000 @ 22.4 "Hg

Calibrations: Span Gas CO_2: 16.86% CO: 4.37%

CO: 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	10:48	10:49		1105
CO_2 %	0.00	16.86	0.04 0.15	16.82
CO %	0.00	4.38	0	4.35
CO ppm	0.0	494	1	489

Air Velocity (ft/min): Initial: 16 Final: ~~450~~ 15 K

Scale Audit (lbs): Initial: 10 Final: 20.0

Pitot Tube Leak Test: Initial: good Final: good

Stack Diameter (in): 6

Induced Draft: 0.000

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 2/26/24 Initials: K

	Initial	Middle	Ending
P_b (in/Hg)	29.58	29.58	29.59
RH (%)	36	37	35
Ambient (°F)	70	70	71

Tunnel Traverse

	Microtector Reading	dP (in H_2O)	T(°F)
center →	.057	.114	80
1	.030	.060	
2	.047	.098	
3	.050	.100	
4	.036	.072	
5	.030	.060	
6	.045	.090	
7	.043	.086	
↓	~~RT~~ Center:		
8	.023	.046	80

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
−0.4	−0.7

Background Filter Volume:

Technician Signature: Tong Tong

Date: 02/29/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 3

Model: SC 25 Tracking Number: 2142 Date: 02/29/2024

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 12.7

Cal Value (2) = 22% Actual Reading 22.9

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	12 in	23.0	7	17 in	20.6
2	12 in	23.8	8	17 in	21.0
3	12 in	23.9	9	___ in	___
4	12 in	22.6	10	___ in	___
5	17 in	23.3	11	___ in	___
6	17 in	23.3	12	___ in	___

Total Pre-Burn Fuel Weight: 12.4 Pre-Burn Fuel Average Moisture: 22.6 % db

Time (clock): 9:30 Room Temperature (F): 69 Initials: TT

Test Fuel

Firebox Volume (ft³): 2.16 Test Fuel Piece Length (in): 17 3/8, 18

Load Weight Range (lb): (13.6, 16.6) Total Wet Fuel Load Weight (lb): 15.8 (13.2, 16.0)

Fuel Type & Amount: 2 x 4: 3 4 x 4: 2

Weight (with spacers): 6.8 Weight (with spacers): 9.0

Piece:	Weight (lbs):	Moisture Readings (%DB):				Fuel Type:	
1	1.8	22.0	23.2	19.0		2x4	17.75"
2	1.8	20.4	20.0	21.9		2x4	18.0"
3	2.1	22.4	19.5	21.3		2x4	18.0"
4	4.1	19.5	23.8	24.2		4x4	17.75"
5	4.4	19.2	21.9	22.0		4x4	18.0"
6	___	___	___	___		___	
7	___	___	___	___		___	

Spacer Moisture Readings (%DB)

24.3	21.0	21.1	16.0	23.8	19.0	22.8	20.9
24.5	22.4	20.9	24.9	25.0	21.5	___	___
___	___	___	___	___	___	___	___
___	___	___	___	___	___	___	___

Time (clock): 10:00 Room Temperature (F): 69 Initials: TT

Technician Signature: Tony Tong Date: 02/29/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 3

Model: SC 25 Tracking Number: 2142 Date: 02/29/2024

Test Crew: T. Tong, K. Morgan

OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: Tony

Date/Time in Dessicator: 1100 (2300) 02/29/24

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	03/01/24	3/4/24 09:05	3/5/24 7:12		
R/H %:	11.7	15.6	15.6		
Temp:	68.7	69.3	69		
200 mg Audit:	200.0	200.1	200.1		
2 g Audit:	2000.2	2000.3	2000.3		
100 g Audit:	99997.8	99997.9	99997.8		
Initials:	RT	K	K		

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	Front Filter	F173/A	246.7 (246.7)	246.7	246.7			
	Rear Filter							
	Probe	3	116010.6	116010.6	116010.8			
	O-Ring Set	S649	3307.9	3307.9	3307.9			
A	Front Filter	F174/A	246.6	256.0	255.7	255.7		
	Rear Filter							
	Probe	23	114076.3	114076.3	114076.4			
	O-Ring Set	S652	3374.6	3375.0	3374.6	3374.6		
B	Front Filter	F175/A	247.6	256.8	256.3	256.5		
	Rear Filter							
	Probe	24	114126.5	114126.5	114126.6			
	O-Ring Set	S662	3322.1	3322.0	3322.1 (3321.7)			
BG	Filter	F223	120.5	120.4	120.5			

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

Equations and Sample Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	3

Sample calculations of each equation used in the referenced 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	22.01	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 moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.417	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	15.04	Traverse Worksheet
θ	- Duration of test, min	668	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	29.59	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

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

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	107.731	107.700	9.715	106.93
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	0.95	2.17	1.64
T_m	- Temperature of Dry Gas Meter, °F	81.1	80.9	70.9	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.1	0.1	0.2	n/a
m_f	- mass of particulate matter from filters, mg	9.1	8.9	0.0	0.0
m_g	- mass of particulate matter from filter seals, mg	0.0	0.0	0.0	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.1	0.1	0.2	n/a
m_f	- mass of particulate matter from filters, mg	9.1	8.9	0.0	n/a
m_g	- mass of particulate matter from filter seals, mg	0.0	0.0	0.0	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 = 22.01 %, dry basis
M_{Swb} = 1.6 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((1.6 x 0.4536) (100 / (100 + 22.01))

M_{Sdb} = **0.595** 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} = 14.2 lb.
FM_{CPn} = 21.35 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 14.2 x 0.4536 x (100 / (100 + 14.2))

M_{Cdb} = **5.31** 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} = 11.70 lb
V_C = 0.417 ft^3

D_{Cdb} = 11.7 / 0.417

D_{Cdb} = **28.08** 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} = 0.595
M_{Cdb} = 5.31

M_{FTAdb} = 0.595 + 5.31

M_{FTAdb} = **5.90** kg

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

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

Sample Calculation:

M_{FTAdb} = 5.903
θ = 668

BR = (60 x 5.903) / 668

BR = **0.53** 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 = 0.813

$\Delta P^{1/2}_{AVG}$ = 0.342

$T_{S\,(avg)}$ = 538

Pbar = 29.59

Pg = -0.4

Ps = 29.56

V_S = 0.813 x 85.49 x 0.99 x 0.342 x √ [(538 / (29.56 x 28.78)]

V_S = **18.700** ft/sec

(First Hour of Test)

F_P = 0.813

$\Delta P^{1/2}_{AVG}$ = 0.343

$T_{S\,(avg)}$ = 539

Pbar = 29.58

Pg = -0.4

Ps = 29.55

V_S = 0.813 x 85.49 x 0.99 x 0.343 x √ [(539 / (29.55 x 28.78)]

V_S = **18.773** 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 = 29.56
$T_{s(avg)}$ = 538
Vs = 18.70

Qstd = 3600 x (1 - 0.02) x 18.7 x 0.19635 x (528 / 538) x (29.56 / 29.92)

Qstd = **12554.2** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 29.55
$T_{s(avg)}$ = 539
Vs = 18.773

Qstd = 3600 x (1 - 0.02) x 18.773 x 0.1963 x (528 / 539) x (29.55 / 29.92)

Qstd = **12587.6** 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

$$V_{m(std)} = 17.64 \times 107.731 \times 1.016 \times \frac{\left(29.59 + \frac{1.24}{13.6}\right)}{(81.1 + 460)}$$

$V_{m(std)}$ = **105.897** dscf

Train B

$$V_{m(std)} = 17.64 \times 107.700 \times 1.011 \times \frac{\left(29.59 + \frac{0.95}{13.6}\right)}{(81 + 460)}$$

$V_{m(std)}$ = **105.308** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.72 \times 1.015 \times \frac{\left(\underline{29.58} + \frac{2.17}{13.6}\right)}{(70.9 + 460)}$$

$V_{m(std)}$ = **9.743** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 106.93 \times 1.011 \times \frac{\left(\underline{29.59} + \frac{1.64}{13.6}\right)}{(79.0 + 460)}$$

$V_{m(std)}$ = **105.100** 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 = 0.1 + 9.1 + 0.0

m_n = **9.2** mg

Train B

m_n = 0.1 + 8.9 + 0.0

m_n = **9.0** mg

Train C (1st hour)

m_n = 0.2 + 0.0 + 0

m_n = **0.2** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 0.1 + 9.1 + 0.0

m_n = **9.2** mg

Train B

m_n = 0.1 + 8.9 + 0.0

m_n = **9.0** mg

Train C (1st hour)

m_n = 0.2 + 0.0 + 0

m_n = **0.2** 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

$$C_s = 0.001 \times \frac{9.2}{105.90}$$

C_s = **0.000087** g/dscf

Train B

$$C_s = 0.001 \times \frac{9.0}{105.31}$$

C_s = **0.0000855** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.2}{9.74}$$

Cs = **0.000021** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{105.10}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{9.2}{105.90}$$

C_s = **0.000087** g/dscf

Train B

$$C_s = 0.001 \times \frac{9.0}{105.31}$$

C_s = **0.0000855** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.2}{9.74}$$

Cs = **0.000021** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{105.10}$$

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 12554.2 x 668 / 60

E_T = **12.14** g

Train B

E_T = (0.000085 - 0.000000) x 12554.2 x 668 / 60

E_T = **11.95** g

First Hour

E_T = (0.000021 - 0.000000) x 12587.6 x 60 / 60

E_T = 0.26 g

Trains A and B Average

E = **12.04** g

Sample calculations (Corrected)

Train A

E_T = (0.000087 - 0.000000) x 12554.2 x 668 / 60

E_T = **12.14** g

Train B

E_T = (0.000085 - 0.000000) x 12554.2 x 668 / 60

E_T = **11.95** g

First Hour

E_T = (0.000021 - 0.000000) x 12587.6 x 60 / 60

E_T = **0.26** g

Trains A and B Average

E_T = **12.04** 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 = 12.14 g

θ = 668 min

PM_R = 60 x (12.14 / 668)

PM_R = **1.09** g/hr

Train B

E_T = 11.95 g

θ = 668 min

PM_R = 60 x (11.95 / 668)

PM_R = **1.07** g/hr

A and B Average

E_T = **1.08** g/hr

First Hour

E_T = 0.26 g

θ = 60 min

PM_R = 60 x (0.26 / 60)

PM_R = **0.26** g/hr

Sample Calculation (Corrected)

Train A

E_T = 12.14 g

θ = 668 min

PM_R = 60 x (12.14 / 668)

PM_R = **1.09** g/hr

Train B

E_T = 11.95 g

θ = 668 min

PM_R = 60 x (11.95 / 668)

PM_R = **1.07** g/hr

A and B Average

E_T = **1.08** g

First Hour

E_T = 0.26 g

θ = 60 min

PM_R = 60 x (0.26 / 60)

PM_R = **0.26** 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 = 12.14 g
M_{FTAdb} = 5.90 kg
PM_F = 12.14 / 5.90
PM_F = **2.06** g/kg

Train B

E_T = 11.95 g
M_{FTAdb} = 5.90 kg
PM_F = 11.95 / 5.90
PM_F = **2.02** g/kg

Sample Calculation (Corrected)

Train A

E_T = 12.14 g
M_{FTAdb} = 5.90 kg
PM_F = 12.14 / 5.90
PM_F = **2.06** g/kg

Train B

E_T = 11.95 g
M_{FTAdb} = 5.90 kg
PM_F = 11.95 / 5.90
PM_F = **2.02** 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	668	668	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	0.166	0.162	0.172
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	107.731	107.7	9.715
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	18.864	18.864	18.864
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	18.700	18.700	18.777
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	533.0	533.0	530.0
T_m	=	Absolute average dry gas meter temperature, ^oR	541.1	540.9	530.9
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	549.0	549.0	549.0
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	538.2	538.2	538.8

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

Train A PR = $\left(\frac{668 \times 0.166 \times 18.7 \times 541 \times 549}{1 \times 107.731 \times 18.864 \times 533 \times 538}\right)$ X 100 = 105.7 %

Train B PR = $\left(\frac{668 \times 0.162 \times 18.7 \times 541 \times 549}{1 \times 107.7 \times 18.864 \times 533 \times 538}\right)$ X 100 = 103.1 %

Train B PR = $\left(\frac{60 \times 0.172 \times 18.777 \times 531 \times 549}{1 \times 9.715 \times 18.864 \times 530 \times 539}\right)$ X 100 = 107.9 %

Run 4 Test Data

Test Date:	3/1/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	SC 25

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Project No.: 0142WN020E
Tracking No.: 2142
Run: 4
Test Date: 03/01/24

Burn-Rate Result

1.71 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	4.09	4.09	2.14	2.14
Emission Rate, g/hr	**1.20**	1.20	**2.14**	2.14
Emissions Factor, g/kg	0.70	0.70	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		101.7	98.7
Average Tunnel Gas Velocity (vs), feet/second		19.322	19.236
Average Tunnel Gas Flow Rate(Qsd	DSCF/hr	12421.2	12431.1
	DSCF/min	207.0	207.2
Average Delta p, in. H2O		0.114	0.114
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	205

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	29.930	33.463	33.071	9.816	29.930	33.463	33.071	9.816
Average Gas Meter Temperature, °F	79	80	80	68	79	80	80	68
Total Sample Volume (V_{mstd}), DSCF	29.400	32.970	32.377	9.888	29.400	32.970	32.377	9.888
Total Particulates (mn), mg - m_n	0.0	3.5	2.8	1.7	0.0	3.5	2.8	1.7
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00011	0.00009	0.00017	0.00000	0.00011	0.00009	0.00017
Total Particulate Emissions (ET), grams	n/a	4.51	3.67	2.14	n/a	4.51	3.67	2.14
Particulate Emission Rate, g/hr	n/a	1.32	1.08	2.14	n/a	1.32	1.08	2.14
Emissions Factor, g/kg	n/a	0.77	0.63	n/a	n/a	0.77	0.63	n/a
Difference, ET from Average ET, grams	n/a	0.42	-0.42	n/a	n/a	0.42	-0.42	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	73	73	74	✓
Filter Face Velocity, fpm	< 30	9.05	8.84	8.73	✓
Dryer Exit Temperature, °F	< 80	64	57	59	✓
Tunnel Velocity, fpm	>800	1,159	1,154		✓
First Hour Leakage	0.007	0.004			✓
Train A Leakage Rate	0.007		0.002		✓
Train B Leakage Rate	0.006			0.001	✓
Leakage Rate Limits (cfm) are < 4% of average sample rate or < 0.01 cfm, which ever is less					
Negative Probe Weight	=> 0	0.1	1	0.3	✓
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		72		✓
Ambient Temp, °F	< 90		75		✓
Trains A and B Precision	(*A*) < 7.5%		10.21%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.14		✓
Stove Surface ΔT	<= 125 °F		107		✓
Room Air Velocity	< 50 fpm		0		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	4
Test Date:	3/1/2024

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: SC25
Date: 03/01/24
Run: 4
Control #: 2142
Test Duration: 205
Output Category: III

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	74.9%	81.0%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	75%	81.4%

Output Rate (kJ/h)	25,389	24,085	**(Btu/h)**
Burn Rate (kg/h)	1.71	3.77	**(lb/h)**
Input (kJ/h)	33,882	32,140	**(Btu/h)**

Test Load Weight (dry kg)	5.84	12.88	**dry lb**
MC wet (%)	17.44		
MC dry (%)	21.12		
Particulate (g)	4.09		
CO (g)	34		
Test Duration (h)	3.42		

Emissions	Particulate	CO
g/MJ Output	0.05	0.39
g/kg Dry Fuel	0.70	5.79
g/h	1.20	9.90
lb/MM Btu Output	0.11	0.91

Air/Fuel Ratio (A/F)	12.32

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

VERSION:	**2.4**	**4/15/2010**			
Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	SC25				
Date:	3/1/2024		**Temp. Units**	F	(F or C)
Run:	4		**Weight Units**	lb	(kg or lb)
Control #:	2142				
Test Duration:	205				
Output Category:	III		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.44		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	15.60		**%C**	48.73	
Burn Rate (dry kg/h):	1.71		**%H**	6.87	
Total Particulate Emissions:	4.09 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.03**	**9.00**	**#DIV/0!**	**387.84**	**72.40**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	15.60	0.20	2.27		419.0	75.0
1	15.50	0.24	1.12		352.0	75.0
2	15.40	0.01	4.23		359.0	74.0
3	15.30	0.01	5.18		382.0	74.0
4	15.30	0.01	6.24		394.0	74.0
5	15.20	0.01	5.97		400.0	73.0
6	15.10	0.01	5.71		401.0	73.0
7	15.00	0.01	8.00		404.0	73.0
8	14.90	0.01	8.77		413.0	73.0
9	14.70	0.01	8.90		418.0	73.0
10	14.60	0.02	8.95		425.0	73.0
11	14.50	0.07	10.86		432.0	73.0
12	14.30	0.03	10.04		432.0	72.0
13	14.20	0.01	7.30		425.0	73.0
14	14.10	0.01	7.51		418.0	73.0
15	14.00	0.01	6.66		413.0	73.0
16	13.90	0.01	6.21		406.0	72.0
17	13.80	0.01	6.19		404.0	72.0
18	13.70	0.01	6.06		401.0	72.0
19	13.60	0.01	6.43		399.0	72.0
20	13.50	0.01	6.84		395.0	72.0
21	13.50	0.01	6.99		395.0	72.0
22	13.40	0.01	7.27		392.0	72.0
23	13.30	0.01	7.42		394.0	72.0
24	13.20	0.01	7.92		396.0	72.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	13.10	0.01	8.71		396.0	72.0
26	12.90	0.01	9.08		397.0	72.0
27	12.80	0.01	8.75		399.0	72.0
28	12.70	0.01	8.34		397.0	72.0
29	12.60	0.01	8.24		394.0	72.0
30	12.60	0.01	8.28		392.0	72.0
31	12.50	0.01	8.38		392.0	72.0
32	12.40	0.01	8.76		389.0	72.0
33	12.30	0.01	8.79		389.0	72.0
34	12.20	0.01	8.93		388.0	72.0
35	12.10	0.01	8.97		388.0	72.0
36	12.00	0.01	9.34		389.0	72.0
37	11.90	0.01	9.65		388.0	72.0
38	11.80	0.01	9.82		390.0	72.0
39	11.70	0.01	10.20		389.0	72.0
40	11.60	0.01	10.15		389.0	72.0
41	11.50	0.01	10.15		389.0	72.0
42	11.40	0.01	9.77		389.0	72.0
43	11.30	0.01	9.21		388.0	72.0
44	11.20	0.01	8.82		389.0	72.0
45	11.20	0.01	8.52		388.0	72.0
46	11.10	0.01	8.38		389.0	72.0
47	11.00	0.01	9.38		391.0	72.0
48	10.90	0.01	10.11		395.0	72.0
49	10.80	0.02	10.46		402	72
50	10.70	0.02	10.66		404	72
51	10.60	0.02	10.8		406	72
52	10.50	0.02	10.82		411	72
53	10.40	0.02	10.73		414	72
54	10.30	0.02	10.76		414	72
55	10.20	0.03	11.58		415	72
56	10.10	0.01	11.29		416	72
57	10.00	0.01	11.09		415	72
58	9.90	0.01	10.92		414	72
59	9.80	0.17	12.02		416	72
60	9.70	0.02	10.67		415	72
61	9.60	0.05	11.16		416	72
62	9.50	0.02	10.73		415	72
63	9.40	0.02	10.26		413	72
64	9.20	0.07	10.75		412	72
65	9.10	0.06	10.78		412	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	9.00	0.06	10.84		411	72
67	8.90	0.03	10.69		410	72
68	8.80	0.02	10.69		413	72
69	8.70	0.04	11.55		415	72
70	8.60	0.22	11.96		420	72
71	8.50	0.24	11.64		421	72
72	8.40	0.15	11.57		420	72
73	8.30	0.15	11.37		421	72
74	8.20	0.11	11.35		419	73
75	8.10	0.1	11.37		420	72
76	8.00	0.12	11.33		422	73
77	7.90	0.13	11.27		421	73
78	7.80	0.11	11.13		423	73
79	7.70	0.07	11.01		423	73
80	7.60	0.06	10.96		423	72
81	7.50	0.02	10.79		423	72
82	7.40	0.02	10.66		422	72
83	7.30	0.01	10.5		422	72
84	7.20	0.01	10.34		422	73
85	7.10	0.01	10.2		423	73
86	7.00	0.01	10.06		424	73
87	6.90	0.01	9.97		421	72
88	6.80	0.01	9.8		420	73
89	6.70	0.01	9.81		420	73
90	6.70	0.01	9.77		420	73
91	6.60	0.01	9.73		418	73
92	6.50	0.01	9.86		414	73
93	6.40	0.00858	9.78		414	73
94	6.30	0.00757	9.69		413	73
95	6.20	0.00495	9.84		412	73
96	6.10	0.01	10.39		409	72
97	6.00	0.03	10.63		410	73
98	5.90	0.02	10.71		411	72
99	5.80	0.05	10.98		413	72
100	5.70	0.04	11.1		415	72
101	5.60	0.12	11.19		418	72
102	5.50	0.1	11.13		419	72
103	5.40	0.1	11.17		420	72
104	5.30	0.12	11.13		421	72
105	5.20	0.14	11.15		421	72
106	5.10	0.13	11.11		422	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	5.00	0.12	11.17		420	73
108	4.90	0.09	11.15		420	73
109	4.80	0.08	11.17		420	72
110	4.70	0.06	11.4		421	72
111	4.60	0.08	11.55		422	72
112	4.50	0.11	11.84		422	72
113	4.40	0.14	11.98		424	72
114	4.30	0.14	11.93		425	72
115	4.20	0.15	11.96		426	73
116	4.10	0.14	11.88		427	73
117	4.00	0.17	11.84		428	73
118	3.90	0.18	11.76		428	72
119	3.90	0.14	11.4		430	73
120	3.80	0.11	11.17		431	73
121	3.70	0.09	10.94		428	73
122	3.60	0.05	10.8		426	73
123	3.50	0.03	10.84		423	73
124	3.40	0.02	10.71		422	73
125	3.30	0.01	10.52		421	73
126	3.30	0.01	10.43		418	73
127	3.20	0.00592	10.35		414	73
128	3.10	0.00424	10.32		411	73
129	3.00	0.00522	10.31		408	73
130	2.90	0.00502	10.09		405	73
131	2.90	0.00498	9.89		404	73
132	2.80	0.00469	9.72		401	73
133	2.70	0.00508	9.56		398	73
134	2.70	0.00472	9.38		396	73
135	2.60	0.00485	9.26		393	73
136	2.60	0.00502	9.28		393	73
137	2.50	0.00424	9.3		392	73
138	2.40	0.00427	9.32		392	73
139	2.40	0.00732	9.38		390	73
140	2.30	0.00638	9.43		387	73
141	2.30	0.01	9.49		386	73
142	2.20	0.01	9.49		385	73
143	2.10	0.01	9.54		384	73
144	2.10	0.01	9.65		382	73
145	2.00	0.01	9.55		380	73
146	2.00	0.00773	9.34		379	73
147	1.90	0.00472	9.18		377	73

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	1.90	0.00437	9.08		374	73
149	1.80	0.00239	8.98		372	73
150	1.80	0.001	8.84		370	73
151	1.70	0.00078	8.71		368	73
152	1.70	0.00071	8.65		365	72
153	1.60	0.00126	8.16		364	72
154	1.60	0.00103	8.11		362	73
155	1.50	0.00097	8.03		360	73
156	1.50	0.00064	7.96		359	73
157	1.50	0.00064	8		357	73
158	1.40	0.00061	7.99		357	73
159	1.40	0.00058	8		357	72
160	1.30	0.00055	7.97		355	72
161	1.30	0.00064	7.99		354	72
162	1.20	0.00064	8.06		355	72
163	1.20	0.00078	7.54		354	72
164	1.20	0.00074	7.4		352	72
165	1.10	0.00071	7.38		352	72
166	1.10	0.00078	7.34		351	73
167	1.10	0.00071	7.28		350	72
168	1.00	0.00084	7.22		347	72
169	1.00	0.00097	7.09		346	72
170	1.00	0.00106	6.93		344	72
171	0.90	0.00106	6.75		344	72
172	0.90	0.00103	6.56		343	72
173	0.90	0.00094	6.4		342	72
174	0.90	0.00081	6.44		339	72
175	0.80	0.00081	6.38		337	72
176	0.80	0.00081	6.39		335	72
177	0.80	0.00081	6.3		333	72
178	0.80	0.00084	6.25		331	72
179	0.70	0.00084	6.29		330	72
180	0.70	0.00087	6.31		328	72
181	0.70	0.00081	6.32		328	72
182	0.70	0.00084	6.36		326	72
183	0.60	0.00084	6.39		324	72
184	0.60	0.00087	6.46		324	72
185	0.60	0.00087	6.51		323	72
186	0.60	0.0009	6.54		322	72
187	0.50	0.00094	6.58		323	72
188	0.50	0.00094	6.62		323	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	0.50	0.00094	6.7		321	72
190	0.50	0.00094	6.71		320	72
191	0.40	0.00087	6.72		317	72
192	0.40	0.0009	6.73		318	72
193	0.40	0.00094	6.8		318	72
194	0.30	0.00097	6.6		317	72
195	0.30	0.001	6.57		316	72
196	0.30	0.00094	6.62		316	72
197	0.30	0.001	6.61		315	72
198	0.20	0.001	6.61		315	72
199	0.20	0.00103	6.58		314	72
200	0.20	0.00113	6.6		315	72
201	0.20	0.00106	6.59		313	72
202	0.20	0.00106	6.53		313	72
203	0.10	0.00106	6.55		313	72
204	0.10	0.00113	6.57		312	72
205	0.00	0.00107	6.65		311	72

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : SC 25
Tracking No. : 2142
Project No. : 0142WN020E
Test Date : 3/1/2024
Run No. : 4

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.159** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 15.113 lb.
Minimum Fuel Weight : 13.60 lb.
Maximum Fuel Weight : 16.62 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	18.00	22.3	23.8	23.8	23.3	1.46	0.0547		1.8		1.46
2	1.90	2x4	17.75	21.9	21.4	21.2	21.5	1.56	0.0539		1.9		1.56
3	4.20	4x4	18.00	23.8	22.8	21.3	22.6	3.42	0.1276	4.2		3.42	
4	4.20	4x4	17.75	23.8	19.7	19.9	21.1	3.47	0.1258	4.2		3.47	
5	2.00	2x4	17.75	19.9	20.4	20.3	20.2	1.66	0.0539		2.0		1.66
6													
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
13.8	16.0	13.8	16.0					
17.3	11.5	15.0	13.5					
20.2	19.8	11.2						
13.2	18.8	15.8						

Avg : 15.4

Assembled Crib Fuel Load with Spacers Attached

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.10	2x4		2.1000
2	2.30	2x4		2.3000
3	2.40	2x4		2.4000
4	4.40	4x4	4.40	
5	4.40	4x4	4.40	
6				
7				
8				
9				

Combined Mass of 4 x 4s 8.8 lb
Combined Mass of 2 x 4s 6.8 lb

Total Wet Mass of Fuel Load **15.6** 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	3	5.7	4.69	7.23	5.97	27.84	33.90	21.13	17.44
4 x 4	2	8.4	6.89						
Spacers	14	1.5	1.30						
Totals		15.6	12.88						

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 Pieces Moisture, % db
Measured	15.6	7.23	27.84	44	21.8
Required	13.6 - 16.6	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.:	2142
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WN020E
Model:	SC 25	Test Date:	3/1/2024

Dilution 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 *	0.064	100	0.253
X2	25.0	0.00	0.100	100	0.316
X3	75.0	0.00	0.104	100	0.322
X4	93.3	-0.5 *	0.070	100	0.265
Y1	6.7	0.5 *	0.060	100	0.245
Y2	25.0	0.00	0.096	100	0.310
Y3	75.0	0.00	0.096	100	0.310
Y4	93.3	-0.5 *	0.060	100	0.245
Center	50.0	0.00	0.116	100	0.341

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	29.5405882	in HG

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

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 19.4550$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 23.3948$$

$$F_P = V_{strav} / V_{scent} = 0.832$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 16.179\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	10:27	13:52
Barometric Pressure, in. Hg	29.57	29.56
Room Air Velocity, fpm	0	0
Room Air Temperature, °F	69	71
Room Relative Humidity, %	33.0	33.0
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

Dilution Tunnel

Date last cleaned	2/26/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

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

2 Create a smoking condition during start of pre-burn activities and using adequate lighting pointed upward and around 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 dilution tunnel flow turned-off, observe the flue draft gauge while turning the dilution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducement is occurring. Determine the cause (i.e. flue chimney too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 4

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E
Test Date: 3/1/24
Beginning Clock Time: 9:07

Coal Bed Range (lb):	3.1 (min)	3.9 (max)

Preburn Fuel Data

4 pieces @ 12 inches
4 pieces @ 17 inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

23.4	23.8					
21.2	22.3					
23.2	23.3					
22.0	19.4					

Avg Preburn Moisture (% DB): **22.33**

			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	14.8	-0.079	602	186	233	451	438	755	382	373	72
1	14.7	-0.08	587	157	233	438	429	767	369	376	72
2	14.7	-0.079	575	190	233	427	422	766	369	373	71
3	14.6	-0.079	563	223	232	416	414	761	370	369	72
4	14.6	-0.078	552	228	231	406	407	760	365	369	71
5	14.5	-0.079	542	232	230	397	400	751	360	366	71
6	14.5	-0.079	533	235	228	387	394	741	355	364	71
7	14.4	-0.078	524	237	226	378	388	732	351	360	71
8	14.3	-0.078	515	239	223	369	383	729	346	360	71
9	14.3	-0.078	507	240	221	364	378	731	342	360	71
10	14.1	-0.078	502	241	218	360	373	734	339	365	70
11	14	-0.08	498	241	216	356	368	766	336	373	70
12	13.9	-0.083	500	241	214	353	366	829	335	382	70
13	14.1	-0.086	506	241	212	352	366	876	335	402	70
14	13.9	-0.09	516	240	210	353	366	940	337	426	70
15	13.6	-0.091	529	240	209	356	366	978	340	441	70
16	13.4	-0.092	543	239	208	358	366	994	343	448	70
17	13.1	-0.093	558	238	207	361	367	1011	346	457	70
18	12.9	-0.094	572	238	206	365	369	1020	350	462	70
19	12.6	-0.094	584	236	206	370	371	1028	353	466	70
20	12.4	-0.094	596	235	207	374	375	1033	357	468	71
21	12.1	-0.093	606	234	207	375	376	1027	360	469	71
22	11.9	-0.094	616	233	207	375	378	1019	362	470	71
23	11.7	-0.094	625	232	208	377	382	1021	365	471	71
24	11.4	-0.094	633	231	208	378	385	1028	367	471	71
25	11.2	-0.092	641	229	208	378	389	1033	369	470	71
26	11	-0.092	648	228	208	378	392	1026	371	468	71
27	10.8	-0.092	655	227	208	379	395	1021	373	466	71
28	10.6	-0.092	660	226	208	380	398	1020	374	464	71
29	10.4	-0.091	665	225	208	383	401	1017	376	462	72
30	10.2	-0.091	670	224	208	386	403	1011	378	458	72
31	10	-0.09	672	223	207	390	406	991	380	452	72
32	9.8	-0.089	672	223	207	395	409	968	381	445	72
33	9.7	-0.088	670	222	207	397	410	954	381	439	72
34	9.6	-0.088	667	221	206	397	410	960	380	437	72
35	9.4	-0.088	665	220	206	401	413	960	381	436	72
36	9.3	-0.087	664	219	206	405	415	949	382	432	72
37	9.1	-0.087	662	219	205	405	416	960	381	431	72
38	9	-0.088	663	218	205	405	416	991	381	433	73
39	8.8	-0.089	667	218	205	408	419	1009	383	440	72
40	8.6	-0.088	671	217	204	410	422	1010	385	439	72
41	8.5	-0.088	676	216	204	412	423	1027	386	442	72
42	8.3	-0.089	681	216	204	414	426	1039	388	443	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	8.1	-0.089	687	215	203	421	432	1032	392	445	73
44	8	-0.088	691	214	203	423	435	1029	393	442	73
45	7.8	-0.088	695	214	203	423	439	1036	395	440	73
46	7.7	-0.088	699	213	203	424	444	1039	397	440	73
47	7.5	-0.088	701	212	203	424	448	1042	398	441	73
48	7.4	-0.088	704	212	203	425	452	1040	399	442	73
49	7.2	-0.088	706	211	203	429	457	1037	401	441	73
50	7	-0.089	706	211	203	435	461	1035	403	441	73
51	6.9	-0.089	707	210	204	439	464	1032	405	440	73
52	6.7	-0.087	708	210	204	444	465	1033	406	441	74
53	6.6	-0.088	708	209	204	449	467	1032	407	441	73
54	6.5	-0.088	708	209	205	453	469	1028	409	440	74
55	6.3	-0.088	708	209	205	457	472	1028	410	437	74
56	6.1	-0.087	707	208	206	461	477	1023	412	436	74
57	6	-0.087	706	208	206	466	479	1023	413	436	74
58	5.8	-0.088	705	208	207	471	481	1022	414	436	74
59	5.7	-0.088	704	207	208	476	484	1020	416	434	74
60	5.5	-0.087	704	207	209	481	486	1020	417	433	74
61	5.4	-0.086	704	208	210	486	488	1018	419	435	74
62	5.3	-0.087	704	207	211	491	489	1016	420	433	74
63	5.1	-0.087	704	207	213	495	491	1015	422	432	74
64	5	-0.086	703	207	214	497	492	1013	423	431	74
65	4.9	-0.085	703	207	216	500	494	1014	424	430	74
66	4.8	-0.087	703	207	217	502	497	1016	425	431	74
67	4.6	-0.087	704	197	218	505	500	1029	425	432	74
68	4.5	-0.086	705	190	220	508	510	1040	427	435	74
69	4.4	-0.086	707	185	222	513	519	1044	429	432	74
70	4.3	-0.086	708	183	225	517	524	1041	431	431	74
71	4.2	-0.085	709	183	227	519	526	1028	433	429	74
72	4.1	-0.084	708	183	229	524	529	1009	435	425	74
73	4	-0.084	705	183	232	528	530	987	436	421	74
74	4	-0.084	701	183	235	535	531	964	437	416	74
75	3.9	-0.082	696	183	238	539	531	941	437	410	74
76	3.8	-0.081	688	184	240	541	531	924	437	403	74
77	3.8	-0.081	681	184	243	542	530	910	436	399	74
78	3.7	-0.08	673	185	246	542	529	898	435	395	74
79	3.7	-0.08	666	186	249	540	527	889	434	392	74
80	3.6	-0.079	658	187	251	539	526	881	432	389	74

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:27
Test Length: 205 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 @	17.5	in. Hg
Post-Test	0.002	cfm @	17.5	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		15.6	**33.463**	**0.163**	**1.27**	**79.5**	**1.97**	**73.27**	**57.03**	**72.40**	**100.0**	**98.7**	**0.114**	**0.337**	**19.24**
Minimum	0.0	0.0	0.000	0.152	0.91	72	1.94	68	52	72	98.6	91	0.110	0.332	19.01
Max	15.6	0.2	33.463	0.165	1.29	82	1.99	74	60	75	104.9	159	0.116	0.341	20.21
0	15.6		0.000		0.91	72	1.94	68	60	75		145	0.113	0.336	20.21
1	15.5	0.1	0.152	0.152	1.29	72	1.97	69	53	75	99.1	159	0.110	0.332	19.94
2	15.4	0.1	0.315	0.163	1.29	72	1.97	70	52	74	104.9	116	0.115	0.339	19.79
3	15.3	0.1	0.477	0.162	1.28	72	1.97	70	52	74	100.9	109	0.114	0.338	19.54
4	15.3	0.0	0.640	0.163	1.27	72	1.97	70	52	74	101.5	106	0.115	0.339	19.46
5	15.2	0.1	0.802	0.162	1.27	73	1.96	70	52	73	100.8	104	0.113	0.336	19.37
6	15.1	0.1	0.966	0.164	1.29	73	1.97	71	52	73	102.1	103	0.113	0.336	19.26
7	15.0	0.1	1.129	0.163	1.29	73	1.97	71	52	73	101.6	103	0.114	0.338	19.30
8	14.9	0.1	1.291	0.162	1.29	73	1.97	71	52	73	100.7	103	0.115	0.339	19.38
9	14.7	0.2	1.454	0.163	1.29	73	1.97	71	52	73	101.2	103	0.113	0.336	19.34
10	14.6	0.1	1.616	0.162	1.29	73	1.95	71	52	73	100.9	103	0.113	0.336	19.25
11	14.5	0.1	1.778	0.162	1.28	73	1.95	71	53	73	101.1	104	0.114	0.338	19.31
12	14.3	0.2	1.941	0.163	1.28	73	1.94	72	53	72	101.4	104	0.115	0.339	19.40
13	14.2	0.1	2.104	0.163	1.29	73	1.94	72	53	73	100.9	102	0.115	0.339	19.42
14	14.1	0.1	2.267	0.163	1.28	74	1.94	72	53	73	100.8	102	0.114	0.338	19.36
15	14.0	0.1	2.429	0.162	1.29	74	1.94	72	53	73	100.1	101	0.115	0.339	19.36
16	13.9	0.1	2.592	0.163	1.28	74	1.94	72	53	72	100.8	101	0.113	0.336	19.31
17	13.8	0.1	2.754	0.162	1.27	74	1.94	72	53	72	100.4	101	0.114	0.338	19.26
18	13.7	0.1	2.916	0.162	1.28	74	1.95	72	53	72	100.4	100	0.114	0.338	19.30
19	13.6	0.1	3.078	0.162	1.28	74	1.96	72	53	72	100.1	100	0.115	0.339	19.33
20	13.5	0.1	3.241	0.163	1.27	74	1.95	72	53	72	100.8	100	0.113	0.336	19.29
21	13.5	0.0	3.403	0.162	1.28	75	1.97	72	53	72	100.0	100	0.116	0.341	19.33
22	13.4	0.1	3.566	0.163	1.28	75	1.97	73	54	72	100.3	99	0.114	0.338	19.36
23	13.3	0.1	3.729	0.163	1.27	75	1.97	73	54	72	100.2	99	0.115	0.339	19.31
24	13.2	0.1	3.891	0.162	1.28	75	1.97	73	54	72	99.9	99	0.113	0.336	19.27
25	13.1	0.1	4.054	0.163	1.27	75	1.97	73	54	72	100.8	99	0.113	0.336	19.19
26	12.9	0.2	4.215	0.161	1.28	75	1.96	73	54	72	99.6	99	0.115	0.339	19.27
27	12.8	0.1	4.378	0.163	1.27	76	1.97	73	54	72	100.4	99	0.114	0.338	19.31
28	12.7	0.1	4.540	0.162	1.28	76	1.97	73	54	72	99.8	99	0.113	0.336	19.23
29	12.6	0.1	4.702	0.162	1.28	76	1.96	73	54	72	99.9	99	0.115	0.339	19.27
30	12.6	0.0	4.865	0.163	1.28	76	1.97	73	55	72	100.3	99	0.114	0.338	19.31
31	12.5	0.1	5.028	0.163	1.28	76	1.96	73	55	72	100.0	98	0.116	0.341	19.35
32	12.4	0.1	5.191	0.163	1.28	76	1.97	73	55	72	99.7	98	0.115	0.339	19.38
33	12.3	0.1	5.353	0.162	1.28	76	1.97	73	55	72	99.3	98	0.114	0.338	19.30
34	12.2	0.1	5.516	0.163	1.27	77	1.97	73	55	72	100.2	98	0.113	0.336	19.21
35	12.1	0.1	5.678	0.162	1.27	77	1.97	73	55	72	99.6	98	0.115	0.339	19.25
36	12.0	0.1	5.841	0.163	1.27	77	1.96	73	55	72	100.0	98	0.114	0.338	19.30
37	11.9	0.1	6.003	0.162	1.28	77	1.97	73	55	72	99.3	98	0.115	0.339	19.30
38	11.8	0.1	6.166	0.163	1.28	77	1.97	73	55	72	99.8	98	0.115	0.339	19.34
39	11.7	0.1	6.328	0.162	1.28	77	1.97	73	55	72	99.2	98	0.114	0.338	19.30
40	11.6	0.1	6.491	0.163	1.28	77	1.97	73	56	72	100.1	97	0.113	0.336	19.20

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:27
Test Length: 205 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 @	17.5	in. Hg
Post-Test	0.002	cfm @	17.5	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	11.5	0.1	6.655	0.164	1.28	77	1.96	73	56	72	100.7	97	0.115	0.339	19.24
42	11.4	0.1	6.818	0.163	1.27	78	1.97	73	56	72	99.8	97	0.114	0.338	19.28
43	11.3	0.1	6.980	0.162	1.28	78	1.97	73	56	72	99.1	97	0.114	0.338	19.24
44	11.2	0.1	7.143	0.163	1.28	78	1.97	73	56	72	99.7	97	0.115	0.339	19.28
45	11.2	0.0	7.306	0.163	1.28	78	1.97	73	56	72	99.7	97	0.113	0.336	19.24
46	11.1	0.1	7.469	0.163	1.28	78	1.96	73	56	72	100.1	97	0.113	0.336	19.15
47	11.0	0.1	7.632	0.163	1.27	78	1.97	73	56	72	100.1	98	0.115	0.339	19.25
48	10.9	0.1	7.794	0.162	1.28	78	1.97	73	56	72	99.1	98	0.115	0.339	19.34
49	10.8	0.1	7.958	0.164	1.28	78	1.97	73	56	72	100.1	98	0.115	0.339	19.34
50	10.7	0.1	8.120	0.162	1.28	78	1.97	73	56	72	99.0	98	0.114	0.338	19.30
51	10.6	0.1	8.284	0.164	1.28	78	1.97	73	57	72	100.5	99	0.114	0.338	19.26
52	10.5	0.1	8.447	0.163	1.27	79	1.97	73	57	72	100.0	99	0.114	0.338	19.27
53	10.4	0.1	8.610	0.163	1.28	79	1.97	73	57	72	99.8	99	0.114	0.338	19.27
54	10.3	0.1	8.773	0.163	1.28	79	1.98	73	57	72	99.9	99	0.113	0.336	19.23
55	10.2	0.1	8.936	0.163	1.27	79	1.98	73	57	72	99.9	99	0.115	0.339	19.27
56	10.1	0.1	9.099	0.163	1.27	79	1.98	73	57	72	99.6	99	0.115	0.339	19.36
57	10.0	0.1	9.262	0.163	1.28	79	1.97	73	57	72	99.6	99	0.113	0.336	19.27
58	9.9	0.1	9.425	0.163	1.28	79	1.97	73	57	72	100.0	100	0.114	0.338	19.24
59	9.8	0.1	9.588	0.163	1.27	79	1.97	73	57	72	100.1	100	0.114	0.338	19.29
60	9.7	0.1	9.751	0.163	1.28	79	1.98	73	57	72	100.0	100	0.113	0.336	19.25
61	9.6	0.1	9.914	0.163	1.28	79	1.97	73	57	72	100.0	100	0.115	0.339	19.29
62	9.5	0.1	10.077	0.163	1.28	79	1.97	73	57	72	99.9	100	0.113	0.336	19.29
63	9.4	0.1	10.241	0.164	1.27	79	1.98	73	57	72	100.5	100	0.115	0.339	19.29
64	9.2	0.2	10.404	0.163	1.27	79	1.97	73	57	72	99.9	100	0.113	0.336	19.29
65	9.1	0.1	10.567	0.163	1.28	79	1.97	73	57	72	100.0	100	0.114	0.338	19.25
66	9.0	0.1	10.731	0.164	1.28	79	1.97	73	57	72	100.6	100	0.114	0.338	19.29
67	8.9	0.1	10.894	0.163	1.27	80	1.98	73	58	72	99.9	100	0.113	0.336	19.25
68	8.8	0.1	11.057	0.163	1.27	80	1.98	73	58	72	100.2	100	0.112	0.335	19.16
69	8.7	0.1	11.220	0.163	1.28	80	1.97	73	58	72	100.3	99	0.113	0.336	19.15
70	8.6	0.1	11.383	0.163	1.28	80	1.98	73	58	72	100.4	100	0.112	0.335	19.15
71	8.5	0.1	11.546	0.163	1.27	80	1.97	73	58	72	100.4	100	0.113	0.336	19.16
72	8.4	0.1	11.709	0.163	1.28	80	1.98	73	58	72	100.3	100	0.113	0.336	19.20
73	8.3	0.1	11.872	0.163	1.28	80	1.97	73	58	72	100.4	101	0.112	0.335	19.17
74	8.2	0.1	12.036	0.164	1.28	80	1.97	74	58	73	101.1	100	0.113	0.336	19.17
75	8.1	0.1	12.199	0.163	1.28	80	1.98	74	58	72	100.4	100	0.112	0.335	19.16
76	8.0	0.1	12.363	0.164	1.27	80	1.98	74	58	73	101.1	101	0.113	0.336	19.17
77	7.9	0.1	12.527	0.164	1.28	80	1.98	74	58	73	101.0	101	0.113	0.336	19.22
78	7.8	0.1	12.690	0.163	1.28	80	1.98	74	58	73	100.2	101	0.114	0.338	19.26
79	7.7	0.1	12.853	0.163	1.27	80	1.97	74	58	73	100.0	100	0.113	0.336	19.25
80	7.6	0.1	13.016	0.163	1.27	80	1.97	74	58	72	100.1	101	0.113	0.336	19.21
81	7.5	0.1	13.179	0.163	1.27	80	1.97	74	58	72	100.2	100	0.113	0.336	19.21
82	7.4	0.1	13.343	0.164	1.28	80	1.98	74	58	72	100.8	100	0.113	0.336	19.20
83	7.3	0.1	13.506	0.163	1.28	80	1.98	74	58	72	100.1	100	0.114	0.338	19.25
84	7.2	0.1	13.669	0.163	1.28	80	1.97	74	58	73	99.9	101	0.114	0.338	19.30

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:27
Test Length: 205 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 @	17.5	in. Hg
Post-Test	0.002	cfm @	17.5	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	7.1	0.1	13.833	0.164	1.28	80	1.98	74	58	73	100.6	100	0.112	0.335	19.21
86	7.0	0.1	13.996	0.163	1.28	80	1.98	74	58	73	100.2	101	0.114	0.338	19.21
87	6.9	0.1	14.160	0.164	1.28	80	1.98	74	58	72	100.6	101	0.115	0.339	19.35
88	6.8	0.1	14.323	0.163	1.28	80	1.97	74	58	73	99.7	100	0.113	0.336	19.30
89	6.7	0.1	14.487	0.164	1.27	80	1.98	74	58	73	100.7	101	0.112	0.335	19.17
90	6.7	0.0	14.651	0.164	1.28	81	1.98	74	58	73	101.0	100	0.113	0.336	19.17
91	6.6	0.1	14.815	0.164	1.28	81	1.98	74	58	73	100.7	100	0.113	0.336	19.20
92	6.5	0.1	14.978	0.163	1.28	81	1.97	74	58	73	99.8	100	0.115	0.339	19.29
93	6.4	0.1	15.141	0.163	1.28	81	1.98	74	58	73	99.4	100	0.114	0.338	19.33
94	6.3	0.1	15.305	0.164	1.27	81	1.98	74	58	73	100.2	100	0.113	0.336	19.25
95	6.2	0.1	15.468	0.163	1.28	81	1.98	74	58	73	99.9	100	0.113	0.336	19.20
96	6.1	0.1	15.631	0.163	1.28	81	1.97	74	58	72	100.0	100	0.113	0.336	19.20
97	6.0	0.1	15.795	0.164	1.27	81	1.98	74	58	73	100.6	100	0.113	0.336	19.20
98	5.9	0.1	15.958	0.163	1.28	81	1.98	74	58	72	99.9	100	0.114	0.338	19.25
99	5.8	0.1	16.122	0.164	1.28	81	1.97	74	58	72	100.3	100	0.114	0.338	19.29
100	5.7	0.1	16.285	0.163	1.28	81	1.97	74	58	72	99.6	100	0.114	0.338	19.29
101	5.6	0.1	16.449	0.164	1.28	81	1.97	74	58	72	100.3	100	0.113	0.336	19.25
102	5.5	0.1	16.612	0.163	1.28	81	1.97	74	58	72	99.8	100	0.114	0.338	19.25
103	5.4	0.1	16.776	0.164	1.28	81	1.98	74	58	72	100.3	100	0.114	0.338	19.29
104	5.3	0.1	16.940	0.164	1.28	81	1.98	74	59	72	100.2	100	0.114	0.338	19.29
105	5.2	0.1	17.104	0.164	1.27	81	1.98	74	59	72	100.3	100	0.113	0.336	19.25
106	5.1	0.1	17.267	0.163	1.27	81	1.98	74	59	72	99.9	100	0.113	0.336	19.20
107	5.0	0.1	17.431	0.164	1.28	81	1.98	74	59	73	100.6	101	0.114	0.338	19.25
108	4.9	0.1	17.594	0.163	1.27	81	1.98	74	59	73	99.8	101	0.114	0.338	19.31
109	4.8	0.1	17.758	0.164	1.27	81	1.98	74	59	72	100.5	101	0.112	0.335	19.22
110	4.7	0.1	17.921	0.163	1.28	81	1.97	74	59	72	100.0	101	0.115	0.339	19.26
111	4.6	0.1	18.084	0.163	1.27	81	1.98	74	59	72	99.6	101	0.114	0.338	19.35
112	4.5	0.1	18.248	0.164	1.27	81	1.97	74	59	72	100.1	101	0.114	0.338	19.31
113	4.4	0.1	18.411	0.163	1.27	81	1.98	74	59	72	99.9	101	0.112	0.335	19.22
114	4.3	0.1	18.574	0.163	1.27	81	1.98	74	59	72	100.1	101	0.114	0.338	19.22
115	4.2	0.1	18.738	0.164	1.27	81	1.98	74	59	73	100.6	101	0.113	0.336	19.26
116	4.1	0.1	18.901	0.163	1.28	81	1.98	74	59	73	100.0	101	0.113	0.336	19.22
117	4.0	0.1	19.065	0.164	1.28	81	1.98	74	59	73	100.8	101	0.112	0.335	19.18
118	3.9	0.1	19.229	0.164	1.28	81	1.98	74	59	72	100.9	101	0.113	0.336	19.18
119	3.9	0.0	19.393	0.164	1.28	81	1.98	74	59	73	100.8	101	0.113	0.336	19.22
120	3.8	0.1	19.556	0.163	1.28	81	1.98	74	59	73	100.2	101	0.112	0.335	19.18
121	3.7	0.1	19.719	0.163	1.27	81	1.98	74	59	73	100.2	101	0.114	0.338	19.22
122	3.6	0.1	19.883	0.164	1.27	81	1.98	74	59	73	100.6	101	0.113	0.336	19.26
123	3.5	0.1	20.046	0.163	1.27	81	1.98	74	59	73	99.9	101	0.114	0.338	19.26
124	3.4	0.1	20.209	0.163	1.27	81	1.99	74	59	73	100.0	101	0.112	0.335	19.22
125	3.3	0.1	20.373	0.164	1.28	81	1.98	74	59	73	100.6	101	0.115	0.339	19.26
126	3.3	0.0	20.536	0.163	1.27	81	1.98	74	59	73	99.9	101	0.112	0.335	19.26
127	3.2	0.1	20.699	0.163	1.27	81	1.98	74	59	73	100.2	101	0.112	0.335	19.14
128	3.1	0.1	20.863	0.164	1.28	81	1.98	74	59	73	100.8	101	0.115	0.339	19.26

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:27
Test Length: 205 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 @	17.5	in. Hg
Post-Test	0.002	cfm @	17.5	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	3.0	0.1	21.026	0.163	1.27	81	1.98	74	59	73	99.6	100	0.114	0.338	19.34
130	2.9	0.1	21.190	0.164	1.28	81	1.99	74	59	73	100.0	100	0.114	0.338	19.29
131	2.9	0.0	21.353	0.163	1.28	81	1.99	74	59	73	99.6	100	0.114	0.338	19.29
132	2.8	0.1	21.517	0.164	1.28	81	1.98	74	59	73	100.3	100	0.113	0.336	19.25
133	2.7	0.1	21.681	0.164	1.28	81	1.97	74	59	73	100.4	99	0.113	0.336	19.19
134	2.7	0.0	21.845	0.164	1.27	81	1.98	74	59	73	100.5	99	0.113	0.336	19.19
135	2.6	0.1	22.008	0.163	1.28	81	1.98	74	59	73	99.9	99	0.113	0.336	19.19
136	2.6	0.0	22.172	0.164	1.28	81	1.98	74	59	73	100.5	99	0.113	0.336	19.19
137	2.5	0.1	22.335	0.163	1.27	81	1.98	74	59	73	99.8	99	0.114	0.338	19.23
138	2.4	0.1	22.498	0.163	1.27	81	1.98	74	59	73	99.5	98	0.114	0.338	19.26
139	2.4	0.0	22.662	0.164	1.28	81	1.98	74	59	73	100.0	98	0.114	0.338	19.25
140	2.3	0.1	22.825	0.163	1.27	81	1.99	74	59	73	99.5	98	0.113	0.336	19.21
141	2.3	0.0	22.989	0.164	1.28	81	1.98	74	59	73	100.0	98	0.116	0.341	19.30
142	2.2	0.1	23.152	0.163	1.28	81	1.97	74	58	73	98.9	98	0.115	0.339	19.38
143	2.1	0.1	23.316	0.164	1.27	81	1.98	74	58	73	99.4	98	0.115	0.339	19.34
144	2.1	0.0	23.479	0.163	1.28	81	1.98	74	58	73	99.2	98	0.113	0.336	19.25
145	2.0	0.1	23.643	0.164	1.28	81	1.97	74	58	73	100.1	98	0.114	0.338	19.21
146	2.0	0.0	23.806	0.163	1.28	81	1.98	74	58	73	99.7	98	0.112	0.335	19.17
147	1.9	0.1	23.970	0.164	1.28	81	1.98	74	58	73	100.5	97	0.113	0.336	19.12
148	1.9	0.0	24.134	0.164	1.27	81	1.98	74	58	73	100.2	97	0.115	0.339	19.24
149	1.8	0.1	24.298	0.164	1.27	81	1.97	74	58	73	99.7	97	0.115	0.339	19.32
150	1.8	0.0	24.462	0.164	1.27	81	1.98	74	58	73	99.6	97	0.114	0.338	19.28
151	1.7	0.1	24.625	0.163	1.28	81	1.98	74	58	73	99.2	96	0.113	0.336	19.19
152	1.7	0.0	24.789	0.164	1.27	81	1.98	74	58	72	100.0	96	0.114	0.338	19.18
153	1.6	0.1	24.952	0.163	1.27	81	1.98	74	58	72	99.6	96	0.111	0.333	19.09
154	1.6	0.0	25.115	0.163	1.28	81	1.98	74	58	73	99.7	96	0.115	0.339	19.13
155	1.5	0.1	25.279	0.164	1.28	81	1.98	74	58	73	99.9	96	0.114	0.338	19.26
156	1.5	0.0	25.442	0.163	1.27	81	1.97	74	58	73	99.2	96	0.113	0.336	19.18
157	1.5	0.0	25.605	0.163	1.27	81	1.97	74	58	73	99.5	96	0.113	0.336	19.13
158	1.4	0.1	25.769	0.164	1.27	81	1.98	74	58	73	100.2	96	0.113	0.336	19.13
159	1.4	0.0	25.933	0.164	1.27	81	1.97	74	58	72	100.2	95	0.113	0.336	19.13
160	1.3	0.1	26.096	0.163	1.28	81	1.98	74	58	72	99.3	95	0.115	0.339	19.20
161	1.3	0.0	26.260	0.164	1.28	81	1.98	74	58	72	99.7	95	0.113	0.336	19.20
162	1.2	0.1	26.424	0.164	1.28	81	1.98	74	58	72	99.8	95	0.114	0.338	19.16
163	1.2	0.0	26.588	0.164	1.28	82	1.98	74	58	72	99.8	95	0.113	0.336	19.16
164	1.2	0.0	26.752	0.164	1.28	82	1.98	74	58	72	99.8	95	0.114	0.338	19.16
165	1.1	0.1	26.915	0.163	1.28	82	1.98	74	58	72	99.0	95	0.114	0.338	19.20
166	1.1	0.0	27.079	0.164	1.27	82	1.98	74	58	73	99.6	95	0.113	0.336	19.16
167	1.1	0.0	27.243	0.164	1.27	82	1.97	74	58	72	99.8	94	0.113	0.336	19.11
168	1.0	0.1	27.406	0.163	1.27	82	1.98	74	58	72	99.3	94	0.113	0.336	19.10
169	1.0	0.0	27.569	0.163	1.27	82	1.98	74	58	72	99.3	94	0.113	0.336	19.10
170	1.0	0.0	27.733	0.164	1.27	82	1.98	74	58	72	99.6	94	0.116	0.341	19.23
171	0.9	0.1	27.897	0.164	1.28	82	1.98	74	58	72	99.2	94	0.113	0.336	19.23
172	0.9	0.0	28.060	0.163	1.27	82	1.98	73	58	72	98.8	94	0.114	0.338	19.14

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:27
Test Length: 205 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 @ 17.5 in. Hg
Post-Test 0.002 cfm @ 17.5 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	0.9	0.0	28.223	0.163	1.28	82	1.98	73	58	72	99.1	94	0.113	0.336	19.14
174	0.9	0.0	28.387	0.164	1.28	82	1.97	73	58	72	99.7	94	0.114	0.338	19.14
175	0.8	0.1	28.551	0.164	1.28	82	1.98	73	58	72	99.7	94	0.113	0.336	19.14
176	0.8	0.0	28.715	0.164	1.27	82	1.98	73	58	72	99.8	94	0.113	0.336	19.10
177	0.8	0.0	28.878	0.163	1.27	82	1.98	73	58	72	99.1	93	0.114	0.338	19.13
178	0.8	0.0	29.042	0.164	1.28	82	1.98	73	58	72	99.7	93	0.112	0.335	19.08
179	0.7	0.1	29.206	0.164	1.27	82	1.98	73	58	72	99.7	93	0.115	0.339	19.13
180	0.7	0.0	29.370	0.164	1.27	82	1.98	73	58	72	99.2	93	0.115	0.339	19.25
181	0.7	0.0	29.534	0.164	1.27	82	1.98	73	57	72	99.1	93	0.113	0.336	19.17
182	0.7	0.0	29.698	0.164	1.28	82	1.97	73	57	72	99.7	93	0.112	0.335	19.04
183	0.6	0.1	29.861	0.163	1.27	82	1.98	73	57	72	99.2	92	0.114	0.338	19.07
184	0.6	0.0	30.025	0.164	1.27	82	1.97	73	57	72	99.5	92	0.114	0.338	19.15
185	0.6	0.0	30.188	0.163	1.27	82	1.97	73	57	72	98.7	93	0.114	0.338	19.16
186	0.6	0.0	30.352	0.164	1.27	82	1.97	73	57	72	99.2	92	0.115	0.339	19.20
187	0.5	0.1	30.516	0.164	1.27	82	1.97	73	57	72	99.0	92	0.114	0.338	19.19
188	0.5	0.0	30.679	0.163	1.27	82	1.98	73	57	72	98.6	92	0.114	0.338	19.15
189	0.5	0.0	30.843	0.164	1.28	82	1.98	73	57	72	99.5	92	0.112	0.335	19.07
190	0.5	0.0	31.006	0.163	1.28	82	1.98	73	57	72	99.0	92	0.115	0.339	19.11
191	0.4	0.1	31.170	0.164	1.27	82	1.97	73	57	72	99.4	92	0.113	0.336	19.15
192	0.4	0.0	31.334	0.164	1.28	82	1.98	73	57	72	99.4	92	0.114	0.338	19.11
193	0.4	0.0	31.497	0.163	1.28	82	1.97	73	57	72	98.8	92	0.114	0.338	19.15
194	0.3	0.1	31.661	0.164	1.28	82	1.97	73	57	72	99.3	92	0.114	0.338	19.15
195	0.3	0.0	31.825	0.164	1.28	82	1.98	73	57	72	99.4	92	0.113	0.336	19.11
196	0.3	0.0	31.990	0.165	1.27	82	1.98	73	57	72	100.0	91	0.114	0.338	19.10
197	0.3	0.0	32.153	0.163	1.28	82	1.98	73	57	72	98.8	91	0.113	0.336	19.09
198	0.2	0.1	32.317	0.164	1.28	82	1.97	73	57	72	99.5	91	0.113	0.336	19.05
199	0.2	0.0	32.481	0.164	1.28	82	1.98	73	57	72	99.4	91	0.115	0.339	19.13
200	0.2	0.0	32.645	0.164	1.27	82	1.98	73	57	72	99.2	91	0.113	0.336	19.13
201	0.2	0.0	32.808	0.163	1.27	82	1.98	73	57	72	98.9	91	0.112	0.335	19.01
202	0.2	0.0	32.972	0.164	1.27	82	1.98	73	57	72	99.7	91	0.114	0.338	19.05
203	0.1	0.1	33.135	0.163	1.28	82	1.98	73	57	72	98.8	91	0.114	0.338	19.13
204	0.1	0.0	33.299	0.164	1.27	82	1.97	73	57	72	99.4	91	0.112	0.335	19.05
205	0.0	0.1	33.463	0.164	1.27	82	1.98	73	57	72	99.6	91	0.114	0.338	19.05

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time: 205 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18 in. Hg
Post-Test 0.001 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)*
Tot / Avg	**33.071**	**0.161**	**0.95**	**79.8**	**2.20**	**73.51**	**58.64**	**100.0**	**563.5**	**193.6**	**215.6**	**420.4**	**419.0**	**669.7**	**107.4**
Minimum	0.000	0.156	0.86	73	2.10	68	55	98.5	429	172	175	338	335	514	321
Max	33.071	0.163	0.95	82	2.20	74	60	104.0	669	243	267	531	516	767	433
0	0.000		0.86	73	2.10	68	61		669	191	258	531	516	753	433
1	0.156	0.156	0.96	73	2.20	70	57	102.8	667	199	264	516	502	743	430
2	0.316	0.160	0.95	73	2.20	71	56	104.0	640	199	267	496	488	719	418
3	0.476	0.160	0.95	73	2.20	71	56	100.7	628	218	267	480	476	723	414
4	0.637	0.161	0.94	73	2.20	71	56	101.3	619	232	266	467	465	725	410
5	0.797	0.160	1.05	73	2.30	71	56	100.7	612	231	264	455	455	722	403
6	0.960	0.163	0.97	73	2.20	72	56	102.8	605	236	262	445	446	712	399
7	1.122	0.162	0.96	73	2.20	72	55	102.3	599	237	259	436	438	705	394
8	1.283	0.161	0.96	73	2.20	72	55	101.3	596	240	255	428	431	709	390
9	1.444	0.161	0.96	73	2.20	72	55	101.2	594	239	251	421	425	712	386
10	1.604	0.160	0.96	74	2.20	72	55	100.8	593	241	248	415	420	716	383
11	1.766	0.162	0.96	74	2.20	72	55	102.2	594	242	244	411	416	724	381
12	1.926	0.160	0.96	74	2.20	72	55	100.6	595	242	241	405	410	723	379
13	2.087	0.161	0.95	74	2.20	73	55	100.8	593	243	239	398	405	712	376
14	2.248	0.161	0.95	74	2.20	73	55	100.7	589	243	236	393	400	705	372
15	2.408	0.160	0.95	74	2.20	73	55	100.1	585	243	233	387	394	697	368
16	2.568	0.160	0.95	74	2.20	73	55	100.2	580	242	230	381	388	689	364
17	2.730	0.162	0.95	75	2.20	73	55	101.6	575	242	227	375	382	681	360
18	2.890	0.160	0.95	75	2.20	73	55	100.2	569	241	224	369	377	674	356
19	3.050	0.160	0.95	75	2.20	73	55	99.9	563	241	221	365	372	667	352
20	3.211	0.161	0.95	75	2.20	73	55	100.6	557	240	218	361	367	662	349
21	3.372	0.161	0.94	75	2.20	73	56	100.6	551	239	215	357	363	656	345
22	3.532	0.160	0.95	75	2.20	73	56	99.7	546	238	212	354	359	652	342
23	3.693	0.161	0.95	75	2.20	73	56	100.2	542	237	210	350	355	648	339
24	3.855	0.162	0.95	76	2.20	73	56	101.0	539	235	207	347	352	646	336
25	4.014	0.159	0.95	76	2.20	73	56	99.4	536	234	205	345	351	646	334
26	4.175	0.161	0.95	76	2.20	73	56	100.6	533	233	203	343	349	647	332
27	4.336	0.161	0.95	76	2.20	73	56	100.3	533	232	201	342	347	649	331
28	4.497	0.161	0.94	76	2.20	73	56	100.4	532	230	199	341	345	647	329
29	4.657	0.160	0.95	76	2.20	73	56	99.9	531	229	197	340	343	644	328
30	4.817	0.160	0.95	77	2.20	73	56	99.6	530	228	195	339	342	640	327
31	4.979	0.162	0.94	77	2.20	73	56	100.4	529	226	193	338	340	639	325
32	5.139	0.160	0.95	77	2.20	73	57	98.9	528	225	192	338	339	637	324
33	5.300	0.161	0.95	77	2.20	73	57	99.7	528	224	190	338	337	636	323
34	5.462	0.162	0.95	77	2.20	73	57	100.7	527	222	189	338	337	635	323
35	5.622	0.160	0.95	77	2.20	73	57	99.6	528	221	188	338	336	634	322
36	5.782	0.160	0.95	77	2.20	73	57	99.4	528	219	186	339	335	634	321
37	5.944	0.162	0.95	77	2.20	73	57	100.5	529	218	185	340	335	636	321
38	6.105	0.161	0.95	78	2.20	73	57	99.7	530	217	184	341	335	638	321
39	6.265	0.160	0.95	78	2.20	73	57	99.0	533	216	183	343	336	640	322
40	6.426	0.161	0.95	78	2.20	73	57	99.9	535	215	182	345	336	642	323

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time: 205 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18 in. Hg
Post-Test 0.001 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)
41	6.588	0.162	0.95	78	2.20	73	57	100.6	538	214	181	347	337	645	323
42	6.748	0.160	0.95	78	2.20	73	57	99.1	541	213	180	349	338	645	324
43	6.909	0.161	0.95	78	2.20	73	58	99.7	544	212	179	350	339	646	325
44	7.070	0.161	0.95	78	2.20	73	58	99.7	545	211	179	351	340	647	325
45	7.232	0.162	0.95	78	2.20	73	58	100.4	546	210	178	350	340	648	325
46	7.392	0.160	0.95	78	2.20	73	58	99.4	547	209	177	350	340	648	325
47	7.553	0.161	0.95	78	2.20	73	58	100.1	546	208	177	353	340	648	325
48	7.715	0.162	0.95	79	2.20	73	58	100.3	548	207	176	354	339	653	325
49	7.876	0.161	0.95	79	2.20	73	58	99.3	551	206	176	355	339	661	325
50	8.037	0.161	0.95	79	2.20	73	58	99.4	555	205	176	357	340	668	327
51	8.198	0.161	0.95	79	2.20	73	58	99.7	561	204	176	359	340	676	328
52	8.360	0.162	0.95	79	2.20	73	58	100.5	566	203	175	361	341	682	329
53	8.520	0.160	0.95	79	2.20	73	58	99.2	572	203	175	362	342	689	331
54	8.682	0.162	0.95	79	2.20	74	58	100.6	578	202	175	364	343	693	332
55	8.843	0.161	0.95	79	2.20	74	58	100.0	582	201	175	366	344	699	334
56	9.004	0.161	0.95	79	2.20	74	58	99.6	587	200	175	368	346	702	335
57	9.165	0.161	0.95	79	2.20	74	58	99.6	590	199	175	370	347	702	336
58	9.326	0.161	0.95	79	2.20	74	58	100.0	593	199	176	373	350	700	338
59	9.488	0.162	0.95	79	2.20	74	59	100.7	596	198	176	376	353	709	340
60	9.649	0.161	0.95	79	2.20	74	59	100.0	599	197	176	378	356	708	341
61	9.810	0.161	0.95	79	2.20	74	59	100.0	602	196	176	381	359	710	343
62	9.972	0.162	0.95	79	2.20	74	59	100.6	604	195	177	382	362	708	344
63	10.133	0.161	0.95	80	2.20	74	59	99.8	606	195	177	385	365	706	346
64	10.294	0.161	0.95	80	2.20	74	59	99.7	607	194	177	389	368	704	347
65	10.455	0.161	0.95	80	2.20	74	59	99.9	608	193	177	392	369	703	348
66	10.617	0.162	0.95	80	2.20	74	59	100.5	609	193	178	395	371	704	349
67	10.778	0.161	0.95	80	2.20	74	59	99.9	611	192	178	397	373	706	350
68	10.939	0.161	0.95	80	2.20	74	59	100.2	612	192	178	397	375	708	351
69	11.100	0.161	0.95	80	2.20	74	59	100.3	614	191	178	397	378	715	352
70	11.262	0.162	0.95	80	2.20	74	59	101.0	617	191	179	396	385	725	354
71	11.423	0.161	0.95	80	2.20	74	59	100.4	619	190	179	396	394	730	356
72	11.584	0.161	0.95	80	2.20	74	59	100.3	621	189	179	396	403	733	358
73	11.746	0.162	0.95	80	2.20	74	59	101.0	622	189	180	396	411	736	360
74	11.907	0.161	0.95	80	2.20	74	59	100.5	623	189	180	396	417	737	361
75	12.068	0.161	0.95	80	2.20	74	59	100.4	624	188	181	396	422	738	362
76	12.229	0.161	0.95	80	2.20	74	59	100.5	625	187	181	397	426	742	363
77	12.392	0.163	0.95	80	2.20	74	59	101.7	625	187	181	397	430	743	364
78	12.553	0.161	0.95	80	2.20	74	59	100.2	625	186	182	398	434	746	365
79	12.714	0.161	0.95	80	2.20	74	59	100.0	626	186	183	397	438	747	366
80	12.875	0.161	0.95	80	2.20	74	59	100.1	626	186	183	397	441	749	367
81	13.037	0.162	0.95	80	2.20	74	59	100.9	627	185	184	398	444	750	368
82	13.198	0.161	0.95	80	2.20	74	59	100.2	627	185	184	398	445	752	368
83	13.360	0.162	0.95	81	2.20	74	60	100.6	627	184	185	398	446	754	368
84	13.521	0.161	0.95	81	2.20	74	59	99.7	628	184	185	397	447	755	368

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time: 205 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18 in. Hg
Post-Test 0.001 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)
85	13.683	0.162	0.95	81	2.20	74	60	100.4	628	183	186	397	448	755	368
86	13.844	0.161	0.95	81	2.20	74	60	100.0	627	183	186	397	449	753	368
87	14.006	0.162	0.95	81	2.20	74	60	100.4	627	183	187	397	449	751	369
88	14.168	0.162	0.95	81	2.20	74	60	100.1	626	182	187	396	446	748	367
89	14.330	0.162	0.95	81	2.20	74	60	100.6	625	182	188	396	443	744	367
90	14.491	0.161	0.95	81	2.20	74	60	100.3	624	182	188	396	440	741	366
91	14.652	0.161	0.95	81	2.20	74	60	100.1	621	182	189	397	437	738	365
92	14.815	0.163	0.95	81	2.20	74	60	101.0	619	181	189	398	435	734	364
93	14.976	0.161	0.95	81	2.20	74	60	99.5	617	181	190	400	433	730	364
94	15.137	0.161	0.95	81	2.20	74	60	99.6	614	181	190	403	431	726	364
95	15.298	0.161	0.95	81	2.20	74	60	99.9	611	181	191	407	428	723	364
96	15.461	0.163	0.95	81	2.20	74	60	101.2	607	180	191	412	425	720	363
97	15.622	0.161	0.95	81	2.20	74	60	100.0	604	180	192	418	423	719	363
98	15.783	0.161	0.95	81	2.20	74	60	99.9	602	180	192	424	421	719	364
99	15.945	0.162	0.95	81	2.20	74	60	100.3	601	180	193	430	420	720	365
100	16.108	0.163	0.95	81	2.20	74	60	100.8	602	180	194	436	418	721	366
101	16.269	0.161	0.95	81	2.20	74	60	99.7	603	179	195	441	417	723	367
102	16.430	0.161	0.95	81	2.20	74	60	99.8	605	179	196	445	416	724	368
103	16.592	0.162	0.95	81	2.20	74	60	100.3	607	179	196	450	415	724	369
104	16.754	0.162	0.95	81	2.20	74	60	100.2	610	179	197	454	414	725	371
105	16.915	0.161	0.95	81	2.20	74	60	99.7	612	179	198	458	414	726	372
106	17.076	0.161	0.95	81	2.20	74	60	99.9	614	179	199	463	414	725	374
107	17.238	0.162	0.95	81	2.20	74	60	100.6	616	179	200	467	413	725	375
108	17.400	0.162	0.95	81	2.20	74	60	100.4	617	179	200	471	413	725	376
109	17.561	0.161	0.95	81	2.20	74	60	99.9	619	179	201	475	413	725	377
110	17.723	0.162	0.95	81	2.20	74	60	100.6	620	178	202	479	414	727	379
111	17.885	0.162	0.95	81	2.20	74	60	100.3	620	178	203	483	414	730	380
112	18.046	0.161	0.94	81	2.20	74	60	99.5	622	178	204	487	415	736	381
113	18.207	0.161	0.95	81	2.20	74	60	99.9	623	178	204	491	416	742	382
114	18.369	0.162	0.95	81	2.20	74	60	100.7	625	178	205	495	416	747	384
115	18.531	0.162	0.95	81	2.20	74	60	100.6	628	178	206	498	418	752	386
116	18.692	0.161	0.95	81	2.20	74	60	100.0	630	178	207	499	419	755	387
117	18.854	0.162	0.95	81	2.20	74	60	100.8	632	178	208	502	420	760	388
118	19.015	0.161	0.95	81	2.20	74	60	100.3	634	178	209	503	422	763	389
119	19.177	0.162	0.95	81	2.20	74	60	100.8	636	178	210	504	424	766	390
120	19.338	0.161	0.95	81	2.20	74	60	100.2	638	178	211	505	426	767	392
121	19.499	0.161	0.95	81	2.20	74	60	100.2	638	178	212	506	428	764	392
122	19.661	0.162	0.95	81	2.20	74	60	100.6	638	178	213	508	430	759	393
123	19.823	0.162	0.95	81	2.20	74	60	100.5	637	178	214	510	432	754	394
124	19.984	0.161	0.95	81	2.20	74	60	100.0	635	178	215	511	434	750	395
125	20.145	0.161	0.95	81	2.20	74	60	100.0	634	178	216	513	436	744	395
126	20.307	0.162	0.95	81	2.20	74	60	100.5	631	178	218	514	439	738	396
127	20.468	0.161	0.95	81	2.20	74	60	100.2	628	178	220	514	441	733	396
128	20.630	0.162	0.95	81	2.20	74	60	100.8	624	178	221	514	444	729	396

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time: 205 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18 in. Hg
Post-Test 0.001 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)
129	20.791	0.161	0.95	81	2.20	74	60	99.6	620	178	223	514	446	725	396
130	20.953	0.162	0.95	81	2.20	74	60	100.0	617	179	224	514	448	722	396
131	21.114	0.161	0.95	81	2.20	74	60	99.6	612	179	226	512	450	719	396
132	21.276	0.162	0.95	81	2.20	74	60	100.3	608	179	228	511	451	715	395
133	21.437	0.161	0.95	82	2.20	74	60	99.7	604	180	229	510	453	712	395
134	21.599	0.162	0.95	82	2.20	74	60	100.3	599	180	230	507	454	708	394
135	21.760	0.161	0.95	82	2.20	74	60	99.7	596	181	232	505	454	705	394
136	21.921	0.161	0.95	82	2.20	74	60	99.7	592	181	233	503	454	703	393
137	22.083	0.162	0.95	82	2.20	74	60	100.2	588	181	234	501	455	700	392
138	22.245	0.162	0.95	82	2.20	74	60	99.9	585	181	235	498	456	697	391
139	22.406	0.161	0.95	82	2.20	74	60	99.2	582	181	236	497	458	693	391
140	22.568	0.162	0.95	82	2.20	74	60	99.9	578	179	237	495	459	689	390
141	22.729	0.161	0.95	82	2.20	74	60	99.2	575	179	238	494	461	685	389
142	22.891	0.162	0.95	82	2.20	74	60	99.4	572	179	238	494	463	681	389
143	23.052	0.161	0.95	82	2.20	74	60	98.7	569	180	239	493	464	677	389
144	23.214	0.162	0.95	82	2.20	74	60	99.6	566	180	241	493	466	673	389
145	23.376	0.162	0.95	82	2.20	74	60	99.9	564	180	241	492	468	669	389
146	23.537	0.161	0.95	82	2.20	74	60	99.5	561	181	243	491	470	666	389
147	23.699	0.162	0.95	82	2.20	74	60	100.3	559	181	243	490	472	662	389
148	23.860	0.161	0.95	82	2.20	74	60	99.4	557	182	245	489	473	658	389
149	24.022	0.162	0.95	82	2.20	74	60	99.5	554	183	245	487	475	654	389
150	24.183	0.161	0.95	82	2.20	74	60	98.8	551	183	246	485	476	651	388
151	24.345	0.162	0.95	82	2.20	74	60	99.7	548	184	247	484	477	646	388
152	24.506	0.161	0.95	82	2.20	74	60	99.2	545	184	248	481	479	642	387
153	24.668	0.162	0.95	82	2.20	74	60	100.1	542	185	249	480	479	640	387
154	24.829	0.161	0.95	82	2.20	74	60	99.6	540	185	250	477	480	637	386
155	24.991	0.162	0.95	82	2.20	74	60	99.7	537	186	251	473	480	634	385
156	25.152	0.161	0.95	82	2.20	74	60	99.0	534	186	252	470	481	631	385
157	25.314	0.162	0.95	82	2.20	74	60	100.0	532	185	252	467	482	628	384
158	25.475	0.161	0.95	82	2.20	74	60	99.5	529	185	253	464	482	625	383
159	25.637	0.162	0.95	82	2.20	74	60	100.0	526	183	253	461	483	622	381
160	25.799	0.162	0.95	82	2.20	74	60	99.7	524	182	253	458	483	619	380
161	25.961	0.162	0.95	82	2.20	74	59	99.5	521	182	253	455	484	618	379
162	26.122	0.161	0.95	82	2.20	74	59	99.0	519	182	254	453	484	616	378
163	26.283	0.161	0.95	82	2.20	74	59	99.2	517	183	254	450	483	615	377
164	26.446	0.163	0.95	82	2.20	74	59	100.4	514	183	254	448	482	613	376
165	26.607	0.161	0.94	82	2.20	74	59	99.0	512	183	254	445	482	611	375
166	26.768	0.161	0.95	82	2.20	74	59	99.0	510	184	254	443	482	609	375
167	26.930	0.162	0.95	82	2.20	74	59	99.8	508	184	254	440	482	607	374
168	27.092	0.162	0.95	82	2.20	74	59	99.9	506	185	253	437	482	605	373
169	27.254	0.162	0.94	82	2.20	74	59	99.9	503	185	253	434	482	602	371
170	27.415	0.161	0.95	82	2.20	74	59	99.0	501	186	251	431	481	600	370
171	27.576	0.161	0.95	82	2.20	74	59	98.6	499	186	251	428	479	598	369
172	27.739	0.163	0.95	82	2.20	74	59	100.1	497	186	250	425	477	595	367

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 4 **Test Date:** 3/1/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time: 205 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0.001 cfm @ 18 in. Hg
Post-Test 0.001 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)
173	27.900	0.161	0.95	82	2.20	74	59	99.1	494	186	249	423	475	593	365
174	28.061	0.161	0.95	82	2.20	74	59	99.1	492	187	247	420	473	589	364
175	28.222	0.161	0.95	82	2.20	74	59	99.1	489	188	247	418	471	585	363
176	28.385	0.163	0.95	82	2.20	74	59	100.4	486	188	245	415	468	581	360
177	28.545	0.160	0.95	82	2.20	74	59	98.5	483	188	244	414	466	578	359
178	28.707	0.162	0.95	82	2.20	74	59	99.7	481	188	243	411	463	574	357
179	28.869	0.162	0.95	82	2.20	74	59	99.7	478	188	242	409	461	570	356
180	29.031	0.162	0.94	82	2.20	74	59	99.3	475	188	241	407	458	567	354
181	29.192	0.161	0.95	82	2.20	74	59	98.5	472	187	241	405	455	564	352
182	29.354	0.162	0.95	82	2.20	73	59	99.7	470	186	240	403	452	560	350
183	29.516	0.162	0.95	82	2.20	73	59	99.9	467	186	239	401	449	557	348
184	29.677	0.161	0.95	82	2.20	73	59	98.9	465	186	239	399	446	554	347
185	29.838	0.161	0.95	82	2.20	73	59	98.7	462	186	238	397	443	551	345
186	30.000	0.162	0.95	82	2.20	73	59	99.2	460	180	238	396	441	548	343
187	30.162	0.162	0.95	82	2.20	73	59	99.0	457	177	238	394	438	545	341
188	30.324	0.162	0.95	82	2.20	73	59	99.2	455	176	238	392	436	543	339
189	30.485	0.161	0.95	82	2.20	73	59	98.9	453	174	238	391	433	541	338
190	30.647	0.162	0.95	82	2.20	73	59	99.6	452	173	238	390	431	538	337
191	30.809	0.162	0.95	82	2.20	73	59	99.4	449	173	238	389	430	536	336
192	30.970	0.161	0.95	82	2.20	73	59	98.8	448	172	238	388	428	535	335
193	31.132	0.162	0.95	82	2.20	73	59	99.4	446	172	238	386	426	532	334
194	31.293	0.161	0.95	82	2.20	73	59	98.7	444	172	238	385	425	531	333
195	31.456	0.163	0.95	82	2.20	73	59	100.0	443	173	238	384	423	529	332
196	31.617	0.161	0.95	82	2.20	73	58	98.8	441	173	239	384	422	527	332
197	31.778	0.161	0.95	82	2.20	73	58	98.8	439	173	239	383	420	525	331
198	31.940	0.162	0.95	82	2.20	73	58	99.5	438	173	239	382	419	523	330
199	32.102	0.162	0.95	82	2.20	73	58	99.4	436	173	239	381	417	522	329
200	32.263	0.161	0.95	82	2.20	73	58	98.6	435	173	240	380	416	521	329
201	32.425	0.162	0.95	82	2.20	73	58	99.5	434	173	240	379	414	519	328
202	32.586	0.161	0.95	82	2.20	73	58	99.1	433	173	240	378	412	518	327
203	32.749	0.163	0.95	82	2.20	73	58	100.0	432	174	241	377	411	517	327
204	32.910	0.161	0.95	82	2.20	73	58	98.8	430	174	241	376	409	516	326
205	33.071	0.161	0.95	82	2.20	73	58	99.0	429	174	242	375	408	514	326

Train C - First Hour Particulate Sampling

Run: 4
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 10:27
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/1/24

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 0.004 cfm @ 23 in. Hg
Post-Test 0.004 cfm @ 23 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	**9.816**	**0.164**	**2.22**	**68.5**	**-2.09**	**71.7**	**63.9**	**100.0**
Minimum	0.000	0.128	1.26	68	-2.39	67	63	82.2
Max	9.816	0.169	2.31	69	-1.13	73	64	105.2
0	0.000		1.26	68	-1.13	67	63	
1	0.128	0.128	2.30	68	-2.10	69	63	82.2
2	0.294	0.166	2.30	68	-2.28	70	63	105.2
3	0.463	0.169	2.28	68	-1.97	70	63	103.8
4	0.627	0.164	2.26	68	-1.87	70	63	100.7
5	0.791	0.164	2.25	68	-2.09	70	63	100.7
6	0.956	0.165	2.23	68	-2.07	70	63	101.5
7	1.123	0.167	2.31	68	-2.09	71	63	102.9
8	1.286	0.163	2.30	68	-2.15	71	63	100.1
9	1.452	0.166	2.30	68	-1.92	71	64	101.8
10	1.618	0.166	2.28	68	-2.25	71	64	102.2
11	1.786	0.168	2.26	68	-1.90	71	64	103.6
12	1.948	0.162	2.27	68	-2.36	72	64	99.6
13	2.116	0.168	2.28	68	-2.24	72	64	102.8
14	2.281	0.165	2.25	68	-1.98	72	64	100.8
15	2.446	0.165	2.25	68	-2.24	72	64	100.9
16	2.611	0.165	2.26	68	-2.38	72	64	101.0
17	2.775	0.164	2.26	68	-1.97	72	64	100.6
18	2.940	0.165	2.25	68	-2.36	72	64	101.1
19	3.105	0.165	2.23	68	-2.16	72	64	100.9
20	3.269	0.164	2.25	68	-2.12	72	64	100.3
21	3.433	0.164	2.25	68	-2.39	72	64	100.2
22	3.598	0.165	2.25	68	-1.95	72	64	100.6
23	3.762	0.164	2.23	68	-2.06	72	64	99.9
24	3.925	0.163	2.24	68	-1.87	72	64	99.5
25	4.090	0.165	2.23	68	-2.37	72	64	101.1
26	4.253	0.163	2.23	68	-2.17	72	64	99.8
27	4.417	0.164	2.23	68	-1.97	72	64	100.1
28	4.581	0.164	2.21	68	-2.08	72	64	100.2
29	4.745	0.164	2.21	68	-2.24	72	64	100.3
30	4.908	0.163	2.24	68	-1.86	72	64	99.5
31	5.072	0.164	2.24	69	-1.87	72	64	99.7
32	5.236	0.164	2.22	69	-2.38	72	64	99.3

Train C - First Hour Particulate Sampling

Run: 4
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 10:27
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/1/24

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 0.004 cfm @ 23 in. Hg
Post-Test 0.004 cfm @ 23 in. Hg

Elapsed Time (min)	**Train C Sampling System**							
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*
33	5.400	0.164	2.24	69	-2.07	72	64	99.5
34	5.563	0.163	2.24	69	-2.02	72	64	99.3
35	5.727	0.164	2.23	69	-1.92	72	64	100.0
36	5.891	0.164	2.23	69	-1.95	72	64	99.8
37	6.055	0.164	2.23	69	-2.03	72	64	99.6
38	6.219	0.164	2.23	69	-2.13	72	64	99.5
39	6.382	0.163	2.23	69	-2.12	72	64	98.9
40	6.545	0.163	2.23	69	-2.18	72	64	99.1
41	6.709	0.164	2.23	69	-2.15	72	64	99.8
42	6.872	0.163	2.23	69	-2.22	72	64	99.0
43	7.036	0.164	2.23	69	-2.20	72	64	99.6
44	7.200	0.164	2.21	69	-2.16	72	64	99.6
45	7.363	0.163	2.22	69	-1.92	72	64	99.0
46	7.526	0.163	2.22	69	-2.38	72	64	99.3
47	7.690	0.164	2.23	69	-2.07	72	64	100.0
48	7.854	0.164	2.21	69	-2.08	72	64	99.6
49	8.014	0.160	2.23	69	-2.25	72	64	96.9
50	8.181	0.167	2.23	69	-1.90	72	64	101.2
51	8.345	0.164	2.20	69	-1.90	72	64	99.7
52	8.508	0.163	2.21	69	-2.33	72	64	99.2
53	8.671	0.163	2.23	69	-1.90	72	64	99.2
54	8.835	0.164	2.22	69	-1.89	72	64	99.9
55	8.999	0.164	2.23	69	-2.04	73	64	99.9
56	9.162	0.163	2.23	69	-1.86	73	64	99.0
57	9.326	0.164	2.22	69	-2.12	73	64	99.6
58	9.489	0.163	2.23	69	-2.17	73	64	99.3
59	9.652	0.163	2.22	69	-2.13	73	64	99.4
60	9.816	0.164	2.21	69	-2.34	73	64	99.9

