

CERTIFICATE OF CONFORMITY

Emissions – Wood Heater

EPA 40 CFR Part 60, Subpart AAA, ASTM E2515-17, CSA B415.1-2010 (R2020), EPA ATM 2/6/24,
NYSERDA Test Method (IDC)

WHI24 – 21514328

Organization

Stove Builder International
250 de Copenhague
St Augustin de Desmaures, QC G3A 2H3
Canada

Product: Everest III, HE325R, Dallaire, St. Clair 3000R, Solution 3.0 ZC

Catalytic: No

Maximum Output: 78,200 Btu/hr.

Average Emissions: 1.9 g/hr.

Average Annual Delivered Efficiency (HHV): 65%

Test Fuel Type: Cordwood

Average CO Emissions Rate (g/min): 1.7

Conformance: Complies with 2020 particulate emissions standard

Test Report No.: 23-241 (PFS-TECO)

Certification Body: Intertek Testing Services NA, Inc.

Registered Address: 545 E. Algonquin Rd., Arlington Heights, IL 60005, USA

Initial Issue Date: 29-Jul-24

Issue Status: 4

This is a certificate of conformity to confirm that the bearer has successfully completed the requirements of the Intertek certification scheme which include the testing of products and the initial assessment. The bearer is subject to continuing assessments of their compliance through surveillance and testing of products samples taken from production (as applicable to the scheme) and has been registered within the scheme for the products detailed. The validity of this certificate is contingent to the listing's status on the Intertek Directory of Building Products: bpdirectory.intertek.com.

Jean-Philippe Kayl
Vice President – Global Certification
Name


Signature

20-Dec-24
Date

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Version: 11 November 2021 SFT-BCH-OP-19c

Certificate of Conformity WHI24-21514328

Appendix A

Certificate of Conformity #:		Certificate of Conformity Issue Date:	
WHI24-2151428		July 29, 2024	
REVISION #	REVISION DATE	ISSUE STATUS	REVISION
0	July 29, 2024	1	Original Certificate of Conformity Issue
1	November 6, 2024	2	Update report in accordance with EPA deficiency email dated 10/9/24
2	December 17, 2024	3	Removed "FP18R" from model name Dallaire to match listing report.
3	December 20, 2024	4	Corrected minor typo in product name

Revised Report #:		Report Issue Date:	
23-241 (PFS-TECO)		July 17, 2024	
REVISION #	REVISION DATE	REPORT PAGES	REVISION
0	July 17, 2024	N/A	Original Report Issue
1	November 4, 2024	7	Added 1 st hour emissions data to results table and discussion.
		22	Added filter holder material description.
		Appendix A	Added dilution tunnel specifications and schematic.
		1	Corrected typo for report issue date.

Stove Builder International

Project # 23-241 R1

Model: Everest III Series

Type: Non-catalytic Wood Fired Heater

Original Report Date: July 17, 2024

Revised Report Date: November 4, 2024

NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard (EPA Alternate Test Method)

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Revision Summary

July 17, 2024 – Original Issue

November 4, 2024 – Revision 1 (R1) includes fixes requested by EPA on October 9, 2024. Including:

- Added 1st hour emissions data to results tables and results discussion on page 7.
- Added details of 2515 sample holder material. See page 22.
- Added dilution tunnel schematic to Appendix A.
- Corrected typo on original issue report, page 1.

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Affidavit

PFS-TECO was contracted by Stove Builder International (SBI) to provide testing services for the Everest III Series Wood-Fired Room Heater per the *NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard*, which was approved for use by EPA under an Alternate Test Method (ATM) in a letter to the manufacturer dated February 6, 2024. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory beginning on 5/6/2024 and ending on 5/8/2024. PFS' laboratory is located at 11785 SE Hwy 212 Ste 305, Clackamas, OR 97015. Testing procedures followed the NYSERDA IDC method, with variances as described in the ATM. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel* and *NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces*, with variances as described in the ATM. A copy of the EPA ATM letter is included in Appendix A for reference, as required by the approval letter. Test results apply only to the specific appliance tested.

PFS-TECO is accredited by the U.S. Environmental Protection Agency for the certification and auditing of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards for Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces, Methods 28R, 28WHH, 28 WHH-PTS, and all methods listed in Sections 60.534 and 60.5476. PFS-TECO holds EPA Accreditation Certificate Numbers 4 and 4M (mobile). PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2017 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

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



Aaron Kravitz, Laboratory Manager

Introduction

SBI contracted with PFS-TECO to perform EPA certification testing on the Everest III Series Wood-Fired Room Heater. All testing was performed at PFS' Portland laboratory. All testing was performed by Aaron Kravitz.

Notes

- Prior to the start of testing, 50 hours of conditioning was performed by the manufacturer in accordance with the ATM.
- Prior to the start of testing, the dilution tunnel was cleaned with a steel brush (May 3, 2024 10:00 AM).
- A TEOM using TX-40 filters was used to determine 1st hour emissions and integrated emissions in accordance with the ATM for all test runs.
- A total of 3 test runs were completed. Test runs were performed in accordance with the ATM. All runs have been found to be appropriate, see the Run Narrative section for further detail on each run.
- No fuel pieces were intentionally squared or debarked and met all requirements specified in the ATM. Fuel pieces used for testing had little to no bark due to natural drying, splitting, and impacts caused by multiple moisture measurements. As required, video recording of all runs was performed.
- For the purpose of measuring temperature of the unit, 5 thermocouples were installed on the outer surface of the firebox per the ATM.

Wood Heater Identification and Testing

- Appliance Tested: ***Everest III***
- Serial Number: ***PFS Tracking Number 191***
- Manufacturer: ***Stove Builder International***
- Catalyst: ***No***
- Heat exchange blower: ***Integral***
- Type: ***Wood Stove***
- Style: ***Built-In Fireplace***
- Unit Condition: ***Good***
- Date Received: ***Thursday, April 25, 2024***
- Testing Period – Start: ***Monday, May 06, 2024***
Finish: ***Wednesday, May 08, 2024***
- Test Location: ***PFS TECO***
11785 SE Hwy 212 Ste. 305
Clackamas, OR 97015
- Elevation: ***~131 Feet above sea level***
- Test Technician(s): ***Aaron Kravitz***
- Observers: ***Bernard Blouin of SBI, Laboratory Engineer***

Test Procedures and Equipment

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

Equipment List:

Equipment ID#	Equipment Description
50	Digiweigh DWP12i Platform Scale
129	APEX XC-60-ED Digital Emissions Sampling Box A
130	APEX XC-60-ED Digital Emissions Sampling Box B
137	California Analytical ZRE CO2/CO/O2 IR ANALYZER
94	Moisture meter calibration block
95	Anemometer
97	10 lb audit weight
107	Sartorius Analytical Balance
109A/B	Troemner 100mg/200mg Audit Weights
217	Microtector
115	Delmhorst Wood Moisture Meter
190	Mettler 3'x3' floor scale w/digital weight indicator
205	DewTrak tunnel dewpoint monitor
207	Dewalt Tape Measure
208	Digital Calipers
216	Temperature Logger
CC505834	Gas Analyzer Calibration Span Gas
CC139173	Gas Analyzer Calibration Mid Gas
CC341544	Gas Analyzer Calibration Mid Gas
EPA B47459	Dichot TEOM – Tunnel Sampling
EPA B47461	Dichot TEOM – Ambient Sampling
197	Mass Flow Meter
Thermo CVK7037	TEOM Calibration Kit
202	Digital Barometer

The TEOM instruments were calibrated in accordance with NYSERDA Standard Operation Procedures for Thermo Scientific 1405-D TEOM™ for use in a dilution tunnel, dated September 29, 2022, and the manufacturer's instructions, using mass flow meter ID # 197 and manufacturer-supplied calibration kit serial # CVK7037.

Barometric pressure data was taken from local National Weather Service station KPDX. As PFS and KPDX are at the same altitude, the correction for altitude per ASTM E2515 6.1.2 is 1:1. NWS data was verified with on-site barometer #202, which is calibrated yearly. At the time of testing, this equipment was more than six months from its last calibration. However, it has been calibrated since, and the new calibration cert shows that its as-received calibration was within spec. Both calibration certificates are shown in Appendix C.

Results

The average emissions rate for the test series was measured to be **1.2 g/hr** when measured with a TEOM, or **1.9 g/hr** when measured in accordance with ASTM E2515. With average 1st hour TEOM emissions of **5.73 g/hr**. Average Higher Heating Value efficiency of **65%**. The average CO emission rate for the test series was **1.7 g/min**. The SBI Everest III Wood-Fired Room Heater meets the 2020 cordwood PM emission standard of ≤ 2.5 g/hr per CFR 40 part 60, §60.532 (c).

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

Summary Tables

Run 1

	Burn Phase:	L1	L2	L3	L4	1 st hr	Total
	Burn Time (min):	29	71	115	326	60	544
	Burn Rate (dry kg/hr):	5.75	4.99	2.33	2.58		2.71
TEOM	Eg:	2.1	6.2	2	4.5		14.8
TEOM	Eg/hr:	4.3	5.3	1	0.83	7.74	1.64
TEOM	Eg/kg:	0.74	1.06	0.45	0.4	1.21	0.61
TEOM	Eg/MJ output:	0.06	0.09	0.03	0.03		0.05
TEOM	Elb/mmbtu output:	0.14	0.21	0.08	0.07		0.11
2515	Eg:						21.1
2515	Eg/hr:						2.33
2515	Eg/kg:						0.86
2515	Eg/MJ output:						0.07
2515	Elb/mmbtu output:						0.16
	CO (g):	93.6	410.4	211.6	542.9		1,256.90
	CO (g/min):	3.2	5.8	1.8	1.7		2.3
	CO g/hr:	190	347	110	100		139
	CO g/kg:	33	69.5	47.3	38.7		51.2
	CO g/MJ output:	2.6	5.9	3.7	3.7		4.0
	CO lb/mmBTU output:	6.0	13.6	8.6	8.5		9.4
	Output (BTU/hr)	66,855	56,047	28,339	25,942		32,446
	Efficiency (%)	60.8%	60.8%	65.2%	65.3%		63.7%

Run 2

	Burn Phase:	L1	L2	L3	L4	1 st hr	Total
	Burn Time (min):	27	91	111	346	60	578
	Burn Rate (dry kg/hr):	6.10	4.00	2.34	2.39		2.53
TEOM	Eg:	4.1	2.8	0.87	2.6		10.3
TEOM	Eg/hr:	9.1	1.8	0.47	0.45	6.73	1.1
TEOM	Eg/kg:	1.5	0.46	0.20	0.23	1.05	0.42
TEOM	Eg/MJ output:	0.11	0.04	0.02	0.02		0.03
TEOM	Elb/mmbtu output:	0.26	0.09	0.04	0.04		0.08
2515	Eg:						17.2
2515	Eg/hr:						1.8
2515	Eg/kg:						0.70
2515	Eg/MJ output:						0.05
2515	Elb/mmbtu output:						0.12
	CO (g):	128.1	298.4	129.1	414.5		970.1
	CO (g/min):	4.7	3.3	1.2	1.2		1.7
	CO g/hr:	284.7	196.7	69.8	71.9		100.7
	CO g/kg:	46.7	49.2	29.8	30.1		39.8
	CO g/MJ output:	3.5	4.0	2.3	2.8		3.1
	CO lb/mmBTU output:	8.1	9.3	5.3	6.6		7.2
	Output (BTU/hr)	77,050	46,569	28,859	23,936		30,802
	Efficiency (%)	65.7%	63.4%	66.2%	65.0%		64.9%

Run 3

	Burn Phase:	L1	L2	L3	L4	1 st hr	Total
	Burn Time (min):	26	84	110	319	60	542
	Burn Rate (dry kg/hr):	6.30	4.10	2.30	2.61		2.65
TEOM	Eg:	1.8	1.2	2.4	3.3		8.7
TEOM	Eg/hr:	4.2	0.8	1.3	0.62	2.71	0.96
TEOM	Eg/kg:	0.66	0.2	0.59	0.29	0.43	0.36
TEOM	Eg/MJ output:	0.05	0.02	0.04	0.02		0.03
TEOM	Elb/mmbtu output:	0.12	0.04	0.10	0.05		0.06
2515	Eg:						14.7
2515	Eg/hr:						1.6
2515	Eg/kg:						0.61
2515	Eg/MJ output:						0.05
2515	Elb/mmbtu output:						0.11
	CO (g):	62.9	142.1	157.4	265.2		627.6
	CO (g/min):	2.4	1.7	1.4	0.83		1.2
	CO g/hr:	145.2	101.5	85.9	49.9		69.5
	CO g/kg:	23.0	24.8	37.3	19.1		26.2
	CO g/MJ output:	1.8	1.8	2.9	1.8		2.2
	CO lb/mmBTU output:	4.1	4.3	6.8	4.1		5.0
	Output (BTU/hr)	78,249	50,595	27,934	26,972		33,139
	Efficiency (%)	65.6%	64.5%	65.3%	66.9%		65.9%

Test Run Narrative

Run 1

Run 1 was performed on 5/6/2024 as an Integrated Duty Cycle run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. L2 test fuel was loaded at 29 minutes, L3 at 102 minutes, and L4 at 218 minutes. The total test time was 544 minutes. The particulate emissions rate from kindling ignition to test completion was 1.6 g/hr as measured by the TEOM, or 2.3 g/hr as measured in accordance with ASTM E2515. No filter change was needed for E2515 sampling. The overall burn rate from ignition to completion was 2.71 kg/hr, and overall efficiency was 63.8%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. No condensed water was detected in the tunnel at any time. Video was recorded for the entire run.

Run 2

Run 2 was performed on 5/7/2024 as an Integrated Duty Cycle run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. L2 test fuel was loaded at 28 minutes, L3 at 120 minutes, and L4 at 232 minutes. The total test time was 578 minutes. The particulate emissions rate from kindling ignition to test completion was 1.1 g/hr as measured by the TEOM, or 1.8 g/hr as measured in accordance with ASTM E2515. No filter change was needed for E2515 sampling. The overall burn rate from ignition to completion was 2.54 kg/hr, and overall efficiency was 65.0%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. No condensed water was detected in the tunnel at any time. Video was recorded for the entire run.

Run 3

Run 3 was performed on 5/8/2024 as an Integrated Duty Cycle run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. L2 test fuel was loaded at 27 minutes, L3 at 112 minutes, and L4 at 223 minutes. The total test time was 542 minutes. The particulate emissions rate from kindling ignition to test completion was 0.97 g/hr as measured by the TEOM, or 1.6 g/hr as measured in accordance with ASTM E2515. No filter change was needed for E2515 sampling. The overall burn rate from ignition to completion was 2.65 kg/hr, and overall efficiency was 66.0%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. No condensed water was detected in the tunnel at any time. Video was recorded for the entire run.

Test Conditions Summary

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

Run	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Test Run Time (Min)
	Pre	Post	Pre	Post		
1	67.2	68.8	39.2	31.1	29.87	544
2	66.7	69.4	32.4	29.1	30.16	578
3	67.4	70.6	30.2	22.2	30.18	542

Appliance Operation and Test Settings

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

Settings & Run Notes

	L1 Settings	L2 Settings	L3 Settings	L4 Settings
Run 1	Air control fully open Fan off	Air control fully open until 50% fuel consumption, then fully closed Fan on high	Air control fully closed Fan on high	Air control fully closed Fan on high
Run 2	Air control fully open Fan off	Air control fully open until 50% fuel consumption, then fully closed Fan on high	Air control fully closed Fan on high	Air control fully closed Fan on high
Run 3	Air control fully open Fan off	Air control fully open until 50% fuel consumption, then fully closed Fan on high	Air control fully closed Fan on high	Air control fully closed Fan on high

Appliance Description

Models: The Everest III is part of the Everest III Series, all of which are identical with respect to all parts that may impact emissions performance as specified by 40 CFR 60 § 60.533(k). The models are only different with respect to branding, decorative features, and support method . Drawings for all models are in Appendix D. See below for model list:

- Everest III, HE325R, Dallaire, St. Clair 3000R and the Solution 3.0 ZC

Appliance Type: Built-In Wood-Fired Room Heater

Total Firebox Volume: 3.04 ft³

Usable Firebox Volume: 2.61 ft³, see ATM document in Appendix A for further detail on Total versus Usable Firebox Volume.