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/1/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time 205 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 (%)*
Tot / Avg	**29.930**	**0.146**	**1.67**	**69.4**	**-2.13**	**387.84**	**-0.081**	**250.4**	**0.03**	**9.00**
Minimum	0.000	0.002	1.66	68	-2.30	311.00	-0.090	5.5	0.00	1.12
Max	29.930	0.165	1.79	70	-2.00	432.00	-0.066	1040.0	0.24	12.02
0	0.000		0.36	68	-0.10	419	-0.085	1040.0	0.20	2.27
1	0.164	0.164	1.79	68	-2.20	352	-0.066	1040.0	0.24	1.12
2	0.167	0.003	1.78	68	-2.20	359	-0.082	227.0	0.01	4.23
3	0.330	0.163	1.77	68	-2.30	382	-0.084	81.2	0.01	5.18
4	0.333	0.003	1.76	68	-2.10	394	-0.084	82.5	0.01	6.24
5	0.498	0.165	1.75	68	-2.30	400	-0.086	81.6	0.01	5.97
6	0.663	0.165	1.75	68	-2.30	401	-0.085	70.3	0.00	5.71
7	0.828	0.165	1.73	68	-2.20	404	-0.086	130.2	0.01	8.00
8	0.992	0.164	1.73	68	-2.20	413	-0.087	189.8	0.01	8.77
9	1.155	0.163	1.73	68	-2.10	418	-0.088	152.8	0.01	8.90
10	1.315	0.160	1.71	68	-2.20	425	-0.089	226.4	0.02	8.95
11	1.318	0.003	1.72	68	-2.20	432	-0.090	688.1	0.07	10.86
12	1.478	0.160	1.71	68	-2.10	432	-0.089	328.9	0.03	10.04
13	1.481	0.003	1.70	68	-2.20	425	-0.087	101.3	0.01	7.30
14	1.641	0.160	1.71	68	-2.20	418	-0.087	70.9	0.00	7.51
15	1.643	0.002	1.71	68	-2.20	413	-0.086	69.6	0.00	6.66
16	1.806	0.163	1.71	68	-2.30	406	-0.086	67.3	0.00	6.21
17	1.965	0.159	1.70	68	-2.30	404	-0.086	67.3	0.00	6.19
18	1.968	0.003	1.70	68	-2.00	401	-0.085	68.6	0.00	6.06
19	2.130	0.162	1.69	68	-2.00	399	-0.084	67.6	0.00	6.43
20	2.291	0.161	1.69	68	-2.30	395	-0.084	61.8	0.00	6.84
21	2.453	0.162	1.69	68	-2.20	395	-0.083	65.0	0.00	6.99
22	2.614	0.161	1.69	68	-2.00	392	-0.083	69.6	0.00	7.27
23	2.776	0.162	1.69	68	-2.10	394	-0.085	72.5	0.01	7.42
24	2.937	0.161	1.67	68	-2.20	396	-0.084	88.0	0.01	7.92
25	3.098	0.161	1.69	68	-2.00	396	-0.083	92.6	0.01	8.71
26	3.259	0.161	1.69	68	-2.20	397	-0.084	92.2	0.01	9.08
27	3.420	0.161	1.67	68	-2.00	399	-0.084	85.1	0.00	8.75
28	3.581	0.161	1.68	68	-2.10	397	-0.084	68.0	0.00	8.34
29	3.742	0.161	1.68	68	-2.30	394	-0.083	58.9	0.00	8.24
30	3.903	0.161	1.68	68	-2.30	392	-0.082	58.6	0.00	8.28
31	4.064	0.161	1.67	68	-2.20	392	-0.083	64.7	0.00	8.38
32	4.224	0.160	1.67	68	-2.30	389	-0.082	62.4	0.00	8.76

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/1/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time 205 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	4.385	0.161	1.68	68	-2.10	389	-0.083	60.5	0.00	8.79
34	4.546	0.161	1.67	68	-2.10	388	-0.082	57.9	0.00	8.93
35	4.706	0.160	1.67	68	-2.00	388	-0.082	59.6	0.00	8.97
36	4.867	0.161	1.68	68	-2.20	389	-0.082	58.9	0.00	9.34
37	5.027	0.160	1.68	68	-2.20	388	-0.082	59.9	0.00	9.65
38	5.188	0.161	1.67	68	-2.30	390	-0.082	61.5	0.00	9.82
39	5.348	0.160	1.66	68	-2.00	389	-0.082	63.7	0.00	10.20
40	5.509	0.161	1.67	69	-2.10	389	-0.083	59.6	0.00	10.15
41	5.670	0.161	1.67	69	-2.00	389	-0.083	54.7	0.00	10.15
42	5.830	0.160	1.66	69	-2.00	389	-0.082	55.0	0.00	9.77
43	5.990	0.160	1.67	69	-2.20	388	-0.081	62.4	0.00	9.21
44	6.151	0.161	1.67	69	-2.20	389	-0.081	67.3	0.00	8.82
45	6.311	0.160	1.66	69	-2.00	388	-0.082	76.7	0.00	8.52
46	6.472	0.161	1.66	69	-2.20	389	-0.083	74.7	0.00	8.38
47	6.633	0.161	1.67	69	-2.10	391	-0.082	80.0	0.01	9.38
48	6.794	0.161	1.67	69	-2.20	395	-0.083	125.1	0.01	10.11
49	6.953	0.159	1.66	69	-2.00	402	-0.084	164.2	0.02	10.46
50	7.114	0.161	1.67	69	-2.00	404	-0.084	184.6	0.02	10.66
51	7.275	0.161	1.67	69	-2.10	406	-0.085	210.7	0.02	10.80
52	7.435	0.160	1.66	69	-2.20	411	-0.085	222.1	0.02	10.82
53	7.596	0.161	1.66	69	-2.10	414	-0.086	202.4	0.02	10.73
54	7.757	0.161	1.67	69	-2.20	414	-0.085	177.8	0.02	10.76
55	7.914	0.157	1.67	69	-2.30	415	-0.085	244.8	0.03	11.58
56	7.918	0.004	1.67	69	-2.20	416	-0.086	160.3	0.01	11.29
57	8.077	0.159	1.66	69	-2.30	415	-0.085	164.1	0.01	11.09
58	8.238	0.161	1.67	69	-2.30	414	-0.087	118.1	0.01	10.92
59	8.398	0.160	1.67	69	-2.20	416	-0.085	688.1	0.17	12.02
60	8.559	0.161	1.66	69	-2.10	415	-0.086	324.1	0.02	10.67
61	8.719	0.160	1.66	69	-2.10	416	-0.086	367.9	0.05	11.16
62	8.880	0.161	1.67	69	-2.00	415	-0.084	347.4	0.02	10.73
63	9.041	0.161	1.66	69	-2.30	413	-0.085	206.3	0.02	10.26
64	9.201	0.160	1.66	69	-2.10	412	-0.085	548.1	0.07	10.75
65	9.362	0.161	1.67	69	-2.00	412	-0.085	643.4	0.06	10.78
66	9.522	0.160	1.67	69	-2.00	411	-0.084	647.6	0.06	10.84
67	9.683	0.161	1.66	69	-2.20	410	-0.086	325.9	0.03	10.69
68	9.843	0.160	1.67	69	-2.30	413	-0.085	215.0	0.02	10.69

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/1/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time 205 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 (%)
69	10.004	0.161	1.67	69	-2.00	415	-0.086	350.7	0.04	11.55
70	10.165	0.161	1.66	69	-2.20	420	-0.087	1040.0	0.22	11.96
71	10.325	0.160	1.66	69	-2.00	421	-0.087	1040.0	0.24	11.64
72	10.486	0.161	1.66	69	-2.30	420	-0.085	1040.0	0.15	11.57
73	10.646	0.160	1.67	69	-2.00	421	-0.086	1040.0	0.15	11.37
74	10.807	0.161	1.67	69	-2.30	419	-0.086	1040.0	0.11	11.35
75	10.967	0.160	1.67	69	-2.20	420	-0.087	949.1	0.10	11.37
76	11.128	0.161	1.67	69	-2.10	422	-0.087	1039.2	0.12	11.33
77	11.289	0.161	1.67	69	-2.00	421	-0.086	1040.0	0.13	11.27
78	11.450	0.161	1.67	69	-2.00	423	-0.085	1040.0	0.11	11.13
79	11.610	0.160	1.68	69	-2.00	423	-0.086	760.6	0.07	11.01
80	11.771	0.161	1.68	69	-2.00	423	-0.087	466.8	0.06	10.96
81	11.932	0.161	1.67	69	-2.10	423	-0.087	258.4	0.02	10.79
82	12.092	0.160	1.67	69	-2.20	422	-0.087	187.2	0.02	10.66
83	12.253	0.161	1.67	69	-2.30	422	-0.085	162.6	0.01	10.50
84	12.414	0.161	1.68	69	-2.20	422	-0.086	157.1	0.01	10.34
85	12.574	0.160	1.67	69	-2.00	423	-0.086	155.8	0.01	10.20
86	12.735	0.161	1.67	69	-2.30	424	-0.087	141.2	0.01	10.06
87	12.896	0.161	1.67	69	-2.20	421	-0.086	142.8	0.01	9.97
88	13.057	0.161	1.67	69	-2.00	420	-0.086	145.7	0.01	9.80
89	13.217	0.160	1.67	69	-2.20	420	-0.086	131.5	0.01	9.81
90	13.378	0.161	1.67	70	-2.30	420	-0.085	117.2	0.01	9.77
91	13.539	0.161	1.68	70	-2.10	418	-0.085	106.5	0.01	9.73
92	13.700	0.161	1.67	70	-2.00	414	-0.085	95.8	0.01	9.86
93	13.860	0.160	1.67	70	-2.10	414	-0.085	85.8	0.00	9.78
94	14.021	0.161	1.67	70	-2.10	413	-0.084	75.7	0.00	9.69
95	14.182	0.161	1.67	70	-2.20	412	-0.084	49.5	0.00	9.84
96	14.343	0.161	1.67	70	-2.00	409	-0.084	102.5	0.01	10.39
97	14.504	0.161	1.67	70	-2.00	410	-0.084	286.3	0.03	10.63
98	14.665	0.161	1.67	70	-2.00	411	-0.085	248.7	0.02	10.71
99	14.826	0.161	1.67	70	-2.10	413	-0.085	471.5	0.05	10.98
100	14.986	0.160	1.67	70	-2.20	415	-0.086	467.3	0.04	11.10
101	15.147	0.161	1.68	70	-2.00	418	-0.086	1030.7	0.12	11.19
102	15.308	0.161	1.68	70	-2.00	419	-0.085	1006.5	0.10	11.13
103	15.469	0.161	1.67	70	-2.00	420	-0.086	931.9	0.10	11.17
104	15.629	0.160	1.67	70	-2.10	421	-0.086	1040.0	0.12	11.13

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/1/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time 205 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	15.790	0.161	1.68	70	-2.20	421	-0.086	1040.0	0.14	11.15
106	15.951	0.161	1.67	70	-2.10	422	-0.086	1040.0	0.13	11.11
107	16.112	0.161	1.66	70	-2.00	420	-0.086	1040.0	0.12	11.17
108	16.273	0.161	1.67	70	-2.10	420	-0.086	1010.0	0.09	11.15
109	16.434	0.161	1.67	70	-2.10	420	-0.086	866.4	0.08	11.17
110	16.594	0.160	1.67	70	-2.10	421	-0.085	624.3	0.06	11.40
111	16.755	0.161	1.66	70	-2.30	422	-0.085	814.1	0.08	11.55
112	16.915	0.160	1.67	70	-2.10	422	-0.087	1040.0	0.11	11.84
113	17.076	0.161	1.67	70	-2.00	424	-0.087	1040.0	0.14	11.98
114	17.237	0.161	1.66	70	-2.10	425	-0.086	1040.0	0.14	11.93
115	17.397	0.160	1.67	70	-2.20	426	-0.086	1040.0	0.15	11.96
116	17.558	0.161	1.67	70	-2.30	427	-0.087	1040.0	0.14	11.88
117	17.719	0.161	1.66	70	-2.10	428	-0.087	1040.0	0.17	11.84
118	17.879	0.160	1.66	70	-2.00	428	-0.087	1040.0	0.18	11.76
119	18.040	0.161	1.67	70	-2.00	430	-0.087	1040.0	0.14	11.40
120	18.200	0.160	1.68	70	-2.00	431	-0.087	1040.0	0.11	11.17
121	18.361	0.161	1.66	70	-2.30	428	-0.086	890.8	0.09	10.94
122	18.522	0.161	1.67	70	-2.10	426	-0.086	580.0	0.05	10.80
123	18.679	0.157	1.67	70	-2.00	423	-0.086	340.7	0.03	10.84
124	18.683	0.004	1.67	70	-2.20	422	-0.086	265.9	0.02	10.71
125	18.844	0.161	1.67	70	-2.20	421	-0.085	167.7	0.01	10.52
126	19.004	0.160	1.66	70	-2.10	418	-0.085	106.2	0.01	10.43
127	19.164	0.160	1.67	70	-2.30	414	-0.085	59.2	0.00	10.35
128	19.325	0.161	1.67	70	-2.00	411	-0.084	42.4	0.00	10.32
129	19.486	0.161	1.67	70	-2.30	408	-0.083	52.2	0.00	10.31
130	19.646	0.160	1.66	70	-2.00	405	-0.083	50.2	0.00	10.09
131	19.807	0.161	1.67	70	-2.00	404	-0.083	49.8	0.00	9.89
132	19.965	0.158	1.67	70	-2.00	401	-0.083	46.9	0.00	9.72
133	19.968	0.003	1.67	70	-2.20	398	-0.082	50.8	0.00	9.56
134	20.128	0.160	1.67	70	-2.00	396	-0.082	47.2	0.00	9.38
135	20.289	0.161	1.67	70	-2.20	393	-0.082	48.5	0.00	9.26
136	20.450	0.161	1.67	70	-2.10	393	-0.082	50.2	0.00	9.28
137	20.611	0.161	1.67	70	-2.30	392	-0.081	42.4	0.00	9.30
138	20.770	0.159	1.66	70	-2.10	392	-0.081	42.7	0.00	9.32
139	20.931	0.161	1.67	70	-2.00	390	-0.080	73.2	0.00	9.38
140	21.092	0.161	1.67	70	-2.00	387	-0.080	63.8	0.00	9.43

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/1/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time 205 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	21.253	0.161	1.66	70	-2.00	386	-0.080	104.9	0.01	9.49
142	21.413	0.160	1.66	70	-2.10	385	-0.080	100.8	0.01	9.49
143	21.574	0.161	1.67	70	-2.30	384	-0.081	119.8	0.01	9.54
144	21.735	0.161	1.67	70	-2.30	382	-0.079	118.5	0.01	9.65
145	21.895	0.160	1.66	70	-2.30	380	-0.079	108.9	0.01	9.55
146	22.056	0.161	1.67	70	-2.00	379	-0.079	77.3	0.00	9.34
147	22.216	0.160	1.67	70	-2.20	377	-0.079	47.2	0.00	9.18
148	22.377	0.161	1.66	70	-2.10	374	-0.079	43.7	0.00	9.08
149	22.537	0.160	1.66	70	-2.10	372	-0.078	23.9	0.00	8.98
150	22.699	0.162	1.67	70	-2.00	370	-0.078	10.0	0.00	8.84
151	22.859	0.160	1.66	70	-2.30	368	-0.077	7.8	0.00	8.71
152	23.020	0.161	1.66	70	-2.10	365	-0.077	7.1	0.00	8.65
153	23.180	0.160	1.66	70	-2.20	364	-0.077	12.6	0.00	8.16
154	23.341	0.161	1.67	70	-2.20	362	-0.077	10.3	0.00	8.11
155	23.502	0.161	1.66	70	-2.20	360	-0.077	9.7	0.00	8.03
156	23.662	0.160	1.67	70	-2.10	359	-0.077	6.4	0.00	7.96
157	23.823	0.161	1.67	70	-2.20	357	-0.076	6.4	0.00	8.00
158	23.984	0.161	1.67	70	-2.00	357	-0.076	6.1	0.00	7.99
159	24.144	0.160	1.66	70	-2.20	357	-0.076	5.8	0.00	8.00
160	24.305	0.161	1.66	70	-2.00	355	-0.076	5.5	0.00	7.97
161	24.466	0.161	1.67	70	-2.10	354	-0.076	6.4	0.00	7.99
162	24.627	0.161	1.67	70	-2.30	355	-0.076	6.4	0.00	8.06
163	24.786	0.159	1.66	70	-2.20	354	-0.076	7.8	0.00	7.54
164	24.947	0.161	1.67	70	-2.30	352	-0.075	7.4	0.00	7.40
165	25.108	0.161	1.68	70	-2.20	352	-0.076	7.1	0.00	7.38
166	25.269	0.161	1.67	70	-2.00	351	-0.076	7.8	0.00	7.34
167	25.429	0.160	1.67	70	-2.10	350	-0.076	7.1	0.00	7.28
168	25.590	0.161	1.67	70	-2.10	347	-0.076	8.4	0.00	7.22
169	25.751	0.161	1.67	70	-2.00	346	-0.075	9.7	0.00	7.09
170	25.911	0.160	1.66	70	-2.30	344	-0.075	10.6	0.00	6.93
171	26.072	0.161	1.67	70	-2.30	344	-0.075	10.6	0.00	6.75
172	26.233	0.161	1.67	70	-2.30	343	-0.074	10.3	0.00	6.56
173	26.394	0.161	1.67	70	-2.20	342	-0.074	9.4	0.00	6.40
174	26.554	0.160	1.66	70	-2.00	339	-0.074	8.1	0.00	6.44
175	26.715	0.161	1.67	70	-2.00	337	-0.074	8.1	0.00	6.38
176	26.876	0.161	1.66	70	-2.10	335	-0.073	8.1	0.00	6.39

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/1/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time 205 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	27.036	0.160	1.66	70	-2.00	333	-0.073	8.1	0.00	6.30
178	27.197	0.161	1.66	70	-2.00	331	-0.073	8.4	0.00	6.25
179	27.358	0.161	1.67	70	-2.20	330	-0.073	8.4	0.00	6.29
180	27.519	0.161	1.66	70	-2.00	328	-0.073	8.7	0.00	6.31
181	27.679	0.160	1.67	70	-2.10	328	-0.072	8.1	0.00	6.32
182	27.840	0.161	1.67	70	-2.10	326	-0.072	8.4	0.00	6.36
183	28.001	0.161	1.67	70	-2.20	324	-0.072	8.4	0.00	6.39
184	28.159	0.158	1.66	70	-2.20	324	-0.072	8.7	0.00	6.46
185	28.161	0.002	1.66	70	-2.20	323	-0.071	8.7	0.00	6.51
186	28.320	0.159	1.67	70	-2.30	322	-0.072	9.0	0.00	6.54
187	28.322	0.002	1.67	70	-2.20	323	-0.071	9.4	0.00	6.58
188	28.480	0.158	1.67	70	-2.30	323	-0.071	9.4	0.00	6.62
189	28.483	0.003	1.67	70	-2.10	321	-0.071	9.4	0.00	6.70
190	28.641	0.158	1.67	70	-2.10	320	-0.071	9.4	0.00	6.71
191	28.644	0.003	1.67	70	-2.30	317	-0.071	8.7	0.00	6.72
192	28.804	0.160	1.67	70	-2.10	318	-0.070	9.0	0.00	6.73
193	28.963	0.159	1.67	70	-2.20	318	-0.070	9.4	0.00	6.80
194	28.965	0.002	1.67	70	-2.20	317	-0.071	9.7	0.00	6.60
195	29.124	0.159	1.66	70	-2.20	316	-0.070	10.0	0.00	6.57
196	29.126	0.002	1.68	70	-2.00	316	-0.070	9.4	0.00	6.62
197	29.284	0.158	1.66	70	-2.10	315	-0.070	10.0	0.00	6.61
198	29.287	0.003	1.67	70	-2.30	315	-0.070	10.0	0.00	6.61
199	29.445	0.158	1.66	70	-2.30	314	-0.070	10.3	0.00	6.58
200	29.447	0.002	1.67	70	-2.00	315	-0.070	11.3	0.00	6.60
201	29.605	0.158	1.67	70	-2.00	313	-0.070	10.6	0.00	6.59
202	29.608	0.003	1.67	70	-2.30	313	-0.070	10.6	0.00	6.53
203	29.769	0.161	1.66	70	-2.00	313	-0.070	10.6	0.00	6.55
204	29.926	0.157	1.67	70	-2.00	312	-0.070	11.3	0.00	6.57
205	29.930	0.004	1.66	70	-2.30	311	-0.070	10.7	0.00	6.65

Train D - Ambient Background and Flue Gas Data

Run: 4 **Test Date:** 3/1/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:27
Total Sampling Time 205 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 (%)*

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Tracking No.:	2142
Project No.:	0142WN020E
Run No.:	4
Test Date:	3/1/24

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

Train A

Sample Component / Date / Time in Desiccator		Reagent	Filter, Probe or Dish #	Weights Final, mg	Tare, mg	Particulate, mg Uncorrected	Corrected
FilterPairs		Filter	F177	247.8	247.1	0.7	0.7
Probe catch*		Probe	27	114350.7	114349.7	1.0	1.0
ilter seals catch*		Seals	S665	3307.0	3305.2	1.8	1.8
				Total Particulate, mg:		**3.5**	**3.5**

Train B

Sample Component / Date / Time in Desiccator		Reagent	Filter, Probe or Dish #	Weights Final, mg	Tare, mg	Particulate, mg Uncorrected	Corrected
FilterPairs		Filter	F178	248.8	246.6	2.2	2.2
Probe catch*		Probe	OES 4	114149.0	114148.7	0.3	0.3
ilter seals catch*		Seals	S659	3322.4	3322.1	0.3	0.3
			Sub-Total	Total Particulate, mg:		**2.8**	**2.8**

Train C - *First Hour*

Sample Component / Date / Time in Desiccator		Reagent	Filter, Probe or Dish #	Weights Final, mg	Tare, mg	Particulate, mg Uncorrected	Corrected
FilterPairs		Filter	F176	248.4	247.4	1.0	1.0
Probe catch*		Probe	73	117070.2	117070.1	0.1	0.1
ilter seals catch*		Seals	S666	3400.7	3400.1	0.6	0.6
				Total Particulate, mg:		**1.7**	**1.7**

Train D - *Ambient Background*

Sample Component / Date / Time in Desiccator		Reagent	Filter # or	Weights Final, mg	Tare, mg	Particulate, mg
Filter catch*		Filter	F224	121.9	122.0	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 appropriately 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:	SC 25
Project Number:	0142WN020E
Run Number:	4
Test Date:	3/1/2024

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

- Fuel Field Notes
- Velocity Traverse Field Notes
- Flue Gas Analyzer Calibration
- Supplementary Field Notes
- Gravimetric Tare Sheets

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

Client:Valley Comfort Project Number:0142WN020E Run Number:4

Model: SC 25 Tracking Number: 2142 Date: 03/01/2024

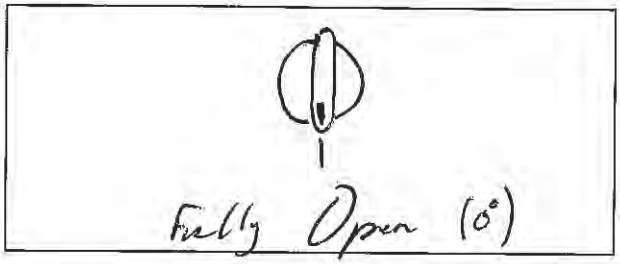
Test Crew:RT KM

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:



Secondary: N/A

Tertiary/Pilot: N/A

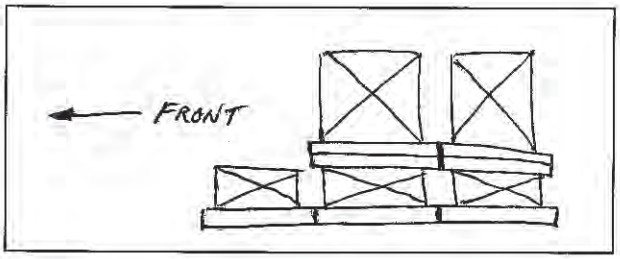
Fan: On High - Duration of test

Preburn Notes

Time	Notes
0925	Preburn loaded
0920	Scale plus 0.3 lbs due to probe added after bias check
1027	At 3.2 lbs preburn was stopped (ENDED)

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: Used to load

Fuel loaded by: 45

Door closed at: 60

Primary air: Fully open

Notes: Fan off to load fuel, then set on high (60 sec)

Time	Notes
1027	Test start
1127	1st hour sampling stopped
1552	Test done.

Technician Signature: Kyle Morgan Date: 3/1/24

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

Client: Valley Comfort Project Number: 0142WN020E Run Number: 4

Model: SC 25 Tracking Number: 2142 Date: 03/01/2024

Test Crew: RT KM

OMNI Equipment ID numbers:

12 PAE Post-Test

First hour: 0.004 @ 23"
A 0.002 @ 17.5
B 0.001 @ 18
Ambient 0.002 @ 15

Wood Heater Supplemental Data

Start Time: 10:27

Stop Time: 13:52

Booth #:

Post-Test

Stack Gas Leak Check:

Initial: ✓ Final: ✓

Sample Train Leak Check:

A: .002 @ 8.4 "Hg

B: Ø @ 7.8 "Hg

1st hr Ø @ 7.4

Calibrations: Span Gas CO_2: 16.86% CO: 4.37% Bias check Nitro: Ø

CO: 500 ppm

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	0910	0915	13:54	13:55
CO_2	Ø	16.89	0.01	16.87
CO	Ø	4.38	-0.002	4.366
	Ø	498	0.01	491

Air Velocity (ft/min): Initial: Ø Final: Ø

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: See Run 1 Initials: EC

	Initial	Middle	Ending
P_b (in/Hg)	29.57	29.56	29.48
RH (%)	33	33	32
Ambient (°F)	69	71	72

Tunnel Traverse

	Microtector Reading	dP (in H_2O)	T(°F)
1	.032	.064	100
2	.050	.100	
3	.052	.104	
4	.035	.070	
5	.030	.060	
6	.048	.096	
7	.048	.096	
8	.030	.060	✓
Center:			
	.058	.116	100

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.4	-0.40

Background Filter Volume:

Technician Signature: Kyle Morgan Date: 3/1/24

Client: Valley Comfort Project Number: 0142WN020E Run Number: 4
Model: SC 25 Tracking Number: 2142 Date: 03/01/2024
Test Crew: RT KM
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
Cal Value (2) = 22% Actual Reading 22

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	17 in	23.4	7	12 in	23.3
2	17 in	21.2	8	12 in	19.4
3	17 in	23.2	9	____ in	____
4	17 in	22.0	10	____ in	____
5	12 in	23.8	11	____ in	____
6	12 in	22.3	12	____ in	____

Total Pre-Burn Fuel Weight: 13.4 Pre-Burn Fuel Average Moisture: 22.3% db

Time (clock): 0800 Room Temperature (F): 65 Initials: RT

Test Fuel

Firebox Volume (ft³): 2.159 Test Fuel Piece Length (in): 18
Load Weight Range (lb): 13.6 - 16.6 Total Wet Fuel Load Weight (lb): 15.6

Fuel Type & Amount: 2 x 4: 3 4 x 4: 2
Weight (with spacers): 6.8 Weight (with spacers): 8.8

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	2.1 / 1.8	22.3	23.8	23.8	2x4 18"
2	2.3 / 1.9	21.9	21.4	21.2	2x4 17.75"
3	4.4 / 4.2	23.8	22.8	21.3	4x4 18"
4	4.4 / 4.2	23.8	19.7	19.9	4x4 17.75"
5	2.4 / 2.0	19.9	20.4	20.3	2x4 17.75"
6	____	____	____	____	____
7	____	____	____	____	____

Spacer Moisture Readings (%DB)

13.8	16.0	13.8	16	____	____	____	____
17.3	11.5	15.0	13.5	____	____	____	____
20.2	19.8	11.2	____	____	____	____	____
13.2	18.8	15.8	____	____	____	____	____

Time (clock): 0845 Room Temperature (F): 68 Initials: RT

Technician Signature: Kurt Mayer Date: 3/1/24

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

Client: Valley Comfort Project Number: 0142WN020E Run Number: 4

Model: ~~RT Tiny K, K. Morgan~~ SC25 Tracking Number: 2142 Date: 03/01/2024

Test Crew: RT KM

OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: RT

Date/Time in Dessicator: 3-1-24 1st hour 11:40 1440 minutes

Filters Weighed in PAIRS

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/04/24 9:10	3/05/24 7:20			
R/H %:	15.6	16			
Temp:	69	69			
200 mg Audit:	200.1	200.1			
2 g Audit:	2000.3	2000.3			
100 g Audit:	99997.9	99997.8			
Initials:	JC	JC			

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	
A (First Hour)	Front Filter	F176	247.4	248.5	248.4				✓
	Rear Filter	F176A							
	Probe	73	117070.1	117070.2	117070.2				✓
	O-Ring Set	5666	3400.1	3400.6	3400.7				✓
A (Remainder)	Front Filter	F177	247.1	247.7	247.8				✓
	Rear Filter	A							
	Probe	27	114349.7	114350.8	114350.7				✓
	O-Ring Set	5665	3305.2	3307.1	3307.0				✓
B	Front Filter	F178	246.6	248.8	248.8				✓
	Rear Filter	A							
	Probe	0554	114148.7	114149.0	114149.0				✓
	O-Ring Set	5659	3322.1 ~~3322.1~~ JC	3322.4	3322.4				✓
BG	Filter	F224	122.0	121.9	121.9				✓

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

Equations and Sample Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	4

Sample calculations of each equation used in the referenced 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	15.42	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	1.5	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 moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.416	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	16.18	Traverse Worksheet
θ	- Duration of test, min	205	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	29.57	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

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

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	33.463	33.071	9.816	29.93
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	1.27	0.95	2.22	1.67
T_m	- Temperature of Dry Gas Meter, °F	79.5	79.8	68.5	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	1.0	0.3	0.1	n/a
m_f	- mass of particulate matter from filters, mg	0.7	2.2	1.0	0.0
m_g	- mass of particulate matter from filter seals, mg	1.8	0.3	0.6	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	1.0	0.3	0.1	n/a
m_f	- mass of particulate matter from filters, mg	0.7	2.2	1.0	n/a
m_g	- mass of particulate matter from filter seals, mg	1.8	0.3	0.6	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 = 15.42 %, dry basis
M_{Swb} = 1.5 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((1.5 x 0.4536) (100 / (100 + 15.42))

M_{Sdb} = **0.589** 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} = 14.1 lb.
FM_{CPn} = 21.75 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 14.1 x 0.4536 x (100 / (100 + 14.1))

M_{Cdb} = **5.25** 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} = 11.58 lb
V_C = 0.416 ft^3

D_{Cdb} = 11.58 / 0.416

D_{Cdb} = **27.84** 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} = 0.589
M_{Cdb} = 5.25

M_{FTAdb} = 0.589 + 5.25

M_{FTAdb} = **5.84** kg

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

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

Sample Calculation:

M_{FTAdb} = 5.843
θ = 205

BR = (60 x 5.843) / 205

BR = **1.71** 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 = 0.832

$\Delta P^{1/2}_{AVG}$ = 0.337

$T_{S\,(avg)}$ = 559

Pbar = 29.57

Pg = -0.4

Ps = 29.54

V_S = 0.832 x 85.49 x 0.99 x 0.337 x √ [(559 / (29.54 x 28.78)]

V_S = **19.236** ft/sec

(First Hour of Test)

F_P = 0.832

$\Delta P^{1/2}_{AVG}$ = 0.338

$T_{S\,(avg)}$ = 562

Pbar = 29.57

Pg = -0.4

Ps = 29.54

V_S = 0.832 x 85.49 x 0.99 x 0.338 x √ [(562 / (29.54 x 28.78)]

V_S = **19.322** 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 = 29.54
$T_{s(avg)}$ = 559
Vs = 19.24

Qstd = 3600 x (1 - 0.02) x 19.236 x 0.19635 x (528 / 559) x (29.54 / 29.92)

Qstd = **12431.1** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 29.54
$T_{s(avg)}$ = 562
Vs = 19.322

Qstd = 3600 x (1 - 0.02) x 19.322 x 0.1963 x (528 / 562) x (29.54 / 29.92)

Qstd = **12421.2** 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

$$V_{m(std)} = 17.64 \times 33.463 \times 1.016 \times \frac{(29.57 + \frac{1.27}{13.6})}{(79.5 + 460)}$$

$V_{m(std)}$ = **32.970** dscf

Train B

$$V_{m(std)} = 17.64 \times 33.071 \times 1.011 \times \frac{(29.57 + \frac{0.95}{13.6})}{(80 + 460)}$$

$V_{m(std)}$ = **32.377** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.82 \times 1.015 \times \frac{(\underline{29.57} + \frac{2.22}{13.6})}{(68.5 + 460)}$$

$V_{m(std)}$ = **9.888** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 29.93 \times 1.011 \times \frac{(\underline{29.57} + \frac{1.67}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **29.400** 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 = 1.0 + 0.7 + 1.8

m_n = **3.5** mg

Train B

m_n = 0.3 + 2.2 + 0.3

m_n = **2.8** mg

Train C (1st hour)

m_n = 0.1 + 1.0 + 0.6

m_n = **1.7** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 1.0 + 0.7 + 1.8

m_n = **3.5** mg

Train B

m_n = 0.3 + 2.2 + 0.3

m_n = **2.8** mg

Train C (1st hour)

m_n = 0.1 + 1.0 + 0.6

m_n = **1.7** 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

$$C_s = 0.001 \times \frac{3.5}{32.97}$$

C_s = **0.000106** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.8}{32.38}$$

C_s = **0.0000865** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.7}{9.89}$$

Cs = **0.000172** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{29.40}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{3.5}{32.97}$$

C_s = **0.000106** g/dscf

Train B

$$C_s = 0.001 \times \frac{2.8}{32.38}$$

C_s = **0.0000865** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.7}{9.89}$$

Cs = **0.000172** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{29.40}$$

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 = (0.000106 - 0.000000) x 12431.1 x 205 / 60

E_T = **4.51** g

Train B

E_T = (0.000086 - 0.000000) x 12431.1 x 205 / 60

E_T = **3.67** g

First Hour

E_T = (0.000172 - 0.000000) x 12421.2 x 60 / 60

E_T = 2.14 g

Trains A and B Average

E = **4.09** g

Sample calculations (Corrected)

Train A

E_T = (0.000106 - 0.000000) x 12431.1 x 205 / 60

E_T = **4.51** g

Train B

E_T = (0.000086 - 0.000000) x 12431.1 x 205 / 60

E_T = **3.67** g

First Hour

E_T = (0.000172 - 0.000000) x 12421.2 x 60 / 60

E_T = **2.14** g

Trains A and B Average

E_T = **4.09** 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 = 4.51 g

θ = 205 min

PM_R = 60 x (4.51 / 205)

PM_R = **1.32** g/hr

Train B

E_T = 3.67 g

θ = 205 min

PM_R = 60 x (3.67 / 205)

PM_R = **1.08** g/hr

A and B Average

E_T = **1.20** g/hr

First Hour

E_T = 2.14 g

θ = 60 min

PM_R = 60 x (2.14 / 60)

PM_R = **2.14** g/hr

Sample Calculation (Corrected)

Train A

E_T = 4.51 g

θ = 205 min

PM_R = 60 x (4.51 / 205)

PM_R = **1.32** g/hr

Train B

E_T = 3.67 g

θ = 205 min

PM_R = 60 x (3.67 / 205)

PM_R = **1.08** g/hr

A and B Average

E_T = **1.20** g

First Hour

E_T = 2.14 g

θ = 60 min

PM_R = 60 x (2.14 / 60)

PM_R = **2.14** 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 = 4.51 g
M_{FTAdb} = 5.84 kg
PM_F = 4.51 / 5.84
PM_F = **0.77** g/kg

Train B

E_T = 3.67 g
M_{FTAdb} = 5.84 kg
PM_F = 3.67 / 5.84
PM_F = **0.63** g/kg

Sample Calculation (Corrected)

Train A

E_T = 4.51 g
M_{FTAdb} = 5.84 kg
PM_F = 4.51 / 5.84
PM_F = **0.77** g/kg

Train B

E_T = 3.67 g
M_{FTAdb} = 5.84 kg
PM_F = 3.67 / 5.84
PM_F = **0.63** 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	205	205	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	0.163	0.16	0.166
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	33.463	33.071	9.816
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	19.867	19.867	19.867
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	19.239	19.239	19.333
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	539.5	539.8	528.5
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	597.5	597.5	597.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	558.7	558.7	561.7

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

Train A PR = $\left(\frac{205 \text{ x } 0.163 \text{ x } 19.239 \text{ x } 540 \text{ x } 598}{1 \text{ x } 33.463 \text{ x } 19.867 \text{ x } 532 \text{ x } 559}\right)$ X 100 = 104.9 %

Train B PR = $\left(\frac{205 \text{ x } 0.16 \text{ x } 19.239 \text{ x } 540 \text{ x } 598}{1 \text{ x } 33.071 \text{ x } 19.867 \text{ x } 533 \text{ x } 559}\right)$ X 100 = 104.0 %

Train B PR = $\left(\frac{60 \text{ x } 0.166 \text{ x } 19.333 \text{ x } 528 \text{ x } 598}{1 \text{ x } 9.816 \text{ x } 19.867 \text{ x } 528 \text{ x } 562}\right)$ X 100 = 105.1 %

Run 5 Test Data

Test Date:	3/1/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	SC 25

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Project No.: 0142WN020E
Tracking No.: 2142
Run: 5
Test Date: 03/01/24

Burn-Rate Result

1.61 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	4.53	4.53	1.89	1.89
Emission Rate, g/hr	**1.26**	1.26	**1.89**	1.89
Emissions Factor, g/kg	0.78	0.78	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		98.5	98.5
Average Tunnel Gas Velocity (vs), feet/second		19.172	19.204
Average Tunnel Gas Flow Rate(Qsd)	DSCF/hr	12357.9	12336.9
	DSCF/min	206.0	205.6
Average Delta p, in. H2O		0.114	0.114
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	216

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	35.383	35.182	35.436	9.844	35.383	35.182	35.436	9.844
Average Gas Meter Temperature, °F	79	81	82	71	79	81	82	71
Total Sample Volume (V_{mstd}), DSCF	34.539	34.318	34.330	9.825	34.539	34.318	34.330	9.825
Total Particulates (mn), mg - m_n	0.0	3.4	3.6	1.5	0.0	3.4	3.6	1.5
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00010	0.00010	0.00015	0.00000	0.00010	0.00010	0.00015
Total Particulate Emissions (ET), grams	n/a	4.40	4.66	1.89	n/a	4.40	4.66	1.89
Particulate Emission Rate, g/hr	n/a	1.22	1.29	1.89	n/a	1.22	1.29	1.89
Emissions Factor, g/kg	n/a	0.76	0.80	n/a	n/a	0.76	0.80	n/a
Difference, ET from Average ET, grams	n/a	-0.13	0.13	n/a	n/a	-0.13	0.13	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	75	75	74	✓
Filter Face Velocity, fpm	< 30	8.83	8.75	8.84	✓
Dryer Exit Temperature, °F	< 80	66	57	60	✓
Tunnel Velocity, fpm	>800	1,150	1,152		✓
First Hour Leakage	0.007	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	0.5	0.7	✓
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		73		✓
Ambient Temp, °F	< 90		75		✓
Trains A and B Precision	(*A*) < 7.5%		2.84%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.04		✓
Stove Surface ΔT	<= 125 °F		65		✓
Room Air Velocity	< 50 fpm		15		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	5
Test Date:	3/1/2024

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: SC25
Date: 03/01/24
Run: 5
Control #: 2142
Test Duration: 216
Output Category: III

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	75.2%	81.3%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	76%	81.7%

Output Rate (kJ/h)	23,981	22,749	**(Btu/h)**
Burn Rate (kg/h)	1.61	3.55	**(lb/h)**
Input (kJ/h)	31,882	30,244	**(Btu/h)**

Test Load Weight (dry kg)	5.79	12.77	**dry lb**
MC wet (%)	17.08		
MC dry (%)	20.60		
Particulate (g)	4.53		
CO (g)	75		
Test Duration (h)	3.60		

Emissions	**Particulate**	**CO**
g/MJ Output	0.05	0.87
g/kg Dry Fuel	0.78	12.99
g/h	1.26	20.90
lb/MM Btu Output	0.12	2.03

Air/Fuel Ratio (A/F)	12.27

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

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort	**Appliance Type:**	Cat	(Cat, Non
Model:	SC25			
Date:	3/1/2024	**Temp. Units**	F	(F or C)
Run:	5	**Weight Units**	lb	(kg or lb)
Control #:	2142			
Test Duration:	216			
Output Category:	III			

		Fuel Data		
			D. Fir	
Wood Moisture (% wet):	17.08	**HHV**	19,810	kJ/kg
Load Weight (lb wet):	15.40	**%C**	48.73	
Burn Rate (dry kg/h):	1.61	**%H**	6.87	
Total Particulate Emissions:	4.53 g	**%O**	43.9	
		%Ash	0.5	

Averages	**0.06**	**9.00**	**#DIV/0!**	**366.83**	**73.65**	
				Temp. (ºF)		
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	15.40	0.23	1.61		362.0	75.0
1	15.20	0.24	0.71		332.0	75.0
2	15.10	0.00	4.25		343.0	75.0
3	15.00	0.00	4.05		358.0	75.0
4	14.90	0.00	4.27		362.0	75.0
5	14.90	0.00	5.31		365.0	74.0
6	14.80	0.00	6.01		367.0	74.0
7	14.70	0.00	6.01		371.0	74.0
8	14.60	0.01	6.74		372.0	74.0
9	14.50	0.00	6.16		372.0	74.0
10	14.40	0.00	5.79		368.0	74.0
11	14.40	0.00	5.77		366.0	74.0
12	14.30	0.00	5.66		367.0	74.0
13	14.20	0.00	5.64		366.0	73.0
14	14.10	0.00	5.96		366.0	74.0
15	14.00	0.00	5.77		362.0	73.0
16	14.00	0.00	5.61		360.0	73.0
17	13.90	0.00	5.92		360.0	73.0
18	13.80	0.00	6.42		361.0	73.0
19	13.70	0.00	6.63		362.0	73.0
20	13.60	0.00	6.85		365.0	73.0
21	13.60	0.00	7.04		365.0	73.0
22	13.50	0.00	7.19		366.0	73.0
23	13.40	0.00	7.45		367.0	73.0
24	13.30	0.00	7.83		367.0	73.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	13.20	0.00	8.16		364.0	73.0
26	13.10	0.00	7.88		362.0	73.0
27	13.00	0.00	7.64		358.0	73.0
28	13.00	0.00	7.55		357.0	73.0
29	12.90	0.00	7.40		356.0	73.0
30	12.80	0.00	7.32		354.0	73.0
31	12.70	0.00	7.53		353.0	73.0
32	12.70	0.00	7.53		352.0	73.0
33	12.60	0.00	7.86		352.0	73.0
34	12.50	0.00	8.33		353.0	73.0
35	12.40	0.00	8.69		352.0	73.0
36	12.30	0.00	9.06		352.0	73.0
37	12.20	0.00	9.36		353.0	73.0
38	12.10	0.00	8.96		355.0	73.0
39	12.10	0.00	8.80		356.0	73.0
40	12.00	0.00	8.84		355.0	73.0
41	11.90	0.00	8.92		355.0	73.0
42	11.80	0.00	8.90		355.0	73.0
43	11.70	0.00	8.75		354.0	73.0
44	11.70	0.00	8.58		354.0	73.0
45	11.60	0.00	8.59		355.0	73.0
46	11.50	0.00	8.77		355.0	73.0
47	11.40	0.00	8.86		354.0	73.0
48	11.30	0.00	8.71		355.0	73.0
49	11.30	0.00269	8.56		354	73
50	11.20	0.00262	8.43		353	73
51	11.10	0.00292	8.12		352	73
52	11.00	0.0032	7.74		353	73
53	11.00	0.00314	7.68		354	73
54	10.90	0.00346	8.79		354	73
55	10.80	0.00411	9.12		358	73
56	10.70	0.00421	9.29		359	73
57	10.70	0.00521	9.64		363	73
58	10.60	0.00528	9.64		367	73
59	10.50	0.00745	10.12		370	73
60	10.40	0.00615	9.8		372	73
61	10.30	0.00579	9.88		374	73
62	10.20	0.00609	9.61		375	73
63	10.10	0.00605	9.54		377	73
64	10.00	0.00599	9.56		377	74
65	10.00	0.00593	9.84		377	73

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	9.90	0.00641	9.98		376	73
67	9.80	0.00731	10.03		378	73
68	9.70	0.01	10.14		380	73
69	9.60	0.01	10.17		381	73
70	9.50	0.00826	10.2		381	74
71	9.40	0.00968	10.18		382	73
72	9.30	0.00819	10.1		382	73
73	9.20	0.00541	9.93		382	73
74	9.10	0.00547	9.8		382	73
75	9.10	0.00541	9.98		382	73
76	9.00	0.00528	10.1		382	73
77	8.90	0.00544	10.28		383	73
78	8.80	0.00625	10.31		384	74
79	8.70	0.00712	10.29		385	74
80	8.60	0.01	10.06		387	74
81	8.60	0.02	9.98		388	74
82	8.50	0.02	10.08		388	74
83	8.40	0.02	10.06		385	74
84	8.30	0.03	10.05		385	73
85	8.20	0.02	9.98		383	74
86	8.10	0.01	9.99		382	73
87	8.00	0.02	9.94		381	74
88	8.00	0.01	10.06		379	73
89	7.90	0.00803	9.92		382	73
90	7.80	0.00868	10.08		382	74
91	7.70	0.02	10.36		383	74
92	7.60	0.01	10.52		384	73
93	7.50	0.02	10.58		385	74
94	7.40	0.01	10.59		386	73
95	7.30	0.01	10.55		386	73
96	7.30	0.00631	10.43		385	74
97	7.20	0.00563	10.34		384	74
98	7.10	0.00576	10.23		383	73
99	7.00	0.00663	10.27		382	74
100	6.90	0.00625	10.23		381	73
101	6.90	0.00463	10.1		379	74
102	6.80	0.00414	10.23		378	74
103	6.70	0.00431	10.29		378	73
104	6.60	0.00502	10.62		378	74
105	6.50	0.01	11.24		381	74
106	6.40	0.04	11.67		384	74

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	6.30	0.14	11.95		387	74
108	6.20	0.19	12.21		388	74
109	6.10	0.26	12.34		393	74
110	6.00	0.33	12.41		396	74
111	5.90	0.32	12.51		398	74
112	5.80	0.34	12.46		400	74
113	5.70	0.4	12.64		402	74
114	5.60	0.38	12.55		406	74
115	5.40	0.42	12.71		407	74
116	5.30	0.38	12.6		409	74
117	5.20	0.41	12.6		412	74
118	5.10	0.42	12.64		411	74
119	5.00	0.43	12.77		412	74
120	4.90	0.34	12.89		414	74
121	4.80	0.32	12.98		417	74
122	4.60	0.34	12.94		418	74
123	4.50	0.3	12.91		416	74
124	4.40	0.3	12.71		415	74
125	4.30	0.35	12.56		416	74
126	4.20	0.32	12.38		414	74
127	4.10	0.31	12.15		414	74
128	4.00	0.37	11.97		412	74
129	3.90	0.32	12.01		413	74
130	3.80	0.28	12		414	74
131	3.70	0.29	12.02		413	74
132	3.60	0.23	12.06		413	74
133	3.50	0.55	11.73		412	74
134	3.40	0.6	11.45		410	74
135	3.40	0.6	11.09		407	74
136	3.30	0.42	11		406	75
137	3.20	0.35	10.86		402	74
138	3.10	0.3	10.78		403	75
139	3.00	0.26	10.65		400	75
140	3.00	0.23	10.73		398	74
141	2.90	0.17	10.78		396	74
142	2.80	0.12	10.72		393	74
143	2.80	0.04	10.82		389	75
144	2.70	0.03	10.77		385	74
145	2.60	0.02	10.68		384	75
146	2.60	0.01	10.19		381	75
147	2.50	0.04	10.16		379	75

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	2.40	0.05	10.08		379	75
149	2.40	0.06	10.05		376	75
150	2.30	0.04	9.96		374	75
151	2.30	0.01	9.96		374	74
152	2.20	0.00563	9.9		373	75
153	2.10	0.001	9.92		371	75
154	2.10	0.00061	10.02		370	75
155	2.00	0.00075	10.09		368	75
156	2.00	0.00097	9.45		368	75
157	1.90	0.00129	9.18		369	74
158	1.90	0.00148	8.94		369	75
159	1.80	0.00097	8.76		368	74
160	1.80	0.00097	8.44		367	74
161	1.70	0.00097	8.23		366	74
162	1.70	0.00091	8.03		365	74
163	1.60	0.00091	7.92		362	74
164	1.60	0.00107	7.73		360	75
165	1.60	0.00107	7.68		359	74
166	1.50	0.00107	7.62		357	74
167	1.50	0.00103	7.58		355	74
168	1.50	0.00123	7.55		355	74
169	1.40	0.00126	7.57		354	74
170	1.40	0.00136	7.6144		353	74
171	1.40	0.001313	7.6588		352	74
172	1.40	0.001352	7.7032		351	74
173	1.30	0.001391	7.7476		350	74
174	1.30	0.00143	7.792		349	74
175	1.30	0.00148	7.8364		348	74
176	1.20	0.001448	7.8808		347	74
177	1.20	0.001408	7.9252		346	74
178	1.20	0.001367	7.97		346	74
179	1.10	0.00132	7.97		346	74
180	1.10	0.00129	8.05		344	74
181	1.00	0.00126	8.04		344	74
182	1.00	0.00107	8.06		341	74
183	0.90	0.00113	8		340	74
184	0.90	0.00116	7.89		338	74
185	0.90	0.0012	7.82		339	74
186	0.90	0.00116	7.81		336	74
187	0.80	0.00104	7.79		335	73
188	0.80	0.00091	7.75		335	74

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	0.80	0.00081	7.71		333	74
190	0.70	0.00088	7.6		331	74
191	0.70	0.00078	7.62		329	74
192	0.70	0.00075	7.61		329	73
193	0.70	0.00071	7.58		328	73
194	0.60	0.00071	7.56		326	73
195	0.60	0.00071	7.53		324	73
196	0.60	0.00071	7.49		324	73
197	0.60	0.00075	7.5		323	73
198	0.50	0.00075	7.49		323	73
199	0.50	0.00081	7.41		322	73
200	0.50	0.00084	7.42		322	73
201	0.40	0.00081	7.39		321	73
202	0.40	0.00088	7.36		321	73
203	0.40	0.00084	7.31		321	73
204	0.40	0.00091	7.23		320	73
205	0.30	0.00087	7.14		319	73
206	0.30	0.00091	7.11		319	73
207	0.30	0.00094	7.1		318	73
208	0.30	0.001	7.17		316	73
209	0.20	0.00094	7.14		316	73
210	0.20	0.001	7.12		316	73
211	0.20	0.00104	7.14		315	73
212	0.20	0.00097	7.06		315	73
213	0.20	0.00104	7.02		316	73
214	0.10	0.00104	7.02		314	73
215	0.10	0.001	6.97		314	73
216	0.00	0.00107	6.89		313	73

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : SC 25
Tracking No. : 2142
Project No. : 0142WN020E
Test Date : 3/1/2024
Run No. : 5

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.159** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 15.113 lb.
Minimum Fuel Weight : 13.60 lb.
Maximum Fuel Weight : 16.62 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	1.70	2x4	17.75	20.2	22.6	20.2	21.0	1.40	0.0539		1.7		1.40
2	2.00	2x4	18.00	20.4	20.4	19.7	20.2	1.66	0.0547		2.0		1.66
3	1.80	2x4	18.00	21.4	19.4	22.1	21.0	1.49	0.0547		1.8		1.49
4	4.10	4x4	17.75	20.0	19.6	22.4	20.7	3.40	0.1258	4.1		3.40	
5	4.20	4x4	18.00	20.9	21.1	23.8	21.9	3.44	0.1276	4.2		3.44	
6													
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
10.4	15.4	19.7	18.8					
14.8	20.8	16.2	22.0					
12.9	15.9	17.2						
15.5	20.2	15.2						

Avg : 16.8

Assembled Crib Fuel Load with Spacers Attached

PC #	Weight, lb with Spacers	Size	4 x 4s	2 x 4s
1	2.10	2x4		2.1000
2	2.40	2x4		2.4000
3	2.00	2x4		2.0000
4	4.40	4x4	4.40	
5	4.50	4x4	4.50	
6				
7				
8				
9				

Combined Mass of 4 x 4s 8.9 lb
Combined Mass of 2 x 4s 6.5 lb

Total Wet Mass of Fuel Load **15.4** 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	3	5.5	4.56	7.13	5.91	27.35	33.11	20.60	17.08
4 x 4	2	8.3	6.84						
Spacers	14	1.6	1.37						
Totals		15.4	12.77						

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 Pieces Moisture, % db
Measured	15.4	7.13	27.35	42	20.9
Required	13.6 - 16.6	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.:	2142
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WN020E
Model:	SC 25	Test Date:	3/1/2024

Dilution 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 *	0.056	93	0.237
X2	25.0	0.00	0.096	93	0.310
X3	75.0	0.00	0.098	93	0.313
X4	93.3	-0.5 *	0.064	93	0.253
Y1	6.7	0.5 *	0.064	93	0.253
Y2	25.0	0.00	0.086	93	0.293
Y3	75.0	0.00	0.100	93	0.316
Y4	93.3	-0.5 *	0.076	93	0.276
Center	50.0	0.00	0.116	93	0.341

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	29.4505882	in HG

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

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 19.2327$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 23.2836$$

$$F_P = V_{strav} / V_{scent} = 0.826$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 15.887\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	17:27	21:03
Barometric Pressure, in. Hg	29.48	29.28
Room Air Velocity, fpm	15	6
Room Air Temperature, °F	72	72
Room Relative Humidity, %	32.0	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

Dilution Tunnel

Date last cleaned	2/26/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

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

2 Create a smoking condition during start of pre-burn activities and using adequate lighting pointed upward and around 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 dilution tunnel flow turned-off, observe the flue draft gauge while turning the dilution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducement is occurring. Determine the cause (i.e. flue chimney too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 5

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E
Test Date: 3/1/24
Beginning Clock Time: 15:47

Coal Bed Range (lb):	3.1 (min)	3.9 (max)

Preburn Fuel Data

8 pieces @ 12 inches
8 pieces @ 17 inches
_____ pieces @ _____ inches

Fuel Moisture Readings (% DB):

22.1	22.4	20.6	24.2	19.5	25.0	21.0
21.7	23.3	23.0	22.6	25.0	21.7	19.7
25.0	21.1					

Avg Preburn Moisture (% DB): **22.37**

			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	12	-0.076	488	208	186	359	320	707	312	388	73
1	11.9	-0.078	484	207	184	359	319	740	311	356	73
2	11.8	-0.077	484	206	183	358	320	757	310	350	73
3	11.7	-0.076	483	205	183	355	320	750	309	345	73
4	11.6	-0.076	482	205	182	352	320	740	308	341	73
5	11.6	-0.075	481	204	181	349	319	730	307	335	73
6	11.5	-0.074	479	204	180	347	318	725	306	330	72
7	11.4	-0.074	476	203	179	344	317	721	304	327	73
8	11.4	-0.074	474	203	178	343	316	717	303	325	73
9	11.3	-0.074	471	202	177	342	315	715	301	324	72
10	11.2	-0.073	469	201	177	341	315	716	301	323	72
11	11.1	-0.074	467	200	176	339	316	718	300	323	72
12	11.1	-0.073	466	200	175	338	317	719	299	324	72
13	11	-0.074	464	199	174	336	318	718	298	323	72
14	10.9	-0.073	463	198	174	335	318	717	298	321	72
15	10.8	-0.073	461	197	173	333	318	715	296	321	72
16	10.8	-0.072	460	196	172	332	318	718	296	320	72
17	10.7	-0.073	459	195	171	331	316	720	294	320	72
18	10.6	-0.072	458	194	171	331	315	720	294	321	72
19	10.6	-0.072	458	193	170	331	313	717	293	318	72
20	10.5	-0.071	457	193	169	331	311	714	292	316	72
21	10.5	-0.072	456	192	169	331	309	711	291	315	72
22	10.4	-0.071	456	191	168	331	308	708	291	313	72
23	10.3	-0.071	455	190	167	332	306	708	290	313	72
24	10.3	-0.071	454	189	166	332	304	710	289	314	72
25	10.2	-0.071	453	188	166	333	303	712	289	314	72
26	10.2	-0.071	453	187	165	335	301	712	288	313	72
27	10.1	-0.072	453	186	165	336	300	718	288	314	72
28	10	-0.072	453	185	164	337	299	725	288	315	72
29	10	-0.071	454	184	164	338	298	731	288	316	72
30	9.9	-0.072	455	184	163	338	297	736	287	318	72
31	9.8	-0.072	456	183	163	339	297	737	288	319	72
32	9.7	-0.072	457	182	162	339	298	739	288	321	72
33	9.7	-0.073	458	181	162	341	300	737	288	320	72
34	9.6	-0.072	459	181	162	343	300	742	289	322	72
35	9.5	-0.073	461	180	161	346	300	750	290	324	72
36	9.4	-0.073	464	179	161	348	301	757	291	326	72
37	9.3	-0.074	468	178	161	350	302	763	292	328	72
38	9.2	-0.073	472	178	161	353	303	768	293	329	72
39	9.2	-0.074	476	177	161	355	303	773	294	332	72
40	9.1	-0.073	480	176	161	358	304	778	296	332	72
41	9	-0.076	485	176	162	361	306	784	298	345	72
42	8.9	-0.077	492	175	162	364	308	826	300	355	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	8.8	-0.077	500	174	162	368	311	855	303	364	72
44	8.7	-0.078	509	174	162	371	313	865	306	369	72
45	8.5	-0.079	518	173	163	374	316	874	309	374	72
46	8.4	-0.079	528	172	163	376	319	878	312	378	72
47	8.3	-0.079	535	172	164	379	322	877	314	379	73
48	8.2	-0.079	542	171	164	381	325	881	317	381	73
49	8.1	-0.079	549	171	165	383	328	890	319	382	73
50	8	-0.08	555	171	165	386	331	903	322	386	73
51	8.1	-0.082	562	170	166	389	334	906	324	386	73
52	8	-0.081	568	170	167	393	337	912	327	388	73
53	7.9	-0.083	574	170	167	399	340	918	330	392	73
54	7.8	-0.082	581	170	168	405	344	921	334	396	73
55	7.7	-0.081	586	169	169	410	348	920	336	395	73
56	7.5	-0.082	591	169	170	416	352	922	340	396	73
57	7.4	-0.082	596	169	171	421	356	921	343	396	73
58	7.3	-0.083	600	169	172	426	360	927	345	398	73
59	7.2	-0.082	604	169	173	432	365	931	349	399	73
60	7	-0.082	607	169	174	437	368	932	351	398	74
61	6.9	-0.081	610	169	175	443	373	933	354	399	73
62	6.8	-0.084	613	169	177	448	378	936	357	400	74
63	6.6	-0.082	615	169	178	454	383	938	360	401	74
64	6.5	-0.082	617	169	179	459	387	937	362	400	74
65	6.4	-0.083	619	170	180	464	392	940	365	400	74
66	6.3	-0.084	621	170	182	469	397	943	368	399	74
67	6.1	-0.084	623	170	183	474	402	949	370	400	74
68	6	-0.083	626	171	185	478	407	951	373	401	74
69	5.9	-0.084	628	171	186	481	410	955	375	401	74
70	5.8	-0.083	630	172	188	484	413	959	377	403	74
71	5.6	-0.083	633	172	189	486	416	963	379	402	74
72	5.5	-0.083	636	173	191	488	419	970	381	403	74
73	5.4	-0.082	638	173	192	488	423	973	383	402	74
74	5.3	-0.083	641	174	194	488	427	976	385	404	75
75	5.1	-0.082	644	174	196	489	431	978	387	403	74
76	5	-0.082	646	175	197	489	435	978	388	402	75
77	4.9	-0.082	648	176	199	489	438	978	390	402	75
78	4.8	-0.082	649	176	200	489	441	978	391	402	75
79	4.7	-0.079	651	177	202	489	443	977	392	401	75
80	4.6	-0.082	651	178	204	489	446	976	394	401	75
81	4.5	-0.082	653	179	206	491	450	974	396	402	75
82	4.4	-0.082	653	179	207	493	454	978	397	402	75
83	4.3	-0.083	655	180	209	496	459	982	400	404	75
84	4.2	-0.084	656	181	211	497	465	982	402	405	75
85	4.1	-0.082	656	182	213	499	470	973	404	404	75
86	4	-0.082	657	183	215	501	474	963	406	401	75
87	3.9	-0.082	656	183	218	503	478	955	408	400	75
88	3.9	-0.082	655	184	220	504	482	950	409	397	75
89	3.8	-0.079	654	185	223	505	486	942	411	395	75
90	3.7	-0.08	652	187	225	506	492	931	412	390	75
91	3.7	-0.079	649	188	227	507	497	920	414	388	75
92	3.6	-0.079	646	190	230	507	501	909	415	384	75
93	3.5	-0.078	643	191	233	507	503	897	415	382	75
94	3.5	-0.078	638	193	235	507	505	885	416	378	75
95	3.4	-0.078	634	195	238	507	507	875	416	376	75
96	3.4	-0.077	629	197	240	507	509	866	416	373	75
97	3.3	-0.076	624	199	242	507	512	858	417	371	75
98	3.3	-0.076	619	202	245	507	514	851	417	368	75
99	3.2	-0.076	614	204	247	506	516	844	417	364	75
100	3.2	-0.076	610	206	250	505	517	838	418	362	75

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 17:27
Test Length: 216 min
Recording Interval: 10 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 @	22.5	in. Hg
Post-Test	0	cfm @	9.82	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		15.4	**35.182**	**0.160**	**1.23**	**81.5**	**1.96**	**74.78**	**57.30**	**73.70**	**99.9**	**98.5**	**0.114**	**0.338**	**19.22**
Minimum	0.0	0.2	0.000	0.098	0.82	75	1.76	70	54	73	99.0	92	0.109	0.330	19.08
Max	15.4	1.1	35.182	0.163	1.27	83	1.98	76	62	75	101.8	138	0.117	0.342	19.77
0	15.4		0.000		0.82	75	1.76	70	62	75		138	0.109	0.330	19.77
10	14.4	1.0	1.610	0.161	1.26	76	1.95	73	54	74	101.8	98	0.114	0.338	19.31
20	13.6	0.8	3.225	0.162	1.25	77	1.95	74	54	73	99.6	97	0.116	0.341	19.26
30	12.8	0.8	4.850	0.163	1.27	78	1.97	75	55	73	100.1	96	0.113	0.336	19.20
40	12.0	0.8	6.478	0.163	1.25	80	1.95	75	56	73	100.2	96	0.115	0.339	19.15
50	11.2	0.8	8.106	0.163	1.26	81	1.96	75	57	73	99.6	95	0.117	0.342	19.31
60	10.4	0.8	9.735	0.163	1.26	81	1.96	75	57	73	99.0	96	0.116	0.341	19.35
70	9.5	0.9	11.365	0.163	1.26	82	1.97	75	58	74	99.2	97	0.115	0.339	19.28
80	8.6	0.9	12.997	0.163	1.25	82	1.96	75	58	74	99.7	98	0.115	0.339	19.26
90	7.8	0.8	14.629	0.163	1.25	83	1.96	75	58	74	99.7	98	0.115	0.339	19.27
100	6.9	0.9	16.261	0.163	1.25	83	1.97	75	58	73	99.7	98	0.114	0.338	19.23
110	6.0	0.9	17.892	0.163	1.26	83	1.97	75	58	74	100.1	99	0.112	0.335	19.11
120	4.9	1.1	19.523	0.163	1.25	83	1.98	76	58	74	100.8	101	0.113	0.336	19.09
130	3.8	1.1	21.152	0.163	1.25	83	1.98	76	59	74	100.6	101	0.114	0.338	19.19
140	3.0	0.8	22.782	0.163	1.25	83	1.98	76	59	74	100.1	100	0.115	0.339	19.27
150	2.3	0.7	24.412	0.163	1.25	83	1.97	76	58	75	99.9	98	0.112	0.335	19.16
160	1.8	0.5	26.043	0.163	1.25	83	1.97	76	58	74	100.3	98	0.114	0.338	19.10
170	1.4	0.4	27.675	0.163	1.25	83	1.97	75	58	74	100.0	96	0.115	0.339	19.21
180	1.1	0.3	29.308	0.163	1.26	83	1.97	75	57	74	99.6	95	0.114	0.338	19.18
190	0.7	0.4	30.938	0.163	1.25	83	1.97	75	57	74	99.4	94	0.114	0.338	19.12
200	0.5	0.2	32.570	0.163	1.25	83	1.97	75	57	73	99.5	93	0.115	0.339	19.15
210	0.2	0.3	34.203	0.163	1.25	83	1.97	74	56	73	99.4	92	0.113	0.336	19.09
216	0.0	0.2	35.182	0.098	1.25	83	1.97	74	56	73	99.4	92	0.115	0.339	19.08

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time: 216 min
Recording Interval: 10 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.6 in. Hg
Post-Test 0 cfm @ 10.58 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)*
Tot / Avg	**35.436**	**0.161**	**0.95**	**82.1**	**2.29**	**74.48**	**59.74**	**99.9**	**552.1**	**202.9**	**214.5**	**418.2**	**416.3**	**646.1**	**65.4**
Minimum	0.000	0.098	0.60	76	2.20	71	57	98.8	470	184	174	328	323	549	316
Max	35.436	0.165	0.00	0	0.00	0	0	101.6	653	245	253	505	521	770	413
0	0.000		0.60	76	2.20	71	63		607	197	253	498	510	691	413
10	1.618	0.162	0.95	76	2.20	73	57	101.6	543	240	244	397	406	637	366
20	3.230	0.161	0.94	77	2.20	74	57	98.8	503	245	214	346	353	595	332
30	4.858	0.163	0.97	79	2.30	74	57	99.6	496	234	193	328	339	573	318
40	6.496	0.164	0.97	80	2.30	75	58	100.1	501	222	181	330	348	578	316
50	8.137	0.164	0.97	81	2.30	75	59	99.8	504	212	175	341	357	598	318
60	9.779	0.164	0.97	82	2.30	74	59	99.1	522	203	174	365	334	621	320
70	11.423	0.164	0.97	82	2.30	75	59	99.4	555	195	174	392	323	647	328
80	13.067	0.164	0.97	83	2.30	75	60	99.7	573	190	176	406	345	668	338
90	14.713	0.165	0.97	83	2.30	75	60	99.9	576	186	179	414	371	688	345
100	16.357	0.164	0.98	83	2.30	75	60	99.8	581	184	183	437	387	683	354
110	18.003	0.165	0.97	83	2.30	75	60	100.5	593	185	191	467	396	702	366
120	19.646	0.164	0.97	84	2.30	75	61	100.8	639	187	205	488	418	741	387
130	21.289	0.164	0.97	84	2.30	75	61	100.7	653	190	221	505	450	770	404
140	22.932	0.164	0.97	84	2.30	75	61	100.1	639	192	235	504	464	745	407
150	24.575	0.164	0.97	84	2.30	75	61	99.9	604	196	240	489	517	699	409
160	26.219	0.164	0.97	84	2.30	75	61	100.3	579	201	246	469	521	676	403
170	27.864	0.165	0.97	84	2.30	75	61	100.0	553	202	245	438	487	648	385
180	29.512	0.165	0.97	84	2.30	75	60	99.7	530	198	240	419	467	623	371
190	31.156	0.164	0.97	84	2.30	75	60	99.5	510	199	240	409	458	598	363
200	32.802	0.165	0.97	84	2.30	74	60	99.5	490	200	241	401	449	572	356
210	34.452	0.165	0.98	84	2.30	74	60	99.7	477	204	242	390	440	558	351
216	35.436	0.098	0.97	84	2.30	74	59	99.2	470	205	242	385	436	549	348

Train C - First Hour Particulate Sampling

Run: 5
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 17:27
Total Sampling Time: 60 min
Recording Interval: 10 min

Test Date: 3/1/24

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 @ 17.9 in. Hg
Post-Test 0 cfm @ 6.72 in. Hg

Elapsed Time (min)	**Train C Sampling System**							
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*
Tot / Avg	**9.844**	**0.164**	**1.94**	**71.4**	**-1.89**	**73.4**	**66.0**	**100.3**
Minimum	0.000	0.162	0.17	71	-2.38	70	66	99.4
Max	9.844	0.165	2.26	72	-0.03	75	66	100.7
0	0.000		0.17	71	-0.03	70	66	
10	1.619	0.162	2.26	71	-2.38	73	66	100.5
20	3.268	0.165	2.24	71	-2.31	74	66	100.7
30	4.913	0.165	2.23	71	-1.89	74	66	100.5
40	6.557	0.164	2.22	72	-2.38	75	66	100.5
50	8.200	0.164	2.23	72	-2.37	74	66	100.0
60	9.844	0.164	2.22	72	-1.87	74	66	99.4

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 min
Recording Interval 10 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 (%)*
Tot / Avg	**35.383**	**0.161**	**1.66**	**71.8**	**-2.07**	**365.30**	**-0.077**	**272.3**	**0.07**	**8.71**
Minimum	0.000	0.098	1.70	71	-2.30	313.00	-0.085	8.4	0.00	1.61
Max	35.383	0.165	1.76	72	-2.00	414.00	-0.063	1040.0	0.34	12.89
0	0.000		0.54	71	-1.10	362	-0.063	1040.0	0.23	1.61
10	1.640	0.164	1.76	71	-2.10	368	-0.080	32.7	0.00	5.79
20	3.288	0.165	1.73	71	-2.00	365	-0.079	44.4	0.00	6.85
30	4.928	0.164	1.72	71	-2.10	354	-0.078	26.2	0.00	7.32
40	6.566	0.164	1.72	72	-2.10	355	-0.077	25.2	0.00	8.84
50	8.204	0.164	1.71	72	-2.20	353	-0.076	26.2	0.00	8.43
60	9.842	0.164	1.72	72	-2.10	372	-0.080	61.5	0.01	9.80
70	11.480	0.164	1.71	72	-2.10	381	-0.081	82.6	0.01	10.20
80	13.117	0.164	1.71	72	-2.10	387	-0.081	99.4	0.01	10.06
90	14.754	0.164	1.70	72	-2.10	382	-0.081	86.8	0.01	10.08
100	16.391	0.164	1.71	72	-2.00	381	-0.081	62.5	0.01	10.23
110	18.027	0.164	1.70	72	-2.10	396	-0.082	1040.0	0.33	12.41
120	19.664	0.164	1.71	72	-2.00	414	-0.085	1040.0	0.34	12.89
130	21.300	0.164	1.71	72	-2.10	414	-0.084	1040.0	0.28	12.00
140	22.937	0.164	1.71	72	-2.10	398	-0.082	1040.0	0.23	10.73
150	24.574	0.164	1.71	72	-2.10	374	-0.079	441.1	0.04	9.96
160	26.211	0.164	1.72	72	-2.10	367	-0.078	9.7	0.00	8.44
170	27.848	0.164	1.70	72	-2.30	353	-0.077	13.6	0.00	7.57
180	29.486	0.164	1.71	72	-2.10	344	-0.075	12.9	0.00	8.05
190	31.123	0.164	1.70	72	-2.30	331	-0.072	8.8	0.00	7.60
200	32.761	0.164	1.72	72	-2.00	322	-0.071	8.4	0.00	7.42
210	34.399	0.164	1.71	72	-2.30	316	-0.070	10.0	0.00	7.12
216	35.383	0.098	1.70	72	-2.10	313	-0.070	10.7	0.00	6.89

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Tracking No.:	2142
Project No.:	0142WN020E
Run No.:	5
Test Date:	3/1/24

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

Train A

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
FilterPairs	3/01/24 @ 17:31	Filter	F242	241.0	238.5	2.5	2.5
Probe catch*		Probe	15	114340.2	114339.7	0.5	0.5
ilter seals catch*		Seals	S663	3307.8	3307.4	0.4	0.4
				Total Particulate, mg:		**3.4**	**3.4**

Train B

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
FilterPairs	3/01/24 @ 17:31	Filter	F243	241.3	238.7	2.6	2.6
Probe catch*		Probe	62	117664.0	117663.3	0.7	0.7
ilter seals catch*		Seals	S664	4145.0	4144.7	0.3	0.3
			Sub-Total	Total Particulate, mg:		**3.6**	**3.6**

Train C - *First Hour*

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
FilterPairs	3/01/24 @ 17:31	Filter	F241	243.2	241.8	1.4	1.4
Probe catch*		Probe	66	118457.1	118457.0	0.1	0.1
ilter seals catch*		Seals	S658	3244.1	3244.1	0.0	0.0
				Total Particulate, mg:		**1.5**	**1.5**

Train D - *Ambient Background*

Sample Component	Date / Time in Desiccator	Reagent	Filter # or	Weights: Final, mg	Weights: Tare, mg	Particulate, mg
Filter catch*	3/01/24 @ 17:31	Filter	F225	121.9	122.1	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 appropriately 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:	SC 25
Project Number:	0142WN020E
Run Number:	5
Test Date:	3/1/2024

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

- Fuel Field Notes
- Velocity Traverse Field Notes
- Flue Gas Analyzer Calibration
- Supplementary Field Notes
- Gravimetric Tare Sheets

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

Client: Valley Comfort Project Number: 0142WN020E Run Number: 5

Model: SC 25 Tracking Number: 2142 Date: 03/01/2024

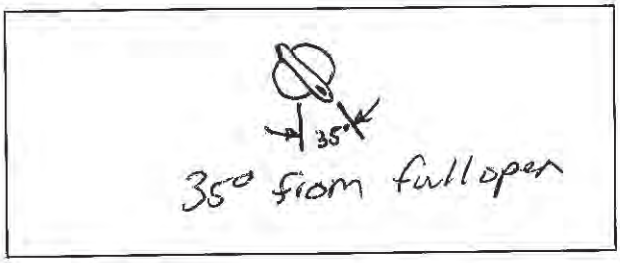
Test Crew: RT

OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:



Secondary: N/A

Tertiary/Pilot: N/A

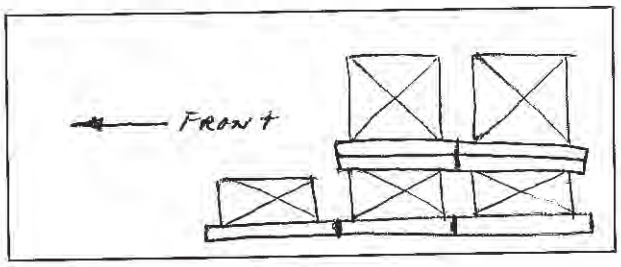
Fan: Medium High (100 V) Duration of test

Preburn Notes

Time	Notes
1534	Preburn load At 12.0 lbs preburn, air setting set to test 55°
40	at 9.0 lbs, set to test setting (35° from full open)
51	Flue Probe add 0.1 lb.
100	End preburn

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: Left at test setting

Notes:

Time	Notes	A	B
45	Loaded (By-pass open for 45 sec. fuel)		
2:50	Computer for A+B Shut-down. Had to Reboot	29.152	29.402
216 min	End of test (scale = 0)		

Technician Signature: Ian A. Morgan Date: 3/1/24

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Project Number: 0142WN020E Run Number: 5
Model: SC 25 Tracking Number: 2142 Date: 3/01/2024
Test Crew: RT
OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 17:27 216 min Booth #: 1
Stop Time: 21:03

Stack Gas Leak Check:
Initial: ✓ Final: ✓

Sample Train Leak Check: Post-Test
A: 0 @ 9.82 "Hg
B: 0 @ 10.58 "Hg
1st hr-C 0 @ 6.72 "Hg

PRE-TEST
A 0 @ 22.5
B 0 @ 17.6
C 0 @ 17.9

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

BIAS ✓

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	1530	1530	21:15	21:18
CO_2	0	16.84	0.00	16.69
CO	0	4.38	-0.002	4.338
CO, ppm	0	497	-2	494

16.82
4.34

17:27
3:36
20:63
21:03

Air Velocity (ft/min): Initial: <~~50~~ K 15 Final: 6 fpm
Scale Audit (lbs): Initial: 20.0 Final: 20.0
Pitot Tube Leak Test: Initial: ✓ Final: good
Stack Diameter (in): 6
Induced Draft: NONE
% Smoke Capture: 100%
Flue Pipe Cleaned Prior to First Test in Series:
Date: See Run 1 Initials: K

	Initial	Middle	Ending
P_b (in/Hg)	29.48	29.36	29.28
RH (%)	32	32	31
Ambient (°F)	72	72	72

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
.028	.056	93
.048	.096	93
.049	.098	93
.032	.064	93
.032	.064	93
.043	.086	93
.050	.100	93
.038	.076	93
Center:		
.058	.116	93

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.4	-0.4

Background Filter Volume: 35,410

Technician Signature: K. J. Morgan Date: 3/1/24

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

Client: Valley Comfort Project Number: 0142WN020E Run Number: 5

Model: SC 25 Tracking Number: 2142 Date: 03/01/2024

Test Crew: RT

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.

Cal Value (2) = 22% Actual Reading 22

Piece:	Length:	Reading:	Piece:	Length:	Reading:	
1	12 in	22.1	7	17 in	21	12" 21.7
2	12 in	22.4	8	17 in	21.7	12" 19.7
3	12 in	20.6	9	17 in	23.3	12" 25.0
4	12 in	24.2	10	17 in	23.0	12" 21.1
5	17 in	19.5	11	17 in	22.6	
6	17 in	25.0	12	17 in	25	

Total Pre-Burn Fuel Weight: 12.5 Pre-Burn Fuel Average Moisture: 22.37

Time (clock): 15:00 Room Temperature (F): 70 Initials: JC

Test Fuel

Firebox Volume (ft³): 2.159 Test Fuel Piece Length (in): 17.75/18

Load Weight Range (lb): 13.6 – 16.6 Total Wet Fuel Load Weight (lb): 15.4

CBR: 3.1 – 3.8

Fuel Type & Amount: 2 x 4: 6 (3 6) 4 x 4: 2

Weight (with spacers): 6.6 Weight (with spacers): 8.8

Piece:	Weight (lbs):	Moisture Readings (%DB):			Fuel Type:
1	4.1 / 4.7	20.2	22.6	20.2	2x4 17.75
2	2.4 / 2.0	20.4	20.7	19.7	2x4 18"
3	2.0 / 1.8	21.4	19.4	22.1	2x4 18"
4	4.3 / 4.1	20	17.6	22.4	4x4 18"
5	4.5 / 4.2	30.7	21.1	23.8	4x4 17.75
6					
7					

Spacer Moisture Readings (%DB)

10.7	15.4	19.7	18.8				
14.8	20.8	16.2	23.0				
12.9	15.9	17.2					
15.5	20.2	15.2					

Time (clock): 1500 Room Temperature (F): 72 Initials: RT

20.60 %dB
17.08 %WB
12.77 dry lb
5.79 Kg, dry
1.7 3.4
1.6 3.62
1.5 → 3.86
1.4 4.14
1.3 4.45

1.61 g/hr

Technician Signature: Date: 03-01-24

1.61 1.88 1hr

OMNI-Test Laboratories, Inc.

ASTM E2780 Wood Heater Run Sheets

Client: Valley Comfort Project Number: 0142WN020E Run Number: 5

Model: SC 25 Tracking Number: 2142 Date: 03/01/2024

Test Crew: RT Riley Tiggs, Tony Tong, Ken Morgan

OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By: Riley T

Date/Time in Dessicator: 3/1/24 17:31

15: 114339.7 62: 117663.6
F242: 241.2 F243: 241.1
F225: 122.0 S664: 4146.0
ORings: 3309.3 F241: 243.4
66: 118457.2 S658: 3245.6

A + AmB

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
Date/Time:	3/4/24 0928	3/5/24 730	3/06/24 8:20	3/07/24 7:14	
R/H %:	15.6	16.0	16.0	16.3	
Temp:	69	69	67	64	
200 mg Audit:	200.1	200.1	200.1	200.0	
2 g Audit:	2000.3	2000.3	2000.3	2000.2	
100 g Audit:	99997.9	99997.8	99997.8	99997.7	
Initials:	K	K	K	K	

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	Front Filter	F241	241.8	243.1 ~~244.0~~ K	243.2			
	Rear Filter	A						
	Probe	66	118457.0	118457.5	118457.6	118457.2	118457.1	
	O-Ring Set	S658	3244.1	3244.9	3244.0	3244.1		
A (Remainder)	Front Filter	F242	238.5	241.0	241.0			
	Rear Filter	A						
	Probe	15	114339.7	114340.0	114340.4	114340.2		
	O-Ring Set	S663	3307.4	3308.8	3308.0	3307.8		
B	Front Filter	F243	238.7	241.3	241.3			
	Rear Filter	A						
	Probe	62	117663.3	117663.9	117664.2	117664.0		
	O-Ring Set	S664	4144.7	4145.8	4145.2	4145.0		
BG	Filter	F225	122.1	121.9	121.9			

Technician Signature: K. Morgan Date: 3/7/24

Equations and Sample Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	5

Sample calculations of each equation used in the referenced 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	16.79	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 moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.417	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	15.89	Traverse Worksheet
θ	- Duration of test, min	216	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	29.38	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

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

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	35.182	35.436	9.844	35.383
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	1.23	0.95	1.94	1.66
T_m	- Temperature of Dry Gas Meter, °F	81.5	82.1	71.4	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.5	0.7	0.1	n/a
m_f	- mass of particulate matter from filters, mg	2.5	2.6	1.4	0.0
m_g	- mass of particulate matter from filter seals, mg	0.4	0.3	0.0	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.5	0.7	0.1	n/a
m_f	- mass of particulate matter from filters, mg	2.5	2.6	1.4	n/a
m_g	- mass of particulate matter from filter seals, mg	0.4	0.3	0.0	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 = 16.79 %, dry basis
M_{Swb} = 1.6 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((1.6 x 0.4536) (100 / (100 + 16.79))

M_{Sdb} = **0.621** 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} = 13.8 lb.
FM_{CPn} = 20.95 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 13.8 x 0.4536 x (100 / (100 + 13.8))

M_{Cdb} = **5.18** 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} = 11.41 lb
V_C = 0.417 ft^3

D_{Cdb} = 11.41 / 0.417

D_{Cdb} = **27.38** 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} = 0.621
M_{Cdb} = 5.18

M_{FTAdb} = 0.621 + 5.18

M_{FTAdb} = **5.80** kg

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

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

Sample Calculation:

M_{FTAdb} = 5.797
θ = 216

BR = (60 x 5.797) / 216

BR = **1.61** 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 = 0.826

$\Delta P^{1/2}_{AVG}$ = 0.338

$T_{S\,(avg)}$ = 559

Pbar = 29.38

Pg = -0.4

Ps = 29.35

V_S = 0.826 x 85.49 x 0.99 x 0.338 x √ [(559 / (29.35 x 28.78)]

V_S = **19.204** ft/sec

(First Hour of Test)

F_P = 0.826

$\Delta P^{1/2}_{AVG}$ = 0.338

$T_{S\,(avg)}$ = 559

Pbar = 29.48

Pg = -0.4

Ps = 29.45

V_S = 0.826 x 85.49 x 0.99 x 0.338 x √ [(559 / (29.45 x 28.78)]

V_S = **19.172** 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 = 29.35
$T_{s(avg)}$ = 559
Vs = 19.204

Qstd = 3600 x (1 - 0.02) x 19.204 x 0.19635 x (528 / 559) x (29.35 / 29.92)

Qstd = **12336.9** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 29.45
$T_{s(avg)}$ = 559
Vs = 19.172

Qstd = 3600 x (1 - 0.02) x 19.172 x 0.1963 x (528 / 559) x (29.45 / 29.92)

Qstd = **12357.9** 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

$$V_{m(std)} = 17.64 \times 35.182 \times 1.016 \times \frac{(29.38 + \frac{1.23}{13.6})}{(81.5 + 460)}$$

$V_{m(std)}$ = **34.318** dscf

Train B

$$V_{m(std)} = 17.64 \times 35.436 \times 1.011 \times \frac{(29.38 + \frac{0.95}{13.6})}{(82 + 460)}$$

$V_{m(std)}$ = **34.330** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.84 \times 1.015 \times \frac{(\underline{29.48} + \frac{1.94}{13.6})}{(71.4 + 460)}$$

$V_{m(std)}$ = **9.825** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 35.38 \times 1.011 \times \frac{(\underline{29.38} + \frac{1.66}{13.6})}{(79.0 + 460)}$$

$V_{m(std)}$ = **34.539** 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 = 0.5 + 2.5 + 0.4

m_n = **3.4** mg

Train B m_n = 0.7 + 2.6 + 0.3

m_n = **3.6** mg

Train C (1st hour)

m_n = 0.1 + 1.4 + 0

m_n = **1.5** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A m_n = 0.5 + 2.5 + 0.4

m_n = **3.4** mg

Train B m_n = 0.7 + 2.6 + 0.3

m_n = **3.6** mg

Train C (1st hour)

m_n = 0.1 + 1.4 + 0

m_n = **1.5** 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

$$C_s = 0.001 \times \frac{3.4}{34.32}$$

C_s = **0.000099** g/dscf

Train B

$$C_s = 0.001 \times \frac{3.6}{34.33}$$

C_s = **0.0001049** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.5}{9.82}$$

Cs = **0.000153** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{34.54}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{3.4}{34.32}$$

C_s = **0.000099** g/dscf

Train B

$$C_s = 0.001 \times \frac{3.6}{34.33}$$

C_s = **0.0001049** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{1.5}{9.82}$$

Cs = **0.000153** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{34.54}$$

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 = (0.000099 - 0.000000) x 12336.9 x 216 / 60

E_T = **4.40** g

Train B

E_T = (0.000105 - 0.000000) x 12336.9 x 216 / 60

E_T = **4.66** g

First Hour

E_T = (0.000153 - 0.000000) x 12357.9 x 60 / 60

E_T = 1.89 g

Trains A and B Average

E = **4.53** g

Sample calculations (Corrected)

Train A

E_T = (0.000099 - 0.000000) x 12336.9 x 216 / 60

E_T = **4.40** g

Train B

E_T = (0.000105 - 0.000000) x 12336.9 x 216 / 60

E_T = **4.66** g

First Hour

E_T = (0.000153 - 0.000000) x 12357.9 x 60 / 60

E_T = **1.89** g

Trains A and B Average

E_T = **4.53** 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 = 4.40 g

θ = 216 min

PM_R = 60 x (4.40 / 216)

PM_R = **1.22** g/hr

Train B

E_T = 4.66 g

θ = 216 min

PM_R = 60 x (4.66 / 216)

PM_R = **1.29** g/hr

A and B Average

E_T = **1.26** g/hr

First Hour

E_T = 1.89 g

θ = 60 min

PM_R = 60 x (1.89 / 60)

PM_R = **1.89** g/hr

Sample Calculation (Corrected)

Train A

E_T = 4.40 g

θ = 216 min

PM_R = 60 x (4.40 / 216)

PM_R = **1.22** g/hr

Train B

E_T = 4.66 g

θ = 216 min

PM_R = 60 x (4.66 / 216)

PM_R = **1.29** g/hr

A and B Average

E_T = **1.26** g

First Hour

E_T = 1.89 g

θ = 60 min

PM_R = 60 x (1.89 / 60)

PM_R = **1.89** 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 = 4.40 g
M_{FTAdb} = 5.80 kg
PM_F = 4.40 / 5.80
PM_F = **0.76** g/kg

Train B

E_T = 4.66 g
M_{FTAdb} = 5.80 kg
PM_F = 4.66 / 5.80
PM_F = **0.80** g/kg

Sample Calculation (Corrected)

Train A

E_T = 4.40 g
M_{FTAdb} = 5.80 kg
PM_F = 4.40 / 5.80
PM_F = **0.76** g/kg

Train B

E_T = 4.66 g
M_{FTAdb} = 5.80 kg
PM_F = 4.66 / 5.80
PM_F = **0.80** 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	216	216	60
θ_i	=	Length of recording interval, min	10	10	10
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf	0.1615	0.1612	0.1649
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	35.182	35.436	9.844
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	19.285	19.285	19.285
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	19.224	19.224	19.224
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	536.5	536.5	531.0
T_m	=	Absolute average dry gas meter temperature, ^oR	541.5	542.1	531.4
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	557.5	557.5	557.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	558.5	558.5	558.5

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

Train A PR = $\left(\frac{216 \times 0.162 \times 19.224 \times 541 \times 558}{10 \times 35.182 \times 19.285 \times 537 \times 559}\right)$ X 100 = 10.0 %

Train B PR = $\left(\frac{216 \times 0.161 \times 19.224 \times 542 \times 558}{10 \times 35.436 \times 19.285 \times 537 \times 559}\right)$ X 100 = 9.9 %

Train B PR = $\left(\frac{60 \times 0.165 \times 19.224 \times 531 \times 558}{10 \times 9.844 \times 19.285 \times 531 \times 559}\right)$ X 100 = 10.0 %

Run 6 Test Data

Test Date:	3/4/2024
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model	SC 25

Contents, in the following order:

Wood Heater Test Results

ASTM E2780 / ASTM E2515

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Project No.: 0142WN020E
Tracking No.: 2142
Run: 6
Test Date: 03/04/24

Burn-Rate Result

1.01 kg/hr

Particulate Emissions Results

	Average of Trains A and B		First Hour	
	Uncorrected	*Corrected*	*Uncorrected*	*Corrected*
Total Emissions - E_T, g	1.39	1.39	0.13	0.13
Emission Rate, g/hr	**0.24**	0.24	**0.13**	0.13
Emissions Factor, g/kg	0.23	0.23	n/a	n/a

Dilution Tunnel Flow Parameters

		First Hour	Duration of Test
Average Tunnel Temperature, °F		86.9	86.8
Average Tunnel Gas Velocity (vs), feet/second		19.009	18.929
Average Tunnel Gas Flow Rate(Qsd),	DSCF/hr	12730.3	12666.6
	DSCF/min	212.2	211.1
Average Delta p, in. H2O		0.122	0.121
Tunnel Static Pressure, in. H2O		-0.400	-0.400
Total Time of Test, Min		60	353

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	56.520	56.867	56.912	9.637	56.520	56.867	56.912	9.637
Average Gas Meter Temperature, °F	79	82	82	71	79	82	82	71
Total Sample Volume (V_{mstd}), DSCF	56.259	56.540	56.248	9.802	56.259	56.540	56.248	9.802
Total Particulates (mn), mg - m_n	0.0	1.2	0.9	0.1	0.0	1.2	0.9	0.1
Particulate Concentration (C_s - C_r), g/DSCF	0.00000	0.00002	0.00002	0.00001	0.00000	0.00002	0.00002	0.00001
Total Particulate Emissions (ET), grams	n/a	1.58	1.19	0.13	n/a	1.58	1.19	0.13
Particulate Emission Rate, g/hr	n/a	0.27	0.20	0.13	n/a	0.27	0.20	0.13
Emissions Factor, g/kg	n/a	0.27	0.20	n/a	n/a	0.27	0.20	n/a
Difference, ET from Average ET, grams	n/a	0.19	-0.19	n/a	n/a	0.19	-0.19	n/a

Test Methodology Specifications and Quality Checks

Parameter	*Requirement*	*Measured / Observed*			*Complies?*
		First Hour	*Train 1*	*Train 2*	
Filter Temperature, °F	< 90	73	74	73	✓
Filter Face Velocity, fpm	< 30	8.73	8.73	8.73	✓
Dryer Exit Temperature, °F	< 80	65	50	52	✓
Tunnel Velocity, fpm	>800	1,141	1,136		✓
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	0.4	0	✓
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		71		✓
Ambient Temp, °F	< 90		75		✓
Trains A and B Precision	(*A*) < 7.5%		14.03%		✓
Either A or B must conform	(*B*) < 0.5 g/kg		0.07		✓
Stove Surface ΔT	<= 125 °F		14		✓
Room Air Velocity	< 50 fpm		13		✓

CSA B415.1-11 Efficiency Results

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	6
Test Date:	3/4/2024

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: SC25
Date: 03/04/24
Run: 6
Control #: 2142
Test Duration: 353
Output Category: II

Technicians: _____

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	80.5%	87.0%
Combustion Efficiency	98.9%	98.9%
Heat Transfer Efficiency	81%	87.9%

Output Rate (kJ/h)	16,032	15,208	**(Btu/h)**
Burn Rate (kg/h)	1.01	2.22	**(lb/h)**
Input (kJ/h)	19,926	18,902	**(Btu/h)**

Test Load Weight (dry kg)	5.92	13.04	**dry lb**
MC wet (%)	17.45		
MC dry (%)	21.14		
Particulate (g)	1.385		
CO (g)	115		
Test Duration (h)	5.88		

Emissions	**Particulate**	**CO**
g/MJ Output	0.01	1.22
g/kg Dry Fuel	0.23	19.46
g/h	0.24	19.58
lb/MM Btu Output	0.03	2.84

Air/Fuel Ratio (A/F)	12.34

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

VERSION: 2.4 4/15/2010

Manufacturer:	Valley Comfort		**Appliance Type:**	Cat	(Cat, Non
Model:	SC25				
Date:	3/4/2024		**Temp. Units**	F	(F or C)
Run:	6		**Weight Units**	lb	(kg or lb)
Control #:	2142				
Test Duration:	353				
Output Category:	II		**Fuel Data**		
				D. Fir	
Wood Moisture (% wet):	17.45		**HHV**	19,810	kJ/kg
Load Weight (lb wet):	15.80		**%C**	48.73	
Burn Rate (dry kg/h):	1.01		**%H**	6.87	
Total Particulate Emissions:	1.385 g		**%O**	43.9	
			%Ash	0.5	

Averages	**0.11**	**8.89**	**#DIV/0!**	**249.21**	**72.90**	
				Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	15.80	0.24	1.51		309.0	75.0
1	15.60	0.15	1.69		304.0	75.0
2	15.50	0.00	7.07		268.0	75.0
3	15.50	0.00	6.58		256.0	75.0
4	15.40	0.00	6.86		256.0	75.0
5	15.30	0.00	6.20		254.0	75.0
6	15.30	0.00	6.77		250.0	75.0
7	15.20	0.00	6.75		248.0	74.0
8	15.20	0.00	6.36		245.0	74.0
9	15.10	0.00	6.36		245.0	74.0
10	15.00	0.00	6.79		246.0	74.0
11	15.00	0.00	6.42		247.0	74.0
12	14.90	0.00	7.08		246.0	74.0
13	14.90	0.00	7.21		245.0	74.0
14	14.80	0.00	6.99		243.0	74.0
15	14.80	0.00	6.64		243.0	74.0
16	14.70	0.00	6.93		241.0	73.0
17	14.60	0.00	7.27		240.0	74.0
18	14.60	0.00	7.27		239.0	74.0
19	14.50	0.00	7.45		241.0	73.0
20	14.50	0.00	7.93		241.0	74.0
21	14.40	0.00	7.80		241.0	73.0
22	14.30	0.00	8.24		242.0	73.0
23	14.30	0.00	8.22		241.0	73.0
24	14.20	0.00	8.18		242.0	73.0

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
25	14.20	0.00	8.49		242.0	73.0
26	14.10	0.00	8.56		242.0	73.0
27	14.00	0.00	8.93		242.0	73.0
28	14.00	0.00	8.56		243.0	73.0
29	13.90	0.00	8.65		244.0	73.0
30	13.80	0.00	8.73		243.0	73.0
31	13.80	0.00	8.68		243.0	73.0
32	13.70	0.00	9.01		243.0	73.0
33	13.70	0.00	8.82		242.0	73.0
34	13.60	0.00	9.09		241.0	73.0
35	13.50	0.00	8.92		242.0	73.0
36	13.50	0.00	8.28		241.0	73.0
37	13.40	0.00	8.49		240.0	73.0
38	13.40	0.00	8.62		239.0	72.0
39	13.30	0.00	8.50		238.0	72.0
40	13.30	0.00	8.42		238.0	72.0
41	13.20	0.00	9.13		236.0	72.0
42	13.10	0.00	9.31		236.0	72.0
43	13.10	0.00	9.24		234.0	72.0
44	13.00	0.01	10.27		239.0	72.0
45	12.90	0.00	9.83		241.0	72.0
46	12.90	0.00	9.94		240.0	72.0
47	12.80	0.00	9.95		241.0	72.0
48	12.70	0.00	9.80		239.0	72.0
49	12.70	0.00547	10.76		240	72
50	12.60	0.01	10.96		241	72
51	12.50	0.03	10.28		245	72
52	12.50	0.00362	9.7		247	72
53	12.40	0.00311	9.54		246	72
54	12.40	0.00298	8.97		245	72
55	12.30	0.00282	8.65		242	72
56	12.30	0.00265	8.21		238	72
57	12.30	0.00301	7.89		236	72
58	12.20	0.00282	7.67		235	72
59	12.20	0.00272	7.56		233	72
60	12.10	0.00272	7.61		230	72
61	12.10	0.00282	7.58		228	72
62	12.00	0.00288	7.52		227	72
63	12.00	0.00298	7.56		226	72
64	12.00	0.00311	7.54		225	72
65	11.90	0.00317	7.6		224	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
66	11.90	0.00327	7.55		224	72
67	11.90	0.0032	7.49		223	72
68	11.80	0.0032	7.49		220	72
69	11.80	0.00327	7.46		220	72
70	11.80	0.00314	7.15		217	72
71	11.70	0.00307	7.15		218	72
72	11.70	0.00311	7.14		217	72
73	11.70	0.00317	7.17		217	72
74	11.60	0.00301	7.02		217	72
75	11.60	0.00295	6.95		217	72
76	11.60	0.00301	7.01		214	72
77	11.50	0.00311	7.08		212	72
78	11.50	0.00314	6.88		213	72
79	11.50	0.00327	6.79		212	72
80	11.40	0.00333	6.82		211	72
81	11.40	0.00336	6.84		211	72
82	11.40	0.0034	6.89		212	72
83	11.30	0.0034	6.95		212	72
84	11.30	0.00336	6.91		208	72
85	11.30	0.00336	6.97		208	72
86	11.20	0.00343	7.06		206	72
87	11.20	0.0034	7.06		207	72
88	11.20	0.00346	7.1		208	72
89	11.20	0.00356	7.2		208	72
90	11.10	0.00365	7.25		208	72
91	11.10	0.00362	7.35		207	72
92	11.10	0.00372	7.41		208	72
93	11.00	0.00372	7.42		208	72
94	11.00	0.00388	7.51		207	72
95	11.00	0.00385	7.68		207	72
96	10.90	0.00392	7.77		206	72
97	10.90	0.00395	7.8		209	72
98	10.90	0.00405	7.88		210	72
99	10.80	0.00411	7.95		209	72
100	10.80	0.00405	8.08		209	72
101	10.70	0.00411	7.91		210	72
102	10.70	0.00427	8		212	72
103	10.70	0.00443	8.11		212	72
104	10.60	0.00453	8.15		212	72
105	10.60	0.00456	8.19		213	72
106	10.60	0.00476	8.06		213	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
107	10.50	0.00489	8.14		214	72
108	10.50	0.00502	8.25		216	72
109	10.40	0.00521	8.4		217	72
110	10.40	0.00521	8.43		218	72
111	10.40	0.00534	8.47		218	72
112	10.30	0.00534	8.48		218	72
113	10.30	0.00527	8.5		218	72
114	10.30	0.00521	8.51		218	72
115	10.20	0.00531	8.51		218	72
116	10.20	0.00524	8.48		218	72
117	10.10	0.00527	8.47		218	72
118	10.10	0.00547	8.38		218	72
119	10.10	0.00556	8.45		220	72
120	10.00	0.00537	8.27		219	72
121	10.00	0.00515	8.17		220	72
122	9.90	0.00508	8.09		218	72
123	9.90	0.00518	8.08		219	72
124	9.90	0.00521	8.03		219	72
125	9.80	0.00534	8.01		218	72
126	9.80	0.00537	8.1		217	72
127	9.80	0.00576	7.95		216	72
128	9.70	0.00602	7.87		217	72
129	9.70	0.00579	7.81		219	72
130	9.70	0.00589	7.85		218	72
131	9.60	0.00602	7.77		219	72
132	9.60	0.00612	7.69		218	72
133	9.60	0.00593	7.67		219	72
134	9.60	0.00583	7.58		218	72
135	9.50	0.00593	7.59		219	72
136	9.50	0.00608	7.52		217	72
137	9.50	0.00612	7.54		217	72
138	9.40	0.00618	7.49		218	71
139	9.40	0.00621	7.53		220	72
140	9.40	0.00625	7.51		221	72
141	9.30	0.00625	7.45		220	72
142	9.30	0.00654	7.47		218	72
143	9.20	0.00657	7.53		220	72
144	9.20	0.00677	7.51		222	72
145	9.20	0.00667	7.43		224	72
146	9.10	0.00663	7.3		224	72
147	9.10	0.0067	7.19		223	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
148	9.10	0.00609	7.32		223	72
149	9.10	0.00621	7.21		225	72
150	9.00	0.00631	7.25		226	72
151	9.00	0.00634	7.47		225	72
152	8.90	0.00686	7.45		228	72
153	8.90	0.00693	7.44		228	72
154	8.90	0.00706	7.51		228	72
155	8.80	0.00706	7.49		230	72
156	8.80	0.00718	7.55		231	72
157	8.80	0.00722	7.58		232	72
158	8.70	0.00748	7.67		234	72
159	8.70	0.00757	7.68		234	72
160	8.70	0.00757	7.79		235	72
161	8.60	0.01	7.86		236	72
162	8.60	0.0078	8.03		235	72
163	8.50	0.00786	8.05		236	72
164	8.50	0.00819	8.18		238	72
165	8.50	0.01	8.31		240	72
166	8.40	0.01	8.3		238	72
167	8.40	0.01	8.32		239	72
168	8.30	0.01	8.35		239	72
169	8.30	0.01	8.29		243	72
170	8.20	0.01	8.25		245	72
171	8.20	0.01	8.25		247	72
172	8.20	0.01	8.38		247	72
173	8.10	0.01	8.38		248	72
174	8.10	0.01	8.3		250	72
175	8.00	0.01	8.35		251	72
176	8.00	0.01	8.41		252	71
177	7.90	0.01	8.48		252	72
178	7.90	0.01	8.54		252	72
179	7.90	0.01	8.34		256	72
180	7.80	0.01	8.47		254	72
181	7.80	0.01	8.61		256	72
182	7.70	0.01	8.62		255	72
183	7.70	0.01	8.74		257	72
184	7.60	0.01	8.87		257	72
185	7.60	0.01	9.06		261	72
186	7.50	0.01	9.01		263	72
187	7.50	0.01	9.18		264	72
188	7.40	0.03	9.43		266	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
189	7.40	0.02	9.65		267	72
190	7.30	0.03	9.76		266	72
191	7.20	0.03	10.16		267	72
192	7.20	0.06	10.37		268	72
193	7.10	0.09	10.52		269	72
194	7.10	0.13	10.43		270	72
195	7.00	0.11	10.54		275	72
196	6.90	0.13	10.48		275	72
197	6.90	0.22	10.45		276	72
198	6.80	0.21	10.44		280	73
199	6.70	0.28	10.5		282	73
200	6.70	0.36	10.7		283	73
201	6.60	0.29	11.47		286	73
202	6.50	0.35	11.71		288	73
203	6.50	0.55	11.82		291	73
204	6.40	0.69	12		292	73
205	6.30	0.81	12.12		296	73
206	6.20	0.92	12.13		297	73
207	6.10	1.17	12.2		299	73
208	6.10	1.35	12.4		301	73
209	6.00	1.58	12.4		306	73
210	5.90	1.7	12.56		309	73
211	5.80	1.97	12.6		314	73
212	5.70	2.18	12.57		315	73
213	5.60	2.76	12.54		317	73
214	5.50	0.82	13.32		318	73
215	5.40	0.52	12.99		314	73
216	5.40	0.42	12.92		310	74
217	5.30	0.41	11.93		306	74
218	5.20	1.55	11.81		307	74
219	5.10	1.88	11.78		311	74
220	5.00	1.81	11.59		313	74
221	4.90	1.64	11.5		312	74
222	4.90	1.17	11.52		309	74
223	4.80	0.79	11.27		308	74
224	4.80	0.43	11.21		304	74
225	4.70	0.26	10.98		303	73
226	4.70	0.17	10.77		302	73
227	4.60	0.12	10.81		302	73
228	4.60	0.16	10.52		300	73
229	4.50	0.1	10.52		299	73

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
230	4.40	0.06	10.43		298	73
231	4.40	0.09	10.37		298	73
232	4.30	0.07	10.47		299	73
233	4.30	0.1	10.63		299	73
234	4.20	0.16	10.79		299	73
235	4.20	0.18	11.1		300	73
236	4.10	0.23	10.82		300	73
237	4.10	0.16	10.72		297	73
238	4.00	0.08	10.65		299	73
239	4.00	0.12	10.7		299	73
240	3.90	0.12	10.61		298	73
241	3.90	0.14	10.49		298	74
242	3.80	0.14	10.28		297	74
243	3.80	0.01	9.82		296	74
244	3.70	0.00767	9.64		294	74
245	3.70	0.00764	9.67		292	74
246	3.60	0.01	9.64		290	74
247	3.60	0.03	9.8		290	74
248	3.50	0.04	9.84		286	74
249	3.50	0.07	10		286	74
250	3.40	0.09	10		286	74
251	3.40	0.11	10.15		287	74
252	3.30	0.14	10.28		286	74
253	3.30	0.14	10.35		287	74
254	3.20	0.14	10.37		288	74
255	3.10	0.13	10.45		285	74
256	3.10	0.13	10.54		286	74
257	3.00	0.13	10.69		288	74
258	3.00	0.16	10.82		289	74
259	2.90	0.18	10.96		290	74
260	2.80	0.15	11.08		289	74
261	2.80	0.19	11.29		287	74
262	2.70	0.24	11.36		290	74
263	2.70	0.28	11.36		291	74
264	2.60	0.33	11.52		294	74
265	2.50	0.41	11.5		294	74
266	2.50	0.42	11.65		294	74
267	2.40	0.5	11.67		295	74
268	2.30	0.49	11.76		297	74
269	2.30	0.51	11.8		300	74
270	2.20	0.45	11.69		300	74

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
271	2.20	0.34	11.67		296	74
272	2.10	0.31	11.63		294	74
273	2.00	0.25	11.51		297	74
274	2.00	0.12	11.1		296	74
275	2.00	0.08	10.64		295	74
276	1.90	0.07	10.46		293	74
277	1.90	0.03	10.1		292	74
278	1.80	0.02	10.01		288	74
279	1.80	0.01	9.89		285	74
280	1.70	0.01	9.83		282	74
281	1.70	0.00757	9.78		281	74
282	1.60	0.00486	9.81		276	74
283	1.60	0.00285	9.75		276	74
284	1.60	0.00304	9.74		272	74
285	1.50	0.00262	9.68		272	75
286	1.50	0.0021	9.47		270	75
287	1.50	0.00185	9.48		267	75
288	1.40	0.00168	9.36		263	75
289	1.40	0.00145	9.25		258	74
290	1.40	0.00132	9.16		260	75
291	1.40	0.0012	9.15		258	75
292	1.30	0.00107	9.11		255	74
293	1.30	0.001	9.15		255	75
294	1.30	0.00094	9.16		256	75
295	1.30	0.00087	9.23		254	74
296	1.20	0.00087	9.24		253	75
297	1.20	0.00084	9.28		251	75
298	1.20	0.00081	9.25		251	75
299	1.20	0.00084	9.21		247	75
300	1.10	0.00084	9.04		248	75
301	1.10	0.00094	8.95		246	75
302	1.10	0.00087	8.91		244	74
303	1.10	0.00084	8.88		244	75
304	1.00	0.00078	8.85		244	75
305	1.00	0.00081	8.86		243	75
306	1.00	0.00081	8.83		240	75
307	1.00	0.00074	8.88		240	74
308	1.00	0.00081	8.86		241	74
309	0.90	0.00078	8.84		240	74
310	0.90	0.00078	8.85		239	74
311	0.90	0.00078	8.84		238	74

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
312	0.90	0.00078	8.93		239	74
313	0.90	0.00078	8.9		237	74
314	0.80	0.00081	8.91		236	74
315	0.80	0.00078	8.98		236	74
316	0.80	0.00081	9.03		234	74
317	0.80	0.00078	8.96		235	74
318	0.80	0.00087	8.21		234	74
319	0.70	0.00094	8.38		233	74
320	0.70	0.00097	8.4		234	74
321	0.70	0.001	8.4		233	73
322	0.70	0.00103	8.45		235	73
323	0.70	0.00103	8.45		233	73
324	0.60	0.00107	8.49		232	73
325	0.60	0.00107	8.55		230	73
326	0.60	0.00107	8.54		231	73
327	0.60	0.0011	8.54		232	74
328	0.60	0.0011	8.56		232	73
329	0.50	0.0011	8.5		231	73
330	0.50	0.0011	8.45		229	73
331	0.50	0.0011	8.47		230	73
332	0.50	0.0011	8.38		230	73
333	0.50	0.00113	8.47		231	73
334	0.40	0.0011	8.43		228	73
335	0.40	0.00113	8.44		226	73
336	0.40	0.0011	8.47		226	73
337	0.40	0.00113	8.43		225	73
338	0.40	0.00116	8.41		226	73
339	0.30	0.00116	8.43		225	73
340	0.30	0.00116	8.49		226	73
341	0.30	0.0012	8.52		227	73
342	0.30	0.00116	8.43		226	73
343	0.30	0.00123	8.45		227	73
344	0.30	0.0012	8.45		225	73
345	0.20	0.00123	8.48		227	73
346	0.20	0.00123	8.46		225	72
347	0.20	0.00126	8.46		224	72
348	0.20	0.00123	8.41		224	73
349	0.20	0.00129	8.38		224	72
350	0.10	0.00132	8.47		225	72
351	0.10	0.00136	8.5		223	72
352	0.10	0.00136	8.41		222	72

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
353	0.00	0.00148	7.91		223	73

Test Fuel Properties

ASTM E2780

Manufacturer : Valley Comfort Systems, Inc. (Blaze King)
Model : SC 25
Tracking No. : 2142
Project No. : 0142WN020E
Test Date : 3/4/2024
Run No. : 6

Moisture Meter Cal	
Cal Block	Measured
12.0	12.0
22.0	22.0

Firebox Volume : **2.159** ft^3
% 2 x 4 Required : 35 - 65 %
Ideal Fuel Weight : 15.113 lb.
Minimum Fuel Weight : 13.60 lb.
Maximum Fuel Weight : 16.62 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	17.75	19.3	22.0	19.2	20.2	1.66	0.0539		2.0		1.66
2	1.90	2x4	18.00	22.6	19.7	21.9	21.4	1.57	0.0547		1.9		1.57
3	1.90	2x4	18.00	22.1	19.5	21.2	20.9	1.57	0.0547		1.9		1.57
4	4.20	4x4	17.75	20.9	23.8	21.2	22.0	3.44	0.1258	4.2		3.44	
5	4.10	4x4	18.00	19.5	22.8	23.2	21.8	3.37	0.1276	4.1		3.37	
6													
7													
8													
9													

Spacer Data

Moisture Readings, Dry Basis % (One reading per spacer)								
19.2	16.1	16.7	21.7	15.9	20.9	21.4	18.6	
16.4	18.7	19.2	14.8	16.2	21.5	19.3	21.3	

Avg : 18.6

Assembled Crib Fuel Load with Spacers Attached

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	2.10	2x4		2.1000
4	4.40	4x4	4.40	
5	4.40	4x4	4.40	
6				
7				
8				
9				

Combined Mass of 4 x 4s 8.8 lb
Combined Mass of 2 x 4s 7.0 lb

Total Wet Mass of Fuel Load **15.8** 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	3	5.8	4.80	7.32	6.04	27.86	33.83	21.14	17.45
4 x 4	2	8.3	6.81						
Spacers	16	1.7	1.43						
Totals		15.8	13.04						

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 Pieces Moisture, % db
Measured	15.8	7.32	27.86	44	21.3
Required	13.6 - 16.6	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.:	2142
Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)	Project No.:	0142WN020E
Model:	SC 25	Test Date:	3/4/2024

Dilution 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 *	0.068	91	0.261
X2	25.0	0.00	0.096	91	0.310
X3	75.0	0.00	0.100	91	0.316
X4	93.3	-0.5 *	0.060	91	0.245
Y1	6.7	0.5 *	0.060	91	0.245
Y2	25.0	0.00	0.092	91	0.303
Y3	75.0	0.00	0.084	91	0.290
Y4	93.3	-0.5 *	0.072	91	0.268
Center	50.0	0.00	0.120	91	0.346

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	29.9605882	in HG

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

$$V_{strav} = K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 18.9285$$

$$V_{scent} = K_p C_p \sqrt{\Delta p}_{center} \sqrt{\frac{T_{s,center}}{P_s M_s}} = 23.4367$$

$$F_P = V_{strav} / V_{scent} = 0.808$$

$$Initial\ Tunnel\ Velocity, V_s = F_P K_p C_p \sqrt{\Delta p}_{avg} \sqrt{\frac{T_{s,avg}}{P_s M_s}} = 15.287\ ft/sec$$

Supplementary Data and Information

Environment

	Test Start	Test End
Time of Day	10:54	
Barometric Pressure, in. Hg	29.99	29.93
Room Air Velocity, fpm	8	13
Room Air Temperature, °F	72	72
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

Dilution Tunnel

Date last cleaned	2/26/2024	
Smoke Capture, % (visual)[2]	100	
Draft Inducement, (pass/fail)[3]	Pass	
Static Pressure, in. H_2O	-0.400	-0.400

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

2 Create a smoking condition during start of pre-burn activities and using adequate lighting pointed upward and around 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 dilution tunnel flow turned-off, observe the flue draft gauge while turning the dilution tunnel on. Any detectible response by the draft gauge associated with activation of the tunnel flow indicates that draft inducement is occurring. Determine the cause (i.e. flue chimney too deep into tunnel?) before continuing.

Preburn Data

ASTM E2780

Run: 6

Manufacturer: Valley Comfort Systems, Inc. (Blaze King
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E
Test Date: 3/4/24
Beginning Clock Time: 9:18

Coal Bed Range (lb):	3.2 (min)	4.0 (max)

Preburn Fuel Data

4 pieces @ 12 inches
4 pieces @ 17 inches
____ pieces @ ____ inches

Fuel Moisture Readings (% DB):

20.5	20.3					
21.3	19.7					
19.8	20.6					
22.4						
22.7						

Avg Preburn Moisture (% DB): **20.91**

			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	8.3	-0.088	809	315	275	569	480	1038	490	365	77
1	8.2	-0.084	808	317	277	567	478	1007	489	322	77
2	8.1	-0.081	806	320	279	564	477	993	489	299	77
3	8.1	-0.077	803	321	280	560	475	983	488	281	77
4	8	-0.076	799	322	282	556	473	975	486	268	77
5	7.9	-0.075	796	321	283	553	471	971	485	257	77
6	7.9	-0.075	792	319	284	549	468	966	482	250	77
7	7.8	-0.073	788	317	285	546	466	962	480	244	77
8	7.7	-0.072	784	318	285	543	463	958	479	241	77
9	7.7	-0.072	779	318	286	541	461	953	477	237	76
10	7.6	-0.071	774	318	286	538	458	947	475	235	76
11	7.6	-0.071	769	318	287	536	456	941	473	231	76
12	7.5	-0.07	766	318	287	533	454	936	472	231	76
13	7.4	-0.071	761	318	287	531	452	932	470	229	76
14	7.4	-0.07	757	318	287	529	450	928	468	226	76
15	7.3	-0.069	753	318	287	528	448	920	467	226	76
16	7.2	-0.069	749	318	287	525	446	913	465	227	76
17	7.2	-0.067	746	317	286	523	445	908	463	224	76
18	7.1	-0.067	742	317	286	521	443	906	462	221	76
19	7.1	-0.067	739	316	286	520	441	907	460	220	75
20	7	-0.067	737	316	286	519	440	908	460	220	75
21	7	-0.067	735	315	285	515	438	928	458	218	75
22	6.9	-0.068	736	315	285	510	436	969	456	224	75
23	6.9	-0.067	739	314	285	506	434	988	456	229	75
24	6.8	-0.069	742	313	284	502	432	1000	455	234	75
25	6.7	-0.069	746	313	284	498	430	1008	454	236	75
26	6.7	-0.07	751	312	283	495	428	1014	454	240	75
27	6.6	-0.07	754	312	283	491	427	1017	453	243	75
28	6.5	-0.071	757	311	282	488	425	1019	453	245	75
29	6.5	-0.071	760	310	282	486	423	1022	452	249	75
30	6.4	-0.071	762	309	281	483	422	1024	451	251	75
31	6.3	-0.072	765	309	281	481	421	1027	451	254	75
32	6.2	-0.073	766	308	280	478	420	1030	450	255	75
33	6.1	-0.072	768	308	280	476	419	1033	450	255	75
34	6.1	-0.073	769	308	280	474	418	1036	450	258	75
35	6	-0.073	770	309	279	472	417	1040	449	261	75
36	5.9	-0.074	772	309	279	470	416	1047	449	262	75
37	5.8	-0.074	774	309	278	468	416	1046	449	264	74
38	5.7	-0.074	775	309	278	467	415	1047	449	269	75
39	5.6	-0.074	776	308	278	466	415	1046	449	273	75
40	5.5	-0.075	777	308	278	465	415	1043	449	276	75
41	5.5	-0.075	777	307	277	465	415	1042	448	274	75
42	5.4	-0.074	776	306	277	464	415	1041	448	274	74

			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	5.3	-0.074	777	306	277	463	415	1041	448	274	75
44	5.2	-0.073	777	305	277	463	415	1040	447	274	75
45	5.1	-0.073	777	305	277	462	415	1040	447	269	74
46	5	-0.074	776	305	277	461	415	1039	447	270	74
47	5	-0.073	776	304	277	460	415	1039	446	272	75
48	4.9	-0.073	776	304	277	459	416	1037	446	272	75
49	4.8	-0.073	775	304	277	459	417	1034	446	272	74
50	4.7	-0.073	774	304	278	458	417	1032	446	272	74
51	4.7	-0.073	774	303	278	458	418	1029	446	271	74
52	4.6	-0.072	772	302	279	458	419	1026	446	271	74
53	4.5	-0.072	771	301	279	458	420	1023	446	266	74
54	4.5	-0.071	770	300	280	458	421	1024	446	266	74
55	4.4	-0.07	769	301	280	457	421	1024	446	263	74
56	4.4	-0.07	768	301	281	457	421	1023	446	263	75
57	4.3	-0.069	767	297	282	457	421	1021	445	260	75
58	4.3	-0.068	766	293	283	457	422	1017	444	260	75
59	4.3	-0.069	764	287	284	458	423	1004	443	258	75
60	4.2	-0.068	759	285	284	459	425	968	442	256	75
61	4.2	-0.067	751	281	285	460	427	943	441	253	75
62	4.1	-0.067	741	277	287	462	429	924	439	249	75
63	4.1	-0.068	731	276	288	463	431	908	438	247	74
64	4.1	-0.067	721	276	290	465	434	892	437	246	75
65	4	-0.066	711	277	291	466	436	879	436	243	75
66	4	-0.065	702	279	293	467	438	867	436	242	75
67	4	-0.064	693	279	294	468	440	855	435	238	75
68	3.9	-0.064	685	278	296	468	442	844	434	235	75
69	3.9	-0.064	678	278	298	467	444	833	433	232	75

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 min
Recording Interval: 1 min

Test Date: 3/4/24

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 @	17.8	in. Hg
Post-Test	0	cfm @	17.39	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		15.8	**56.867**	**0.161**	**1.24**	**81.7**	**1.84**	**73.53**	**50.22**	**72.90**	**100.0**	**86.8**	**0.121**	**0.348**	**18.93**
Minimum	0.0	0.0	0.000	0.151	0.93	75	1.71	70	40	71	98.4	81	0.117	0.342	18.74
Max	15.8	0.2	56.867	0.163	1.27	84	1.87	76	54	75	103.2	131	0.124	0.352	19.65
0	15.8		0.000		0.93	75	1.75	70	43	75		131	0.117	0.342	19.65
1	15.6	0.2	0.151	0.151	1.27	75	1.86	73	40	75	98.5	120	0.120	0.346	19.40
2	15.5	0.1	0.312	0.161	1.27	75	1.86	73	40	75	103.2	101	0.122	0.349	19.35
3	15.5	0.0	0.473	0.161	1.26	75	1.86	73	40	75	101.5	95	0.121	0.348	19.18
4	15.4	0.1	0.632	0.159	1.25	75	1.85	73	40	75	100.2	93	0.121	0.348	19.07
5	15.3	0.1	0.791	0.159	1.25	75	1.84	73	40	75	100.2	92	0.122	0.349	19.08
6	15.3	0.0	0.951	0.160	1.24	75	1.85	73	40	75	100.8	91	0.120	0.346	19.03
7	15.2	0.1	1.111	0.160	1.24	76	1.84	73	40	74	100.7	90	0.122	0.349	19.01
8	15.2	0.0	1.270	0.159	1.23	76	1.84	73	40	74	99.8	90	0.121	0.348	19.04
9	15.1	0.1	1.428	0.158	1.24	76	1.83	73	40	74	99.1	89	0.122	0.349	19.03
10	15.0	0.1	1.587	0.159	1.24	76	1.84	73	41	74	99.8	89	0.120	0.346	18.98
11	15.0	0.0	1.747	0.160	1.23	76	1.83	73	41	74	100.5	89	0.122	0.349	18.98
12	14.9	0.1	1.905	0.158	1.23	76	1.83	73	41	74	99.0	89	0.122	0.349	19.06
13	14.9	0.0	2.063	0.158	1.12	76	1.71	74	41	74	99.0	89	0.120	0.346	18.98
14	14.8	0.1	2.223	0.160	1.27	76	1.86	74	41	74	100.4	88	0.122	0.349	18.97
15	14.8	0.0	2.385	0.162	1.26	76	1.86	74	41	74	101.5	87	0.121	0.348	19.00
16	14.7	0.1	2.546	0.161	1.27	77	1.87	74	41	73	100.7	87	0.121	0.348	18.95
17	14.6	0.1	2.707	0.161	1.26	77	1.86	74	42	74	100.7	88	0.122	0.349	19.00
18	14.6	0.0	2.868	0.161	1.27	77	1.86	74	42	74	100.5	87	0.122	0.349	19.03
19	14.5	0.1	3.030	0.162	1.27	77	1.86	74	42	73	101.0	87	0.122	0.349	19.03
20	14.5	0.0	3.191	0.161	1.27	77	1.86	74	42	74	100.4	87	0.122	0.349	19.03
21	14.4	0.1	3.353	0.162	1.27	77	1.86	74	42	73	101.1	87	0.121	0.348	18.99
22	14.3	0.1	3.515	0.162	1.27	77	1.86	74	42	73	101.2	86	0.121	0.348	18.94
23	14.3	0.0	3.676	0.161	1.26	78	1.86	74	42	73	100.6	86	0.121	0.348	18.93
24	14.2	0.1	3.837	0.161	1.26	78	1.86	74	43	73	100.4	86	0.122	0.349	18.97
25	14.2	0.0	3.998	0.161	1.26	78	1.86	74	43	73	99.9	85	0.124	0.352	19.08
26	14.1	0.1	4.160	0.162	1.26	78	1.86	74	43	73	100.2	85	0.122	0.349	19.07
27	14.0	0.1	4.321	0.161	1.27	78	1.85	74	43	73	99.8	85	0.122	0.349	18.99
28	14.0	0.0	4.483	0.162	1.25	78	1.84	74	43	73	100.8	85	0.120	0.346	18.91
29	13.9	0.1	4.643	0.160	1.24	78	1.84	74	43	73	99.5	84	0.124	0.352	18.98
30	13.8	0.1	4.804	0.161	1.25	78	1.84	74	44	73	99.7	84	0.122	0.349	19.05
31	13.8	0.0	4.964	0.160	1.26	78	1.84	74	44	73	99.1	84	0.122	0.349	18.97
32	13.7	0.1	5.125	0.161	1.25	79	1.84	74	44	73	99.8	84	0.122	0.349	18.97
33	13.7	0.0	5.287	0.162	1.24	79	1.85	74	44	73	100.3	84	0.122	0.349	18.97
34	13.6	0.1	5.448	0.161	1.25	79	1.85	74	44	73	99.5	83	0.123	0.351	19.00
35	13.5	0.1	5.608	0.160	1.25	79	1.85	74	44	73	98.7	83	0.123	0.351	19.03
36	13.5	0.0	5.769	0.161	1.25	79	1.85	73	45	73	99.3	83	0.122	0.349	18.99
37	13.4	0.1	5.930	0.161	1.25	79	1.85	73	45	73	99.5	83	0.122	0.349	18.96
38	13.4	0.0	6.091	0.161	1.25	79	1.85	73	45	72	99.6	83	0.122	0.349	18.96
39	13.3	0.1	6.253	0.162	1.25	79	1.85	73	45	72	100.1	83	0.123	0.351	18.99
40	13.3	0.0	6.414	0.161	1.25	79	1.85	73	45	72	99.4	83	0.122	0.349	18.99

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 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 @	17.8	in. Hg
Post-Test	0	cfm @	17.39	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	13.2	0.1	6.574	0.160	1.25	79	1.84	73	45	72	98.8	83	0.123	0.351	18.99
42	13.1	0.1	6.735	0.161	1.25	80	1.84	73	45	72	99.2	83	0.123	0.351	19.03
43	13.1	0.0	6.896	0.161	1.25	80	1.84	73	46	72	99.1	82	0.122	0.349	18.99
44	13.0	0.1	7.058	0.162	1.26	80	1.85	73	46	72	99.7	83	0.124	0.352	19.02
45	12.9	0.1	7.220	0.162	1.25	80	1.85	73	46	72	99.7	83	0.122	0.349	19.03
46	12.9	0.0	7.380	0.160	1.24	80	1.84	73	46	72	98.4	83	0.124	0.352	19.03
47	12.8	0.1	7.541	0.161	1.26	80	1.85	73	46	72	99.1	83	0.121	0.348	18.99
48	12.7	0.1	7.702	0.161	1.25	80	1.85	73	46	72	99.3	82	0.123	0.351	18.95
49	12.7	0.0	7.863	0.161	1.25	80	1.85	73	46	72	99.1	82	0.123	0.351	19.02
50	12.6	0.1	8.025	0.162	1.26	80	1.84	73	46	72	99.5	82	0.123	0.351	19.02
51	12.5	0.1	8.187	0.162	1.25	80	1.84	72	46	72	99.5	82	0.123	0.351	19.02
52	12.5	0.0	8.348	0.161	1.25	80	1.85	72	47	72	98.9	82	0.123	0.351	19.02
53	12.4	0.1	8.509	0.161	1.26	80	1.85	72	47	72	99.0	83	0.123	0.351	19.02
54	12.4	0.0	8.670	0.161	1.25	80	1.85	72	47	72	99.2	83	0.121	0.348	18.96
55	12.3	0.1	8.831	0.161	1.25	80	1.84	72	47	72	99.4	83	0.123	0.351	18.96
56	12.3	0.0	8.993	0.162	1.26	80	1.85	72	47	72	100.1	83	0.120	0.346	18.92
57	12.3	0.0	9.155	0.162	1.26	80	1.85	72	47	72	100.3	83	0.123	0.351	18.92
58	12.2	0.1	9.316	0.161	1.26	80	1.85	72	47	72	99.3	83	0.123	0.351	19.03
59	12.2	0.0	9.477	0.161	1.25	80	1.85	72	47	72	99.0	83	0.123	0.351	19.03
60	12.1	0.1	9.639	0.162	1.25	80	1.85	72	47	72	99.8	84	0.122	0.349	19.00
61	12.1	0.0	9.800	0.161	1.26	80	1.85	72	47	72	99.4	84	0.122	0.349	18.97
62	12.0	0.1	9.961	0.161	1.26	80	1.84	72	48	72	99.7	84	0.120	0.346	18.90
63	12.0	0.0	10.124	0.163	1.25	80	1.85	72	48	72	101.2	84	0.122	0.349	18.90
64	12.0	0.0	10.285	0.161	1.26	80	1.85	72	48	72	99.7	83	0.122	0.349	18.96
65	11.9	0.1	10.446	0.161	1.25	80	1.84	72	48	72	99.6	84	0.121	0.348	18.93
66	11.9	0.0	10.607	0.161	1.26	81	1.85	72	48	72	99.8	84	0.121	0.348	18.90
67	11.9	0.0	10.769	0.162	1.25	81	1.85	72	48	72	100.4	84	0.121	0.348	18.90
68	11.8	0.1	10.930	0.161	1.26	81	1.85	72	48	72	99.6	84	0.122	0.349	18.93
69	11.8	0.0	11.092	0.162	1.26	81	1.84	72	48	72	100.0	84	0.123	0.351	19.01
70	11.8	0.0	11.254	0.162	1.25	81	1.85	72	48	72	99.7	84	0.122	0.349	19.01
71	11.7	0.1	11.416	0.162	1.25	81	1.85	73	48	72	100.0	84	0.121	0.348	18.93
72	11.7	0.0	11.577	0.161	1.25	81	1.85	73	48	72	99.5	84	0.122	0.349	18.93
73	11.7	0.0	11.738	0.161	1.26	81	1.85	72	48	72	99.5	84	0.121	0.348	18.93
74	11.6	0.1	11.900	0.162	1.26	81	1.85	73	48	72	100.4	84	0.120	0.346	18.86
75	11.6	0.0	12.061	0.161	1.26	81	1.85	73	48	72	99.8	84	0.122	0.349	18.90
76	11.6	0.0	12.223	0.162	1.26	81	1.85	73	48	72	100.1	84	0.123	0.351	19.01
77	11.5	0.1	12.385	0.162	1.25	81	1.85	73	48	72	99.7	84	0.122	0.349	19.01
78	11.5	0.0	12.547	0.162	1.25	81	1.84	73	48	72	99.9	84	0.122	0.349	18.97
79	11.5	0.0	12.708	0.161	1.25	81	1.85	73	48	72	99.3	84	0.122	0.349	18.97
80	11.4	0.1	12.870	0.162	1.25	81	1.84	73	48	72	100.0	84	0.122	0.349	18.97
81	11.4	0.0	13.031	0.161	1.25	81	1.85	73	48	72	99.3	84	0.122	0.349	18.97
82	11.4	0.0	13.193	0.162	1.26	81	1.85	73	49	72	99.9	84	0.123	0.351	19.01
83	11.3	0.1	13.355	0.162	1.25	81	1.84	73	49	72	99.9	84	0.121	0.348	18.97
84	11.3	0.0	13.517	0.162	1.25	81	1.85	73	49	72	100.2	84	0.121	0.348	18.90

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 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 @	17.8	in. Hg
Post-Test	0	cfm @	17.39	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	11.3	0.0	13.678	0.161	1.25	81	1.84	73	49	72	99.7	84	0.121	0.348	18.90
86	11.2	0.1	13.839	0.161	1.25	81	1.85	73	49	72	99.8	84	0.120	0.346	18.86
87	11.2	0.0	14.001	0.162	1.25	81	1.84	73	49	72	100.5	84	0.122	0.349	18.90
88	11.2	0.0	14.162	0.161	1.26	81	1.85	73	49	72	99.4	84	0.123	0.351	19.01
89	11.2	0.0	14.324	0.162	1.26	81	1.85	73	49	72	99.9	84	0.121	0.348	18.97
90	11.1	0.1	14.487	0.163	1.25	81	1.85	73	49	72	100.7	84	0.122	0.349	18.93
91	11.1	0.0	14.648	0.161	1.26	81	1.85	73	49	72	99.4	83	0.122	0.349	18.96
92	11.1	0.0	14.810	0.162	1.25	81	1.85	73	49	72	99.8	83	0.122	0.349	18.96
93	11.0	0.1	14.971	0.161	1.25	81	1.84	73	49	72	99.3	83	0.121	0.348	18.92
94	11.0	0.0	15.132	0.161	1.25	81	1.84	73	49	72	99.6	83	0.121	0.348	18.88
95	11.0	0.0	15.294	0.162	1.26	81	1.85	73	49	72	100.3	83	0.121	0.348	18.88
96	10.9	0.1	15.456	0.162	1.26	81	1.85	73	49	72	100.3	83	0.121	0.348	18.88
97	10.9	0.0	15.619	0.163	1.25	81	1.85	73	49	72	101.0	83	0.120	0.346	18.84
98	10.9	0.0	15.780	0.161	1.26	82	1.85	73	49	72	99.6	83	0.123	0.351	18.92
99	10.8	0.1	15.942	0.162	1.25	82	1.85	73	49	72	100.0	84	0.120	0.346	18.93
100	10.8	0.0	16.103	0.161	1.25	82	1.85	73	49	72	99.4	84	0.123	0.351	18.93
101	10.7	0.1	16.264	0.161	1.25	82	1.84	73	49	72	99.4	83	0.119	0.345	18.89
102	10.7	0.0	16.426	0.162	1.26	82	1.85	73	49	72	100.2	84	0.122	0.349	18.85
103	10.7	0.0	16.588	0.162	1.26	82	1.85	73	49	72	100.3	84	0.120	0.346	18.90
104	10.6	0.1	16.751	0.163	1.24	82	1.85	73	49	72	101.0	84	0.120	0.346	18.82
105	10.6	0.0	16.912	0.161	1.26	82	1.84	73	49	72	99.8	84	0.122	0.349	18.90
106	10.6	0.0	17.073	0.161	1.24	82	1.84	73	49	72	99.6	84	0.120	0.346	18.90
107	10.5	0.1	17.234	0.161	1.24	82	1.84	73	49	72	99.8	84	0.120	0.346	18.82
108	10.5	0.0	17.395	0.161	1.24	82	1.84	73	49	72	99.9	84	0.121	0.348	18.86
109	10.4	0.1	17.556	0.161	1.25	82	1.83	73	50	72	99.8	84	0.120	0.346	18.86
110	10.4	0.0	17.718	0.162	1.23	82	1.84	73	50	72	100.4	84	0.121	0.348	18.86
111	10.4	0.0	17.879	0.161	1.25	82	1.83	73	50	72	99.5	84	0.123	0.351	18.97
112	10.3	0.1	18.039	0.160	1.24	82	1.84	73	50	72	98.6	84	0.120	0.346	18.93
113	10.3	0.0	18.200	0.161	1.24	82	1.83	73	50	72	99.5	84	0.122	0.349	18.90
114	10.3	0.0	18.361	0.161	1.24	82	1.84	73	50	72	99.5	84	0.121	0.348	18.93
115	10.2	0.1	18.522	0.161	1.25	82	1.84	73	50	72	99.6	84	0.120	0.346	18.86
116	10.2	0.0	18.684	0.162	1.24	82	1.84	73	50	72	100.2	84	0.123	0.351	18.93
117	10.1	0.1	18.845	0.161	1.25	82	1.84	73	50	72	99.3	84	0.121	0.348	18.97
118	10.1	0.0	19.006	0.161	1.24	82	1.84	73	50	72	99.5	84	0.120	0.346	18.86
119	10.1	0.0	19.167	0.161	1.25	82	1.84	73	50	72	99.7	84	0.122	0.349	18.90
120	10.0	0.1	19.328	0.161	1.24	82	1.84	73	50	72	99.5	84	0.121	0.348	18.93
121	10.0	0.0	19.489	0.161	1.25	82	1.83	73	50	72	99.5	84	0.121	0.348	18.90
122	9.9	0.1	19.651	0.162	1.24	82	1.84	73	50	72	100.2	84	0.121	0.348	18.90
123	9.9	0.0	19.812	0.161	1.23	82	1.84	73	50	72	99.7	84	0.120	0.346	18.86
124	9.9	0.0	19.972	0.160	1.24	82	1.84	73	50	72	99.0	84	0.122	0.349	18.90
125	9.8	0.1	20.133	0.161	1.24	82	1.84	73	50	72	99.5	85	0.121	0.348	18.94
126	9.8	0.0	20.294	0.161	1.24	82	1.84	73	50	72	99.6	85	0.121	0.348	18.91
127	9.8	0.0	20.456	0.162	1.24	82	1.83	73	50	72	100.3	85	0.121	0.348	18.91
128	9.7	0.1	20.617	0.161	1.25	82	1.84	73	50	72	99.6	85	0.122	0.349	18.95

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 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 @	17.8	in. Hg
Post-Test	0	cfm @	17.39	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	9.7	0.0	20.778	0.161	1.24	82	1.84	73	50	72	99.4	85	0.121	0.348	18.95
130	9.7	0.0	20.939	0.161	1.25	82	1.84	73	50	72	99.6	85	0.121	0.348	18.91
131	9.6	0.1	21.099	0.160	1.25	82	1.84	73	50	72	99.1	85	0.120	0.346	18.87
132	9.6	0.0	21.261	0.162	1.25	82	1.84	73	50	72	100.4	84	0.121	0.348	18.87
133	9.6	0.0	21.422	0.161	1.24	82	1.84	73	50	72	99.4	84	0.123	0.351	18.97
134	9.6	0.0	21.584	0.162	1.25	82	1.84	73	50	72	99.8	84	0.121	0.348	18.97
135	9.5	0.1	21.745	0.161	1.24	82	1.83	73	50	72	99.5	84	0.120	0.346	18.86
136	9.5	0.0	21.906	0.161	1.25	82	1.83	73	50	72	99.7	83	0.121	0.348	18.85
137	9.5	0.0	22.067	0.161	1.25	82	1.84	73	50	72	99.4	83	0.122	0.349	18.92
138	9.4	0.1	22.228	0.161	1.25	82	1.84	72	50	71	99.6	83	0.118	0.344	18.80
139	9.4	0.0	22.390	0.162	1.24	82	1.83	72	50	72	100.6	84	0.122	0.349	18.81
140	9.4	0.0	22.552	0.162	1.25	82	1.84	73	50	72	100.2	84	0.122	0.349	18.97
141	9.3	0.1	22.713	0.161	1.24	82	1.83	72	50	72	99.5	84	0.119	0.345	18.86
142	9.3	0.0	22.874	0.161	1.25	82	1.83	73	50	72	99.9	84	0.121	0.348	18.82
143	9.2	0.1	23.035	0.161	1.24	82	1.84	73	50	72	99.8	84	0.121	0.348	18.90
144	9.2	0.0	23.196	0.161	1.25	82	1.84	73	50	72	99.7	84	0.120	0.346	18.86
145	9.2	0.0	23.358	0.162	1.25	82	1.84	73	50	72	100.6	85	0.120	0.346	18.83
146	9.1	0.1	23.519	0.161	1.25	82	1.84	73	50	72	100.1	85	0.120	0.346	18.83
147	9.1	0.0	23.681	0.162	1.24	82	1.84	73	50	72	100.8	85	0.119	0.345	18.80
148	9.1	0.0	23.841	0.160	1.25	82	1.84	73	50	72	99.7	85	0.120	0.346	18.80
149	9.1	0.0	24.002	0.161	1.25	82	1.84	73	50	72	100.1	85	0.121	0.348	18.87
150	9.0	0.1	24.164	0.162	1.25	82	1.84	73	50	72	100.4	85	0.121	0.348	18.91
151	9.0	0.0	24.325	0.161	1.25	82	1.84	73	50	72	99.6	85	0.122	0.349	18.95
152	8.9	0.1	24.487	0.162	1.25	82	1.84	73	50	72	100.2	85	0.120	0.346	18.91
153	8.9	0.0	24.648	0.161	1.24	82	1.84	73	50	72	99.9	85	0.120	0.346	18.83
154	8.9	0.0	24.808	0.160	1.25	82	1.83	73	50	72	99.4	85	0.120	0.346	18.83
155	8.8	0.1	24.969	0.161	1.25	82	1.84	73	51	72	100.1	85	0.120	0.346	18.83
156	8.8	0.0	25.131	0.162	1.25	82	1.84	73	51	72	100.9	85	0.118	0.344	18.76
157	8.8	0.0	25.292	0.161	1.25	82	1.84	73	51	72	100.3	85	0.122	0.349	18.83
158	8.7	0.1	25.454	0.162	1.25	82	1.83	73	51	72	100.3	85	0.122	0.349	18.99
159	8.7	0.0	25.615	0.161	1.23	82	1.84	73	51	72	99.4	85	0.120	0.346	18.91
160	8.7	0.0	25.776	0.161	1.25	82	1.84	73	51	72	99.8	85	0.121	0.348	18.87
161	8.6	0.1	25.936	0.160	1.25	82	1.84	73	51	72	99.1	85	0.121	0.348	18.91
162	8.6	0.0	26.098	0.162	1.24	82	1.84	73	51	72	100.5	85	0.119	0.345	18.83
163	8.5	0.1	26.259	0.161	1.24	82	1.84	73	51	72	100.1	85	0.121	0.348	18.83
164	8.5	0.0	26.421	0.162	1.24	82	1.84	73	51	72	100.5	85	0.121	0.348	18.91
165	8.5	0.0	26.582	0.161	1.24	82	1.84	73	51	72	99.7	85	0.121	0.348	18.91
166	8.4	0.1	26.742	0.160	1.24	82	1.84	73	51	72	99.1	85	0.120	0.346	18.87
167	8.4	0.0	26.903	0.161	1.25	82	1.84	73	51	72	99.9	85	0.121	0.348	18.87
168	8.3	0.1	27.064	0.161	1.24	82	1.84	73	51	72	99.9	86	0.120	0.346	18.88
169	8.3	0.0	27.226	0.162	1.25	82	1.84	73	51	72	100.6	86	0.121	0.348	18.89
170	8.2	0.1	27.388	0.162	1.24	82	1.84	73	51	72	100.5	86	0.121	0.348	18.93
171	8.2	0.0	27.549	0.161	1.24	82	1.84	73	51	72	99.8	86	0.120	0.346	18.89
172	8.2	0.0	27.709	0.160	1.24	82	1.85	73	51	72	99.4	86	0.120	0.346	18.85

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 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 @	17.8	in. Hg
Post-Test	0	cfm @	17.39	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	8.1	0.1	27.870	0.161	1.24	82	1.84	73	51	72	100.2	86	0.120	0.346	18.85
174	8.1	0.0	28.031	0.161	1.24	82	1.84	73	51	72	100.3	86	0.119	0.345	18.81
175	8.0	0.1	28.193	0.162	1.25	82	1.84	73	51	72	101.1	86	0.119	0.345	18.77
176	8.0	0.0	28.355	0.162	1.24	82	1.84	73	51	71	100.8	85	0.122	0.349	18.88
177	7.9	0.1	28.516	0.161	1.24	82	1.83	73	51	72	99.7	86	0.121	0.348	18.96
178	7.9	0.0	28.676	0.160	1.25	82	1.84	73	51	72	99.0	86	0.121	0.348	18.93
179	7.9	0.0	28.838	0.162	1.25	82	1.84	73	51	72	100.4	86	0.121	0.348	18.93
180	7.8	0.1	28.999	0.161	1.24	82	1.84	73	51	72	99.8	86	0.120	0.346	18.89
181	7.8	0.0	29.160	0.161	1.25	82	1.84	73	51	72	100.2	86	0.119	0.345	18.81
182	7.7	0.1	29.322	0.162	1.23	82	1.84	73	51	72	101.0	86	0.120	0.346	18.81
183	7.7	0.0	29.483	0.161	1.24	82	1.84	73	51	72	100.3	87	0.120	0.346	18.86
184	7.6	0.1	29.644	0.161	1.24	82	1.84	73	51	72	100.3	87	0.120	0.346	18.87
185	7.6	0.0	29.805	0.161	1.24	82	1.85	73	51	72	100.3	87	0.120	0.346	18.87
186	7.5	0.1	29.966	0.161	1.24	82	1.84	73	51	72	100.1	87	0.121	0.348	18.91
187	7.5	0.0	30.127	0.161	1.25	82	1.84	73	51	72	99.8	87	0.122	0.349	18.99
188	7.4	0.1	30.289	0.162	1.24	82	1.84	73	51	72	100.4	87	0.120	0.346	18.95
189	7.4	0.0	30.450	0.161	1.24	82	1.84	73	51	72	99.9	87	0.121	0.348	18.91
190	7.3	0.1	30.611	0.161	1.24	82	1.84	73	51	72	99.9	87	0.121	0.348	18.95
191	7.2	0.1	30.771	0.160	1.24	82	1.84	73	51	72	99.5	88	0.119	0.345	18.88
192	7.2	0.0	30.932	0.161	1.24	82	1.84	73	51	72	100.4	88	0.121	0.348	18.89
193	7.1	0.1	31.094	0.162	1.24	82	1.84	73	51	72	100.8	88	0.121	0.348	18.96
194	7.1	0.0	31.255	0.161	1.24	82	1.84	73	51	72	100.1	88	0.119	0.345	18.89
195	7.0	0.1	31.416	0.161	1.24	82	1.85	73	51	72	100.4	88	0.120	0.346	18.85
196	6.9	0.1	31.577	0.161	1.24	82	1.84	74	51	72	100.3	88	0.121	0.348	18.93
197	6.9	0.0	31.738	0.161	1.25	82	1.84	74	51	72	100.1	89	0.121	0.348	18.97
198	6.8	0.1	31.899	0.161	1.24	82	1.84	74	51	73	100.1	89	0.120	0.346	18.94
199	6.7	0.1	32.061	0.162	1.24	82	1.84	74	51	73	101.1	89	0.119	0.345	18.86
200	6.7	0.0	32.222	0.161	1.24	82	1.85	74	51	73	100.5	89	0.121	0.348	18.90
201	6.6	0.1	32.383	0.161	1.23	82	1.85	74	51	73	100.3	89	0.120	0.346	18.94
202	6.5	0.1	32.544	0.161	1.24	82	1.84	74	51	73	100.3	89	0.120	0.346	18.90
203	6.5	0.0	32.704	0.160	1.24	82	1.85	74	51	73	99.8	89	0.120	0.346	18.90
204	6.4	0.1	32.865	0.161	1.24	82	1.84	74	51	73	100.5	89	0.119	0.345	18.86
205	6.3	0.1	33.027	0.162	1.23	82	1.85	74	52	73	101.1	89	0.122	0.349	18.94
206	6.2	0.1	33.188	0.161	1.24	82	1.85	74	52	73	100.1	90	0.121	0.348	19.03
207	6.1	0.1	33.348	0.160	1.24	82	1.85	74	52	73	99.6	90	0.119	0.345	18.92
208	6.1	0.0	33.509	0.161	1.24	82	1.85	74	52	73	100.5	90	0.121	0.348	18.92
209	6.0	0.1	33.670	0.161	1.24	82	1.84	74	52	73	100.4	91	0.121	0.348	19.01
210	5.9	0.1	33.831	0.161	1.24	82	1.85	74	52	73	100.3	91	0.120	0.346	18.98
211	5.8	0.1	33.993	0.162	1.24	82	1.85	74	52	73	101.1	91	0.120	0.346	18.94
212	5.7	0.1	34.153	0.160	1.23	82	1.84	74	52	73	99.9	91	0.121	0.348	18.98
213	5.6	0.1	34.314	0.161	1.24	83	1.85	74	52	73	100.3	91	0.120	0.346	18.98
214	5.5	0.1	34.474	0.160	1.24	83	1.85	74	52	73	99.8	92	0.120	0.346	18.95
215	5.4	0.1	34.635	0.161	1.24	83	1.84	74	52	73	100.7	92	0.119	0.345	18.92
216	5.4	0.0	34.797	0.162	1.23	83	1.85	74	52	74	101.3	92	0.121	0.348	18.96

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 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 @ 17.8 in. Hg
Post-Test 0 cfm @ 17.39 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	5.3	0.1	34.958	0.161	1.24	83	1.85	74	52	74	100.3	92	0.121	0.348	19.03
218	5.2	0.1	35.118	0.160	1.23	83	1.85	75	52	74	99.7	92	0.119	0.345	18.96
219	5.1	0.1	35.279	0.161	1.23	83	1.85	75	52	74	100.7	92	0.119	0.345	18.88
220	5.0	0.1	35.440	0.161	1.24	83	1.85	75	52	74	100.8	92	0.120	0.346	18.92
221	4.9	0.1	35.601	0.161	1.24	83	1.85	75	52	74	100.6	92	0.120	0.346	18.96
222	4.9	0.0	35.763	0.162	1.24	83	1.85	75	52	74	101.1	92	0.120	0.346	18.96
223	4.8	0.1	35.923	0.160	1.23	83	1.85	75	52	74	100.0	92	0.119	0.345	18.92
224	4.8	0.0	36.084	0.161	1.24	83	1.85	75	52	74	100.8	92	0.119	0.345	18.88
225	4.7	0.1	36.244	0.160	1.24	83	1.85	75	52	73	100.2	92	0.120	0.346	18.92
226	4.7	0.0	36.405	0.161	1.24	83	1.84	75	52	73	100.6	91	0.120	0.346	18.95
227	4.6	0.1	36.567	0.162	1.23	83	1.84	75	53	73	101.0	91	0.120	0.346	18.94
228	4.6	0.0	36.729	0.162	1.24	83	1.84	74	53	73	101.1	91	0.120	0.346	18.94
229	4.5	0.1	36.890	0.161	1.24	83	1.85	74	53	73	100.3	91	0.121	0.348	18.98
230	4.4	0.1	37.050	0.160	1.24	83	1.84	74	53	73	99.5	91	0.121	0.348	19.02
231	4.4	0.0	37.211	0.161	1.24	83	1.84	74	53	73	100.1	91	0.120	0.346	18.98
232	4.3	0.1	37.372	0.161	1.24	83	1.84	74	53	73	100.4	92	0.120	0.346	18.95
233	4.3	0.0	37.534	0.162	1.24	83	1.84	74	53	73	101.1	92	0.121	0.348	18.99
234	4.2	0.1	37.695	0.161	1.24	83	1.85	74	53	73	100.3	92	0.120	0.346	18.99
235	4.2	0.0	37.856	0.161	1.24	83	1.85	74	53	73	100.3	92	0.121	0.348	18.99
236	4.1	0.1	38.017	0.161	1.24	83	1.84	75	53	73	100.4	92	0.119	0.345	18.96
237	4.1	0.0	38.178	0.161	1.24	83	1.85	75	53	73	100.6	92	0.120	0.346	18.92
238	4.0	0.1	38.339	0.161	1.24	83	1.84	75	53	73	100.6	92	0.120	0.346	18.96
239	4.0	0.0	38.501	0.162	1.24	83	1.85	75	53	73	101.0	92	0.121	0.348	18.99
240	3.9	0.1	38.662	0.161	1.24	83	1.85	75	53	73	100.3	92	0.120	0.346	18.99
241	3.9	0.0	38.823	0.161	1.24	83	1.85	75	53	74	100.3	91	0.120	0.346	18.95
242	3.8	0.1	38.984	0.161	1.23	83	1.85	75	53	74	100.5	91	0.119	0.345	18.90
243	3.8	0.0	39.144	0.160	1.24	83	1.85	75	53	74	100.2	92	0.119	0.345	18.87
244	3.7	0.1	39.305	0.161	1.24	83	1.85	75	53	74	100.9	92	0.120	0.346	18.92
245	3.7	0.0	39.467	0.162	1.24	83	1.85	75	53	74	101.1	91	0.121	0.348	18.99
246	3.6	0.1	39.628	0.161	1.23	83	1.85	75	53	74	100.3	92	0.120	0.346	18.99
247	3.6	0.0	39.789	0.161	1.24	83	1.85	75	53	74	100.5	92	0.119	0.345	18.92
248	3.5	0.1	39.950	0.161	1.24	83	1.85	75	53	74	100.6	92	0.121	0.348	18.96
249	3.5	0.0	40.110	0.160	1.24	83	1.85	75	53	74	99.8	92	0.120	0.346	18.99
250	3.4	0.1	40.272	0.162	1.24	83	1.84	75	53	74	100.9	91	0.121	0.348	18.99
251	3.4	0.0	40.433	0.161	1.23	83	1.85	75	53	74	100.4	92	0.119	0.345	18.95
252	3.3	0.1	40.594	0.161	1.23	83	1.84	75	53	74	100.5	91	0.121	0.348	18.95
253	3.3	0.0	40.754	0.160	1.24	83	1.84	75	53	74	99.7	91	0.120	0.346	18.98
254	3.2	0.1	40.915	0.161	1.24	83	1.85	75	53	74	100.4	91	0.119	0.345	18.90
255	3.1	0.1	41.076	0.161	1.24	83	1.85	75	53	74	100.5	91	0.121	0.348	18.94
256	3.1	0.0	41.238	0.162	1.24	83	1.85	75	53	74	101.0	91	0.120	0.346	18.98
257	3.0	0.1	41.399	0.161	1.24	83	1.85	75	53	74	100.3	91	0.120	0.346	18.94
258	3.0	0.0	41.560	0.161	1.23	83	1.85	75	53	74	100.3	91	0.121	0.348	18.98
259	2.9	0.1	41.720	0.160	1.24	83	1.85	75	53	74	99.7	91	0.119	0.345	18.94
260	2.8	0.1	41.881	0.161	1.25	83	1.85	75	53	74	100.7	91	0.118	0.344	18.82

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 min
Recording Interval: 1 min

Test Date: 3/4/24

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 @	17.8	in. Hg
Post-Test	0	cfm @	17.39	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	2.8	0.0	42.042	0.161	1.24	83	1.84	75	53	74	101.0	91	0.120	0.346	18.86
262	2.7	0.1	42.204	0.162	1.24	83	1.85	75	53	74	101.3	92	0.120	0.346	18.95
263	2.7	0.0	42.365	0.161	1.24	83	1.85	75	53	74	100.4	92	0.121	0.348	18.99
264	2.6	0.1	42.525	0.160	1.23	83	1.84	75	53	74	99.6	91	0.120	0.346	18.99
265	2.5	0.1	42.686	0.161	1.24	83	1.84	75	53	74	100.4	91	0.119	0.345	18.90
266	2.5	0.0	42.847	0.161	1.24	83	1.84	75	53	74	100.6	91	0.120	0.346	18.90
267	2.4	0.1	43.008	0.161	1.24	83	1.85	75	53	74	100.6	92	0.120	0.346	18.95
268	2.3	0.1	43.169	0.161	1.24	83	1.85	75	53	74	100.5	92	0.120	0.346	18.96
269	2.3	0.0	43.330	0.161	1.23	83	1.85	75	53	74	100.6	92	0.119	0.345	18.92
270	2.2	0.1	43.490	0.160	1.24	83	1.85	75	53	74	100.1	92	0.120	0.346	18.92
271	2.2	0.0	43.651	0.161	1.24	83	1.85	75	53	74	100.6	92	0.120	0.346	18.96
272	2.1	0.1	43.812	0.161	1.23	83	1.84	75	53	74	100.5	92	0.120	0.346	18.96
273	2.0	0.1	43.974	0.162	1.23	83	1.84	75	53	74	101.1	92	0.120	0.346	18.96
274	2.0	0.0	44.135	0.161	1.24	83	1.85	75	53	74	100.5	92	0.120	0.346	18.96
275	2.0	0.0	44.296	0.161	1.23	83	1.85	75	53	74	100.6	92	0.119	0.345	18.92
276	1.9	0.1	44.456	0.160	1.24	83	1.85	75	53	74	100.1	92	0.120	0.346	18.92
277	1.9	0.0	44.617	0.161	1.24	83	1.85	75	53	74	100.6	92	0.120	0.346	18.96
278	1.8	0.1	44.778	0.161	1.24	83	1.85	75	53	74	100.5	91	0.120	0.346	18.95
279	1.8	0.0	44.939	0.161	1.24	83	1.84	75	53	74	100.4	92	0.121	0.348	18.99
280	1.7	0.1	45.100	0.161	1.23	83	1.85	75	53	74	100.3	91	0.120	0.346	18.99
281	1.7	0.0	45.261	0.161	1.24	83	1.85	75	53	74	100.3	92	0.121	0.348	18.99
282	1.6	0.1	45.422	0.161	1.24	83	1.85	75	53	74	100.1	92	0.122	0.349	19.07
283	1.6	0.0	45.582	0.160	1.24	83	1.85	75	53	74	99.3	91	0.120	0.346	19.03
284	1.6	0.0	45.744	0.162	1.24	83	1.85	75	53	74	100.6	91	0.122	0.349	19.02
285	1.5	0.1	45.906	0.162	1.23	84	1.85	76	53	75	100.5	91	0.120	0.346	19.02
286	1.5	0.0	46.066	0.160	1.23	84	1.85	75	53	75	99.3	91	0.121	0.348	18.98
287	1.5	0.0	46.227	0.161	1.24	83	1.85	75	53	75	100.1	90	0.120	0.346	18.97
288	1.4	0.1	46.387	0.160	1.24	83	1.84	75	53	75	99.7	90	0.119	0.345	18.88
289	1.4	0.0	46.548	0.161	1.23	84	1.85	75	54	74	100.4	90	0.121	0.348	18.92
290	1.4	0.0	46.710	0.162	1.23	84	1.84	75	54	75	100.7	91	0.120	0.346	18.97
291	1.4	0.0	46.872	0.162	1.24	84	1.85	75	54	75	100.7	90	0.120	0.346	18.93
292	1.3	0.1	47.032	0.160	1.23	84	1.85	75	54	74	99.5	90	0.120	0.346	18.92
293	1.3	0.0	47.193	0.161	1.24	84	1.84	75	54	75	100.2	90	0.120	0.346	18.92
294	1.3	0.0	47.354	0.161	1.24	84	1.84	75	54	75	100.1	90	0.121	0.348	18.96
295	1.3	0.0	47.515	0.161	1.24	84	1.84	75	54	74	100.1	90	0.119	0.345	18.92
296	1.2	0.1	47.677	0.162	1.23	84	1.85	75	54	75	100.9	90	0.120	0.346	18.88
297	1.2	0.0	47.838	0.161	1.23	84	1.85	75	54	75	100.1	89	0.121	0.348	18.95
298	1.2	0.0	47.999	0.161	1.24	84	1.85	75	54	75	99.6	89	0.122	0.349	19.02
299	1.2	0.0	48.160	0.161	1.24	84	1.85	75	54	75	99.4	89	0.121	0.348	19.02
300	1.1	0.1	48.320	0.160	1.24	84	1.85	75	54	75	99.0	88	0.120	0.346	18.93
301	1.1	0.0	48.482	0.162	1.24	84	1.85	75	54	75	100.4	87	0.120	0.346	18.88
302	1.1	0.0	48.644	0.162	1.24	84	1.84	75	54	74	100.4	87	0.121	0.348	18.91
303	1.1	0.0	48.805	0.161	1.23	84	1.84	75	54	75	99.8	87	0.119	0.345	18.87
304	1.0	0.1	48.965	0.160	1.23	84	1.85	75	54	75	99.3	87	0.121	0.348	18.87

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 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 @	17.8	in. Hg
Post-Test	0	cfm @	17.39	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	1.0	0.0	49.126	0.161	1.23	84	1.85	75	54	75	99.4	86	0.123	0.351	19.02
306	1.0	0.0	49.287	0.161	1.24	84	1.85	75	54	75	98.9	86	0.121	0.348	19.01
307	1.0	0.0	49.448	0.161	1.24	84	1.85	75	54	74	99.2	86	0.121	0.348	18.93
308	1.0	0.0	49.610	0.162	1.24	84	1.85	75	54	74	100.1	86	0.120	0.346	18.89
309	0.9	0.1	49.771	0.161	1.23	84	1.84	75	54	74	99.7	86	0.120	0.346	18.85
310	0.9	0.0	49.932	0.161	1.24	84	1.85	75	54	74	99.6	85	0.121	0.348	18.88
311	0.9	0.0	50.093	0.161	1.24	84	1.85	74	54	74	99.5	85	0.120	0.346	18.87
312	0.9	0.0	50.254	0.161	1.24	84	1.84	74	54	74	99.6	85	0.120	0.346	18.83
313	0.9	0.0	50.415	0.161	1.24	84	1.84	74	54	74	99.6	85	0.121	0.348	18.87
314	0.8	0.1	50.577	0.162	1.24	84	1.85	74	54	74	100.1	85	0.120	0.346	18.87
315	0.8	0.0	50.738	0.161	1.23	84	1.85	74	54	74	99.4	85	0.122	0.349	18.91
316	0.8	0.0	50.899	0.161	1.24	84	1.85	74	54	74	99.2	85	0.121	0.348	18.95
317	0.8	0.0	51.060	0.161	1.24	84	1.84	74	54	74	99.2	85	0.121	0.348	18.91
318	0.8	0.0	51.221	0.161	1.24	84	1.85	74	54	74	99.5	85	0.119	0.345	18.83
319	0.7	0.1	51.382	0.161	1.24	84	1.85	74	54	74	99.7	84	0.120	0.346	18.79
320	0.7	0.0	51.545	0.163	1.23	84	1.84	74	54	74	100.8	84	0.121	0.348	18.86
321	0.7	0.0	51.705	0.160	1.24	84	1.84	74	54	73	98.7	84	0.121	0.348	18.90
322	0.7	0.0	51.867	0.162	1.24	84	1.85	74	54	73	99.8	84	0.121	0.348	18.90
323	0.7	0.0	52.028	0.161	1.24	84	1.84	74	54	73	99.2	84	0.121	0.348	18.90
324	0.6	0.1	52.189	0.161	1.24	84	1.84	73	54	73	99.0	83	0.122	0.349	18.93
325	0.6	0.0	52.350	0.161	1.24	84	1.85	73	54	73	98.9	83	0.121	0.348	18.92
326	0.6	0.0	52.512	0.162	1.24	84	1.84	73	54	73	99.6	83	0.121	0.348	18.88
327	0.6	0.0	52.673	0.161	1.24	84	1.85	73	54	74	99.1	83	0.121	0.348	18.88
328	0.6	0.0	52.834	0.161	1.24	83	1.85	73	54	73	99.1	83	0.122	0.349	18.92
329	0.5	0.1	52.995	0.161	1.24	83	1.84	73	54	73	99.2	83	0.120	0.346	18.88
330	0.5	0.0	53.156	0.161	1.24	83	1.84	73	54	73	99.4	83	0.121	0.348	18.84
331	0.5	0.0	53.317	0.161	1.24	83	1.85	73	54	73	99.4	83	0.121	0.348	18.88
332	0.5	0.0	53.479	0.162	1.24	83	1.84	73	54	73	100.0	83	0.120	0.346	18.84
333	0.5	0.0	53.641	0.162	1.24	83	1.84	73	54	73	100.2	83	0.120	0.346	18.80
334	0.4	0.1	53.802	0.161	1.24	83	1.84	72	54	73	99.6	82	0.120	0.346	18.79
335	0.4	0.0	53.963	0.161	1.24	83	1.85	72	54	73	99.5	82	0.121	0.348	18.82
336	0.4	0.0	54.124	0.161	1.24	83	1.84	72	54	73	99.5	83	0.120	0.346	18.83
337	0.4	0.0	54.285	0.161	1.24	83	1.85	72	54	73	99.3	82	0.122	0.349	18.87
338	0.4	0.0	54.447	0.162	1.24	83	1.85	72	54	73	99.7	82	0.121	0.348	18.90
339	0.3	0.1	54.609	0.162	1.24	83	1.84	72	54	73	99.6	82	0.122	0.349	18.90
340	0.3	0.0	54.770	0.161	1.24	83	1.84	72	54	73	99.1	82	0.120	0.346	18.86
341	0.3	0.0	54.931	0.161	1.24	83	1.85	72	54	73	99.4	82	0.120	0.346	18.78
342	0.3	0.0	55.092	0.161	1.24	83	1.84	72	54	73	99.7	82	0.119	0.345	18.74
343	0.3	0.0	55.253	0.161	1.24	83	1.84	72	54	73	99.8	82	0.120	0.346	18.74
344	0.3	0.0	55.415	0.162	1.25	83	1.84	72	54	73	100.2	82	0.121	0.348	18.82
345	0.2	0.1	55.577	0.162	1.24	83	1.84	72	54	73	99.9	82	0.121	0.348	18.86
346	0.2	0.0	55.738	0.161	1.25	83	1.84	72	54	72	99.2	82	0.121	0.348	18.86
347	0.2	0.0	55.899	0.161	1.24	83	1.84	72	54	72	99.4	82	0.119	0.345	18.78
348	0.2	0.0	56.060	0.161	1.25	83	1.85	72	54	73	99.6	82	0.121	0.348	18.78

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 10:54
Test Length: 353 min
Recording Interval: 1 min

Test Date: 3/4/24

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 @ 17.8 in. Hg
Post-Test 0 cfm @ 17.39 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	0.2	0.0	56.221	0.161	1.24	83	1.84	72	54	72	99.4	81	0.120	0.346	18.81
350	0.1	0.1	56.383	0.162	1.24	83	1.84	72	54	72	100.0	82	0.121	0.348	18.81
351	0.1	0.0	56.545	0.162	1.24	83	1.84	72	54	72	99.9	82	0.121	0.348	18.86
352	0.1	0.0	56.706	0.161	1.24	82	1.84	71	54	72	99.4	82	0.120	0.346	18.82
353	0.0	0.1	56.867	0.161	1.24	82	1.84	72	54	73	99.6	81	0.120	0.346	18.77

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)*
Tot / Avg	**56.912**	**0.161**	**0.95**	**81.9**	**2.05**	**72.86**	**52.41**	**100.0**	**615.7**	**228.4**	**251.6**	**389.9**	**386.3**	**864.2**	**14.2**
Minimum	0.000	0.155	0.82	76	2.00	71	43	98.3	531	199	204	319	334	740	324
Max	56.912	0.163	0.96	84	2.10	75	56	102.3	808	295	347	496	476	1097	429
0	0.000		0.82	76	2.00	71	45		670	237	301	461	440	882	422
1	0.155	0.155	0.96	76	2.10	72	43	100.9	659	236	303	449	429	818	415
2	0.315	0.160	0.96	76	2.10	72	43	102.3	647	229	303	441	423	809	409
3	0.476	0.161	0.95	76	2.00	72	43	101.2	638	230	303	434	418	848	405
4	0.636	0.160	0.95	76	2.00	73	43	100.6	632	257	303	428	413	866	407
5	0.795	0.159	0.95	76	2.00	73	43	100.0	627	258	302	423	409	862	404
6	0.955	0.160	0.94	76	2.00	73	43	100.5	622	256	301	418	405	856	400
7	1.114	0.159	0.94	76	2.00	73	43	99.9	618	258	300	414	401	855	398
8	1.273	0.159	0.94	76	2.00	73	43	99.8	614	259	298	409	397	854	395
9	1.433	0.160	0.93	76	2.00	73	44	100.3	610	260	296	405	394	852	393
10	1.591	0.158	0.94	76	2.00	73	44	99.1	606	264	294	402	391	851	391
11	1.750	0.159	0.93	76	2.00	73	44	99.8	602	266	291	398	388	851	389
12	1.910	0.160	0.93	77	2.00	73	44	100.2	598	264	289	395	385	848	386
13	2.068	0.158	0.93	77	2.00	73	44	98.8	595	265	287	392	382	846	384
14	2.229	0.161	0.97	77	2.10	73	44	100.8	591	264	285	388	380	840	382
15	2.392	0.163	0.97	77	2.10	73	44	101.9	588	265	283	385	377	832	380
16	2.554	0.162	0.97	77	2.10	73	44	101.2	584	265	280	382	375	826	377
17	2.715	0.161	0.97	77	2.10	73	44	100.7	581	266	278	380	373	825	376
18	2.877	0.162	0.97	77	2.10	73	45	101.1	578	267	276	377	371	826	374
19	3.040	0.163	0.95	77	2.10	73	45	101.5	576	268	274	375	369	826	372
20	3.200	0.160	0.96	78	2.10	73	45	99.6	574	271	272	373	367	828	371
21	3.361	0.161	0.96	78	2.10	73	45	100.2	573	271	269	371	366	830	370
22	3.522	0.161	0.96	78	2.10	73	45	100.4	572	273	267	369	364	832	369
23	3.684	0.162	0.96	78	2.10	73	45	101.0	572	274	266	368	362	832	368
24	3.845	0.161	0.96	78	2.10	73	45	100.3	571	274	264	366	361	832	367
25	4.006	0.161	0.96	78	2.10	73	45	99.9	571	277	262	364	360	833	367
26	4.168	0.162	0.96	78	2.10	73	46	100.1	572	283	260	362	358	836	367
27	4.329	0.161	0.94	79	2.10	73	46	99.6	572	288	258	361	357	840	367
28	4.490	0.161	0.95	79	2.10	73	46	100.0	574	288	257	360	356	844	367
29	4.650	0.160	0.95	79	2.10	73	46	99.3	576	289	255	358	355	847	367
30	4.812	0.162	0.95	79	2.10	73	46	100.0	577	289	253	357	354	845	366
31	4.972	0.160	0.95	79	2.10	73	46	98.8	578	289	252	356	353	844	366
32	5.133	0.161	0.95	79	2.10	73	46	99.7	579	289	250	355	353	844	365
33	5.294	0.161	0.95	79	2.00	73	47	99.7	580	288	249	354	352	843	365
34	5.455	0.161	0.95	79	2.10	73	47	99.5	581	287	248	354	352	843	364
35	5.615	0.160	0.95	79	2.00	73	47	98.6	582	287	246	353	351	843	364
36	5.776	0.161	0.95	79	2.10	73	47	99.3	583	286	245	353	351	841	364
37	5.938	0.162	0.95	80	2.10	73	47	100.0	583	285	244	352	351	837	363
38	6.098	0.160	0.95	80	2.10	73	47	98.8	582	283	242	352	351	834	362
39	6.259	0.161	0.95	80	2.10	73	47	99.3	582	281	241	352	350	831	361
40	6.421	0.162	0.95	80	2.10	73	47	99.8	581	279	240	352	350	830	360

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)
41	6.581	0.160	0.95	80	2.10	73	48	98.6	580	280	239	352	351	828	360
42	6.742	0.161	0.95	80	2.00	73	48	99.1	579	281	238	353	352	825	361
43	6.903	0.161	0.95	80	2.00	72	48	99.0	579	280	237	353	352	824	360
44	7.064	0.161	0.95	80	2.10	72	48	99.0	581	280	236	354	353	846	361
45	7.225	0.161	0.95	80	2.00	72	48	99.0	583	281	235	355	354	849	362
46	7.386	0.161	0.95	80	2.10	72	48	99.0	584	281	234	356	356	844	362
47	7.548	0.162	0.95	80	2.10	72	48	99.7	585	277	233	357	357	842	362
48	7.709	0.161	0.95	80	2.10	72	48	99.2	587	272	232	358	358	843	361
49	7.870	0.161	0.95	80	2.10	72	48	99.1	589	268	232	358	358	851	361
50	8.031	0.161	0.95	80	2.10	72	49	98.9	596	267	231	357	357	894	362
51	8.193	0.162	0.95	80	2.10	72	49	99.5	605	270	231	357	357	921	364
52	8.353	0.160	0.95	80	2.10	72	49	98.3	613	278	230	357	358	906	367
53	8.515	0.162	0.95	80	2.10	72	49	99.6	617	285	229	357	359	884	369
54	8.677	0.162	0.95	80	2.10	72	49	99.8	619	288	229	357	359	870	370
55	8.838	0.161	0.95	80	2.10	72	49	99.4	620	290	228	356	359	862	371
56	8.999	0.161	0.95	81	2.10	72	49	99.4	619	291	227	356	359	852	370
57	9.160	0.161	0.95	81	2.10	72	49	99.4	617	294	226	355	359	845	370
58	9.322	0.162	0.95	81	2.00	72	49	99.7	614	295	226	355	358	838	370
59	9.483	0.161	0.95	81	2.10	72	50	98.8	610	294	225	354	358	828	368
60	9.644	0.161	0.95	81	2.00	72	50	99.0	606	294	225	354	357	818	367
61	9.805	0.161	0.95	81	2.10	72	50	99.2	601	293	224	353	357	811	366
62	9.967	0.162	0.95	81	2.00	72	50	100.1	597	289	224	352	356	805	364
63	10.128	0.161	0.95	81	2.10	72	50	99.7	592	278	224	352	356	802	360
64	10.290	0.162	0.95	81	2.10	72	50	100.0	588	267	223	351	355	799	357
65	10.452	0.162	0.95	81	2.00	72	50	100.0	585	256	222	350	355	797	354
66	10.613	0.161	0.95	81	2.10	72	50	99.6	582	249	222	350	355	795	352
67	10.774	0.161	0.95	81	2.00	72	50	99.7	579	245	222	349	354	793	350
68	10.936	0.162	0.95	81	2.00	72	50	100.2	576	241	221	348	354	791	348
69	11.098	0.162	0.95	81	2.10	72	50	99.9	573	237	221	347	353	789	346
70	11.259	0.161	0.95	81	2.10	72	50	99.1	571	231	221	346	352	787	344
71	11.420	0.161	0.95	81	2.00	72	50	99.3	568	229	220	346	352	783	343
72	11.582	0.162	0.95	81	2.10	72	50	100.1	566	227	220	345	351	779	342
73	11.744	0.162	0.95	81	2.10	72	50	100.1	563	226	219	344	350	777	340
74	11.906	0.162	0.94	81	2.10	72	51	100.3	561	225	219	343	349	774	339
75	12.067	0.161	0.95	81	2.00	72	51	99.8	559	223	218	342	349	772	338
76	12.228	0.161	0.95	81	2.10	72	51	99.4	557	222	218	341	348	770	337
77	12.390	0.162	0.95	81	2.00	72	51	99.7	554	221	218	340	347	769	336
78	12.551	0.161	0.95	81	2.00	72	51	99.2	552	220	217	339	347	768	335
79	12.713	0.162	0.95	81	2.10	72	51	99.9	550	219	217	338	346	767	334
80	12.874	0.161	0.95	81	2.00	72	51	99.3	548	219	216	337	345	767	333
81	13.037	0.163	0.95	81	2.10	72	51	100.5	546	218	216	336	345	766	332
82	13.198	0.161	0.95	81	2.10	72	51	99.2	544	217	216	335	344	765	331
83	13.359	0.161	0.95	81	2.10	72	51	99.2	543	217	215	334	343	763	330
84	13.521	0.162	0.96	81	2.00	72	51	100.1	541	216	215	333	343	761	330

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)
85	13.683	0.162	0.95	81	2.10	72	51	100.3	540	216	215	333	342	760	329
86	13.844	0.161	0.95	81	2.10	72	51	99.8	538	216	214	332	342	758	328
87	14.005	0.161	0.95	81	2.10	72	51	99.8	537	216	214	331	341	757	328
88	14.168	0.163	0.95	81	2.10	72	51	100.6	536	215	213	330	341	756	327
89	14.329	0.161	0.95	81	2.10	72	51	99.2	535	215	213	330	340	756	327
90	14.490	0.161	0.95	81	2.10	72	51	99.4	535	215	213	329	339	756	326
91	14.652	0.162	0.95	81	2.10	72	51	99.9	534	215	212	329	339	757	326
92	14.815	0.163	0.96	81	2.10	72	51	100.4	534	214	212	328	338	758	325
93	14.976	0.161	0.95	81	2.10	72	51	99.3	534	214	212	328	337	760	325
94	15.137	0.161	0.96	81	2.10	72	51	99.5	534	214	211	327	337	761	325
95	15.299	0.162	0.95	81	2.10	72	51	100.2	534	214	211	326	337	763	324
96	15.462	0.163	0.95	82	2.10	72	51	100.7	534	214	210	326	336	766	324
97	15.623	0.161	0.95	82	2.10	72	51	99.5	535	213	210	326	336	769	324
98	15.784	0.161	0.95	82	2.10	72	52	99.4	536	213	210	325	336	772	324
99	15.946	0.162	0.96	82	2.10	72	51	99.9	536	213	210	325	335	775	324
100	16.108	0.162	0.95	82	2.10	72	52	99.9	538	213	209	324	335	778	324
101	16.269	0.161	0.95	82	2.10	72	52	99.3	539	213	209	324	335	782	324
102	16.431	0.162	0.95	82	2.10	72	52	100.2	540	212	209	324	335	786	324
103	16.592	0.161	0.95	82	2.10	72	52	99.6	542	212	208	323	335	790	324
104	16.755	0.163	0.95	82	2.10	72	52	101.0	543	212	208	323	335	794	324
105	16.916	0.161	0.95	82	2.10	72	52	99.7	545	211	208	323	335	798	324
106	17.077	0.161	0.95	82	2.10	72	52	99.5	547	211	208	322	335	803	325
107	17.239	0.162	0.95	82	2.10	72	52	100.3	549	211	207	322	335	808	325
108	17.402	0.163	0.95	82	2.10	72	52	101.1	552	211	207	321	334	813	325
109	17.563	0.161	0.95	82	2.10	72	52	99.7	554	210	207	321	334	817	325
110	17.724	0.161	0.96	82	2.10	72	52	99.7	557	210	207	321	334	820	326
111	17.886	0.162	0.95	82	2.10	72	52	100.0	560	210	207	321	334	823	326
112	18.048	0.162	0.95	82	2.10	72	52	99.8	562	210	206	321	334	825	327
113	18.210	0.162	0.95	82	2.00	72	52	100.0	564	210	206	321	335	827	327
114	18.371	0.161	0.95	82	2.10	72	52	99.4	567	210	206	320	335	828	328
115	18.533	0.162	0.95	82	2.10	72	52	100.1	569	210	206	320	335	829	328
116	18.695	0.162	0.95	82	2.10	72	52	100.1	571	209	206	320	336	828	328
117	18.856	0.161	0.95	82	2.10	72	52	99.2	572	209	206	320	336	827	329
118	19.018	0.162	0.95	82	2.00	72	52	100.0	573	209	206	320	336	827	329
119	19.180	0.162	0.95	82	2.00	72	52	100.2	575	209	206	320	336	828	329
120	19.341	0.161	0.95	82	2.00	72	52	99.4	575	209	205	321	337	827	329
121	19.503	0.162	0.95	82	2.10	72	52	100.0	576	208	205	321	337	824	329
122	19.664	0.161	0.95	82	2.10	72	52	99.5	577	209	205	321	337	822	330
123	19.826	0.162	0.95	82	2.10	72	52	100.2	577	209	205	321	337	820	330
124	19.988	0.162	0.94	82	2.10	72	52	100.2	577	209	205	321	337	818	330
125	20.149	0.161	0.95	82	2.00	72	52	99.5	576	209	205	321	337	817	330
126	20.311	0.162	0.95	82	2.00	72	52	100.1	576	209	205	321	337	817	330
127	20.473	0.162	0.95	82	2.10	72	52	100.2	576	209	205	321	338	816	330
128	20.634	0.161	0.95	82	2.10	72	52	99.5	576	209	205	321	338	816	330