Air Introduction System: Primary combustion air enters the appliance through the air control opening located on the bottom front of the stove. Air is routed up the sides of the firebox, then down into the combustion chamber in front of the door glass. Secondary air brought in through a fixed opening on the bottom of the appliance. . Secondary air is routed up the back of the firebox and feed into a set of four secondary air tubes. Dimensions on all these features can be found in Appendix D.

Baffles: Combustion air is routed to the front of the stove with a ceramic fiber baffle that sits on top of the secondary air tubes located above the firebox.

Refractory Insulation: The firebox is lined with 1 1/4" thick high-density firebrick.

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

Fan: A variable speed convection fan is mounted to the front of the appliance, under the firebox.

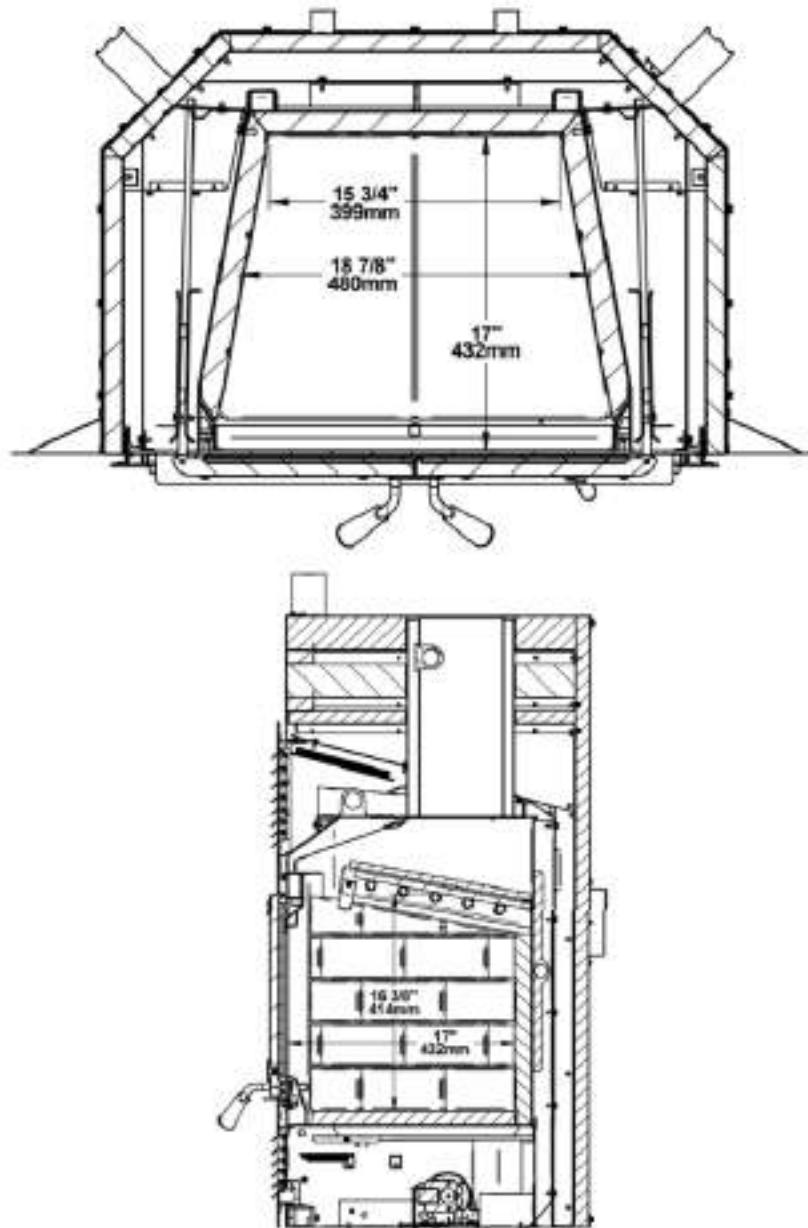
Appliance Dimensions

Everest III Unit Dimensions – Excluding legs, insert shrouds, etc.

Height	Width	Depth
45 15/16"	43 9/16"	22 7/8"

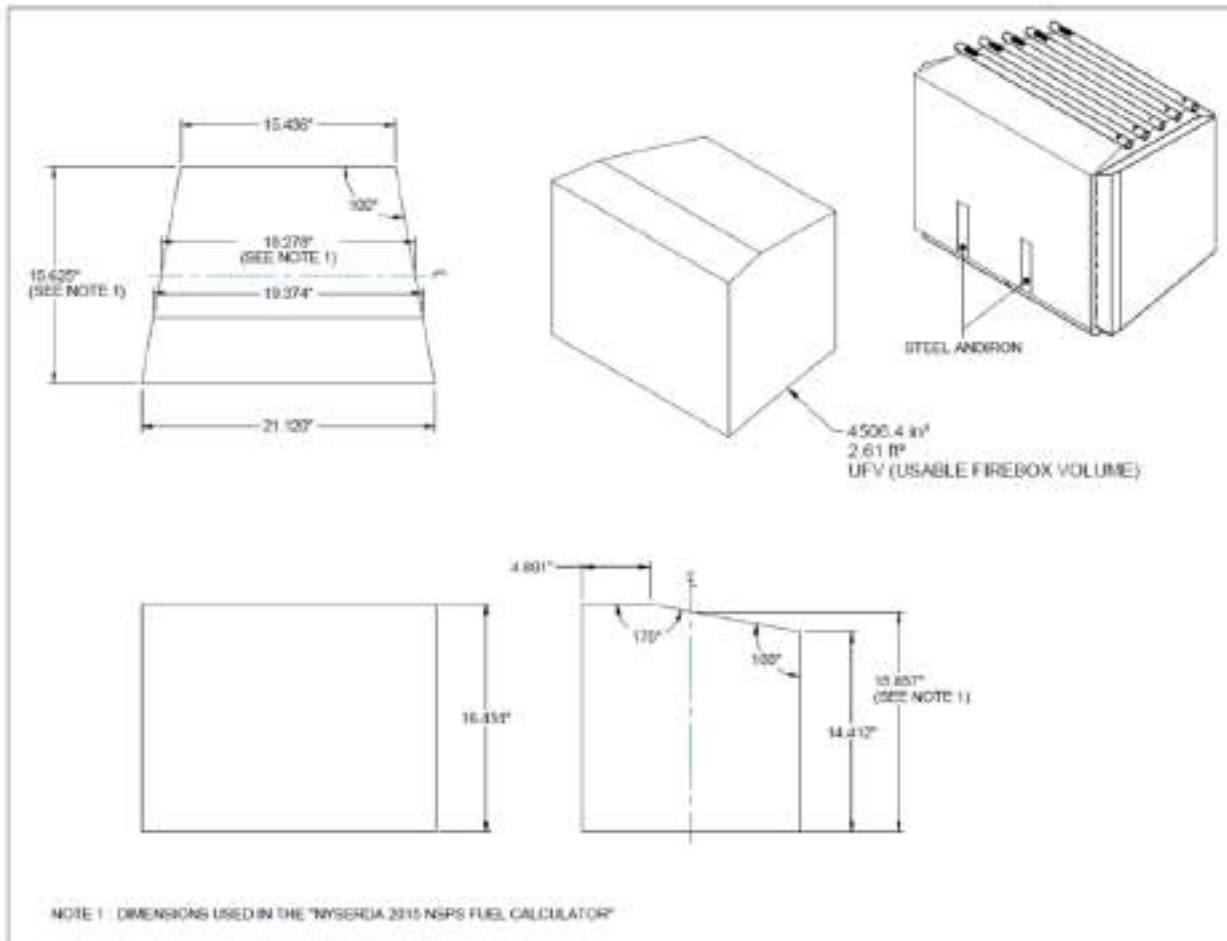
Appliance design drawings can be found in Appendix D submitted with the CBI copy of this report.

Overall Firebox Volume Dimension



$$OFV = 18.875 \times 17.000 \times 16.375 = 5254.330 \text{ in}^3 \quad OFV = \frac{5257.33}{12^3} = 3.04 \text{ ft}^3$$

Usable Firebox Volume Dimensions



$$UFV = UFV_{front} + UFV_{rear} + UFV_{rear,tri}$$

$$UFV_{front} = \frac{(21.120 + 19.374)}{2} \times 4.801 \times 16.414 = 1595.5 \text{ in}^3$$

$$UFV_{rear} = \frac{(19.374 + 15.436)}{2} \times 14.412 \times (15.625 - 4.801) = 2715.3 \text{ in}^3$$

$$UFV_{rear,top,center} = \frac{1}{2} \times 15.436 \times (16.414 - 14.412) \times (15.625 - 4.801) = 167.2 \text{ in}^3$$

$$UFV_{rear,top,side} = \frac{1}{3} \times \frac{19.374 - 15.436}{2} \times (16.414 - 14.412) \times (15.625 - 4.801) = 14.2 \text{ in}^3$$

$$UFV = 1595.5 + 2715.3 + 167.2 + (2 \times 14.2) = 4506.4 \text{ in}^3$$

$$UFV = \frac{4506.4}{12^3} = 2.61 \text{ ft}^3$$

Per user's manual, no fuel should be put on the grid section identified with an X. This explains the difference between the overall and usable firebox volume.

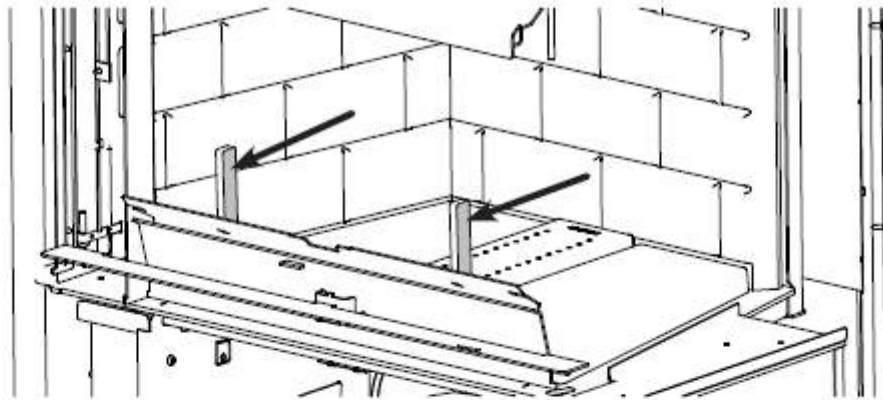


Figure 10: Log retainers

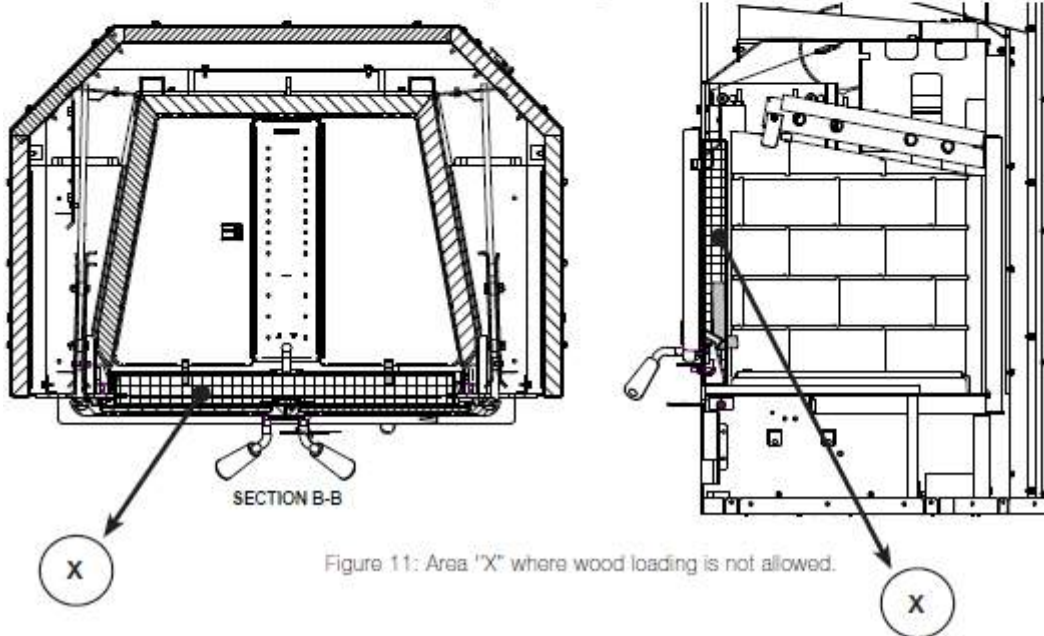


Figure 11: Area "X" where wood loading is not allowed.

Fuel was loaded in East-West orientation per the the Fuel Load Calculator and the ATM letter.

Appliance Front



Appliance Left



Appliance Right



Appliance Rear



Appliance Fire Box



Test Fuel Properties

Test fuel used was maple cordwood, split and air-dried to the specified moisture content range. No kiln-drying was used. Fuel is sourced locally in Oregon. Fuel was not debarked, though bark frequently fell off of fuel pieces in the course of splitting to final size. Fuel was free of decay, fungus or other contaminants. No moisture was added to the fuel. Test fuel moisture was measured within 24h from loading. The fuel was stored in the same ambient condition than the laboratory. As per the Fuel Load Calculator, all pieces of fuel were cut to 15.25 inches long.

While splitting test fuel, it was verified that every piece of test fuel with 4 sides were verified to meet the 70% rule in the ATM. No pieces were intentionally squared. Typical fuel loads are pictured below:

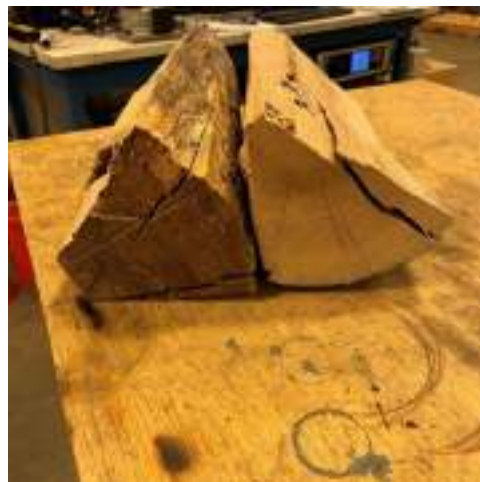
Typical L1 Load



Typical L2 Load



Typical L3 Load



Typical L4 Load



Sampling Locations and Descriptions

PM measurement sample ports are located 16.5 feet downstream from any disturbances and 3.5 feet upstream from any disturbances. Flow rate traverse data was collected 8 feet downstream from any disturbances and 4 feet upstream from any disturbances. (See photograph below and Tunnel Schematic in Appendix A).

Sample Points



Sampling Methods

ASTM E2515 was used in collecting particulate samples. Samples included: the primary (front) filter, backup (rear) filter and sample probe. The primary materials of the filter holders consisted of an aluminum front filter holder and polycarbonate rear filter holder. The dilution tunnel is 12 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used with the exception of caveats described in the ATM: , filter temperatures were maintained between 80 and 90°F for all tests, filters were weighed in pairs where applicable, and no sampling intervals fell outside of proportional rates of +/- 10%. Ambient temperatures were recorded in accordance with ASTM E2515 using a probe located at the level of the primary air intake, 5' away from and in the 90° arc in front of the test unit. Flue gasses were sampled from a probe 2" above the flue temperature probe through a sampling system verified to have a 90% response time of under 30 seconds.

Analytical Methods Description

All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings dessicated for a minimum of 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 Section 10. Prior to being placed in the dessicator, sample filters were initially weighed within 1 hour of the post-test leak checks in accordance with the ATM.

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per, ASTM E2515-11 and the ATM. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined. Sampling trains were disassembled only after post-leak check were performed and found compliant.

Raw data, calibration records, and other relevant documentation will be retained by PFS-TECO for a minimum of 7 years.

Appliance Sealing and Storage

Upon completion of testing, the appliance and the chimney were secured with metal strapping and the seal below was applied, the appliance was then returned to the

manufacturer's location at: 250 Rue de Copenhagen Saint-Augustin-de-Desmaures, QC G3A 2H3 for archival.

Sealing Label

ATTENTION:

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

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

REPORT # _____	DATE SEALED _____
MANUFACTURER _____	MODEL # _____

Sealed Unit



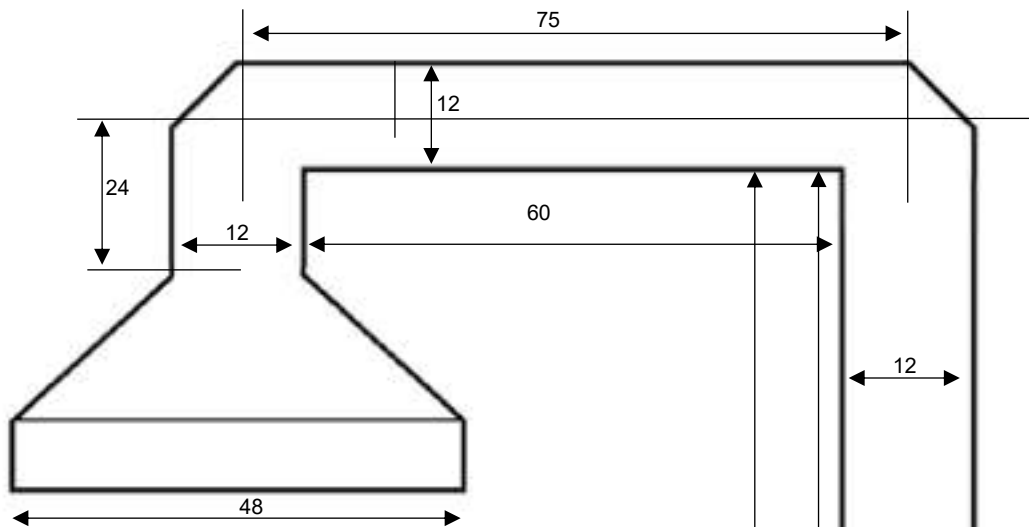
List of Appendices

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

Appendix A – Test Run Data, Technician Notes, Sample Analysis, and Alternate Test Method Approval

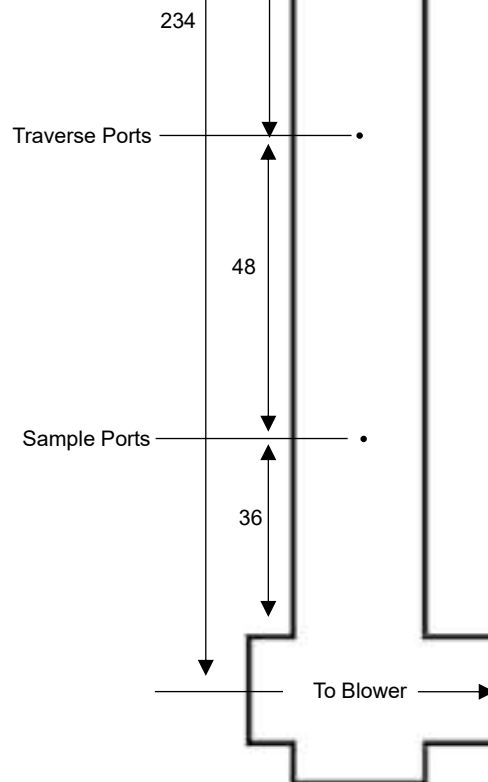
Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records



Booth #2 Tunnel Schematic

All dimensions are in inches



Unit preburn period

Total preburning time (h)

54.97

Model tested:

Everest III Series

Date	Load Type	Duration	Av. Flue	Fuel added	Moisture	Burn Rate (Dry)
		(min)	(°F)	(lbs)	(DB%)	(kg/hr)
2024-03-21	Load 1 - Start-up	28	663	8.11	20.0	5.7
	Load 2 - High-fire	84	829	18.13	20.5	3.9
	Load 3 - Maintenance-fire	106	547	13.00	19.9	2.3
	Load 4 - Low burn rate	408	537	31.96	20.9	1.6
2024-03-22	Load 1 - Start-up	28	655	7.62	20.5	5.4
	Load 2 - High-fire	87	813	17.96	19.9	3.7
	Load 3 - Maintenance-fire	120	623	13.60	20.7	2.0
	Load 4 - Low burn rate	355	580	30.94	21.4	1.8
2024-04-02	Load 1 - Start-up	30	721	8.06	20.1	5.5
	Load 2 - High-fire	79	908	18.18	21.3	4.0
	Load 3 - Maintenance-fire	93	771	13.68	18.8	2.8
	Load 4 - Low burn rate	375	601	31.10	21.0	1.7
2024-04-06	Load 1 - Start-up	30	715	8.01	21.1	5.3
	Load 2 - High-fire	68	925	17.82	20.4	4.7
	Load 3 - Maintenance-fire	96	738	13.04	20.5	2.4
	Load 4 - Low burn rate	308	669	31.23	21.3	2.0
2024-04-08	Load 1 - Start-up	32	693	8.03	19.8	4.8
	Load 2 - High-fire	82	876	18.48	20.7	4.0
	Load 3 - Maintenance-fire	92	740	12.92	21.3	2.5
	Load 4 - Low burn rate	289	704	31.64	21.2	2.2
2024-04-09	Load 1 - Start-up	27	774	8.03	20.3	5.8
	Load 2 - High-fire	77	876	18.53	21.3	4.3
	Load 3 - Maintenance-fire	100	705	12.96	20.9	2.3
	Load 4 - Low burn rate	304	692	31.68	20.5	2.1

High fire air control (max. position)



Low fire air control (max. position)



Everest III Series Pre-burn Data		2024-03-21	Total time (h)		10.43				
Wood Specie: Maple									
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel	Fuel Burnt (Dry)	Burn Rate (Dry)	Time	Flue Temp
(-)	(-)	(lb)	(DB %)	(-)	(in.)	(lb)	(kg/hr)	(min)	(°F)
2024-03-21 11:31	Load 1 - Start-up	8.11	20.0	5	15.25	5.89	5.73	28	662.9
2024-03-21 11:59	Load 2 - High-fire	18.13	20.5	5	15.25	13.25	3.86	84	828.6
2024-03-21 13:24	Load 3 - Maintenance-fire	13.00	19.9	2	15.25	9.79	2.26	106	546.8
2024-03-21 15:11	Load 4 - Low burn rate	31.96	20.9	6	15.25	26.47	1.59	408	537.2

	Average Tflue (°F)	662.9		828.6		546.8		537.2
	Load 1 - Start-up (min)	28	High-fire (min)	84	Maintenance-fire (min)	106	Low burn rate (min)	408
Air control position	Full open		Full open then fully closed (@50% fuel load)		Fully closed		Fully closed	
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)
0	2024-03-21 11:31	73.8	2024-03-21 11:59	763.6	2024-03-21 13:24	597.8	2024-03-21 15:11	528.0
1	2024-03-21 11:32	227.0	2024-03-21 12:00	762.9	2024-03-21 13:25	487.1	2024-03-21 15:12	377.0
2	2024-03-21 11:33	524.6	2024-03-21 12:01	636.2	2024-03-21 13:26	560.6	2024-03-21 15:13	433.5
3	2024-03-21 11:34	669.5	2024-03-21 12:02	747.7	2024-03-21 13:27	579.9	2024-03-21 15:14	457.6
4	2024-03-21 11:35	751.0	2024-03-21 12:03	773.6	2024-03-21 13:28	592.1	2024-03-21 15:15	509.7
5	2024-03-21 11:36	765.8	2024-03-21 12:04	787.0	2024-03-21 13:29	601.3	2024-03-21 15:16	654.0
6	2024-03-21 11:37	713.5	2024-03-21 12:05	799.9	2024-03-21 13:30	603.8	2024-03-21 15:17	632.3
7	2024-03-21 11:38	668.7	2024-03-21 12:06	810.2	2024-03-21 13:31	595.5	2024-03-21 15:18	626.9
8	2024-03-21 11:39	634.1	2024-03-21 12:07	830.3	2024-03-21 13:32	590.2	2024-03-21 15:19	641.9
9	2024-03-21 11:40	615.5	2024-03-21 12:08	846.9	2024-03-21 13:33	588.0	2024-03-21 15:20	674.8
10	2024-03-21 11:41	605.5	2024-03-21 12:09	859.2	2024-03-21 13:34	584.7	2024-03-21 15:21	701.2
11	2024-03-21 11:42	608.1	2024-03-21 12:10	876.6	2024-03-21 13:35	578.9	2024-03-21 15:22	677.0
12	2024-03-21 11:43	624.2	2024-03-21 12:11	886.4	2024-03-21 13:36	575.4	2024-03-21 15:23	669.8
13	2024-03-21 11:44	644.6	2024-03-21 12:12	892.4	2024-03-21 13:37	570.6	2024-03-21 15:24	669.2
14	2024-03-21 11:45	661.7	2024-03-21 12:13	897.2	2024-03-21 13:38	566.0	2024-03-21 15:25	667.4
15	2024-03-21 11:46	679.1	2024-03-21 12:14	910.5	2024-03-21 13:39	563.6	2024-03-21 15:26	664.7
16	2024-03-21 11:47	699.5	2024-03-21 12:15	927.2	2024-03-21 13:40	561.2	2024-03-21 15:27	666.3
17	2024-03-21 11:48	715.3	2024-03-21 12:16	942.5	2024-03-21 13:41	558.9	2024-03-21 15:28	668.0
18	2024-03-21 11:49	731.3	2024-03-21 12:17	948.7	2024-03-21 13:42	555.2	2024-03-21 15:29	671.7
19	2024-03-21 11:50	746.9	2024-03-21 12:18	954.4	2024-03-21 13:43	554.6	2024-03-21 15:30	678.9
20	2024-03-21 11:51	755.1	2024-03-21 12:19	960.1	2024-03-21 13:44	554.9	2024-03-21 15:31	685.4
21	2024-03-21 11:52	762.4	2024-03-21 12:20	961.1	2024-03-21 13:45	554.4	2024-03-21 15:32	690.9
22	2024-03-21 11:53	762.1	2024-03-21 12:21	960.2	2024-03-21 13:46	554.1	2024-03-21 15:33	698.1
23	2024-03-21 11:54	766.8	2024-03-21 12:22	961.8	2024-03-21 13:47	552.9	2024-03-21 15:34	707.4
24	2024-03-21 11:55	767.1	2024-03-21 12:23	968.4	2024-03-21 13:48	551.2	2024-03-21 15:35	714.1
25	2024-03-21 11:56	764.0	2024-03-21 12:24	973.4	2024-03-21 13:49	551.0	2024-03-21 15:36	711.7
26	2024-03-21 11:57	762.5	2024-03-21 12:25	981.0	2024-03-21 13:50	549.4	2024-03-21 15:37	707.6
27	2024-03-21 11:58	761.9	2024-03-21 12:26	987.6	2024-03-21 13:51	549.9	2024-03-21 15:38	702.7
28	2024-03-21 11:59	763.6	2024-03-21 12:27	996.5	2024-03-21 13:52	547.5	2024-03-21 15:39	698.9
29			2024-03-21 12:28	1003.8	2024-03-21 13:53	524.4	2024-03-21 15:40	699.3
30			2024-03-21 12:29	1011.0	2024-03-21 13:54	515.4	2024-03-21 15:41	699.3
31			2024-03-21 12:30	1016.0	2024-03-21 13:55	511.0	2024-03-21 15:42	703.1
32			2024-03-21 12:31	1021.4	2024-03-21 13:56	515.7	2024-03-21 15:43	705.6
33			2024-03-21 12:32	1025.5	2024-03-21 13:57	505.4	2024-03-21 15:44	706.4
34			2024-03-21 12:33	988.6	2024-03-21 13:58	510.9	2024-03-21 15:45	703.1
35			2024-03-21 12:34	956.6	2024-03-21 13:59	516.0	2024-03-21 15:46	704.8
36			2024-03-21 12:35	925.9	2024-03-21 14:00	511.2	2024-03-21 15:47	709.2
37			2024-03-21 12:36	903.0	2024-03-21 14:01	506.9	2024-03-21 15:48	708.7
38			2024-03-21 12:37	885.4	2024-03-21 14:02	508.8	2024-03-21 15:49	705.3
39			2024-03-21 12:38	871.8	2024-03-21 14:03	512.7	2024-03-21 15:50	704.1
40			2024-03-21 12:39	861.6	2024-03-21 14:04	515.7	2024-03-21 15:51	703.2
41			2024-03-21 12:40	851.2	2024-03-21 14:05	518.5	2024-03-21 15:52	701.2
42			2024-03-21 12:41	842.2	2024-03-21 14:06	520.2	2024-03-21 15:53	702.7
43			2024-03-21 12:42	833.7	2024-03-21 14:07	523.6	2024-03-21 15:54	701.1
44			2024-03-21 12:43	828.1	2024-03-21 14:08	525.8	2024-03-21 15:55	702.4
45			2024-03-21 12:44	822.9	2024-03-21 14:09	529.5	2024-03-21 15:56	702.3
46			2024-03-21 12:45	817.6	2024-03-21 14:10	533.5	2024-03-21 15:57	704.2
47			2024-03-21 12:46	814.7	2024-03-21 14:11	537.9	2024-03-21 15:58	705.6
48			2024-03-21 12:47	811.7	2024-03-21 14:12	541.4	2024-03-21 15:59	707.9
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53			2024-03-21 12:52	813.7	2024-03-21 14:17	559.1	2024-03-21 16:04	721.8
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55			2024-03-21 12:54	814.0	2024-03-21 14:19	563.9	2024-03-21 16:06	729.5
56			2024-03-21 12:55	812.0	2024-03-21 14:20	564.2	2024-03-21 16:07	732.0
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62			2024-03-21 13:01	791.9	2024-03-21 14:26	557.2	2024-03-21 16:13	761.8
63			2024-03-21 13:02	793.2	2024-03-21 14:27	554.1	2024-03-21 16:14	764.9
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76			2024-03-21 13:15	678.9	2024-03-21 14:40	526.2	2024-03-21 16:27	818.5
77			2024-03-21 13:16	668.8	2024-03-21 14:41	528.8	2024-03-21 16:28	821.2
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80			2024-03-21 13:19	644.6	2024-03-21 14:44	532.0	2024-03-21 16:31	840.2
81			2024-03-21 13:20	636.8	2024-03-21 14:45	534.1	2024-03-21 16:32	841.8
82			2024-03-21 13:21	627.0	2024-03-21 14:46	536.6	2024-03-21 16:33	846.1
83			2024-03-21 13:22	616.2	2024-03-21 14:47	538.3	2024-03-21 16:34	849.5
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98					2024-03-21 15:02	548.3	2024-03-21 16:49	846.3
99					2024-03-21 15:03	548.8	2024-03-21 16:50	842.6
100					2024-03-21 15:04	548.6	2024-03-21 16:51	837.4
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104					2024-03-21 15:08	548.1	2024-03-21 16:55	820.1
105					2024-03-21 15:09	547.0	2024-03-21 16:56	818.1
106					2024-03-21 15:10	546.7	2024-03-21 16:57	815.6
107							2024-03-21 16:58	815.5
108							2024-03-21 16:59	813.3
109							2024-03-21 17:00	812.9
110							2024-03-21 17:01	814.6
111							2024-03-21 17:02	817.5
112							2024-03-21 17:03	820.0
113							2024-03-21 17:04	820.9
114							2024-03-21 17:05	827.1
115							2024-03-21 17:06	834.9
116							2024-03-21 17:07	836.3
117							2024-03-21 17:08	833.3
118							2024-03-21 17:09	831.3
119							2024-03-21 17:10	828.0
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123							2024-03-21 17:14	794.4
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125							2024-03-21 17:16	773.2
126							2024-03-21 17:17	768.0
127							2024-03-21 17:18	763.1
128							2024-03-21 17:19	757.6
129							2024-03-21 17:20	751.3
130							2024-03-21 17:21	751.5
131							2024-03-21 17:22	748.8
132							2024-03-21 17:23	742.2
133							2024-03-21 17:24	737.8
134							2024-03-21 17:25	732.5
135							2024-03-21 17:26	727.3
136							2024-03-21 17:27	721.2
137							2024-03-21 17:28	718.9
138							2024-03-21 17:29	713.8
139							2024-03-21 17:30	710.8
140							2024-03-21 17:31	707.3
141							2024-03-21 17:32	703.5
142							2024-03-21 17:33	701.5
143							2024-03-21 17:34	698.4
144							2024-03-21 17:35	695.2
145							2024-03-21 17:36	693.9
146							2024-03-21 17:37	690.1
147							2024-03-21 17:38	692.0
148							2024-03-21 17:39	689.4