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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	20.796	0.162	0.95	82	2.00	72	52	100.0	575	209	205	321	338	818	330
130	20.957	0.161	0.95	82	2.10	72	52	99.5	575	208	205	321	338	818	329
131	21.120	0.163	0.95	82	2.00	72	52	100.9	575	208	205	321	338	818	329
132	21.281	0.161	0.95	82	2.10	72	52	99.7	574	208	205	321	338	818	329
133	21.442	0.161	0.95	82	2.10	72	52	99.4	574	207	205	321	338	818	329
134	21.604	0.162	0.95	82	2.10	72	52	99.7	574	208	205	321	338	817	329
135	21.767	0.163	0.95	82	2.00	72	52	100.6	573	208	205	321	338	816	329
136	21.928	0.161	0.95	82	2.00	72	52	99.6	572	209	204	321	338	815	329
137	22.090	0.162	0.96	82	2.10	72	52	100.0	571	210	204	321	338	816	329
138	22.252	0.162	0.95	82	2.10	72	52	100.1	570	209	204	321	338	816	328
139	22.415	0.163	0.95	82	2.10	72	52	101.1	569	210	204	320	337	816	328
140	22.576	0.161	0.95	82	2.10	72	52	99.5	569	209	204	320	337	815	328
141	22.737	0.161	0.95	82	2.00	72	52	99.4	568	208	205	320	337	815	328
142	22.899	0.162	0.95	82	2.10	72	52	100.4	568	207	204	320	337	815	327
143	23.062	0.163	0.95	82	2.00	72	52	101.0	567	207	204	320	337	817	327
144	23.223	0.161	0.95	82	2.00	72	52	99.6	566	206	204	320	336	818	326
145	23.385	0.162	0.95	82	2.10	72	52	100.5	566	206	204	320	336	819	326
146	23.546	0.161	0.96	82	2.10	72	52	100.0	566	205	205	320	336	821	326
147	23.709	0.163	0.95	82	2.10	72	52	101.4	565	205	204	319	335	823	326
148	23.870	0.161	0.95	82	2.10	72	52	100.2	564	204	204	319	335	824	325
149	24.032	0.162	0.95	82	2.10	72	52	100.6	564	204	204	319	335	823	325
150	24.194	0.162	0.95	82	2.00	72	52	100.3	563	203	204	319	335	823	325
151	24.356	0.162	0.95	82	2.10	72	53	100.1	563	203	205	320	335	824	325
152	24.517	0.161	0.95	82	2.10	72	53	99.5	563	203	205	319	334	827	325
153	24.679	0.162	0.95	82	2.00	72	52	100.4	564	202	205	319	334	830	325
154	24.841	0.162	0.95	82	2.00	72	53	100.6	564	202	205	319	334	833	325
155	25.003	0.162	0.95	82	2.10	72	53	100.6	565	202	205	319	334	835	325
156	25.164	0.161	0.95	82	2.10	72	53	100.2	566	201	205	319	334	837	325
157	25.326	0.162	0.95	82	2.10	72	53	100.8	567	201	205	319	334	838	325
158	25.488	0.162	0.95	82	2.10	72	52	100.2	568	200	205	319	334	840	325
159	25.650	0.162	0.95	82	2.00	72	52	100.0	569	200	205	319	334	843	325
160	25.811	0.161	0.95	82	2.10	72	53	99.7	570	200	205	319	334	846	326
161	25.972	0.161	0.95	82	2.00	72	53	99.7	571	200	205	319	334	849	326
162	26.134	0.162	0.95	82	2.10	72	53	100.4	573	200	206	319	334	853	326
163	26.296	0.162	0.95	82	2.00	72	53	100.6	574	200	206	319	334	856	327
164	26.457	0.161	0.95	82	2.10	72	53	99.8	575	200	205	319	334	860	327
165	26.619	0.162	0.95	82	2.10	72	53	100.2	577	200	206	320	335	864	328
166	26.781	0.162	0.95	82	2.10	72	53	100.3	579	200	206	321	335	867	328
167	26.943	0.162	0.95	82	2.10	72	53	100.4	582	200	206	321	336	869	329
168	27.104	0.161	0.95	82	2.10	72	53	99.9	584	200	206	322	336	872	330
169	27.266	0.162	0.95	82	2.10	72	53	100.5	586	200	206	323	336	874	330
170	27.428	0.162	0.95	82	2.00	72	53	100.4	589	200	206	323	336	876	331
171	27.590	0.162	0.95	82	2.00	73	53	100.4	591	200	206	324	336	878	331
172	27.751	0.161	0.95	82	2.10	73	53	100.0	594	200	206	325	336	881	332

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)
173	27.912	0.161	0.95	82	2.00	72	53	100.1	596	200	207	326	337	884	333
174	28.075	0.163	0.95	82	2.10	72	53	101.5	598	200	207	326	337	888	334
175	28.236	0.161	0.95	82	2.00	72	53	100.4	600	200	207	327	337	891	334
176	28.398	0.162	0.95	82	2.00	72	53	100.8	602	200	207	327	337	894	335
177	28.560	0.162	0.95	82	2.00	72	53	100.3	604	200	207	328	338	897	335
178	28.722	0.162	0.95	82	2.10	72	53	100.2	606	200	207	329	338	901	336
179	28.884	0.162	0.95	82	2.10	72	53	100.3	608	199	208	330	338	904	337
180	29.045	0.161	0.95	82	2.10	72	53	99.8	610	200	208	330	339	905	337
181	29.207	0.162	0.95	82	2.00	72	53	100.7	611	200	208	331	339	907	338
182	29.369	0.162	0.95	82	2.10	72	53	100.9	612	200	208	332	340	911	338
183	29.531	0.162	0.95	82	2.10	72	53	100.9	613	199	208	333	340	915	339
184	29.692	0.161	0.95	82	2.10	72	53	100.2	615	199	208	334	340	921	339
185	29.853	0.161	0.95	82	2.10	72	53	100.2	617	199	209	335	341	927	340
186	30.016	0.163	0.95	82	2.00	72	53	101.3	619	199	209	336	341	930	341
187	30.177	0.161	0.95	82	2.10	72	53	99.8	621	199	209	337	341	934	341
188	30.338	0.161	0.95	82	2.10	72	53	99.7	623	199	209	339	342	935	342
189	30.500	0.162	0.95	82	2.10	72	53	100.5	625	199	210	343	343	931	344
190	30.662	0.162	0.95	82	2.10	72	53	100.5	627	199	210	348	343	929	345
191	30.823	0.161	0.95	82	2.10	73	53	100.1	627	199	211	353	344	929	347
192	30.985	0.162	0.95	82	2.10	73	53	100.9	628	199	211	358	345	927	348
193	31.147	0.162	0.95	82	2.10	73	53	100.7	629	199	212	362	346	927	350
194	31.309	0.162	0.95	82	2.10	73	53	100.7	632	200	213	363	347	944	351
195	31.470	0.161	0.95	82	2.10	73	53	100.4	638	200	213	364	347	968	352
196	31.631	0.161	0.95	82	2.10	73	53	100.3	646	200	214	364	348	982	354
197	31.793	0.162	0.95	82	2.10	73	53	100.7	654	200	214	364	348	990	356
198	31.955	0.162	0.95	82	2.10	73	53	100.7	662	200	215	365	349	996	358
199	32.116	0.161	0.95	82	2.10	73	53	100.4	670	200	216	365	350	1002	360
200	32.277	0.161	0.95	82	2.10	73	53	100.5	677	200	216	365	350	1007	362
201	32.440	0.163	0.95	82	2.10	73	53	101.5	684	200	217	365	350	1013	363
202	32.601	0.161	0.94	82	2.10	73	53	100.3	691	200	217	365	350	1020	365
203	32.762	0.161	0.95	82	2.10	73	53	100.4	700	201	218	365	351	1026	367
204	32.923	0.161	0.95	82	2.10	73	53	100.5	708	201	219	366	351	1031	369
205	33.086	0.163	0.94	82	2.10	73	53	101.6	716	202	220	366	352	1037	371
206	33.247	0.161	0.94	82	2.10	73	53	100.0	726	202	220	367	353	1043	374
207	33.408	0.161	0.95	82	2.10	73	54	100.2	733	202	221	368	355	1049	376
208	33.569	0.161	0.95	82	2.10	73	54	100.5	742	203	221	369	356	1055	378
209	33.731	0.162	0.95	82	2.10	73	54	101.0	750	203	222	370	357	1060	380
210	33.892	0.161	0.95	82	2.10	73	54	100.3	759	203	223	371	358	1066	383
211	34.054	0.162	0.95	82	2.10	73	54	101.1	767	203	224	372	360	1073	385
212	34.216	0.162	0.95	82	2.10	73	54	101.1	775	204	225	374	361	1080	388
213	34.377	0.161	0.95	83	2.10	73	54	100.3	784	205	225	375	363	1084	390
214	34.538	0.161	0.95	83	2.10	74	54	100.3	790	205	226	380	367	1075	394
215	34.699	0.161	0.95	83	2.10	74	54	100.6	790	207	227	385	372	1036	396
216	34.862	0.163	0.95	83	2.10	74	54	101.8	786	212	228	391	377	1013	399

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)
217	35.022	0.160	0.95	83	2.10	74	54	99.6	781	212	228	395	381	1004	399
218	35.183	0.161	0.95	83	2.10	74	54	100.3	779	211	229	397	383	1042	400
219	35.345	0.162	0.95	83	2.10	74	54	101.3	783	211	230	399	385	1078	402
220	35.507	0.162	0.95	83	2.10	74	54	101.4	789	211	231	400	386	1093	403
221	35.668	0.161	0.95	83	2.10	74	54	100.6	795	210	231	402	388	1097	405
222	35.829	0.161	0.95	83	2.10	74	54	100.5	801	210	232	403	389	1096	407
223	35.991	0.162	0.95	83	2.10	74	54	101.2	804	210	232	404	390	1094	408
224	36.153	0.162	0.94	83	2.10	74	54	101.4	807	210	233	405	391	1089	409
225	36.314	0.161	0.95	83	2.10	74	54	100.8	808	210	234	406	392	1083	410
226	36.475	0.161	0.95	83	2.10	74	54	100.5	807	211	234	408	393	1077	411
227	36.637	0.162	0.95	83	2.00	74	54	101.0	806	211	235	409	394	1073	411
228	36.799	0.162	0.95	83	2.10	74	55	101.0	803	211	236	410	395	1069	411
229	36.960	0.161	0.95	83	2.10	73	55	100.3	801	210	236	412	396	1065	411
230	37.122	0.162	0.95	83	2.10	73	55	100.7	798	210	236	413	396	1061	411
231	37.284	0.162	0.95	83	2.10	73	55	100.7	795	210	237	414	397	1056	411
232	37.446	0.162	0.95	83	2.10	74	55	101.0	791	210	238	415	398	1053	410
233	37.607	0.161	0.95	83	2.10	74	55	100.4	788	210	239	416	398	1051	410
234	37.769	0.162	0.95	83	2.10	74	55	100.9	785	210	240	417	399	1052	410
235	37.931	0.162	0.95	83	2.10	74	55	100.9	783	209	241	419	399	1055	410
236	38.093	0.162	0.95	83	2.10	74	55	101.0	781	209	241	420	400	1057	410
237	38.254	0.161	0.95	83	2.10	74	55	100.6	779	209	242	421	401	1056	410
238	38.416	0.162	0.95	83	2.10	74	55	101.2	778	209	243	422	402	1054	411
239	38.578	0.162	0.95	83	2.10	74	55	101.0	776	209	244	423	403	1053	411
240	38.739	0.161	0.95	83	2.10	74	55	100.3	775	209	244	424	404	1051	411
241	38.900	0.161	0.95	83	2.10	74	55	100.3	774	209	245	425	404	1048	411
242	39.062	0.162	0.95	83	2.10	74	55	101.1	773	209	246	426	405	1046	412
243	39.224	0.162	0.95	83	2.10	74	55	101.4	770	209	247	429	407	1037	412
244	39.385	0.161	0.94	83	2.00	74	55	100.8	765	208	247	432	409	1008	412
245	39.546	0.161	0.94	83	2.00	74	55	100.4	757	207	248	436	411	983	412
246	39.707	0.161	0.94	83	2.00	74	55	100.2	747	207	249	439	413	966	411
247	39.868	0.161	0.93	83	2.00	74	55	100.5	738	208	251	442	414	955	411
248	40.028	0.160	0.94	83	2.00	74	55	100.0	728	208	252	446	416	950	410
249	40.189	0.161	0.94	83	2.00	74	55	100.4	720	207	253	448	417	946	409
250	40.350	0.161	0.94	83	2.00	74	55	100.2	712	208	254	451	418	944	409
251	40.510	0.160	0.93	83	2.00	74	55	99.7	706	207	255	453	419	945	408
252	40.671	0.161	0.94	83	2.00	74	55	100.4	700	207	256	456	421	946	408
253	40.832	0.161	0.93	83	2.00	74	55	100.3	696	207	258	458	422	947	408
254	40.992	0.160	0.94	83	2.00	74	55	99.8	692	208	259	460	423	947	408
255	41.153	0.161	0.94	83	2.00	74	55	100.5	689	208	260	462	424	946	409
256	41.314	0.161	0.94	83	2.00	74	55	100.3	686	208	261	464	426	945	409
257	41.475	0.161	0.93	83	2.00	74	55	100.3	684	208	263	466	427	945	410
258	41.635	0.160	0.93	83	2.00	74	55	99.7	683	208	263	467	428	946	410
259	41.795	0.160	0.94	83	2.00	74	55	99.7	682	209	265	469	429	947	411
260	41.957	0.162	0.94	83	2.00	74	55	101.3	681	209	266	471	430	947	411

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)
261	42.117	0.160	0.94	83	2.00	74	55	100.3	681	209	267	472	432	948	412
262	42.278	0.161	0.94	83	2.00	74	55	100.7	682	209	268	473	434	951	413
263	42.439	0.161	0.94	83	2.00	74	55	100.4	682	210	269	474	435	955	414
264	42.599	0.160	0.93	83	2.00	74	55	99.6	684	210	270	476	437	958	415
265	42.759	0.160	0.94	83	2.00	74	55	99.7	685	210	272	477	440	963	417
266	42.920	0.161	0.94	83	2.00	74	55	100.6	686	210	273	478	442	967	418
267	43.081	0.161	0.93	83	2.00	74	55	100.6	687	211	274	479	444	970	419
268	43.241	0.160	0.94	83	2.00	74	55	99.9	688	211	275	481	446	973	420
269	43.402	0.161	0.94	83	2.00	74	55	100.6	690	212	277	482	449	977	422
270	43.563	0.161	0.93	83	2.00	75	55	100.7	691	212	278	484	452	979	423
271	43.723	0.160	0.93	83	2.00	75	55	100.0	692	212	279	485	454	980	424
272	43.883	0.160	0.93	83	2.00	75	55	99.8	693	213	280	487	457	980	426
273	44.045	0.162	0.93	83	2.00	75	55	101.1	694	213	281	488	459	980	427
274	44.204	0.159	0.93	83	2.00	75	55	99.2	695	213	282	488	461	975	428
275	44.365	0.161	0.94	83	2.00	75	56	100.6	695	214	283	488	462	967	428
276	44.526	0.161	0.93	83	2.00	75	55	100.7	694	215	285	488	463	955	429
277	44.687	0.161	0.93	84	2.00	75	56	100.5	692	215	286	488	465	941	429
278	44.846	0.159	0.94	84	2.00	75	56	99.0	689	216	287	489	466	929	429
279	45.007	0.161	0.93	84	2.00	75	56	100.1	685	216	287	490	467	919	429
280	45.169	0.162	0.93	84	2.00	75	56	100.7	681	217	289	490	468	909	429
281	45.329	0.160	0.93	84	2.00	75	56	99.4	676	218	289	491	469	898	429
282	45.489	0.160	0.94	84	2.00	75	56	99.3	671	218	290	491	471	889	428
283	45.650	0.161	0.93	84	2.00	75	56	99.7	665	219	291	492	472	881	428
284	45.811	0.161	0.94	84	2.00	75	56	99.8	659	219	292	493	473	873	427
285	45.971	0.160	0.93	84	2.00	75	56	99.2	654	220	293	494	474	867	427
286	46.133	0.162	0.93	84	2.00	75	56	100.5	649	221	293	495	475	861	427
287	46.293	0.160	0.94	84	2.00	75	56	99.3	644	223	295	495	475	856	426
288	46.453	0.160	0.94	84	2.00	75	56	99.5	640	224	296	496	476	851	426
289	46.614	0.161	0.94	84	2.00	75	56	100.2	636	225	298	496	476	846	426
290	46.775	0.161	0.93	84	2.00	75	56	100.1	631	226	299	496	475	840	425
291	46.935	0.160	0.94	84	2.00	75	56	99.4	627	227	301	495	475	835	425
292	47.096	0.161	0.94	84	2.00	75	56	100.1	624	228	303	495	474	830	425
293	47.258	0.162	0.94	84	2.00	75	56	100.7	620	230	305	495	474	825	425
294	47.418	0.160	0.94	84	2.00	75	56	99.4	616	232	307	494	473	821	424
295	47.579	0.161	0.94	84	2.00	75	56	100.0	613	233	309	494	473	817	424
296	47.740	0.161	0.93	84	2.00	75	56	100.2	610	234	311	493	473	813	424
297	47.900	0.160	0.94	84	2.00	75	56	99.4	607	235	313	493	473	809	424
298	48.061	0.161	0.94	84	2.10	75	56	99.6	604	236	314	492	474	806	424
299	48.222	0.161	0.94	84	2.00	75	56	99.4	601	237	316	492	474	803	424
300	48.383	0.161	0.94	84	2.00	75	56	99.5	598	238	318	491	474	800	424
301	48.543	0.160	0.94	84	2.00	75	56	99.1	595	239	320	491	474	797	424
302	48.704	0.161	0.94	84	2.00	74	56	99.7	593	239	322	490	474	794	424
303	48.866	0.162	0.94	84	2.00	74	56	100.3	590	240	324	490	473	792	423
304	49.026	0.160	0.94	84	2.00	74	56	99.2	587	241	325	489	472	789	423

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)
305	49.186	0.160	0.94	84	2.00	74	56	98.7	585	242	327	488	472	786	423
306	49.348	0.162	0.94	84	2.00	74	56	99.5	582	243	328	488	471	783	422
307	49.509	0.161	0.93	84	2.00	74	56	99.1	580	243	330	487	470	780	422
308	49.669	0.160	0.94	84	2.00	74	56	98.8	577	244	331	487	469	778	422
309	49.829	0.160	0.94	84	2.00	74	56	99.0	575	245	332	487	468	776	421
310	49.991	0.162	0.93	84	2.00	74	56	100.2	573	245	333	486	467	774	421
311	50.151	0.160	0.93	84	2.00	74	56	98.8	571	246	333	486	467	772	421
312	50.312	0.161	0.94	84	2.00	74	56	99.5	569	247	334	486	466	769	420
313	50.474	0.162	0.93	84	2.00	74	56	100.2	568	247	335	485	465	768	420
314	50.634	0.160	0.93	84	2.00	74	56	98.8	566	247	336	484	464	766	419
315	50.795	0.161	0.94	84	2.00	74	56	99.3	564	247	337	484	464	764	419
316	50.956	0.161	0.94	84	2.00	74	56	99.1	563	248	338	483	463	763	419
317	51.117	0.161	0.94	84	2.00	73	56	99.1	561	249	338	482	462	762	418
318	51.278	0.161	0.94	84	2.00	73	56	99.4	560	250	339	481	461	760	418
319	51.438	0.160	0.94	84	2.00	73	56	99.1	559	251	339	480	460	760	418
320	51.600	0.162	0.94	84	2.00	73	56	100.2	558	251	339	478	460	760	417
321	51.761	0.161	0.94	84	2.00	73	56	99.2	557	252	340	476	459	760	417
322	51.921	0.160	0.94	84	2.00	73	56	98.5	556	253	340	475	459	759	417
323	52.082	0.161	0.94	84	2.00	73	56	99.1	555	255	341	473	459	758	417
324	52.243	0.161	0.94	84	2.00	73	56	99.0	554	256	341	471	459	757	416
325	52.404	0.161	0.94	84	2.00	73	56	98.8	553	256	342	470	459	756	416
326	52.565	0.161	0.94	84	2.00	73	56	99.0	552	256	341	468	459	755	415
327	52.727	0.162	0.93	84	2.00	73	56	99.7	551	256	342	467	459	754	415
328	52.887	0.160	0.94	84	2.00	73	56	98.3	550	255	343	465	460	753	415
329	53.048	0.161	0.94	84	2.00	72	56	99.0	549	254	343	464	460	751	414
330	53.209	0.161	0.94	84	2.00	72	56	99.2	548	253	343	462	460	750	413
331	53.370	0.161	0.93	84	2.00	72	56	99.2	547	253	344	461	460	749	413
332	53.531	0.161	0.94	84	2.00	72	56	99.2	546	253	343	459	460	748	412
333	53.692	0.161	0.94	84	2.00	72	56	99.4	545	253	344	458	460	747	412
334	53.854	0.162	0.94	84	2.00	72	56	100.0	544	253	344	456	461	746	412
335	54.014	0.160	0.94	84	2.00	72	56	98.6	543	254	344	455	461	745	411
336	54.175	0.161	0.94	84	2.00	72	56	99.2	542	255	345	454	461	744	411
337	54.336	0.161	0.94	83	2.00	72	56	99.2	541	255	345	452	461	744	411
338	54.498	0.162	0.94	83	2.00	72	56	99.6	540	256	345	451	462	743	411
339	54.658	0.160	0.94	83	2.00	72	56	98.3	540	256	346	450	462	743	411
340	54.819	0.161	0.94	83	2.00	72	56	99.0	539	256	345	448	462	742	410
341	54.981	0.162	0.93	83	2.00	72	56	100.0	538	256	346	447	463	742	410
342	55.141	0.160	0.94	83	2.00	72	56	99.0	537	256	346	446	463	741	410
343	55.302	0.161	0.94	83	2.00	72	56	99.8	537	257	346	445	464	741	410
344	55.463	0.161	0.94	83	2.00	72	56	99.6	536	257	346	444	464	741	409
345	55.625	0.162	0.94	83	2.00	72	56	99.9	535	258	346	443	464	741	409
346	55.785	0.160	0.94	83	2.00	72	56	98.5	535	258	346	442	465	740	409
347	55.946	0.161	0.94	83	2.00	71	56	99.4	534	258	346	441	465	740	409
348	56.108	0.162	0.94	83	2.00	71	56	100.2	534	259	347	439	465	740	409

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 6 **Test Date:** 3/4/24

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time: 353 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 18.22 in. Hg
Post-Test 0 cfm @ 17.52 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)
349	56.268	0.160	0.94	83	2.00	71	56	98.8	533	259	347	438	466	740	409
350	56.429	0.161	0.94	83	2.00	71	56	99.3	532	260	346	437	466	740	408
351	56.590	0.161	0.94	83	2.00	71	56	99.3	532	260	346	436	466	740	408
352	56.751	0.161	0.94	83	2.00	71	56	99.2	532	260	347	435	467	740	408
353	56.912	0.161	0.94	83	2.00	71	56	99.4	531	260	346	434	467	741	408

Train C - First Hour Particulate Sampling

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 10:54
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/4/24

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 @ 23.28 in. Hg
Post-Test 0 cfm @ 23.18 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	**9.637**	**0.161**	**2.17**	**70.7**	**-2.04**	**72.3**	**65.0**	**100.2**
Minimum	0.000	0.139	1.11	70	-2.35	70	65	90.4
Max	9.637	0.163	2.26	71	-1.76	73	65	104.2
0	0.000		1.11	70	-2.18	70	65	
1	0.139	0.139	2.26	70	-2.34	72	65	90.4
2	0.302	0.163	2.24	70	-2.30	72	65	104.2
3	0.464	0.162	2.24	70	-2.35	72	65	101.9
4	0.627	0.163	2.20	70	-1.89	72	65	102.6
5	0.788	0.161	2.21	70	-2.23	72	65	101.3
6	0.950	0.162	2.18	70	-2.24	72	65	101.9
7	1.110	0.160	2.18	70	-1.83	72	65	100.7
8	1.271	0.161	2.19	70	-1.80	72	65	101.2
9	1.431	0.160	2.18	70	-2.14	73	65	100.4
10	1.591	0.160	2.17	70	-1.81	73	65	100.5
11	1.751	0.160	2.16	70	-1.87	73	65	100.6
12	1.911	0.160	2.16	70	-1.81	73	65	100.4
13	2.071	0.160	2.15	70	-2.13	73	65	100.4
14	2.230	0.159	2.15	70	-1.95	73	65	99.9
15	2.389	0.159	2.13	70	-2.30	73	65	99.7
16	2.548	0.159	2.14	70	-2.14	73	65	99.7
17	2.707	0.159	2.14	70	-2.16	73	65	99.8
18	2.866	0.159	2.13	71	-1.81	73	65	99.5
19	3.025	0.159	2.13	71	-2.25	73	65	99.3
20	3.183	0.158	2.13	71	-1.98	73	65	98.7
21	3.342	0.159	2.12	71	-2.14	73	65	99.4
22	3.501	0.159	2.13	71	-2.20	73	65	99.5
23	3.660	0.159	2.10	71	-2.00	73	65	99.6
24	3.818	0.158	2.12	71	-1.79	73	65	98.9
25	3.977	0.159	2.12	71	-1.76	73	65	99.1
26	4.136	0.159	2.22	71	-2.06	73	65	98.7
27	4.298	0.162	2.22	71	-2.01	73	65	100.8
28	4.460	0.162	2.22	71	-1.87	73	65	101.2
29	4.622	0.162	2.22	71	-2.19	73	65	101.1
30	4.784	0.162	2.19	71	-1.96	73	65	100.7
31	4.945	0.161	2.22	71	-1.81	73	65	100.1
32	5.107	0.162	2.21	71	-2.02	73	65	100.9

Train C - First Hour Particulate Sampling

Run: 6
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 10:54
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/4/24

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 @ 23.28 in. Hg
Post-Test 0 cfm @ 23.18 in. Hg

Elapsed Time (min)	**Train C Sampling System**							
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*
33	5.269	0.162	2.20	71	-1.82	73	65	100.9
34	5.430	0.161	2.22	71	-1.84	73	65	100.1
35	5.592	0.162	2.21	71	-1.85	73	65	100.5
36	5.753	0.161	2.21	71	-2.14	73	65	99.8
37	5.916	0.163	2.21	71	-2.30	73	65	101.3
38	6.077	0.161	2.21	71	-1.81	72	65	100.1
39	6.239	0.162	2.21	71	-2.06	72	65	100.6
40	6.401	0.162	2.19	71	-1.85	72	65	100.5
41	6.562	0.161	2.21	71	-2.03	72	65	99.9
42	6.724	0.162	2.20	71	-2.32	72	65	100.4
43	6.886	0.162	2.17	71	-1.79	72	65	100.3
44	7.047	0.161	2.23	71	-1.85	72	65	99.7
45	7.210	0.163	2.21	71	-1.81	72	65	100.9
46	7.371	0.161	2.21	71	-1.82	72	65	99.6
47	7.533	0.162	2.21	71	-1.90	72	65	100.3
48	7.695	0.162	2.21	71	-2.34	72	65	100.4
49	7.857	0.162	2.21	71	-2.16	72	65	100.3
50	8.019	0.162	2.21	71	-1.95	72	65	100.1
51	8.180	0.161	2.21	71	-2.19	72	65	99.4
52	8.342	0.162	2.21	71	-2.12	71	65	100.1
53	8.504	0.162	2.21	71	-1.97	71	65	100.1
54	8.666	0.162	2.22	71	-2.27	71	65	100.3
55	8.828	0.162	2.19	71	-2.27	71	65	100.5
56	8.990	0.162	2.20	71	-1.81	71	65	100.6
57	9.151	0.161	2.21	71	-2.31	71	65	100.1
58	9.313	0.162	2.20	71	-2.17	71	65	100.4
59	9.475	0.162	2.20	71	-2.32	71	65	100.1
60	9.637	0.162	2.19	71	-1.92	71	65	100.2

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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 (%)*
Tot / Avg	**56.520**	**0.160**	**1.68**	**71.3**	**-2.24**	**249.21**	**-0.067**	**267.9**	**0.11**	**8.89**
Minimum	0.000	0.158	1.65	70	-2.70	206.00	-0.080	7.4	0.00	1.51
Max	56.520	0.180	2.09	72	-2.10	318.00	-0.059	1040.0	2.76	13.32
0	0.000		1.71	70	-2.40	309	-0.069	1040.0	0.24	1.51
1	0.177	0.177	2.09	70	-2.70	304	-0.067	1040.0	0.15	1.69
2	0.357	0.180	2.08	71	-2.60	268	-0.070	31.4	0.00	7.07
3	0.536	0.179	2.06	71	-2.50	256	-0.071	29.5	0.00	6.58
4	0.714	0.178	2.05	71	-2.50	256	-0.071	25.9	0.00	6.86
5	0.891	0.177	2.03	71	-2.50	254	-0.071	23.3	0.00	6.20
6	1.069	0.178	2.04	71	-2.70	250	-0.071	23.9	0.00	6.77
7	1.246	0.177	2.03	71	-2.50	248	-0.070	25.5	0.00	6.75
8	1.422	0.176	2.01	71	-2.40	245	-0.071	25.5	0.00	6.36
9	1.598	0.176	2.02	71	-2.60	245	-0.070	23.3	0.00	6.36
10	1.774	0.176	2.01	71	-2.50	246	-0.070	25.5	0.00	6.79
11	1.950	0.176	1.99	71	-2.40	247	-0.070	24.2	0.00	6.42
12	2.125	0.175	2.01	71	-2.40	246	-0.070	26.5	0.00	7.08
13	2.301	0.176	1.99	71	-2.40	245	-0.070	29.1	0.00	7.21
14	2.476	0.175	1.99	71	-2.60	243	-0.069	26.9	0.00	6.99
15	2.644	0.168	1.67	71	-2.30	243	-0.069	25.5	0.00	6.64
16	2.804	0.160	1.68	71	-2.40	241	-0.069	25.2	0.00	6.93
17	2.965	0.161	1.69	71	-2.20	240	-0.069	27.5	0.00	7.27
18	3.125	0.160	1.68	71	-2.10	239	-0.069	27.8	0.00	7.27
19	3.284	0.159	1.68	71	-2.10	241	-0.068	28.8	0.00	7.45
20	3.444	0.160	1.68	71	-2.20	241	-0.069	28.5	0.00	7.93
21	3.604	0.160	1.68	71	-2.30	241	-0.069	29.1	0.00	7.80
22	3.764	0.160	1.67	71	-2.10	242	-0.069	28.8	0.00	8.24
23	3.923	0.159	1.67	71	-2.30	241	-0.069	29.1	0.00	8.22
24	4.083	0.160	1.67	71	-2.20	242	-0.070	31.1	0.00	8.18
25	4.243	0.160	1.67	71	-2.20	242	-0.069	31.1	0.00	8.49
26	4.403	0.160	1.67	71	-2.20	242	-0.069	32.0	0.00	8.56
27	4.562	0.159	1.68	71	-2.40	242	-0.069	34.0	0.00	8.93
28	4.722	0.160	1.67	71	-2.10	243	-0.069	33.3	0.00	8.56
29	4.882	0.160	1.67	71	-2.30	244	-0.069	35.2	0.00	8.65
30	5.041	0.159	1.67	71	-2.20	243	-0.069	33.6	0.00	8.73
31	5.201	0.160	1.67	71	-2.30	243	-0.069	33.3	0.00	8.68
32	5.360	0.159	1.67	71	-2.30	243	-0.068	34.0	0.00	9.01

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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	5.520	0.160	1.68	71	-2.20	242	-0.069	32.7	0.00	8.82
34	5.680	0.160	1.67	71	-2.40	241	-0.069	33.6	0.00	9.09
35	5.839	0.159	1.67	71	-2.10	242	-0.068	33.0	0.00	8.92
36	5.999	0.160	1.68	71	-2.40	241	-0.069	29.8	0.00	8.28
37	6.159	0.160	1.67	71	-2.20	240	-0.068	29.8	0.00	8.49
38	6.318	0.159	1.67	71	-2.30	239	-0.069	29.8	0.00	8.62
39	6.478	0.160	1.67	71	-2.10	238	-0.068	28.8	0.00	8.50
40	6.638	0.160	1.67	71	-2.30	238	-0.067	28.5	0.00	8.42
41	6.797	0.159	1.67	71	-2.10	236	-0.069	27.9	0.00	9.13
42	6.957	0.160	1.68	71	-2.20	236	-0.067	27.2	0.00	9.31
43	7.117	0.160	1.67	71	-2.40	234	-0.068	26.5	0.00	9.24
44	7.276	0.159	1.67	71	-2.10	239	-0.067	137.3	0.00	10.27
45	7.436	0.160	1.67	71	-2.40	241	-0.069	28.5	0.00	9.83
46	7.596	0.160	1.66	71	-2.10	240	-0.069	28.2	0.00	9.94
47	7.755	0.159	1.67	71	-2.10	241	-0.067	30.7	0.00	9.95
48	7.915	0.160	1.68	71	-2.10	239	-0.068	28.2	0.00	9.80
49	8.075	0.160	1.68	71	-2.30	240	-0.068	54.7	0.00	10.76
50	8.234	0.159	1.67	71	-2.10	241	-0.069	171.6	0.01	10.96
51	8.394	0.160	1.67	71	-2.20	245	-0.070	205.0	0.03	10.28
52	8.554	0.160	1.67	71	-2.10	247	-0.069	36.2	0.00	9.70
53	8.713	0.159	1.66	71	-2.30	246	-0.069	31.1	0.00	9.54
54	8.873	0.160	1.67	71	-2.10	245	-0.069	29.8	0.00	8.97
55	9.032	0.159	1.68	71	-2.40	242	-0.068	28.2	0.00	8.65
56	9.192	0.160	1.66	71	-2.20	238	-0.067	26.5	0.00	8.21
57	9.352	0.160	1.67	71	-2.20	236	-0.066	30.1	0.00	7.89
58	9.511	0.159	1.68	71	-2.10	235	-0.066	28.2	0.00	7.67
59	9.671	0.160	1.66	71	-2.40	233	-0.065	27.2	0.00	7.56
60	9.830	0.159	1.66	71	-2.40	230	-0.065	27.2	0.00	7.61
61	9.990	0.160	1.68	71	-2.40	228	-0.064	28.2	0.00	7.58
62	10.149	0.159	1.67	71	-2.30	227	-0.064	28.8	0.00	7.52
63	10.309	0.160	1.67	71	-2.40	226	-0.064	29.8	0.00	7.56
64	10.468	0.159	1.68	71	-2.10	225	-0.063	31.1	0.00	7.54
65	10.628	0.160	1.67	71	-2.30	224	-0.063	31.7	0.00	7.60
66	10.788	0.160	1.67	71	-2.20	224	-0.063	32.7	0.00	7.55
67	10.948	0.160	1.67	71	-2.10	223	-0.063	32.0	0.00	7.49
68	11.107	0.159	1.67	71	-2.20	220	-0.063	32.0	0.00	7.49

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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 (%)*
69	11.267	0.160	1.67	71	-2.10	220	-0.063	32.7	0.00	7.46
70	11.427	0.160	1.67	71	-2.10	217	-0.063	31.4	0.00	7.15
71	11.586	0.159	1.67	71	-2.40	218	-0.062	30.7	0.00	7.15
72	11.745	0.159	1.67	71	-2.20	217	-0.062	31.1	0.00	7.14
73	11.906	0.161	1.67	71	-2.10	217	-0.062	31.7	0.00	7.17
74	12.065	0.159	1.67	71	-2.40	217	-0.062	30.1	0.00	7.02
75	12.224	0.159	1.67	71	-2.10	217	-0.062	29.5	0.00	6.95
76	12.384	0.160	1.67	71	-2.10	214	-0.062	30.1	0.00	7.01
77	12.543	0.159	1.67	71	-2.30	212	-0.061	31.1	0.00	7.08
78	12.702	0.159	1.67	71	-2.30	213	-0.062	31.4	0.00	6.88
79	12.862	0.160	1.67	71	-2.30	212	-0.061	32.7	0.00	6.79
80	13.022	0.160	1.67	71	-2.10	211	-0.061	33.3	0.00	6.82
81	13.181	0.159	1.66	71	-2.30	211	-0.061	33.6	0.00	6.84
82	13.341	0.160	1.67	71	-2.10	212	-0.061	34.0	0.00	6.89
83	13.500	0.159	1.67	71	-2.20	212	-0.061	34.0	0.00	6.95
84	13.659	0.159	1.67	71	-2.40	208	-0.060	33.6	0.00	6.91
85	13.819	0.160	1.67	71	-2.10	208	-0.060	33.6	0.00	6.97
86	13.978	0.159	1.66	71	-2.40	206	-0.060	34.3	0.00	7.06
87	14.137	0.159	1.66	71	-2.10	207	-0.060	34.0	0.00	7.06
88	14.297	0.160	1.67	71	-2.30	208	-0.060	34.6	0.00	7.10
89	14.457	0.160	1.67	71	-2.30	208	-0.059	35.6	0.00	7.20
90	14.615	0.158	1.67	71	-2.10	208	-0.059	36.5	0.00	7.25
91	14.775	0.160	1.67	71	-2.30	207	-0.059	36.2	0.00	7.35
92	14.935	0.160	1.66	71	-2.30	208	-0.060	37.2	0.00	7.41
93	15.094	0.159	1.66	71	-2.40	208	-0.060	37.2	0.00	7.42
94	15.254	0.160	1.67	71	-2.10	207	-0.060	38.8	0.00	7.51
95	15.414	0.160	1.67	71	-2.30	207	-0.059	38.5	0.00	7.68
96	15.572	0.158	1.67	71	-2.30	206	-0.060	39.2	0.00	7.77
97	15.732	0.160	1.68	71	-2.10	209	-0.060	39.5	0.00	7.80
98	15.892	0.160	1.66	71	-2.20	210	-0.060	40.5	0.00	7.88
99	16.051	0.159	1.66	71	-2.40	209	-0.059	41.1	0.00	7.95
100	16.210	0.159	1.67	71	-2.20	209	-0.060	40.5	0.00	8.08
101	16.370	0.160	1.67	71	-2.10	210	-0.060	41.1	0.00	7.91
102	16.530	0.160	1.66	71	-2.10	212	-0.061	42.7	0.00	8.00
103	16.689	0.159	1.67	71	-2.30	212	-0.060	44.3	0.00	8.11
104	16.849	0.160	1.66	71	-2.10	212	-0.061	45.3	0.00	8.15

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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	17.008	0.159	1.66	71	-2.30	213	-0.061	45.6	0.00	8.19
106	17.167	0.159	1.67	71	-2.20	213	-0.061	47.6	0.00	8.06
107	17.328	0.161	1.68	71	-2.20	214	-0.061	48.9	0.00	8.14
108	17.487	0.159	1.66	71	-2.40	216	-0.061	50.2	0.00	8.25
109	17.646	0.159	1.67	71	-2.30	217	-0.061	52.1	0.00	8.40
110	17.806	0.160	1.67	71	-2.30	218	-0.061	52.1	0.00	8.43
111	17.966	0.160	1.66	71	-2.10	218	-0.061	53.4	0.00	8.47
112	18.125	0.159	1.67	71	-2.30	218	-0.062	53.4	0.00	8.48
113	18.284	0.159	1.67	71	-2.30	218	-0.061	52.7	0.00	8.50
114	18.444	0.160	1.66	71	-2.40	218	-0.061	52.1	0.00	8.51
115	18.603	0.159	1.66	71	-2.20	218	-0.062	53.1	0.00	8.51
116	18.763	0.160	1.67	71	-2.10	218	-0.062	52.4	0.00	8.48
117	18.922	0.159	1.66	71	-2.20	218	-0.062	52.7	0.00	8.47
118	19.082	0.160	1.67	71	-2.20	218	-0.062	54.7	0.00	8.38
119	19.241	0.159	1.67	71	-2.10	220	-0.061	55.6	0.00	8.45
120	19.401	0.160	1.66	71	-2.10	219	-0.060	53.7	0.00	8.27
121	19.560	0.159	1.66	71	-2.20	220	-0.061	51.5	0.00	8.17
122	19.720	0.160	1.67	71	-2.20	218	-0.062	50.8	0.00	8.09
123	19.879	0.159	1.66	71	-2.10	219	-0.062	51.8	0.00	8.08
124	20.039	0.160	1.66	71	-2.30	219	-0.061	52.1	0.00	8.03
125	20.198	0.159	1.67	71	-2.30	218	-0.061	53.4	0.00	8.01
126	20.357	0.159	1.66	71	-2.10	217	-0.061	53.7	0.00	8.10
127	20.517	0.160	1.67	71	-2.30	216	-0.061	57.6	0.00	7.95
128	20.676	0.159	1.67	71	-2.30	217	-0.061	60.2	0.00	7.87
129	20.836	0.160	1.66	71	-2.30	219	-0.061	57.9	0.00	7.81
130	20.995	0.159	1.66	71	-2.30	218	-0.061	58.9	0.00	7.85
131	21.155	0.160	1.67	71	-2.20	219	-0.062	60.2	0.00	7.77
132	21.314	0.159	1.66	71	-2.10	218	-0.062	61.2	0.00	7.69
133	21.474	0.160	1.67	71	-2.20	219	-0.062	59.3	0.00	7.67
134	21.633	0.159	1.67	71	-2.20	218	-0.062	58.3	0.00	7.58
135	21.793	0.160	1.67	71	-2.30	219	-0.062	59.3	0.00	7.59
136	21.953	0.160	1.67	71	-2.20	217	-0.062	60.8	0.00	7.52
137	22.113	0.160	1.68	71	-2.10	217	-0.062	61.2	0.00	7.54
138	22.273	0.160	1.68	71	-2.20	218	-0.062	61.8	0.00	7.49
139	22.432	0.159	1.67	71	-2.30	220	-0.062	62.1	0.00	7.53
140	22.592	0.160	1.68	71	-2.10	221	-0.062	62.5	0.00	7.51

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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	22.752	0.160	1.67	71	-2.10	220	-0.062	62.5	0.00	7.45
142	22.911	0.159	1.67	71	-2.40	218	-0.063	65.4	0.00	7.47
143	23.071	0.160	1.68	71	-2.40	220	-0.062	65.7	0.00	7.53
144	23.231	0.160	1.66	71	-2.40	222	-0.062	67.7	0.00	7.51
145	23.390	0.159	1.66	71	-2.10	224	-0.062	66.7	0.00	7.43
146	23.550	0.160	1.68	71	-2.30	224	-0.062	66.3	0.00	7.30
147	23.710	0.160	1.68	71	-2.40	223	-0.063	67.0	0.00	7.19
148	23.869	0.159	1.66	71	-2.40	223	-0.062	60.9	0.00	7.32
149	24.028	0.159	1.67	71	-2.20	225	-0.063	62.1	0.00	7.21
150	24.188	0.160	1.67	71	-2.10	226	-0.062	63.1	0.00	7.25
151	24.348	0.160	1.66	71	-2.20	225	-0.063	63.4	0.00	7.47
152	24.507	0.159	1.67	71	-2.30	228	-0.063	68.6	0.00	7.45
153	24.666	0.159	1.67	71	-2.20	228	-0.063	69.3	0.00	7.44
154	24.825	0.159	1.66	71	-2.10	228	-0.063	70.6	0.00	7.51
155	24.985	0.160	1.66	71	-2.10	230	-0.064	70.6	0.00	7.49
156	25.144	0.159	1.66	71	-2.10	231	-0.064	71.8	0.00	7.55
157	25.304	0.160	1.66	71	-2.10	232	-0.064	72.2	0.00	7.58
158	25.463	0.159	1.67	71	-2.10	234	-0.064	74.8	0.00	7.67
159	25.623	0.160	1.67	71	-2.10	234	-0.064	75.7	0.00	7.68
160	25.782	0.159	1.66	71	-2.10	235	-0.065	75.7	0.00	7.79
161	25.941	0.159	1.67	71	-2.10	236	-0.065	78.0	0.01	7.86
162	26.101	0.160	1.66	71	-2.10	235	-0.065	78.0	0.00	8.03
163	26.260	0.159	1.66	71	-2.10	236	-0.065	78.6	0.00	8.05
164	26.419	0.159	1.67	71	-2.40	238	-0.065	81.9	0.00	8.18
165	26.578	0.159	1.67	71	-2.30	240	-0.066	87.4	0.01	8.31
166	26.738	0.160	1.66	71	-2.20	238	-0.066	88.1	0.01	8.30
167	26.896	0.158	1.67	71	-2.40	239	-0.065	90.7	0.01	8.32
168	27.056	0.160	1.67	71	-2.10	239	-0.066	91.6	0.01	8.35
169	27.215	0.159	1.66	71	-2.20	243	-0.066	91.9	0.01	8.29
170	27.374	0.159	1.67	71	-2.30	245	-0.067	92.9	0.01	8.25
171	27.534	0.160	1.65	71	-2.10	247	-0.067	93.6	0.01	8.25
172	27.693	0.159	1.66	71	-2.40	247	-0.067	94.9	0.01	8.38
173	27.852	0.159	1.67	71	-2.10	248	-0.068	96.2	0.01	8.38
174	28.012	0.160	1.67	71	-2.10	250	-0.068	97.1	0.01	8.30
175	28.171	0.159	1.67	71	-2.30	251	-0.068	98.4	0.01	8.35
176	28.331	0.160	1.68	71	-2.10	252	-0.068	98.4	0.01	8.41

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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	28.491	0.160	1.67	71	-2.10	252	-0.069	100.7	0.01	8.48
178	28.651	0.160	1.66	71	-2.10	252	-0.068	102.3	0.01	8.54
179	28.810	0.159	1.67	71	-2.10	256	-0.069	93.9	0.01	8.34
180	28.970	0.160	1.68	71	-2.10	254	-0.069	87.1	0.01	8.47
181	29.130	0.160	1.66	71	-2.10	256	-0.069	90.0	0.01	8.61
182	29.289	0.159	1.67	71	-2.10	255	-0.069	93.9	0.01	8.62
183	29.449	0.160	1.67	71	-2.30	257	-0.069	99.1	0.01	8.74
184	29.608	0.159	1.66	71	-2.30	257	-0.069	99.4	0.01	8.87
185	29.768	0.160	1.66	71	-2.10	261	-0.070	114.6	0.01	9.06
186	29.927	0.159	1.67	71	-2.10	263	-0.069	141.2	0.01	9.01
187	30.086	0.159	1.66	71	-2.10	264	-0.070	140.6	0.01	9.18
188	30.245	0.159	1.67	71	-2.20	266	-0.072	312.1	0.03	9.43
189	30.404	0.159	1.67	71	-2.30	267	-0.071	229.9	0.02	9.65
190	30.564	0.160	1.66	71	-2.30	266	-0.072	275.3	0.03	9.76
191	30.723	0.159	1.67	71	-2.30	267	-0.071	331.3	0.03	10.16
192	30.882	0.159	1.67	71	-2.30	268	-0.070	626.9	0.06	10.37
193	31.041	0.159	1.66	71	-2.30	269	-0.072	729.1	0.09	10.52
194	31.200	0.159	1.66	71	-2.10	270	-0.072	1040.0	0.13	10.43
195	31.360	0.160	1.65	71	-2.10	275	-0.073	1040.0	0.11	10.54
196	31.519	0.159	1.66	71	-2.10	275	-0.073	1040.0	0.13	10.48
197	31.678	0.159	1.67	71	-2.10	276	-0.073	1040.0	0.22	10.45
198	31.838	0.160	1.67	71	-2.30	280	-0.073	1040.0	0.21	10.44
199	31.997	0.159	1.66	71	-2.40	282	-0.074	1040.0	0.28	10.50
200	32.156	0.159	1.67	71	-2.10	283	-0.074	1040.0	0.36	10.70
201	32.316	0.160	1.67	71	-2.10	286	-0.074	1040.0	0.29	11.47
202	32.474	0.158	1.66	71	-2.10	288	-0.075	1040.0	0.35	11.71
203	32.634	0.160	1.67	71	-2.20	291	-0.075	1040.0	0.55	11.82
204	32.793	0.159	1.66	71	-2.40	292	-0.076	1040.0	0.69	12.00
205	32.952	0.159	1.66	71	-2.20	296	-0.076	1040.0	0.81	12.12
206	33.111	0.159	1.67	71	-2.10	297	-0.077	1040.0	0.92	12.13
207	33.271	0.160	1.66	71	-2.10	299	-0.077	1040.0	1.17	12.20
208	33.429	0.158	1.66	71	-2.20	301	-0.078	1040.0	1.35	12.40
209	33.589	0.160	1.67	71	-2.30	306	-0.078	1040.0	1.58	12.40
210	33.748	0.159	1.66	71	-2.10	309	-0.078	1040.0	1.70	12.56
211	33.907	0.159	1.66	71	-2.20	314	-0.079	1040.0	1.97	12.60
212	34.067	0.160	1.66	71	-2.30	315	-0.080	1040.0	2.18	12.57

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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 (%)
213	34.225	0.158	1.66	71	-2.10	317	-0.080	1040.0	2.76	12.54
214	34.384	0.159	1.66	71	-2.10	318	-0.077	1040.0	0.82	13.32
215	34.544	0.160	1.67	71	-2.30	314	-0.075	1040.0	0.52	12.99
216	34.702	0.158	1.66	71	-2.10	310	-0.078	1040.0	0.42	12.92
217	34.861	0.159	1.66	71	-2.20	306	-0.078	1040.0	0.41	11.93
218	35.020	0.159	1.67	71	-2.10	307	-0.079	1040.0	1.55	11.81
219	35.179	0.159	1.66	71	-2.10	311	-0.079	1040.0	1.88	11.78
220	35.339	0.160	1.66	71	-2.10	313	-0.079	1040.0	1.81	11.59
221	35.497	0.158	1.66	71	-2.20	312	-0.078	1040.0	1.64	11.50
222	35.656	0.159	1.65	71	-2.30	309	-0.078	1040.0	1.17	11.52
223	35.815	0.159	1.67	71	-2.10	308	-0.077	1040.0	0.79	11.27
224	35.974	0.159	1.67	71	-2.30	304	-0.076	1040.0	0.43	11.21
225	36.133	0.159	1.66	71	-2.20	303	-0.076	1040.0	0.26	10.98
226	36.292	0.159	1.67	71	-2.40	302	-0.076	1040.0	0.17	10.77
227	36.452	0.160	1.68	71	-2.10	302	-0.076	1040.0	0.12	10.81
228	36.611	0.159	1.67	71	-2.30	300	-0.076	1040.0	0.16	10.52
229	36.770	0.159	1.67	71	-2.40	299	-0.076	1040.0	0.10	10.52
230	36.930	0.160	1.67	71	-2.30	298	-0.076	641.8	0.06	10.43
231	37.089	0.159	1.66	71	-2.10	298	-0.075	868.2	0.09	10.37
232	37.248	0.159	1.67	71	-2.20	299	-0.076	759.7	0.07	10.47
233	37.408	0.160	1.68	71	-2.20	299	-0.076	988.6	0.10	10.63
234	37.567	0.159	1.66	71	-2.30	299	-0.076	1040.0	0.16	10.79
235	37.726	0.159	1.67	71	-2.10	300	-0.075	1040.0	0.18	11.10
236	37.886	0.160	1.66	71	-2.10	300	-0.076	1040.0	0.23	10.82
237	38.045	0.159	1.66	71	-2.10	297	-0.076	1040.0	0.16	10.72
238	38.204	0.159	1.67	71	-2.20	299	-0.075	806.3	0.08	10.65
239	38.364	0.160	1.67	71	-2.30	299	-0.075	1040.0	0.12	10.70
240	38.523	0.159	1.66	71	-2.10	298	-0.075	1040.0	0.12	10.61
241	38.682	0.159	1.67	71	-2.30	298	-0.075	1040.0	0.14	10.49
242	38.842	0.160	1.66	71	-2.30	297	-0.076	1040.0	0.14	10.28
243	39.001	0.159	1.66	71	-2.30	296	-0.075	334.5	0.01	9.82
244	39.160	0.159	1.67	71	-2.10	294	-0.074	76.7	0.00	9.64
245	39.320	0.160	1.67	71	-2.40	292	-0.074	76.4	0.00	9.67
246	39.479	0.159	1.66	71	-2.20	290	-0.074	164.8	0.01	9.64
247	39.638	0.159	1.67	71	-2.10	290	-0.074	270.4	0.03	9.80
248	39.798	0.160	1.67	71	-2.30	286	-0.073	355.5	0.04	9.84

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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	39.956	0.158	1.66	71	-2.40	286	-0.074	656.4	0.07	10.00
250	40.116	0.160	1.67	71	-2.20	286	-0.074	777.2	0.09	10.00
251	40.275	0.159	1.66	71	-2.30	287	-0.074	1040.0	0.11	10.15
252	40.434	0.159	1.66	71	-2.30	286	-0.074	1040.0	0.14	10.28
253	40.593	0.159	1.67	71	-2.30	287	-0.073	1040.0	0.14	10.35
254	40.753	0.160	1.66	71	-2.40	288	-0.073	1040.0	0.14	10.37
255	40.911	0.158	1.66	71	-2.30	285	-0.073	1040.0	0.13	10.45
256	41.070	0.159	1.66	71	-2.10	286	-0.074	1040.0	0.13	10.54
257	41.230	0.160	1.67	72	-2.40	288	-0.074	1040.0	0.13	10.69
258	41.388	0.158	1.66	72	-2.20	289	-0.073	1040.0	0.16	10.82
259	41.548	0.160	1.67	72	-2.10	290	-0.074	1040.0	0.18	10.96
260	41.707	0.159	1.67	72	-2.10	289	-0.074	1040.0	0.15	11.08
261	41.866	0.159	1.66	72	-2.20	287	-0.074	1040.0	0.19	11.29
262	42.025	0.159	1.67	72	-2.20	290	-0.074	1040.0	0.24	11.36
263	42.184	0.159	1.66	72	-2.30	291	-0.074	1040.0	0.28	11.36
264	42.343	0.159	1.66	72	-2.10	294	-0.075	1040.0	0.33	11.52
265	42.502	0.159	1.67	72	-2.30	294	-0.075	1040.0	0.41	11.50
266	42.662	0.160	1.66	72	-2.10	294	-0.075	1040.0	0.42	11.65
267	42.821	0.159	1.66	72	-2.20	295	-0.075	1040.0	0.50	11.67
268	42.979	0.158	1.66	72	-2.30	297	-0.075	1040.0	0.49	11.76
269	43.139	0.160	1.65	72	-2.40	300	-0.075	1040.0	0.51	11.80
270	43.297	0.158	1.66	72	-2.40	300	-0.075	1040.0	0.45	11.69
271	43.457	0.160	1.66	72	-2.30	296	-0.075	1040.0	0.34	11.67
272	43.615	0.158	1.65	72	-2.40	294	-0.074	1040.0	0.31	11.63
273	43.774	0.159	1.66	72	-2.40	297	-0.075	1040.0	0.25	11.51
274	43.934	0.160	1.66	72	-2.20	296	-0.074	1040.0	0.12	11.10
275	44.093	0.159	1.66	72	-2.10	295	-0.073	610.7	0.08	10.64
276	44.252	0.159	1.67	72	-2.40	293	-0.074	730.9	0.07	10.46
277	44.411	0.159	1.65	72	-2.10	292	-0.072	331.3	0.03	10.10
278	44.569	0.158	1.65	72	-2.10	288	-0.073	245.1	0.02	10.01
279	44.729	0.160	1.67	72	-2.30	285	-0.072	159.0	0.01	9.89
280	44.888	0.159	1.65	72	-2.20	282	-0.072	104.9	0.01	9.83
281	45.046	0.158	1.66	72	-2.30	281	-0.072	75.7	0.00	9.78
282	45.206	0.160	1.66	72	-2.20	276	-0.071	48.6	0.00	9.81
283	45.365	0.159	1.66	72	-2.40	276	-0.071	28.5	0.00	9.75
284	45.524	0.159	1.66	72	-2.10	272	-0.070	30.4	0.00	9.74

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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 (%)
285	45.682	0.158	1.66	72	-2.20	272	-0.069	26.2	0.00	9.68
286	45.842	0.160	1.66	72	-2.40	270	-0.069	21.0	0.00	9.47
287	46.001	0.159	1.66	72	-2.10	267	-0.069	18.5	0.00	9.48
288	46.160	0.159	1.67	72	-2.30	263	-0.069	16.8	0.00	9.36
289	46.319	0.159	1.65	72	-2.30	258	-0.068	14.5	0.00	9.25
290	46.478	0.159	1.66	72	-2.10	260	-0.068	13.2	0.00	9.16
291	46.637	0.159	1.67	72	-2.20	258	-0.067	12.0	0.00	9.15
292	46.796	0.159	1.65	72	-2.40	255	-0.067	10.7	0.00	9.11
293	46.955	0.159	1.65	72	-2.30	255	-0.067	10.0	0.00	9.15
294	47.115	0.160	1.66	72	-2.10	256	-0.066	9.4	0.00	9.16
295	47.274	0.159	1.66	72	-2.30	254	-0.066	8.7	0.00	9.23
296	47.433	0.159	1.67	72	-2.10	253	-0.066	8.7	0.00	9.24
297	47.592	0.159	1.67	72	-2.10	251	-0.066	8.4	0.00	9.28
298	47.752	0.160	1.65	72	-2.40	251	-0.065	8.1	0.00	9.25
299	47.911	0.159	1.66	72	-2.30	247	-0.065	8.4	0.00	9.21
300	48.070	0.159	1.65	72	-2.20	248	-0.065	8.4	0.00	9.04
301	48.229	0.159	1.66	72	-2.20	246	-0.065	9.4	0.00	8.95
302	48.388	0.159	1.67	72	-2.30	244	-0.065	8.7	0.00	8.91
303	48.548	0.160	1.66	72	-2.20	244	-0.065	8.4	0.00	8.88
304	48.707	0.159	1.66	72	-2.20	244	-0.064	7.8	0.00	8.85
305	48.866	0.159	1.67	72	-2.20	243	-0.064	8.1	0.00	8.86
306	49.026	0.160	1.66	72	-2.20	240	-0.064	8.1	0.00	8.83
307	49.185	0.159	1.66	72	-2.30	240	-0.064	7.4	0.00	8.88
308	49.344	0.159	1.67	72	-2.20	241	-0.064	8.1	0.00	8.86
309	49.504	0.160	1.65	72	-2.10	240	-0.063	7.8	0.00	8.84
310	49.662	0.158	1.66	72	-2.10	239	-0.063	7.8	0.00	8.85
311	49.822	0.160	1.66	72	-2.40	238	-0.063	7.8	0.00	8.84
312	49.982	0.160	1.66	72	-2.40	239	-0.063	7.8	0.00	8.93
313	50.140	0.158	1.66	72	-2.20	237	-0.064	7.8	0.00	8.90
314	50.300	0.160	1.66	72	-2.10	236	-0.063	8.1	0.00	8.91
315	50.460	0.160	1.67	72	-2.40	236	-0.063	7.8	0.00	8.98
316	50.618	0.158	1.66	72	-2.40	234	-0.062	8.1	0.00	9.03
317	50.778	0.160	1.67	72	-2.10	235	-0.063	7.8	0.00	8.96
318	50.938	0.160	1.66	72	-2.40	234	-0.063	8.7	0.00	8.21
319	51.096	0.158	1.66	72	-2.10	233	-0.062	9.4	0.00	8.38
320	51.256	0.160	1.67	72	-2.20	234	-0.062	9.7	0.00	8.40

Train D - Ambient Background and Flue Gas Data

Run: 6 **Test Date:** 3/4/2024

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 10:54
Total Sampling Time 353 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 (%)
321	51.416	0.160	1.66	72	-2.20	233	-0.063	10.0	0.00	8.40
322	51.574	0.158	1.66	72	-2.20	235	-0.063	10.3	0.00	8.45
323	51.734	0.160	1.67	72	-2.20	233	-0.063	10.3	0.00	8.45
324	51.894	0.160	1.65	72	-2.20	232	-0.063	10.7	0.00	8.49
325	52.053	0.159	1.66	72	-2.10	230	-0.062	10.7	0.00	8.55
326	52.213	0.160	1.67	72	-2.30	231	-0.062	10.7	0.00	8.54
327	52.373	0.160	1.67	72	-2.20	232	-0.062	11.0	0.00	8.54
328	52.532	0.159	1.66	72	-2.40	232	-0.062	11.0	0.00	8.56
329	52.691	0.159	1.67	72	-2.30	231	-0.063	11.0	0.00	8.50
330	52.851	0.160	1.67	72	-2.40	229	-0.062	11.0	0.00	8.45
331	53.010	0.159	1.66	72	-2.40	230	-0.063	11.0	0.00	8.47
332	53.170	0.160	1.67	72	-2.30	230	-0.063	11.0	0.00	8.38
333	53.330	0.160	1.66	72	-2.30	231	-0.062	11.3	0.00	8.47
334	53.490	0.160	1.66	72	-2.20	228	-0.062	11.0	0.00	8.43
335	53.649	0.159	1.67	72	-2.10	226	-0.062	11.3	0.00	8.44
336	53.809	0.160	1.68	72	-2.40	226	-0.062	11.0	0.00	8.47
337	53.969	0.160	1.66	72	-2.30	225	-0.063	11.3	0.00	8.43
338	54.128	0.159	1.66	72	-2.10	226	-0.061	11.6	0.00	8.41
339	54.288	0.160	1.67	72	-2.10	225	-0.063	11.6	0.00	8.43
340	54.447	0.159	1.66	72	-2.10	226	-0.061	11.6	0.00	8.49
341	54.607	0.160	1.67	72	-2.20	227	-0.061	12.0	0.00	8.52
342	54.766	0.159	1.67	72	-2.20	226	-0.061	11.6	0.00	8.43
343	54.926	0.160	1.66	72	-2.20	227	-0.062	12.3	0.00	8.45
344	55.085	0.159	1.66	72	-2.10	225	-0.061	12.0	0.00	8.45
345	55.245	0.160	1.67	72	-2.30	227	-0.062	12.3	0.00	8.48
346	55.404	0.159	1.67	72	-2.20	225	-0.061	12.3	0.00	8.46
347	55.563	0.159	1.66	72	-2.20	224	-0.061	12.6	0.00	8.46
348	55.723	0.160	1.68	72	-2.40	224	-0.062	12.3	0.00	8.41
349	55.882	0.159	1.67	72	-2.30	224	-0.061	12.9	0.00	8.38
350	56.042	0.160	1.66	72	-2.30	225	-0.062	13.2	0.00	8.47
351	56.201	0.159	1.67	72	-2.20	223	-0.061	13.6	0.00	8.50
352	56.361	0.160	1.67	72	-2.40	222	-0.060	13.6	0.00	8.41
353	56.520	0.159	1.66	72	-2.40	223	-0.061	14.8	0.00	7.91

Gravimetric Lab Data

ASTM E2515

Manufacturer:	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Tracking No.:	2142
Project No.:	0142WN020E
Run No.:	6
Test Date:	3/4/24

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

Train A

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
FilterPairs	3/04/24 @ 17:30	Filter	F180	247.1	246.3	0.8	0.8
Probe catch*		Probe	OES 6	113709.0	113708.6	0.4	0.4
ilter seals catch*		Seals	S668	3397.4	3397.4	0.0	0.0
				Total Particulate, mg:		**1.2**	**1.2**

Train B

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
FilterPairs	3/04/24 @ 17:30	Filter	F244	240.4	239.5	0.9	0.9
Probe catch*		Probe	33	113943.9	113943.9	0.0	0.0
ilter seals catch*		Seals	S669	3339.0	3339.0	0.0	0.0
			Sub-Total	Total Particulate, mg:		**0.9**	**0.9**

Train C - *First Hour*

Sample Component	Date / Time in Desiccator	Reagent	Filter, Probe or Dish #	Weights: Final, mg	Weights: Tare, mg	Particulate, mg: Uncorrected	Particulate, mg: Corrected
FilterPairs	3/04/24 @ 17:30	Filter	F179	247.4	247.3	0.1	0.1
Probe catch*		Probe	OES 5	113570.3	113570.3	0.0	0.0
ilter seals catch*		Seals	S667	3414.8	3414.8	0.0	0.0
				Total Particulate, mg:		**0.1**	**0.1**

Train D - *Ambient Background*

Sample Component	Date / Time in Desiccator	Reagent	Filter # or	Weights: Final, mg	Weights: Tare, mg	Particulate, mg
Filter catch*	3/04/24 @ 17:30	Filter	F226	120.3	120.4	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 appropriately 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:	SC 25
Project Number:	0142WN020E
Run Number:	6
Test Date:	3/4/2024

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

- Fuel Field Notes
- Velocity Traverse Field Notes
- Flue Gas Analyzer Calibration
- Supplementary Field Notes
- Gravimetric Tare Sheets

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 6
Model: SC 25 Tracking Number: 2142 Date: 03/04/2024
Test Crew: T. Tong, K. Morgan
OMNI Equipment ID numbers:

Wood Heater Run Notes

Air Control Settings

Primary:

70° CCW from Full open (6°)

Secondary: N/A

Tertiary/Pilot: N/A

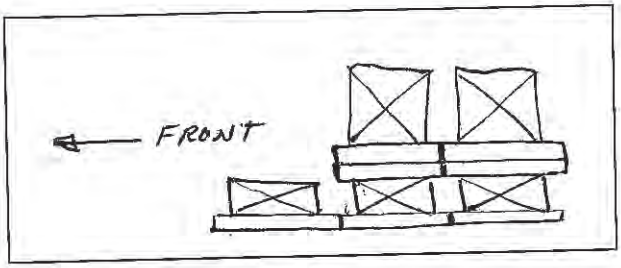
Fan: No Fan (Fan Confirmation Test)

Preburn Notes

Time	Notes
~~-8~~	Scale +0.4 due to adding Flue gas probe 8.0 lb. (8.4 indicated on scale) Test setting, start of Preburn
69	End Preburn

Test Notes

Sketch test fuel configuration:



Start up procedures & Timeline:

Bypass: OPEN for 40 Sec
Fuel loaded by: 40 Sec
Door closed at: 40 Sec
Primary air: No adjustment

Notes:

Time	Notes
10:54	Test started
11:54	First hour sampling ended
16:47	Test ended

Technician Signature: K. J. Morgan Date: 3/4/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 6

Model: SC 25 Tracking Number: 2142 Date: 03/04/2024

Test Crew: T. Tang, K. Morgan

OMNI Equipment ID numbers:

Wood Heater Supplemental Data

Start Time: 10:54

Stop Time: 16:47

Booth #: 1

Stack Gas Leak Check:

Initial: good Final: good

Pre-Test

Sample Train Leak Check:

A: 0.000 @ 17.8 "Hg

B: 0.000 @ 18.22 "Hg

1st hr-A, 0.000 @ 23.28 "Hg

Post-Test

A: 0.000 @ 17.39 "Hg

B: 0.000 @ 17.52 "Hg

A, 0.000 @ 23.18 "Hg

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

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	9:20	9:21	4:52 pm	4:56 pm
CO_2 %	0.00	16.87	0.02	16.82
CO %	0.00	4.39	0.000	4.358
CO ppm	0.0	493	0	489

Air Velocity (ft/min): Initial: 8 Final: 13

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

Pitot Tube Leak Test: Initial: good Final: good

Stack Diameter (in): 6

Induced Draft: 0.000

% Smoke Capture: 100

Flue Pipe Cleaned Prior to First Test in Series:

Date: 2/26/24 Initials: K

	Initial	Middle	Ending
P_b (in/Hg)	29.99	29.96	29.93
RH (%)	32%	31%	32%
Ambient (°F)	72.3	72	72

Background Filter Volume: 9.742

Tunnel Traverse

Microtector Reading	dP (in H_2O)	T(°F)
.034	.068	91
.048	.096	91
.050	.100	91
.030	.060	91
.030	.060	91
.046	.092	91
.042	.084	91
.038	.072	91
Center:		
.060	.120	90

Tunnel Static Pressure (in H_2O):	
Beginning of Test	End of Test
-0.4	-0.4

Technician Signature: K. J. Morgan

Date: 3/4/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 6

Model: SC 25 Tracking Number: 2142 Date: 03/04/2024

Test Crew: T. Tang, 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 12.4

Cal Value (2) = 22% Actual Reading ~~22.9~~

Piece:	Length:	Reading:	Piece:	Length:	Reading:
1	12 in	~~20.5~~	7	17 in	19.7
2	12 in	21.3	8	17 in	~~20.6~~
3	12 in	19.8	9	____ in	____
4	12 in	22.4	10	____ in	____
5	17 in	22.7	11	____ in	____
6	17 in	20.3	12	____ in	____

Total Pre-Burn Fuel Weight: 12.5 Pre-Burn Fuel Average Moisture: ~~21.17~~ 20.91 %db

Time (clock): 8:45 Room Temperature (F): 76 Initials: ____

Test Fuel

Firebox Volume (ft³): 2.16 Test Fuel Piece Length (in): 17 3/4, 18

Load Weight Range (lb): (13.6, 16.6) Total Wet Fuel Load Weight (lb): 15.8 (3.2, 4.0)

Fuel Type & Amount: 2 x 4: 3 4 x 4: 2

Weight (with spacers): 7.0 Weight (with spacers): 8.8

Piece:	Weight (lbs):	Moisture Readings (%DB): 19.2				Fuel Type:	
1	2.0	19.3	22.0	~~18.2~~	2x4	17 3/4	13.04 dry lb
2	1.9	22.6	19.7	21.9	~~2x4~~	18	17.45% WB
3	1.9	22.1	19.5	21.3	~~2x4~~	18	
4	4.2	20.9	23.8	21.2	4x4	17 3/4	
5	4.1	19.5	22.8	23.2	4x4	18	
6	____	____	____	____	____	____	
7	____	____	____	____	____	____	

2.5, 2.4, 2.1, 4.4, 4.4

Spacer Moisture Readings (%DB) Not used

19.2	16.1	16.7	21.7	15.9	20.9	21.4	~~18.6~~
16.4	18.7	19.2	16.8	16.2	21.5	19.3	~~21.3~~
____	____	____	____	____	____	____	____
____	____	____	____	____	____	____	____

Time (clock): 9:00 Room Temperature (F): 76 Initials: TT

Technician Signature: ~~Tom Tang~~ Date: 03/04/24

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

Client: Valley Comfort Systems Project Number: 0142WN020E Run Number: 6
Model: SC 25 Tracking Number: 2142 Date: 03/04/2024
Test Crew: T. Tong, K. Morgan
OMNI Equipment ID numbers:

ASTM E2515 Lab Sheet

Assembled By:

T. Tong

Date/Time in Dessicator:

3/04/24 17:30

	Weighing #1	Weighing #2	Weighing #3	Weighing #4	Weighing #5
	Date/Time: 3/6/24 8:31	Date/Time: 3/7/24 7:14	Date/Time: 3/7/24 16:20	Date/Time:	Date/Time:
	R/H %: 16	R/H %: 16.3	R/H %: 18	R/H %:	R/H %:
	Temp: 67	Temp: 64	Temp: 69	Temp:	Temp:
	200 mg Audit: 200.1	200 mg Audit: 200.0	200 mg Audit: 200.1	200 mg Audit:	200 mg Audit:
	2 g Audit: 2000.3	2 g Audit: 2000.2	2 g Audit: 2000.3	2 g Audit:	2 g Audit:
	100 g Audit: 99997.8	100 g Audit 99997.7	100 g Audit 99997.8	100 g Audit	100 g Audit
	Initials: K	Initials: K	Initials: K	Initials:	Initials:

Train	Element	ID #	Tare (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)	Weight (mg)
A (First Hour)	✓ Front Filter	F179/A	247.3	247.5	247.4 ✓			✓
	Rear Filter					✓	113570.3 K	
	✓ Probe	OES 5	113570.3	113570.7	113570.3	113570.3 ✓		✓
	✓ O-Ring Set	S667	3414.8	3414.7	3414.8 ✓			✓
A	✓ Front Filter	F180/A	246.3	247.1	247.1 ✓			✓
	Rear Filter							
	✓ Probe	OES 6	113708.6	113709.1	113709.0 ✓			✓
	✓ O-Ring Set	S668	3397.4	3397.3	3397.4 ✓			✓
B	✓ Front Filter	F244/A	239.5	240.5	240.4 ✓			✓
	Rear Filter							
	✓ Probe	33	113943.9	113943.8	113943.9 ✓			✓
	✓ O-Ring Set	S669	3339.0	3338.9	3339.0 ✓			✓
BG	✓ Filter	F226	120.4	120.4	120.3 ✓			✓

Technician Signature: K. Morgan Date: 3/7/24

Equations and Sample Calculations – ASTM E2780 & E2515

Manufacturer	Valley Comfort Systems, Inc. (Blaze King)
Model:	SC 25
Project Number:	0142WN020E
Run Number:	6

Sample calculations of each equation used in the referenced 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	18.62	Fuel Properties Work Sheet
M_{Swb}	- Weight of Test Fuel Spacers, wet basis, kg	1.7	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 moisture in fuel crib, % dry basis	[1]Varies	Fuel Properties Work Sheet
V_C	- Volume of Fuel Crib, ft^3 (less spacers)	0.417	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	15.29	Traverse Worksheet
θ	- Duration of test, min	353	*Train A Worksheet*
P_{bar}	- Barometric pressure (average) at the testing site, in. Hg	29.96	*Traverse Worksheet*
Pg	- Tunnel Static Pressure	-0.4	*Traverse Worksheet*

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

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	56.867	56.912	9.637	56.52
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	0.95	2.17	1.68
T_m	- Temperature of Dry Gas Meter, °F	81.7	81.9	70.7	79.0
Uncorrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.4	0.0	0.0	n/a
m_f	- mass of particulate matter from filters, mg	0.8	0.9	0.1	0.0
m_g	- mass of particulate matter from filter seals, mg	0.0	0.0	0.0	n/a
Corrected Sample Mass					
m_p	- mass of particulate matter from probe, mg	0.4	0.0	0.0	n/a
m_f	- mass of particulate matter from filters, mg	0.8	0.9	0.1	n/a
m_g	- mass of particulate matter from filter seals, mg	0.0	0.0	0.0	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 = 18.62 %, dry basis
M_{Swb} = 1.7 lb.
0.4536 = Conversion factor, lb. → kg

M_{Sdb} = ((1.7 x 0.4536) (100 / (100 + 18.62))

M_{Sdb} = **0.650** 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} = 14.1 lb.
FM_{CPn} = 21.26 %, dry basis
0.4536 = Conversion factor, lb. → kg

M_{Cdb} = 14.1 x 0.4536 x (100 / (100 + 14.1))

M_{Cdb} = **5.27** 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} = 11.63 lb
V_C = 0.417 ft^3

D_{Cdb} = 11.63 / 0.417

D_{Cdb} = **27.90** 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} = 0.650
M_{Cdb} = 5.27

M_{FTAdb} = 0.65 + 5.27

M_{FTAdb} = **5.92** kg

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

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

Sample Calculation:

M_{FTAdb} = 5.925
θ = 353

BR = (60 x 5.925) / 353

BR = **1.01** 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 = 0.808

$\Delta P^{1/2}_{AVG}$ = 0.348

$T_{S\,(avg)}$ = 547

Pbar = 29.96

Pg = -0.4

Ps = 29.93

V_S = 0.808 x 85.49 x 0.99 x 0.348 x √ [(547 / (29.93 x 28.78)]

V_S = **18.929** ft/sec

(First Hour of Test)

F_P = 0.808

$\Delta P^{1/2}_{AVG}$ = 0.349

$T_{S\,(avg)}$ = 547

Pbar = 29.99

Pg = -0.4

Ps = 29.96

V_S = 0.808 x 85.49 x 0.99 x 0.349 x √ [(547 / (29.96 x 28.78)]

V_S = **19.009** 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 = 29.93
$T_{s(avg)}$ = 547
Vs = 18.93

Qstd = 3600 x (1 - 0.02) x 18.929 x 0.19635 x (528 / 547) x (29.93 / 29.92)

Qstd = **12666.6** dscf/hr

(First Hour):

B_{ws} = 0.02
A = 0.19635
P_s = 29.96
$T_{s(avg)}$ = 547
Vs = 19.009

Qstd = 3600 x (1 - 0.02) x 19.009 x 0.1963 x (528 / 547) x (29.96 / 29.92)

Qstd = **12730.3** 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

$$V_{m(std)} = 17.64 \times 56.867 \times 1.016 \times \frac{\left(29.96 + \frac{1.24}{13.6}\right)}{(81.7 + 460)}$$

$V_{m(std)}$ = **56.540** dscf

Train B

$$V_{m(std)} = 17.64 \times 56.912 \times 1.011 \times \frac{\left(29.96 + \frac{0.95}{13.6}\right)}{(82 + 460)}$$

$V_{m(std)}$ = **56.248** dscf

Train C (1st Hour)

$$V_{m(std)} = 17.64 \times 9.64 \times 1.015 \times \frac{\left(\underline{29.99} + \frac{2.17}{13.6}\right)}{(70.7 + 460)}$$

$V_{m(std)}$ = **9.802** dscf

Train D (Background)

$$V_{m(std)} = 17.64 \times 56.52 \times 1.011 \times \frac{\left(\underline{29.96} + \frac{1.68}{13.6}\right)}{(79.0 + 460)}$$

$V_{m(std)}$ = **56.259** 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 + 0.8 + 0.0

m_n = **1.2** mg

Train B

m_n = 0.0 + 0.9 + 0.0

m_n = **0.9** mg

Train C (1st hour)

m_n = 0.0 + 0.1 + 0

m_n = **0.1** mg

Train D (Background)

$m_n = m_f$ = 0.0

m_n = **0.0** mg

Sample Calculations (Corrected):

Train A

m_n = 0.4 + 0.8 + 0.0

m_n = **1.2** mg

Train B

m_n = 0.0 + 0.9 + 0.0

m_n = **0.9** mg

Train C (1st hour)

m_n = 0.0 + 0.1 + 0

m_n = **0.1** 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

$$C_s = 0.001 \times \frac{1.2}{56.54}$$

C_s = **0.000021** g/dscf

Train B

$$C_s = 0.001 \times \frac{0.9}{56.25}$$

C_s = **0.0000160** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.1}{9.80}$$

Cs = **0.000010** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{56.26}$$

C_r = **0.000000** g/dscf

Sample Calculations (Corrected):

Train A

$$C_s = 0.001 \times \frac{1.2}{56.54}$$

C_s = **0.000021** g/dscf

Train B

$$C_s = 0.001 \times \frac{0.9}{56.25}$$

C_s = **0.0000160** g/dscf

Train C (1st Hour)

$$Cs = 0.001 \times \frac{0.1}{9.80}$$

Cs = **0.000010** g/dscf

Train D (Background)

$$C_r = 0.001 \times \frac{0.0}{56.26}$$

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 = (0.000021 - 0.000000) x 12666.6 x 353 / 60

E_T = **1.58** g

Train B

E_T = (0.000016 - 0.000000) x 12666.6 x 353 / 60

E_T = **1.19** g

First Hour

E_T = (0.000010 - 0.000000) x 12730.3 x 60 / 60

E_T = 0.13 g

Trains A and B Average

E = **1.39** g

Sample calculations (Corrected)

Train A

E_T = (0.000021 - 0.000000) x 12666.6 x 353 / 60

E_T = **1.58** g

Train B

E_T = (0.000016 - 0.000000) x 12666.6 x 353 / 60

E_T = **1.19** g

First Hour

E_T = (0.000010 - 0.000000) x 12730.3 x 60 / 60

E_T = **0.13** g

Trains A and B Average

E_T = **1.39** 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 = 1.58 g

θ = 353 min

PM_R = 60 x (1.58 / 353)

PM_R = **0.27** g/hr

Train B

E_T = 1.19 g

θ = 353 min

PM_R = 60 x (1.19 / 353)

PM_R = **0.20** g/hr

A and B Average

E_T = **0.24** g/hr

First Hour

E_T = 0.13 g

θ = 60 min

PM_R = 60 x (0.13 / 60)

PM_R = **0.13** g/hr

Sample Calculation (Corrected)

Train A

E_T = 1.58 g

θ = 353 min

PM_R = 60 x (1.58 / 353)

PM_R = **0.27** g/hr

Train B

E_T = 1.19 g

θ = 353 min

PM_R = 60 x (1.19 / 353)

PM_R = **0.20** g/hr

A and B Average

E_T = **0.24** g

First Hour

E_T = 0.13 g

θ = 60 min

PM_R = 60 x (0.13 / 60)

PM_R = **0.13** 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 = 1.58 g
M_{FTAdb} = 5.92 kg
PM_F = 1.58 / 5.92
PM_F = **0.27** g/kg

Train B

E_T = 1.19 g
M_{FTAdb} = 5.92 kg
PM_F = 1.19 / 5.92
PM_F = **0.20** g/kg

Sample Calculation (Corrected)

Train A

E_T = 1.58 g
M_{FTAdb} = 5.92 kg
PM_F = 1.58 / 5.92
PM_F = **0.27** g/kg

Train B

E_T = 1.19 g
M_{FTAdb} = 5.92 kg
PM_F = 1.19 / 5.92
PM_F = **0.20** 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	353	353	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	0.163
V_m	=	Volume of gas sample as measured by dry gas meter, dcf	56.867	56.912	9.637
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec	19.375	19.375	19.375
V_s	=	Average gas velocity in the dilution tunnel, ft/sec	18.930	18.930	19.025
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR	535.0	536.0	530.0
T_m	=	Absolute average dry gas meter temperature, ^oR	541.7	541.9	530.7
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interv	570.5	570.5	570.5
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR	546.8	546.8	546.9

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

Train A PR = $\left(\frac{353 \text{ x } 0.161 \text{ x } 18.93 \text{ x } 542 \text{ x } 571}{1 \text{ x } 56.867 \text{ x } 19.375 \text{ x } 535 \text{ x } 547}\right)$ X 100 = 103.2 %

Train B PR = $\left(\frac{353 \text{ x } 0.16 \text{ x } 18.93 \text{ x } 542 \text{ x } 571}{1 \text{ x } 56.912 \text{ x } 19.375 \text{ x } 536 \text{ x } 547}\right)$ X 100 = 102.3 %

Train B PR = $\left(\frac{60 \text{ x } 0.163 \text{ x } 19.025 \text{ x } 531 \text{ x } 571}{1 \text{ x } 9.637 \text{ x } 19.375 \text{ x } 530 \text{ x } 547}\right)$ X 100 = 104.1 %

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: 11-14-23 Time: 1300	Date: 11-15-23 Time: 1500 RH %: 15.1 T (°F): 69.1	Date: 11/28/23 Time: 15:00 RH %: 9.9 T (°F): 67.7	Date: 11/29/23 Time: 13:30 RH %: 9.3 T (°F): 66.0	Date: Time: RH %: T (°F):	Date Used	Project Number	Run No.
ID #	Audit: 200.0	Audit: 200.1	Audit: 200.1	Audit:			
F161/F161A	247.2	247.2					
F162/F162A	247.2	247.2					
F163/F163A	245.5	245.3					
F164/F164A	248.2	248.1					
F165/F165A	247.5	247.4					
F166/F166A	246.4	246.2					
F167/F167A	246.9	246.7			02/27/24	0142WN020E	1
F168/F168A	247.4	247.2					
F169/F169A	246.8	246.8					
F170/F170A	246.1	245.9		✓	02/28/24	0142WN020E	2
F171/F171A	246.2	246.0					
F172/F172A	246.7	246.8					
F173/F173A	246.8	246.7			02/29/24	0142WN020E	3
F174/F174A	246.8	246.6					
F175/F175A	248.0	247.7	247.6				
F176/F176A	247.6	247.4			3/01/24	0142WN020E	4
F177/F177A	247.5	246.9	247.1		3/01/24	0142WN020E	4
F178/F178A	246.8	246.6			3/01/24	0142WN020E	4
F179/F179A	247.5	247.3			03/04/24	0142WN020E	6
F180/F180A	246.4	246.3					
	Initials: RC	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: _____ Date: _____ Evaluator signature: _____

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: 2-14-24 Time: 1345 ID #	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.
F241/F241A	241.8	241.8 ✓			3/01/24	0142WN020E	5
F242/F242A	238.4	238.5 ✓			3/01/24	0142WN020E	5
F243/F243A	238.8	238.7 ✓			3/01/24	0142WN020E	5
F244/F244A	239.5	239.5 ✓			03/04/24	0142WN020E	6
F245/F245A	238.8	238.9 ✓					
F246/F246A	239.6	239.7 ✓					
F247/F247A	238.3	238.4 ✓					
F248/F248A	239.2	239.3 ✓					
F249/F249A	238.4	238.3 ✓					
F250/F250A	238.0	238.1 ✓					
F251/F251A	238.0	238.4					
F252/F252A	238.3	238.1 ✓					
F253/F253A	238.8	238.8 ✓					
F254/F254A	240.3	240.3 ✓					
F255/F255A	239.0	239.0 ✓					
F256/F256A	239.7	239.6 ✓					
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: PT	Initials: PT	Initials:	Initials:			

Final Technician Signature: _____ Date:_____ Evaluator signature:_____

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: Terry Tong Balance ID #: 00637 Thermohygrometer ID #: Audit Weight ID #/Mass: 1

Placed in Dessicator: Date: 11/30/23 Time: 15:40	Date: 12/04/23 Time: 8:30 RH %: 10.7 T (°F): 65.2	Date: 12/05/23 Time: 9:00 RH %: 12.9 T (°F): 67.5	Date: Time: RH %: T (°F):	Date: Time: RH %: T (°F):	Date Used	Project Number	Run No.
ID #	Audit: 200.1	Audit: 200.1	Audit:	Audit:			
F221	125.2	125.2 ✓			01/27/24	0142WN020E	1
F222	120.6	120.5 ✓			02/28/24	0142WN020E	2
F223	120.3	120.5 ✓			02/29/24	0142WN020E	3
F224	121.9	122.0 ✓			3/01/24	0142WN020E	4
F225	122.0	122.1 ✓			3/01/24	0142WN020E	5
F226	120.3	120.4 ✓			03/04/24	0142WN020E	6
F227	123.1	123.1 ✓					
F228	122.5	122.4 ✓					
F229	120.4	120.5 ✓					
F230	120.6	120.6 ✓					
F231	120.4	120.5 ✓					
F232	121.5	121.6 ✓					
F233	121.8	121.7 ✓					
F234	121.4	121.4 ✓					
F235	120.0	120.2 ✓					
F236	121.4	121.5 ✓					
F237	120.9	121.0 ✓					
F238	121.5	121.4 ✓					
F239	121.0	121.0 ✓	1				
F240	121.5	121.6 ✓	121.6 3/12/24 check				
	Initials: TT	Initials: TT	Initials:	Initials:			

Final Technician Signature: Terry Tong Date: 12/05/23 Evaluator signature: Kelly 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 5g

Placed in Dessicator: Date: 11/15/23 Time: 12:00	Date: 11/22/23 Time: 12:00 RH %: 17.4 T (°F): 68.7 Audit: 5000.0	Date: 11/27/23 Time: 8:20 RH %: 9.4 T (°F): 63.5 Audit: 5000.0	Date: 11/28/23 Time: 8:30 RH %: 9.0 T (°F): 64.8 Audit: 4999.9	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
ID #							
S639	3403.1	3403.1 ✓					
S646	3392.4	3392.3 ✓					
S641	3365.3	3365.0 ✓	3365.0 ✓				
S642	4130.1	4130.0 ✓					
S643	3372.4	3372.4 ✓					
S644	3387.8	3387.5 ✓	3387.5 ✓		02/27/24	0142WN020E	1
S645	3339.7	3339.4 ✓	3339.5 ✓		02/28/24	0142WN020E	2
S646	3340.5	3340.5 ✓					
S647	4167.9	4167.7 ✓					
S648	4093.1	4093.1 ✓					
S649	3308.6	3308.1 ✓	3307.9 ✓				
S650	3384.3	3384.2 ✓					
S651	3362.1	3362.2 ✓					
S652	3374.5	3374.6 ✓			02/29/24	0142WN020E	3
S653	3353.4	3353.4 ✓					
S654	3455.6	3455.6 ✓			02/27/24	0142WN020E	1
S655	3267.2	3267.2 ✓					
S656	3464.1	3464.0 ✓			02/27/24	0142WN020E	1
S657	3413.8	3413.7 ✓					
S658	3243.9	3244.1 ✓			3/1/24	0142WN020E	5
	Initials: TT	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: Tommy Tong Date: 11/28/2023 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 #: Thermohygrometer ID #: Audit Weight ID #/Mass: /

Placed in Dessicator: Date: 2-14-24 Time: 1345 ID #	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.
F241/F241A	241.8	241.8 ✓			3/01/24	0142WN020E	5
F242/F242A	238.4	238.5 ✓			3/01/24	0142WN020E	5
F243/F243A	238.8	238.7 ✓			3/01/24	0142WN020E	5
F244/F244A	239.5	239.5 ✓			03/04/24	0142WN020E	6
F245/F245A	238.8	238.9 ✓					
F246/F246A	239.6	239.7 ✓					
F247/F247A	238.3	238.4 ✓					
F248/F248A	239.2	239.3 ✓					
F249/F249A	238.4	238.3 ✓					
F250/F250A	238.0	238.1 ✓					
F251/F251A	238.0	238.4					
F252/F252A	238.3	238.1 ✓					
F253/F253A	238.8	238.8 ✓					
F254/F254A	240.3	240.3 ✓					
F255/F255A	239.0	239.0 ✓					
F256/F256A	239.7	239.6 ✓					
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: PL	Initials: RD	Initials:	Initials:			

Final Technician Signature: _____ Date:_____ Evaluator signature:_____

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 ✓			02/27/24	0142WN020E	1
OES 5	113571.2	113570.7	113570.8 ✓				
3	116011.0	116010.8 ✓					
65	117079.4	117079.3 ✓					
38	114149.4	114149.3 ✓			02/27/24	0142WN020E	1
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	116965.0 ✓					
37	114465.8	114465.6 ✓					
20	114254.1	114253.9 ✓					
13	114321.6	114321.7 ✓			02/28/24	0142WN020E	2
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: 00283 A / 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.
3	116010.6	116010.6			02/29/24	0142WN020E	3
OES 4	114148.6	114148.7			3/01/24	0142WN020E	4
OES 5	113570.3	113570.3			03/04/24	0142WN020E	6
OES 6	113709.0	113708.7	113708.6		↓	↓	↓
12	114284.6	114285.0	114284.3				
14	114546.9	114546.4	114546.3				
18	114399.7 ~~117663.7~~	114399.2	114399.0				
15	114339.9	114339.7			3/01/24	0142WN020E	5
23	114076.3	114076.3			02/29/24	0142WN020E	3
24	114126.4	114126.5			↓	↓	↓
33	113944.0	113943.9			03/04/24	0142WN020E	6
35	114327.4	114327.4					
66	118457.5	118457.1	118457.0		3/01/24	0142WN020E	5
62	117663.8	117663.1	117663.3		3/01/24	0142WN020E	5
75	117641.0	117641.0					
78	117460.7	117460.6			02/27/24	0142WN020E	1
65	117079.1	117079.2					
77	116181.6	116181.6					
21	114390.6	114390.4			02/28/24	0142WN020E	2
27	114369.8	114369.7			3/01/24	0142WN020E	4
	Initials: TT	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: _____ Date: _____ Evaluator signature: _____

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 1 100 g

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				
78	117070.0	117070.1			3/01/24	0142WN020E	4
28	114749.4	114749.5					
68	116880.1	116880.1			02/28/24	0142WN020E	2
	Initials: TT	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: _____ Date: _____ Evaluator signature: _____

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: 2-14-24 Time: 1100	Date: 2-15-24 Time: 1145 RH %: 11.2 T (°F): 69.6	Date: 2-22-24 Time: 1707 RH %: 11.7 T (°F): 69.7	Date: 02/26/24 Time: 0900 RH %: 11.2 T (°F): 69.9	Date: Time: RH %: T (°F):	Date Used	Project Number	Run No.
ID #	Audit: 4999.8	Audit: 4999.9	Audit: 4999.9	Audit:			
S659	3322.3	3322.1 ✓			3/01/24	0142WN020E	4
S660	3409.3	3409.1 ✓			02/28/24	0142WN020E	2
S661	3401.5	3401.0	3401.0 ✓		↓	↓	↓
S662	3322.3	3322.1 ✓			02/29/24	0142WN020E	3
S663	3307.6	3307.4 ✓			3/01/24	0142WN020E	5
S664	4145.1	4144.6	4144.7 ✓		3/01/24	0142WN020E	5
S665	3305.5	3305.1	3305.2 ✓		3/01/24	0142WN020E	4
S666	3400.4	3400.0	3400.1 ✓		3/01/14	0142WN020E	4
S667	3415.0	3414.8 ✓			03/04/24	0142WN020E	6
S668	3397.5	3397.4 ✓			↓	↓	↓
S669	3339.2	3339.0 ✓					
S670	3266.6	3266.4 ✓					
S671	3431.6	3431.4 ✓					
S672	3354.0	3354.0 ✓					
S673	3410.7	3410.5 ✓					
S674	3289.4	3289.2 ✓					
S675	3401.2	3401.1 ✓					
S676	3225.9	3225.7 ✓					
S677	3296.1	3296.0 ✓					
S678	3314.2	3314.0 ✓					
	Initials: RC	Initials: RC	Initials:	Initials:			

Final Technician Signature: _____ Date: _____ Evaluator signature: _____

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 5g

Placed in Dessicator: Date: 11/15/23 Time: 12:00 ID #	Date: 11/22/23 Time: 12:00 RH %: 17.4 T (°F): 68.7 Audit: 5000.0	Date: 11/27/23 Time: 8:20 RH %: 9.4 T (°F): 63.5 Audit: 5000.3	Date: 11/28/23 Time: 8:30 RH %: 9.0 T (°F): 64.8 Audit: 4999.9	Date: Time: RH %: T (°F): Audit:	Date Used	Project Number	Run No.
S639	3403.1	3403.1					
S640	3392.4	3392.3					
S641	3365.3	3365.0	3365.0				
S642	4130.1	4130.0					
S643	3372.4	3372.4					
S644	3387.8	3387.5	3387.5		02/27/24	0142WN020E	1
S645	3339.7	3339.4	3339.5		02/28/24	0142WN020E	2
S646	3340.5	3340.5					
S647	4167.9	4167.7					
S648	4093.1	4093.1					
S649	3308.6	3308.1	3307.9		2/29/24	0142WN020E	3
S650	3384.3	3384.2					
S651	3362.1	3362.2					
S652	3374.5	3374.6			02/29/24	0142WN020E	3
S653	3353.4	3353.4					
S654	3455.6	3455.6			02/27/24	0142WN020E	1
S655	3267.2	3267.2					
S656	3464.1	3464.0			02/27/24	0142WN020E	1
S657	3413.8	3413.7					
S658	3243.9	3244.1			3/1/24	0142WN020E	5
	Initials: TT	Initials: TT	Initials: TT	Initials:			

Final Technician Signature: Tom Tom Date: 11/28/2023 Evaluator signature: M. Morgan

Control No. P-SFDP-0002.xls, Effective Date: 2/1/2017

6. Appliance Engineering Drawings

(CBI Report Only)

Model Ashford AF25: Pages

Model Sirocco SC25: Pages

Model Boxer BX24: Pages

7. Appliance Labeling and Owner's Manual(s)

ASHFORD 25 INSERT

SN - 59.

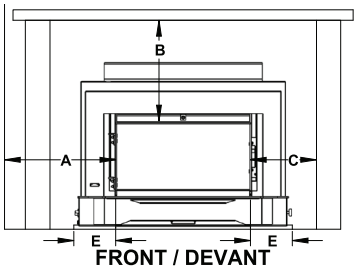
BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE
MODEL / MODÈLE: AF25
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S628:2022
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA

0142WN020E
0142WN017S

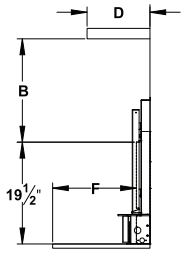
Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Not to be installed in any factory built fireplace. Install and use in a code complying fireplace only. Do not remove bricks or mortar in masonry fireplace. Do not use grate or elevate fire. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Use a 6" stainless steel liner listed to UL 1777, ULCS635, or ULCS640. Inspect and clean chimney frequently; under certain conditions of use, creosote buildup may occur rapidly. Do not over fire; if heater or chimney glows, the appliance is over firing.

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. Ne pas installer dans un foyer préfabriqué. Installer et utiliser uniquement dans un foyer conforme au code. Ne retirez pas les briques ou le mortier du foyer de maçonnerie. N'utilisez pas de grille ni de feu surélevé. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". Utilisez une gaine en acier inoxydable de 6" homologuée UL 1777, ULCS635 ou ULCS640. Inspectez et nettoyez fréquemment la cheminée; dans certaines conditions d'utilisation, l'accumulation de créosote peut se produire rapidement. Ne pas trop brûler; si l'appareil de chauffage ou la cheminée brille, l'appareil est en surchauffe.

Minimum Clearances to Combustibles (measured from firebox door opening) / Dégagements minimaux aux combustibles (mesurés à partir de l'ouverture de la porte du foyer)		
A	Side of door flange to combustible wall Du côté du rebord de l'ouverture de porte à tout mur combustible	13.5" 343 mm
B	Top of door flange to bottom of mantel and combustible facing Du dessus du rebord de l'ouverture de porte au bas du manteau et de toute façade combustible	20" 508 mm
C	Side of door flange to side combustible facing Du côté du rebord de l'ouverture de la porte à toute surface de côté combustible	10" 254 mm
D	Mantle width maximum Largeur maximum du manteau	12" 305 mm
E	Minimum hearth side extension Extension latérale minimum du foyer	8" * 204mm *
F	Mimimum hearth front extension Extension frontale minimum du foyer	16" USA 407 mm 18" CANADA 458 mm



FRONT / DEVANT



SIDE / COTÉ

* Measured from either side of door flange
* Mesuré de chaque côté de la bride de la porte

Non-combustible floor protection is required and must extend 16" (in USA) or 18" (in Canada) out in front of the door opening and extend 8" to either side of the door opening. With the floor flush with the bottom of the appliance and to an elevation of 5" below the firebox bottom, a 1/2" layer of thermal protection where R=1.06 is required. Anything 0 to 5" below the firebox bottom requires UL 1682 type 2 thermal protection where R=1.06 is required.

Une protection de sol incombustible est requise et doit s'étendre de 16" (aux USA) ou de 18" (au Canada) devant l'ouverture de la porte et s'étendre de 8" de chaque côté de l'ouverture de la porte. Avec le plancher au même niveau du fond de l'appareil et à une élévation de 5 po en dessous du fond de la chambre à combustion, une couche de protection thermique de 1/2" où R = 1,06 est nécessaire. Tout de 0 à 5 "en dessous du fond de la chambre à combustion nécessite UL 1,682 type 2 protection thermique R = 1,06 est nécessaire.

Electrical rating: 115 VAC, 60 Hz, 0.58 Amps. Risk of electrical shock; disconnect power before servicing appliance. Do not route power cord in front or beneath appliance. This appliance is certified to comply with 2020 particulate emission standards using crib wood (EPA test methods 28R/5G, ASTM E2515, and ASTM E2780, with an emission-rate of 0.74 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 #115-0335. Replace glass with 5mm ceramic glass only.

Caractéristiques électriques: 115 VCA, 60 Hz, 0,35 A. Risque de choc électrique; débranchez l'alimentation avant de réparer l'appareil. Ne faites pas passer le cordon d'alimentation devant ou sous l'appareil. Cet appareil est certifié conforme aux normes d'émission de particules 2020 en utilisant du bois de crib (méthodes d'essai EPA 28R/5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.74 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. OEM de la chambre de combustion #115-0335. Remplacez le verre par du verre céramique de 5 mm uniquement.

CAUTION: HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ THIS LABEL AND INSTRUCTION MANUAL BEFORE OPERATING HEATER
ATTENTION: CHAUD LORS DU FONCTIONNEMENT. GARDEZ LES ENFANTS, VÊTEMENTS ET MEUBLES ÉLOIGNÉS. UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. LIRE CETTE ÉTIQUETTE ET LES INSTRUCTIONS D'INSTALLATION AVANT DE FAIRE FONCTIONNER CET APPAREIL.

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 ☐

170-0269 [03 24]

SIROCCO 25 INSERT

SN - 60.

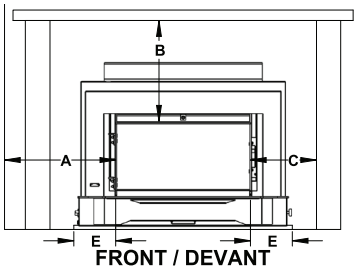
BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE
MODEL / MODÈLE: SC25
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S628:2022
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA

0142WN020E
0142WN017S

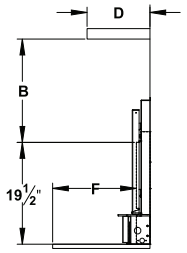
Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Not to be installed in any factory built fireplace. Install and use in a code complying fireplace only. Do not remove bricks or mortar in masonry fireplace. Do not use grate or elevate fire. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Use a 6" stainless steel liner listed to UL 1777, ULCS635, or ULCS640. Inspect and clean chimney frequently; under certain conditions of use, creosote buildup may occur rapidly. Do not over fire; if heater or chimney glows, the appliance is over firing.

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. Ne pas installer dans un foyer préfabriqué. Installer et utiliser uniquement dans un foyer conforme au code. Ne retirez pas les briques ou le mortier du foyer de maçonnerie. N'utilisez pas de grille ni de feu surélevé. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". Utilisez une gaine en acier inoxydable de 6" homologuée UL 1777, ULCS635 ou ULCS640. Inspectez et nettoyez fréquemment la cheminée; dans certaines conditions d'utilisation, l'accumulation de créosote peut se produire rapidement. Ne pas trop brûler; si l'appareil de chauffage ou la cheminée brille, l'appareil est en surchauffe.

Minimum Clearances to Combustibles (measured from firebox door opening) / Dégagements minimaux aux combustibles (mesurés à partir de l'ouverture de la porte du foyer)		
A	Side of door flange to combustible wall Du côté du rebord de l'ouverture de porte à tout mur combustible	13.5" 343 mm
B	Top of door flange to bottom of mantel and combustible facing Du dessus du rebord de l'ouverture de porte au bas du manteau et de toute façade combustible	20" 508 mm
C	Side of door flange to side combustible facing Du côté du rebord de l'ouverture de la porte à toute surface de côté combustible	10" 254 mm
D	Mantle width maximum Largeur maximum du manteau	12" 305 mm
E	Minimum hearth side extension Extension latérale minimum du foyer	8" * 204mm *
F	Mimimum hearth front extension Extension frontale minimum du foyer	16" USA 407 mm 18" CANADA 458 mm



FRONT / DEVANT



SIDE / COTÉ

*** Measured from either side of door flange**
*** Mesuré de chaque côté de la bride de la porte**

Non-combustible floor protection is required and must extend 16" (in USA) or 18" (in Canada) out in front of the door opening and extend 8" to either side of the door opening. With the floor flush with the bottom of the appliance and to an elevation of 5" below the firebox bottom, a 1/2" layer of thermal protection where R=1.06 is required. Anything 0 to 5" below the firebox bottom requires UL 1682 type 2 thermal protection where R=1.06 is required.

Une protection de sol incombustible est requise et doit s'étendre de 16" (aux USA) ou de 18" (au Canada) devant l'ouverture de la porte et s'étendre de 8" de chaque côté de l'ouverture de la porte. Avec le plancher au même niveau du fond de l'appareil et à une élévation de 5 po en dessous du fond de la chambre à combustion, une couche de protection thermique de 1/2" où R = 1,06 est nécessaire. Tout de 0 à 5 "en dessous du fond de la chambre à combustion nécessite UL 1,682 type 2 protection thermique R = 1,06 est nécessaire.

Electrical rating: 115 VAC, 60 Hz, 0.58 Amps. Risk of electrical shock; disconnect power before servicing appliance. Do not route power cord in front or beneath appliance. This appliance is certified to comply with 2020 particulate emission standards using crib wood (EPA test methods 28R/5G, ASTM E2515, and ASTM E2780, with an emission-rate of 0.74 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 #115-0335. Replace glass with 5mm ceramic glass only.

Caractéristiques électriques: 115 VCA, 60 Hz, 0,35 A. Risque de choc électrique; débranchez l'alimentation avant de réparer l'appareil. Ne faites pas passer le cordon d'alimentation devant ou sous l'appareil. Cet appareil est certifié conforme aux normes d'émission de particules 2020 en utilisant du bois de crib (méthodes d'essai EPA 28R/5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.74 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. OEM de la chambre de combustion #115-0335. Remplacez le verre par du verre céramique de 5 mm uniquement.

CAUTION: HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ THIS LABEL AND INSTRUCTION MANUAL BEFORE OPERATING HEATER
ATTENTION: CHAUD LORS DU FONCTIONNEMENT. GARDEZ LES ENFANTS, VÊTEMENTS ET MEUBLES ÉLOIGNÉS. UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. LIRE CETTE ÉTIQUETTE ET LES INSTRUCTIONS D'INSTALLATION AVANT DE FAIRE FONCTIONNER CET APPAREIL.

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 ☐

170-0270 [03 24]

BOXER BX24

SN - 61.

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

MODEL / MODÈLE: BX24
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

0142WN020E
0142WN017S

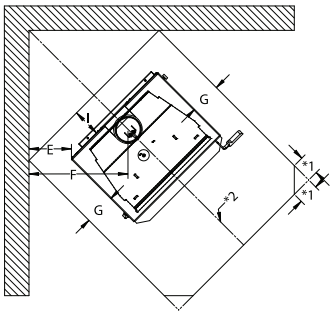
PREVENT HOUSE FIRES - Install and use only in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. The flue size is 6".
CHIMNEYS: DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. Except for installation detailed below, use 6" listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA or a masonry residential type chimney. Do not install in a sleeping room. Passing through a wall or ceiling requires special methods: see instructions and local building codes.

POUR PRÉVENIR UN INCENDIE - Installer et employer seulement selon le manuel d'installation de Blaze King. Contacter les autorités locales en bâtiments ou en matière de prévention d'incendies au sujet des normes d'inspection et d'installation dans votre secteur. La dimension des conduits de cheminée est de 6".
CHEMINÉE: NE PAS CONNECTER CETTE UNITÉ A UNE CONDUITE DE CHEMINÉE SERVANT UN AUTRE APPAREIL. Excepté pour les situations détaillées ci-dessous, employer une cheminée de 6" homologuée par le fabricant à des fins d'utilisation pour combustibles solides conformément à la norme ULC629 au Canada ou UL-103HT aux Etats-Unis ou employer une cheminée en maçonnerie de type résidentiel. Ne pas installer dans une chambre à coucher. Passer à travers un mur ou un plafond requiert une méthode spécifique décrite dans les instructions et dans le code local du bâtiment.

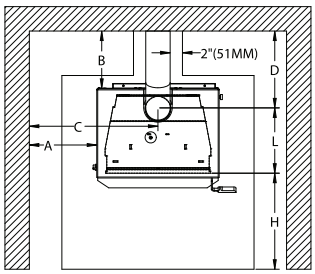
MINIMUM CLEARANCES TO COMBUSTIBLES (See owners manual for complete description of all requirements)
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)

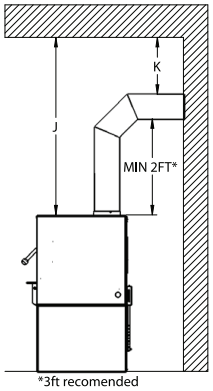
Residential Installations / Installations Résidentielles	A	B	C	D	E	F	J
Roof exit, parallel and corner. Sortie de toit, parallèle et coin.	10" 254 mm	10" 254 mm	25.125" 639 mm	15.125"* 385 mm	2.75" 70 mm	16.375"* 416 mm	49" 1245 mm
Wall exit, parallel and corner. Sortie de mur, parallèle et coin.	10" 254 mm	14" 356 mm	25.125" 639 mm	19.125"* 483 mm	2.75" 70 mm	16.375"* 416 mm	49"* 1245 mm

***Check with local codes and pipe manufacturers for pipe clearances. In Canada 18" clearances from single wall pipe is required.**
*** Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements. Au Canada un dégagement de 18 po est exigé pour un tuyau à simple paroi.**



*1= 3 1/8" in Canada and 2 1/8" in USA
*2 = 57 1/4" in Canada and 55 1/4" in USA





*3ft recomended

G - 5 3/4" (147 mm) in U.S.A.
8" (203 mm) in Canada

H - 16" (406 mm) in U.S.A.
18" (456 mm) in Canada

I - 0" (0 mm) in U.S.A.
8" (203 mm) in Canada

K - 18" (456 mm) *

L - 16.06" (408 mm) *

Floor protection may be any non-combustible material or Listed Floor Protector, and must extend at least 18" (456 mm) in Canada or 16" (406 mm) in U.S.A., in front of the loading door opening: In USA, minimum size is 41 3/4" width x 36 3/4" depth (1061 mm width x 934 mm depth)
In Canada, minimum size is 46 1/4" width x 46 3/4" depth (1175 mm width x 1188 mm depth)
Electrical rating: (120V, 60Hz, 0.75 Amps. Risk of electrical shock. Disconnect power before servicing unit. Do not route power cord in front of or beneath heater).
U.S. ENVIRONMENTAL PROTECTION AGENCY - Certified to comply with 2020 particulate emission standards using crib wood. EPA test methods 28R/5G, ASTM E2515, and ASTM E2780, with an emission-rate of 0.74 g/hr. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in the owner's manual, or if the catalytic element is deactivated or removed.
ONLY OPERATE WITH DOOR CLOSED. Open door to feed fire ONLY. *DO NOT OBSTRUCT COMBUSTION AIR OPENINGS. For Use With Solid Wood Fuel Only - Do not burn other fuels, this may make the catalyst in the combustor inactive. The performance of the catalytic device or its durability has not been evaluated as part of the certification. Combustor part number: 115-0335. Provide adequate outside air for combustion. *Replace with only ceramic glass, 5 mm. Thickness.

La protection de plancher peut être de n'importe quel matériel non combustible ou Protecteur de plancher approuvé, et doit se prolonger au moins de 18" (456 mm) au Canada ou 16" (406 mm) aux États-Unis devant la porte de chargement: Aux États-Unis, la taille minimum est de 41 3/4" largeur x 36 3/4" profondeur (1061 mm largeur x 934 mm profondeur). Au Canada la taille minimum est 46 1/4" largeur x 46 3/4" profondeur (1175 mm largeur x 1188 mm profondeur)
L'AGENCE DE PROTECTION ENVIRONNEMENTALE DES U.S. - - Certifié conformément aux normes d'émission de particules 2020 , en utilisant du bois machiné (méthodes d'essai EPA 28R / 5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.74 g /h). Cet appareil de chauffage au bois nécessite des inspections périodiques et des réparations pour un fonctionnement adéquat. Consulter le manuel du propriétaire pour plus d'informations. Il est contre les règlements fédéraux de faire fonctionner cet appareil de chauffage à l'encontre des instructions d'utilisation fournies dans le manuel du propriétaire, ou si l'élément catalytique est enlevé ou désactivé.
FONCTIONNER UNIQUEMENT AVEC LA PORTE FERMÉE. Ouvrir la porte pour alimenter le feu SEULEMENT. *Ne pas obstruer l'entrée d'air de combustion. Fournir l'apport d'air extérieur adéquat pour alimenter la combustion. Utiliser uniquement avec des combustibles solides - ne pas brûler aucun autre combustible, ce qui peut rendre le catalyseur de la chambre à combustion inactif. La performance du catalyseur ou sa longévité n'a pas été évaluée dans le cadre de la certification. Numéro du catalyseur: 115-0335. *Employer seulement le verre en céramique d'une épaisseur de 5mm si le remplacement est nécessaire.

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 ☐

170-0271 [04 24]

ASHFORD AF25

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

U.S. EPA CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD

EM O-TL C US

0142WN020E
0142WN017S

Installer: Please complete the details on the back cover 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

ASHFORD 25 INSERT

SN - 59.

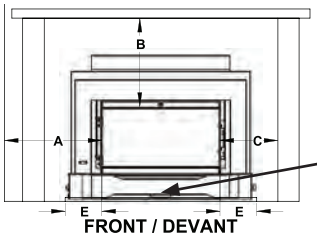
BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE
MODEL / MODÈLE: AF25
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S628:2022
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA

0142WN020E
0142WN017S

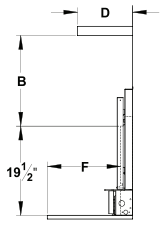
Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Not to be installed in any factory built fireplace. Install and use in a code complying fireplace only. Do not remove bricks or mortar in masonry fireplace. Do not use grate or elevate fire. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Use a 6" stainless steel liner listed to UL 1777, ULCS635, or ULCS640. Inspect and clean chimney frequently; under certain conditions of use, creosote buildup may occur rapidly. Do not over fire; if heater or chimney glows, the appliance is over firing.

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. Ne pas installer dans un foyer préfabriqué. Installer et utiliser uniquement dans un foyer conforme au code. Ne retirez pas les briques ou le mortier du foyer de maçonnerie. N'utilisez pas de grille ni de feu surélevé. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". Utilisez une gaine en acier inoxydable de 6" homologuée UL 1777, ULCS635 ou ULCS640. Inspectez et nettoyez fréquemment la cheminée; dans certaines conditions d'utilisation, l'accumulation de créosote peut se produire rapidement. Ne pas trop brûler; si l'appareil de chauffage ou la cheminée brille, l'appareil est en surchauffe.

Minimum Clearances to Combustibles (measured from firebox door opening) / Dégagements minimaux aux combustibles (mesurés à partir de l'ouverture de la porte du foyer)		
A	Side of door flange to combustible wall Du côté du rebord de l'ouverture de porte à tout mur combustible	13.5" 343 mm
B	Top of door flange to bottom of mantel and combustible facing Du dessus du rebord de l'ouverture de porte au bas du manteau et de toute façade combustible	20" 508 mm
C	Side of door flange to side combustible facing Du côté du rebord de l'ouverture de la porte à toute surface de côté combustible	10" 254 mm
D	Mantle width maximum Largeur maximum du manteau	12" 305 mm
E	Minimum hearth side extension Extension latérale minimum du foyer	8" * 204mm *
F	Mimimum hearth front extension Extension frontale minimum du foyer	16" USA 407 mm 18" CANADA 458 mm



FRONT / DEVANT



SIDE / COTÉ

* Measured from either side of door flange
* Mesuré de chaque côté de la bride de la porte

Non-combustible floor protection is required and must extend 16" (in USA) or 18" (in Canada) out in front of the door opening and extend 8" to either side of the door opening. With the floor flush with the bottom of the appliance and to an elevation of 5" below the firebox bottom, a 1/2" layer of thermal protection where R=1.06 is required. Anything 0 to 5" below the firebox bottom requires UL 1682 type 2 thermal protection where R=1.06 is required.

Une protection de sol incombustible est requise et doit s'étendre de 16" (aux USA) ou de 18" (au Canada) devant l'ouverture de la porte et s'étendre de 8" de chaque côté de l'ouverture de la porte. Avec le plancher au même niveau du fond de l'appareil et à une élévation de 5 po en dessous du fond de la chambre à combustion, une couche de protection thermique de 1/2" où R = 1,06 est nécessaire. Tout de 0 à 5 "en dessous du fond de la chambre à combustion nécessite UL 1,682 type 2 protection thermique R = 1,06 est nécessaire.

Electrical rating: 115 VAC, 60 Hz, 0.58 Amps. Risk of electrical shock; disconnect power before servicing appliance. Do not route power cord in front or beneath appliance. This appliance is certified to comply with 2020 particulate emission standards using crib wood (EPA test methods 28R/5G, ASTM E2515, and ASTM E2780, with an emission-rate of 0.74 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 #115-0335. Replace glass with 5mm ceramic glass only.

Caractéristiques électriques: 115 VCA, 60 Hz, 0,35 A. Risque de choc électrique; débranchez l'alimentation avant de réparer l'appareil. Ne faites pas passer le cordon d'alimentation devant ou sous l'appareil. Cet appareil est certifié conforme aux normes d'émission de particules 2020 en utilisant du bois de crib (méthodes d'essai EPA 28R/5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.74 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. OEM de la chambre de combustion #115-0335. Remplacez le verre par du verre céramique de 5 mm uniquement.

CAUTION: HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ THIS LABEL AND INSTRUCTION MANUAL BEFORE OPERATING HEATER
ATTENTION: CHAUD LORS DU FONCTIONNEMENT. GARDEZ LES ENFANTS, VÊTEMENTS ET MEUBLES ÉLOIGNÉS. UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. LIRE CETTE ÉTIQUETTE ET LES INSTRUCTIONS D'INSTALLATION AVANT DE FAIRE FONCTIONNER CET APPAREIL.

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 ☐

170-0269 [03 24]

The certification label is on a pull out tray beneath the firebox.

The content within this manual describes the installation and operation of the Blaze King AF25. 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	0.21 g/min	1.08 g/hr
Med-low Burn (1)	0.05 g/min	0.16 g/hr
Med-low Burn (2)	0.29 g/min	0.22 g/hr
Med-high Burn	0.35 g/min	1.26 g/hr
High Burn	0.17 g/min	1.20 g/hr
EPA emission rate weighted average		0.74 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 8,038 to 24,085 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

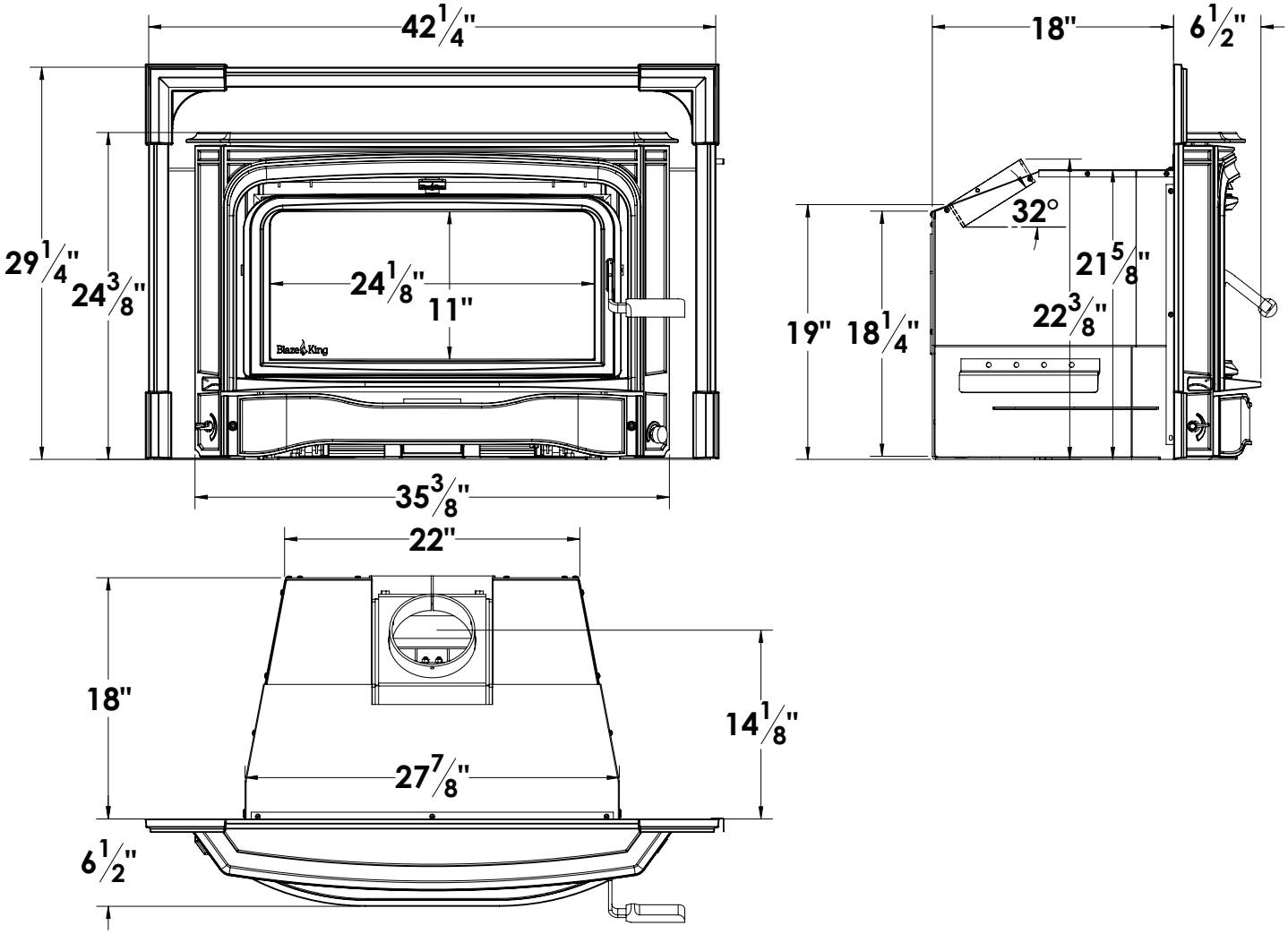
SPECIFICATIONS

ASHFORD 25, AF25 SPECIFICATIONS	
Flue Collar Opening	6” I.D. (152.4 mm)
Firebox Door Opening	25 1/4” x 10 5/8” (642 mm x 270 mm)
Firebox Depth	16 3/4” (426 mm) brick to brick, 18” (457 mm) brick to glass
Firebox Width	18” to 22.75” (457.2 mm to 577.9 mm)
Firebox Height	10” (254 mm)
Firebox Volume	2.159 ft^3 (0.0611 m^3)
Tested Fuel Length	17.75” - 18” (451 mm - 457.2 mm)
Wood Capacity (approximate)	White Oak - 53 lb (24.0 kg) / Douglas Fir - 35lb (15.9 kg)
Shipping Weight	415 lb (189 kg)

PARTS INCLUDED
1. Fire Poker
2. Manual Kit (w/ Warranty Cards, Bypass Handle)

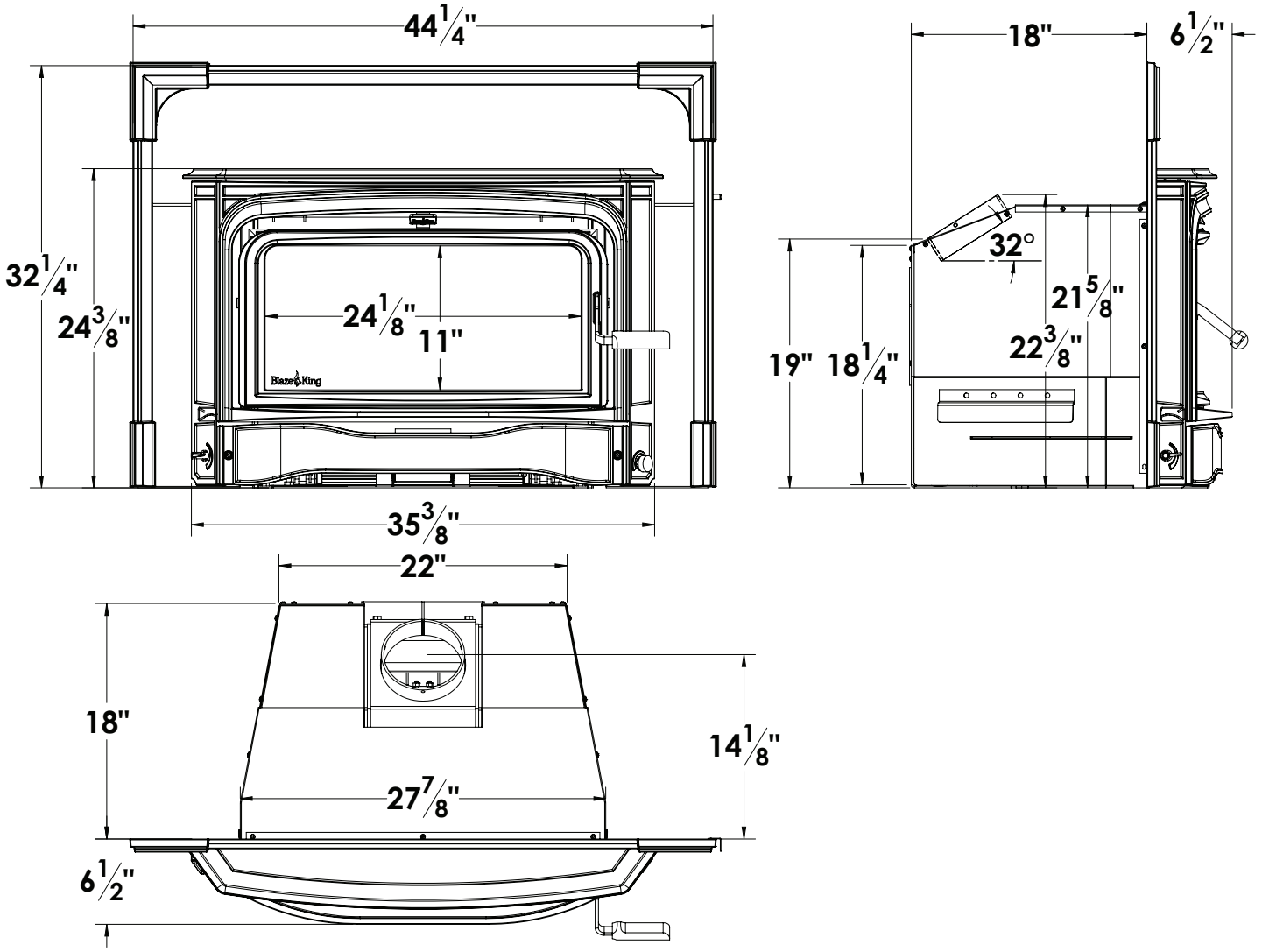
REQUIRED KIT (MUST INSTALL ONE OPTION)	
1. S.Z2091 - Shroud AF25 29 1/4”	2. S.Z2093 - Shroud AF25 32 1/4”

AF25 WITH 29 1/4" SHROUD (S.Z2091)



APPLIANCE DIMENSIONS

AF25 WITH 32 1/4" SHROUD (S.Z2093)



MINIMUM CLEARANCES

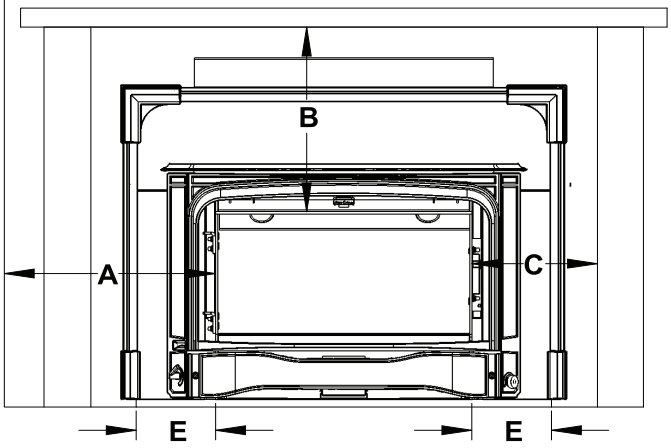
A	Side of door flange to combustible wall	13.5” (343 mm)
B	Top of door flange to bottom of mantel / combustible facing	20” (508 mm)
C	Side of door flange to combustible facing	10” (254 mm)
D	Maximum mantel width	12” (305 mm)
E	Minimum side hearth extension from door flange	8" (203 mm)
F	Minimum front hearth extension from door flange	16" (406 mm) in USA 18" (457 mm) in CANADA

This appliance must be installed in compliance with all local codes and regulations.

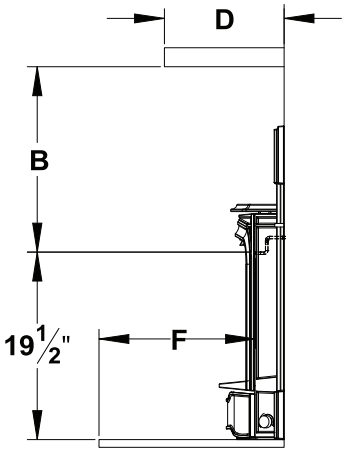
Refer to local codes and pipe manufacturer specs for required minimum clearances.

Minimum clearances may only be reduced by means approved by the regulatory authority.

Minimum fireplace opening is 29” (737 mm) W x 22” (559 mm) H x 19” (483 mm) D.



FRONT / DEVANT



SIDE / COTÉ

FLOOR PROTECTION

If the bottom of the appliance is at least 5” (125 mm) above (combustible) floor level, only ember protection is required (UL1618 Type 1) extending 16” (406 mm) in USA or 18” (457 mm) in Canada in front of the door and extending 8” (203 mm) from either side of the door opening. If the bottom of the appliance is within 5” of (combustible) floor level, then a layer of non-combustible thermal protection (UL1618 Type 2, R=1.06 minimum) is required under the appliance extending 16” (406 mm) in the USA and 18” (457 mm) in Canada.

⚠WARNING

THIS APPLIANCE MUST BE INSTALLED WITH A CONTINUOUS CHIMNEY LINER OF 6" DIAMETER EXTENDING FROM THE APPLIANCE TO THE TOP OF THE CHIMNEY. THE CHIMNEY LINER MUST CONFORM TO THE CLASS 3 REQUIREMNETS OF CAN/ULC-S635, STANDARD OR LINING SYSTEMS FOR EXISTING MASONRY OR FACTORY BUILT CHIMNEYS AND VENTS, OR CAN/ULC-S640, STANDARD FOR LINING SYSTEMS FOR NEW MASONRY CHIMNEYS.
FAILURE TO COMPLY 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). Your Blaze King should be installed using an insulated chimney liner. 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

All joints within the venting system must be securely fastened with sheet metal screws. Place a bead of furnace cement around the flue collar connection to ensure the flue pipe is properly connected, secured, and sealed. Do not use a flue pipe to pass through an attic or roof space, closet or similar concealed space, or a floor or ceiling as 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 to the exterior of the structure. Do not connect this appliance to a chimney serving another appliance; To do so will affect the safe operation of both appliances and will void the appliance warranty. You must comply with the local authority having jurisdiction.

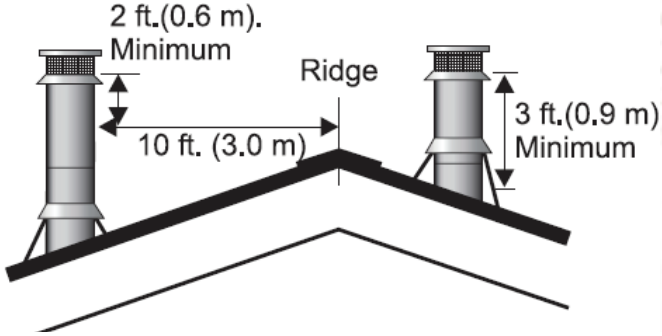
CONNECTION TO A MASONRY CHIMNEY

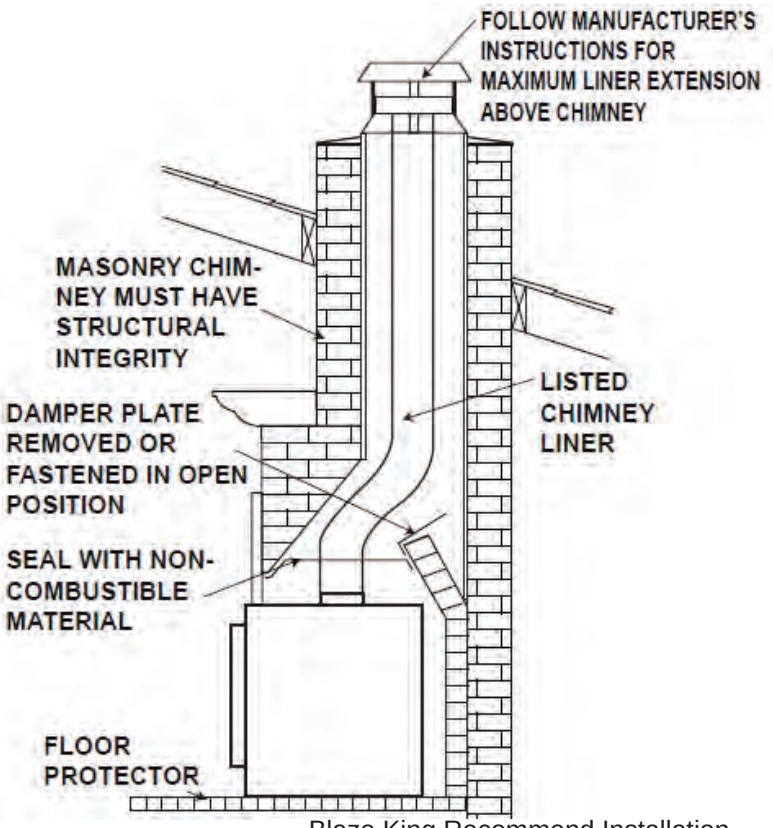
It is recommended that the inner, cross sectional area of the masonry chimney be no less than the area of the appliance flue (28in² or 180cm²). Ensure the masonry chimney meets the minimum standards per the National Fire Protection Association by having it inspected by a certified professional. There must be no cracks, no loose mortar, and no signs of deterioration or blockage. Ensure the chimney is properly cleaned before installing the appliance.

Masonry or steel, including the damper plate, may be removed from the smoke shelf and adjacent damper frame if necessary to accommodate a chimney liner, provided that their removal will not weaken the structure of the fireplace and/or chimney, and will not reduce protection for combustible materials to less than that required by the National Building Code. If the fireplace is modified to accommodate the appliance, the qualified installer must attached a metal tag (supplied by the manufacturer) with screws or nails to the fireplace in a location that is readily visible should the appliance be removed. The tag will state: *"This fireplace has been altered to accommodate a fireplace insert and should be inspected by a qualified person prior to re-use as a conventional fireplace."*

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. A rough masonry chimney without a good smooth liner can result in the rapid build up creosote.

A chimney must extend at least three feet above the highest point where it passes through the roof and at least two feet higher than any portion of the building within ten feet of the chimney.





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)	

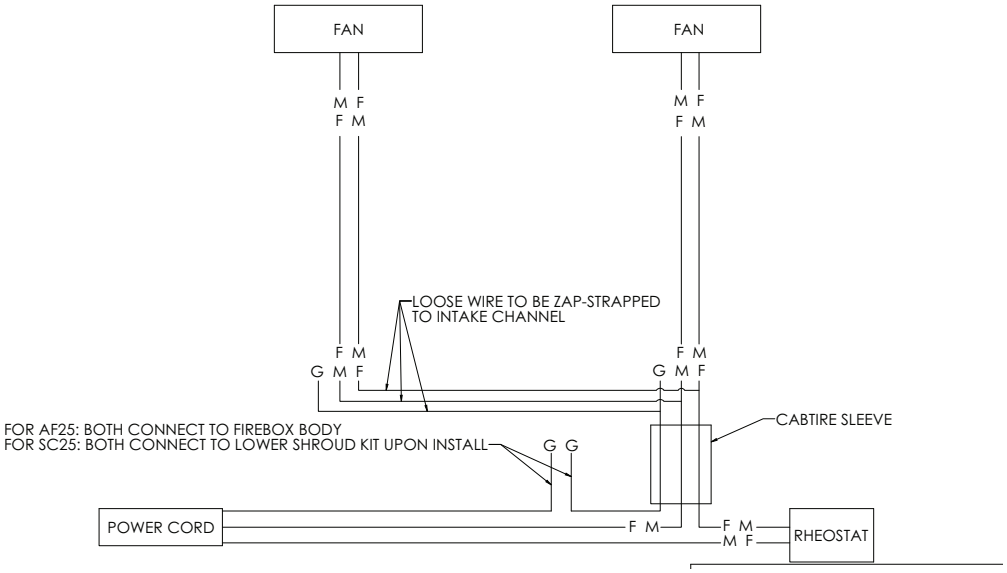
The above figures are only guidelines, please refer to the "***DRAFT PERFORMANCE"*** section.

⚠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.

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.

INITIAL SETUP

Note: This appliance is shipped with all cast iron pieces attached causing it to be "front heavy" and difficult to manuver when installing. Though not required, the front cast assembly can be removed to ease positioning of the appliance infront of the fireplace opening and the reattached after.

FRONT CAST ASSEMBLY REMOVAL

Disconnect the x2 rheostat wires from the front cast assembly. Use a 7/16" wrench to remove the nuts from the top and side brackets (x8 total). Use a 3/8" wrench to remove the x2 nuts from the catalytic thermometer. Open the loading door and slide the cast assembly out from the firebox and set aside.

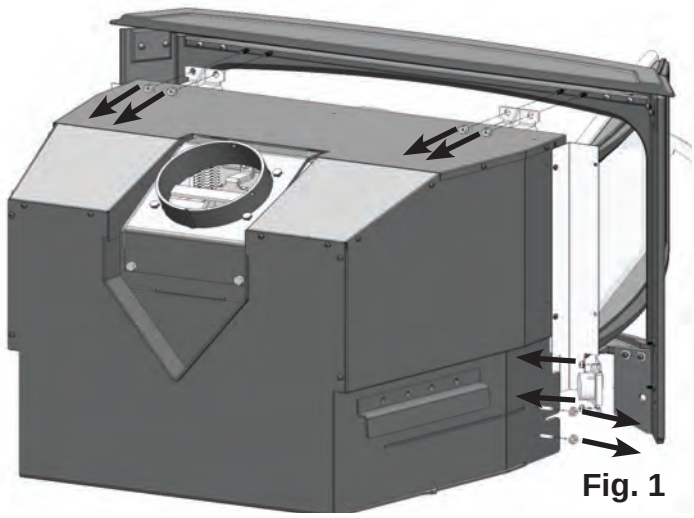


Fig. 1

FLUE COLLAR ASSEMBLY REMOVAL

From within the firebox, use a 9/16” wrench to remove the x2 nuts that hold flue collar assembly in place and then remove the assembly from the rear. Ensure the gasket is still fully intact and adhered to flue collar base. (**Fig. 2**)

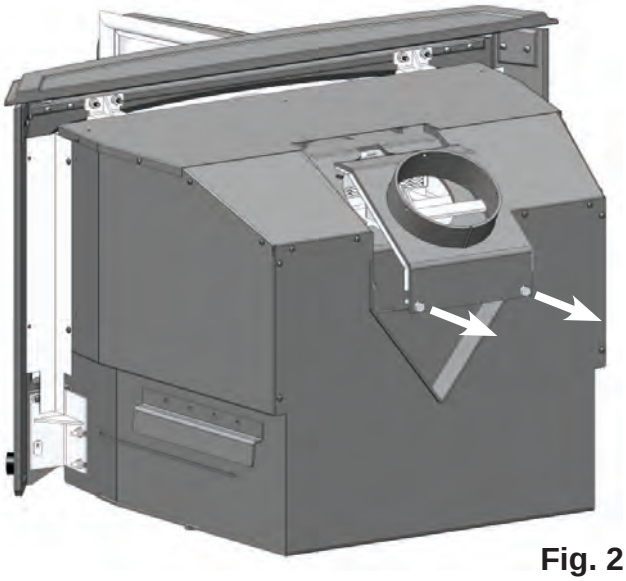


Fig. 2

THERMOSTAT ROD INSTALLATION

Note: The front cast assembly must be reattached at this time in order to continue with Initial Setup.

First, ensure the fans are in correct position and have not shifted during transport. Ensure the thermostat is in the fully open position with the set screw making contact with the stop (see below). Slide the thermostat rod in through the left cast side and align its machined face with the machined face of the rod protruding from the thermostat. With both rods fully interlocked, secure them in place by tightening the grub screw in the set collar supplied with the thermostat rod. (**Fig. 3**)

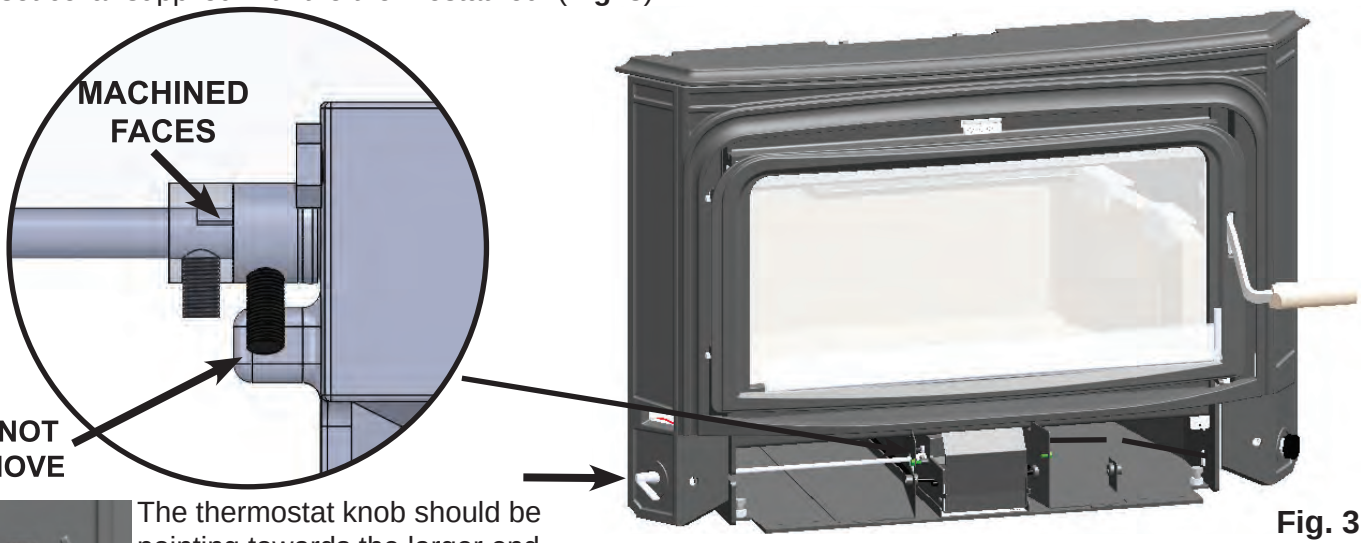


Fig. 3

Fig. 4

The thermostat knob should be pointing towards the larger end of the gradient when fully open, if not, then the thermostat rod needs to be re-installed at the proper alignment. (**Fig. 4**)

POWER CORD ROUTING

Determine where the nearest electrical outlet is and then feed the power cord through the lower rear corner of either the left or right cast side. Ensure all wiring is tucked above the protruding flanges of the front cover. (**Fig. 5**)

Note: If power cord is run out the right side, ensure any excess wire is secured with a zip tie to avoid potential interference with the fan.

Fig. 5

SHROUD KIT INSTALLATION

Note: Follow the instructions provided with the shroud kit in order to fully assemble prior to installing onto the appliance.

Position the assembled shroud tight to the rear of the front cast assembly and fasten it to the firebox with the x7 screws provided with the kit. The bypass door handle bracket can be placed on either side of the shroud. (Fig. 6)

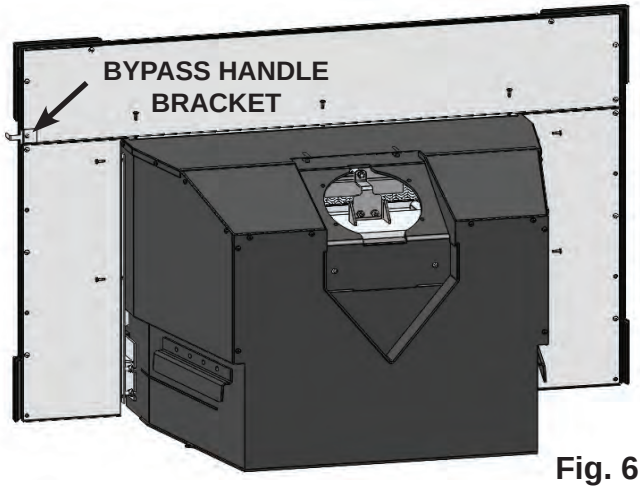


Fig. 6

FIREPLACE INSTALLATION

Before sliding the appliance into the fireplace opening, determine how much levelling will be required to ensure a proper installation as the appliance must sit level and be slightly higher than the protruding hearth front. Using a 5/32" wrench, unfasten the x2 bolts (**Fig. 7**) securing the lower cast front to the cast assembly then locate the x4 levelling bolts at the front and rear corners of the appliance (**Fig. 8**) which must be adjusted accordingly to insure a level installation. Once satisfied with level, reinstall the lower cast front.

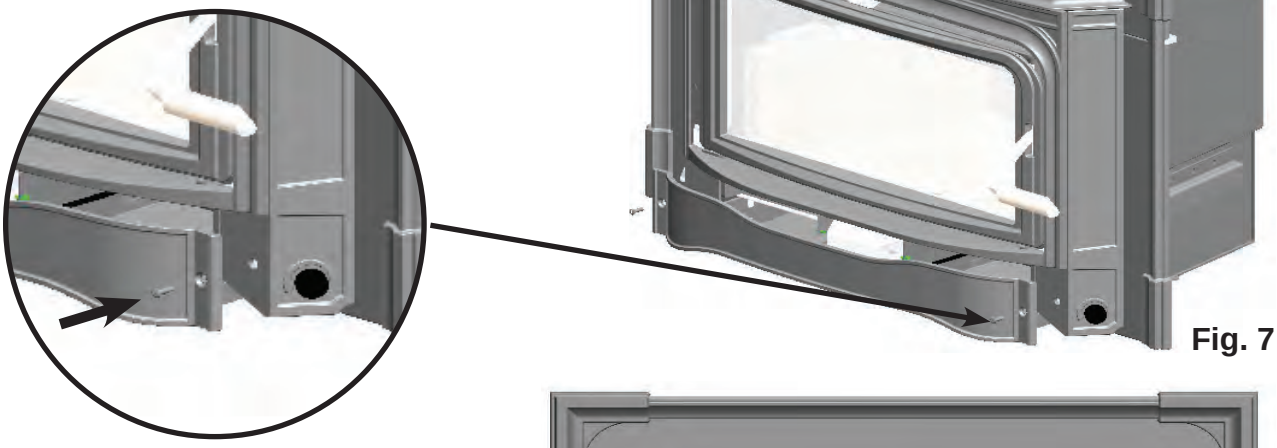


Fig. 7

Note: If additional levelling is required, use only non-combustible material to fill any space under the appliance (ie. firebricks).

Note: The leveling bolts may make it difficult to slide the appliance over a rough hearth. To remedy this, there are x2 metal strips supplied with the appliance. Position the strips below the levelling bolts and slide the appliance into the fireplace.

Fig. 8

FLUE COLLAR INSTALLATION

1. Once the liner has been dropped down the chimney, it must be securely attached to the flue collar assembly (refer to the "***CHIMNEY CONNECTIONS"*** section***).***
   Note: Ensure the flue collar assembly will hang roughly 2' (607 mm) above the floor of the fireplace once attached to the chimney liner as this will ease the connection to the appliance once it is pushed into the fireplace opening.
2. Open the appliance loading door and remove the bypass shield **(Fig. 9)** using a 7/16" wrench and set it aside.
3. Open the bypass door (refer to "***OPERATING INSTRUCTIONS"*** section*)* in order to gain access to reach up through the appliance to grab hanging flue collar assembly.
4. Pull the flue collar assembly down to align the bolts with the through holes in the rear of the firebox then pull forward.
   Note: Ensure the underside of the flue collar assembly is sliding along the top side of the firebox as the gasket of the flue collar assembly must be properly seated to ensure a good seal. FEEL THE AREA WHERE THE FLUE COLLAR MAKES CONTACT WITH THE FIREBOX; IF THERE IS A GAP, THE FLUE COLLAR IS NOT SEATED PROPERLY AND NEEDS TO BE REALIGNED.

5. Once a good seal has been confirmed, fasten the flue collar assembly to firebox with the hardware used during its removal.
   Note: Ensure the nuts are tightened evenly to ensure a good seal.

6. Reinstall the bypass shield and close the bypass door before sliding the appliance into its final position within the fireplace opening.

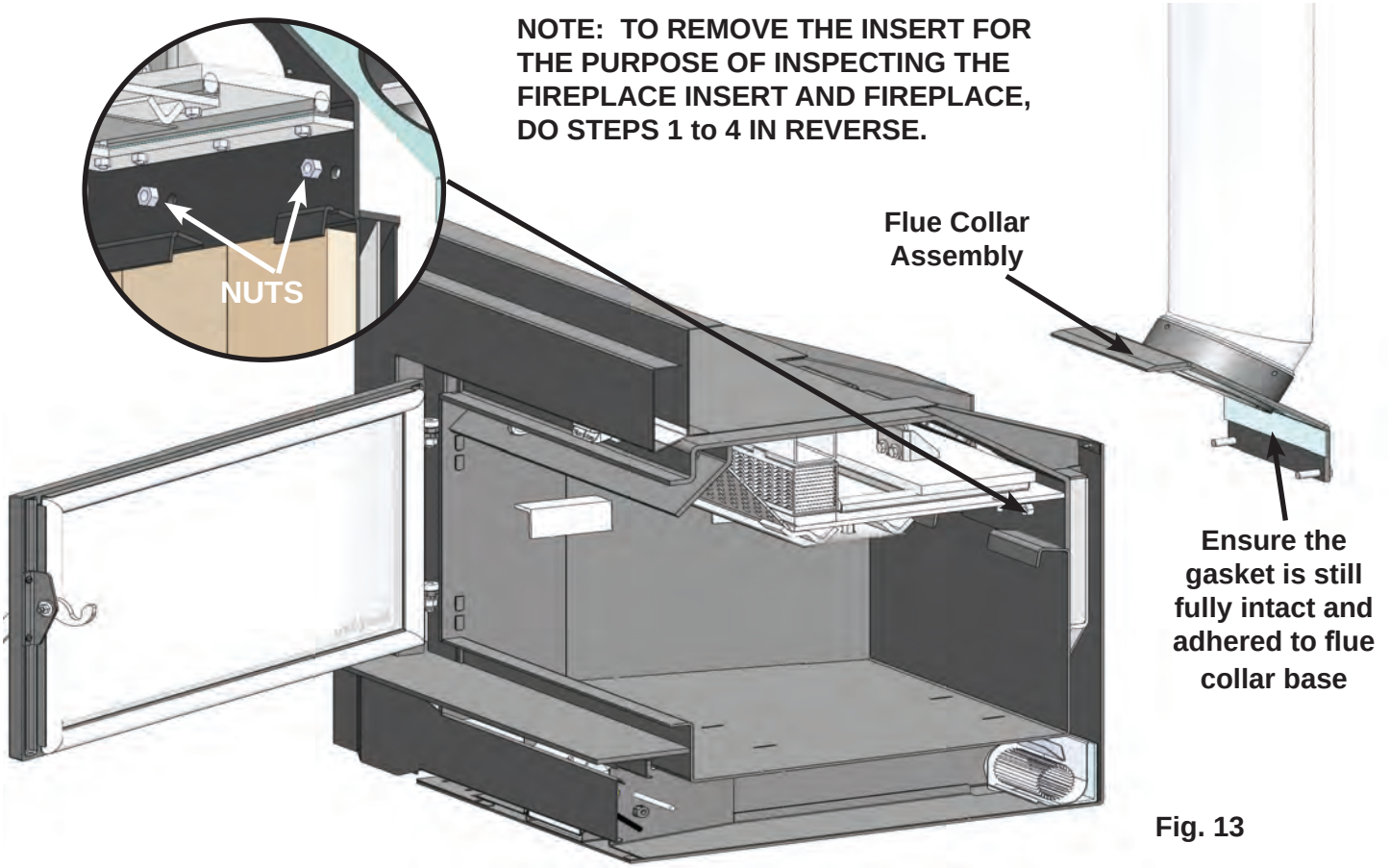


Fig. 13

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.

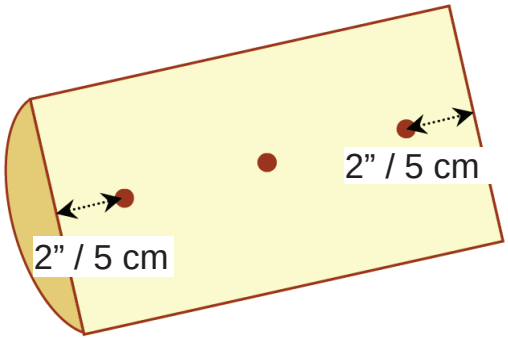
Both hardwood and softwood burn equally well in this appliance, but the more dense hardwood will weigh more per cord and burn a little slower and longer. Never burn salt-water driftwood as it is very corrosive and will deteriorate the structure of the appliance. The burning of salt-water driftwood will 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 is used to manipulate fuel loads.

BYPASS DOOR & BYPASS HANDLE

This 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. To open the bypass door, use the bypass handle to grab the **side of the bypass latch** (**Fig. A)** to pull the rod outward. To close, position the bypass handle on the **center of the bypasss latch** (**Fig. B**) and push inward.

⚠WARNING

DO NOT TOUCH THE BYPASS LATCH DIRECTLY AS DIRECT CONTACT MAY CAUSE SERIOUS BURNS. ALWAYS USE THE BYPASS HANDLE TO MANUVER THE BYPASS LATCH.

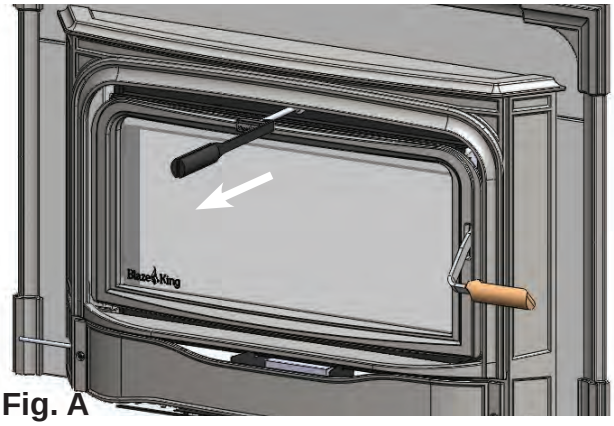


Fig. A

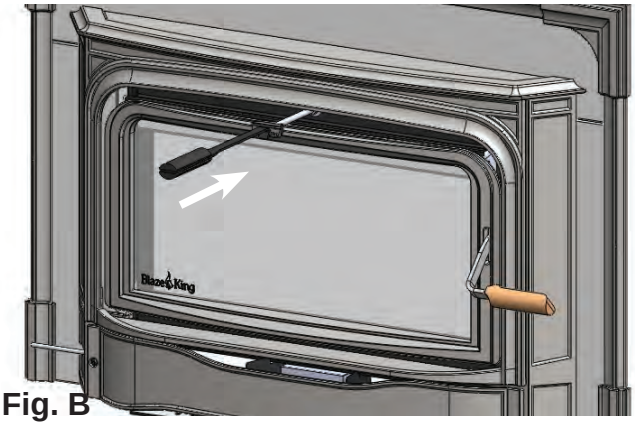


Fig. B

CATALYTIC THERMOMETER

The catalytic thermometer is located in the lower left-hand corner of the surround. Its sole purpose is to indicate whether the combustor is ACTIVE or INACTIVE. **The ACTIVE ZONE is the RED area on the gauge. The INACTIVE ZONE is the WHITE area on the gauge**. It is important to ensure that the appliance is operated in the stove in the ACTIVE zone. When the thermometer reads INACTIVE it means that the combustor temperature is below 500F and may not producing a clean burn. The needle should point to the active zone, the red area of the gauge, during normal operation. **Note:** The needle, when active, will stay in one position in the Red Active Zone. For calibration instructions refer to the "*MAINTENANCE*" section.

Thermometer Gauge

THERMOSTAT

The thermostat is located below the ash lip of the appliance and is controlled by the thermostat knob which is located on the lower left side of the front cast assembly. 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 is set at the factory. **DO NOT TAMPER WITH THE THERMOSTAT**, this will result in a malfunctioning thermostat.

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.

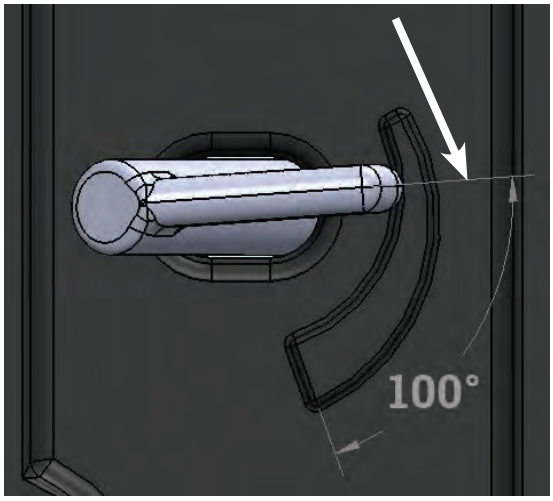
⚠WARNING

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.

TESTED LOW BURN SETTING



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.**

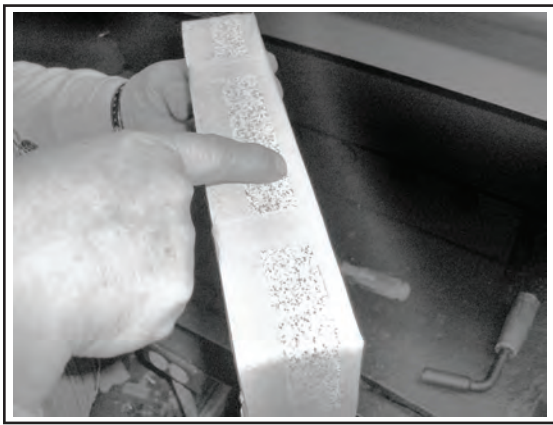
COMBUSTOR REPLACEMENT

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).

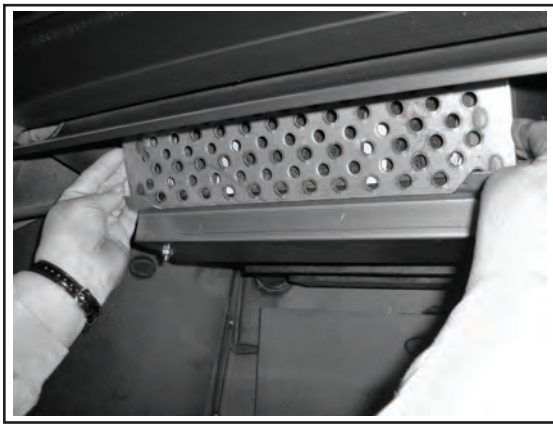
3. There are metal tabs across the bottom and on either side of the combustor. Using a flat blade screwdriver or pocket knife blade, slide the tip in between the metal tab on the left side of the combustor and the steel dome of the stove (the dome is the housing that encases the combustor). Apply slight 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.



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.CAT2425**.

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

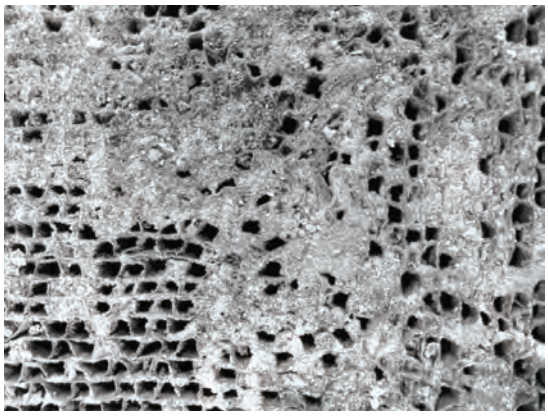
COMBUSTOR TROUBLESHOOTING

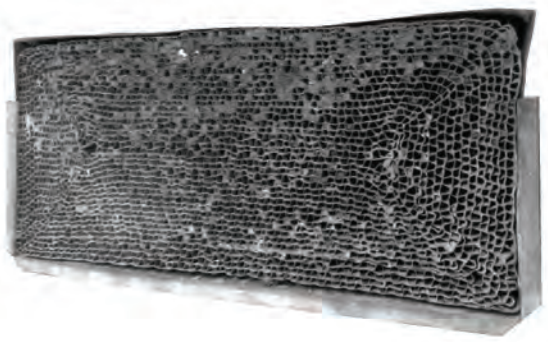
PROBLEM: CREOSOTE PLUGGING

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).

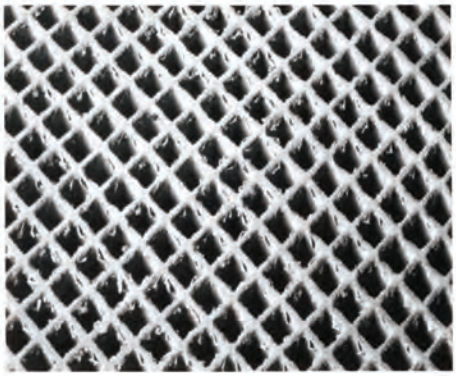




PROBLEM: COMBUSTOR PEELING

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.

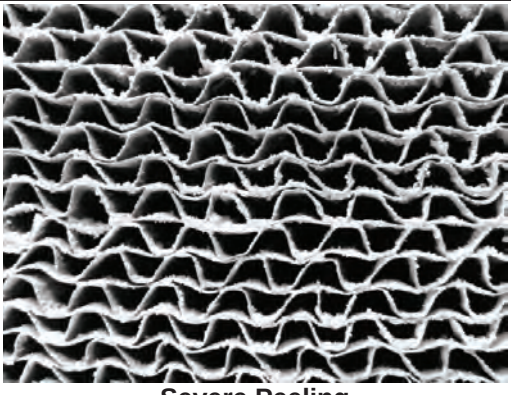
The images to the right are examples of minor peeling (does not affect proper combustor function) and severe peeling (closed or plugged combustor that needs replacement).



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).

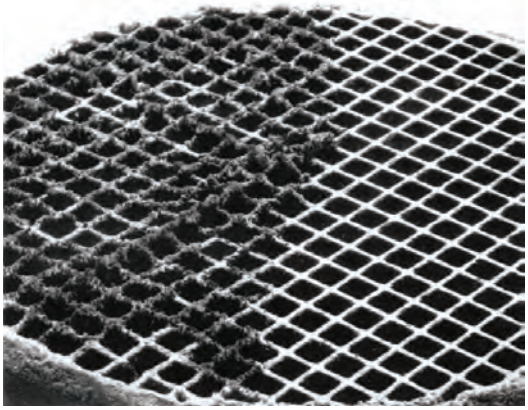


Severe Peeling

CATALYTIC COMBUSTOR

PROBLEM: COMBUSTOR MASKING

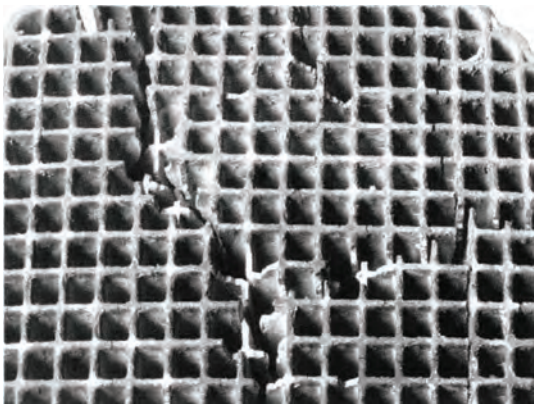
Possible Cause: The combustor is coated with a layer of fly-ash or soot from burning material that produces substantial char and fly-ash.
Solution: When the appliance is cool to touch, clean the front face of the combustor with a soft-bristled brush or vacuum lightly (refer to ***COMBUSTOR CLEANING*** 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.

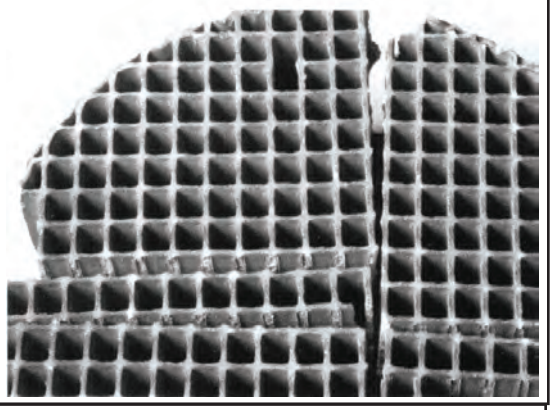
If cracking causes large pieces of the combustor to separate, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



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.

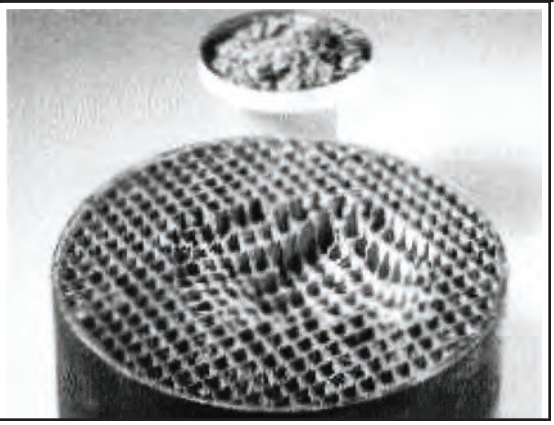
Possible Cause: Distortion of surrounding dome housing.
Solution: The combustor should slide in and out of the dome housing with relative ease. If this is not the case, contact your dealer for further inspection.



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 Thermostat for proper function.
4. Check Fan Assemblies for proper operation.
5. Remove all ash from firebox and ash drawer after final burn of season.
6. Check all gaskets for proper seal and adjust as required.
7. Inspect and clean the Venting System.

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

1. Open the loading door to gain access to the latch catch on the right side of the firebox. **(Fig. 10)**
2. Use a 7/16" wrench to loosen the two flange nuts on the latch catch.
3. Push the latch catch backwards 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.

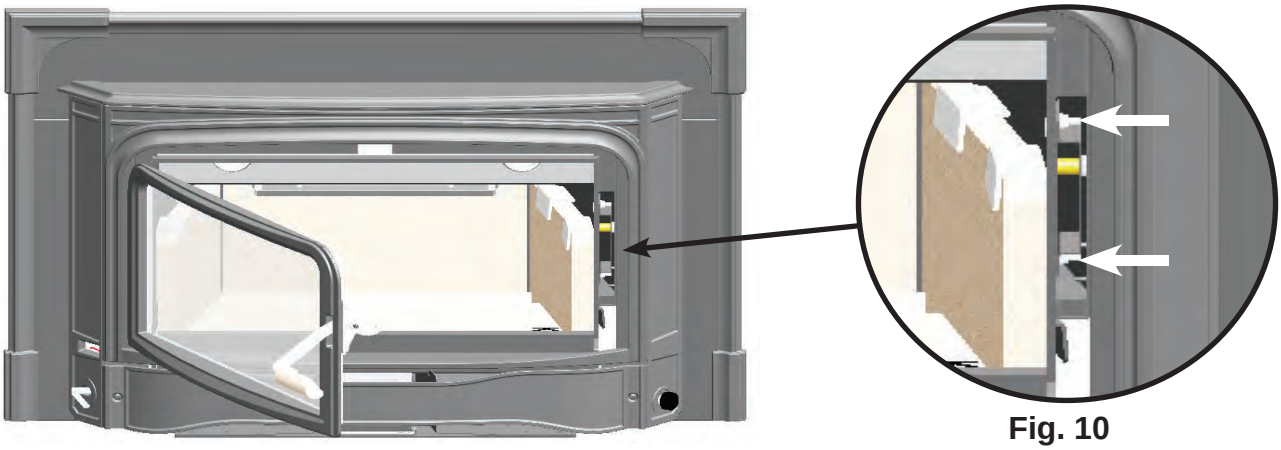


Fig. 10

⚠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.

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.

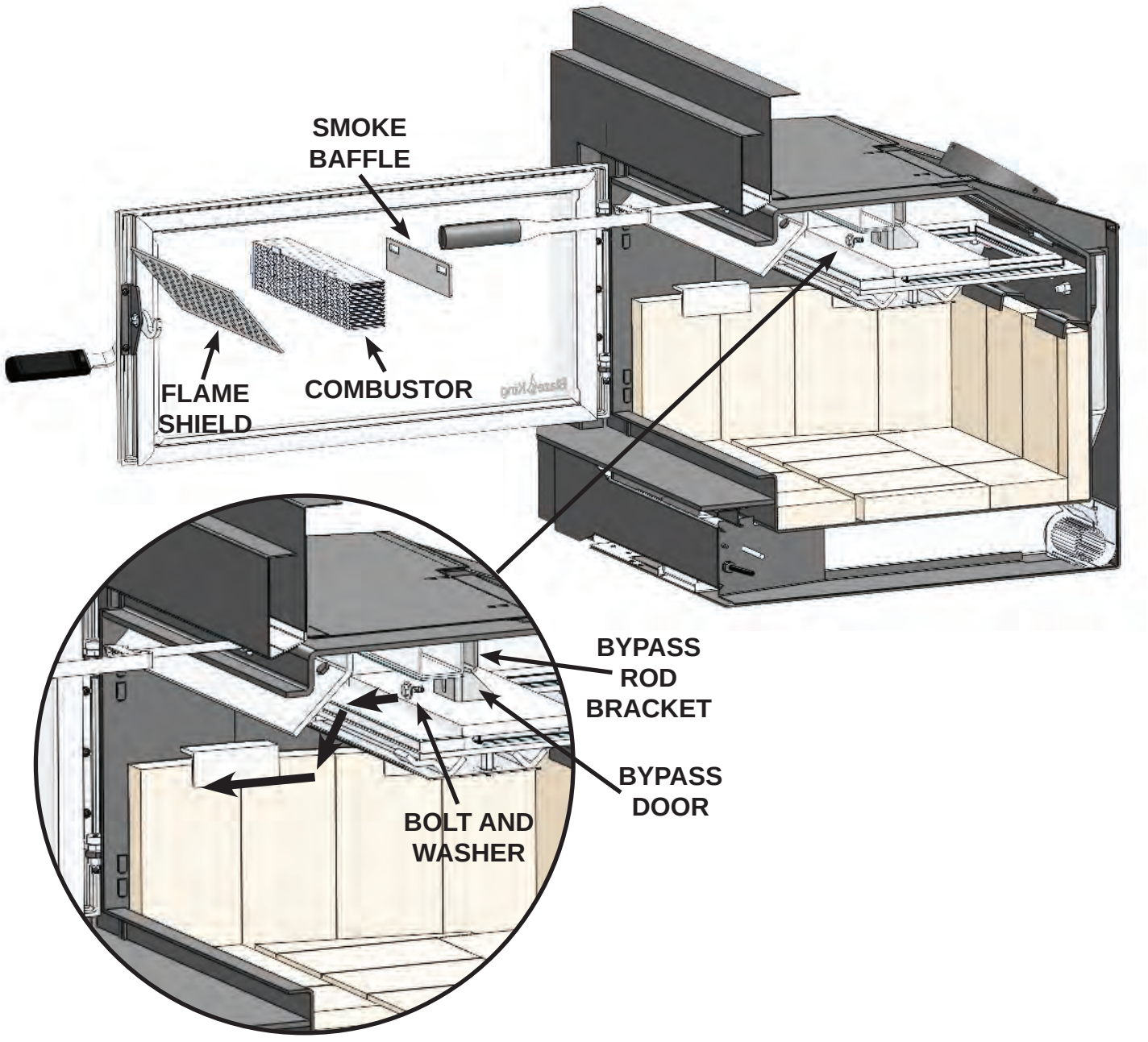
BYPASS DOOR GASKET INSPECTION

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.

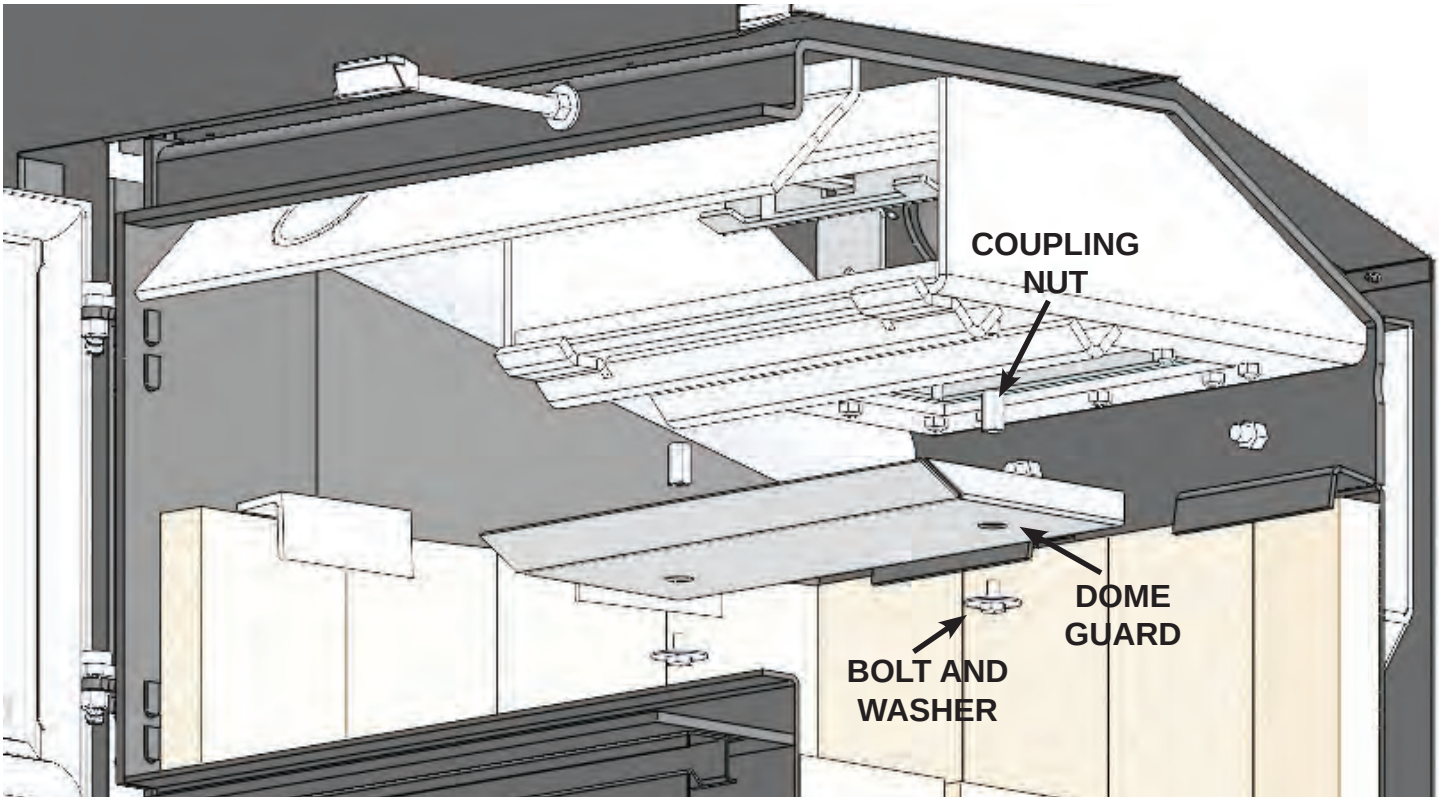
Note: This inspection could also yield a dead combustor, see *"COMBUSTOR MONITORING".*

BYPASS DOOR GASKET RETAINER REPLACEMENT

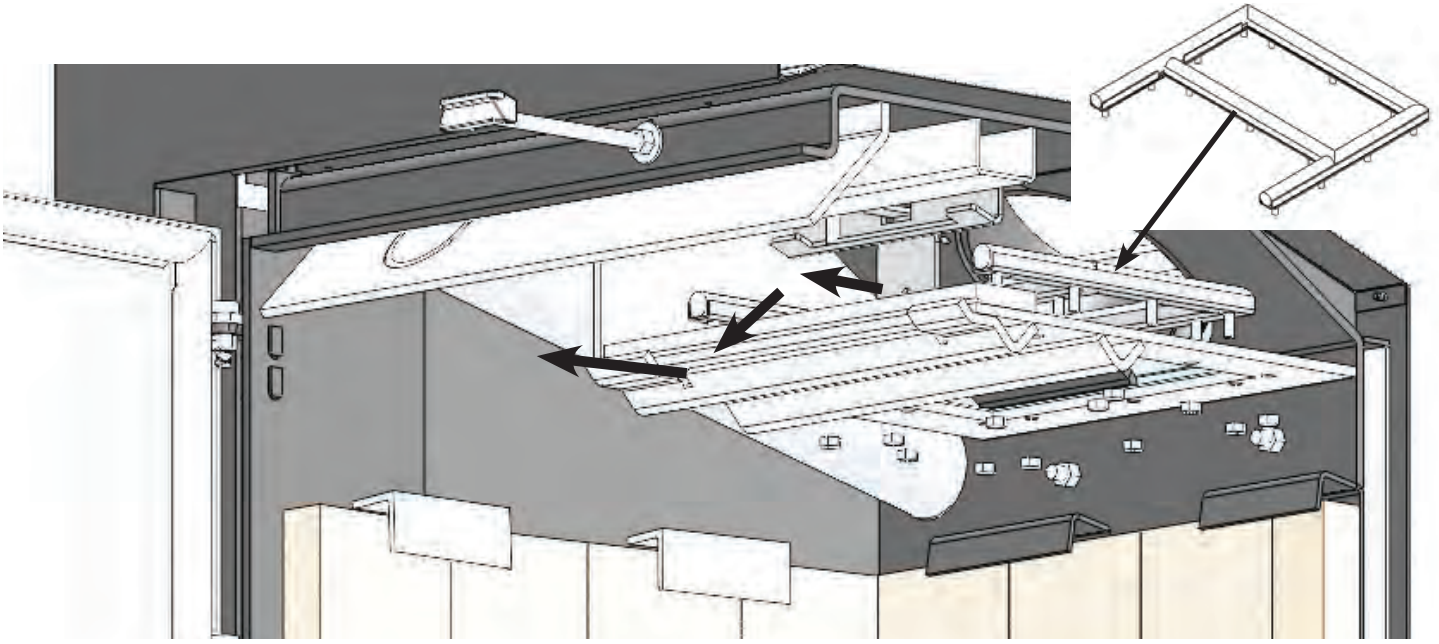
1. Remove flame shield, combustor, and smoke baffle from dome (see "***CATALYTIC COMBUSTOR REPLACEMENT"***).
2. Open the bypass door and use a 7/16" socket to unfasten the bolt and washer that holds the bypass door to the bypass rod bracket. Once loose, remove the bypass door through the combustor opening.



3. Remove the two 1/4-20 bolts and washers that hold the dome guard in place, be sure to support the dome guard during this process is it will come loose. Once the dome guard is removed, unthread the two 1/4-20 coupling nuts that spaced the dome guard from the dome bottom.



4. Remove the twelve remaining 1/4-20 nuts from the dome bottom. Lift the bypass door gasket retainer assembly upwards (enough to clear the threaded posts from the dome) and remove through the combustor opening. Once removed, ensure all debris is cleared from the inner surface of the dome.To reinstall the new bypass door gasket retainer, follow these steps in reverse order.