149						2024-03-21 17:40	681.4
150						2024-03-21 17:41	675.7
151						2024-03-21 17:42	670.2
152						2024-03-21 17:43	667.7
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154						2024-03-21 17:45	658.6
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157						2024-03-21 17:48	646.5
158						2024-03-21 17:49	642.8
159						2024-03-21 17:50	638.9
160						2024-03-21 17:51	635.8
161						2024-03-21 17:52	632.2
162						2024-03-21 17:53	628.0
163						2024-03-21 17:54	624.0
164						2024-03-21 17:55	619.0
165						2024-03-21 17:56	615.7
166						2024-03-21 17:57	612.9
167						2024-03-21 17:58	608.8
168						2024-03-21 17:59	604.2
169						2024-03-21 18:00	601.3
170						2024-03-21 18:01	598.5
171						2024-03-21 18:02	596.5
172						2024-03-21 18:03	593.0
173						2024-03-21 18:04	589.2
174						2024-03-21 18:05	580.9
175						2024-03-21 18:06	573.6
176						2024-03-21 18:07	570.1
177						2024-03-21 18:08	564.2
178						2024-03-21 18:09	560.0
179						2024-03-21 18:10	555.0
180						2024-03-21 18:11	551.9
181						2024-03-21 18:12	549.3
182						2024-03-21 18:13	544.2
183						2024-03-21 18:14	540.6
184						2024-03-21 18:15	537.7
185						2024-03-21 18:16	534.8
186						2024-03-21 18:17	532.8
187						2024-03-21 18:18	529.4
188						2024-03-21 18:19	524.3
189						2024-03-21 18:20	521.5
190						2024-03-21 18:21	519.2
191						2024-03-21 18:22	515.7
192						2024-03-21 18:23	512.4
193						2024-03-21 18:24	508.8
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207						2024-03-21 18:38	462.8
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213						2024-03-21 18:44	448.5
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308						2024-03-21 20:20	372.1
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310						2024-03-21 20:22	369.3

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322						2024-03-21 20:34	362.4
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326						2024-03-21 20:38	357.4
327						2024-03-21 20:39	357.3
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332						2024-03-21 20:44	350.9
333						2024-03-21 20:45	349.8
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336						2024-03-21 20:48	346.9
337						2024-03-21 20:49	346.2
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341						2024-03-21 20:53	343.2
342						2024-03-21 20:54	342.6
343						2024-03-21 20:55	342.5
344						2024-03-21 20:56	342.0
345						2024-03-21 20:57	341.0
346						2024-03-21 20:58	340.6
347						2024-03-21 20:59	339.6
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361						2024-03-21 21:13	333.8
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389						2024-03-21 21:41	333.8
390						2024-03-21 21:42	333.8
391						2024-03-21 21:43	334.0

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393							2024-03-21 21:45	335.1
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395							2024-03-21 21:47	335.6
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397							2024-03-21 21:49	336.1
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399							2024-03-21 21:51	336.5
400							2024-03-21 21:52	337.2
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402							2024-03-21 21:54	338.5
403							2024-03-21 21:55	338.8
404							2024-03-21 21:56	339.6
405							2024-03-21 21:57	340.1
406							2024-03-21 21:58	339.7
407							2024-03-21 21:59	340.7
408							2024-03-21 21:59	340.9

Everest III Series Pre-burn Data		2024-03-22		Total time (h)		9.83			
Wood Specie: Maple									
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel	Fuel Burnt (Dry)	Burn Rate (Dry)	Time	Flue Temp
(-)	(-)	(lb)	(DB %)	(-)	(in.)	(lb)	(kg/hr)	(min)	(°F)
2024-03-22 11:38	Load 1 - Start-up	7.62	20.5	5	15.25	5.51	5.36	28	654.6
2024-03-22 12:06	Load 2 - High-fire	17.96	19.9	5	15.25	13.11	3.69	87	812.6
2024-03-22 13:33	Load 3 - Maintenance-fire	13.60	20.7	2	15.25	9.85	2.01	120	623.3
2024-03-22 15:33	Load 4 - Low burn rate	30.94	21.4	6	15.25	25.49	1.76	355	579.5

	Average Tflue (°F)		654.6		812.6		623.3		579.5	
	Load 1 - Start-up (min)		28 High-fire (min)		87 Maintenance-fire (min)		120 Low burn rate (min)		355	
Air control position	Full open		Full open then fully closed (@50% fuel load)		Fully closed		Fully closed			
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)		
0	2024-03-22 11:38	75.7	2024-03-22 12:06	776.4	2024-03-22 13:33	587.0	2024-03-22 15:33	534.4		
1	2024-03-22 11:39	202.4	2024-03-22 12:07	667.6	2024-03-22 13:34	506.8	2024-03-22 15:34	374.1		
2	2024-03-22 11:40	479.2	2024-03-22 12:08	732.3	2024-03-22 13:35	567.6	2024-03-22 15:35	386.6		
3	2024-03-22 11:41	753.3	2024-03-22 12:09	764.1	2024-03-22 13:36	600.8	2024-03-22 15:36	457.2		
4	2024-03-22 11:42	897.2	2024-03-22 12:10	791.8	2024-03-22 13:37	628.7	2024-03-22 15:37	583.9		
5	2024-03-22 11:43	904.9	2024-03-22 12:11	805.8	2024-03-22 13:38	649.3	2024-03-22 15:38	713.3		
6	2024-03-22 11:44	758.7	2024-03-22 12:12	809.3	2024-03-22 13:39	643.6	2024-03-22 15:39	718.7		
7	2024-03-22 11:45	711.2	2024-03-22 12:13	818.6	2024-03-22 13:40	636.0	2024-03-22 15:40	729.4		
8	2024-03-22 11:46	681.4	2024-03-22 12:14	825.8	2024-03-22 13:41	634.6	2024-03-22 15:41	758.2		
9	2024-03-22 11:47	658.8	2024-03-22 12:15	825.4	2024-03-22 13:42	627.5	2024-03-22 15:42	780.2		
10	2024-03-22 11:48	637.6	2024-03-22 12:16	831.3	2024-03-22 13:43	624.6	2024-03-22 15:43	803.6		
11	2024-03-22 11:49	618.5	2024-03-22 12:17	841.6	2024-03-22 13:44	625.4	2024-03-22 15:44	778.5		
12	2024-03-22 11:50	612.0	2024-03-22 12:18	853.2	2024-03-22 13:45	627.9	2024-03-22 15:45	775.7		
13	2024-03-22 11:51	613.9	2024-03-22 12:19	861.5	2024-03-22 13:46	632.0	2024-03-22 15:46	772.7		
14	2024-03-22 11:52	616.2	2024-03-22 12:20	864.6	2024-03-22 13:47	632.4	2024-03-22 15:47	771.3		
15	2024-03-22 11:53	621.6	2024-03-22 12:21	871.6	2024-03-22 13:48	630.8	2024-03-22 15:48	770.4		
16	2024-03-22 11:54	633.1	2024-03-22 12:22	882.8	2024-03-22 13:49	631.6	2024-03-22 15:49	771.6		
17	2024-03-22 11:55	640.8	2024-03-22 12:23	891.1	2024-03-22 13:50	635.9	2024-03-22 15:50	769.0		
18	2024-03-22 11:56	647.2	2024-03-22 12:24	904.4	2024-03-22 13:51	641.6	2024-03-22 15:51	771.6		
19	2024-03-22 11:57	675.9	2024-03-22 12:25	914.8	2024-03-22 13:52	648.2	2024-03-22 15:52	770.8		
20	2024-03-22 11:58	695.3	2024-03-22 12:26	932.5	2024-03-22 13:53	655.1	2024-03-22 15:53	768.1		
21	2024-03-22 11:59	699.8	2024-03-22 12:27	948.2	2024-03-22 13:54	661.5	2024-03-22 15:54	767.1		
22	2024-03-22 12:00	703.8	2024-03-22 12:28	964.2	2024-03-22 13:55	668.2	2024-03-22 15:55	763.8		
23	2024-03-22 12:01	709.4	2024-03-22 12:29	979.5	2024-03-22 13:56	669.9	2024-03-22 15:56	756.3		
24	2024-03-22 12:02	721.0	2024-03-22 12:30	989.5	2024-03-22 13:57	671.0	2024-03-22 15:57	749.5		
25	2024-03-22 12:03	734.5	2024-03-22 12:31	995.4	2024-03-22 13:58	672.8	2024-03-22 15:58	743.4		
26	2024-03-22 12:04	745.7	2024-03-22 12:32	998.5	2024-03-22 13:59	673.4	2024-03-22 15:59	740.5		
27	2024-03-22 12:05	757.9	2024-03-22 12:33	998.9	2024-03-22 14:00	675.9	2024-03-22 16:00	737.7		
28	2024-03-22 12:06	776.4	2024-03-22 12:34	999.6	2024-03-22 14:01	679.6	2024-03-22 16:01	739.8		
29			2024-03-22 12:35	1001.4	2024-03-22 14:02	681.8	2024-03-22 16:02	737.5		
30			2024-03-22 12:36	1003.0	2024-03-22 14:03	685.6	2024-03-22 16:03	739.2		
31			2024-03-22 12:37	1005.7	2024-03-22 14:04	687.8	2024-03-22 16:04	739.6		
32			2024-03-22 12:38	997.2	2024-03-22 14:05	688.8	2024-03-22 16:05	743.6		
33			2024-03-22 12:39	978.9	2024-03-22 14:06	691.0	2024-03-22 16:06	747.0		
34			2024-03-22 12:40	944.4	2024-03-22 14:07	691.7	2024-03-22 16:07	750.5		
35			2024-03-22 12:41	917.9	2024-03-22 14:08	694.7	2024-03-22 16:08	750.3		
36			2024-03-22 12:42	896.8	2024-03-22 14:09	696.5	2024-03-22 16:09	744.3		
37			2024-03-22 12:43	877.1	2024-03-22 14:10	695.6	2024-03-22 16:10	737.1		
38			2024-03-22 12:44	861.1	2024-03-22 14:11	695.5	2024-03-22 16:11	735.2		
39			2024-03-22 12:45	846.2	2024-03-22 14:12	694.7	2024-03-22 16:12	733.6		
40			2024-03-22 12:46	833.3	2024-03-22 14:13	694.1	2024-03-22 16:13	734.1		
41			2024-03-22 12:47	823.2	2024-03-22 14:14	692.0	2024-03-22 16:14	735.2		
42			2024-03-22 12:48	814.3	2024-03-22 14:15	688.2	2024-03-22 16:15	734.5		
43			2024-03-22 12:49	806.0	2024-03-22 14:16	685.7	2024-03-22 16:16	736.6		
44			2024-03-22 12:50	800.0	2024-03-22 14:17	680.8	2024-03-22 16:17	739.5		
45			2024-03-22 12:51	796.3	2024-03-22 14:18	679.0	2024-03-22 16:18	744.4		
46			2024-03-22 12:52	794.9	2024-03-22 14:19	678.9	2024-03-22 16:19	739.5		
47			2024-03-22 12:53	791.6	2024-03-22 14:20	678.2	2024-03-22 16:20	735.1		
48			2024-03-22 12:54	789.4	2024-03-22 14:21	675.2	2024-03-22 16:21	733.2		
49			2024-03-22 12:55	790.0	2024-03-22 14:22	672.5	2024-03-22 16:22	733.6		
50			2024-03-22 12:56	788.9	2024-03-22 14:23	671.5	2024-03-22 16:23	733.9		
51			2024-03-22 12:57	790.9	2024-03-22 14:24	668.2	2024-03-22 16:24	734.3		
52			2024-03-22 12:58	791.8	2024-03-22 14:25	666.2	2024-03-22 16:25	737.5		
53			2024-03-22 12:59	796.0	2024-03-22 14:26	664.1	2024-03-22 16:26	740.7		
54			2024-03-22 13:00	797.4	2024-03-22 14:27	661.6	2024-03-22 16:27	739.6		
55			2024-03-22 13:01	800.5	2024-03-22 14:28	658.1	2024-03-22 16:28	738.0		
56			2024-03-22 13:02	805.8	2024-03-22 14:29	654.0	2024-03-22 16:29	738.1		
57			2024-03-22 13:03	808.7	2024-03-22 14:30	651.4	2024-03-22 16:30	741.4		
58			2024-03-22 13:04	813.5	2024-03-22 14:31	646.9	2024-03-22 16:31	743.9		
59			2024-03-22 13:05	809.5	2024-03-22 14:32	646.6	2024-03-22 16:32	745.9		
60			2024-03-22 13:06	802.7	2024-03-22 14:33	642.6	2024-03-22 16:33	748.5		
61			2024-03-22 13:07	796.2	2024-03-22 14:34	638.7	2024-03-22 16:34	753.5		
62			2024-03-22 13:08	792.0	2024-03-22 14:35	635.9	2024-03-22 16:35	758.4		
63			2024-03-22 13:09	787.9	2024-03-22 14:36	632.7	2024-03-22 16:36	763.4		
64			2024-03-22 13:10	781.0	2024-03-22 14:37	629.0	2024-03-22 16:37	770.9		
65			2024-03-22 13:11	776.2	2024-03-22 14:38	625.4	2024-03-22 16:38	774.0		
66			2024-03-22 13:12	772.2	2024-03-22 14:39	621.8	2024-03-22 16:39	780.5		
67			2024-03-22 13:13	768.3	2024-03-22 14:40	618.4	2024-03-22 16:40	787.2		
68			2024-03-22 13:14	761.0	2024-03-22 14:41	614.8	2024-03-22 16:41	791.3		
69			2024-03-22 13:15	755.3	2024-03-22 14:42	608.8	2024-03-22 16:42	798.3		
70			2024-03-22 13:16	746.5	2024-03-22 14:43	607.2	2024-03-22 16:43	805.7		
71			2024-03-22 13:17	734.8	2024-03-22 14:44	604.7	2024-03-22 16:44	813.7		
72			2024-03-22 13:18	723.9	2024-03-22 14:45	602.4	2024-03-22 16:45	820.8		

73			2024-03-22 13:19	719.7	2024-03-22 14:46	601.7	2024-03-22 16:46	833.1
74			2024-03-22 13:20	708.6	2024-03-22 14:47	597.4	2024-03-22 16:47	831.1
75			2024-03-22 13:21	700.4	2024-03-22 14:48	595.0	2024-03-22 16:48	843.6
76			2024-03-22 13:22	690.0	2024-03-22 14:49	591.9	2024-03-22 16:49	847.9
77			2024-03-22 13:23	683.1	2024-03-22 14:50	591.0	2024-03-22 16:50	848.2
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79			2024-03-22 13:25	668.3	2024-03-22 14:52	587.2	2024-03-22 16:52	842.4
80			2024-03-22 13:26	656.7	2024-03-22 14:53	585.6	2024-03-22 16:53	842.6
81			2024-03-22 13:27	645.3	2024-03-22 14:54	585.6	2024-03-22 16:54	839.0
82			2024-03-22 13:28	632.3	2024-03-22 14:55	584.5	2024-03-22 16:55	841.5
83			2024-03-22 13:29	621.0	2024-03-22 14:56	583.0	2024-03-22 16:56	838.1
84			2024-03-22 13:30	611.5	2024-03-22 14:57	582.7	2024-03-22 16:57	834.9
85			2024-03-22 13:31	603.0	2024-03-22 14:58	580.6	2024-03-22 16:58	833.3
86			2024-03-22 13:32	594.8	2024-03-22 14:59	579.2	2024-03-22 16:59	830.1
87			2024-03-22 13:33	587.0	2024-03-22 15:00	578.9	2024-03-22 17:00	827.0
88					2024-03-22 15:01	577.8	2024-03-22 17:01	824.4
89					2024-03-22 15:02	577.5	2024-03-22 17:02	820.2
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91					2024-03-22 15:04	575.6	2024-03-22 17:04	811.6
92					2024-03-22 15:05	574.4	2024-03-22 17:05	808.7
93					2024-03-22 15:06	574.5	2024-03-22 17:06	806.7
94					2024-03-22 15:07	575.5	2024-03-22 17:07	803.6
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244							2024-03-22 19:37	449.4