5. Once the inner dome surface has been cleared, insert the new bypass door gasket retainer assembly and follow the above instructions in reverse to ensure complete install. Ensure that 1/8" ceramic paper is in between the gasket retainer assembly and inner dome surface. Also ensure that all nuts are completely fastened up to the dome bottom. When tightening the 1/4-20 bolt through the bypass door into the bypass rod bracket, do not over tighten. Simply finger tighten the bolt as this allows the bypass door to move down as the gasket begins to seat after the first few fires.
6. When reinstalling the combustor, ensure it has been rewrapped with new expanding gasket that was supplied with the replacement kit. Do not install combustor without gasket.

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.

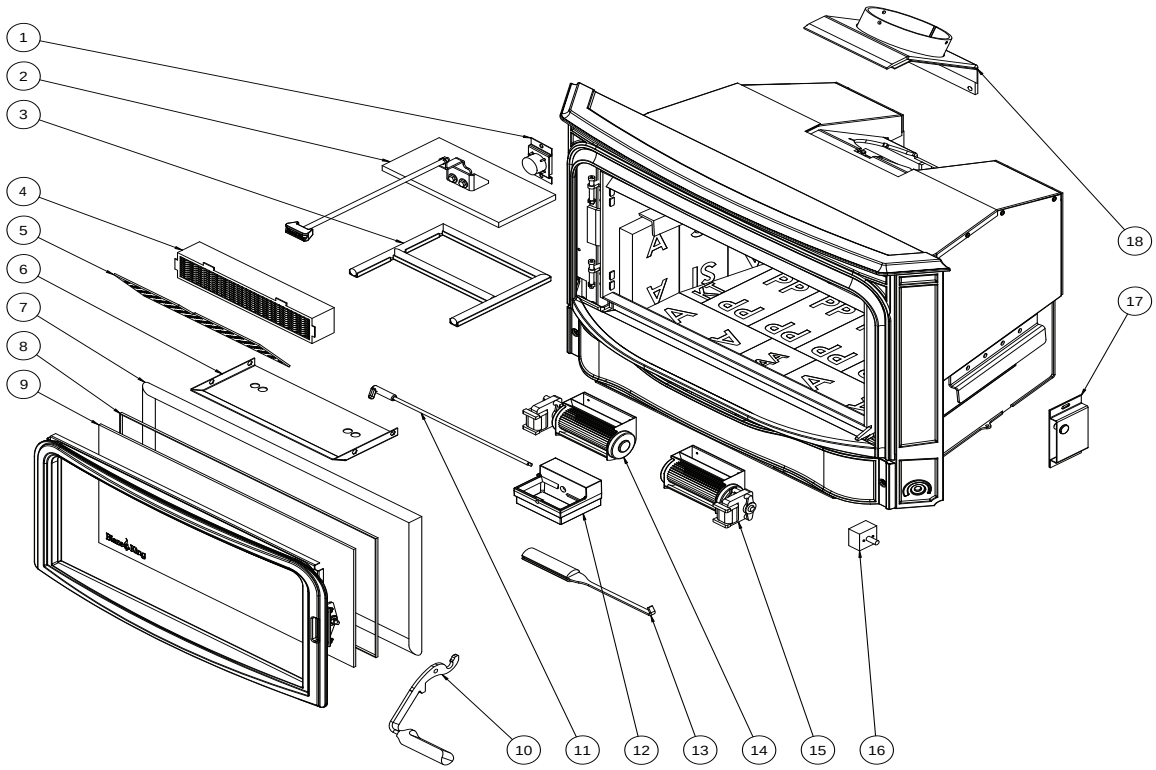
Combustor plugged or coated.	Clean combustor. See “CATALYTIC COMBUSTOR TESTING”
Combustor not functioning.	Check and test combustor. If needed replace combustor. See “CATALYTIC COMBUSTOR, REPLACING”
Thermostat not operating properly.	Consult your blaze King Dealer.
Bypass door leaking or not closing 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.

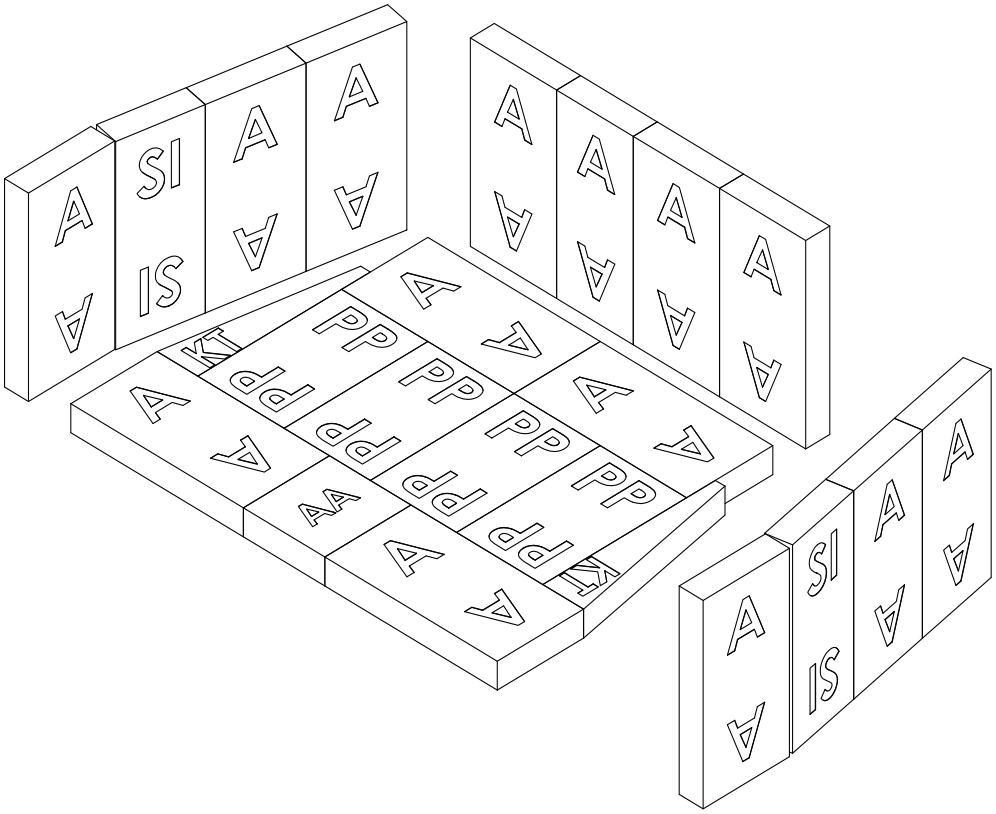
PROBLEM: The combustor temperature cannot be controlled. Turning the thermostat down often makes the combustor temperature go up.
CAUSE Turning the thermostat down, particularly in the first half of the burn cycle, causes the fire to emit more smoke, which is fuel for the combustor. The combustor temperature 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.



No.	Part #	Description	QTY
1	S.Z2089	CATALYTIC THERMOMETER ASSEMBLY	1
2	S.Z2019	BYPASS DOOR ASSEMBLY	1
3	S.Z2022	BYPASS DOOR GASKET RETAINER ASSEMBLY	1
5	S.CAT2425	COMBUSTOR ASSEMBLY	1
6	S.2030	FLAME SHIELD	1
7	S.Z2050	DOME GUARD	1
8	S.155.0186.6	DOOR GASKET - 7ft	1
9	S.155.0254.6	DOOR GLASS GASKET - 7ft	1
10	130-0270	DOOR GLASS	1
11	S.Z2044	DOOR HANDLE	1
12	S.Z2090	THERMOSTAT ROD ASSEMBLY	1
13	S.Z3030	THERMOSTAT ASSEMBLY	1
14	S.Z2052	BYPASS HANDLE	1
15	150-0710-L	LEFT BLOWER	1
16	150-0710-R	RIGHT BLOWER	1
17	145-0136	RHEOSTAT	1
18	S.Z2804	LATCH CATCH ASSEMBLY	1
19	S.Z2015	FLUE COLLAR ASSEMBLY	1

Brick Layout



ITEM NO.	PART NUMBER	QTY.
1	A Size Brick	14
2	AA Size Brick	1
3	KT Size Brick	2
4	PP Size Brick	4
5	SI Size Brick	2

WARRANTY

BLAZE KING WOOD LIMITED WARRANTY

Blaze King and Valley Comfort's respective brands extend the following warranty for wood fired appliances purchased from an authorized Blaze King / Valley Comfort dealer and installed in the United States of America or Canada. Warranty starts with date of purchase by the original owner (End User) except as noted for replacement parts.

Warranty Period		Components Covered	
Parts	Labor	Wood	
1 Year		X	All parts, materials and surface finishes (flaking and peeling) Subject to Conditions, Exclusion, and Limitations listed.
2 Years		X	Fan assemblies and motors, thermal sensors, catalytic thermometer, bi-metallic thermostat assembly, door handle metal components.
5 Years	2 Years	X	Firebox & Heat Exchanger, Bypass Door Steel Components
6 Years		X	Catalyst Combustor (see Conditions, Exclusions, and Limitations)
1 Year		X	Other Replacement Parts
SEE CONDITIONS, EXCLUSIONS, AND LIMITATIONS.			

Blaze King Wood Limited 5 Year Warranty

Blaze King is the manufacturer of the Blaze King line of heating products. At Blaze King, our commitment to the highest level of quality and customer service is the most important thing we do. Each Blaze King stove is built on a tradition of using only the finest materials and is backed by our limited warranty to the original purchaser. With Blaze King, you're not just buying a stove; you're buying a company with years of unequalled performance and quality.

Limited Six (6) Year Warranty:
The CATALYTIC COMBUSTOR is under warranty by Blaze King for six (6) years from the date of original retail purchase. The purchaser shall pay the following share of the then current retail price for the combustor: The first three (3) years no charge, 4th year 60%; 5th year 70%, 6th year 80%. The Combustor must be returned to your dealer along with a completed COMBUSTOR FAILURE REPORT and original proof of purchase document.

Limited (5) Year Warranty:
Under this warranty, Blaze King covers the stove body and accessories against defects in materials and workmanship, for part repair or replacement for the first five (5) years *** to the original purchaser. This Warranty covers: All Steel firebox components against defects in material and workmanship. Please see the exclusions and limitation section below as certain restrictions and exclusions apply this warranty.

Limited Two (2) Year Warranty:
Under this warranty, Blaze King covers, fan assemblies , modular thermostat and door handle steel components against defects in materials and workmanship, for part repair or replacement and limited labor for the first two (2) years to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

Limited One (1) Year Warranty:
Under this warranty, Blaze King covers all parts and materials against defects in materials and workmanship including exterior paint finishes, for part repair or replacement and limited labor for the first year to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

How the Warranty Works

1. All warranties by the manufacturer are set herein and no claim shall be made against the manufacturer on any oral warranty or representation. All claims under this Limited Warranty must be made in writing by your dealer.
2. Any stove or part thereof that is repaired or replaced during the Limited Warranty period will be warranted under the terms of the Limited Warranty for a period not exceeding the remaining term of the original Limited Warranty or six (6) months, whichever is longer.
3. For any part or parts of this stove, which in our judgment show evidence of defects, Blaze King reserves the option to repair or to replace the defective part(s) through an accredited distributor or agent, provided the defective part is returned to the distributor or agent, transportation prepaid, if requested.
4. If you discover a problem that you think may be covered by the Limited Warranty, you MUST REPORT it to your Blaze King dealer WITHIN 30 DAYS from the date the problem was first detected, giving them proof of purchase and the date of purchase. The dealer will investigate the problem and work with Blaze King to determine whether the problem:
   a) Is covered by the Limited Warranty or
   b) Can be fixed in your home or does the product need to be returned to Blaze King for repair.
5. If Blaze King determines that the stove needs to be returned to Blaze King for repair, the customer has the responsibility and the expense of removing it from their home and shipping it to Blaze King. If the problem is covered by the Warranty, Blaze King will repair or replace the item at their discretion and the customer will be responsible for return shipping and re-installation in their home.
6. If the problem is not covered by the Limited Warranty, the customer will be responsible for all repair costs, as well as all storage, shipping and the cost of removing and re-installing the stove.
   If you are not satisfied with the service provided by the Blaze King dealer, write to Blaze King at the address listed on the last page of the Owner's Manual. Include a copy of the original purchase invoice and a description of the problem.

Exclusions and Limitations:

1. This Warranty does not cover tarnish, discoloration or wear on the plated surfaces Painted finishes will change color after initial firing and will continue to change through the lifetime of the stove. This is normal occurrence for all high temperature coatings.
2. This Warranty does not cover gasket material or firebrick.
3. Blaze King strongly recommends installation by a certified installer. Failure to comply may adversely affect coverage under the terms of this warranty. This Limited Warranty covers defects in materials and workmanship only if the product has been installed in accordance with local building and fire codes; in their absence refer to the owner's manual. If the product is damaged or broken as a result of any alteration, wilful abuse, mishandling, accident, neglect, or misuse of the product, the Limited Warranty does not apply.
4. The stove must be operated and maintained at all times in accordance with the instructions in the Owner's Manual. If the unit shows signs of neglect or misuse, it is not covered under the terms of this Warranty policy. Performance problems due to operator error will not be covered by the Limited Warranty policy.
   Some minor expansion, contraction, or movement of certain parts and resulting noise, is normal and not a defect and, therefore, is not covered under this Limited Warranty.
5. Misuse includes over-firing. Over-firing can be identified later by warped plates and paint pigment being burnt off. Over-firing this appliance can cause serious damage and will nullify the Limited Warranty.
6. The Limited Warranty will cover glass thermal breakage only and will not cover misuse of the stove glass, including but not limited to:
   a) Glass that is struck, has surface contaminates or has had harsh or abrasive cleaners used on it.
   b) If the door is slammed or is closed while wood in the firebox is protruding out the stove opening thus striking the glass.
7. This warranty does not cover products made or provided by other manufacturers and used in conjunction with the operation of this stove without prior authorization from Blaze King The use of such products may nullify the Limited Warranty on this stove. If unsure as to the extent of this Limited Warranty, contact your authorized Blaze King dealer before installation.
8. Blaze King will not be responsible for inadequate performance caused by environmental conditions.
9. The Limited Warranty does not cover installation and operational related problems such as use of downdrafts or spillage caused by environmental conditions. Environmental conditions include but are not limited to nearby trees, buildings, roof tops, wind, hills, mountains, inadequate venting or ventilation, excessive offsets, negative air pressures or other influences caused by mechanical systems such as furnaces, fans, clothes dryers etc.
10. The Limited Warranty does not cover damage caused by burning salt-saturated wood, corrosive driftwood, chemically treated wood or any fuel not recommended in the Owner's Manual (use cord wood only).
11. The Limited Warranty is void if:
    a) The stove has been operated in atmospheres contaminated by chlorine, fluorine or other damaging chemicals.
    b) The stove is subject to submersion in water or prolonged periods of dampness or condensation.
    c) Any damage to the unit, combustion chamber or other components due to water, or weather damage which is the result of, but not limited to, improper chimney/venting installation.
    d) Salt air in coastal areas or high humidity can be corrosive to the finish; these environmental conditions can cause rusting. Damage caused by salt air or high humidity is not covered by the Limited Warranty.
12. Exclusions to the Limited Warranty include: injury, loss of use, damage, failure to function due to accident, negligence, misuse, improper installation, alteration or adjustment of the manufacturer's settings of components, lack of proper and regular maintenance, alteration, or act of God.
13. The Limited Warranty does not cover damage caused to the stove while in transit. If this occurs, do not operate the stove and contact your courier and/or dealer.
14. The Limited Warranty does not extend to or include paint, door or glass gaskets or firebricks damage caused by normal wear and tear, such as paint discoloration or chipping, worn or torn gaskets, chipped or cracked firebrick, etc.
15. The Limited Warranty does not include damage to the unit caused by abuse, improper installation, or modification of the unit.
16. Damage to plated surfaces caused by fingerprints, scratches, melted items, or other external scores and residues left on the plated surfaces from the use of abrasive cleaners or polishes is not covered in this warranty.

17. Blaze King is free of liability for any damages caused by the stove, as well as inconvenience expenses and materials. The Limited Warranty does not cover incidental or consequential damages.
18. The Limited Warranty does not cover any loss or damage incurred by the use or removal of any component or apparatus to or from the Blaze King stove without the express written permission of Blaze King and bearing a Blaze King label of approval.
19. Any statement or representation of Blaze King Products and their performance contained in Blaze King advertising, packaging literature, or printed material is not part of the Limited Warranty.
20. The Limited Warranty is automatically voided if the stove's serial number has been removed or altered in any way. If the stove is used for commercial purposes, it is excluded from the Limited Warranty.
21. No dealer, distributor, or similar person has the authority to represent or warrant Blaze King Products beyond the terms contained within the Limited Warranty. Blaze King assumes no liability for such warranties or representations.
22. Blaze King will not cover the cost of the removal or re-installation of the stove, hearth, facing, mantels, venting or other components.
23. Labor to replace or repair items under this Limited Warranty will be covered per our warranty service fee reimbursement and labor rates are set per component schedule. Labor rates vary from location to location and as such total labor costs may not be covered. Please consult with your dealer or service technician for any additional charges such as travel time or additional labor charges that may apply.
24. For parts of the Blaze King 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.: _____

SIROCCO SC25

SOLID FUEL CATALYTIC STOVE

OPERATION & INSTALLATION MANUAL

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. EPA CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD

0142WN020E
0142WN017S

Installer: Please complete the details on the back cover 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 25 INSERT

SN - 60.

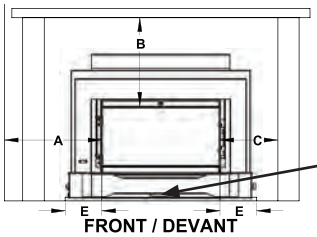
BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE
MODEL / MODÈLE: SC25
ROOM HEATER, SOLID FUEL TYPE / APPAREIL DE CHAUFFAGE, TYPE COMBUSTIBLE SOLIDE
TESTED TO / TESTÉ: UL 1482-11(R2022) & CAN/ULC-S628:2022
CERTIFIED FOR USE IN BOTH USA AND CANADA / CERTIFIÉ POUR UNE UTILISATION AUX ÉTATS-UNIS ET AU CANADA

0142WN020E
0142WN017S

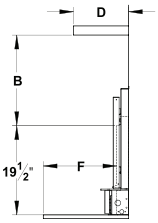
Install and use this appliance in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Not to be installed in any factory built fireplace. Install and use in a code complying fireplace only. Do not remove bricks or mortar in masonry fireplace. Do not use grate or elevate fire. DO NOT CONNECT THIS APPLIANCE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. The flue diameter is 6". Use a 6" stainless steel liner listed to UL 1777, ULCS635, or ULCS640. Inspect and clean chimney frequently; under certain conditions of use, creosote buildup may occur rapidly. Do not over fire; if heater or chimney glows, the appliance is over firing.

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. Ne pas installer dans un foyer préfabriqué. Installer et utiliser uniquement dans un foyer conforme au code. Ne retirez pas les briques ou le mortier du foyer de maçonnerie. N'utilisez pas de grille ni de feu surélevé. NE RACCORDEZ PAS CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL. Le diamètre du conduit est de 6". Utilisez une gaine en acier inoxydable de 6" homologuée UL 1777, ULCS635 ou ULCS640. Inspectez et nettoyez fréquemment la cheminée; dans certaines conditions d'utilisation, l'accumulation de créosote peut se produire rapidement. Ne pas trop brûler; si l'appareil de chauffage ou la cheminée brille, l'appareil est en surchauffe.

Minimum Clearances to Combustibles (measured from firebox door opening) / Dégagements minimaux aux combustibles (mesurés à partir de l'ouverture de la porte du foyer)		
A	Side of door flange to combustible wall Du côté du rebord de l'ouverture de porte à tout mur combustible	13.5" 343 mm
B	Top of door flange to bottom of mantel and combustible facing Du dessus du rebord de l'ouverture de porte au bas du manteau et de toute façade combustible	20" 508 mm
C	Side of door flange to side combustible facing Du côté du rebord de l'ouverture de la porte à toute surface de côté combustible	10" 254 mm
D	Mantle width maximum Largeur maximum du manteau	12" 305 mm
E	Minimum hearth side extension Extension latérale minimum du foyer	8" * 204mm *
F	Mimimum hearth front extension Extension frontale minimum du foyer	16" USA 407 mm 18" CANADA 458 mm



FRONT / DEVANT



SIDE / COTÉ

* Measured from either side of door flange
* Mesuré de chaque côté de la bride de la porte

Non-combustible floor protection is required and must extend 16" (in USA) or 18" (in Canada) out in front of the door opening and extend 8" to either side of the door opening. With the floor flush with the bottom of the appliance and to an elevation of 5" below the firebox bottom, a 1/2" layer of thermal protection where R=1.06 is required. Anything 0 to 5" below the firebox bottom requires UL 1682 type 2 thermal protection where R=1.06 is required.

Une protection de sol incombustible est requise et doit s'étendre de 16" (aux USA) ou de 18" (au Canada) devant l'ouverture de la porte et s'étendre de 8" de chaque côté de l'ouverture de la porte. Avec le plancher au même niveau du fond de l'appareil et à une élévation de 5 po en dessous du fond de la chambre à combustion, une couche de protection thermique de 1/2" où R = 1,06 est nécessaire. Tout de 0 à 5 "en dessous du fond de la chambre à combustion nécessite UL 1,682 type 2 protection thermique R = 1,06 est nécessaire.

Electrical rating: 115 VAC, 60 Hz, 0.58 Amps. Risk of electrical shock; disconnect power before servicing appliance. Do not route power cord in front or beneath appliance. This appliance is certified to comply with 2020 particulate emission standards using crib wood (EPA test methods 28R/5G, ASTM E2515, and ASTM E2780, with an emission-rate of 0.74 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 #115-0335. Replace glass with 5mm ceramic glass only.

Caractéristiques électriques: 115 VCA, 60 Hz, 0,35 A. Risque de choc électrique; débranchez l'alimentation avant de réparer l'appareil. Ne faites pas passer le cordon d'alimentation devant ou sous l'appareil. Cet appareil est certifié conforme aux normes d'émission de particules 2020 en utilisant du bois de crib (méthodes d'essai EPA 28R/5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.74 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. OEM de la chambre de combustion #115-0335. Remplacez le verre par du verre céramique de 5 mm uniquement.

CAUTION: HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. READ THIS LABEL AND INSTRUCTION MANUAL BEFORE OPERATING HEATER
ATTENTION: CHAUD LORS DU FONCTIONNEMENT. GARDEZ LES ENFANTS, VÊTEMENTS ET MEUBLES ÉLOIGNÉS. UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. LIRE CETTE ÉTIQUETTE ET LES INSTRUCTIONS D'INSTALLATION AVANT DE FAIRE FONCTIONNER CET APPAREIL.

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 ☐

170-0270 [03 24]

The certification label is on a pull out tray beneath the firebox.

The content within this manual describes the installation and operation of the Blaze King SC25. 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	0.21 g/min	1.08 g/hr
Med-low Burn (1)	0.05 g/min	0.16 g/hr
Med-low Burn (2)	0.29 g/min	0.22 g/hr
Med-high Burn	0.35 g/min	1.26 g/hr
High Burn	0.17 g/min	1.20 g/hr
EPA emission rate weighted average		0.74 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 8,038 to 24,085 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

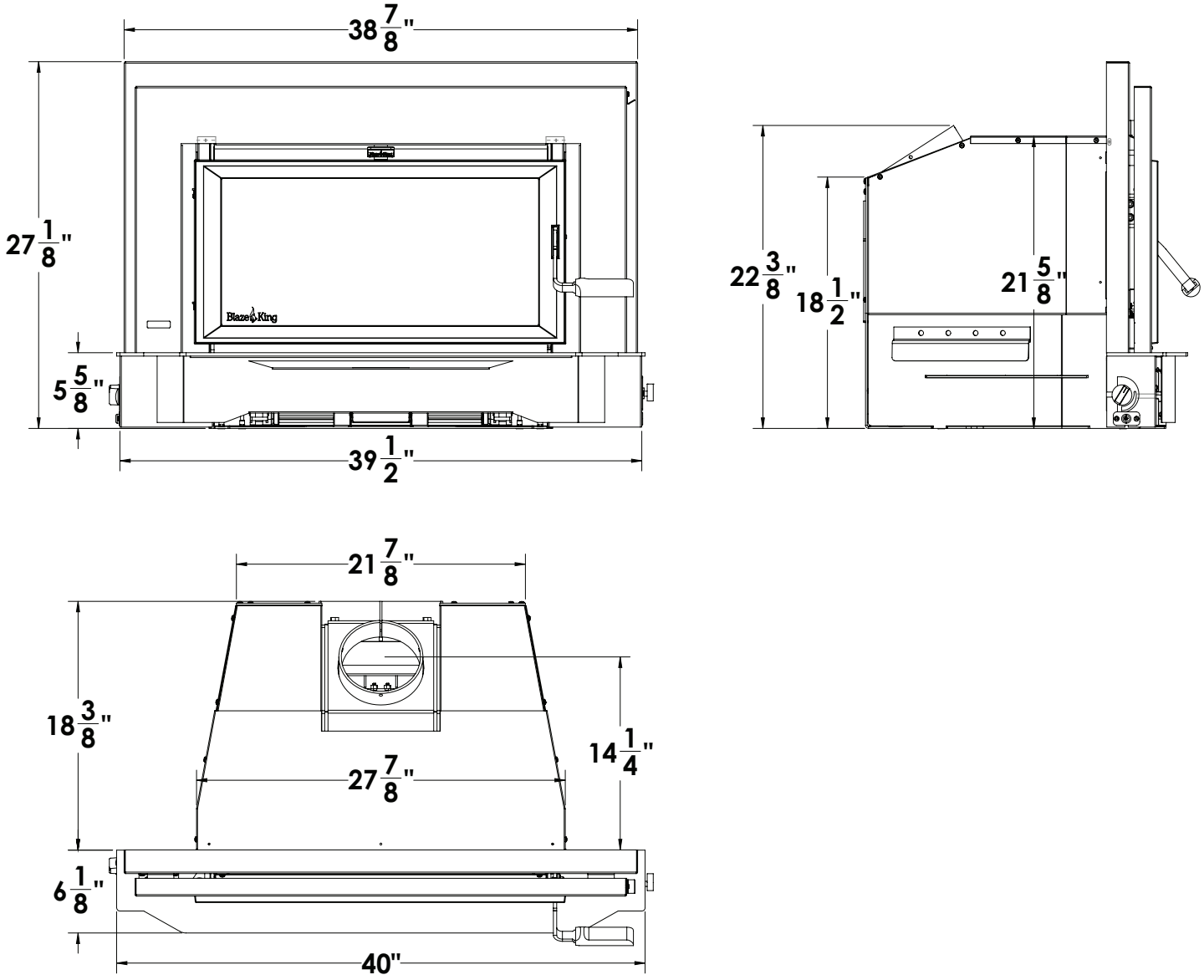
SPECIFICATIONS

SIROCCO 25, SC25 SPECIFICATIONS	
Flue Collar Opening	6” I.D. (152.4 mm)
Firebox Door Opening	25 1/4” x 10 5/8” (642 mm x 270 mm)
Firebox Depth	16 3/4” (426 mm) brick to brick, 18” (457 mm) brick to glass
Firebox Width	18” to 22.75” (457.2 mm to 577.9 mm)
Firebox Height	10” (254 mm)
Firebox Volume	2.159 ft^3 (0.0611 m^3)
Tested Fuel Length	17.75” - 18” (451 mm - 457.2 mm)
Wood Capacity (approximate)	White Oak - 53 lb (24.0 kg) / Douglas Fir - 35lb (15.9 kg)
Shipping Weight	325 lb (148 kg)

PARTS INCLUDED
1. Fire Poker
2. Manual Kit (w/ Warranty Cards, Bypass Handle)

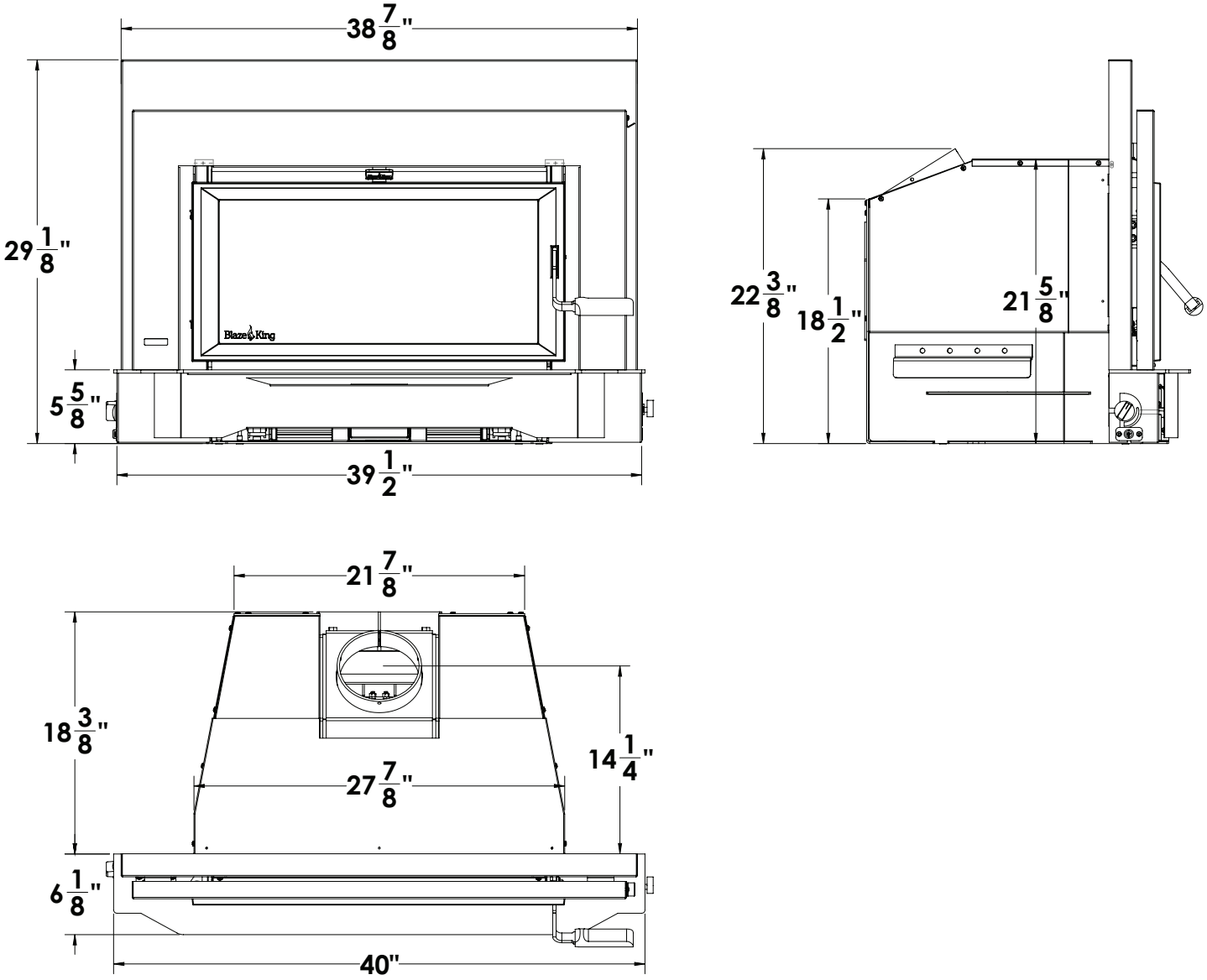
REQUIRED KIT	
1. S.Z2038 - SC25 Lower Shroud	
REQUIRED KIT (MUST INSTALL ONE OPTION)	
1. S.Z2045 - Shroud SC25 27 1/8”	2. S.Z2070 - Shroud SC25 29 1/8”
3. S.Z2075 - Shroud SC25 32 1/8”	

SC25 WITH 27 1/8" SHROUD (S.Z2045)

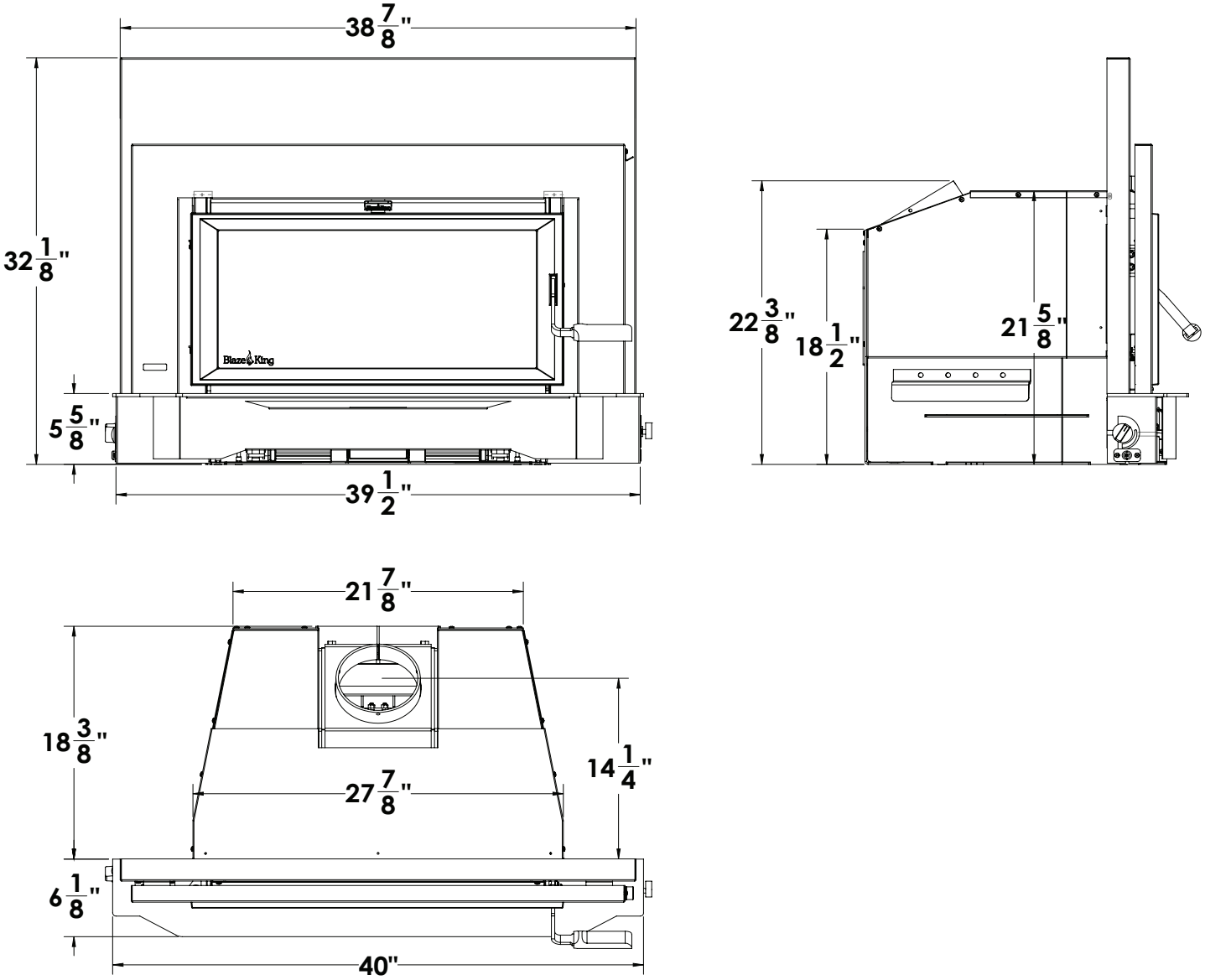


APPLIANCE DIMENSIONS

SC25 WITH 29 1/8” SHROUD (S.Z2070)



SC25 WITH 32 1/8” SHROUD (S.Z2075)



SAFETY CLEARANCES

MINIMUM CLEARANCES

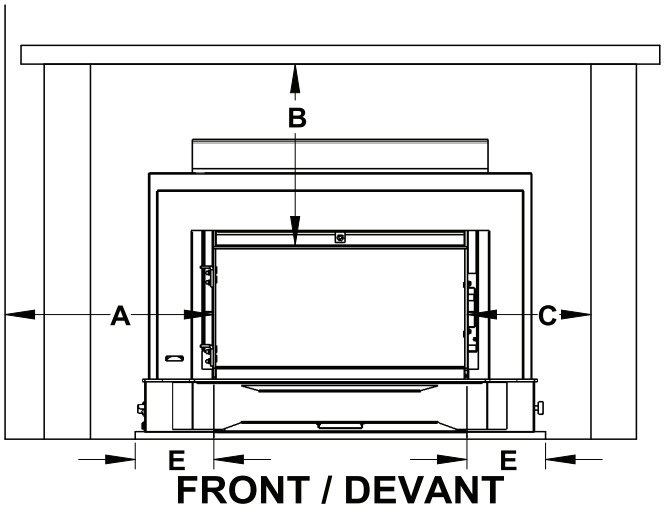
A	Side of door flange to combustible wall	13.5” (343 mm)
B	Top of door flange to bottom of mantel / combustible facing	20” (508 mm)
C	Side of door flange to combustible facing	10” (254 mm)
D	Maximum mantel width	12” (305 mm)
E	Minimum side hearth extension from door flange	8" (203 mm)
F	Minimum front hearth extension from door flange	16" (406 mm) in USA 18" (457 mm) in CANADA

This appliance must be installed in compliance with all local codes and regulations.

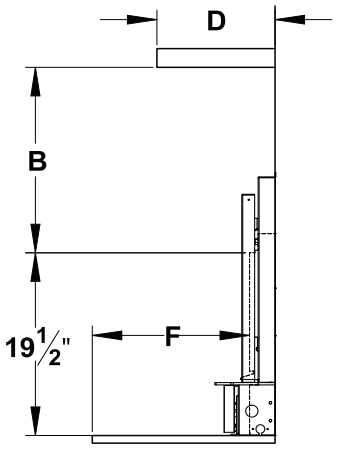
Refer to local codes and pipe manufacturer specs for required minimum clearances.

Minimum clearances may only be reduced by means approved by the regulatory authority.

Minimum fireplace opening is 29” (737 mm) W x 22” (559 mm) H x 19” (483 mm) D.



FRONT / DEVANT



SIDE / COTÉ

FLOOR PROTECTION

If the bottom of the appliance is at least 5” (125 mm) above (combustible) floor level, only ember protection is required (UL1618 Type 1) extending 16” (406 mm) in USA or 18” (457 mm) in Canada in front of the door and extending 8” (203 mm) from either side of the door opening. If the bottom of the appliance is within 5” of (combustible) floor level, then a layer of non-combustible thermal protection (UL1618 Type 2, R=1.06 minimum) is required under the appliance extending 16” (406 mm) in the USA and 18” (457 mm) in Canada.

⚠WARNING

THIS APPLIANCE MUST BE INSTALLED WITH A CONTINUOUS CHIMNEY LINER OF 6" DIAMETER EXTENDING FROM THE APPLIANCE TO THE TOP OF THE CHIMNEY. THE CHIMNEY LINER MUST CONFORM TO THE CLASS 3 REQUIREMNETS OF CAN/ULC-S635, STANDARD OR LINING SYSTEMS FOR EXISTING MASONRY OR FACTORY BUILT CHIMNEYS AND VENTS, OR CAN/ULC-S640, STANDARD FOR LINING SYSTEMS FOR NEW MASONRY CHIMNEYS.
FAILURE TO COMPLY 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). Your Blaze King should be installed using an insulated chimney liner. 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

All joints within the venting system must be securely fastened with sheet metal screws. Place a bead of furnace cement around the flue collar connection to ensure the flue pipe is properly connected, secured, and sealed. Do not use a flue pipe to pass through an attic or roof space, closet or similar concealed space, or a floor or ceiling as 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 to the exterior of the structure. Do not connect this appliance to a chimney serving another appliance; To do so will affect the safe operation of both appliances and will void the appliance warranty. You must comply with the local authority having jurisdiction.

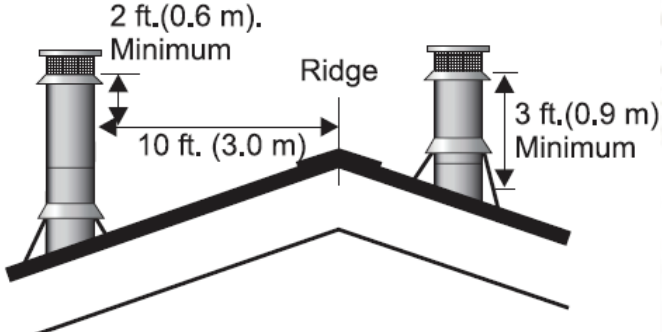
CONNECTION TO A MASONRY CHIMNEY

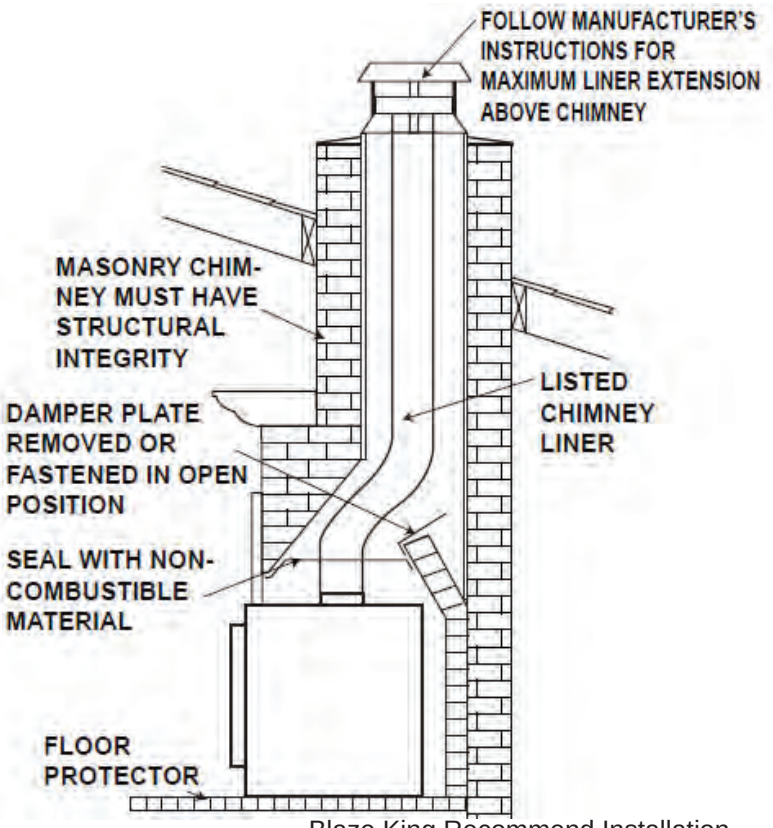
It is recommended that the inner, cross sectional area of the masonry chimney be no less than the area of the appliance flue (28in² or 180cm²). Ensure the masonry chimney meets the minimum standards per the National Fire Protection Association by having it inspected by a certified professional. There must be no cracks, no loose mortar, and no signs of deterioration or blockage. Ensure the chimney is properly cleaned before installing the appliance.

Masonry or steel, including the damper plate, may be removed from the smoke shelf and adjacent damper frame if necessary to accommodate a chimney liner, provided that their removal will not weaken the structure of the fireplace and/or chimney, and will not reduce protection for combustible materials to less than that required by the National Building Code. If the fireplace is modified to accommodate the appliance, the qualified installer must attached a metal tag (supplied by the manufacturer) with screws or nails to the fireplace in a location that is readily visible should the appliance be removed. The tag will state: *"This fireplace has been altered to accommodate a fireplace insert and should be inspected by a qualified person prior to re-use as a conventional fireplace."*

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. A rough masonry chimney without a good smooth liner can result in the rapid build up creosote.

A chimney must extend at least three feet above the highest point where it passes through the roof and at least two feet higher than any portion of the building within ten feet of the chimney.





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)	

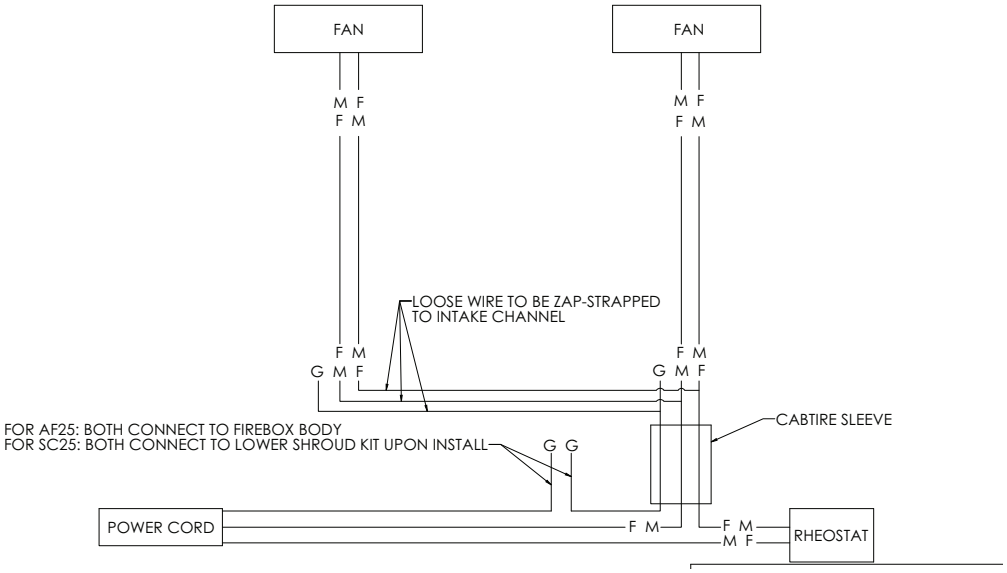
The above figures are only guidelines, please refer to the "***DRAFT PERFORMANCE"*** section.

⚠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.

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.

INITIAL SETUP

FLUE COLLAR ASSEMBLY REMOVAL

From within the firebox, use a 9/16” wrench to remove the x2 nuts that hold flue collar assembly in place and then remove the assembly from the rear. Ensure the gasket is still fully intact and adhered to flue collar base. (**Fig. 1**)

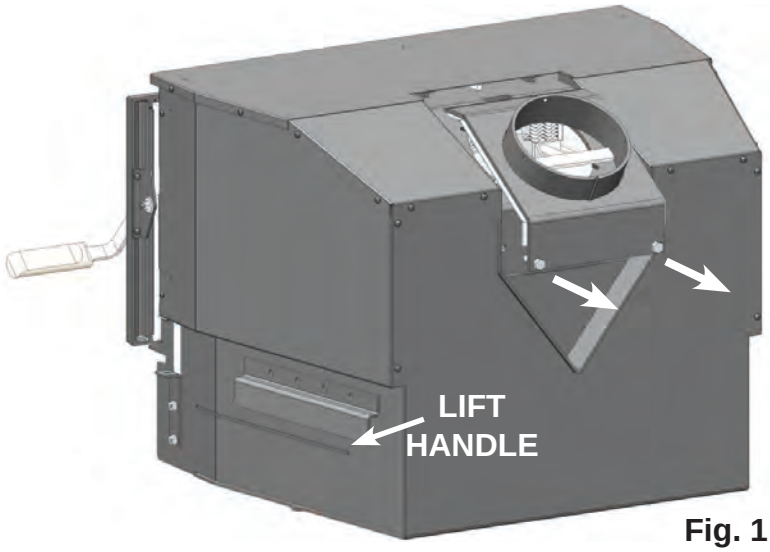


Fig. 1

THERMOSTAT ROD INSTALLATION

First, ensure the fans are in their correct position and have not shifted during transport. Ensure the thermostat is in the fully open position with the set screw making contact with the stop (see below). Slide the thermostat rod in from the left side of the firebox and align its machined face with the machined face of the rod protruding from the thermostat. With both rods fully interlocked, secure them in place by tightening the grub screw in the set collar supplied with the thermostat rod. (Fig. 2)

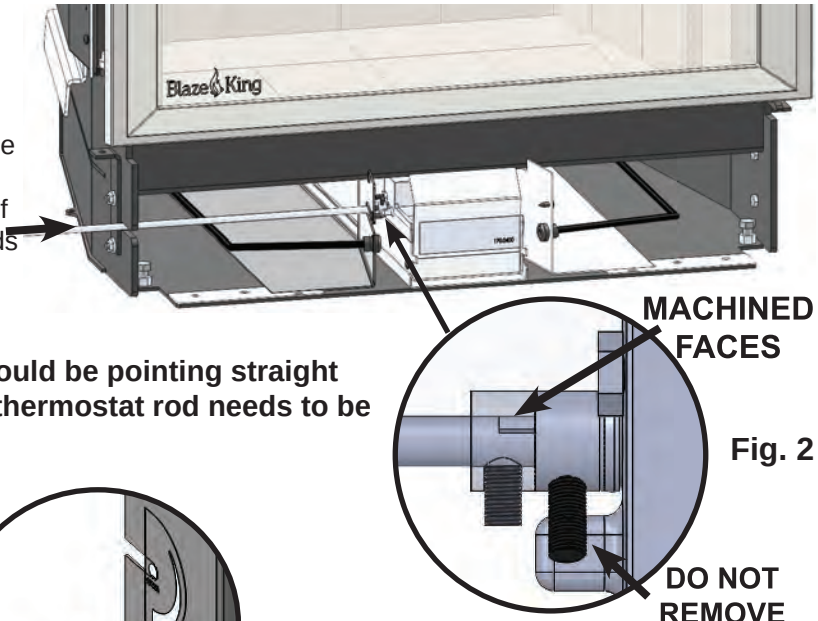


Fig. 2

Note: The pointer on the thermostat knob should be pointing straight downwards when fully open, if not, then the thermostat rod needs to be re-installed at the proper alignment.

LOWER SHROUD INSTALLATION

Note: the front cover of the lower shroud will be installed during the upper shroud installation.

1. Before installing the lower shroud onto the appliance, determine where the nearest electrical outlet is before fastening the power cord mount to either the left or right side of the lower shroud. Be sure to install the plastic plug into the opposite, unused power cord slot. (**Fig. 3**)

Note: If power cord is run out the right side, ensure any excess wire is secured with a zip tie to avoid potential interference with the fan.

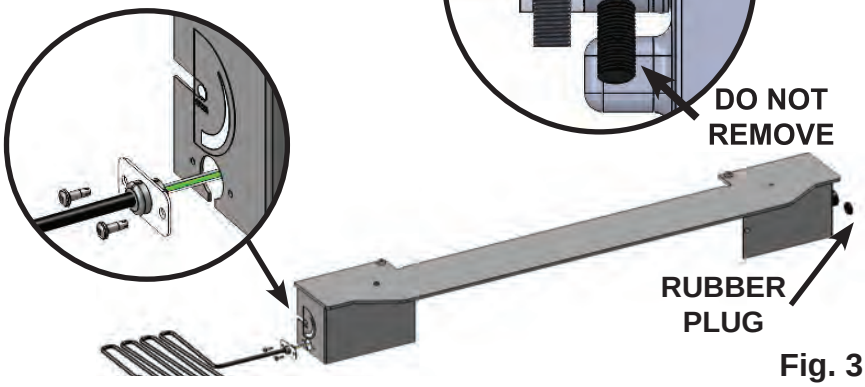


Fig. 3

2. Locate the rheostat (supplied with appliance) and fasten it to the lower shroud with the rheostat nut, ensuring that the rheostat pins protrude through the alignment through holes. Once secure, install rheostat knob. (**Fig. 4**)

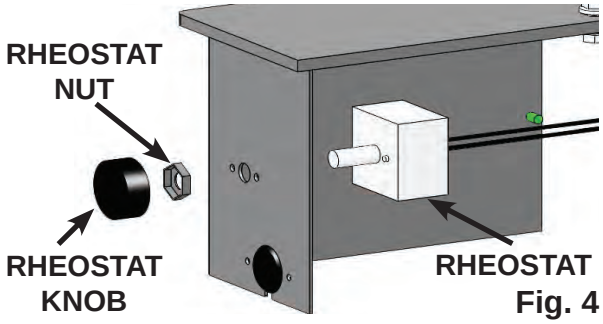


Fig. 4

3. Align the left and right slots in the ash shelf with the mounting brackets on the firebox, then slide into position and tighten the capscrews with a 5/32” allen key. (**Fig. 4**)

Note: Lift the lower shroud upwards in order to clear thermostat cover when installing.

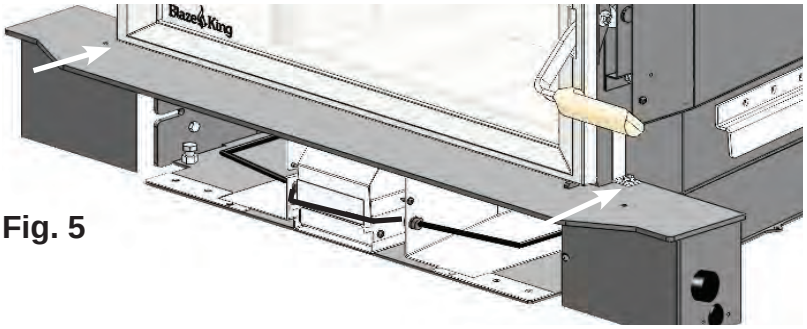


Fig. 5

4. Locate the remaining, loose wire connectors of the power cord, fan interconnect, and rheostat and connect according to wire labels (refer to “***ELECTRICAL CONNECTION***” section). Secure the ground wire of the powercord to the lower shroud by fastening the supplied ground screw into the ground hole. (**Fig. 6**)

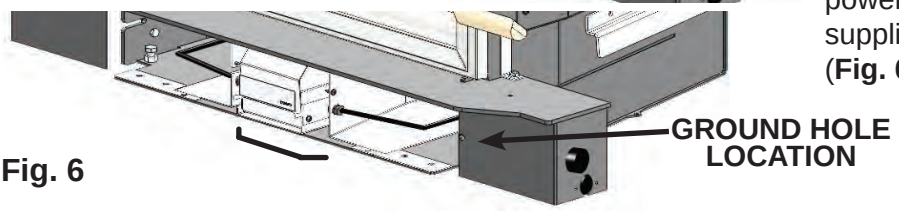


Fig. 6

FIREPLACE LEVELLING

Before sliding the appliance into the fireplace opening, determine how much levelling will be required to ensure a proper installation. Working through the opening of the lower shroud, locate the x4 levelling bolts at the front and rear corners of the appliance which must be adjusted accordingly to insure a level installation. (**Fig. 7**)

Note: If additional levelling is required, use only non-combustible material to fill any space under the appliance (ie. firebricks).

Note: The leveling bolts may make it difficult to slide the appliance over a rough hearth. To remedy this, there are x2 metal strips supplied with the appliance. Position the strips below the levelling bolts and slide the appliance into the fireplace.

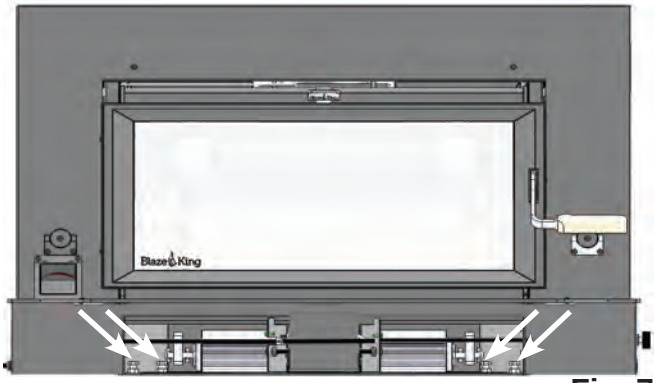


Fig. 7

UPPER SHROUD INSTALLATION

1. Position catalytic thermometer wire across the ash shelf. (**Fig. 8**)

2. With the loading door open, align the notches on the left side of the rear shroud with the screws protruding out of the firebox can and install. Do the same with the right side and then push back and downwards on the rear shroud to lock it in place. (**Fig. 9**)

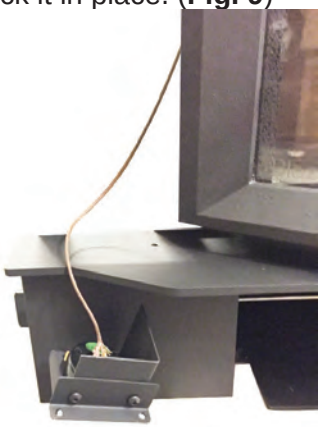


Fig. 8

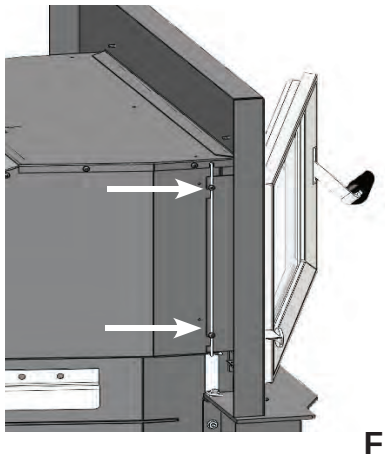


Fig. 9

3. Fasten the catalytic thermometer to the rear shroud with the x2 screws supplied. (**Fig. 10**)

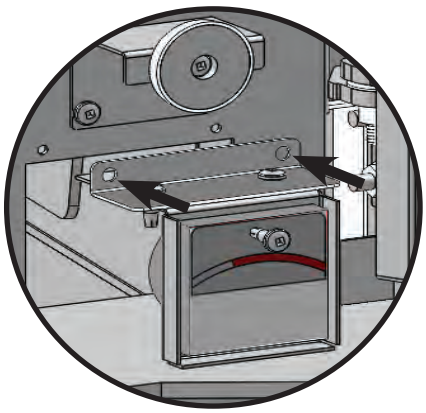


Fig. 10

4. Slide the lower shroud cover (the remaining component from the lower shroud kit) into the notches in the lower shroud body and fasten in place with the x2 screws supplied. (**Fig. 11)**

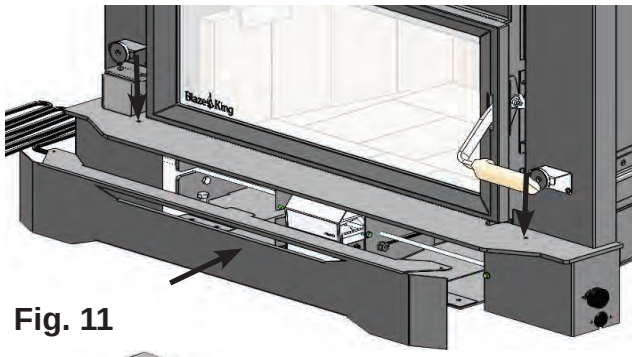


Fig. 11

5. Finally, position the front upper shroud by aligning the notches on its rear with the protruding screws on the rear shroud, then hang. The bottom of the outer shroud is held in place by magnets. (**Fig. 12**)

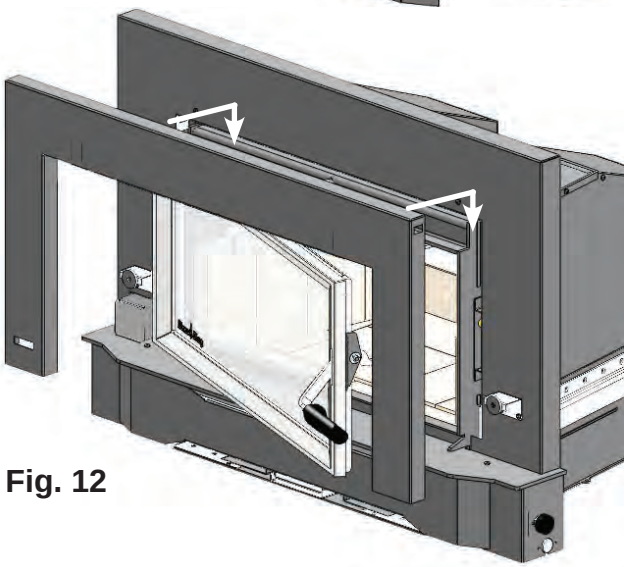


Fig. 12

FLUE COLLAR INSTALLATION

1. Once the liner has been dropped down the chimney, it must be securely attached to the flue collar assembly (refer to the "***CHIMNEY CONNECTIONS"*** section***).***
   Note: Ensure the flue collar assembly will hang roughly 2' (607 mm) above the floor of the fireplace once attached to the chimney liner as this will ease the connection to the appliance once it is pushed into the fireplace opening.
2. Open the appliance loading door.
3. Open the bypass door (refer to "***OPERATING INSTRUCTIONS"*** section*)* in order to gain access to reach up through the appliance to grab hanging flue collar assembly.
4. Pull the flue collar assembly down to align the bolts with the through holes in the rear of the firebox then pull forward.
   Note: Ensure the underside of the flue collar assembly is sliding along the top side of the firebox as the gasket of the flue collar assembly must be properly seated to ensure a good seal. FEEL THE AREA WHERE THE FLUE COLLAR MAKES CONTACT WITH THE FIREBOX; IF THERE IS A GAP, THE FLUE COLLAR IS NOT SEATED PROPERLY AND NEEDS TO BE REALIGNED.
5. Once a good seal has been confirmed, fasten the flue collar assembly to firebox with the hardware used during its removal.
   Note: Ensure the nuts are tightened evenly to ensure a good seal.
6. Close the bypass door before sliding the appliance into its final position within the fireplace opening.

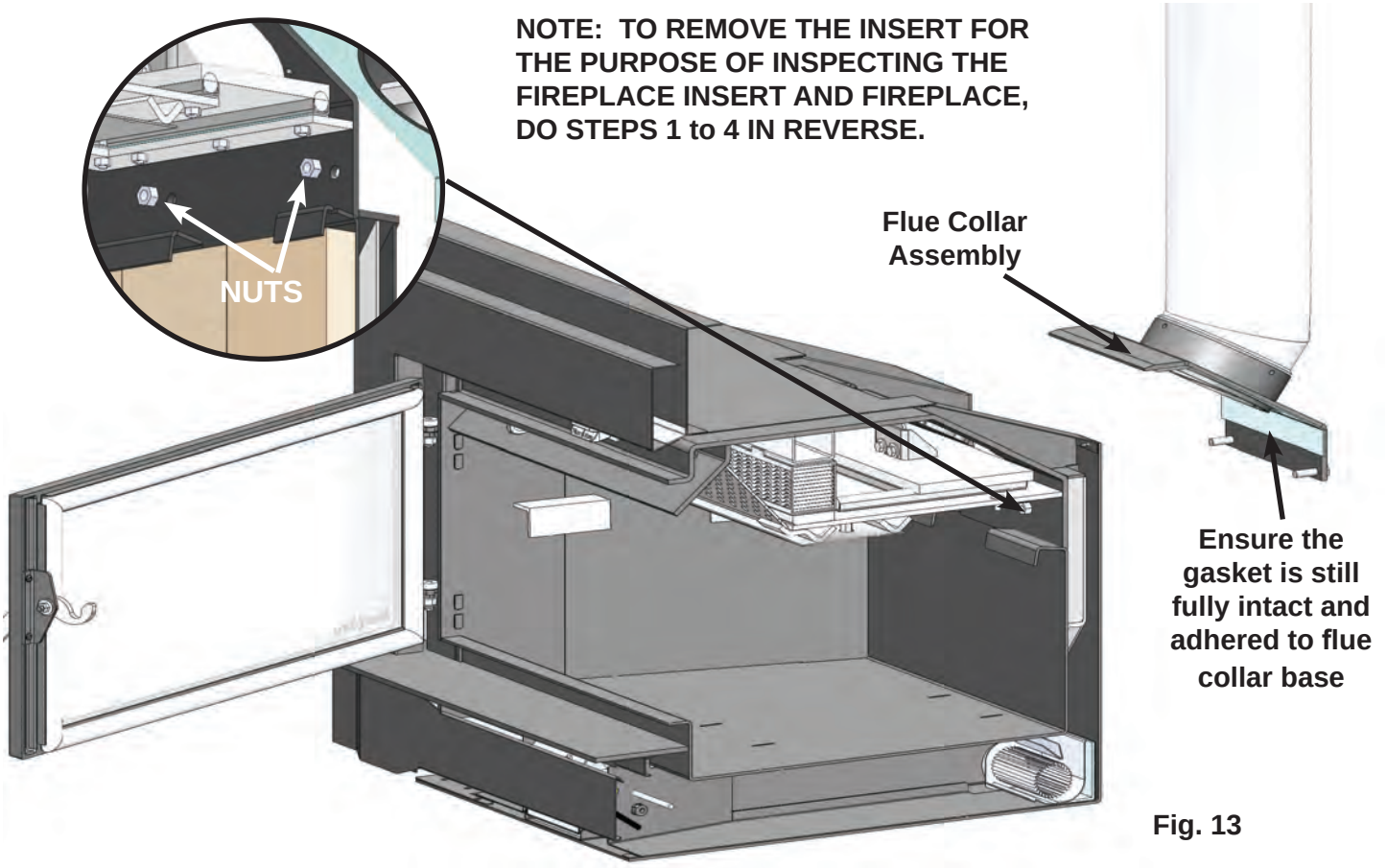


Fig. 13

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.

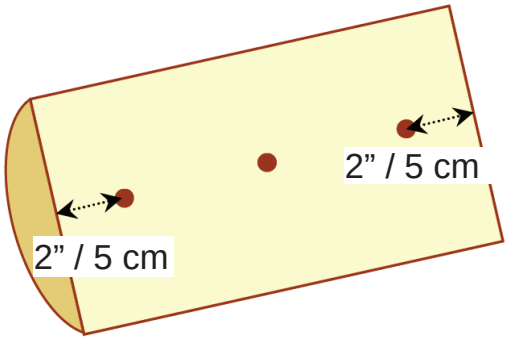
Both hardwood and softwood burn equally well in this appliance, but the more dense hardwood will weigh more per cord and burn a little slower and longer. Never burn salt-water driftwood as it is very corrosive and will deteriorate the structure of the appliance. The burning of salt-water driftwood will 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 is used to manipulate fuel loads.

BYPASS DOOR & BYPASS HANDLE

This 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. To open the bypass door, use the bypass handle to grab the **side of the bypass latch** (**Fig. A)** to pull the rod outward. To close, position the bypass handle on the **center of the bypasss latch** (**Fig. B**) and push inward.

⚠WARNING

DO NOT TOUCH THE BYPASS LATCH DIRECTLY AS DIRECT CONTACT MAY CAUSE SERIOUS BURNS. ALWAYS USE THE BYPASS HANDLE TO MANUVER THE BYPASS LATCH.

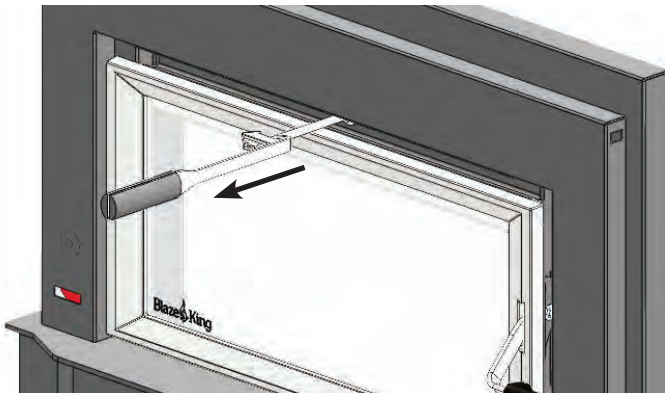


Fig. A

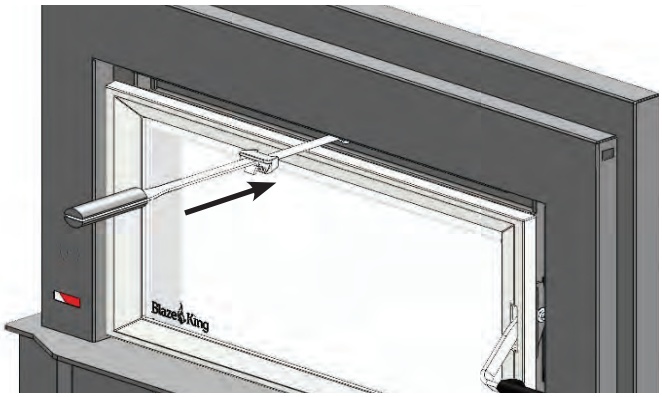


Fig. B

CATALYTIC THERMOMETER

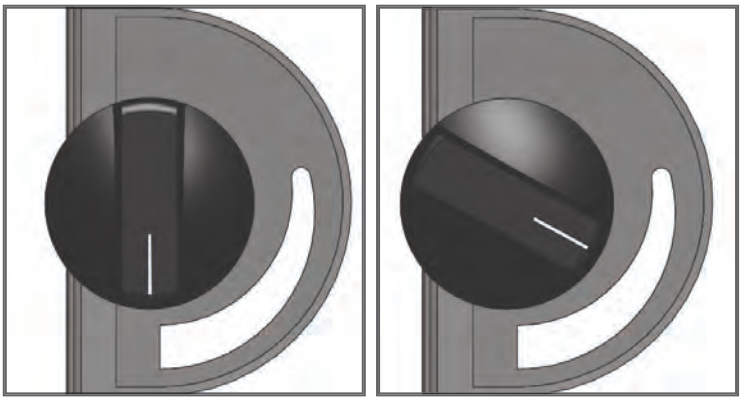
The catalytic thermometer is located in the lower left-hand corner of the surround.Its sole purpose is to indicate whether the combustor is ACTIVE or INACTIVE. **The ACTIVE ZONE is the RED area on the gauge. The INACTIVE ZONE is the WHITE area on the gauge**. It is important to ensure that the appliance is operated in the stove in the ACTIVE zone. When the thermometer reads INACTIVE it means that the combustor temperature is below 500F and may not producing a clean burn. The needle should point to the active zone, the red area of the gauge, during normal operation. **Note:** The needle, when active, will stay in one position in the Red Active Zone. For calibration instructions refer to the "*MAINTENANCE*" section.

Thermometer Gauge

THERMOSTAT

The thermostat is located below the ash lip of the appliance and is controlled by the thermostat knob which is located on the lower left side of the front assembly. 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 is set at the factory. **DO NOT TAMPER WITH THE THERMOSTAT**, this will result in a malfunctioning thermostat.

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 relaoding. Wait 2 minutes for the air flow to stabilize.
2. To help minimize smoke spillage into the room, you may wish to open the bypass door and again wait 2 minutes for the air flow to stabilize.
3. 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 for 20 to 30 minutes OR until the fire is very well established. At that point, turn the thermostat down to the desired setting. Keep in mind, you may not see a large amount of flame activity in the lower thermostat setting. The thermometer needle will remain in the active zone indicating that the burn cycle is continuing.
6. Should you burn the stove on a very low setting for extended periods of time, you will begin to see creosote deposits forming on the glass door. To remove these deposits, simply run the stove on **HIGH** for approximately 30 minutes. The **HIGH** setting will burn off most of the deposits

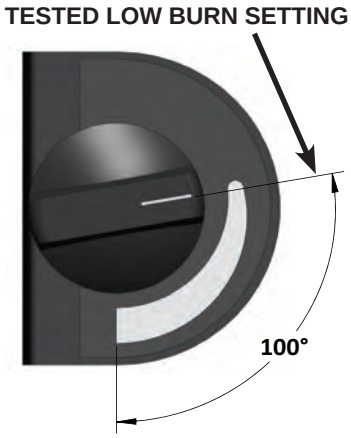
Note: Our loading instructions are outlined in general terms due to the vast array of variables that arise with each installation. Such variables include type of wood fuel, chimney height and configuration, installation altitude, seasonal weather conditions, and the desired heat output required. Over 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.

CATALYTIC COMBUSTOR

⚠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.**

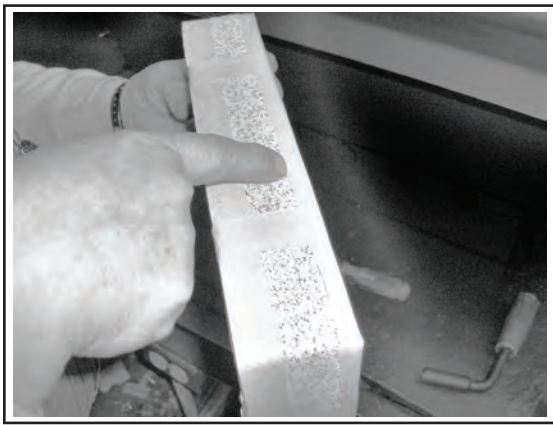
COMBUSTOR REPLACEMENT

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).

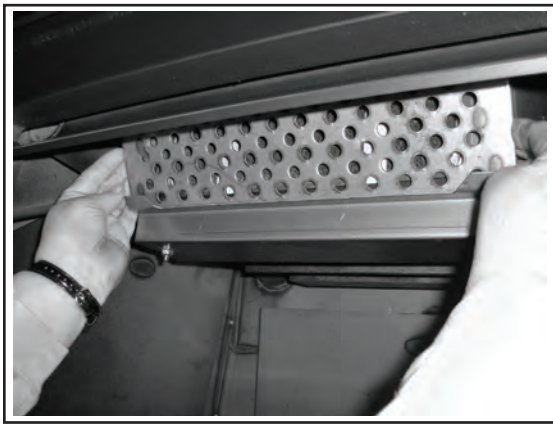
3. There are metal tabs across the bottom and on either side of the combustor. Using a flat blade screwdriver or pocket knife blade, slide the tip in between the metal tab on the left side of the combustor and the steel dome of the stove (the dome is the housing that encases the combustor). Apply slight 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.



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.CAT2425**.

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

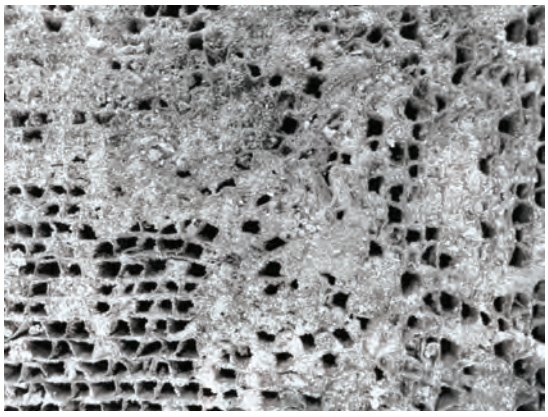
COMBUSTOR TROUBLESHOOTING

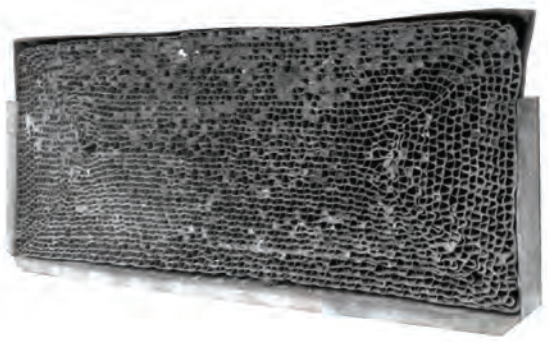
PROBLEM: CREOSOTE PLUGGING

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).

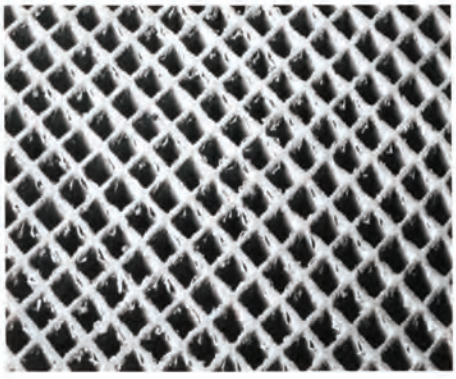




PROBLEM: COMBUSTOR PEELING

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.

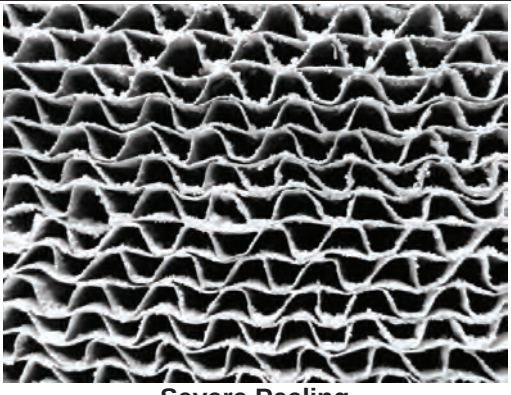
The images to the right are examples of minor peeling (does not affect proper combustor function) and severe peeling (closed or plugged combustor that needs replacement).



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).

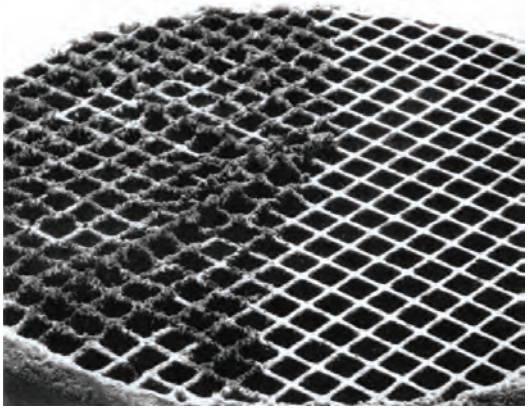


Severe Peeling

CATALYTIC COMBUSTOR

PROBLEM: COMBUSTOR MASKING

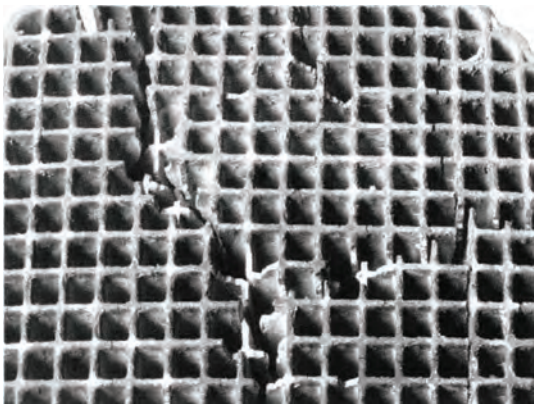
Possible Cause: The combustor is coated with a layer of fly-ash or soot from burning material that produces substantial char and fly-ash.
Solution: When the appliance is cool to touch, clean the front face of the combustor with a soft-bristled brush or vacuum lightly (refer to ***COMBUSTOR CLEANING*** 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.

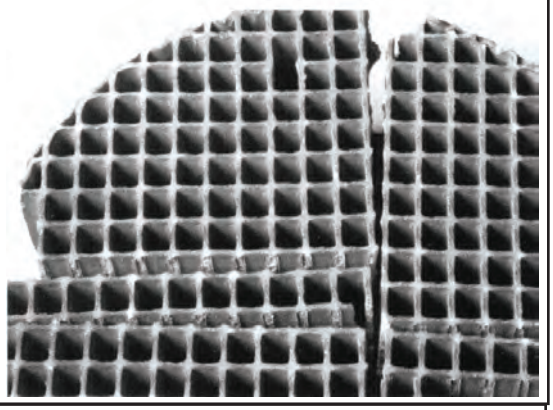
If cracking causes large pieces of the combustor to separate, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



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.

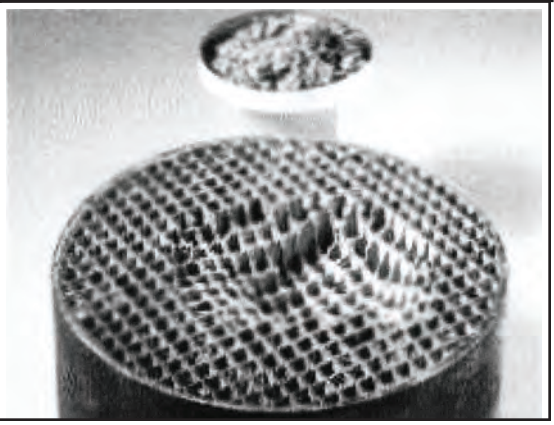
Possible Cause: Distortion of surrounding dome housing.
Solution: The combustor should slide in and out of the dome housing with relative ease. If this is not the case, contact your dealer for further inspection.



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 Thermostat for proper function.
4. Check Fan Assemblies for proper operation.
5. Remove all ash from firebox and ash drawer after final burn of season.
6. Check all gaskets for proper seal and adjust as required.
7. Inspect and clean the Venting System.

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

1. Open the loading door to gain access to the latch catch on the right side of the firebox. **(Fig. 14)**
2. Use a 7/16" wrench to loosen the two flange nuts on the latch catch.
3. Push the latch catch backwards 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.

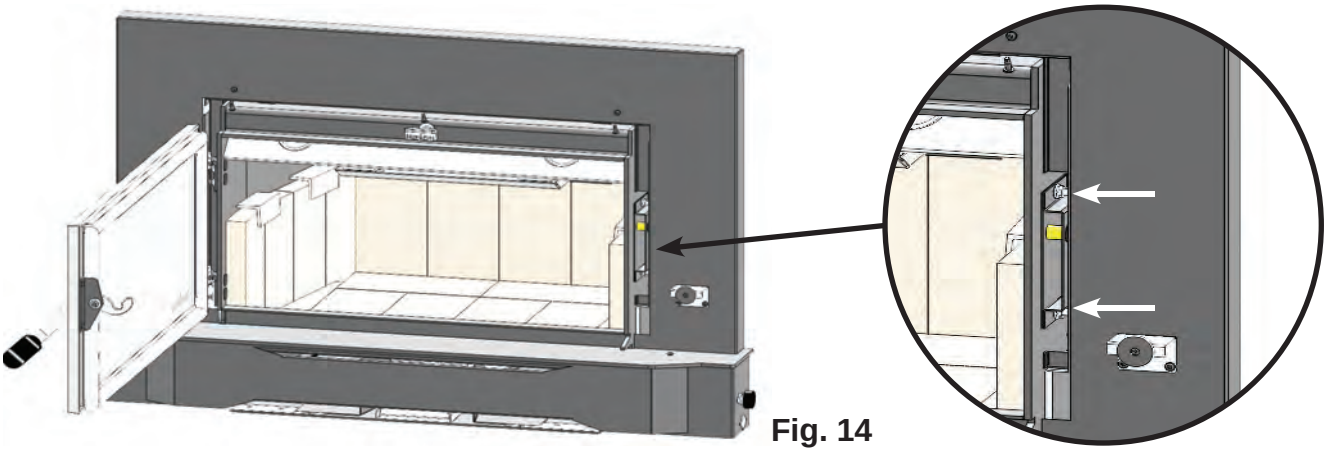


Fig. 14

⚠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.

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.

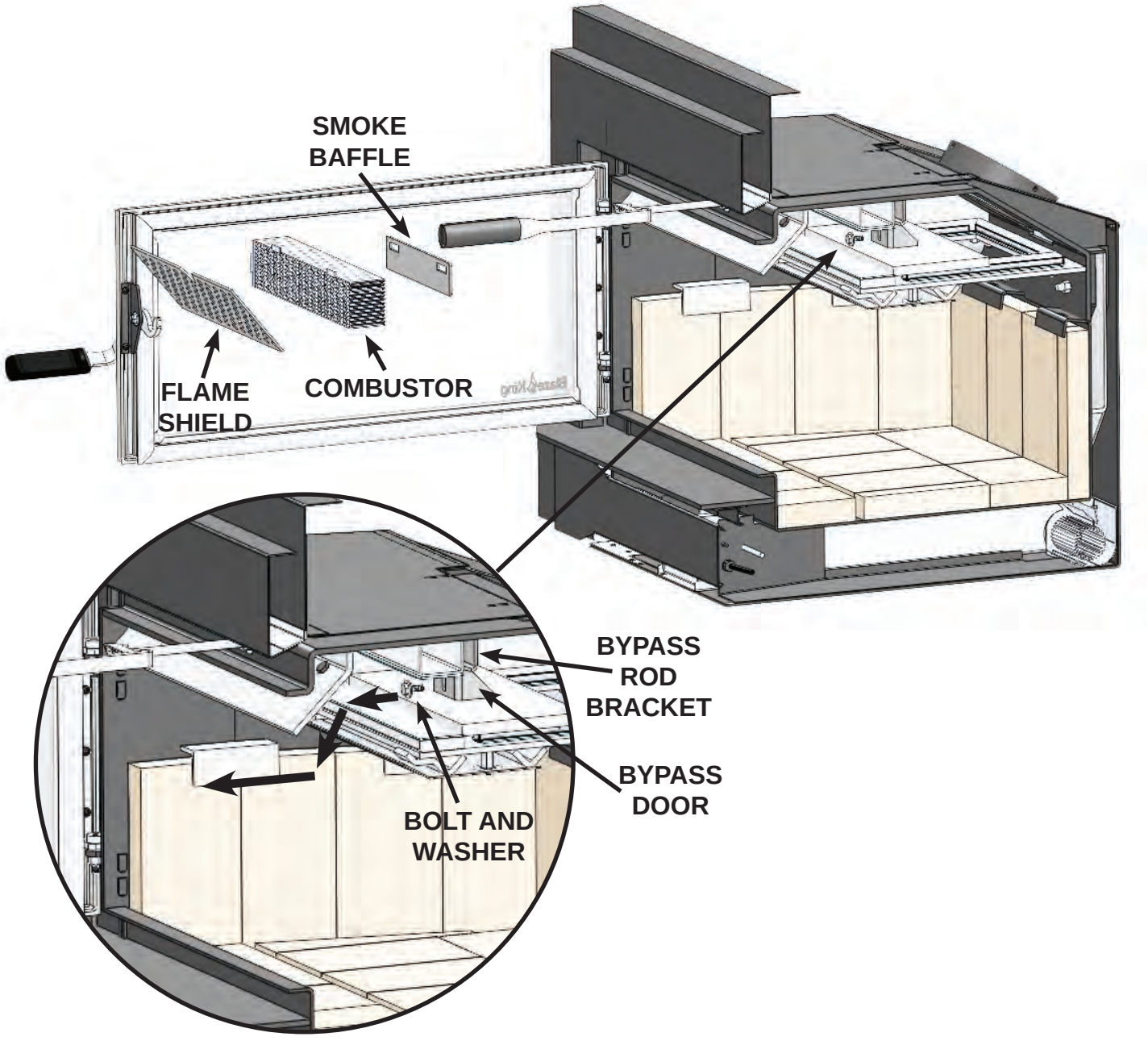
BYPASS DOOR GASKET INSPECTION

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.

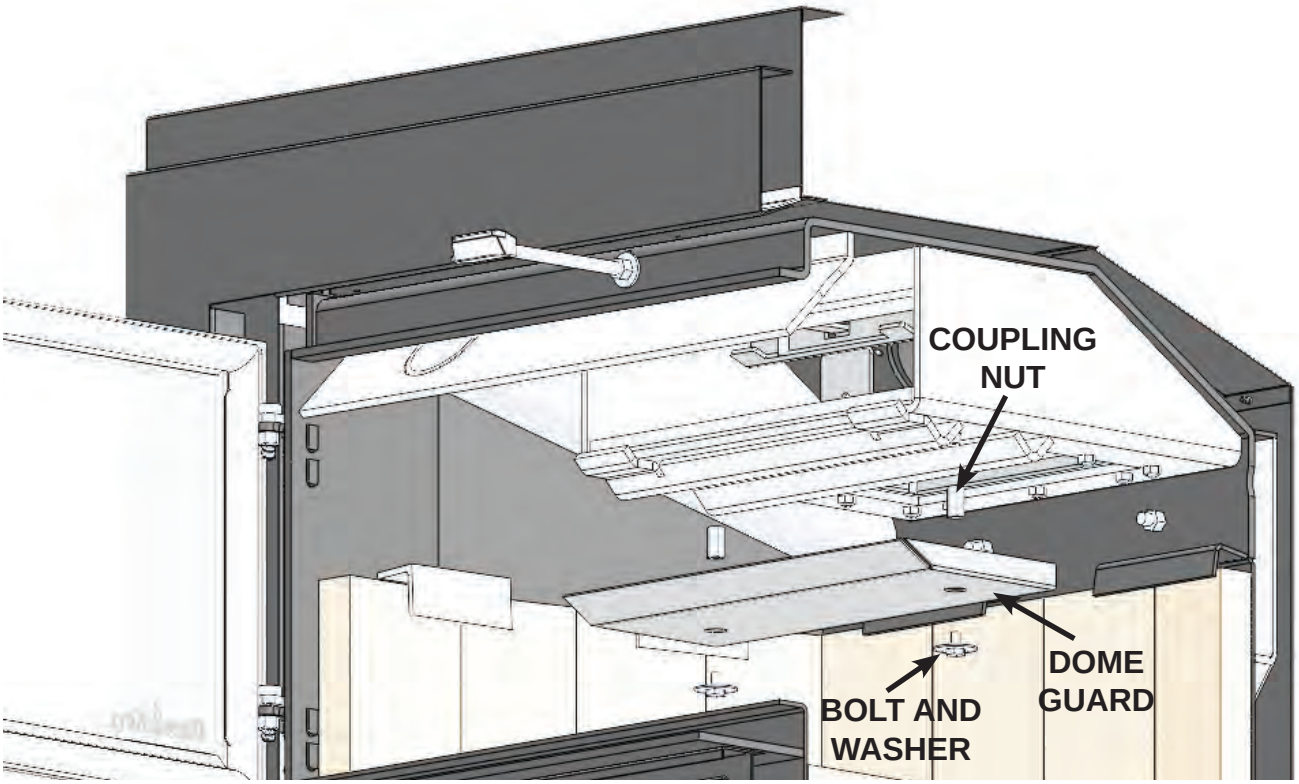
Note: This inspection could also yield a dead combustor, see "*COMBUSTOR MONITORING*".

BYPASS DOOR GASKET RETAINER REPLACEMENT

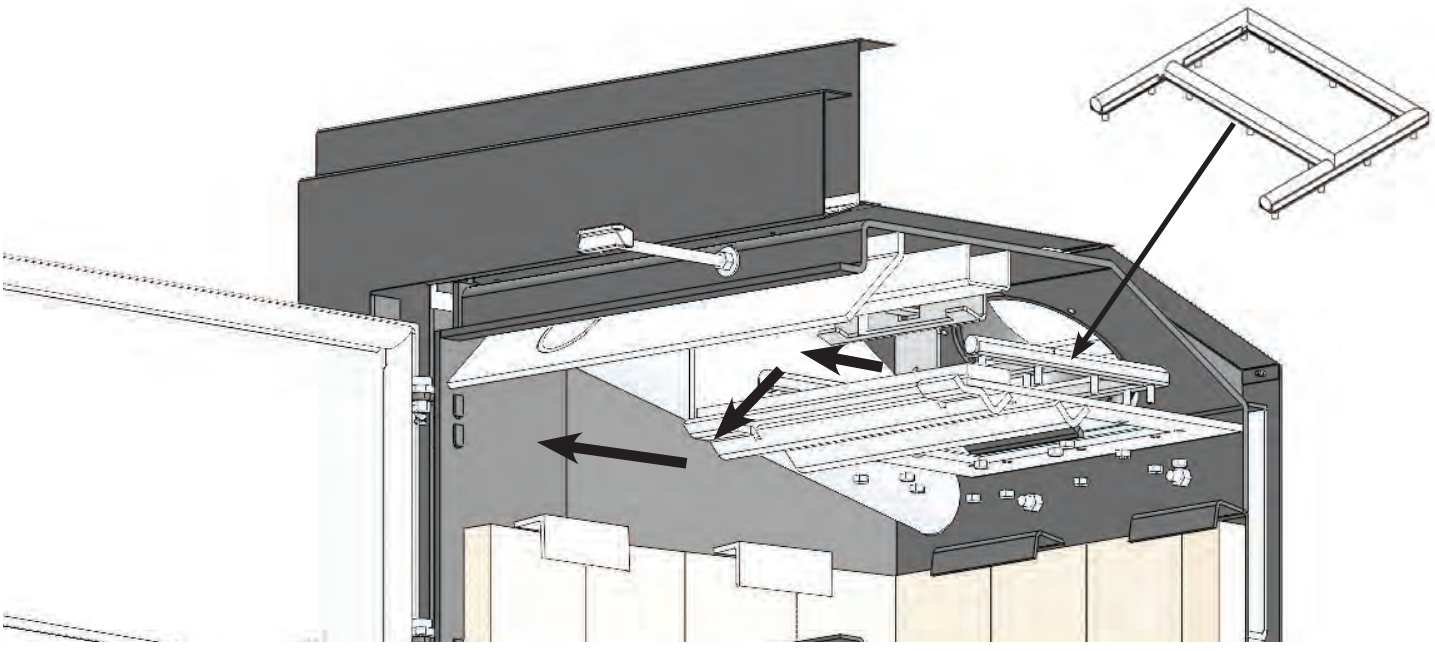
1. Remove flame shield, combustor, and smoke baffle from dome (see "***CATALYTIC COMBUSTOR REPLACEMENT***").
2. Open the bypass door and use a 7/16" socket to unfasten the bolt and washer that holds the bypass door to the bypass rod bracket. Once loose, remove the bypass door through the combustor opening.



3. Remove the two 1/4-20 bolts and washers that hold the dome guard in place, be sure to support the dome guard during this process is it will come loose. Once the dome guard is removed, unthread the two 1/4-20 coupling nuts that spaced the dome guard from the dome bottom.



4. Remove the twelve remaining 1/4-20 nuts from the dome bottom. Lift the bypass door gasket retainer assembly upwards (enough to clear the threaded posts from the dome) and remove through the combustor opening. Once removed, ensure all debris is cleared from the inner surface of the dome.To reinstall the new bypass door gasket retainer, follow these steps in reverse order.



5. Once the inner dome surface has been cleared, insert the new bypass door gasket retainer assembly and follow the above instructions in reverse to ensure complete install. Ensure that 1/8" ceramic paper is in between the gasket retainer assembly and inner dome surface. Also ensure that all nuts are completely fastened up to the dome bottom. When tightening the 1/4-20 bolt through the bypass door into the bypass rod bracket, do not over tighten. Simply finger tighten the bolt as this allows the bypass door to move down as the gasket begins to seat after the first few fires.
6. When reinstalling the combustor, ensure it has been rewrapped with new expanding gasket that was supplied with the replacement kit. Do not install combustor without gasket.

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.

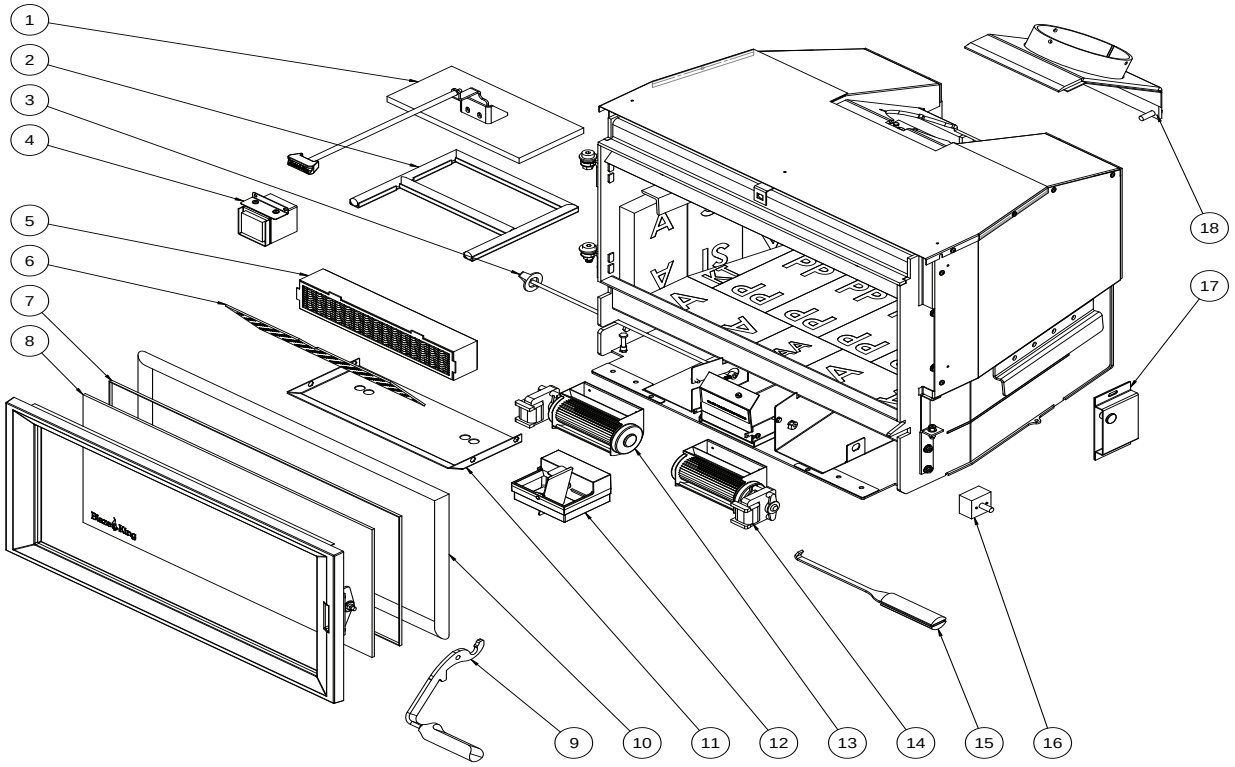
Combustor plugged or coated.	Clean combustor. See “CATALYTIC COMBUSTOR TESTING”
Combustor not functioning.	Check and test combustor. If needed replace combustor. See “CATALYTIC COMBUSTOR, REPLACING”
Thermostat not operating properly.	Consult your blaze King Dealer.
Bypass door leaking or not closing 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.

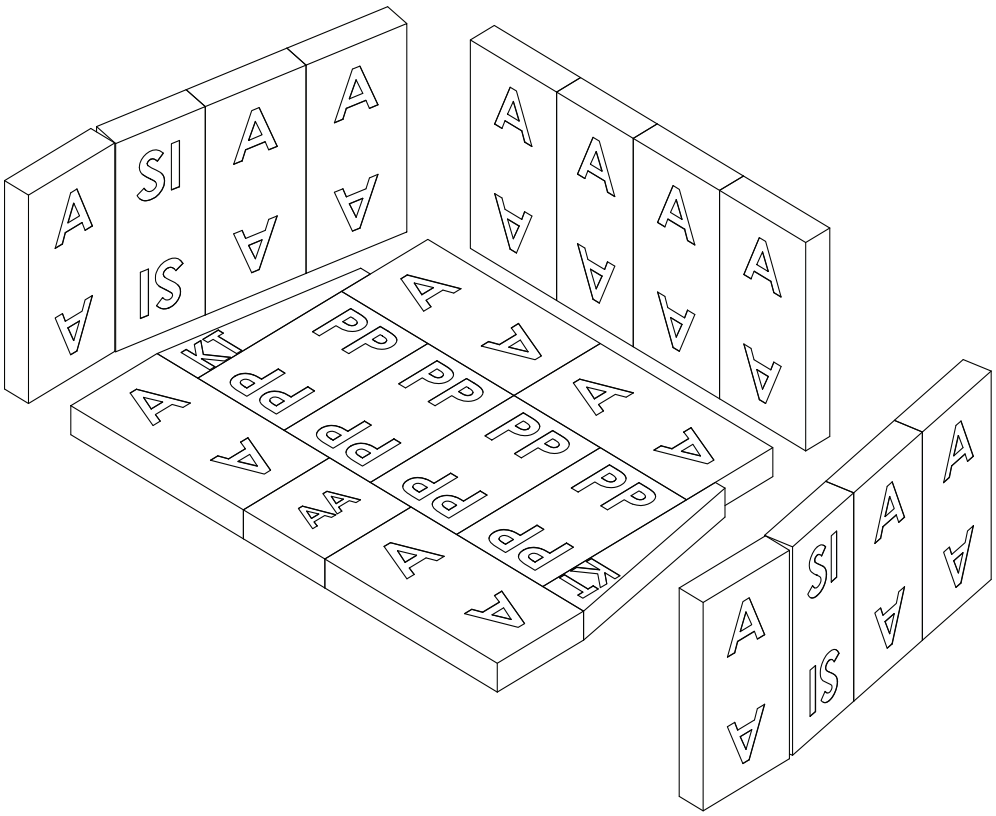
PROBLEM: The combustor temperature cannot be controlled. Turning the thermostat down often makes the combustor temperature go up.
CAUSE Turning the thermostat down, particularly in the first half of the burn cycle, causes the fire to emit more smoke, which is fuel for the combustor. The combustor temperature 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.



No.	Part #	Description	QTY
1	S.Z2019	BYPASS DOOR ASSEMBLY	1
2	S.Z2022	BYPASS DOOR GASKET RETAINER ASSEMBLY	1
3	S.Z2029	THERMOSTAT ROD ASSEMBLY	1
4	S.Z2051	CATALYTIC THERMOMETER ASSEMBLY	1
5	S.CAT2425	COMBUSTOR ASSEMBLY	1
6	S.2030	FLAME SHIELD	1
7	S.155.0254.6	DOOR GLASS GASKET - 7ft	1
8	130-0270	DOOR GLASS	1
9	S.Z2044	DOOR HANDLE	1
10	S.155.0186.6	DOOR GASKET - 7ft	1
11	S.Z2050	DOME GUARD	1
12	S.Z3030	THERMOSTAT ASSEMBLY	1
13	150-0710-L	LEFT BLOWER	1
14	150-0710-R	RIGHT BLOWER	1
15	S.Z2052	BYPASS HANDLE	1
16	145-0136	RHEOSTAT	1
17	S.Z2804	LATCH CATCH ASSEMBLY	1
18	S.Z2015	FLUE COLLAR ASSEMBLY	1

Brick Layout



ITEM NO.	PART NUMBER	QTY.
1	A Size Brick	14
2	AA Size Brick	1
3	KT Size Brick	2
4	PP Size Brick	4
5	SI Size Brick	2

BLAZE KING WOOD LIMITED WARRANTY

Blaze King and Valley Comfort's respective brands extend the following warranty for wood fired appliances purchased from an authorized Blaze King / Valley Comfort dealer and installed in the United States of America or Canada. Warranty starts with date of purchase by the original owner (End User) except as noted for replacement parts.

Warranty Period		Components Covered	
Parts	Labor	Wood	
1 Year		X	All parts, materials and surface finishes (flaking and peeling) Subject to Conditions, Exclusion, and Limitations listed.
2 Years		X	Fan assemblies and motors, thermal sensors, catalytic thermometer, bi-metallic thermostat assembly, door handle metal components.
5 Years	2 Years	X	Firebox & Heat Exchanger, Bypass Door Steel Components
6 Years		X	Catalyst Combustor (see Conditions, Exclusions, and Limitations)
1 Year		X	Other Replacement Parts
SEE CONDITIONS, EXCLUSIONS, AND LIMITATIONS.			

Blaze King Wood Limited 5 Year Warranty

Blaze King is the manufacturer of the Blaze King line of heating products. At Blaze King, our commitment to the highest level of quality and customer service is the most important thing we do. Each Blaze King stove is built on a tradition of using only the finest materials and is backed by our limited warranty to the original purchaser. With Blaze King, you're not just buying a stove; you're buying a company with years of unequalled performance and quality.

Limited Six (6) Year Warranty:
The CATALYTIC COMBUSTOR is under warranty by Blaze King for six (6) years from the date of original retail purchase. The purchaser shall pay the following share of the then current retail price for the combustor: The first three (3) years no charge, 4th year 60%; 5th year 70%, 6th year 80%. The Combustor must be returned to your dealer along with a completed COMBUSTOR FAILURE REPORT and original proof of purchase document.

Limited (5) Year Warranty:
Under this warranty, Blaze King covers the stove body and accessories against defects in materials and workmanship, for part repair or replacement for the first five (5) years *** to the original purchaser. This Warranty covers: All Steel firebox components against defects in material and workmanship. Please see the exclusions and limitation section below as certain restrictions and exclusions apply this warranty.

Limited Two (2) Year Warranty:
Under this warranty, Blaze King covers, fan assemblies , modular thermostat and door handle steel components against defects in materials and workmanship, for part repair or replacement and limited labor for the first two (2) years to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

Limited One (1) Year Warranty:
Under this warranty, Blaze King covers all parts and materials against defects in materials and workmanship including exterior paint finishes, for part repair or replacement and limited labor for the first year to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

How the Warranty Works

1. All warranties by the manufacturer are set herein and no claim shall be made against the manufacturer on any oral warranty or representation. All claims under this Limited Warranty must be made in writing by your dealer.
2. Any stove or part thereof that is repaired or replaced during the Limited Warranty period will be warranted under the terms of the Limited Warranty for a period not exceeding the remaining term of the original Limited Warranty or six (6) months, whichever is longer.
3. For any part or parts of this stove, which in our judgment show evidence of defects, Blaze King reserves the option to repair or to replace the defective part(s) through an accredited distributor or agent, provided the defective part is returned to the distributor or agent, transportation prepaid, if requested.
4. If you discover a problem that you think may be covered by the Limited Warranty, you MUST REPORT it to your Blaze King dealer WITHIN 30 DAYS from the date the problem was first detected, giving them proof of purchase and the date of purchase. The dealer will investigate the problem and work with Blaze King to determine whether the problem:
   a) Is covered by the Limited Warranty or
   b) Can be fixed in your home or does the product need to be returned to Blaze King for repair.
5. If Blaze King determines that the stove needs to be returned to Blaze King for repair, the customer has the responsibility and the expense of removing it from their home and shipping it to Blaze King. If the problem is covered by the Warranty, Blaze King will repair or replace the item at their discretion and the customer will be responsible for return shipping and re-installation in their home.
6. If the problem is not covered by the Limited Warranty, the customer will be responsible for all repair costs, as well as all storage, shipping and the cost of removing and re-installing the stove.
   If you are not satisfied with the service provided by the Blaze King dealer, write to Blaze King at the address listed on the last page of the Owner's Manual. Include a copy of the original purchase invoice and a description of the problem.

Exclusions and Limitations:

1. This Warranty does not cover tarnish, discoloration or wear on the plated surfaces Painted finishes will change color after initial firing and will continue to change through the lifetime of the stove. This is normal occurrence for all high temperature coatings.
2. This Warranty does not cover gasket material or firebrick.
3. Blaze King strongly recommends installation by a certified installer. Failure to comply may adversely affect coverage under the terms of this warranty. This Limited Warranty covers defects in materials and workmanship only if the product has been installed in accordance with local building and fire codes; in their absence refer to the owner's manual. If the product is damaged or broken as a result of any alteration, wilful abuse, mishandling, accident, neglect, or misuse of the product, the Limited Warranty does not apply.
4. The stove must be operated and maintained at all times in accordance with the instructions in the Owner's Manual. If the unit shows signs of neglect or misuse, it is not covered under the terms of this Warranty policy. Performance problems due to operator error will not be covered by the Limited Warranty policy.
   Some minor expansion, contraction, or movement of certain parts and resulting noise, is normal and not a defect and, therefore, is not covered under this Limited Warranty.
5. Misuse includes over-firing. Over-firing can be identified later by warped plates and paint pigment being burnt off. Over-firing this appliance can cause serious damage and will nullify the Limited Warranty.
6. The Limited Warranty will cover glass thermal breakage only and will not cover misuse of the stove glass, including but not limited to:
   a) Glass that is struck, has surface contaminates or has had harsh or abrasive cleaners used on it.
   b) If the door is slammed or is closed while wood in the firebox is protruding out the stove opening thus striking the glass.
7. This warranty does not cover products made or provided by other manufacturers and used in conjunction with the operation of this stove without prior authorization from Blaze King The use of such products may nullify the Limited Warranty on this stove. If unsure as to the extent of this Limited Warranty, contact your authorized Blaze King dealer before installation.
8. Blaze King will not be responsible for inadequate performance caused by environmental conditions.
9. The Limited Warranty does not cover installation and operational related problems such as use of downdrafts or spillage caused by environmental conditions. Environmental conditions include but are not limited to nearby trees, buildings, roof tops, wind, hills, mountains, inadequate venting or ventilation, excessive offsets, negative air pressures or other influences caused by mechanical systems such as furnaces, fans, clothes dryers etc.
10. The Limited Warranty does not cover damage caused by burning salt-saturated wood, corrosive driftwood, chemically treated wood or any fuel not recommended in the Owner's Manual (use cord wood only).
11. The Limited Warranty is void if:
    a) The stove has been operated in atmospheres contaminated by chlorine, fluorine or other damaging chemicals.
    b) The stove is subject to submersion in water or prolonged periods of dampness or condensation.
    c) Any damage to the unit, combustion chamber or other components due to water, or weather damage which is the result of, but not limited to, improper chimney/venting installation.
    d) Salt air in coastal areas or high humidity can be corrosive to the finish; these environmental conditions can cause rusting. Damage caused by salt air or high humidity is not covered by the Limited Warranty.
12. Exclusions to the Limited Warranty include: injury, loss of use, damage, failure to function due to accident, negligence, misuse, improper installation, alteration or adjustment of the manufacturer's settings of components, lack of proper and regular maintenance, alteration, or act of God.
13. The Limited Warranty does not cover damage caused to the stove while in transit. If this occurs, do not operate the stove and contact your courier and/or dealer.
14. The Limited Warranty does not extend to or include paint, door or glass gaskets or firebricks damage caused by normal wear and tear, such as paint discoloration or chipping, worn or torn gaskets, chipped or cracked firebrick, etc.
15. The Limited Warranty does not include damage to the unit caused by abuse, improper installation, or modification of the unit.
16. Damage to plated surfaces caused by fingerprints, scratches, melted items, or other external scores and residues left on the plated surfaces from the use of abrasive cleaners or polishes is not covered in this warranty.

17. Blaze King is free of liability for any damages caused by the stove, as well as inconvenience expenses and materials. The Limited Warranty does not cover incidental or consequential damages.
18. The Limited Warranty does not cover any loss or damage incurred by the use or removal of any component or apparatus to or from the Blaze King stove without the express written permission of Blaze King and bearing a Blaze King label of approval.
19. Any statement or representation of Blaze King Products and their performance contained in Blaze King advertising, packaging literature, or printed material is not part of the Limited Warranty.
20. The Limited Warranty is automatically voided if the stove's serial number has been removed or altered in any way. If the stove is used for commercial purposes, it is excluded from the Limited Warranty.
21. No dealer, distributor, or similar person has the authority to represent or warrant Blaze King Products beyond the terms contained within the Limited Warranty. Blaze King assumes no liability for such warranties or representations.
22. Blaze King will not cover the cost of the removal or re-installation of the stove, hearth, facing, mantels, venting or other components.
23. Labor to replace or repair items under this Limited Warranty will be covered per our warranty service fee reimbursement and labor rates are set per component schedule. Labor rates vary from location to location and as such total labor costs may not be covered. Please consult with your dealer or service technician for any additional charges such as travel time or additional labor charges that may apply.
24. For parts of the Blaze King 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.: _____

BOXER 24 (BX24)

SOLID FUEL WOOD CATALYTIC STOVE: BX24

The Boxer BX24 is not approved for Mobile Home installation

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. EPA CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CRIB WOOD

0142WN020E
0142WN017S

Installer: Please complete the details on the back cover 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

SN - 61.

BOXER BX24

BLAZE KING CATALYTIC STOVE - POÊLE À BOIS CATALYTIQUE

MODEL / MODÈLE: BX24
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

0142WN020E
0142WN017S

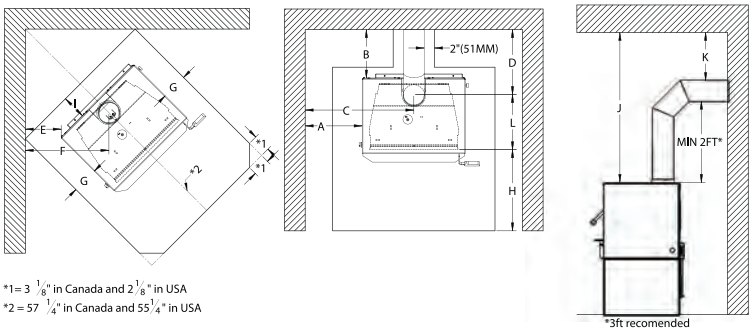
PREVENT HOUSE FIRES - Install and use only in accordance with Blaze King's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area. The flue size is 6".
CHIMNEYS: DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. Except for installation detailed below, use 6" listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the USA or a masonry residential type chimney. Do not install in a sleeping room. Passing through a wall or ceiling requires special methods: see instructions and local building codes.

POUR PRÉVENIR UN INCENDIE - Installer et employer seulement selon le manuel d'installation de Blaze King. Contacter les autorités locales en bâtiments ou en matière de prévention d'incendies au sujet des normes d'inspection et d'installation dans votre secteur. La dimension des conduits de cheminée est de 6".
CHEMINÉE: NE PAS CONNECTER CETTE UNITÉ A UNE CONDUITE DE CHEMINÉE SERVANT UN AUTRE APPAREIL. Excepté pour les situations détaillées ci-dessous, employer une cheminée de 6" homologuée par le fabricant à des fins d'utilisation pour combustibles solides conformément à la norme ULC629 au Canada ou UL-103HT aux Etats-Unis ou employer une cheminée en maçonnerie de type résidentiel. Ne pas installer dans une chambre à coucher. Passer à travers un mur ou un plafond requiert une méthode spécifique décrite dans les instructions et dans le code local du bâtiment.

MINIMUM CLEARANCES TO COMBUSTIBLES (See owners manual for complete description of all requirements)
DÉGAGEMENTS MINIMUM AUX COMBUSTIBLES (voir les directives d'installation pour la description complète de toutes les conditions)

Residential Installations / Installations Résidentielles	A	B	C	D	E	F	J
Roof exit, parallel and corner. Sortie de toit, parallèle et coin.	10" 254 mm	10" 254 mm	25.125" 639 mm	15.125"* 385 mm	2.75" 70 mm	16.375"* 416 mm	49" 1245 mm
Wall exit, parallel and corner. Sortie de mur, parallèle et coin.	10" 254 mm	14" 356 mm	25.125" 639 mm	19.125"* 483 mm	2.75" 70 mm	16.375"* 416 mm	49"* 1245 mm

***Check with local codes and pipe manufacturers for pipe clearances. In Canada 18" clearances from single wall pipe is required.**
*** Vérifier avec le code du bâtiment local et avec le manufacturier de tuyaux pour les dégagements. Au Canada un dégagement de 18 po est exigé pour un tuyau à simple paroi.**



*1= 3 1/8" in Canada and 2 1/8" in USA
*2 = 57 1/4" in Canada and 55 1/4" in USA

G - 5 3/4" (147 mm) in U.S.A.
8" (203 mm) in Canada

H - 16" (406 mm) in U.S.A.
18" (456 mm) in Canada

I - 0" (0 mm) in U.S.A.
8" (203 mm) in Canada

K - 18" (456 mm) *

L - 16.06" (408 mm) *

Floor protection may be any non-combustible material or Listed Floor Protector, and must extend at least 18" (456 mm) in Canada or 16" (406 mm) in U.S.A., in front of the loading door opening: In USA, minimum size is 41 3/4" width x 36 3/4" depth (1061 mm width x 934 mm depth)
In Canada, minimum size is 46 1/4" width x 46 3/4" depth (1175 mm width x 1188 mm depth)
Electrical rating: (120V, 60Hz, 0.75 Amps. Risk of electrical shock. Disconnect power before servicing unit. Do not route power cord in front of or beneath heater).
U.S. ENVIRONMENTAL PROTECTION AGENCY - Certified to comply with 2020 particulate emission standards using crib wood. EPA test methods 28R/5G, ASTM E2515, and ASTM E2780, with an emission-rate of 0.74 g/hr. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in the owner's manual, or if the catalytic element is deactivated or removed.
ONLY OPERATE WITH DOOR CLOSED. Open door to feed fire ONLY. *DO NOT OBSTRUCT COMBUSTION AIR OPENINGS. For Use With Solid Wood Fuel Only - Do not burn other fuels, this may make the catalyst in the combustor inactive. The performance of the catalytic device or its durability has not been evaluated as part of the certification. Combustor part number: 115-0335. Provide adequate outside air for combustion. *Replace with only ceramic glass, 5 mm. Thickness.

La protection de plancher peut être de n'importe quel matériel non combustible ou Protecteur de plancher approuvé, et doit se prolonger au moins de 18" (456 mm) au Canada ou 16" (406 mm) aux États-Unis devant la porte de chargement: Aux États-Unis, la taille minimum est de 41 3/4" largeur x 36 3/4" profondeur (1061 mm largeur x 934 mm profondeur). Au Canada la taille minimum est 46 1/4" largeur x 46 3/4" profondeur (1175 mm largeur x 1188 mm profondeur)
L'AGENCE DE PROTECTION ENVIRONNEMENTALE DES U.S. - - Certifié conformément aux normes d'émission de particules 2020 , en utilisant du bois machiné (méthodes d'essai EPA 28R / 5G, ASTM E2515 et ASTM E2780, avec un taux d'émission de 0.74 g /h). Cet appareil de chauffage au bois nécessite des inspections périodiques et des réparations pour un fonctionnement adéquat. Consulter le manuel du propriétaire pour plus d'informations. Il est contre les règlements fédéraux de faire fonctionner cet appareil de chauffage à l'encontre des instructions d'utilisation fournies dans le manuel du propriétaire, ou si l'élément catalytique est enlevé ou désactivé.
FONCTIONNER UNIQUEMENT AVEC LA PORTE FERMÉE. Ouvrir la porte pour alimenter le feu SEULEMENT. *Ne pas obstruer l'entrée d'air de combustion. Fournir l'apport d'air extérieur adéquat pour alimenter la combustion. Utiliser uniquement avec des combustibles solides - ne pas brûler aucun autre combustible, ce qui peut rendre le catalyseur de la chambre à combustion inactif. La performance du catalyseur ou sa longévité n'a pas été évaluée dans le cadre de la certification. Numéro du catalyseur: 115-0335. *Employer seulement le verre en céramique d'une épaisseur de 5mm si le remplacement est nécessaire.

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 ☐

170-0271 [04 24]

The content within this manual describes the installation and operation of the Blaze King BX24. 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	0.21 g/min	1.08 g/hr
Med-low Burn (1)	0.05 g/min	0.16 g/hr
Med-low Burn (2)	0.29 g/min	0.22 g/hr
Med-high Burn	0.35 g/min	1.26 g/hr
High Burn	0.17 g/min	1.20 g/hr
EPA emission rate weighted average		0.74 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 8,038 to 24,085 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.

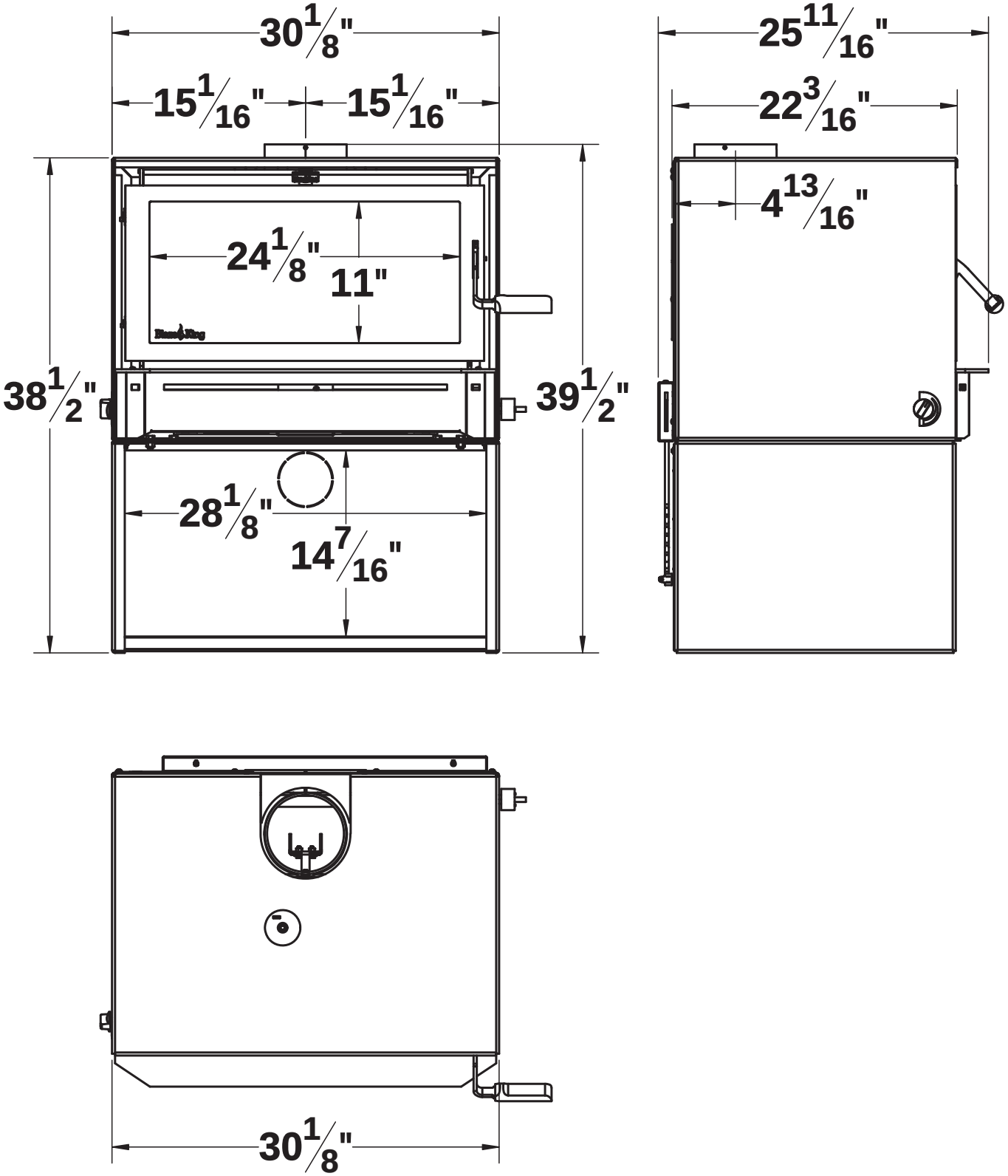
CALIFORNIA PROPOSITION 65

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

BOXER 24, BX24 SPECIFICATIONS	
Flue Collar Opening	6” I.D. (152.4 mm)
Firebox Door Opening	25 1/4” x 10 5/8” (642 mm x 270 mm)
Firebox Depth	16 3/4” (426 mm) brick to brick, 18” (457 mm) brick to glass
Firebox Width	18” to 22.75” (457.2 mm to 577.9 mm)
Firebox Height	10” (254 mm)
Firebox Volume	2.159 ft^3 (0.0611 m^3)
Tested Fuel Length	17.75” - 18” (451 mm - 457.2 mm)
Wood Capacity (approximate)	White Oak - 53 lb (24.0 kg) / Douglas Fir - 35lb (15.9 kg)
Shipping Weight	500 lb (226.8 kg)

PARTS INCLUDED	
1.	Poker
2.	Manual kit (w/ warranty cards, bypass handle(Z2052)

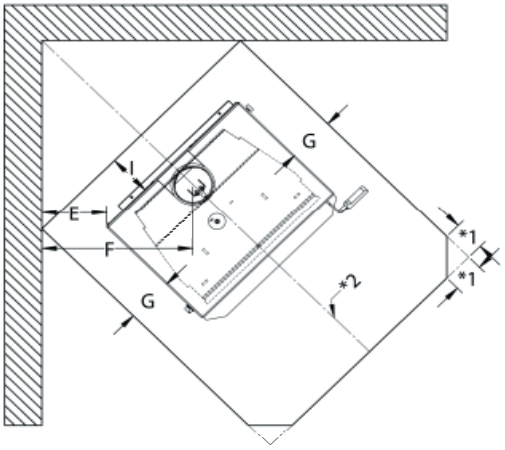

30 1/8"
15 1/16"
15 1/16"
24 1/8"
11"
38 1/2"
39 1/2"
28 1/8"
14 7/16"
25 11/16"
22 3/16"
4 13/16"
30 1/8"

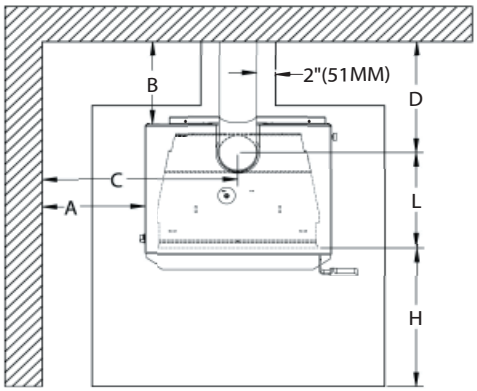
SAFETY CLEARANCES

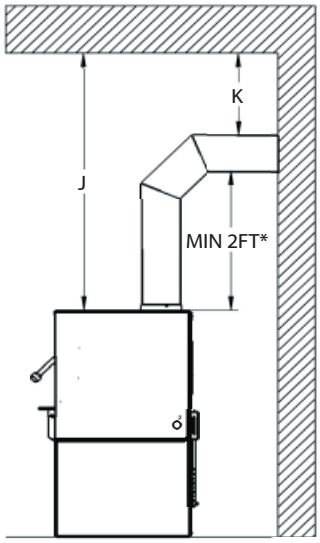
MINIMUM CLEARANCES

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 exit; Parallel or Corner minimum clearances	10" 254 mm	10" 254 mm	25.125" 639 mm	15.125" 385 mm	2.75" 70 mm	16.375" 416 mm	49" 1245 mm
Wall exit; Parallel and Corner minimum clearances	10" 254 mm	14" 365 mm	25.125" 639 mm	19.125" 385 mm	2.75" 70 mm	16.375" 416 mm	49" 1245 mm







*3ft recomended

***1 = 2.125" (54 mm) in USA or 3.125" (79 mm) in Canada**

***2 = 55.25" (1403 mm) in USA or 57.25" (1454 mm) in Canada**

G = 5.75" (146 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 = 16.06" (408 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:

41.75" x 36.75" (1061 mm x 934 mm) in USA and 46.25" x 46.75" (1175 mm x 1188 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.

WOOD STORAGE

This appliance has been tested and certfied to store wood within the cavity of the pedestal base (S.Z2126).

⚠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.**

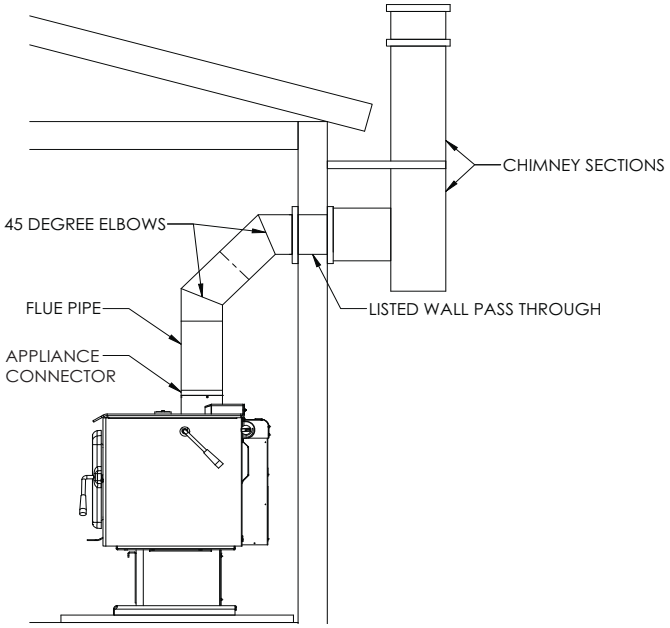
ROLE OF THE CHIMNEY

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 15ft (from stove top to termination) when installing an appliance at sea level (and up to 1000ft 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 3ft 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 leading to more smoke exiting the chimney system.**

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.

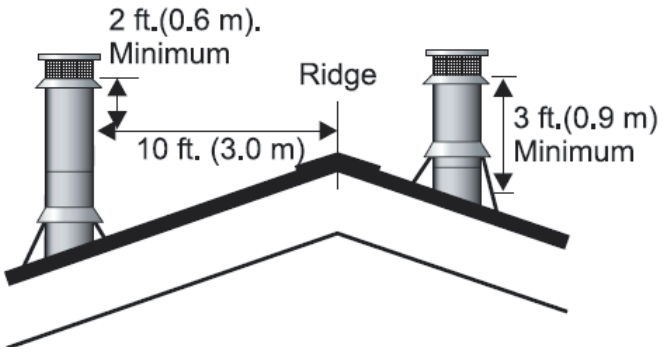


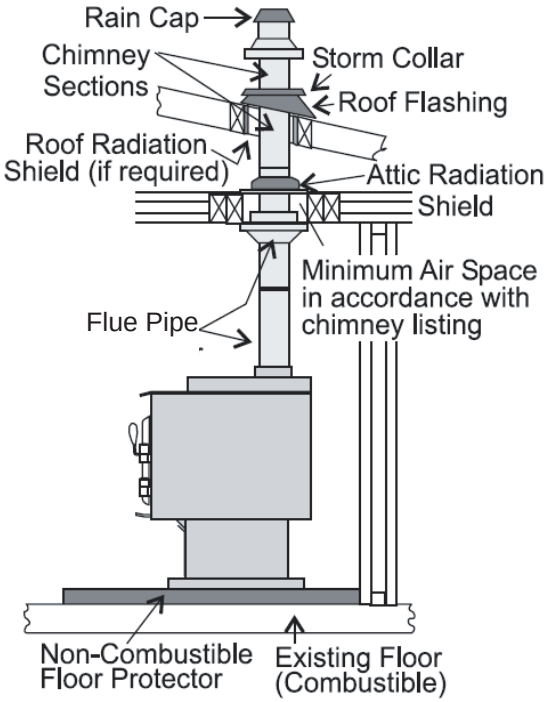
Do not install the chimney directly at the outlet of the appliance. A chimney connector is required unless the appliance is specifically approved for that type of installation. The flue pipe between the appliance connector and chimney should be kept as direct as possible. Do not use a flue pipe to pass 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

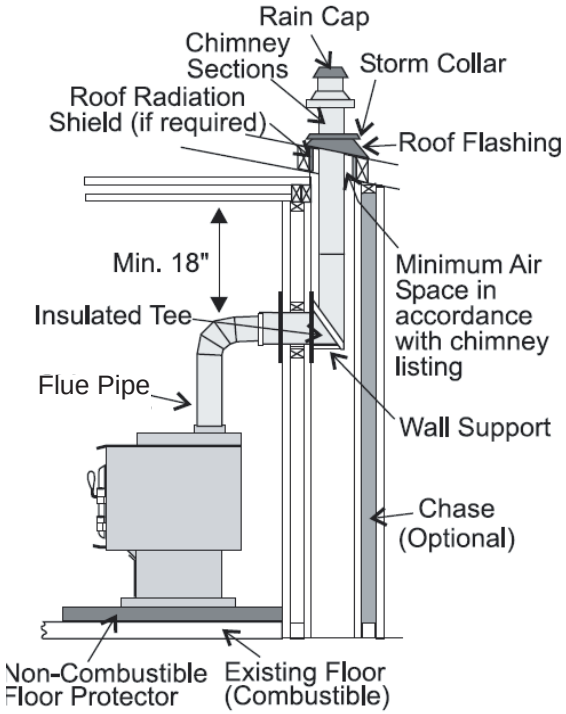
Refer to the prefabricated chimney manufacturer’s installation instructions to ensure safe clearance to combustibles are maintained when installing. All components (ceiling support package or wall pass through and “T” section package, fire stops, insulation shield, roof flashing, chimney cap, etc.) must 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.





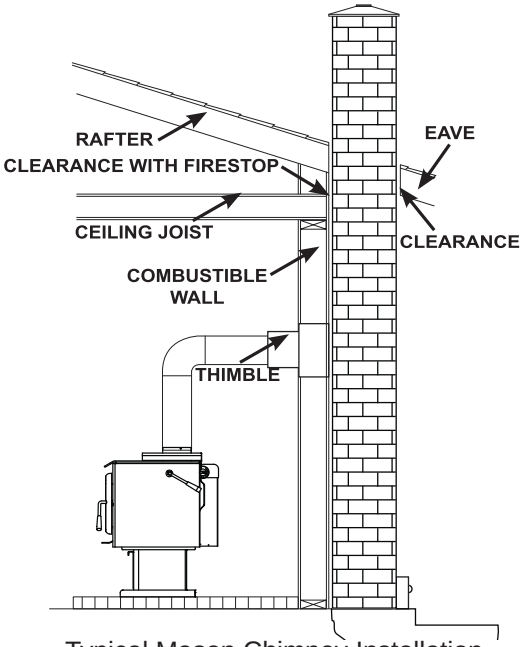
Prefab Chimney Through Ceiling Installation



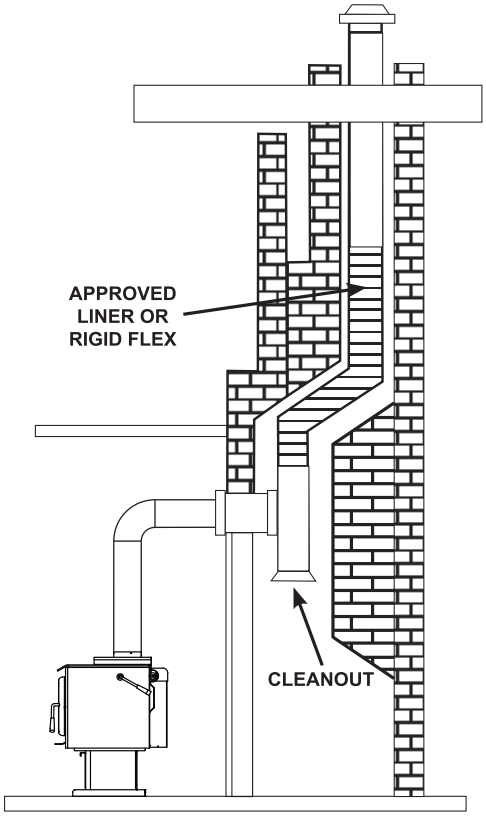
Prefab Chimney Exterior Installation

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. 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.

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.

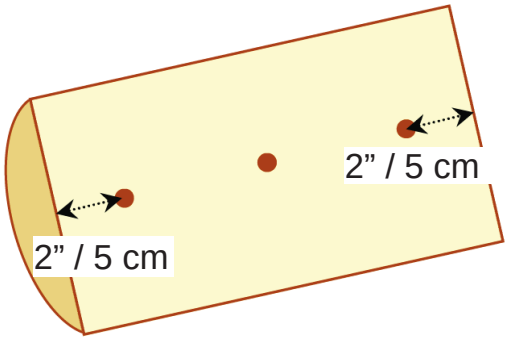
Both hardwood and softwood burn equally well in this appliance, but the more dense hardwood will weigh more per cord and burn a little slower and longer. Never burn salt-water driftwood as it is very corrosive and will deteriorate the structure of the appliance. The burning of salt-water driftwood will 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 is used to manipulate fuel loads.

BYPASS DOOR & BYPASS HANDLE

This 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. To open the bypass door, use the bypass handle to grab the **side of the bypass latch** (**Fig. A)** to pull the rod outward. To close, position the bypass handle on the **center of the bypasss latch** (**Fig. B**) and push inward.

⚠WARNING

DO NOT TOUCH THE BYPASS LATCH DIRECTLY AS DIRECT CONTACT MAY CAUSE SERIOUS BURNS. ALWAYS USE THE BYPASS HANDLE TO MANUVER THE BYPASS LATCH.

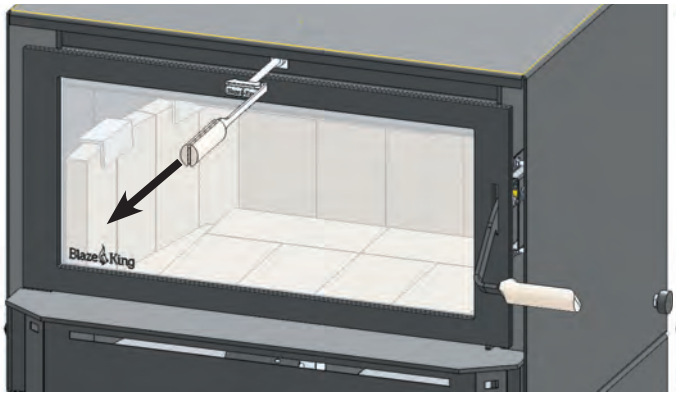


Fig. A

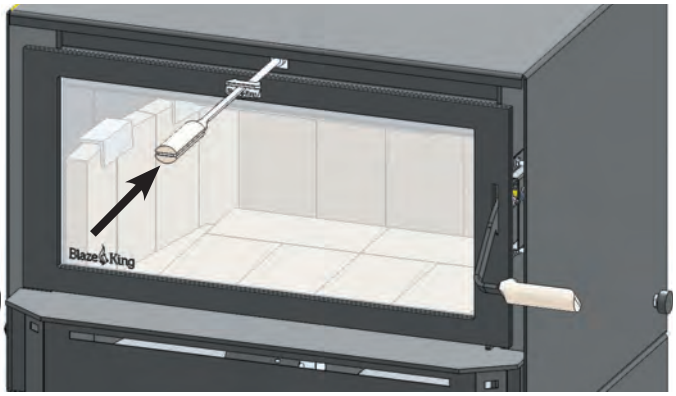


Fig. B

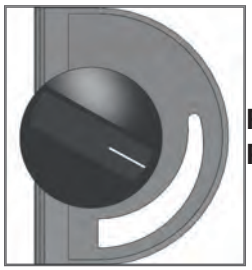
CATALYTIC THERMOMETER

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 below the ash lip of the appliance and is controlled by the thermostat knob which is located on the left side 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 is set at the factory. **DO NOT TAMPER WITH THE THERMOSTAT**, this will result in a malfunctioning thermostat.

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 fitted) **OFF**.
3. Open both the loading door and the bypass 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 (approximately 3 to 5 minutes). **DO NOT LEAVE THE STOVE UNATTENDED.**
6. Once the kindling is fully on fire, place two or three medium size logs onto the fire. Keeping the loading door unlatched, allow the logs to catch fire (approximately 5 minutes). **DO NOT LEAVE THE STOVE UNATTENDED.**
7. Once the logs are burning, latch the loading door shut **BUT** keep the bypass door open. Leaving the loading door open after the 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, finish loading the appliance. Lay the wood as far back in the stove as possible. Latch the loading door shut and observe the catalytic thermometer. Once the needle is in the **ACTIVE ZONE**, close the bypass door.
9. Let the fire burn with the thermostat at the **HIGH** setting for 20-30 minutes or 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. After 20-30 minutes or once the fire is well established, gradually turn the thermostat down to the desired heat output setting. 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. If an optional fan kit is installed, turn the fan on after the initial warm up period of 20-30 minutes.

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 relaoding. Wait 2 minutes for the air flow to stabilize.
2. To help minimize smoke spillage into the room, you may wish to open the bypass door and again wait 2 minutes for the air flow to stabilize.
3. 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 for 20 to 30 minutes OR until the fire is very well established. At that point, turn the thermostat down to the desired setting. Keep in mind, you may not see a large amount of flame activity in the lower thermostat setting. The thermometer needle will remain in the active zone indicating that the burn cycle is continuing.
6. Should you burn the stove on a very low setting for extended periods of time, you will begin to see creosote deposits forming on the glass door. To remove these deposits, simply run the stove on **HIGH** for approximately 30 minutes. The **HIGH** setting will burn off most of the deposits

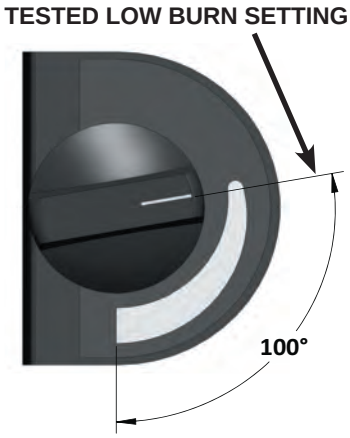
Note: Our loading instructions are outlined in general terms due to the vast array of variables that arise with each installation. Such variables include type of wood fuel, chimney height and configuration, installation altitude, seasonal weather conditions, and the desired heat output required. Over 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. Significantly more smoke may be seen when the exhaust is not routed through the combustor (bypass mode). Smoke may be visible shortly after lighting the fire and shortly after reloading the fire so allow 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

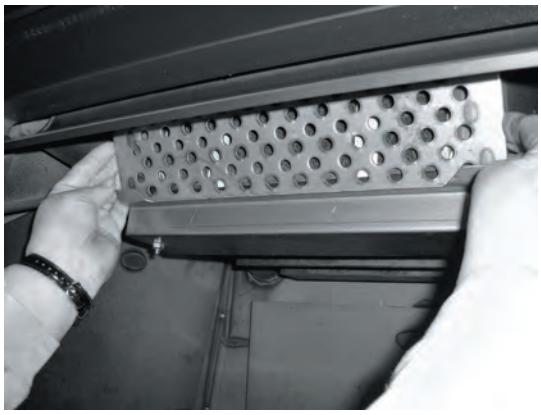
DO NOT PERFORM ANY CLEANING UNTIL THE FIRE IS OUT AND THE APPLIANCE IS COOL. HOT ASH IN A VACUUM CLEANER BAG COULD MELT THE VACUUM AND COULD RESULT IN A HOUSE FIRE CAUSING SERIOUS BODILY HARM.

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

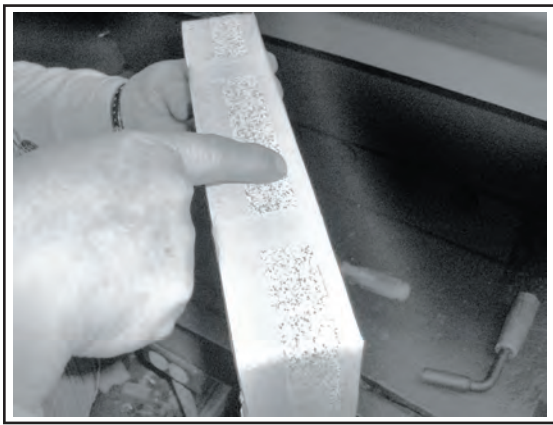
If the catalytic combustor has been deemed "dysfunctional" per the guidelines in "***COMBUSTOR TESTING"***, discontinue use of the appliance until the combustor is replaced. Follow the steps below to complete the replacement **(BLAZE KING RECOMMENDS THAT YOUR DEALER OR CERTIFIED INSTALLER PERFORM THIS 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).

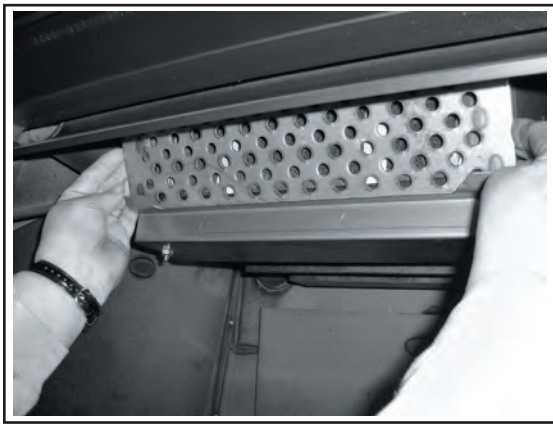
3. There are metal tabs across the bottom and on either side of the combustor. Using a flat blade screwdriver or pocket knife blade, slide the tip in between the metal tab on the left side of the combustor and the steel dome of the stove (the dome is the housing that encases the combustor). Apply slight 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.



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.CAT2425**.

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

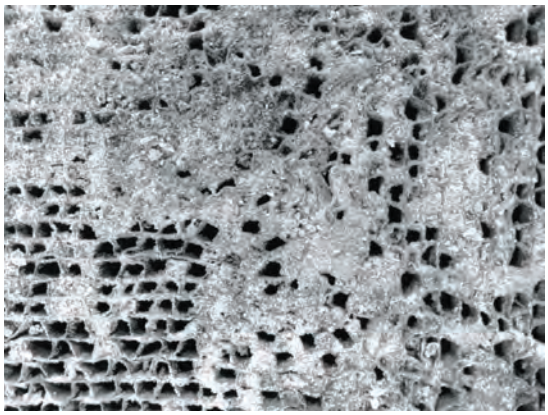
COMBUSTOR TROUBLESHOOTING

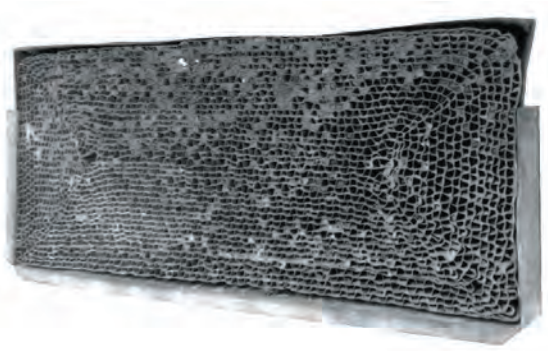
PROBLEM: CREOSOTE PLUGGING

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 with the bypass door closed without the catalytic thermometer needle in the ACTIVE zone.
Solution: Burn dry, seasoned wood and do not close the bypass door 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).

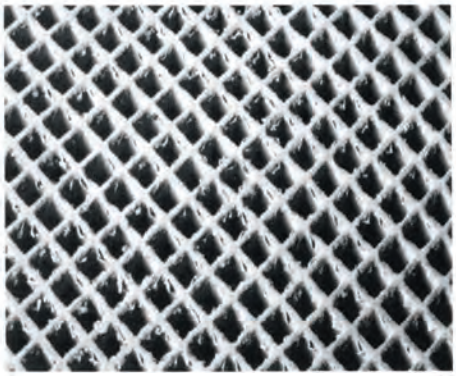




PROBLEM: COMBUSTOR PEELING

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.

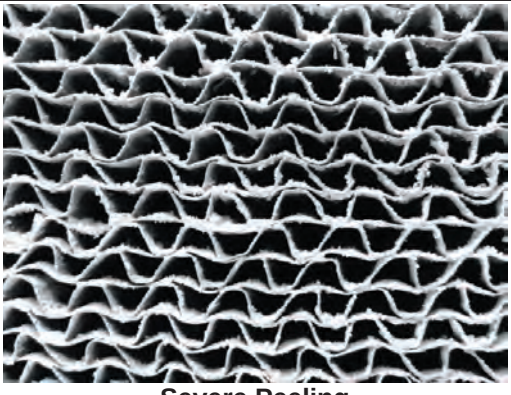
The images to the right are examples of minor peeling (does not affect proper combustor function) and severe peeling (closed or plugged combustor that needs replacement).



Minor Peeling

PROBLEM: CATALYTIC DEACTIVATION

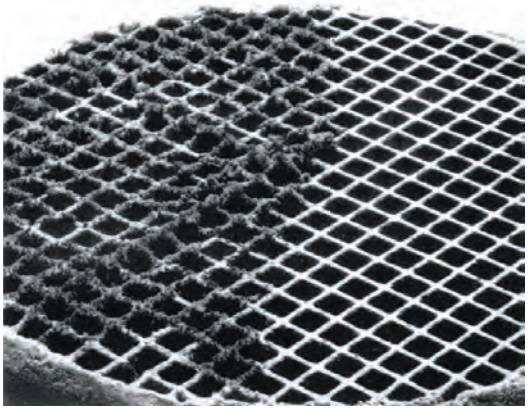
Possible Cause: Burning improper fuels (ie. garbage, pressure-treated lumber, painted wood, etc.).
Solution: Burn good quality, dry, seasoned wood. If proper burning procedures have been followed and this problem persists, replace the combustor with an OEM Blaze King combustor (failure to do so will void your warranty).



Severe Peeling

PROBLEM: COMBUSTOR MASKING

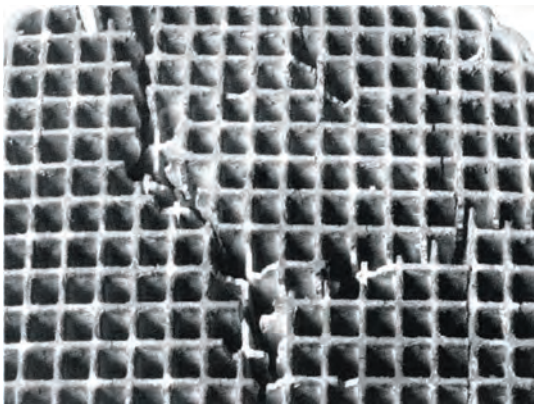
Possible Cause: The combustor is coated with a layer of fly-ash or soot from burning material that produces substantial char and fly-ash.
Solution: When the appliance is cool to touch, clean the front face of the combustor with a soft-bristled brush or vacuum lightly (refer to ***COMBUSTOR CLEANING*** 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

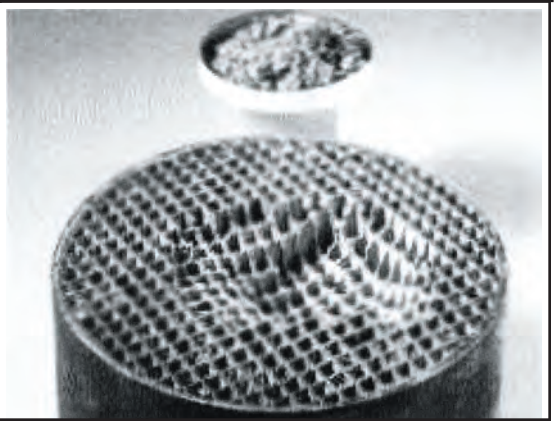
Possible Cause: Mishandling the combustor or operating the appliance without the proper gasket installed.
Solution: Handle with care. Ensure combustor is wrapped with gasket upon reinstallation.

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.

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

1. Open the loading door to gain access to the latch catch on the right side of the firebox. **(Fig. 1)**
2. Use a 7/16" wrench to loosen the two flange nuts on the latch catch.
3. Push the latch catch backwards 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.

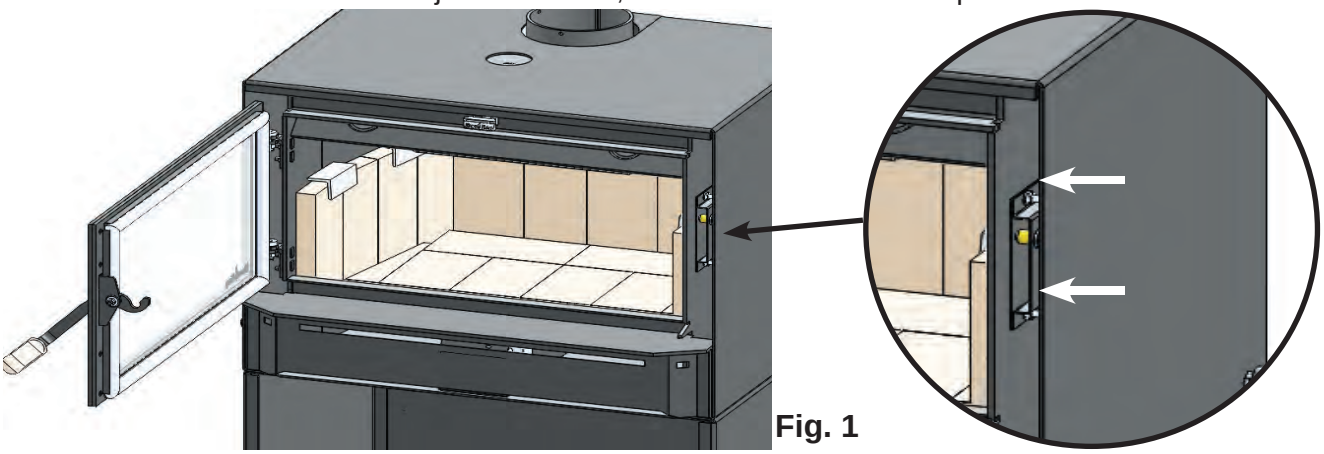


Fig. 1

⚠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.

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

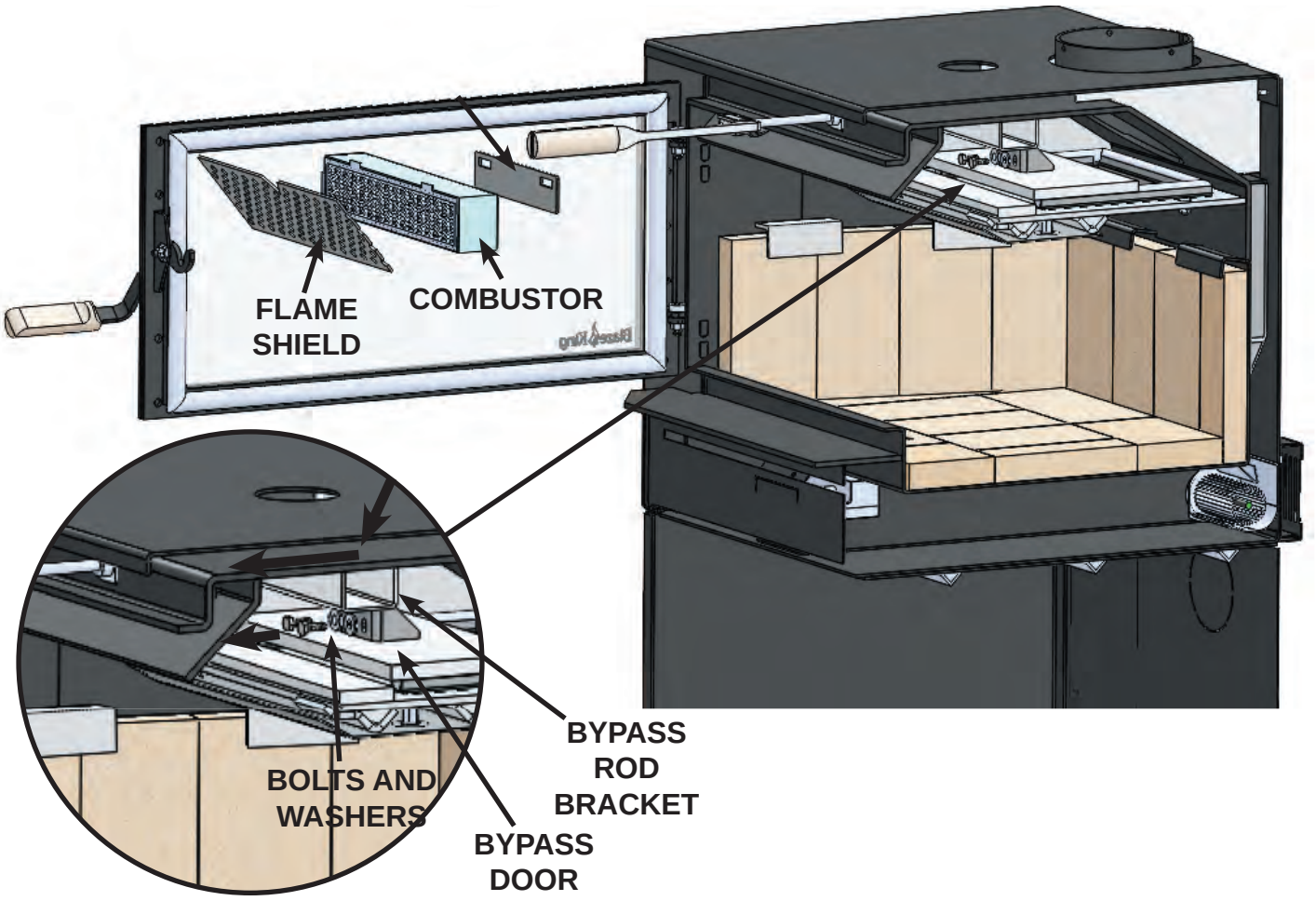
The best way to keep the glass clean is to leave the appliance on high burn for a period of time after each reloading The moisture which is driven from a new load of wood contributes much of the creosote on the inside of the glass. Removing that moisture at the beginning of the burn cycle helps to keep 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

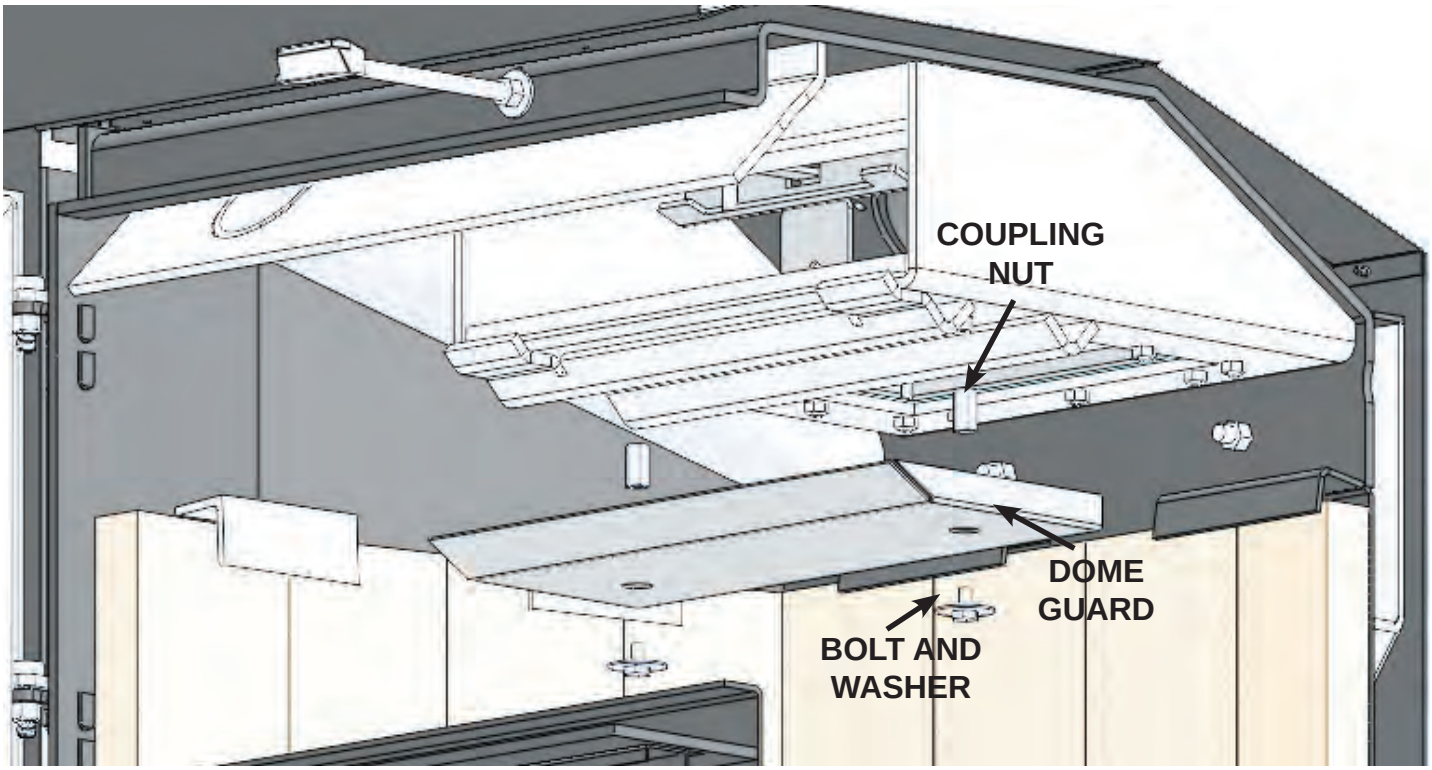
This can be a difficult item to inspect, but to do so would be to visually note the amount of smoke exiting the chimney while the bypass door is both OPEN and CLOSED. There should be significantly less smoke when the door is in the CLOSED position. If this is not the case, the bypass gasket may need to be replaced.
Note: This inspection could also yield a dead combustor, see *"COMBUSTOR MONITORING".*

BYPASS DOOR GASKET RETAINER REPLACEMENT

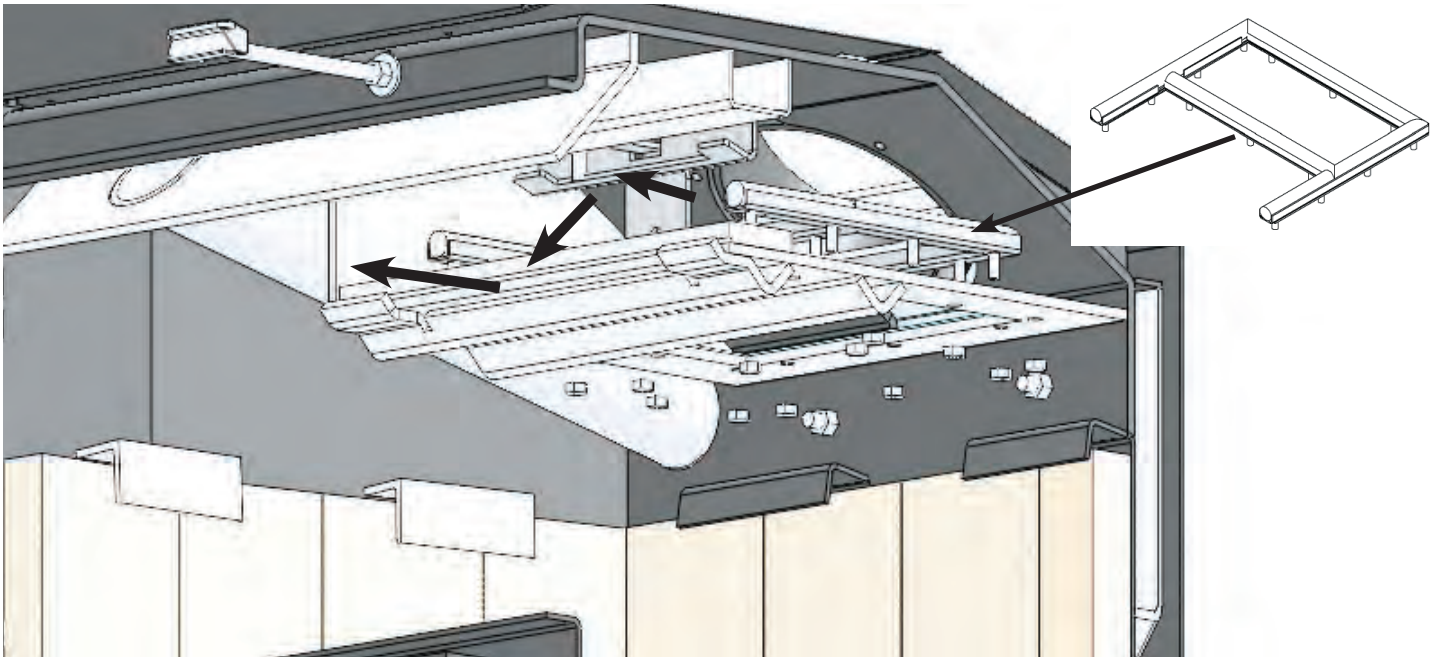
1. Remove flame shield, combustor, and smoke baffle from dome (see "***CATALYTIC COMBUSTOR REPLACEMENT"***).
2. Open the bypass door and use a 7/16" socket to unfasten the bolt and washer that holds the bypass door to the bypass rod bracket. Once loose, remove the bypass door through the combustor opening.



3. Remove the two 1/4-20 bolts and washers that hold the dome guard in place, be sure to support the dome guard during this process is it will come loose. Once the dome guard is removed, unthread the two 1/4-20 coupling nuts that spaced the dome guard from the dome bottom.



4. Remove the twelve remaining 1/4-20 nuts from the dome bottom. Lift the bypass door gasket retainer assembly upwards (enough to clear the threaded posts from the dome) and remove through the combustor opening. Once removed, ensure all debris is cleared from the inner surface of the dome.To reinstall the new bypass door gasket retainer, follow these steps in reverse order.



5. Once the inner dome surface has been cleared, insert the new bypass door gasket retainer assembly and follow the above instructions in reverse to ensure complete install. Ensure that 1/8" ceramic paper is in between the gasket retainer assembly and inner dome surface. Also ensure that all nuts are completely fastened up to the dome bottom. When tightening the 1/4-20 bolt through the bypass door into the bypass rod bracket, do not over tighten. Simply finger tighten the bolt as this allows the bypass door to move down as the gasket begins to seat after the first few fires.
6. When reinstalling the combustor, ensure it has been rewrapped with new expanding gasket that was supplied with the replacement kit. Do not install combustor without gasket.

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.

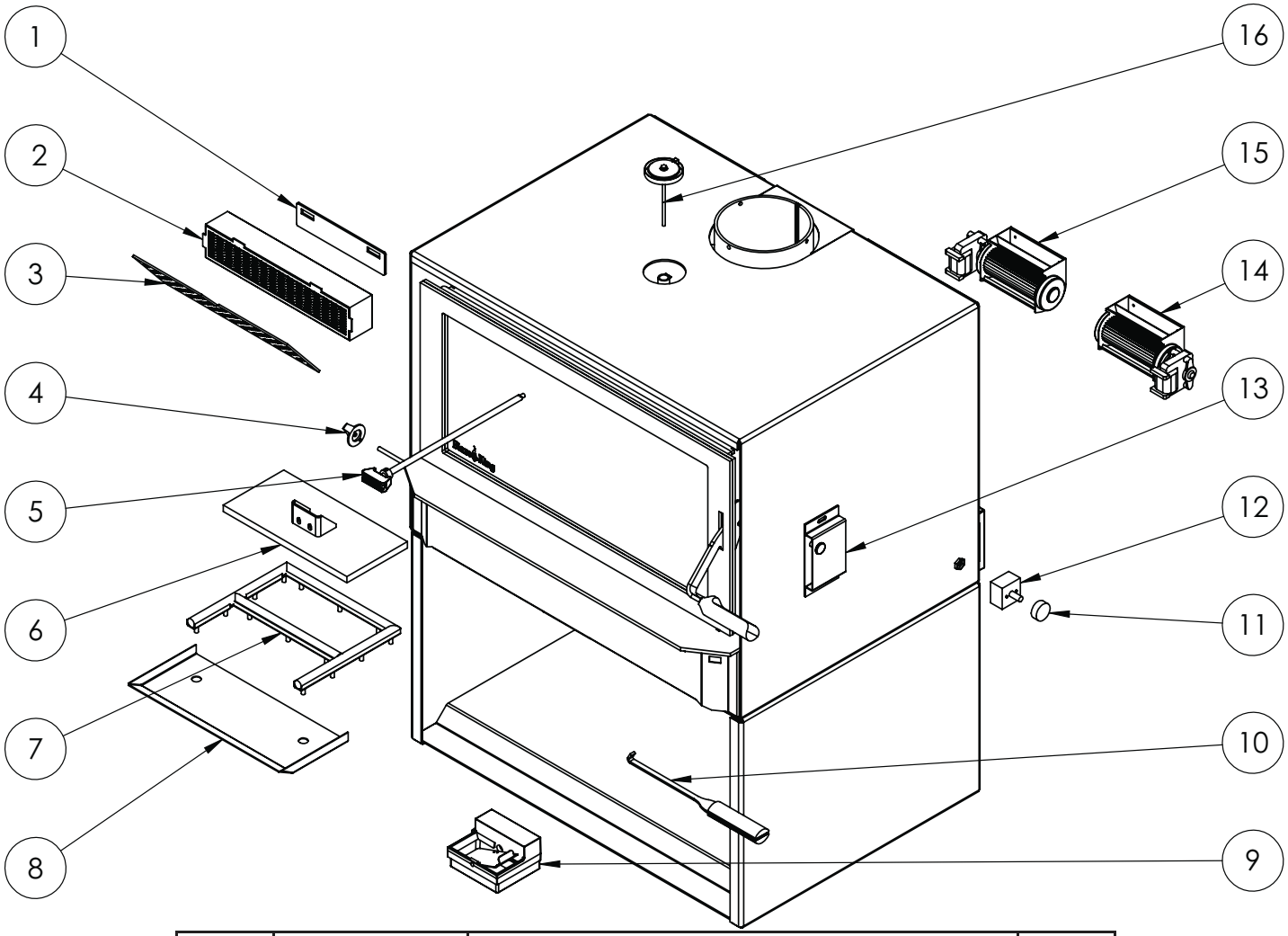
Combustor plugged or coated.	Clean combustor. See “CATALYTIC COMBUSTOR TESTING”
Combustor not functioning.	Check and test combustor. If needed replace combustor. See “CATALYTIC COMBUSTOR, REPLACING”
Thermostat not operating properly.	Consult your blaze King Dealer.
Bypass door leaking or not closing 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.

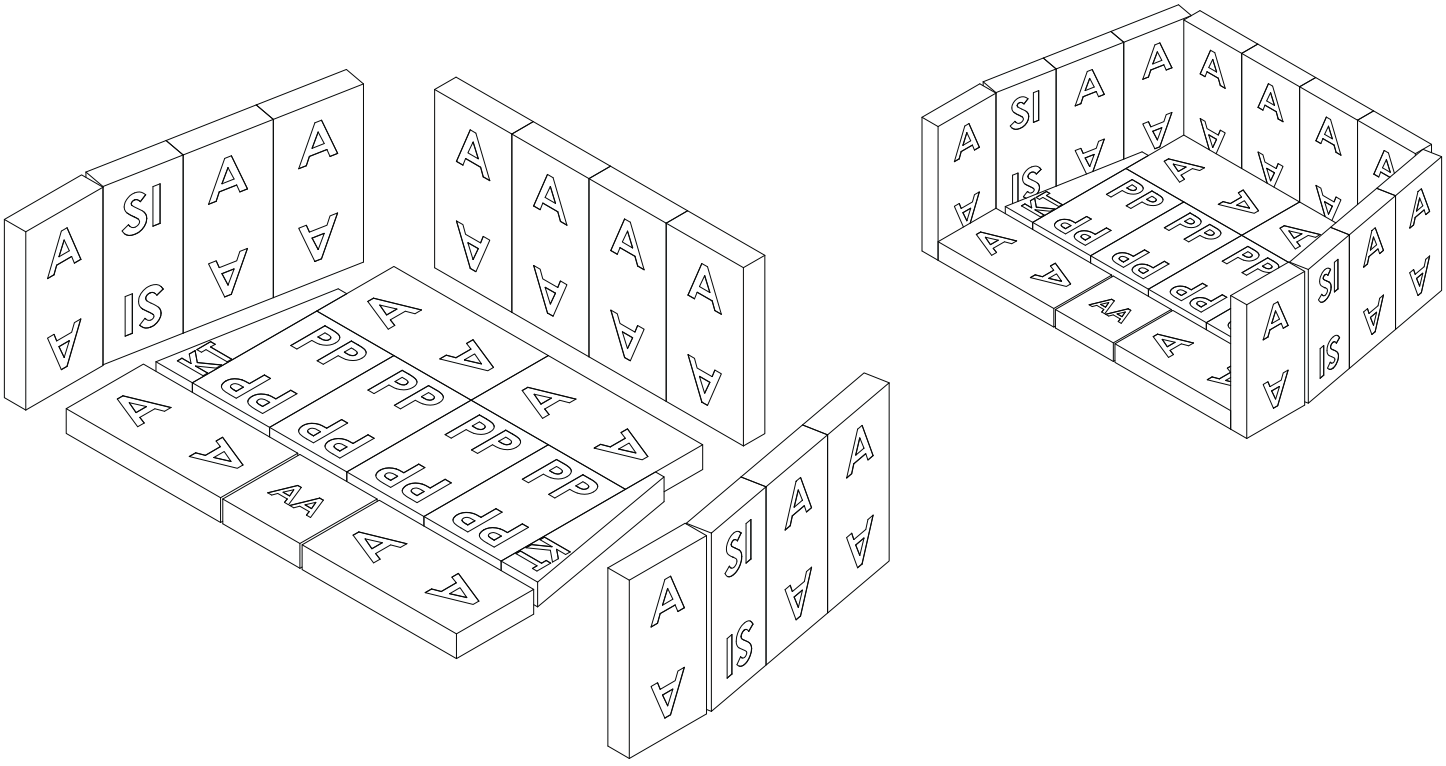
PROBLEM: The combustor temperature cannot be controlled. Turning the thermostat down often makes the combustor temperature go up.
CAUSE Turning the thermostat down, particularly in the first half of the burn cycle, causes the fire to emit more smoke, which is fuel for the combustor. The combustor temperature 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.



Item #	Part #	Description	QTY
1	2049	SMOKE BAFFLE	1
2	S.CAT2425	COMBUSTOR	1
3	2030	FLAME SHELD GRATE	1
4	220.0102	BLACK KNOB 1.50 X 75H (Therm)	1
5	Z2060	BYPASS ROD ASSEMBLY	1
6	Z2019	25 BYPASS DOOR ASM	1
7	Z2022	25 BYPASS GASKET RETAINER ASSEMBLY	1
8	2050	DOME GUARD	1
9	Z3030	25 INSERT THERMOSTAT	1
10	Z2052	BYPASS HANDLE ASSEMBLY	1
11	220.0137	RHEOSTAT KNOB BLACK	1
12	145.0136	RHEOSTAT WITH OFF [O/H/LOW]	1
13	Z2804	ASHFORD DOOR LATCH ASSEMBLY	1
14	150.0710.R	FAN CROSSFLOW 120x47 mm RIGHT	1
15	150.0710.L	FAN CROSSFLOW 120x47 mm LEFT	1
16	120.0342.E	CATALYTIC THERMOMETER W/PAN 4”	1

REFRACTORY BRICK LAYOUT



ITEM NO.	PART NUMBER	QTY.
1	A Size Brick	14
2	AA Size Brick	1
3	KT Size Brick	2
4	PP Size Brick	4
5	SI Size Brick	2

BLAZE KING WOOD LIMITED WARRANTY

Blaze King and Valley Comfort's respective brands extend the following warranty for wood fired appliances purchased from an authorized Blaze King / Valley Comfort dealer and installed in the United States of America or Canada. Warranty starts with date of purchase by the original owner (End User) except as noted for replacement parts.

Warranty Period		Components Covered	
Parts	Labor	Wood	
1 Year		X	All parts, materials and surface finishes (flaking and peeling) Subject to Conditions, Exclusion, and Limitations listed.
2 Years		X	Fan assemblies and motors, thermal sensors, catalytic thermometer, bi-metallic thermostat assembly, door handle metal components.
5 Years	2 Years	X	Firebox & Heat Exchanger, Bypass Door Steel Components
6 Years		X	Catalyst Combustor (see Conditions, Exclusions, and Limitations)
1 Year		X	Other Replacement Parts
SEE CONDITIONS, EXCLUSIONS, AND LIMITATIONS.			

Blaze King Wood Limited 5 Year Warranty

Blaze King is the manufacturer of the Blaze King line of heating products. At Blaze King, our commitment to the highest level of quality and customer service is the most important thing we do. Each Blaze King stove is built on a tradition of using only the finest materials and is backed by our limited warranty to the original purchaser. With Blaze King, you're not just buying a stove; you're buying a company with years of unequalled performance and quality.

Limited Six (6) Year Warranty:
The CATALYTIC COMBUSTOR is under warranty by Blaze King for six (6) years from the date of original retail purchase. The purchaser shall pay the following share of the then current retail price for the combustor: The first three (3) years no charge, 4th year 60%; 5th year 70%, 6th year 80%. The Combustor must be returned to your dealer along with a completed COMBUSTOR FAILURE REPORT and original proof of purchase document.

Limited (5) Year Warranty:
Under this warranty, Blaze King covers the stove body and accessories against defects in materials and workmanship, for part repair or replacement for the first five (5) years *** to the original purchaser. This Warranty covers: All Steel firebox components against defects in material and workmanship. Please see the exclusions and limitation section below as certain restrictions and exclusions apply this warranty.

Limited Two (2) Year Warranty:
Under this warranty, Blaze King covers, fan assemblies , modular thermostat and door handle steel components against defects in materials and workmanship, for part repair or replacement and limited labor for the first two (2) years to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

Limited One (1) Year Warranty:
Under this warranty, Blaze King covers all parts and materials against defects in materials and workmanship including exterior paint finishes, for part repair or replacement and limited labor for the first year to the original purchaser. Please see the exclusions and limitation section below as certain restrictions and exclusions apply to this warranty.

How the Warranty Works

1. All warranties by the manufacturer are set herein and no claim shall be made against the manufacturer on any oral warranty or representation. All claims under this Limited Warranty must be made in writing by your dealer.
2. Any stove or part thereof that is repaired or replaced during the Limited Warranty period will be warranted under the terms of the Limited Warranty for a period not exceeding the remaining term of the original Limited Warranty or six (6) months, whichever is longer.
3. For any part or parts of this stove, which in our judgment show evidence of defects, Blaze King reserves the option to repair or to replace the defective part(s) through an accredited distributor or agent, provided the defective part is returned to the distributor or agent, transportation prepaid, if requested.
4. If you discover a problem that you think may be covered by the Limited Warranty, you MUST REPORT it to your Blaze King dealer WITHIN 30 DAYS from the date the problem was first detected, giving them proof of purchase and the date of purchase. The dealer will investigate the problem and work with Blaze King to determine whether the problem:
   a) Is covered by the Limited Warranty or
   b) Can be fixed in your home or does the product need to be returned to Blaze King for repair.
5. If Blaze King determines that the stove needs to be returned to Blaze King for repair, the customer has the responsibility and the expense of removing it from their home and shipping it to Blaze King. If the problem is covered by the Warranty, Blaze King will repair or replace the item at their discretion and the customer will be responsible for return shipping and re-installation in their home.
6. If the problem is not covered by the Limited Warranty, the customer will be responsible for all repair costs, as well as all storage, shipping and the cost of removing and re-installing the stove.
   If you are not satisfied with the service provided by the Blaze King dealer, write to Blaze King at the address listed on the last page of the Owner's Manual. Include a copy of the original purchase invoice and a description of the problem.