245							2024-03-22 19:38	448.4
246							2024-03-22 19:39	447.4
247							2024-03-22 19:40	446.5
248							2024-03-22 19:41	445.2
249							2024-03-22 19:42	445.0
250							2024-03-22 19:43	443.9
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272							2024-03-22 20:05	429.7
273							2024-03-22 20:06	429.2
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290							2024-03-22 20:23	412.8
291							2024-03-22 20:24	412.1
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302							2024-03-22 20:35	401.4
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304							2024-03-22 20:37	398.4
305							2024-03-22 20:38	397.4
306							2024-03-22 20:39	396.3
307							2024-03-22 20:40	395.1
308							2024-03-22 20:41	394.6
309							2024-03-22 20:42	393.5
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311							2024-03-22 20:44	392.4
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314							2024-03-22 20:47	390.4
315							2024-03-22 20:48	389.4
316							2024-03-22 20:49	388.2
317							2024-03-22 20:50	388.9
318							2024-03-22 20:51	388.0
319							2024-03-22 20:52	387.3
320							2024-03-22 20:53	386.1
321							2024-03-22 20:54	385.6
322							2024-03-22 20:55	385.5
323							2024-03-22 20:56	384.7
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325							2024-03-22 20:58	383.5
326							2024-03-22 20:59	382.5
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328							2024-03-22 21:01	380.8
329							2024-03-22 21:02	380.3
330							2024-03-22 21:03	379.0

331							2024-03-22 21:04	378.6
332							2024-03-22 21:05	378.1
333							2024-03-22 21:06	377.9
334							2024-03-22 21:07	377.7
335							2024-03-22 21:08	376.0
336							2024-03-22 21:09	375.2
337							2024-03-22 21:10	374.5
338							2024-03-22 21:11	373.5
339							2024-03-22 21:12	373.1
340							2024-03-22 21:13	371.9
341							2024-03-22 21:14	370.8
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344							2024-03-22 21:17	368.7
345							2024-03-22 21:18	368.1
346							2024-03-22 21:19	367.3
347							2024-03-22 21:20	367.2
348							2024-03-22 21:21	365.7
349							2024-03-22 21:22	365.7
350							2024-03-22 21:23	365.3
351							2024-03-22 21:24	364.4
352							2024-03-22 21:25	364.0
353							2024-03-22 21:26	363.8
354							2024-03-22 21:27	362.6
355							2024-03-22 21:28	362.0

Everest III Series Pre-burn Data		2024-04-02	Total time (h)		9.62				
Wood Specie: Maple									
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel	Fuel Burnt (Dry)	Burn Rate (Dry)	Time	Flue Temp
(-)	(-)	(lb)	(DB %)	(-)	(in.)	(lb)	(kg/hr)	(min)	(°F)
2024-04-02 11:39	Load 1 - Strart-up	8.06	20.1	5	15.25	6.02	5.46	30	720.9
2024-04-02 12:09	Load 2 - High-fire	18.18	21.3	5	15.25	12.87	3.99	79	908.4
2024-04-02 13:28	Load 3 - Maintenance-fire	13.68	18.8	2	15.25	10.46	2.75	93	771.1
2024-04-02 15:01	Load 4 - Low burn rate	31.10	21.0	6	15.25	25.70	1.68	375	600.8

Average Tflue (°F)		720.9		908.4		771.1		600.8
Load 1 - Start-up (min)		30	High-fire (min)	79	Maintenace-fire (min)	93	Low burn rate (min)	375
Air control position	Full open		Full open then fully closed (@50% fuel load)		Fully closed		Fully closed	
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)
0	2024-04-02 11:39	72.9	2024-04-02 12:09	875.3	2024-04-02 13:28	769.4	2024-04-02 15:01	652.9
1	2024-04-02 11:40	253.8	2024-04-02 12:10	731.3	2024-04-02 13:29	711.4	2024-04-02 15:02	441.9
2	2024-04-02 11:41	469.5	2024-04-02 12:11	846.0	2024-04-02 13:30	823.3	2024-04-02 15:03	697.4
3	2024-04-02 11:42	772.9	2024-04-02 12:12	862.4	2024-04-02 13:31	913.5	2024-04-02 15:04	1000.7
4	2024-04-02 11:43	882.2	2024-04-02 12:13	872.3	2024-04-02 13:32	938.9	2024-04-02 15:05	1155.8
5	2024-04-02 11:44	768.7	2024-04-02 12:14	891.3	2024-04-02 13:33	942.4	2024-04-02 15:06	1253.0
6	2024-04-02 11:45	728.2	2024-04-02 12:15	903.7	2024-04-02 13:34	898.2	2024-04-02 15:07	1090.8
7	2024-04-02 11:46	726.7	2024-04-02 12:16	908.8	2024-04-02 13:35	880.0	2024-04-02 15:08	1046.9
8	2024-04-02 11:47	711.7	2024-04-02 12:17	909.2	2024-04-02 13:36	870.9	2024-04-02 15:09	1039.8
9	2024-04-02 11:48	711.7	2024-04-02 12:18	909.9	2024-04-02 13:37	864.5	2024-04-02 15:10	1022.2
10	2024-04-02 11:49	701.7	2024-04-02 12:19	911.7	2024-04-02 13:38	859.2	2024-04-02 15:11	1012.3
11	2024-04-02 11:50	699.1	2024-04-02 12:20	929.1	2024-04-02 13:39	856.9	2024-04-02 15:12	970.1
12	2024-04-02 11:51	696.6	2024-04-02 12:21	921.1	2024-04-02 13:40	853.8	2024-04-02 15:13	940.6
13	2024-04-02 11:52	696.1	2024-04-02 12:22	948.4	2024-04-02 13:41	851.6	2024-04-02 15:14	916.6
14	2024-04-02 11:53	702.2	2024-04-02 12:23	963.0	2024-04-02 13:42	847.4	2024-04-02 15:15	895.3
15	2024-04-02 11:54	706.9	2024-04-02 12:24	978.0	2024-04-02 13:43	842.6	2024-04-02 15:16	877.5
16	2024-04-02 11:55	711.4	2024-04-02 12:25	993.6	2024-04-02 13:44	840.2	2024-04-02 15:17	863.7
17	2024-04-02 11:56	719.6	2024-04-02 12:26	1023.8	2024-04-02 13:45	838.0	2024-04-02 15:18	853.5
18	2024-04-02 11:57	730.2	2024-04-02 12:27	1050.7	2024-04-02 13:46	835.0	2024-04-02 15:19	843.8
19	2024-04-02 11:58	741.1	2024-04-02 12:28	1074.8	2024-04-02 13:47	831.5	2024-04-02 15:20	835.0
20	2024-04-02 11:59	752.6	2024-04-02 12:29	1083.1	2024-04-02 13:48	830.1	2024-04-02 15:21	826.7
21	2024-04-02 12:00	767.0	2024-04-02 12:30	1085.7	2024-04-02 13:49	829.0	2024-04-02 15:22	821.4
22	2024-04-02 12:01	793.2	2024-04-02 12:31	1086.2	2024-04-02 13:50	828.3	2024-04-02 15:23	816.4
23	2024-04-02 12:02	814.2	2024-04-02 12:32	1089.3	2024-04-02 13:51	825.9	2024-04-02 15:24	812.6
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25	2024-04-02 12:04	850.6	2024-04-02 12:34	1093.7	2024-04-02 13:53	821.3	2024-04-02 15:26	807.7
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370							2024-04-02 21:11	362.7
371							2024-04-02 21:12	361.6
372							2024-04-02 21:13	360.5
373							2024-04-02 21:14	359.2
374							2024-04-02 21:15	358.5
375							2024-04-02 21:16	357.4

Everest III Series Pre-burn Data		2024-04-06		Total time (h)		8.37			
Wood Specie: Maple									
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel	Fuel Burnt (Dry)	Burn Rate (Dry)	Time	Flue Temp
(-)	(-)	(lb)	(DB %)	(-)	(in.)	(lb)	(kg/hr)	(min)	(°F)
2024-04-06 10:39	Load 1 - Start-up	8.01	21.1	5	15.25	5.82	5.28	30	715.5
2024-04-06 11:09	Load 2 - High-fire	17.82	20.4	5	15.25	13.07	4.71	68	924.8
2024-04-06 12:17	Load 3 - Maintenance-fire	13.04	20.5	2	15.25	9.57	2.44	96	737.8
2024-04-06 13:53	Load 4 - Low burn rate	31.23	21.3	6	15.25	25.75	2.05	308	669.2
		Average Tflue (°F)	715.5	924.8	737.8	669.2			
		Load 1 - Start-up (min)	30	High-fire (min)	68	Maintenance-fire (min)	96	Low burn rate (min)	308
Air control position		Full open	Full open then fully closed (@50% fuel load)		Fully closed		Fully closed		
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	
0	2024-04-06 10:39	80.1	2024-04-06 11:09	782.9	2024-04-06 12:17	826.2	2024-04-06 13:53	632.2	
1	2024-04-06 10:40	253.6	2024-04-06 11:10	737.3	2024-04-06 12:18	756.4	2024-04-06 13:54	478.2	
2	2024-04-06 10:41	578.8	2024-04-06 11:11	794.1	2024-04-06 12:19	882.1	2024-04-06 13:55	475.5	
3	2024-04-06 10:42	804.1	2024-04-06 11:12	856.1	2024-04-06 12:20	949.4	2024-04-06 13:56	749.7	
4	2024-04-06 10:43	734.4	2024-04-06 11:13	880.6	2024-04-06 12:21	975.9	2024-04-06 13:57	940.3	
5	2024-04-06 10:44	727.8	2024-04-06 11:14	905.7	2024-04-06 12:22	972.4	2024-04-06 13:58	1029.5	
6	2024-04-06 10:45	730.6	2024-04-06 11:15	996.6	2024-04-06 12:23	941.9	2024-04-06 13:59	951.6	
7	2024-04-06 10:46	745.3	2024-04-06 11:16	1031.8	2024-04-06 12:24	922.3	2024-04-06 14:00	953.6	
8	2024-04-06 10:47	749.9	2024-04-06 11:17	1028.7	2024-04-06 12:25	908.3	2024-04-06 14:01	963.6	
9	2024-04-06 10:48	736.8	2024-04-06 11:18	1031.4	2024-04-06 12:26	899.7	2024-04-06 14:02	978.6	
10	2024-04-06 10:49	729.6	2024-04-06 11:19	994.5	2024-04-06 12:27	891.3	2024-04-06 14:03	991.3	
11	2024-04-06 10:50	721.8	2024-04-06 11:20	977.6	2024-04-06 12:28	879.9	2024-04-06 14:04	957.0	
12	2024-04-06 10:51	739.6	2024-04-06 11:21	973.1	2024-04-06 12:29	875.0	2024-04-06 14:05	935.9	
13	2024-04-06 10:52	745.9	2024-04-06 11:22	978.7	2024-04-06 12:30	868.7	2024-04-06 14:06	923.2	
14	2024-04-06 10:53	749.2	2024-04-06 11:23	982.8	2024-04-06 12:31	864.4	2024-04-06 14:07	910.6	
15	2024-04-06 10:54	752.5	2024-04-06 11:24	1003.2	2024-04-06 12:32	861.2	2024-04-06 14:08	895.4	
16	2024-04-06 10:55	755.9	2024-04-06 11:25	1014.8	2024-04-06 12:33	860.5	2024-04-06 14:09	878.5	
17	2024-04-06 10:56	759.9	2024-04-06 11:26	1011.3	2024-04-06 12:34	856.5	2024-04-06 14:10	853.2	
18	2024-04-06 10:57	763.9	2024-04-06 11:27	1010.5	2024-04-06 12:35	854.0	2024-04-06 14:11	837.6	
19	2024-04-06 10:58	766.4	2024-04-06 11:28	1014.7	2024-04-06 12:36	848.6	2024-04-06 14:12	824.3	
20	2024-04-06 10:59	766.5	2024-04-06 11:29	1015.4	2024-04-06 12:37	844.7	2024-04-06 14:13	811.2	
21	2024-04-06 11:00	768.5	2024-04-06 11:30	1021.6	2024-04-06 12:38	841.3	2024-04-06 14:14	801.2	
22	2024-04-06 11:01	770.4	2024-04-06 11:31	1042.3	2024-04-06 12:39	838.3	2024-04-06 14:15	797.3	
23	2024-04-06 11:02	777.5	2024-04-06 11:32	1058.7	2024-04-06 12:40	836.6	2024-04-06 14:16	796.2	
24	2024-04-06 11:03	780.9	2024-04-06 11:33	1069.9	2024-04-06 12:41	832.7	2024-04-06 14:17	796.2	
25	2024-04-06 11:04	783.1	2024-04-06 11:34	1079.3	2024-04-06 12:42	828.5	2024-04-06 14:18	800.8	
26	2024-04-06 11:05	783.1	2024-04-06 11:35	1088.0	2024-04-06 12:43	826.3	2024-04-06 14:19	805.8	
27	2024-04-06 11:06	780.7	2024-04-06 11:36	1076.0	2024-04-06 12:44	821.6	2024-04-06 14:20	809.0	
28	2024-04-06 11:07	777.8	2024-04-06 11:37	1021.7	2024-04-06 12:45	816.5	2024-04-06 14:21	809.8	
29	2024-04-06 11:08	782.6	2024-04-06 11:38	984.0	2024-04-06 12:46	812.9	2024-04-06 14:22	811.6	
30	2024-04-06 11:09	782.9	2024-04-06 11:39	956.3	2024-04-06 12:47	807.5	2024-04-06 14:23	813.6	
31			2024-04-06 11:40	936.8	2024-04-06 12:48	801.0	2024-04-06 14:24	812.7	
32			2024-04-06 11:41	923.0	2024-04-06 12:49	797.8	2024-04-06 14:25	809.9	
33			2024-04-06 11:42	911.5	2024-04-06 12:50	792.0	2024-04-06 14:26	810.4	
34			2024-04-06 11:43	905.1	2024-04-06 12:51	787.1	2024-04-06 14:27	810.2	
35			2024-04-06 11:44	896.6	2024-04-06 12:52	781.3	2024-04-06 14:28	806.6	
36			2024-04-06 11:45	890.2	2024-04-06 12:53	774.8	2024-04-06 14:29	805.2	
37			2024-04-06 11:46	885.0	2024-04-06 12:54	770.3	2024-04-06 14:30	805.7	
38			2024-04-06 11:47	880.3	2024-04-06 12:55	764.1	2024-04-06 14:31	811.3	
39			2024-04-06 11:48	876.8	2024-04-06 12:56	759.2	2024-04-06 14:32	818.1	
40			2024-04-06 11:49	874.8	2024-04-06 12:57	753.6	2024-04-06 14:33	826.7	
41			2024-04-06 11:50	874.4	2024-04-06 12:58	748.7	2024-04-06 14:34	829.8	
42			2024-04-06 11:51	874.5	2024-04-06 12:59	744.5	2024-04-06 14:35	835.4	
43			2024-04-06 11:52	876.3	2024-04-06 13:00	739.3	2024-04-06 14:36	849.3	
44			2024-04-06 11:53	877.5	2024-04-06 13:01	733.9	2024-04-06 14:37	853.8	
45			2024-04-06 11:54	880.3	2024-04-06 13:02	728.2	2024-04-06 14:38	860.3	
46			2024-04-06 11:55	883.7	2024-04-06 13:03	724.0	2024-04-06 14:39	866.0	
47			2024-04-06 11:56	882.6	2024-04-06 13:04	718.8	2024-04-06 14:40	869.4	
48			2024-04-06 11:57	882.5	2024-04-06 13:05	713.9	2024-04-06 14:41	865.7	
49			2024-04-06 11:58	880.5	2024-04-06 13:06	709.3	2024-04-06 14:42	868.1	
50			2024-04-06 11:59	880.4	2024-04-06 13:07	705.5	2024-04-06 14:43	869.2	
51			2024-04-06 12:00	880.3	2024-04-06 13:08	701.8	2024-04-06 14:44	876.0	
52			2024-04-06 12:01	880.5	2024-04-06 13:09	696.5	2024-04-06 14:45	880.7	
53			2024-04-06 12:02	880.1	2024-04-06 13:10	691.2	2024-04-06 14:46	882.5	
54			2024-04-06 12:03	880.7	2024-04-06 13:11	687.9	2024-04-06 14:47	884.8	
55			2024-04-06 12:04	879.1	2024-04-06 13:12	683.0	2024-04-06 14:48	884.8	
56			2024-04-06 12:05	881.7	2024-04-06 13:13	678.7	2024-04-06 14:49	888.0	
57			2024-04-06 12:06	882.7	2024-04-06 13:14	673.7	2024-04-06 14:50	893.2	
58			2024-04-06 12:07	892.9	2024-04-06 13:15	671.0	2024-04-06 14:51	897.9	
59			2024-04-06 12:08	894.9	2024-04-06 13:16	666.5	2024-04-06 14:52	905.8	
60			2024-04-06 12:09	884.3	2024-04-06 13:17	664.1	2024-04-06 14:53	913.0	
61			2024-04-06 12:10	871.3	2024-04-06 13:18	660.3	2024-04-06 14:54	919.5	
62			2024-04-06 12:11	860.7	2024-04-06 13:19	658.7	2024-04-06 14:55	928.5	
63			2024-04-06 12:12	853.3	2024-04-06 13:20	656.0	2024-04-06 14:56	937.8	
64			2024-04-06 12:13	851.2	2024-04-06 13:21	653.3	2024-04-06 14:57	943.4	
65			2024-04-06 12:14	847.0	2024-04-06 13:22	653.0	2024-04-06 14:58	952.1	
66			2024-04-06 12:15	839.8	2024-04-06 13:23	651.8	2024-04-06 14:59	957.9	
67			2024-04-06 12:16	832.5	2024-04-06 13:24	649.2	2024-04-06 15:00	964.5	
68			2024-04-06 12:17	826.2	2024-04-06 13:25	647.6	2024-04-06 15:01	969.5	
69					2024-04-06 13:26	645.8	2024-04-06 15:02	972.8	
70					2024-04-06 13:27	644.1	2024-04-06 15:03	977.7	
71					2024-04-06 13:28	642.2	2024-04-06 15:04	980.9	
72					2024-04-06 13:29	640.7	2024-04-06 15:05	985.6	
73					2024-04-06 13:30	640.1	2024-04-06 15:06	988.0	
74					2024-04-06 13:31	638.6	2024-04-06 15:07	991.2	
75					2024-04-06 13:32	637.2	2024-04-06 15:08	993.5	