Exclusions and Limitations:

1. This Warranty does not cover tarnish, discoloration or wear on the plated surfaces Painted finishes will change color after initial firing and will continue to change through the lifetime of the stove. This is normal occurrence for all high temperature coatings.
2. This Warranty does not cover gasket material or firebrick.
3. Blaze King strongly recommends installation by a certified installer. Failure to comply may adversely affect coverage under the terms of this warranty. This Limited Warranty covers defects in materials and workmanship only if the product has been installed in accordance with local building and fire codes; in their absence refer to the owner's manual. If the product is damaged or broken as a result of any alteration, wilful abuse, mishandling, accident, neglect, or misuse of the product, the Limited Warranty does not apply.
4. The stove must be operated and maintained at all times in accordance with the instructions in the Owner's Manual. If the unit shows signs of neglect or misuse, it is not covered under the terms of this Warranty policy. Performance problems due to operator error will not be covered by the Limited Warranty policy.
   Some minor expansion, contraction, or movement of certain parts and resulting noise, is normal and not a defect and, therefore, is not covered under this Limited Warranty.
5. Misuse includes over-firing. Over-firing can be identified later by warped plates and paint pigment being burnt off. Over-firing this appliance can cause serious damage and will nullify the Limited Warranty.
6. The Limited Warranty will cover glass thermal breakage only and will not cover misuse of the stove glass, including but not limited to:
   a) Glass that is struck, has surface contaminates or has had harsh or abrasive cleaners used on it.
   b) If the door is slammed or is closed while wood in the firebox is protruding out the stove opening thus striking the glass.
7. This warranty does not cover products made or provided by other manufacturers and used in conjunction with the operation of this stove without prior authorization from Blaze King The use of such products may nullify the Limited Warranty on this stove. If unsure as to the extent of this Limited Warranty, contact your authorized Blaze King dealer before installation.
8. Blaze King will not be responsible for inadequate performance caused by environmental conditions.
9. The Limited Warranty does not cover installation and operational related problems such as use of downdrafts or spillage caused by environmental conditions. Environmental conditions include but are not limited to nearby trees, buildings, roof tops, wind, hills, mountains, inadequate venting or ventilation, excessive offsets, negative air pressures or other influences caused by mechanical systems such as furnaces, fans, clothes dryers etc.
10. The Limited Warranty does not cover damage caused by burning salt-saturated wood, corrosive driftwood, chemically treated wood or any fuel not recommended in the Owner's Manual (use cord wood only).
11. The Limited Warranty is void if:
    a) The stove has been operated in atmospheres contaminated by chlorine, fluorine or other damaging chemicals.
    b) The stove is subject to submersion in water or prolonged periods of dampness or condensation.
    c) Any damage to the unit, combustion chamber or other components due to water, or weather damage which is the result of, but not limited to, improper chimney/venting installation.
    d) Salt air in coastal areas or high humidity can be corrosive to the finish; these environmental conditions can cause rusting. Damage caused by salt air or high humidity is not covered by the Limited Warranty.
12. Exclusions to the Limited Warranty include: injury, loss of use, damage, failure to function due to accident, negligence, misuse, improper installation, alteration or adjustment of the manufacturer's settings of components, lack of proper and regular maintenance, alteration, or act of God.
13. The Limited Warranty does not cover damage caused to the stove while in transit. If this occurs, do not operate the stove and contact your courier and/or dealer.
14. The Limited Warranty does not extend to or include paint, door or glass gaskets or firebricks damage caused by normal wear and tear, such as paint discoloration or chipping, worn or torn gaskets, chipped or cracked firebrick, etc.
15. The Limited Warranty does not include damage to the unit caused by abuse, improper installation, or modification of the unit.
16. Damage to plated surfaces caused by fingerprints, scratches, melted items, or other external scores and residues left on the plated surfaces from the use of abrasive cleaners or polishes is not covered in this warranty.

17. Blaze King is free of liability for any damages caused by the stove, as well as inconvenience expenses and materials. The Limited Warranty does not cover incidental or consequential damages.
18. The Limited Warranty does not cover any loss or damage incurred by the use or removal of any component or apparatus to or from the Blaze King stove without the express written permission of Blaze King and bearing a Blaze King label of approval.
19. Any statement or representation of Blaze King Products and their performance contained in Blaze King advertising, packaging literature, or printed material is not part of the Limited Warranty.
20. The Limited Warranty is automatically voided if the stove's serial number has been removed or altered in any way. If the stove is used for commercial purposes, it is excluded from the Limited Warranty.
21. No dealer, distributor, or similar person has the authority to represent or warrant Blaze King Products beyond the terms contained within the Limited Warranty. Blaze King assumes no liability for such warranties or representations.
22. Blaze King will not cover the cost of the removal or re-installation of the stove, hearth, facing, mantels, venting or other components.
23. Labor to replace or repair items under this Limited Warranty will be covered per our warranty service fee reimbursement and labor rates are set per component schedule. Labor rates vary from location to location and as such total labor costs may not be covered. Please consult with your dealer or service technician for any additional charges such as travel time or additional labor charges that may apply.
24. For parts of the Blaze King 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.

8.3 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)		

VBU1 - Verified Before Use using Item No. 6

VBU2 - 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

Previous Calibration Comparision

Date	4/27/2023	Acceptable Deviation (5%)	Deviation
y Factor	1.007	0.05035	0.009
Acceptance	Acceptable		

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

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. $y = [Vr \times (y \text{ factor (ref)}) \times (Pb + (Pr/ 13.6)) \times (Td + 460)]/ [Vd \times (Pb + (Pd / 13.6)) \times (Tr + 460)]$

** 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 (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		

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

Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.006
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	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. $y = [Vr \times (y\ factor\ (ref)) \times (Pb + (Pr/13.6)) \times (Td + 460)] / [Vd \times (Pb + (Pd/13.6)) \times (Tr + 460)]$

** 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 (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 °C	10.0010	9.601	10.401	0.101	9.900 °C	7.5E-02 ✓
	30 °C	30.0010	29.601	30.401	0.201	29.800 °C	7.5E-02 ✓
	60 °C	59.9910	59.591	60.391	0.291	59.700 °C	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

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. Britton 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

Control No. C-SFU-0002 Doc. Effective Date: 05/07/2008

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 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

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

616

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 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

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.

618

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

ilac-MRA

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

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

621

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 Archival of Test Specimen

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

Contents of Firebox

Appliance banded to pallet, then two seals applied over banding

Appliance Shrink-Wrapped and three additional seals added

Example seal

Ready for shipment back to manufacturer

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 0142WN016E, December 31, 2015, revised June 8, 2021

10. Appendices

Appendix A - (CBI Only)

Appendix B - Manufacturer's letter describing air control mechanism

Appendix C - ALT-154

Appendix D - Full 1-minute data for Run 5 and linearization of 9 missing data points for CSA B415.1

Appendix E - Original 50 hours conditioning data

Appendix F - 30-Day Notice

Appendix G - (CBI Only)

Appendix B

Manufacturer's communication regarding Air 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 Stopped
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@6 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

636

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 Stopped
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@6 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

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 Stopped
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@6 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		550.97
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

638

Wood Heater Test Data - EPA Method 5G

Run:

Manufacturer: Blaze King
Model: PE32
Tracking No.:
Project No.: Low Burn - Invalid Run Stuffed
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@6 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

639

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

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

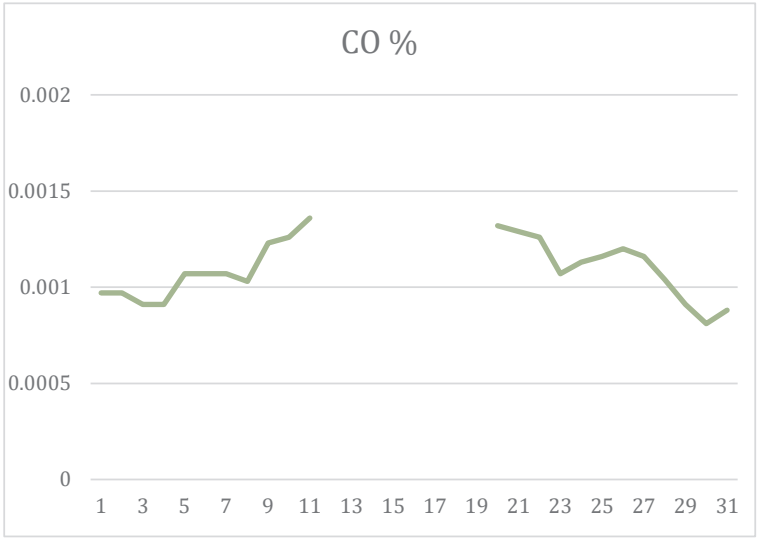
cc: Shannon Banner, EPA/OAQPS/SPPD
Lessard, Patrick, EPA/OAQPS/SPPD
Rafael Sanchez, EPA/OECA
Robert Scinta, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD
Mark Turner, EPA/OAQPS/SPPD
Richard Wayland, EPA/OAQPS/AQAD

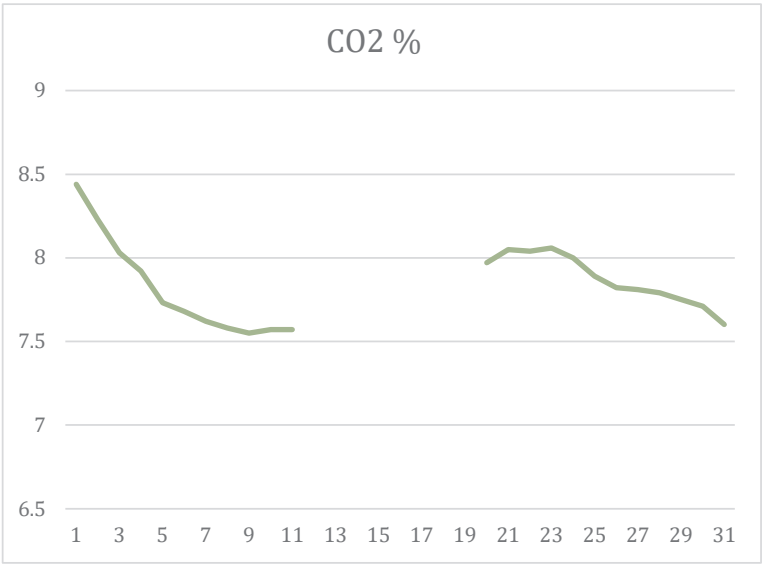
Appendix D - Full Data Set for Run 5

As discussed in section 4, with approximately one hour remaining in the test of run 5 the computer for the datalogging system was accidentally reset when the attending technician's bumped into the computer's reset button. It took several minutes to restart the computer and datalogger system. Fortunately, the blackout of data only lasted 8 minutes and occurred inside of a ten minute interval from when the test had originally began. Therefore, no loss of data associated with 10-minute interval calculations of proportionality had occurred.

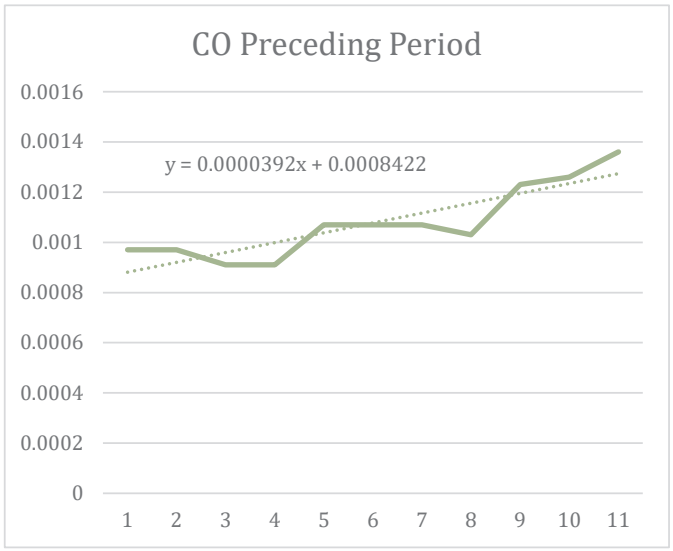
1-minute interval data for CSA B415.1 was effected. However, since nearly 80% of the test had already passed before this event occurred, carbon dioxide (CO2) and carbon monoxide levels were no longer changing very rapidly. The missing CO2 and CO values were linearized based on the trends of the preceding and subsequent 10 - minute periods of the event. The hole in this data appears as follows:

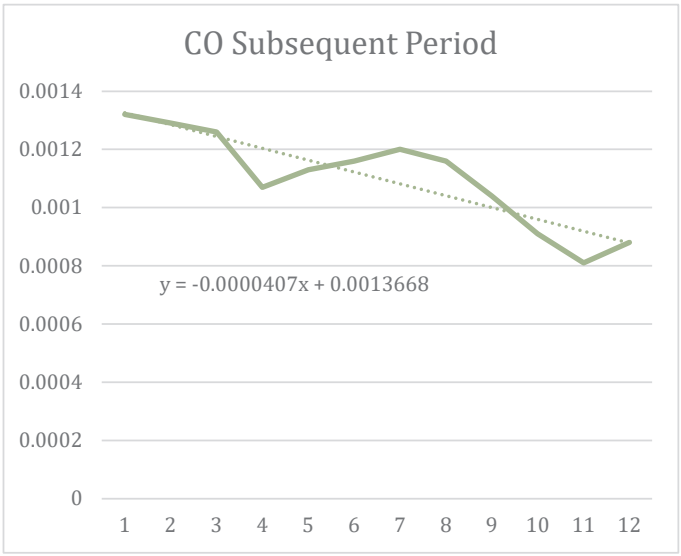
Time (min)	CO (ppm)	CO2 (%)	CO (%)
160	9.7	8.44	0.00097
161	9.7	8.23	0.00097
162	9.1	8.03	0.00091
163	9.1	7.92	0.00091
164	10.7	7.73	0.00107
165	10.7	7.68	0.00107
166	10.7	7.62	0.00107
167	10.3	7.58	0.00103
168	12.3	7.55	0.00123
169	12.6	7.57	0.00126
170	13.6	7.57	0.00136
171			
172			
173			
174	linearization explained below		
175			
176			
177			
178			
179	13.2	7.97	0.00132
180	12.9	8.05	0.00129
181	12.6	8.04	0.00126
182	10.7	8.06	0.00107
183	11.3	8	0.00113
184	11.6	7.89	0.00116
185	12	7.82	0.0012
186	11.6	7.81	0.00116
187	10.4	7.79	0.00104
188	9.1	7.75	0.00091
189	8.1	7.71	0.00081
190	8.8	7.6	0.00088



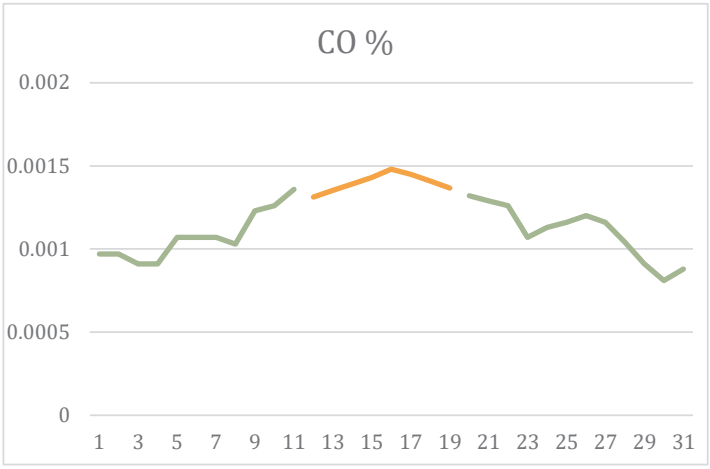


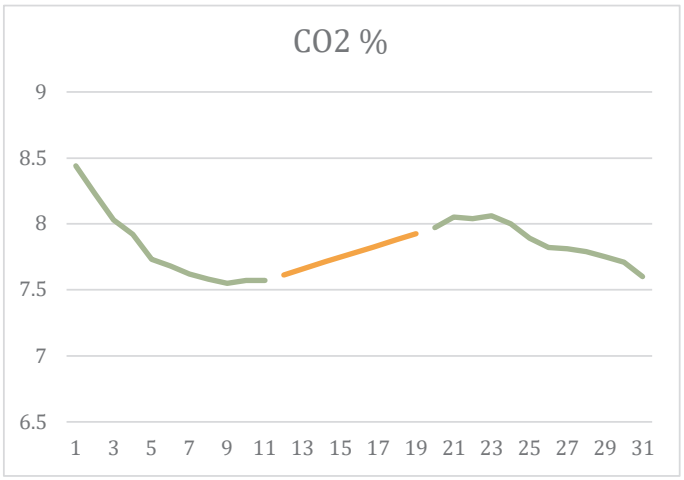
For the CO, the over-all trend was upward before the event, and downward after the event. Both of these trends are linearized to the point where they intersect with one-another.





Upward Trend		Downward Trend		
12	0.0013126	-7	0.0016517	
13	0.0013518	-6	0.001611	
14	0.001391	-5	0.0015703	
15	0.0014302	-4	0.0015296	
16	0.0014694	-3	0.0014889	Approx. intersect at 0.00147
17	0.0015086	-2	0.0014482	
18	0.0015478	-1	0.0014075	
19	0.001587	0	0.0013668	





The linearization for the CO2 is a simple upward slope: dy/dx = (7.97 - 7.57) / 9 = 0.0444 → 0.0444x + 7.57

The missing 9 data points have been approximated in the manner described above in the CSA B415.1 spreadsheet for CO, CO2, flue temp and room temp. The following pages are the full 1-minute data for run 5 with the hole. Note that the proportionality results in this data can not be calculated as-is. This is the reason for presenting the data in 10-minute interval form in section 5.

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 17:27
Test Length: 216 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 @	22.5	in. Hg
Post-Test	0	cfm @	9.82	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		14.0	**35.182**	**0.304**	**1.25**	**81.4**	**1.97**	**74.97**	**57.09**	**73.63**	**186.0**	**97.5**	**0.114**	**0.338**	**19.18**
Minimum	0.0	-1.1	0.000	0.148	0.82	75	1.76	70	54	73	16.6	92	0.109	0.330	19.00
Max	15.4	0.2	35.182	29.308	1.29	83	1.98	76	62	75	17909.5	138	0.117	0.342	19.77
0	15.4		0.000		0.82	75	1.76	70	62	75		138	0.109	0.330	19.77
1	15.2	0.2	0.148	0.148	1.29	75	1.96	72	55	75	n/a	133	0.113	0.336	19.56
2	15.1	0.1	0.311	0.163	1.27	75	1.97	73	54	75	103.5	109	0.115	0.339	19.58
3	15.0	0.1	0.474	0.163	1.27	75	1.97	73	54	75	101.5	104	0.113	0.336	19.33
4	14.9	0.1	0.636	0.162	1.28	75	1.97	73	54	75	101.0	101	0.115	0.339	19.26
5	14.9	0.0	0.799	0.163	1.27	75	1.96	73	54	74	101.3	100	0.115	0.339	19.31
6	14.8	0.1	0.961	0.162	1.27	75	1.97	73	54	74	100.4	99	0.115	0.339	19.29
7	14.7	0.1	1.123	0.162	1.26	75	1.96	73	54	74	100.2	99	0.117	0.342	19.37
8	14.6	0.1	1.285	0.162	1.27	75	1.96	73	54	74	100.1	99	0.114	0.338	19.33
9	14.5	0.1	1.448	0.163	1.26	75	1.96	73	54	74	101.1	98	0.114	0.338	19.19
10	14.4	0.1	1.610	0.162	1.26	76	1.95	73	54	74	100.6	98	0.114	0.338	19.18
11	14.4	0.0	1.772	0.162	1.25	76	1.95	74	54	74	100.4	98	0.115	0.339	19.23
12	14.3	0.1	1.933	0.161	1.26	76	1.95	74	54	74	99.6	98	0.115	0.339	19.27
13	14.2	0.1	2.094	0.161	1.26	76	1.95	74	54	73	99.5	98	0.115	0.339	19.27
14	14.1	0.1	2.256	0.162	1.25	76	1.95	74	54	74	100.2	98	0.114	0.338	19.23
15	14.0	0.1	2.417	0.161	1.25	76	1.94	74	54	73	99.7	97	0.115	0.339	19.22
16	14.0	0.0	2.580	0.163	1.24	76	1.95	74	54	73	100.6	97	0.116	0.341	19.29
17	13.9	0.1	2.741	0.161	1.25	77	1.95	74	54	73	99.1	97	0.115	0.339	19.29
18	13.8	0.1	2.903	0.162	1.24	77	1.95	74	54	73	99.5	97	0.117	0.342	19.34
19	13.7	0.1	3.064	0.161	1.24	77	1.95	74	54	73	98.8	97	0.115	0.339	19.34
20	13.6	0.1	3.225	0.161	1.25	77	1.95	74	54	73	98.9	97	0.116	0.341	19.29
21	13.6	0.0	3.387	0.162	1.25	77	1.94	74	55	73	99.6	97	0.115	0.339	19.29
22	13.5	0.1	3.549	0.162	1.25	77	1.95	74	55	73	16.6	97	0.115	0.339	19.25
23	13.4	0.1	3.711	0.162	1.25	77	1.95	74	55	73	99.7	97	0.116	0.341	19.29
24	13.3	0.1	3.872	0.161	1.25	78	1.94	74	55	73	98.9	97	0.115	0.339	19.29
25	13.2	0.1	4.033	0.161	1.24	78	1.95	75	55	73	99.0	97	0.114	0.338	19.21
26	13.1	0.1	4.197	0.164	1.27	78	1.97	75	55	73	101.1	97	0.115	0.339	19.21
27	13.0	0.1	4.360	0.163	1.27	78	1.97	75	55	73	100.4	96	0.114	0.338	19.20
28	13.0	0.0	4.523	0.163	1.28	78	1.97	75	55	73	100.3	96	0.116	0.341	19.23
29	12.9	0.1	4.686	0.163	1.27	78	1.97	75	55	73	100.2	96	0.114	0.338	19.23
30	12.8	0.1	4.850	0.164	1.27	78	1.97	75	55	73	101.1	96	0.113	0.336	19.11
31	12.7	0.1	5.013	0.163	1.27	79	1.97	75	55	73	100.7	96	0.114	0.338	19.11
32	12.7	0.0	5.176	0.163	1.27	79	1.97	75	55	73	100.4	96	0.115	0.339	19.19
33	12.6	0.1	5.340	0.164	1.27	79	1.96	75	55	73	100.7	96	0.115	0.339	19.23
34	12.5	0.1	5.504	0.164	1.23	79	1.93	75	56	73	100.4	95	0.116	0.341	19.27
35	12.4	0.1	5.666	0.162	1.26	79	1.96	75	56	73	99.0	95	0.116	0.341	19.30
36	12.3	0.1	5.829	0.163	1.25	79	1.95	75	56	73	99.8	96	0.114	0.338	19.23
37	12.2	0.1	5.991	0.162	1.25	79	1.96	75	56	73	99.3	95	0.116	0.341	19.23
38	12.1	0.1	6.153	0.162	1.26	79	1.96	75	56	73	99.3	95	0.114	0.338	19.22
39	12.1	0.0	6.316	0.163	1.26	80	1.96	75	56	73	99.9	95	0.115	0.339	19.18
40	12.0	0.1	6.478	0.162	1.25	80	1.95	75	56	73	99.3	96	0.115	0.339	19.23

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 17:27
Test Length: 216 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 @	22.5	in. Hg
Post-Test	0	cfm @	9.82	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	11.9	0.1	6.641	0.163	1.26	80	1.96	75	56	73	99.7	96	0.116	0.341	19.28
42	11.8	0.1	6.804	0.163	1.26	80	1.96	75	56	73	99.4	95	0.116	0.341	19.31
43	11.7	0.1	6.967	0.163	1.26	80	1.95	75	56	73	99.4	95	0.115	0.339	19.26
44	11.7	0.0	7.130	0.163	1.25	80	1.97	75	56	73	99.5	96	0.117	0.342	19.31
45	11.6	0.1	7.293	0.163	1.25	80	1.96	75	56	73	99.3	95	0.115	0.339	19.31
46	11.5	0.1	7.455	0.162	1.26	80	1.96	75	57	73	99.0	95	0.114	0.338	19.18
47	11.4	0.1	7.617	0.162	1.26	80	1.96	75	57	73	99.3	95	0.115	0.339	19.18
48	11.3	0.1	7.780	0.163	1.25	80	1.96	75	57	73	99.8	96	0.116	0.341	19.27
49	11.3	0.0	7.943	0.163	1.26	80	1.97	75	57	73	99.4	95	0.116	0.341	19.31
50	11.2	0.1	8.106	0.163	1.26	81	1.96	75	57	73	99.1	95	0.117	0.342	19.34
51	11.1	0.1	8.268	0.162	1.26	81	1.97	75	57	73	98.3	95	0.116	0.341	19.34
52	11.0	0.1	8.432	0.164	1.26	81	1.96	75	57	73	99.7	95	0.115	0.339	19.26
53	11.0	0.0	8.595	0.163	1.25	81	1.96	75	57	73	99.3	95	0.116	0.341	19.26
54	10.9	0.1	8.758	0.163	1.26	81	1.96	75	57	73	99.3	95	0.115	0.339	19.26
55	10.8	0.1	8.921	0.163	1.26	81	1.96	75	57	73	99.4	95	0.115	0.339	19.22
56	10.7	0.1	9.084	0.163	1.25	81	1.96	75	57	73	99.5	95	0.115	0.339	19.22
57	10.7	0.0	9.246	0.162	1.26	81	1.96	75	57	73	98.9	96	0.116	0.341	19.27
58	10.6	0.1	9.409	0.163	1.25	81	1.96	75	57	73	99.5	96	0.114	0.338	19.23
59	10.5	0.1	9.572	0.163	1.26	81	1.96	75	57	73	99.7	96	0.115	0.339	19.19
60	10.4	0.1	9.735	0.163	1.26	81	1.96	75	57	73	99.6	96	0.116	0.341	19.28
61	10.3	0.1	9.898	0.163	1.26	81	1.97	75	57	73	99.6	97	0.114	0.338	19.24
62	10.2	0.1	10.061	0.163	1.26	81	1.96	75	57	73	100.0	97	0.114	0.338	19.17
63	10.1	0.1	10.224	0.163	1.26	82	1.96	75	57	73	100.0	96	0.114	0.338	19.16
64	10.0	0.1	10.388	0.164	1.25	82	1.97	75	57	74	100.4	97	0.115	0.339	19.20
65	10.0	0.0	10.551	0.163	1.26	82	1.96	75	58	73	100.0	97	0.112	0.335	19.13
66	9.9	0.1	10.714	0.163	1.26	82	1.97	75	58	73	100.3	97	0.114	0.338	19.08
67	9.8	0.1	10.877	0.163	1.25	82	1.97	75	58	73	100.3	97	0.113	0.336	19.13
68	9.7	0.1	11.040	0.163	1.26	82	1.97	75	58	73	100.1	97	0.115	0.339	19.17
69	9.6	0.1	11.202	0.162	1.26	82	1.96	75	58	73	99.1	97	0.115	0.339	19.25
70	9.5	0.1	11.365	0.163	1.26	82	1.97	75	58	74	99.5	97	0.115	0.339	19.25
71	9.4	0.1	11.528	0.163	1.26	82	1.96	75	58	73	99.6	98	0.115	0.339	19.26
72	9.3	0.1	11.691	0.163	1.26	82	1.97	75	58	73	99.9	98	0.113	0.336	19.18
73	9.2	0.1	11.854	0.163	1.26	82	1.96	75	58	73	99.9	98	0.116	0.341	19.23
74	9.1	0.1	12.018	0.164	1.26	82	1.96	75	58	73	100.3	98	0.114	0.338	19.27
75	9.1	0.0	12.181	0.163	1.26	82	1.97	75	58	73	99.9	98	0.113	0.336	19.14
76	9.0	0.1	12.345	0.164	1.26	82	1.96	75	58	73	100.9	98	0.114	0.338	19.14
77	8.9	0.1	12.508	0.163	1.26	82	1.96	75	58	73	100.4	98	0.112	0.335	19.10
78	8.8	0.1	12.671	0.163	1.25	82	1.97	75	58	74	100.6	98	0.113	0.336	19.06
79	8.7	0.1	12.834	0.163	1.25	82	1.97	75	58	74	100.4	98	0.115	0.339	19.18
80	8.6	0.1	12.997	0.163	1.25	82	1.96	75	58	74	99.8	98	0.115	0.339	19.27
81	8.6	0.0	13.160	0.163	1.26	82	1.97	75	58	74	99.7	98	0.114	0.338	19.23
82	8.5	0.1	13.323	0.163	1.26	82	1.97	75	58	74	100.1	98	0.113	0.336	19.14
83	8.4	0.1	13.486	0.163	1.26	82	1.97	75	58	74	100.1	98	0.116	0.341	19.23
84	8.3	0.1	13.649	0.163	1.26	82	1.97	75	58	73	99.8	98	0.113	0.336	19.23

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

Run: 5
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 17:27
Test Length: 216 min
Recording Interval: 1 min

Test Date: 3/1/24

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 @	22.5	in. Hg
Post-Test	0	cfm @	9.82	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	3.9	0.1	20.989	0.162	1.25	83	1.98	76	59	74	99.5	101	0.115	0.339	19.28
130	3.8	0.1	21.152	0.163	1.25	83	1.98	76	59	74	99.9	101	0.114	0.338	19.28
131	3.7	0.1	21.315	0.163	1.25	83	1.98	76	59	74	100.2	102	0.113	0.336	19.20
132	3.6	0.1	21.478	0.163	1.25	83	1.98	76	59	74	100.6	101	0.112	0.335	19.12
133	3.5	0.1	21.641	0.163	1.25	83	1.98	76	59	74	100.8	101	0.113	0.336	19.11
134	3.4	0.1	21.805	0.164	1.25	83	1.98	76	59	74	101.4	102	0.113	0.336	19.16
135	3.4	0.0	21.968	0.163	1.25	83	1.97	76	59	74	100.5	101	0.114	0.338	19.20
136	3.3	0.1	22.131	0.163	1.25	83	1.97	76	59	75	100.5	101	0.112	0.335	19.15
137	3.2	0.1	22.293	0.162	1.24	83	1.97	76	59	74	100.0	101	0.114	0.338	19.15
138	3.1	0.1	22.456	0.163	1.24	83	1.97	76	59	75	100.5	101	0.113	0.336	19.19
139	3.0	0.1	22.619	0.163	1.25	83	1.98	76	59	75	100.4	101	0.114	0.338	19.19
140	3.0	0.0	22.782	0.163	1.25	83	1.98	76	59	74	100.1	100	0.115	0.339	19.27
141	2.9	0.1	22.945	0.163	1.25	83	1.98	76	59	74	99.9	100	0.113	0.336	19.22
142	2.8	0.1	23.108	0.163	1.25	83	1.98	76	59	74	100.5	100	0.111	0.333	19.05
143	2.8	0.0	23.271	0.163	1.25	83	1.97	76	59	75	100.9	100	0.113	0.336	19.05
144	2.7	0.1	23.434	0.163	1.25	83	1.97	76	58	74	100.5	99	0.114	0.338	19.17
145	2.6	0.1	23.598	0.164	1.25	83	1.98	76	58	75	100.8	99	0.113	0.336	19.16
146	2.6	0.0	23.761	0.163	1.25	83	1.97	76	58	75	100.2	99	0.114	0.338	19.16
147	2.5	0.1	23.924	0.163	1.25	83	1.97	76	58	75	100.2	99	0.113	0.336	19.16
148	2.4	0.1	24.087	0.163	1.24	83	1.98	76	58	75	100.3	99	0.113	0.336	19.12
149	2.4	0.0	24.249	0.162	1.25	83	1.98	76	58	75	99.6	99	0.115	0.339	19.20
150	2.3	0.1	24.412	0.163	1.25	83	1.97	76	58	75	100.0	98	0.112	0.335	19.15
151	2.3	0.0	24.575	0.163	1.25	83	1.98	76	58	74	100.2	98	0.114	0.338	19.10
152	2.2	0.1	24.738	0.163	1.25	83	1.98	76	58	75	100.2	98	0.113	0.336	19.14
153	2.1	0.1	24.901	0.163	1.25	83	1.98	76	58	75	100.1	98	0.114	0.338	19.14
154	2.1	0.0	25.064	0.163	1.25	83	1.98	76	58	75	100.0	98	0.114	0.338	19.18
155	2.0	0.1	25.227	0.163	1.25	83	1.98	76	58	75	99.9	98	0.114	0.338	19.18
156	2.0	0.0	25.391	0.164	1.25	83	1.97	76	58	75	100.6	98	0.113	0.336	19.14
157	1.9	0.1	25.554	0.163	1.24	83	1.98	76	58	74	100.2	98	0.113	0.336	19.10
158	1.9	0.0	25.717	0.163	1.25	83	1.98	76	58	75	100.2	98	0.114	0.338	19.14
159	1.8	0.1	25.880	0.163	1.25	83	1.98	76	58	74	100.0	98	0.114	0.338	19.18
160	1.8	0.0	26.043	0.163	1.25	83	1.97	76	58	74	99.9	98	0.114	0.338	19.18
161	1.7	0.1	26.206	0.163	1.25	83	1.97	76	58	74	100.0	98	0.113	0.336	19.14
162	1.7	0.0	26.369	0.163	1.24	83	1.98	76	58	74	100.1	97	0.113	0.336	19.09
163	1.6	0.1	26.532	0.163	1.25	83	1.97	75	58	74	100.4	97	0.111	0.333	19.00
164	1.6	0.0	26.695	0.163	1.25	83	1.98	75	58	75	100.7	97	0.113	0.336	19.00
165	1.6	0.0	26.858	0.163	1.25	83	1.97	75	58	74	100.6	97	0.112	0.335	19.04
166	1.5	0.1	27.021	0.163	1.26	83	1.98	75	58	74	100.4	97	0.113	0.336	19.04
167	1.5	0.0	27.185	0.164	1.25	83	1.97	75	58	74	101.0	97	0.113	0.336	19.08
168	1.5	0.0	27.348	0.163	1.24	83	1.98	75	58	74	100.1	97	0.114	0.338	19.13
169	1.4	0.1	27.512	0.164	1.25	83	1.98	75	58	74	100.6	96	0.113	0.336	19.12
170	1.4	0.0	27.675	0.163	1.25	83	1.97	75	58	74	99.8	96	0.115	0.339	19.15
171															
172															

Train A - Particulate Sampling and Dilution Tunnel Data

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Start Time: 17:27
Test Length: 216 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 @	22.5	in. Hg
Post-Test	0	cfm @	9.82	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															
174															
175															
176															
177															
178															
179															
180	1.1	-1.1	29.308	29.308	1.26	83	1.97	75	57	74	17909.5	95	0.114	0.338	19.13
181	1.0	0.1	29.471	0.163	1.25	83	1.97	75	57	74	99.5	95	0.115	0.339	19.18
182	1.0	0.0	29.634	0.163	1.25	83	1.97	75	57	74	99.4	95	0.114	0.338	19.18
183	0.9	0.1	29.797	0.163	1.25	83	1.97	75	57	74	99.5	95	0.114	0.338	19.13
184	0.9	0.0	29.960	0.163	1.24	83	1.97	75	57	74	99.6	94	0.113	0.336	19.08
185	0.9	0.0	30.123	0.163	1.25	83	1.97	75	57	74	99.8	94	0.113	0.336	19.03
186	0.9	0.0	30.286	0.163	1.25	83	1.98	75	57	74	99.7	94	0.115	0.339	19.12
187	0.8	0.1	30.449	0.163	1.25	83	1.97	75	57	73	99.4	94	0.114	0.338	19.16
188	0.8	0.0	30.612	0.163	1.25	83	1.97	75	57	74	99.3	94	0.115	0.339	19.16
189	0.8	0.0	30.775	0.163	1.25	83	1.97	75	57	74	99.3	94	0.114	0.338	19.16
190	0.7	0.1	30.938	0.163	1.25	83	1.97	75	57	74	99.4	94	0.114	0.338	19.12
191	0.7	0.0	31.102	0.164	1.25	83	1.98	75	57	74	100.1	94	0.114	0.338	19.12
192	0.7	0.0	31.265	0.163	1.25	83	1.97	75	57	73	99.5	94	0.114	0.338	19.12
193	0.7	0.0	31.429	0.164	1.24	83	1.97	75	57	73	100.0	94	0.115	0.339	19.16
194	0.6	0.1	31.592	0.163	1.26	83	1.98	75	57	73	99.3	93	0.113	0.336	19.11
195	0.6	0.0	31.755	0.163	1.24	83	1.97	75	57	73	99.6	93	0.113	0.336	19.01
196	0.6	0.0	31.918	0.163	1.25	83	1.98	75	57	73	99.8	93	0.114	0.338	19.06
197	0.6	0.0	32.081	0.163	1.25	83	1.97	75	57	73	99.5	93	0.114	0.338	19.10
198	0.5	0.1	32.244	0.163	1.25	83	1.97	75	57	73	99.5	93	0.113	0.336	19.06
199	0.5	0.0	32.407	0.163	1.25	83	1.97	75	57	73	99.5	93	0.115	0.339	19.10
200	0.5	0.0	32.570	0.163	1.25	83	1.97	75	57	73	99.2	93	0.115	0.339	19.18
201	0.4	0.1	32.734	0.164	1.25	83	1.98	75	56	73	99.6	93	0.115	0.339	19.18
202	0.4	0.0	32.897	0.163	1.25	83	1.97	75	56	73	99.2	93	0.113	0.336	19.10
203	0.4	0.0	33.060	0.163	1.25	83	1.98	75	56	73	99.6	93	0.113	0.336	19.01
204	0.4	0.0	33.224	0.164	1.25	83	1.97	75	56	73	100.4	93	0.114	0.338	19.06
205	0.3	0.1	33.387	0.163	1.25	83	1.97	75	56	73	99.4	92	0.115	0.339	19.13
206	0.3	0.0	33.551	0.164	1.25	83	1.97	74	56	73	99.7	92	0.114	0.338	19.12
207	0.3	0.0	33.713	0.162	1.25	83	1.98	74	56	73	98.5	92	0.115	0.339	19.12
208	0.3	0.0	33.877	0.164	1.25	83	1.97	74	56	73	99.6	92	0.115	0.339	19.16
209	0.2	0.1	34.040	0.163	1.25	83	1.98	74	56	73	99.1	92	0.113	0.336	19.08
210	0.2	0.0	34.203	0.163	1.25	83	1.97	74	56	73	99.6	92	0.113	0.336	19.00
211	0.2	0.0	34.366	0.163	1.25	83	1.97	74	56	73	99.8	92	0.113	0.336	19.00
212	0.2	0.0	34.529	0.163	1.25	83	1.98	74	56	73	99.7	92	0.114	0.338	19.04
213	0.2	0.0	34.692	0.163	1.25	83	1.97	74	56	73	99.3	92	0.115	0.339	19.12
214	0.1	0.1	34.855	0.163	1.25	83	1.97	74	56	73	99.2	92	0.113	0.336	19.08
215	0.1	0.0	35.018	0.163	1.25	83	1.97	74	56	73	99.6	92	0.113	0.336	19.00
216	0.0	0.1	35.182	0.164	1.25	83	1.97	74	56	73	100.2	92	0.115	0.339	19.08

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time: 216 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.6 in. Hg
Post-Test 0 cfm @ 10.58 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)*
Tot / Avg	**35.436**	**0.306**	**0.97**	**82.1**	**2.29**	**74.73**	**59.69**	**185.5**	**554.4**	**203.4**	**211.6**	**416.5**	**410.2**	**649.5**	**65.4**
Minimum	0.000	0.157	0.60	76	2.20	71	56	16.3	470	184	174	326	322	549	315
Max	35.436	29.512	0.98	84	2.30	75	61	17895.2	654	246	259	510	526	770	413
0	0.000		0.60	76	2.20	71	63		607	197	253	498	510	691	413
1	0.157	0.157	0.99	76	2.20	72	58	100.9	599	195	258	481	493	701	405
2	0.321	0.164	0.98	76	2.30	72	58	103.3	590	203	259	466	479	684	399
3	0.484	0.163	0.98	76	2.20	73	58	100.7	582	209	259	454	465	683	394
4	0.646	0.162	0.97	76	2.20	73	57	100.2	576	220	258	442	453	677	390
5	0.809	0.163	0.96	76	2.20	73	57	100.5	569	229	256	433	443	668	386
6	0.971	0.162	0.96	76	2.20	73	57	99.6	563	231	255	424	434	663	381
7	1.133	0.162	0.96	76	2.20	73	57	99.4	558	234	252	416	426	657	377
8	1.294	0.161	0.96	76	2.20	73	57	98.7	553	236	250	410	419	652	374
9	1.457	0.163	0.95	76	2.20	73	57	100.3	548	238	247	404	413	646	370
10	1.618	0.161	0.95	76	2.20	73	57	99.3	543	240	244	397	406	637	366
11	1.779	0.161	0.95	76	2.20	74	57	99.2	538	242	241	390	401	631	362
12	1.940	0.161	0.95	76	2.20	74	57	99.0	533	244	238	384	395	628	359
13	2.102	0.162	0.95	77	2.20	74	57	99.4	529	244	235	377	388	624	355
14	2.263	0.161	0.95	77	2.20	74	56	98.8	524	245	231	371	382	619	351
15	2.424	0.161	0.95	77	2.20	74	56	98.9	520	246	228	366	377	614	347
16	2.585	0.161	0.95	77	2.20	74	57	98.6	516	246	225	362	372	607	344
17	2.747	0.162	0.94	77	2.20	74	56	99.0	512	246	222	357	367	602	341
18	2.907	0.160	0.94	77	2.20	74	57	97.7	509	246	219	353	362	598	338
19	3.068	0.161	0.94	77	2.20	74	57	98.2	506	245	216	349	357	596	335
20	3.230	0.162	0.94	77	2.20	74	57	98.9	503	245	214	346	353	595	332
21	3.391	0.161	0.94	78	2.20	74	57	98.3	502	244	211	343	348	594	330
22	3.551	0.160	0.94	78	2.20	74	57	16.3	501	243	209	340	345	593	328
23	3.713	0.162	0.94	78	2.20	74	57	99.0	500	242	207	337	342	594	326
24	3.876	0.163	0.98	78	2.30	74	57	99.5	500	241	205	336	339	593	324
25	4.039	0.163	0.97	78	2.30	74	57	99.7	499	240	203	334	339	589	323
26	4.203	0.164	0.98	78	2.30	74	57	100.5	499	239	201	333	339	584	322
27	4.366	0.163	0.98	78	2.30	74	57	99.8	498	238	199	332	339	581	321
28	4.530	0.164	0.97	79	2.30	74	57	100.2	498	237	197	331	339	578	320
29	4.694	0.164	0.97	79	2.30	74	57	100.0	497	236	195	329	339	575	319
30	4.858	0.164	0.97	79	2.30	74	57	100.3	496	234	193	328	339	573	318
31	5.022	0.164	0.97	79	2.30	75	57	100.7	495	233	192	327	340	571	317
32	5.185	0.163	0.97	79	2.30	75	57	99.8	494	232	190	326	340	568	316
33	5.349	0.164	0.98	79	2.30	75	57	100.1	493	230	189	326	340	566	316
34	5.513	0.164	0.97	79	2.30	75	57	99.8	492	229	188	326	340	565	315
35	5.677	0.164	0.97	80	2.30	75	58	99.5	492	228	186	326	341	565	315
36	5.841	0.164	0.97	80	2.30	75	58	99.6	493	227	185	327	342	567	315
37	6.005	0.164	0.97	80	2.30	75	58	99.8	495	226	184	328	343	569	315
38	6.168	0.163	0.97	80	2.30	75	58	99.1	497	224	183	329	344	571	315
39	6.332	0.164	0.98	80	2.30	75	58	99.9	500	223	182	329	346	575	316
40	6.496	0.164	0.97	80	2.30	75	58	99.9	501	222	181	330	348	578	316

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time: 216 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.6 in. Hg
Post-Test 0 cfm @ 10.58 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)
41	6.661	0.165	0.98	80	2.30	75	58	100.4	503	221	180	330	350	581	317
42	6.825	0.164	0.97	80	2.30	75	58	99.4	504	220	179	330	353	583	317
43	6.989	0.164	0.97	80	2.30	75	58	99.4	504	219	178	330	355	586	317
44	7.152	0.163	0.98	81	2.30	75	58	98.8	505	218	178	328	357	589	317
45	7.316	0.164	0.97	81	2.30	75	58	99.2	506	217	177	328	359	592	317
46	7.480	0.164	0.97	81	2.30	75	58	99.4	506	216	176	330	359	594	317
47	7.645	0.165	0.98	81	2.30	75	58	100.4	506	215	176	333	360	595	318
48	7.809	0.164	0.97	81	2.30	75	58	99.6	506	213	176	336	359	596	318
49	7.973	0.164	0.97	81	2.30	75	58	99.3	505	212	176	339	358	598	318
50	8.137	0.164	0.97	81	2.30	75	59	99.0	504	212	175	341	357	598	318
51	8.301	0.164	0.97	81	2.30	75	59	98.9	504	211	175	342	355	598	317
52	8.465	0.164	0.98	81	2.30	75	59	99.1	504	210	175	343	353	598	317
53	8.629	0.164	0.97	81	2.30	75	59	99.3	504	209	175	344	350	598	316
54	8.794	0.165	0.97	81	2.30	75	59	100.0	504	208	174	346	347	598	316
55	8.958	0.164	0.97	81	2.30	74	59	99.5	506	207	174	348	344	601	316
56	9.122	0.164	0.97	82	2.30	74	59	99.5	508	206	174	350	342	602	316
57	9.286	0.164	0.97	82	2.30	74	59	99.3	511	205	174	353	339	605	316
58	9.450	0.164	0.98	82	2.30	74	59	99.4	515	204	174	357	338	610	318
59	9.615	0.165	0.97	82	2.30	74	59	100.2	518	203	174	361	336	616	318
60	9.779	0.164	0.97	82	2.30	74	59	99.5	522	203	174	365	334	621	320
61	9.944	0.165	0.97	82	2.30	75	59	100.0	526	202	174	369	333	624	321
62	10.108	0.164	0.97	82	2.30	75	59	99.8	530	201	174	373	331	628	322
63	10.272	0.164	0.97	82	2.30	74	59	99.9	533	200	174	375	330	631	322
64	10.437	0.165	0.97	82	2.30	74	59	100.4	537	200	174	378	328	633	323
65	10.601	0.164	0.97	82	2.30	74	59	100.0	540	199	174	380	327	634	324
66	10.765	0.164	0.98	82	2.30	74	59	100.3	542	198	174	383	326	637	325
67	10.930	0.165	0.97	82	2.30	75	59	100.9	545	197	174	385	325	640	325
68	11.095	0.165	0.97	82	2.30	75	59	100.7	548	196	174	388	324	642	326
69	11.259	0.164	0.97	82	2.30	75	59	99.8	552	196	174	390	323	645	327
70	11.423	0.164	0.97	82	2.30	75	59	99.6	555	195	174	392	323	647	328
71	11.587	0.164	0.97	82	2.30	75	59	99.6	558	195	174	394	322	649	329
72	11.752	0.165	0.97	82	2.30	75	59	100.5	561	194	174	396	322	650	329
73	11.916	0.164	0.98	83	2.30	75	59	99.9	564	193	175	398	323	651	331
74	12.081	0.165	0.98	83	2.30	75	60	100.2	566	193	175	400	325	652	332
75	12.246	0.165	0.97	83	2.30	75	60	100.4	568	192	175	401	328	653	333
76	12.410	0.164	0.97	83	2.30	75	60	100.1	569	192	175	403	331	656	334
77	12.574	0.164	0.97	83	2.30	75	60	100.2	570	191	175	404	335	658	335
78	12.738	0.164	0.97	83	2.30	75	60	100.4	571	191	175	405	338	661	336
79	12.903	0.165	0.97	83	2.30	75	60	100.8	572	190	176	406	341	665	337
80	13.067	0.164	0.97	83	2.30	75	60	99.7	573	190	176	406	345	668	338
81	13.232	0.165	0.98	83	2.30	75	60	100.2	574	189	176	405	349	673	339
82	13.397	0.165	0.97	83	2.30	75	60	100.5	576	189	177	404	352	677	340
83	13.561	0.164	0.97	83	2.30	75	60	99.9	576	189	177	404	355	677	340
84	13.725	0.164	0.97	83	2.30	75	60	99.7	577	188	177	405	358	679	341

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time: 216 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.6 in. Hg
Post-Test 0 cfm @ 10.58 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)
85	13.890	0.165	0.97	83	2.30	75	60	100.5	577	188	178	406	360	681	342
86	14.054	0.164	0.98	83	2.30	75	60	99.9	577	188	178	407	362	683	342
87	14.219	0.165	0.98	83	2.30	75	60	100.2	577	187	178	409	364	684	343
88	14.383	0.164	0.97	83	2.30	75	60	99.7	576	187	179	411	366	685	344
89	14.549	0.166	0.97	83	2.30	75	60	101.3	576	186	179	412	369	687	344
90	14.713	0.164	0.97	83	2.30	75	60	100.1	576	186	179	414	371	688	345
91	14.877	0.164	0.98	83	2.30	75	60	99.9	576	186	179	415	374	691	346
92	15.041	0.164	0.97	83	2.30	75	60	99.9	577	186	180	417	377	694	347
93	15.206	0.165	0.97	83	2.30	75	60	100.4	578	185	180	418	380	696	348
94	15.370	0.164	0.97	83	2.30	75	60	99.8	579	185	181	421	382	697	350
95	15.535	0.165	0.97	83	2.30	75	60	100.4	580	185	181	423	384	697	351
96	15.700	0.165	0.97	83	2.30	75	60	100.3	580	185	181	426	386	695	352
97	15.864	0.164	0.97	83	2.30	75	60	99.8	581	185	182	428	387	692	353
98	16.029	0.165	0.97	83	2.30	75	60	100.6	581	185	182	431	387	689	353
99	16.193	0.164	0.97	83	2.30	75	60	100.0	581	184	183	434	388	686	354
100	16.357	0.164	0.98	83	2.30	75	60	99.8	581	184	183	437	387	683	354
101	16.522	0.165	0.98	83	2.30	75	60	100.4	581	184	184	440	388	680	355
102	16.686	0.164	0.97	83	2.30	75	60	99.9	580	184	184	443	387	678	356
103	16.852	0.166	0.97	83	2.30	75	60	100.9	579	184	185	446	388	676	356
104	17.016	0.164	0.97	83	2.30	75	60	99.6	579	184	185	449	388	677	357
105	17.180	0.164	0.97	83	2.30	75	60	100.0	579	185	186	451	389	681	358
106	17.345	0.165	0.97	83	2.30	75	60	100.9	580	185	187	454	389	685	359
107	17.509	0.164	0.97	83	2.30	75	60	100.3	582	185	188	457	391	689	361
108	17.674	0.165	0.97	83	2.30	75	60	100.6	585	185	189	460	393	693	362
109	17.838	0.164	0.97	83	2.30	75	60	99.7	589	185	190	464	394	698	364
110	18.003	0.165	0.97	83	2.30	75	60	100.8	593	185	191	467	396	702	366
111	18.168	0.165	0.97	83	2.30	75	60	101.3	598	185	192	471	399	707	369
112	18.332	0.164	0.96	83	2.30	75	60	100.7	603	185	193	474	401	710	371
113	18.496	0.164	0.97	83	2.30	75	60	100.7	608	186	195	476	402	715	373
114	18.660	0.164	0.97	83	2.30	75	60	100.7	613	186	196	478	404	719	375
115	18.825	0.165	0.97	83	2.30	75	60	101.2	618	186	197	481	406	723	378
116	18.989	0.164	0.97	84	2.30	75	60	100.5	622	186	199	482	409	727	380
117	19.154	0.165	0.97	84	2.30	75	60	100.7	627	186	200	484	411	731	382
118	19.318	0.164	0.97	84	2.30	75	60	100.0	631	187	202	485	413	734	384
119	19.482	0.164	0.97	84	2.30	75	60	100.5	635	187	203	487	416	737	386
120	19.646	0.164	0.97	84	2.30	75	61	100.8	639	187	205	488	418	741	387
121	19.810	0.164	0.97	84	2.30	75	61	100.4	642	188	207	489	421	746	389
122	19.975	0.165	0.97	84	2.30	75	61	100.6	646	188	208	491	424	749	391
123	20.139	0.164	0.97	84	2.30	75	61	99.7	649	188	210	493	428	752	394
124	20.304	0.165	0.97	84	2.30	75	61	100.4	650	188	211	496	432	756	395
125	20.468	0.164	0.96	84	2.30	75	61	100.3	652	189	213	499	435	761	398
126	20.632	0.164	0.97	84	2.30	75	61	100.8	653	189	215	501	438	765	399
127	20.796	0.164	0.97	84	2.30	75	61	100.8	654	189	216	503	442	767	401
128	20.960	0.164	0.97	84	2.30	75	61	100.4	654	190	218	504	445	769	402

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time: 216 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.6 in. Hg
Post-Test 0 cfm @ 10.58 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	21.125	0.165	0.97	84	2.30	75	61	100.6	654	190	220	504	447	770	403
130	21.289	0.164	0.97	84	2.30	75	61	99.8	653	190	221	505	450	770	404
131	21.454	0.165	0.97	84	2.30	75	61	100.7	653	191	223	505	452	770	405
132	21.618	0.164	0.97	84	2.30	75	61	100.5	652	191	225	506	455	769	406
133	21.782	0.164	0.97	84	2.30	75	61	100.6	652	191	226	507	456	768	406
134	21.946	0.164	0.97	84	2.30	75	61	100.6	650	192	228	509	456	766	407
135	22.110	0.164	0.97	84	2.30	75	61	100.4	650	191	230	510	456	764	407
136	22.274	0.164	0.97	84	2.30	75	61	100.3	648	192	231	509	457	761	407
137	22.439	0.165	0.97	84	2.30	75	61	101.0	646	191	232	508	459	757	407
138	22.604	0.165	0.97	84	2.30	75	61	100.9	644	192	234	507	460	754	407
139	22.768	0.164	0.97	84	2.30	75	61	100.2	642	192	235	505	462	749	407
140	22.932	0.164	0.97	84	2.30	75	61	99.9	639	192	235	504	464	745	407
141	23.096	0.164	0.97	84	2.30	75	61	99.8	636	191	236	503	467	740	407
142	23.260	0.164	0.97	84	2.30	75	61	100.3	632	191	236	503	471	736	407
143	23.425	0.165	0.97	84	2.30	75	61	101.4	628	191	237	503	474	731	407
144	23.590	0.165	0.97	84	2.30	75	61	101.0	624	192	238	502	477	726	407
145	23.754	0.164	0.97	84	2.30	75	61	100.0	621	192	238	502	479	722	406
146	23.918	0.164	0.97	84	2.30	75	61	100.0	617	193	238	501	486	716	407
147	24.082	0.164	0.97	84	2.30	75	61	100.0	613	194	239	498	495	710	408
148	24.246	0.164	0.97	84	2.30	75	61	100.1	610	195	239	495	504	706	409
149	24.411	0.165	0.97	84	2.30	75	61	100.6	607	195	239	492	511	703	409
150	24.575	0.164	0.97	84	2.30	75	61	99.8	604	196	240	489	517	699	409
151	24.740	0.165	0.97	84	2.30	75	61	100.6	601	197	240	486	521	696	409
152	24.904	0.164	0.96	84	2.30	75	61	100.0	598	198	240	483	524	693	409
153	25.069	0.165	0.97	84	2.30	75	61	100.5	596	198	241	481	525	690	408
154	25.233	0.164	0.97	84	2.30	75	61	99.8	592	199	241	480	525	687	407
155	25.397	0.164	0.97	84	2.30	75	61	99.7	589	200	242	478	526	684	407
156	25.562	0.165	0.97	84	2.30	75	61	100.4	586	201	243	477	526	681	407
157	25.726	0.164	0.97	84	2.30	75	61	100.0	584	202	244	476	524	682	406
158	25.891	0.165	0.97	84	2.30	75	61	100.7	583	200	245	474	522	681	405
159	26.055	0.164	0.97	84	2.30	75	61	99.8	581	201	245	472	522	679	404
160	26.219	0.164	0.97	84	2.30	75	61	99.7	579	201	246	469	521	676	403
161	26.384	0.165	0.97	84	2.30	75	61	100.4	577	202	247	466	519	673	402
162	26.548	0.164	0.97	84	2.30	75	61	100.0	575	202	247	463	516	670	401
163	26.713	0.165	0.97	84	2.30	75	61	100.9	572	203	247	459	513	667	399
164	26.877	0.164	0.97	84	2.30	75	61	100.5	570	203	247	456	510	664	397
165	27.042	0.165	0.97	84	2.30	75	61	101.0	566	203	247	452	506	661	395
166	27.206	0.164	0.97	84	2.30	75	61	100.3	564	202	247	449	503	658	393
167	27.371	0.165	0.96	84	2.30	75	61	100.8	561	202	246	446	499	656	391
168	27.535	0.164	0.97	84	2.30	75	61	100.0	558	202	246	443	495	653	389
169	27.699	0.164	0.97	84	2.30	75	61	99.8	556	202	245	440	491	650	387
170	27.864	0.165	0.97	84	2.30	75	61	100.2	553	202	245	438	487	648	385
171															
172															

Train B - Particulate Sampling and Appliance Temperatures

ASTM E2515

Run: 5
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Test Date: 3/1/24

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: 17:27
Total Sampling Time: 216 min
Recording Interval: 1 min

Sample Train Leak Checks
Pre-test 0 cfm @ 17.6 in. Hg
Post-Test 0 cfm @ 10.58 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															
174															
175															
176															
177															
178															
179															
180	29.512	29.512	0.97	84	2.30	75	61	17895.2	530	198	240	419	467	623	371
181	29.676	0.164	0.97	84	2.30	75	61	99.3	528	199	240	418	467	620	370
182	29.840	0.164	0.97	84	2.30	75	61	99.2	526	198	240	417	467	617	370
183	30.004	0.164	0.97	84	2.30	75	61	99.3	523	198	240	416	467	615	369
184	30.169	0.165	0.97	84	2.30	75	61	100.1	521	198	240	414	467	612	368
185	30.333	0.164	0.97	84	2.30	75	61	99.7	519	198	240	413	465	610	367
186	30.498	0.165	0.97	84	2.30	75	61	100.2	518	198	240	413	464	609	367
187	30.663	0.165	0.97	84	2.30	75	61	99.9	516	198	240	412	462	607	366
188	30.828	0.165	0.97	84	2.30	75	61	99.7	514	199	240	411	461	604	365
189	30.992	0.164	0.97	84	2.30	75	61	99.1	512	199	240	410	459	601	364
190	31.156	0.164	0.97	84	2.30	75	61	99.2	510	199	240	409	458	598	363
191	31.320	0.164	0.97	84	2.30	75	61	99.4	507	200	240	409	457	595	363
192	31.485	0.165	0.97	84	2.30	75	61	100.0	506	199	240	408	456	592	362
193	31.650	0.165	0.97	84	2.30	75	61	99.9	503	199	240	407	455	589	361
194	31.815	0.165	0.97	84	2.30	75	61	99.8	501	199	240	406	454	586	360
195	31.979	0.164	0.97	84	2.30	75	61	99.5	499	199	240	406	453	583	359
196	32.144	0.165	0.97	84	2.30	75	61	100.2	497	200	240	405	452	581	359
197	32.308	0.164	0.97	84	2.30	75	61	99.4	495	200	240	404	451	578	358
198	32.473	0.165	0.97	84	2.30	75	61	100.0	493	200	241	403	450	576	357
199	32.637	0.164	0.97	84	2.30	75	61	99.4	492	200	241	402	449	574	357
200	32.802	0.165	0.97	84	2.30	75	61	99.7	490	200	241	401	449	572	356
201	32.967	0.165	0.97	84	2.30	75	61	99.4	489	201	241	399	448	570	356
202	33.131	0.164	0.97	84	2.30	75	61	99.0	487	201	241	399	447	569	355
203	33.296	0.165	0.97	84	2.30	75	61	100.1	486	202	241	398	446	568	355
204	33.460	0.164	0.97	84	2.30	75	61	99.6	485	202	241	396	445	566	354
205	33.625	0.165	0.97	84	2.30	75	61	99.8	484	202	241	395	444	565	353
206	33.789	0.164	0.97	84	2.30	75	61	98.9	482	203	241	394	443	563	353
207	33.954	0.165	0.97	84	2.30	75	61	99.6	481	203	242	393	441	562	352
208	34.119	0.165	0.97	84	2.30	75	61	99.5	480	203	242	392	441	561	352
209	34.284	0.165	0.97	84	2.30	75	61	99.6	479	203	242	391	440	559	351
210	34.448	0.164	0.97	84	2.30	75	61	99.4	477	204	242	390	440	558	351
211	34.612	0.164	0.97	84	2.30	75	61	99.6	476	204	242	390	439	556	350
212	34.777	0.165	0.97	84	2.30	75	61	100.1	475	204	242	389	439	555	350
213	34.941	0.164	0.97	84	2.30	75	61	99.2	473	204	242	388	438	553	349
214	35.106	0.165	0.97	84	2.30	75	61	99.7	472	204	242	387	437	552	348
215	35.271	0.165	0.97	84	2.30	75	61	100.0	471	204	242	386	436	550	348
216	35.436	0.165	0.97	84	2.30	75	61	100.0	470	205	242	385	436	549	348

Train C - First Hour Particulate Sampling

Run: 5
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 17:27
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/1/24

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 @ 17.9 in. Hg
Post-Test 0 cfm @ 6.72 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	**9.844**	**0.164**	**2.19**	**71.5**	**-2.10**	**73.9**	**66.0**	**99.8**
Minimum	0.000	0.141	0.17	71	-2.39	70	65	88.5
Max	9.844	0.166	2.28	72	-0.03	75	66	101.7
0	0.000		0.17	71	-0.03	70	66	
1	0.141	0.141	2.22	71	-2.34	72	66	88.5
2	0.305	0.164	2.17	71	-1.85	72	66	101.7
3	0.467	0.162	2.28	71	-2.08	72	66	99.2
4	0.632	0.165	2.26	71	-2.34	72	66	101.1
5	0.797	0.165	2.24	71	-2.16	73	66	100.9
6	0.962	0.165	2.23	71	-1.94	73	66	100.6
7	1.126	0.164	2.21	71	-2.31	73	66	100.1
8	1.290	0.164	2.22	71	-2.36	73	66	100.0
9	1.454	0.164	2.25	71	-2.39	73	66	100.3
10	1.619	0.165	2.26	71	-2.38	73	66	101.2
11	1.784	0.165	2.25	71	-2.01	74	66	101.1
12	1.950	0.166	2.26	71	-1.98	74	66	101.5
13	2.116	0.166	2.24	71	-2.01	74	66	101.4
14	2.280	0.164	2.25	71	-2.16	74	66	100.3
15	2.445	0.165	2.24	71	-2.38	74	66	101.0
16	2.609	0.164	2.25	71	-2.34	74	66	100.1
17	2.774	0.165	2.24	71	-2.26	74	66	100.5
18	2.939	0.165	2.24	71	-1.93	74	66	100.4
19	3.103	0.164	2.24	71	-2.05	74	66	99.6
20	3.268	0.165	2.24	71	-2.31	74	66	100.3
21	3.433	0.165	2.22	71	-2.36	74	66	100.4
22	3.597	0.164	2.24	71	-1.88	74	66	99.9
23	3.761	0.164	2.23	71	-2.37	74	66	99.9
24	3.927	0.166	2.23	71	-1.98	74	66	101.0
25	4.091	0.164	2.23	71	-2.09	74	66	100.0
26	4.255	0.164	2.22	71	-1.96	74	66	100.2
27	4.419	0.164	2.23	71	-2.34	74	66	100.1
28	4.584	0.165	2.22	71	-2.37	74	66	100.6
29	4.748	0.164	2.23	71	-1.95	74	66	99.9
30	4.913	0.165	2.23	71	-1.89	74	66	100.8
31	5.078	0.165	2.22	71	-2.28	75	66	101.1
32	5.242	0.164	2.21	71	-2.11	75	66	100.3

Train C - First Hour Particulate Sampling

Run: 5
Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

Start Time: 17:27
Total Sampling Time: 60 min
Recording Interval: 1 min

Test Date: 3/1/24

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 @ 17.9 in. Hg
Post-Test 0 cfm @ 6.72 in. Hg

Elapsed Time (min)	**Train C Sampling System**							
	Meter Volume (ft^3)	*Sample Rate (CFM)*	*Meter ΔH*	*Meter Temp (°F)*	*Filter Vac (in. Hg)*	*Filter Temp (°F)*	*Dryer Temp (°F)*	*Pro - Rate*
33	5.406	0.164	2.22	72	-2.00	75	66	99.9
34	5.570	0.164	2.23	72	-1.90	75	66	99.5
35	5.735	0.165	2.23	72	-2.24	75	66	99.8
36	5.899	0.164	2.23	72	-1.88	75	66	99.4
37	6.064	0.165	2.23	72	-2.08	75	66	100.2
38	6.228	0.164	2.20	72	-2.32	75	66	99.5
39	6.393	0.165	2.20	72	-2.01	75	66	100.2
40	6.557	0.164	2.22	72	-2.38	75	66	99.7
41	6.721	0.164	2.22	72	-2.28	75	66	99.5
42	6.886	0.165	2.22	72	-1.86	74	66	99.8
43	7.050	0.164	2.23	72	-2.32	74	66	99.1
44	7.214	0.164	2.22	72	-2.12	74	66	99.2
45	7.378	0.164	2.20	72	-1.86	74	66	99.1
46	7.543	0.165	2.20	72	-2.30	74	66	99.9
47	7.707	0.164	2.22	72	-2.18	74	66	99.6
48	7.871	0.164	2.22	72	-1.89	74	66	99.4
49	8.036	0.165	2.22	72	-2.29	74	66	99.7
50	8.200	0.164	2.23	72	-2.37	74	66	98.8
51	8.364	0.164	2.23	72	-2.31	74	66	98.7
52	8.529	0.165	2.22	72	-1.98	74	66	99.5
53	8.693	0.164	2.22	72	-2.16	74	66	99.1
54	8.858	0.165	2.23	72	-2.38	74	65	99.6
55	9.022	0.164	2.22	72	-1.98	74	66	99.1
56	9.187	0.165	2.22	72	-1.98	74	65	99.8
57	9.351	0.164	2.22	72	-2.29	74	66	99.1
58	9.515	0.164	2.22	72	-2.05	74	66	99.2
59	9.679	0.164	2.23	72	-1.93	74	66	99.3
60	9.844	0.165	2.22	72	-1.87	74	66	99.8

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 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 (%)*
Tot / Avg	**35.383**	**0.164**	**1.71**	**71.8**	**-2.17**	**367.00**	**-0.078**	**233.7**	**0.06**	**8.99**
Minimum	0.000	0.161	1.61	71	-2.40	313.00	-0.087	6.1	0.00	0.71
Max	35.383	0.167	1.77	72	-2.00	418.00	-0.063	1040.0	0.60	12.98
0	0.000		0.54	71	-1.10	362	-0.063	1040.0	0.23	1.61
1	0.167	0.167	1.77	71	-2.30	332	-0.075	1040.0	0.24	0.71
2	0.333	0.166	1.76	71	-2.10	343	-0.079	32.7	0.00	4.25
3	0.499	0.166	1.75	71	-2.40	358	-0.080	35.6	0.00	4.05
4	0.660	0.161	1.61	71	-2.10	362	-0.080	34.3	0.00	4.27
5	0.822	0.162	1.69	71	-2.10	365	-0.080	38.5	0.00	5.31
6	0.985	0.163	1.68	71	-2.00	367	-0.081	45.0	0.00	6.01
7	1.146	0.161	1.68	71	-2.10	371	-0.081	41.7	0.00	6.01
8	1.308	0.162	1.68	71	-2.00	372	-0.081	57.6	0.00	6.74
9	1.474	0.166	1.76	71	-2.10	372	-0.081	40.5	0.00	6.16
10	1.640	0.166	1.76	71	-2.10	368	-0.080	32.7	0.00	5.79
11	1.805	0.165	1.75	71	-2.30	366	-0.080	36.2	0.00	5.77
12	1.971	0.166	1.75	71	-2.20	367	-0.080	39.5	0.00	5.66
13	2.136	0.165	1.74	71	-2.30	366	-0.080	38.9	0.00	5.64
14	2.301	0.165	1.74	71	-2.10	366	-0.079	37.9	0.00	5.96
15	2.465	0.164	1.73	71	-2.20	362	-0.080	35.6	0.00	5.77
16	2.630	0.165	1.73	71	-2.10	360	-0.079	34.6	0.00	5.61
17	2.795	0.165	1.73	71	-2.10	360	-0.079	36.2	0.00	5.92
18	2.959	0.164	1.74	71	-2.10	361	-0.079	39.5	0.00	6.42
19	3.124	0.165	1.73	71	-2.20	362	-0.079	40.8	0.00	6.63
20	3.288	0.164	1.73	71	-2.00	365	-0.079	44.4	0.00	6.85
21	3.452	0.164	1.73	71	-2.30	365	-0.080	46.3	0.00	7.04
22	3.617	0.165	1.73	71	-2.00	366	-0.080	43.1	0.00	7.19
23	3.780	0.163	1.72	71	-2.20	367	-0.080	45.6	0.00	7.45
24	3.944	0.164	1.71	71	-2.30	367	-0.079	38.5	0.00	7.83
25	4.108	0.164	1.72	71	-2.10	364	-0.079	27.5	0.00	8.16
26	4.272	0.164	1.72	71	-2.10	362	-0.079	25.5	0.00	7.88
27	4.437	0.165	1.72	71	-2.10	358	-0.078	28.2	0.00	7.64
28	4.600	0.163	1.73	71	-2.30	357	-0.078	25.9	0.00	7.55
29	4.765	0.165	1.71	71	-2.20	356	-0.078	25.9	0.00	7.40
30	4.928	0.163	1.72	71	-2.10	354	-0.078	26.2	0.00	7.32
31	5.092	0.164	1.72	71	-2.10	353	-0.077	24.3	0.00	7.53
32	5.256	0.164	1.71	71	-2.30	352	-0.077	22.3	0.00	7.53

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 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	5.419	0.163	1.72	71	-2.30	352	-0.076	21.7	0.00	7.86
34	5.584	0.165	1.72	71	-2.30	353	-0.076	21.0	0.00	8.33
35	5.748	0.164	1.72	71	-2.20	352	-0.077	22.0	0.00	8.69
36	5.911	0.163	1.72	71	-2.00	352	-0.076	23.3	0.00	9.06
37	6.075	0.164	1.71	71	-2.30	353	-0.076	24.6	0.00	9.36
38	6.239	0.164	1.72	72	-2.10	355	-0.076	25.5	0.00	8.96
39	6.402	0.163	1.71	72	-2.20	356	-0.077	25.2	0.00	8.80
40	6.566	0.164	1.72	72	-2.10	355	-0.077	25.2	0.00	8.84
41	6.730	0.164	1.72	72	-2.10	355	-0.077	25.2	0.00	8.92
42	6.894	0.164	1.72	72	-2.00	355	-0.077	26.2	0.00	8.90
43	7.058	0.164	1.71	72	-2.20	354	-0.077	27.5	0.00	8.75
44	7.221	0.163	1.71	72	-2.10	354	-0.077	28.2	0.00	8.58
45	7.385	0.164	1.71	72	-2.20	355	-0.077	28.2	0.00	8.59
46	7.549	0.164	1.72	72	-2.30	355	-0.077	28.2	0.00	8.77
47	7.713	0.164	1.71	72	-2.10	354	-0.077	25.9	0.00	8.86
48	7.876	0.163	1.72	72	-2.20	355	-0.076	26.2	0.00	8.71
49	8.041	0.165	1.71	72	-2.20	354	-0.076	26.9	0.00	8.56
50	8.204	0.163	1.71	72	-2.20	353	-0.076	26.2	0.00	8.43
51	8.368	0.164	1.71	72	-2.10	352	-0.077	29.2	0.00	8.12
52	8.531	0.163	1.71	72	-2.20	353	-0.077	32.0	0.00	7.74
53	8.695	0.164	1.72	72	-2.30	354	-0.077	31.4	0.00	7.68
54	8.860	0.165	1.72	72	-2.00	354	-0.077	34.6	0.00	8.79
55	9.023	0.163	1.72	72	-2.20	358	-0.078	41.1	0.00	9.12
56	9.188	0.165	1.71	72	-2.30	359	-0.078	42.1	0.00	9.29
57	9.351	0.163	1.71	72	-2.10	363	-0.079	52.1	0.00	9.64
58	9.515	0.164	1.71	72	-2.30	367	-0.079	52.8	0.00	9.64
59	9.679	0.164	1.71	72	-2.20	370	-0.080	74.5	0.00	10.12
60	9.842	0.163	1.72	72	-2.10	372	-0.080	61.5	0.00	9.80
61	10.006	0.164	1.72	72	-2.30	374	-0.080	57.9	0.00	9.88
62	10.170	0.164	1.72	72	-2.00	375	-0.080	60.9	0.00	9.61
63	10.334	0.164	1.70	72	-2.20	377	-0.080	60.5	0.00	9.54
64	10.497	0.163	1.70	72	-2.30	377	-0.080	59.9	0.00	9.56
65	10.661	0.164	1.71	72	-2.10	377	-0.080	59.3	0.00	9.84
66	10.825	0.164	1.71	72	-2.30	376	-0.079	64.1	0.00	9.98
67	10.989	0.164	1.72	72	-2.30	378	-0.080	73.1	0.00	10.03
68	11.152	0.163	1.72	72	-2.00	380	-0.081	93.6	0.01	10.14

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 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 (%)*
69	11.317	0.165	1.72	72	-2.30	381	-0.081	84.5	0.01	10.17
70	11.480	0.163	1.71	72	-2.10	381	-0.081	82.6	0.00	10.20
71	11.643	0.163	1.71	72	-2.20	382	-0.081	96.8	0.00	10.18
72	11.807	0.164	1.71	72	-2.30	382	-0.081	81.9	0.00	10.10
73	11.971	0.164	1.72	72	-2.30	382	-0.081	54.1	0.00	9.93
74	12.135	0.164	1.71	72	-2.30	382	-0.081	54.7	0.00	9.80
75	12.298	0.163	1.72	72	-2.10	382	-0.080	54.1	0.00	9.98
76	12.463	0.165	1.70	72	-2.00	382	-0.081	52.8	0.00	10.10
77	12.626	0.163	1.70	72	-2.10	383	-0.081	54.4	0.00	10.28
78	12.789	0.163	1.71	72	-2.30	384	-0.081	62.5	0.00	10.31
79	12.953	0.164	1.70	72	-2.30	385	-0.081	71.2	0.00	10.29
80	13.117	0.164	1.71	72	-2.10	387	-0.081	99.4	0.01	10.06
81	13.281	0.164	1.71	72	-2.10	388	-0.081	184.7	0.02	9.98
82	13.444	0.163	1.71	72	-2.20	388	-0.081	291.5	0.02	10.08
83	13.608	0.164	1.71	72	-2.00	385	-0.081	171.0	0.02	10.06
84	13.772	0.164	1.70	72	-2.30	385	-0.081	350.4	0.03	10.05
85	13.935	0.163	1.71	72	-2.10	383	-0.081	244.0	0.02	9.98
86	14.099	0.164	1.72	72	-2.30	382	-0.081	140.3	0.01	9.99
87	14.263	0.164	1.71	72	-2.30	381	-0.080	207.0	0.02	9.94
88	14.426	0.163	1.72	72	-2.30	379	-0.080	149.3	0.01	10.06
89	14.591	0.165	1.71	72	-2.30	382	-0.081	80.3	0.00	9.92
90	14.754	0.163	1.70	72	-2.10	382	-0.081	86.8	0.00	10.08
91	14.917	0.163	1.71	72	-2.10	383	-0.081	190.8	0.02	10.36
92	15.081	0.164	1.70	72	-2.10	384	-0.082	144.8	0.01	10.52
93	15.245	0.164	1.71	72	-2.20	385	-0.081	232.5	0.02	10.58
94	15.409	0.164	1.71	72	-2.30	386	-0.081	164.6	0.01	10.59
95	15.572	0.163	1.72	72	-2.30	386	-0.081	90.4	0.01	10.55
96	15.736	0.164	1.71	72	-2.20	385	-0.080	63.1	0.00	10.43
97	15.899	0.163	1.70	72	-2.30	384	-0.081	56.3	0.00	10.34
98	16.063	0.164	1.71	72	-2.30	383	-0.081	57.6	0.00	10.23
99	16.227	0.164	1.71	72	-2.30	382	-0.080	66.3	0.00	10.27
100	16.391	0.164	1.71	72	-2.00	381	-0.081	62.5	0.00	10.23
101	16.554	0.163	1.71	72	-2.10	379	-0.079	46.3	0.00	10.10
102	16.719	0.165	1.71	72	-2.30	378	-0.080	41.4	0.00	10.23
103	16.882	0.163	1.70	72	-2.30	378	-0.080	43.1	0.00	10.29
104	17.045	0.163	1.71	72	-2.30	378	-0.080	50.2	0.00	10.62

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 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	17.209	0.164	1.70	72	-2.30	381	-0.080	73.2	0.01	11.24
106	17.372	0.163	1.71	72	-2.10	384	-0.081	420.7	0.04	11.67
107	17.536	0.164	1.71	72	-2.20	387	-0.082	1040.0	0.14	11.95
108	17.700	0.164	1.72	72	-2.10	388	-0.081	1040.0	0.19	12.21
109	17.864	0.164	1.71	72	-2.00	393	-0.083	1040.0	0.26	12.34
110	18.027	0.163	1.70	72	-2.10	396	-0.082	1040.0	0.33	12.41
111	18.191	0.164	1.71	72	-2.30	398	-0.083	1040.0	0.32	12.51
112	18.355	0.164	1.71	72	-2.00	400	-0.084	1040.0	0.34	12.46
113	18.518	0.163	1.71	72	-2.10	402	-0.083	1040.0	0.40	12.64
114	18.682	0.164	1.71	72	-2.10	406	-0.083	1040.0	0.38	12.55
115	18.846	0.164	1.71	72	-2.30	407	-0.083	1040.0	0.42	12.71
116	19.009	0.163	1.71	72	-2.30	409	-0.084	1040.0	0.38	12.60
117	19.173	0.164	1.71	72	-2.20	412	-0.084	1040.0	0.41	12.60
118	19.336	0.163	1.70	72	-2.10	411	-0.085	1040.0	0.42	12.64
119	19.500	0.164	1.71	72	-2.00	412	-0.085	1040.0	0.43	12.77
120	19.664	0.164	1.71	72	-2.00	414	-0.085	1040.0	0.34	12.89
121	19.828	0.164	1.71	72	-2.20	417	-0.085	1040.0	0.32	12.98
122	19.991	0.163	1.71	72	-2.30	418	-0.087	1040.0	0.34	12.94
123	20.155	0.164	1.70	72	-2.10	416	-0.084	1040.0	0.30	12.91
124	20.318	0.163	1.71	72	-2.00	415	-0.085	1040.0	0.30	12.71
125	20.482	0.164	1.71	72	-2.20	416	-0.085	1040.0	0.35	12.56
126	20.646	0.164	1.71	72	-2.10	414	-0.085	1040.0	0.32	12.38
127	20.809	0.163	1.71	72	-2.10	414	-0.085	1040.0	0.31	12.15
128	20.974	0.165	1.70	72	-2.00	412	-0.085	1040.0	0.37	11.97
129	21.137	0.163	1.71	72	-2.10	413	-0.084	1040.0	0.32	12.01
130	21.300	0.163	1.71	72	-2.10	414	-0.084	1040.0	0.28	12.00
131	21.464	0.164	1.70	72	-2.20	413	-0.085	1040.0	0.29	12.02
132	21.628	0.164	1.71	72	-2.30	413	-0.083	1040.0	0.23	12.06
133	21.792	0.164	1.71	72	-2.30	412	-0.085	1040.0	0.55	11.73
134	21.955	0.163	1.71	72	-2.10	410	-0.085	1040.0	0.60	11.45
135	22.119	0.164	1.71	72	-2.00	407	-0.084	1040.0	0.60	11.09
136	22.283	0.164	1.70	72	-2.10	406	-0.083	1040.0	0.42	11.00
137	22.446	0.163	1.71	72	-2.20	402	-0.083	1040.0	0.35	10.86
138	22.610	0.164	1.71	72	-2.30	403	-0.083	1040.0	0.30	10.78
139	22.774	0.164	1.71	72	-2.30	400	-0.082	1040.0	0.26	10.65
140	22.937	0.163	1.71	72	-2.10	398	-0.082	1040.0	0.23	10.73

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 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	23.101	0.164	1.71	72	-2.00	396	-0.082	1040.0	0.17	10.78
142	23.265	0.164	1.71	72	-2.30	393	-0.081	1040.0	0.12	10.72
143	23.429	0.164	1.71	72	-2.30	389	-0.081	515.0	0.04	10.82
144	23.592	0.163	1.70	72	-2.20	385	-0.081	330.7	0.03	10.77
145	23.755	0.163	1.71	72	-2.10	384	-0.080	263.7	0.02	10.68
146	23.920	0.165	1.71	72	-2.10	381	-0.080	135.7	0.01	10.19
147	24.083	0.163	1.71	72	-2.20	379	-0.081	409.6	0.04	10.16
148	24.247	0.164	1.71	72	-2.20	379	-0.080	480.9	0.05	10.08
149	24.410	0.163	1.70	72	-2.10	376	-0.079	595.4	0.06	10.05
150	24.574	0.164	1.71	72	-2.10	374	-0.079	441.1	0.04	9.96
151	24.738	0.164	1.71	72	-2.30	374	-0.079	190.7	0.01	9.96
152	24.902	0.164	1.71	72	-2.30	373	-0.079	56.3	0.00	9.90
153	25.065	0.163	1.71	72	-2.30	371	-0.078	10.0	0.00	9.92
154	25.229	0.164	1.71	72	-2.30	370	-0.078	6.1	0.00	10.02
155	25.393	0.164	1.71	72	-2.20	368	-0.079	7.5	0.00	10.09
156	25.556	0.163	1.70	72	-2.20	368	-0.078	9.7	0.00	9.45
157	25.720	0.164	1.70	72	-2.30	369	-0.078	12.9	0.00	9.18
158	25.883	0.163	1.71	72	-2.30	369	-0.079	14.8	0.00	8.94
159	26.048	0.165	1.71	72	-2.10	368	-0.078	9.7	0.00	8.76
160	26.211	0.163	1.72	72	-2.10	367	-0.078	9.7	0.00	8.44
161	26.375	0.164	1.71	72	-2.10	366	-0.078	9.7	0.00	8.23
162	26.538	0.163	1.71	72	-2.30	365	-0.077	9.1	0.00	8.03
163	26.702	0.164	1.71	72	-2.10	362	-0.078	9.1	0.00	7.92
164	26.866	0.164	1.71	72	-2.20	360	-0.077	10.7	0.00	7.73
165	27.030	0.164	1.71	72	-2.10	359	-0.077	10.7	0.00	7.68
166	27.193	0.163	1.71	72	-2.30	357	-0.077	10.7	0.00	7.62
167	27.357	0.164	1.71	72	-2.30	355	-0.077	10.3	0.00	7.58
168	27.521	0.164	1.71	72	-2.30	355	-0.077	12.3	0.00	7.55
169	27.684	0.163	1.70	72	-2.00	354	-0.076	12.6	0.00	7.57
170	27.848	0.164	1.70	72	-2.30	353	-0.077	13.6	0.00	7.57
171	28.012	0.164	1.71	72	-2.30	353	-0.077	13.6	0.00	7.57
172	28.176	0.164	1.71	72	-2.30	353	-0.077	13.6	0.00	7.57
173	28.339	0.163	1.71	72	-2.00	353	-0.077	13.6	0.00	7.57
174	28.503	0.164	1.70	72	-2.30	353	-0.077	13.6	0.00	7.57
175	28.667	0.164	1.71	72	-2.30	353	-0.077	13.6	0.00	7.57
176	28.830	0.163	1.71	72	-2.10	353	-0.077	13.6	0.00	7.57

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 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	28.994	0.164	1.70	72	-2.20	353	-0.077	13.6	0.00	7.57
178	29.158	0.164	1.71	72	-2.30	353	-0.077	13.6	0.00	7.57
179	29.322	0.164	1.71	72	-2.20	346	-0.074	13.2	0.00	7.97
180	29.486	0.164	1.71	72	-2.10	344	-0.075	12.9	0.00	8.05
181	29.649	0.163	1.71	72	-2.20	344	-0.075	12.6	0.00	8.04
182	29.813	0.164	1.70	72	-2.30	341	-0.074	10.7	0.00	8.06
183	29.976	0.163	1.71	72	-2.00	340	-0.074	11.3	0.00	8.00
184	30.140	0.164	1.71	72	-2.00	338	-0.074	11.6	0.00	7.89
185	30.304	0.164	1.71	72	-2.00	339	-0.073	12.0	0.00	7.82
186	30.468	0.164	1.71	72	-2.00	336	-0.073	11.6	0.00	7.81
187	30.632	0.164	1.71	72	-2.10	335	-0.073	10.4	0.00	7.79
188	30.796	0.164	1.71	72	-2.10	335	-0.073	9.1	0.00	7.75
189	30.960	0.164	1.70	72	-2.30	333	-0.073	8.1	0.00	7.71
190	31.123	0.163	1.70	72	-2.30	331	-0.072	8.8	0.00	7.60
191	31.287	0.164	1.71	72	-2.10	329	-0.073	7.8	0.00	7.62
192	31.451	0.164	1.71	72	-2.30	329	-0.072	7.5	0.00	7.61
193	31.614	0.163	1.71	72	-2.20	328	-0.072	7.1	0.00	7.58
194	31.779	0.165	1.70	72	-2.10	326	-0.072	7.1	0.00	7.56
195	31.942	0.163	1.70	72	-2.30	324	-0.071	7.1	0.00	7.53
196	32.106	0.164	1.70	72	-2.30	324	-0.072	7.1	0.00	7.49
197	32.270	0.164	1.70	72	-2.00	323	-0.071	7.5	0.00	7.50
198	32.433	0.163	1.71	72	-2.30	323	-0.071	7.5	0.00	7.49
199	32.597	0.164	1.71	72	-2.10	322	-0.071	8.1	0.00	7.41
200	32.761	0.164	1.72	72	-2.00	322	-0.071	8.4	0.00	7.42
201	32.925	0.164	1.70	72	-2.00	321	-0.071	8.1	0.00	7.39
202	33.089	0.164	1.70	72	-2.10	321	-0.071	8.8	0.00	7.36
203	33.252	0.163	1.71	72	-2.20	321	-0.071	8.4	0.00	7.31
204	33.416	0.164	1.70	72	-2.10	320	-0.071	9.1	0.00	7.23
205	33.580	0.164	1.71	72	-2.20	319	-0.070	8.7	0.00	7.14
206	33.744	0.164	1.71	72	-2.20	319	-0.070	9.1	0.00	7.11
207	33.908	0.164	1.72	72	-2.30	318	-0.070	9.4	0.00	7.10
208	34.072	0.164	1.71	72	-2.30	316	-0.071	10.0	0.00	7.17
209	34.236	0.164	1.70	72	-2.10	316	-0.070	9.4	0.00	7.14
210	34.399	0.163	1.71	72	-2.30	316	-0.070	10.0	0.00	7.12
211	34.563	0.164	1.71	72	-2.10	315	-0.070	10.4	0.00	7.14
212	34.727	0.164	1.71	72	-2.00	315	-0.070	9.7	0.00	7.06

Train D - Ambient Background and Flue Gas Data

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

Manufacturer: Valley Comfort Systems, Inc. (Blaze King)
Model: SC 25
Tracking No.: 2142
Project No.: 0142WN020E

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: 17:27
Total Sampling Time 216 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 (%)*
213	34.891	0.164	1.71	72	-2.10	316	-0.070	10.4	0.00	7.02
214	35.055	0.164	1.71	72	-2.10	314	-0.070	10.4	0.00	7.02
215	35.219	0.164	1.70	72	-2.30	314	-0.070	10.0	0.00	6.97
216	35.383	0.164	1.70	72	-2.10	313	-0.070	10.7	0.00	6.89

Appendix E - Original conditioning data

As this model is being re-tested, the manufacturer received permission from the EPA to use the former conditioning data as proof of adequate conditioning for this test program.

Wood Heater Conditioning Data - ASTM E2780/ ASTM E2515

Manufacturer:	Valley Comfort
Model:	SC25
Tracking No.:	2142
Project No.:	0142WN016E
Test Date:	10/12/15 - 10/19/15
Technician:	B. Davis
Operation Category:	2 through 3

Operated on Medium burn setting, fuel moisture between 19 and 25% db.

Elapsed Time (hr)	Fuel Weight	Catalyst Exit Temp (degrees F)
0	13.9	959.0
1	4.0	1162.0
2	9.4	1259.0
3	3.6	1012.0
4	1.3	872.0
5	0.0	882.0
6	1.6	1086.0
7	6.9	1250.0
8	13.5	1076.0
9	7.2	1253.0
10	1.9	975.0
11	0.2	783.0
12	7.9	867.0
13	13.4	679.0
14	3.9	1078.0
15	13.6	1005.0
16	9.7	1047.0
17	6.6	1088.0
18	2.3	1160.0
19	0.2	758.0
20	9.4	468.0
21	9.0	819.0
22	4.0	1006.0
23	15.0	692.0
24	13.6	1001.0
25	11.3	903.0
26	9.7	815.0
27	7.5	1119.0
28	4.5	873.0
29	4.1	639.0
30	3.6	621.0
31	2.5	793.0
32	0.5	890.0

33	14.5	931.0
34	10.6	1162.0
35	5.5	1145.0
36	1.6	957.0
37	0.0	856.0
38	13.0	843.0
39	6.2	1251.0
40	10.8	1119.0
41	4.0	1108.0
42	0.9	1007.0
43	0.0	824.0
44	2.5	860.0
45	10.8	937.0
46	6.0	901.0
47	1.8	893.0
48	0.0	751.0
49	15.3	703.0
50	12.1	966.0

Appendix F

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:

Blaze King Industries, Inc.

146 A Street

Walla Walla, Washington 99362

cneufeld@blazeking.com

EPA Approved Test Laboratory:

OMNI-Test Laboratories, Inc.

13327 NE Airport Way

Portland, Oregon 97230

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:	Date of Scheduled Testing:
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
4/3/2024	0142WN020E	R. Tiegs T. Tong K. Morgan	All	All	First edition of report