76				2024-04-06 13:33	637.8	2024-04-06 15:09	998.1
77				2024-04-06 13:34	636.6	2024-04-06 15:10	1001.5
78				2024-04-06 13:35	635.3	2024-04-06 15:11	1005.4
79				2024-04-06 13:36	635.7	2024-04-06 15:12	1012.9
80				2024-04-06 13:37	634.0	2024-04-06 15:13	1017.2
81				2024-04-06 13:38	632.1	2024-04-06 15:14	1020.7
82				2024-04-06 13:39	629.1	2024-04-06 15:15	1023.5
83				2024-04-06 13:40	627.9	2024-04-06 15:16	1028.2
84				2024-04-06 13:41	627.6	2024-04-06 15:17	1036.1
85				2024-04-06 13:42	625.9	2024-04-06 15:18	1037.9
86				2024-04-06 13:43	624.7	2024-04-06 15:19	1040.3
87				2024-04-06 13:44	624.3	2024-04-06 15:20	1044.3
88				2024-04-06 13:45	623.3	2024-04-06 15:21	1049.9
89				2024-04-06 13:46	622.1	2024-04-06 15:22	1055.6
90				2024-04-06 13:47	622.9	2024-04-06 15:23	1056.3
91				2024-04-06 13:48	621.8	2024-04-06 15:24	1055.8
92				2024-04-06 13:49	621.0	2024-04-06 15:25	1056.8
93				2024-04-06 13:50	619.9	2024-04-06 15:26	1059.3
94				2024-04-06 13:51	623.2	2024-04-06 15:27	1055.3
95				2024-04-06 13:52	624.7	2024-04-06 15:28	1049.3
96				2024-04-06 13:53	632.2	2024-04-06 15:29	1043.5
97						2024-04-06 15:30	1036.3
98						2024-04-06 15:31	1025.4
99						2024-04-06 15:32	1017.9
100						2024-04-06 15:33	1008.0
101						2024-04-06 15:34	1001.2
102						2024-04-06 15:35	993.8
103						2024-04-06 15:36	992.8
104						2024-04-06 15:37	990.7
105						2024-04-06 15:38	972.2
106						2024-04-06 15:39	956.4
107						2024-04-06 15:40	944.0
108						2024-04-06 15:41	933.3
109						2024-04-06 15:42	925.7
110						2024-04-06 15:43	917.5
111						2024-04-06 15:44	909.6
112						2024-04-06 15:45	901.6
113						2024-04-06 15:46	892.2
114						2024-04-06 15:47	887.1
115						2024-04-06 15:48	877.2
116						2024-04-06 15:49	870.9
117						2024-04-06 15:50	862.3
118						2024-04-06 15:51	855.5
119						2024-04-06 15:52	846.5
120						2024-04-06 15:53	837.7
121						2024-04-06 15:54	829.9
122						2024-04-06 15:55	822.3
123						2024-04-06 15:56	816.2
124						2024-04-06 15:57	809.7
125						2024-04-06 15:58	803.0
126						2024-04-06 15:59	793.7
127						2024-04-06 16:00	787.1
128						2024-04-06 16:01	781.1
129						2024-04-06 16:02	775.6
130						2024-04-06 16:03	769.3
131						2024-04-06 16:04	763.1
132						2024-04-06 16:05	756.8
133						2024-04-06 16:06	751.9
134						2024-04-06 16:07	746.0
135						2024-04-06 16:08	740.4
136						2024-04-06 16:09	734.9
137						2024-04-06 16:10	730.1
138						2024-04-06 16:11	727.9
139						2024-04-06 16:12	722.8
140						2024-04-06 16:13	717.2
141						2024-04-06 16:14	709.2
142						2024-04-06 16:15	700.7
143						2024-04-06 16:16	690.5
144						2024-04-06 16:17	682.1
145						2024-04-06 16:18	675.7
146						2024-04-06 16:19	670.3
147						2024-04-06 16:20	664.5
148						2024-04-06 16:21	658.9
149						2024-04-06 16:22	655.3
150						2024-04-06 16:23	647.5
151						2024-04-06 16:24	640.3
152						2024-04-06 16:25	633.8
153						2024-04-06 16:26	627.2
154						2024-04-06 16:27	624.6
155						2024-04-06 16:28	621.6
156						2024-04-06 16:29	617.7
157						2024-04-06 16:30	614.2
158						2024-04-06 16:31	610.9
159						2024-04-06 16:32	607.3
160						2024-04-06 16:33	603.8
161						2024-04-06 16:34	600.3
162						2024-04-06 16:35	595.8
163						2024-04-06 16:36	593.2
164						2024-04-06 16:37	589.5

165						2024-04-06 16:38	587.3
166						2024-04-06 16:39	583.5
167						2024-04-06 16:40	579.9
168						2024-04-06 16:41	575.8
169						2024-04-06 16:42	572.5
170						2024-04-06 16:43	569.3
171						2024-04-06 16:44	566.2
172						2024-04-06 16:45	563.6
173						2024-04-06 16:46	560.8
174						2024-04-06 16:47	558.7
175						2024-04-06 16:48	557.2
176						2024-04-06 16:49	553.8
177						2024-04-06 16:50	550.1
178						2024-04-06 16:51	546.6
179						2024-04-06 16:52	544.6
180						2024-04-06 16:53	541.8
181						2024-04-06 16:54	538.7
182						2024-04-06 16:55	536.3
183						2024-04-06 16:56	533.3
184						2024-04-06 16:57	530.6
185						2024-04-06 16:58	528.1
186						2024-04-06 16:59	526.0
187						2024-04-06 17:00	523.7
188						2024-04-06 17:01	521.5
189						2024-04-06 17:02	519.6
190						2024-04-06 17:03	517.8
191						2024-04-06 17:04	515.0
192						2024-04-06 17:05	514.4
193						2024-04-06 17:06	512.2
194						2024-04-06 17:07	509.9
195						2024-04-06 17:08	508.2
196						2024-04-06 17:09	506.0
197						2024-04-06 17:10	503.0
198						2024-04-06 17:11	500.8
199						2024-04-06 17:12	499.1
200						2024-04-06 17:13	497.3
201						2024-04-06 17:14	495.8
202						2024-04-06 17:15	493.3
203						2024-04-06 17:16	490.8
204						2024-04-06 17:17	489.1
205						2024-04-06 17:18	487.6
206						2024-04-06 17:19	485.6
207						2024-04-06 17:20	483.3
208						2024-04-06 17:21	480.9
209						2024-04-06 17:22	479.2
210						2024-04-06 17:23	477.3
211						2024-04-06 17:24	475.1
212						2024-04-06 17:25	473.2
213						2024-04-06 17:26	471.7
214						2024-04-06 17:27	470.6
215						2024-04-06 17:28	469.2
216						2024-04-06 17:29	466.9
217						2024-04-06 17:30	464.4
218						2024-04-06 17:31	463.1
219						2024-04-06 17:32	461.6
220						2024-04-06 17:33	460.2
221						2024-04-06 17:34	459.9
222						2024-04-06 17:35	459.2
223						2024-04-06 17:36	458.4
224						2024-04-06 17:37	458.3
225						2024-04-06 17:38	456.9
226						2024-04-06 17:39	455.8
227						2024-04-06 17:40	454.3
228						2024-04-06 17:41	453.4
229						2024-04-06 17:42	453.3
230						2024-04-06 17:43	452.2
231						2024-04-06 17:44	450.5
232						2024-04-06 17:45	450.8
233						2024-04-06 17:46	449.1
234						2024-04-06 17:47	448.3
235						2024-04-06 17:48	447.4
236						2024-04-06 17:49	447.0
237						2024-04-06 17:50	446.9
238						2024-04-06 17:51	445.8
239						2024-04-06 17:52	445.7
240						2024-04-06 17:53	445.2
241						2024-04-06 17:54	444.6
242						2024-04-06 17:55	444.3
243						2024-04-06 17:56	443.5
244						2024-04-06 17:57	442.6
245						2024-04-06 17:58	440.7
246						2024-04-06 17:59	438.5
247						2024-04-06 18:00	436.7
248						2024-04-06 18:01	435.4
249						2024-04-06 18:02	433.2
250						2024-04-06 18:03	431.4
251						2024-04-06 18:04	430.6
252						2024-04-06 18:05	429.1
253						2024-04-06 18:06	427.7

254							2024-04-06 18:07	425.9
255							2024-04-06 18:08	424.4
256							2024-04-06 18:09	423.1
257							2024-04-06 18:10	421.7
258							2024-04-06 18:11	419.3
259							2024-04-06 18:12	418.4
260							2024-04-06 18:13	417.5
261							2024-04-06 18:14	415.6
262							2024-04-06 18:15	413.6
263							2024-04-06 18:16	412.7
264							2024-04-06 18:17	411.2
265							2024-04-06 18:18	410.5
266							2024-04-06 18:19	408.9
267							2024-04-06 18:20	408.0
268							2024-04-06 18:21	406.8
269							2024-04-06 18:22	407.3
270							2024-04-06 18:23	407.9
271							2024-04-06 18:24	408.4
272							2024-04-06 18:25	408.4
273							2024-04-06 18:26	409.2
274							2024-04-06 18:27	408.5
275							2024-04-06 18:28	408.0
276							2024-04-06 18:29	407.3
277							2024-04-06 18:30	407.3
278							2024-04-06 18:31	406.5
279							2024-04-06 18:32	406.5
280							2024-04-06 18:33	406.2
281							2024-04-06 18:34	405.2
282							2024-04-06 18:35	405.1
283							2024-04-06 18:36	404.3
284							2024-04-06 18:37	403.3
285							2024-04-06 18:38	402.5
286							2024-04-06 18:39	401.9
287							2024-04-06 18:40	400.5
288							2024-04-06 18:41	398.5
289							2024-04-06 18:42	397.2
290							2024-04-06 18:43	397.1
291							2024-04-06 18:44	396.7
292							2024-04-06 18:45	396.2
293							2024-04-06 18:46	396.2
294							2024-04-06 18:47	395.1
295							2024-04-06 18:48	394.7
296							2024-04-06 18:49	393.8
297							2024-04-06 18:50	394.5
298							2024-04-06 18:51	393.8
299							2024-04-06 18:52	393.0
300							2024-04-06 18:53	392.7
301							2024-04-06 18:54	391.6
302							2024-04-06 18:55	389.5
303							2024-04-06 18:56	388.8
304							2024-04-06 18:57	388.6
305							2024-04-06 18:58	388.5
306							2024-04-06 18:59	388.5
307							2024-04-06 19:00	388.0
308							2024-04-06 19:01	387.9

Everest III Series Pre-burn Data		2024-04-08	Total time (h)		8.25				
Wood Specie: Maple									
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel	Fuel Burnt (Dry)	Burn Rate (Dry)	Time	Flue Temp
(-)	(-)	(lb)	(DB %)	(-)	(in.)	(lb)	(kg/hr)	(min)	(°F)
2024-04-08 11:00	Load 1 - Start-up	8.03	19.8	5	15.25	5.66	4.81	32	692.9
2024-04-08 11:32	Load 2 - High-fire	18.48	20.7	5	15.25	13.46	4.02	82	876.2
2024-04-08 12:54	Load 3 - Maintenance-fire	12.92	21.3	2	15.25	9.41	2.51	92	739.6
2024-04-08 14:26	Load 4 - Low burn rate	31.64	21.2	6	15.25	25.98	2.20	289	704.4

	Average Tflue (°F)		692.9				876.2		739.6				704.4			
	Load 1 - Start-up (min)		32		High-fire (min)		82		Maintenance-fire (min)		92		Low burn rate (min)		289	
Air control position	Full open				Full open then fully closed (@50% fuel load)				Fully closed				Fully closed			
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)
0	2024-04-08 11:00	72.1	2024-04-08 11:32	791.5	2024-04-08 12:54	726.2	2024-04-08 14:26	618.0								
1	2024-04-08 11:01	273.7	2024-04-08 11:33	684.5	2024-04-08 12:55	683.5	2024-04-08 14:27	421.0								
2	2024-04-08 11:02	608.5	2024-04-08 11:34	795.8	2024-04-08 12:56	762.9	2024-04-08 14:28	496.1								
3	2024-04-08 11:03	790.3	2024-04-08 11:35	824.5	2024-04-08 12:57	839.5	2024-04-08 14:29	662.0								
4	2024-04-08 11:04	741.6	2024-04-08 11:36	818.9	2024-04-08 12:58	877.9	2024-04-08 14:30	885.2								
5	2024-04-08 11:05	691.8	2024-04-08 11:37	838.6	2024-04-08 12:59	905.6	2024-04-08 14:31	959.6								
6	2024-04-08 11:06	630.7	2024-04-08 11:38	854.1	2024-04-08 13:00	867.8	2024-04-08 14:32	916.0								
7	2024-04-08 11:07	672.2	2024-04-08 11:39	873.4	2024-04-08 13:01	860.4	2024-04-08 14:33	910.3								
8	2024-04-08 11:08	672.2	2024-04-08 11:40	890.1	2024-04-08 13:02	863.0	2024-04-08 14:34	932.2								
9	2024-04-08 11:09	668.0	2024-04-08 11:41	905.0	2024-04-08 13:03	864.3	2024-04-08 14:35	971.0								
10	2024-04-08 11:10	669.8	2024-04-08 11:42	911.8	2024-04-08 13:04	867.2	2024-04-08 14:36	1013.5								
11	2024-04-08 11:11	659.5	2024-04-08 11:43	916.5	2024-04-08 13:05	868.6	2024-04-08 14:37	988.3								
12	2024-04-08 11:12	640.7	2024-04-08 11:44	917.4	2024-04-08 13:06	870.1	2024-04-08 14:38	975.1								
13	2024-04-08 11:13	658.4	2024-04-08 11:45	917.9	2024-04-08 13:07	869.0	2024-04-08 14:39	987.5								
14	2024-04-08 11:14	687.0	2024-04-08 11:46	916.2	2024-04-08 13:08	870.4	2024-04-08 14:40	985.4								
15	2024-04-08 11:15	698.9	2024-04-08 11:47	919.3	2024-04-08 13:09	869.7	2024-04-08 14:41	959.7								
16	2024-04-08 11:16	705.0	2024-04-08 11:48	926.1	2024-04-08 13:10	867.9	2024-04-08 14:42	945.4								
17	2024-04-08 11:17	717.0	2024-04-08 11:49	931.2	2024-04-08 13:11	865.5	2024-04-08 14:43	939.2								
18	2024-04-08 11:18	730.5	2024-04-08 11:50	938.1	2024-04-08 13:12	861.7	2024-04-08 14:44	947.1								
19	2024-04-08 11:19	736.1	2024-04-08 11:51	941.6	2024-04-08 13:13	854.0	2024-04-08 14:45	949.4								
20	2024-04-08 11:20	740.7	2024-04-08 11:52	946.3	2024-04-08 13:14	852.6	2024-04-08 14:46	951.5								
21	2024-04-08 11:21	745.4	2024-04-08 11:53	954.3	2024-04-08 13:15	849.6	2024-04-08 14:47	949.9								
22	2024-04-08 11:22	749.2	2024-04-08 11:54	958.9	2024-04-08 13:16	847.0	2024-04-08 14:48	949.1								
23	2024-04-08 11:23	748.7	2024-04-08 11:55	964.6	2024-04-08 13:17	844.0	2024-04-08 14:49	946.3								
24	2024-04-08 11:24	764.4	2024-04-08 11:56	968.6	2024-04-08 13:18	841.4	2024-04-08 14:50	943.3								
25	2024-04-08 11:25	797.0	2024-04-08 11:57	974.3	2024-04-08 13:19	838.4	2024-04-08 14:51	939.8								
26	2024-04-08 11:26	811.4	2024-04-08 11:58	978.5	2024-04-08 13:20	834.2	2024-04-08 14:52	938.8								
27	2024-04-08 11:27	804.0	2024-04-08 11:59	985.4	2024-04-08 13:21	831.5	2024-04-08 14:53	932.7								
28	2024-04-08 11:28	799.4	2024-04-08 12:00	992.3	2024-04-08 13:22	828.8	2024-04-08 14:54	921.0								
29	2024-04-08 11:29	797.6	2024-04-08 12:01	1003.3	2024-04-08 13:23	825.3	2024-04-08 14:55	909.9								
30	2024-04-08 11:30	797.4	2024-04-08 12:02	1014.8	2024-04-08 13:24	820.0	2024-04-08 14:56	898.7								
31	2024-04-08 11:31	793.4	2024-04-08 12:03	1024.8	2024-04-08 13:25	815.7	2024-04-08 14:57	887.8								
32	2024-04-08 11:32	791.5	2024-04-08 12:04	1035.4	2024-04-08 13:26	809.5	2024-04-08 14:58	880.3								
33			2024-04-08 12:05	1022.0	2024-04-08 13:27	807.2	2024-04-08 14:59	876.6								
34			2024-04-08 12:06	995.5	2024-04-08 13:28	802.4	2024-04-08 15:00	871.6								
35			2024-04-08 12:07	969.8	2024-04-08 13:29	796.9	2024-04-08 15:01	869.5								
36			2024-04-08 12:08	949.0	2024-04-08 13:30	789.8	2024-04-08 15:02	866.9								
37			2024-04-08 12:09	935.1	2024-04-08 13:31	783.7	2024-04-08 15:03	866.7								
38			2024-04-08 12:10	922.7	2024-04-08 13:32	779.1	2024-04-08 15:04	865.5								
39			2024-04-08 12:11	913.9	2024-04-08 13:33	773.1	2024-04-08 15:05	863.6								
40			2024-04-08 12:12	907.2	2024-04-08 13:34	767.8	2024-04-08 15:06	864.0								
41			2024-04-08 12:13	900.6	2024-04-08 13:35	761.5	2024-04-08 15:07	862.3								
42			2024-04-08 12:14	894.0	2024-04-08 13:36	757.1	2024-04-08 15:08	859.9								
43			2024-04-08 12:15	887.6	2024-04-08 13:37	753.0	2024-04-08 15:09	858.8								
44			2024-04-08 12:16	880.5	2024-04-08 13:38	747.8	2024-04-08 15:10	857.7								
45			2024-04-08 12:17	872.9	2024-04-08 13:39	744.5	2024-04-08 15:11	855.8								
46			2024-04-08 12:18	867.7	2024-04-08 13:40	739.6	2024-04-08 15:12	853.4								
47			2024-04-08 12:19	862.4	2024-04-08 13:41	734.2	2024-04-08 15:13	849.8								
48			2024-04-08 12:20	857.6	2024-04-08 13:42	728.8	2024-04-08 15:14	847.9								
49			2024-04-08 12:21	855.0	2024-04-08 13:43	723.8	2024-04-08 15:15	846.3								
50			2024-04-08 12:22	851.5	2024-04-08 13:44	720.8	2024-04-08 15:16	844.9								
51			2024-04-08 12:23	849.6	2024-04-08 13:45	715.5	2024-04-08 15:17	845.6								
52			2024-04-08 12:24	846.0	2024-04-08 13:46	709.4	2024-04-08 15:18	845.3								
53			2024-04-08 12:25	844.8	2024-04-08 13:47	704.8	2024-04-08 15:19	843.2								
54			2024-04-08 12:26	844.1	2024-04-08 13:48	700.8	2024-04-08 15:20	842.7								
55			2024-04-08 12:27	843.1	2024-04-08 13:49	697.2	2024-04-08 15:21	841.4								
56			2024-04-08 12:28	842.3	2024-04-08 13:50	692.2	2024-04-08 15:22	838.4								
57			2024-04-08 12:29	842.4	2024-04-08 13:51	687.9	2024-04-08 15:23	834.9								
58			2024-04-08 12:30	841.7	2024-04-08 13:52	683.8	2024-04-08 15:24	830.8								
59			2024-04-08 12:31	840.5	2024-04-08 13:53	681.2	2024-04-08 15:25	827.4								
60			2024-04-08 12:32	840.4	2024-04-08 13:54	678.1	2024-04-08 15:26	824.2								
61			2024-04-08 12:33	838.6	2024-04-08 13:55	674.0	2024-04-08 15:27	823.3								
62			2024-04-08 12:34	838.3	2024-04-08 13:56	670.8	2024-04-08 15:28	821.4								
63			2024-04-08 12:35	836.3	2024-04-08 13:57	668.6	2024-04-08 15:29	821.7								
64			2024-04-08 12:36	832.9	2024-04-08 13:58	665.8	2024-04-08 15:30	823.2								
65			2024-04-08 12:37	830.0	2024-04-08 13:59	662.9	2024-04-08 15:31	826.6								
66			2024-04-08 12:38	829.3	2024-04-08 14:00	660.3	2024-04-08 15:32	828.2								
67			2024-04-08 12:39	827.5	2024-04-08 14:01	657.1	2024-04-08 15:33	831.6								
68			2024-04-08 12:40	825.7	2024-04-08 14:02	654.0	2024-04-08 15:34	835.4								
69			2024-04-08 12:41	827.5	2024-04-08 14:03	650.3	2024-04-08 15:35	836.9								
70			2024-04-08 12:42	826.5	2024-04-08 14:04	647.1	2024-04-08 15:36	839.3								
71			2024-04-08 12:43	820.0	2024-04-08 14:05	643.9	2024-04-08 15:37	841.5								
72			2024-04-08 12:44	816.6	2024-04-08 14:06	641.5	2024-04-08 15:38	842.3								
73			2024-04-08 12:45	813.3	2024-04-08 14:07	639.4	2024-04-08 15:39	843.1								
74			2024-04-08 12:46	800.4	2024-04-08 14:08	636.7	2024-04-08 15:40	843.6								
75			2024-04-08 12:47	789.4	2024-04-08 14:09	634.5	2024-04-08 15:41	844.6								
76			2024-04-08 12:48	778.1	2024-04-08 14:10	633.0	2024-04-08 15:42	846.0								
77			2024-04-08 12:49	772.2	2024-04-08 14:11	630.9	2024-04-08 15:43	848.4								
78			2024-04-08 12:50	765.9	2024-04-08 14:12	629.0	2024-04-08 15:44	849.8								
79			2024-04-08 12:51	757.2	2024-04-08 14:13	628.0	2024-04-08 15:45	850.8								
80			2024-04-08 12:52	747.6	2024-04-08 14:14	624.4	2024-04-08 15:46	848.3								
81			2024-04-08 12:53	735.3	2024-04-08 14:15	623.6	2024-04-08 15:47	848.9								
82			2024-04-08 12:54	726.2	2024-04-08 14:16	622.5	2024-04-08 15:48	846.4								

83					2024-04-08 14:17	620.2	2024-04-08 15:49	844.7
84					2024-04-08 14:18	618.5	2024-04-08 15:50	846.0
85					2024-04-08 14:19	618.3	2024-04-08 15:51	847.0
86					2024-04-08 14:20	615.7	2024-04-08 15:52	849.4
87					2024-04-08 14:21	614.8	2024-04-08 15:53	852.1
88					2024-04-08 14:22	613.7	2024-04-08 15:54	854.3
89					2024-04-08 14:23	615.9	2024-04-08 15:55	859.0
90					2024-04-08 14:24	617.6	2024-04-08 15:56	862.9
91					2024-04-08 14:25	619.1	2024-04-08 15:57	867.8
92					2024-04-08 14:26	618.0	2024-04-08 15:58	874.8
93							2024-04-08 15:59	879.3
94							2024-04-08 16:00	885.0
95							2024-04-08 16:01	889.7
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97							2024-04-08 16:03	896.6
98							2024-04-08 16:04	900.5
99							2024-04-08 16:05	902.6
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101							2024-04-08 16:07	913.5
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103							2024-04-08 16:09	917.5
104							2024-04-08 16:10	916.6
105							2024-04-08 16:11	914.8
106							2024-04-08 16:12	905.7
107							2024-04-08 16:13	896.6
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113							2024-04-08 16:19	877.1
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116							2024-04-08 16:22	853.5
117							2024-04-08 16:23	838.6
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119							2024-04-08 16:25	817.1
120							2024-04-08 16:26	809.7
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122							2024-04-08 16:28	797.9
123							2024-04-08 16:29	793.2
124							2024-04-08 16:30	788.5
125							2024-04-08 16:31	785.2
126							2024-04-08 16:32	781.4
127							2024-04-08 16:33	777.6
128							2024-04-08 16:34	773.0
129							2024-04-08 16:35	770.2
130							2024-04-08 16:36	766.4
131							2024-04-08 16:37	761.2
132							2024-04-08 16:38	756.1
133							2024-04-08 16:39	752.0
134							2024-04-08 16:40	749.4
135							2024-04-08 16:41	742.9
136							2024-04-08 16:42	739.0
137							2024-04-08 16:43	736.1
138							2024-04-08 16:44	734.5
139							2024-04-08 16:45	733.4
140							2024-04-08 16:46	732.7
141							2024-04-08 16:47	733.2
142							2024-04-08 16:48	730.6
143							2024-04-08 16:49	726.1
144							2024-04-08 16:50	720.7
145							2024-04-08 16:51	711.9
146							2024-04-08 16:52	706.6
147							2024-04-08 16:53	701.6
148							2024-04-08 16:54	698.1
149							2024-04-08 16:55	694.6
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151							2024-04-08 16:57	687.6
152							2024-04-08 16:58	687.1
153							2024-04-08 16:59	683.8
154							2024-04-08 17:00	678.2
155							2024-04-08 17:01	672.5
156							2024-04-08 17:02	666.8
157							2024-04-08 17:03	661.0
158							2024-04-08 17:04	657.3
159							2024-04-08 17:05	652.0
160							2024-04-08 17:06	644.4
161							2024-04-08 17:07	638.8
162							2024-04-08 17:08	633.9
163							2024-04-08 17:09	628.8
164							2024-04-08 17:10	625.0
165							2024-04-08 17:11	622.3
166							2024-04-08 17:12	618.5
167							2024-04-08 17:13	614.7
168							2024-04-08 17:14	612.0
169							2024-04-08 17:15	609.0
170							2024-04-08 17:16	606.9
171							2024-04-08 17:17	604.0
172							2024-04-08 17:18	601.3
173							2024-04-08 17:19	598.1
174							2024-04-08 17:20	595.5
175							2024-04-08 17:21	593.0
176							2024-04-08 17:22	590.5
177							2024-04-08 17:23	589.1
178							2024-04-08 17:24	587.4

179							2024-04-08 17:25	585.8
180							2024-04-08 17:26	584.9
181							2024-04-08 17:27	584.2
182							2024-04-08 17:28	582.6
183							2024-04-08 17:29	581.8
184							2024-04-08 17:30	579.8
185							2024-04-08 17:31	578.8
186							2024-04-08 17:32	576.9
187							2024-04-08 17:33	575.8
188							2024-04-08 17:34	575.0
189							2024-04-08 17:35	574.3
190							2024-04-08 17:36	573.8
191							2024-04-08 17:37	573.1
192							2024-04-08 17:38	571.4
193							2024-04-08 17:39	570.8
194							2024-04-08 17:40	569.7
195							2024-04-08 17:41	568.8
196							2024-04-08 17:42	568.4
197							2024-04-08 17:43	567.6
198							2024-04-08 17:44	566.4
199							2024-04-08 17:45	566.8
200							2024-04-08 17:46	565.4
201							2024-04-08 17:47	564.1
202							2024-04-08 17:48	562.9
203							2024-04-08 17:49	562.9
204							2024-04-08 17:50	563.1
205							2024-04-08 17:51	562.1
206							2024-04-08 17:52	561.5
207							2024-04-08 17:53	560.2
208							2024-04-08 17:54	560.3
209							2024-04-08 17:55	559.0
210							2024-04-08 17:56	559.5
211							2024-04-08 17:57	559.0
212							2024-04-08 17:58	558.8
213							2024-04-08 17:59	558.5
214							2024-04-08 18:00	558.1
215							2024-04-08 18:01	556.8
216							2024-04-08 18:02	557.2
217							2024-04-08 18:03	557.5
218							2024-04-08 18:04	561.7
219							2024-04-08 18:05	562.7
220							2024-04-08 18:06	566.4
221							2024-04-08 18:07	566.8
222							2024-04-08 18:08	565.4
223							2024-04-08 18:09	564.3
224							2024-04-08 18:10	562.6
225							2024-04-08 18:11	561.4
226							2024-04-08 18:12	560.9
227							2024-04-08 18:13	559.8
228							2024-04-08 18:14	558.5
229							2024-04-08 18:15	557.3
230							2024-04-08 18:16	555.6
231							2024-04-08 18:17	554.3
232							2024-04-08 18:18	552.3
233							2024-04-08 18:19	549.9
234							2024-04-08 18:20	547.9
235							2024-04-08 18:21	547.2
236							2024-04-08 18:22	542.2
237							2024-04-08 18:23	539.1
238							2024-04-08 18:24	536.9
239							2024-04-08 18:25	535.1
240							2024-04-08 18:26	532.9
241							2024-04-08 18:27	531.2
242							2024-04-08 18:28	529.8
243							2024-04-08 18:29	529.1
244							2024-04-08 18:30	527.4
245							2024-04-08 18:31	526.1
246							2024-04-08 18:32	524.2
247							2024-04-08 18:33	522.4
248							2024-04-08 18:34	520.3
249							2024-04-08 18:35	519.8
250							2024-04-08 18:36	518.2
251							2024-04-08 18:37	516.7
252							2024-04-08 18:38	516.0
253							2024-04-08 18:39	515.7
254							2024-04-08 18:40	514.6
255							2024-04-08 18:41	512.6
256							2024-04-08 18:42	511.7
257							2024-04-08 18:43	509.6
258							2024-04-08 18:44	508.6
259							2024-04-08 18:45	506.9
260							2024-04-08 18:46	505.0
261							2024-04-08 18:47	503.5
262							2024-04-08 18:48	501.9
263							2024-04-08 18:49	500.2
264							2024-04-08 18:50	499.1
265							2024-04-08 18:51	497.5
266							2024-04-08 18:52	495.9
267							2024-04-08 18:53	494.4
268							2024-04-08 18:54	493.6
269							2024-04-08 18:55	492.3
270							2024-04-08 18:56	491.0
271							2024-04-08 18:57	489.7
272							2024-04-08 18:58	485.2
273							2024-04-08 18:59	481.9
274							2024-04-08 19:00	479.3

275							2024-04-08 19:01	477.3
276							2024-04-08 19:02	475.9
277							2024-04-08 19:03	474.0
278							2024-04-08 19:04	471.7
279							2024-04-08 19:05	469.4
280							2024-04-08 19:06	466.9
281							2024-04-08 19:07	464.3
282							2024-04-08 19:08	463.0
283							2024-04-08 19:09	461.8
284							2024-04-08 19:10	459.7
285							2024-04-08 19:11	458.2
286							2024-04-08 19:12	456.2
287							2024-04-08 19:13	455.1
288							2024-04-08 19:14	453.6
289							2024-04-08 19:15	451.9

Everest III Series Pre-burn Data		2024-04-09	Total time (h)		8.47				
Wood Specie: Maple									
Load time	Load type	Fuel added	Moisture	Piece amount	Length of fuel	Fuel Burnt (Dry)	Burn Rate (Dry)	Time	Flue Temp
(-)	(-)	(lb)	(DB %)	(-)	(in.)	(lb)	(kg/hr)	(min)	(°F)
2024-04-09 11:00	Load 1 - Start-up	8.03	20.3	5	15.25	5.73	5.78	27	773.7
2024-04-09 11:27	Load 2 - High-fire	18.53	21.3	5	15.25	13.43	4.27	77	875.6
2024-04-09 12:44	Load 3 - Maintenance-fire	12.96	20.9	2	15.25	9.46	2.32	100	705.4
2024-04-09 14:24	Load 4 - Low burn rate	31.68	20.5	6	15.25	26.31	2.12	304	692.3

	Average Tflue (°F)		773.7		875.6		705.4		692.3	
	Load 1 - Start-up (min)		27		High-fire (min)		77		Maintenance-fire (min)	
							100		Low burn rate (min)	
Air control position		Full open		Full open then fully closed (@50% fuel load)		Fully closed		Fully closed		
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)		
0	2024-04-09 11:00	76.9	2024-04-09 11:27	828.7	2024-04-09 12:44	765.9	2024-04-09 14:24	621.0		
1	2024-04-09 11:01	543.5	2024-04-09 11:28	699.8	2024-04-09 12:45	708.5	2024-04-09 14:25	434.2		
2	2024-04-09 11:02	964.7	2024-04-09 11:29	763.7	2024-04-09 12:46	767.2	2024-04-09 14:26	548.8		
3	2024-04-09 11:03	825.9	2024-04-09 11:30	768.5	2024-04-09 12:47	820.5	2024-04-09 14:27	701.5		
4	2024-04-09 11:04	825.0	2024-04-09 11:31	806.0	2024-04-09 12:48	863.9	2024-04-09 14:28	770.4		
5	2024-04-09 11:05	830.3	2024-04-09 11:32	813.5	2024-04-09 12:49	889.9	2024-04-09 14:29	801.9		
6	2024-04-09 11:06	815.1	2024-04-09 11:33	821.5	2024-04-09 12:50	854.2	2024-04-09 14:30	827.9		
7	2024-04-09 11:07	798.3	2024-04-09 11:34	825.7	2024-04-09 12:51	844.7	2024-04-09 14:31	840.4		
8	2024-04-09 11:08	803.0	2024-04-09 11:35	831.9	2024-04-09 12:52	835.4	2024-04-09 14:32	856.1		
9	2024-04-09 11:09	780.7	2024-04-09 11:36	827.2	2024-04-09 12:53	830.4	2024-04-09 14:33	870.2		
10	2024-04-09 11:10	769.4	2024-04-09 11:37	832.7	2024-04-09 12:54	826.8	2024-04-09 14:34	885.3		
11	2024-04-09 11:11	770.5	2024-04-09 11:38	841.4	2024-04-09 12:55	823.6	2024-04-09 14:35	876.3		
12	2024-04-09 11:12	779.7	2024-04-09 11:39	850.2	2024-04-09 12:56	819.9	2024-04-09 14:36	848.8		
13	2024-04-09 11:13	791.8	2024-04-09 11:40	858.6	2024-04-09 12:57	814.8	2024-04-09 14:37	829.9		
14	2024-04-09 11:14	784.4	2024-04-09 11:41	873.2	2024-04-09 12:58	812.0	2024-04-09 14:38	816.3		
15	2024-04-09 11:15	783.8	2024-04-09 11:42	885.2	2024-04-09 12:59	810.6	2024-04-09 14:39	805.4		
16	2024-04-09 11:16	783.2	2024-04-09 11:43	891.5	2024-04-09 13:00	806.7	2024-04-09 14:40	796.7		
17	2024-04-09 11:17	788.2	2024-04-09 11:44	898.0	2024-04-09 13:01	802.5	2024-04-09 14:41	790.3		
18	2024-04-09 11:18	794.0	2024-04-09 11:45	902.2	2024-04-09 13:02	800.6	2024-04-09 14:42	784.9		
19	2024-04-09 11:19	801.9	2024-04-09 11:46	905.8	2024-04-09 13:03	802.6	2024-04-09 14:43	779.4		
20	2024-04-09 11:20	807.2	2024-04-09 11:47	909.5	2024-04-09 13:04	803.2	2024-04-09 14:44	773.2		
21	2024-04-09 11:21	810.9	2024-04-09 11:48	912.6	2024-04-09 13:05	803.1	2024-04-09 14:45	769.7		
22	2024-04-09 11:22	812.3	2024-04-09 11:49	913.8	2024-04-09 13:06	800.5	2024-04-09 14:46	764.8		
23	2024-04-09 11:23	820.2	2024-04-09 11:50	945.8	2024-04-09 13:07	797.8	2024-04-09 14:47	763.9		
24	2024-04-09 11:24	823.6	2024-04-09 11:51	955.7	2024-04-09 13:08	793.5	2024-04-09 14:48	761.4		
25	2024-04-09 11:25	823.1	2024-04-09 11:52	982.0	2024-04-09 13:09	786.7	2024-04-09 14:49	760.4		
26	2024-04-09 11:26	827.5	2024-04-09 11:53	1000.6	2024-04-09 13:10	781.4	2024-04-09 14:50	758.6		
27	2024-04-09 11:27	828.7	2024-04-09 11:54	1010.5	2024-04-09 13:11	775.2	2024-04-09 14:51	757.9		
28			2024-04-09 11:55	1018.9	2024-04-09 13:12	768.3	2024-04-09 14:52	757.4		
29			2024-04-09 11:56	1025.0	2024-04-09 13:13	762.9	2024-04-09 14:53	759.5		
30			2024-04-09 11:57	1029.7	2024-04-09 13:14	757.9	2024-04-09 14:54	762.2		
31			2024-04-09 11:58	1026.5	2024-04-09 13:15	751.9	2024-04-09 14:55	772.5		
32			2024-04-09 11:59	1026.5	2024-04-09 13:16	747.6	2024-04-09 14:56	775.6		
33			2024-04-09 12:00	1004.9	2024-04-09 13:17	743.0	2024-04-09 14:57	774.1		
34			2024-04-09 12:01	971.0	2024-04-09 13:18	739.0	2024-04-09 14:58	772.2		
35			2024-04-09 12:02	941.3	2024-04-09 13:19	734.3	2024-04-09 14:59	771.1		
36			2024-04-09 12:03	918.3	2024-04-09 13:20	729.5	2024-04-09 15:00	768.3		
37			2024-04-09 12:04	901.1	2024-04-09 13:21	725.5	2024-04-09 15:01	763.5		
38			2024-04-09 12:05	890.8	2024-04-09 13:22	720.8	2024-04-09 15:02	759.6		
39			2024-04-09 12:06	883.3	2024-04-09 13:23	716.4	2024-04-09 15:03	756.5		
40			2024-04-09 12:07	877.6	2024-04-09 13:24	715.6	2024-04-09 15:04	754.0		
41			2024-04-09 12:08	874.2	2024-04-09 13:25	711.2	2024-04-09 15:05	752.2		
42			2024-04-09 12:09	872.8	2024-04-09 13:26	709.3	2024-04-09 15:06	751.7		
43			2024-04-09 12:10	872.9	2024-04-09 13:27	705.1	2024-04-09 15:07	751.7		
44			2024-04-09 12:11	873.1	2024-04-09 13:28	702.3	2024-04-09 15:08	752.1		
45			2024-04-09 12:12	870.2	2024-04-09 13:29	699.2	2024-04-09 15:09	755.0		
46			2024-04-09 12:13	866.7	2024-04-09 13:30	697.4	2024-04-09 15:10	758.1		
47			2024-04-09 12:14	864.6	2024-04-09 13:31	694.4	2024-04-09 15:11	762.7		
48			2024-04-09 12:15	862.4	2024-04-09 13:32	692.5	2024-04-09 15:12	767.0		
49			2024-04-09 12:16	859.3	2024-04-09 13:33	689.2	2024-04-09 15:13	770.6		
50			2024-04-09 12:17	856.3	2024-04-09 13:34	686.1	2024-04-09 15:14	773.9		
51			2024-04-09 12:18	853.7	2024-04-09 13:35	684.0	2024-04-09 15:15	776.9		
52			2024-04-09 12:19	854.4	2024-04-09 13:36	682.4	2024-04-09 15:16	780.0		
53			2024-04-09 12:20	855.3	2024-04-09 13:37	679.7	2024-04-09 15:17	781.2		
54			2024-04-09 12:21	855.4	2024-04-09 13:38	676.6	2024-04-09 15:18	782.3		
55			2024-04-09 12:22	855.5	2024-04-09 13:39	674.0	2024-04-09 15:19	781.8		
56			2024-04-09 12:23	855.8	2024-04-09 13:40	670.9	2024-04-09 15:20	783.7		
57			2024-04-09 12:24	855.9	2024-04-09 13:41	669.4	2024-04-09 15:21	784.5		
58			2024-04-09 12:25	855.3	2024-04-09 13:42	666.9	2024-04-09 15:22	786.3		
59			2024-04-09 12:26	854.5	2024-04-09 13:43	664.7	2024-04-09 15:23	786.5		
60			2024-04-09 12:27	854.9	2024-04-09 13:44	662.3	2024-04-09 15:24	787.0		
61			2024-04-09 12:28	856.5	2024-04-09 13:45	659.2	2024-04-09 15:25	789.4		
62			2024-04-09 12:29	858.2	2024-04-09 13:46	657.0	2024-04-09 15:26	791.2		
63			2024-04-09 12:30	861.0	2024-04-09 13:47	655.2	2024-04-09 15:27	793.0		
64			2024-04-09 12:31	866.5	2024-04-09 13:48	652.8	2024-04-09 15:28	797.5		
65			2024-04-09 12:32	868.5	2024-04-09 13:49	650.5	2024-04-09 15:29	802.0		
66			2024-04-09 12:33	871.4	2024-04-09 13:50	648.1	2024-04-09 15:30	807.9		
67			2024-04-09 12:34	862.2	2024-04-09 13:51	645.7	2024-04-09 15:31	812.5		
68			2024-04-09 12:35	851.5	2024-04-09 13:52	644.9	2024-04-09 15:32	817.2		
69			2024-04-09 12:36	843.1	2024-04-09 13:53	644.1	2024-04-09 15:33	821.9		
70			2024-04-09 12:37	838.1	2024-04-09 13:54	643.5	2024-04-09 15:34	825.4		
71			2024-04-09 12:38	832.3	2024-04-09 13:55	641.7	2024-04-09 15:35	827.1		
72			2024-04-09 12:39	828.9	2024-04-09 13:56	639.8	2024-04-09 15:36	829.6		
73			2024-04-09 12:40	821.5	2024-04-09 13:57	639.2	2024-04-09 15:37	832.3		
74			2024-04-09 12:41	810.0	2024-04-09 13:58	637.1	2024-04-09 15:38	836.1		
75			2024-04-09 12:42	793.1	2024-04-09 13:59	635.9	2024-04-09 15:39	840.1		

76			2024-04-09 12:43	774.4	2024-04-09 14:00	634.9	2024-04-09 15:40	844.2
77			2024-04-09 12:44	765.9	2024-04-09 14:01	634.3	2024-04-09 15:41	848.0
78					2024-04-09 14:02	631.7	2024-04-09 15:42	854.0
79					2024-04-09 14:03	629.1	2024-04-09 15:43	857.3
80					2024-04-09 14:04	627.4	2024-04-09 15:44	861.9
81					2024-04-09 14:05	627.0	2024-04-09 15:45	865.8
82					2024-04-09 14:06	626.9	2024-04-09 15:46	871.8
83					2024-04-09 14:07	625.8	2024-04-09 15:47	875.3
84					2024-04-09 14:08	624.9	2024-04-09 15:48	879.4
85					2024-04-09 14:09	624.4	2024-04-09 15:49	883.3
86					2024-04-09 14:10	622.8	2024-04-09 15:50	886.2
87					2024-04-09 14:11	622.0	2024-04-09 15:51	888.1
88					2024-04-09 14:12	620.9	2024-04-09 15:52	892.9
89					2024-04-09 14:13	620.2	2024-04-09 15:53	898.4
90					2024-04-09 14:14	621.3	2024-04-09 15:54	902.7
91					2024-04-09 14:15	618.5	2024-04-09 15:55	907.7
92					2024-04-09 14:16	616.8	2024-04-09 15:56	909.2
93					2024-04-09 14:17	617.4	2024-04-09 15:57	913.5
94					2024-04-09 14:18	618.9	2024-04-09 15:58	917.5
95					2024-04-09 14:19	618.8	2024-04-09 15:59	921.1
96					2024-04-09 14:20	618.9	2024-04-09 16:00	923.0
97					2024-04-09 14:21	619.5	2024-04-09 16:01	925.5
98					2024-04-09 14:22	618.5	2024-04-09 16:02	924.7
99					2024-04-09 14:23	619.1	2024-04-09 16:03	924.7
100					2024-04-09 14:24	621.0	2024-04-09 16:04	924.0
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103							2024-04-09 16:07	922.7
104							2024-04-09 16:08	923.4
105							2024-04-09 16:09	923.7
106							2024-04-09 16:10	924.2
107							2024-04-09 16:11	926.5
108							2024-04-09 16:12	929.9
109							2024-04-09 16:13	931.4
110							2024-04-09 16:14	934.8
111							2024-04-09 16:15	937.0
112							2024-04-09 16:16	940.7
113							2024-04-09 16:17	943.7
114							2024-04-09 16:18	945.6
115							2024-04-09 16:19	949.7
116							2024-04-09 16:20	954.6
117							2024-04-09 16:21	958.2
118							2024-04-09 16:22	958.3
119							2024-04-09 16:23	964.5
120							2024-04-09 16:24	967.7
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122							2024-04-09 16:26	977.4
123							2024-04-09 16:27	989.8
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125							2024-04-09 16:29	975.3
126							2024-04-09 16:30	964.0
127							2024-04-09 16:31	955.4
128							2024-04-09 16:32	949.0
129							2024-04-09 16:33	942.8
130							2024-04-09 16:34	936.4
131							2024-04-09 16:35	931.1
132							2024-04-09 16:36	924.4
133							2024-04-09 16:37	916.7
134							2024-04-09 16:38	909.5
135							2024-04-09 16:39	903.3
136							2024-04-09 16:40	894.1
137							2024-04-09 16:41	881.9
138							2024-04-09 16:42	869.7
139							2024-04-09 16:43	859.6
140							2024-04-09 16:44	849.0
141							2024-04-09 16:45	836.9
142							2024-04-09 16:46	824.5
143							2024-04-09 16:47	813.2
144							2024-04-09 16:48	799.9
145							2024-04-09 16:49	789.9
146							2024-04-09 16:50	781.2
147							2024-04-09 16:51	770.1
148							2024-04-09 16:52	760.0
149							2024-04-09 16:53	750.8
150							2024-04-09 16:54	742.4
151							2024-04-09 16:55	734.6
152							2024-04-09 16:56	727.3
153							2024-04-09 16:57	719.7
154							2024-04-09 16:58	714.4
155							2024-04-09 16:59	708.1
156							2024-04-09 17:00	701.6
157							2024-04-09 17:01	696.7
158							2024-04-09 17:02	691.9
159							2024-04-09 17:03	687.8
160							2024-04-09 17:04	683.3
161							2024-04-09 17:05	678.9
162							2024-04-09 17:06	674.7
163							2024-04-09 17:07	670.9
164							2024-04-09 17:08	666.8

165						2024-04-09 17:09	663.8
166						2024-04-09 17:10	661.1
167						2024-04-09 17:11	658.6
168						2024-04-09 17:12	655.6
169						2024-04-09 17:13	651.9
170						2024-04-09 17:14	649.5
171						2024-04-09 17:15	646.3
172						2024-04-09 17:16	644.1
173						2024-04-09 17:17	640.2
174						2024-04-09 17:18	637.0
175						2024-04-09 17:19	634.9
176						2024-04-09 17:20	632.3
177						2024-04-09 17:21	628.9
178						2024-04-09 17:22	625.9
179						2024-04-09 17:23	623.6
180						2024-04-09 17:24	620.5
181						2024-04-09 17:25	618.0
182						2024-04-09 17:26	616.3
183						2024-04-09 17:27	612.8
184						2024-04-09 17:28	610.3
185						2024-04-09 17:29	608.9
186						2024-04-09 17:30	607.2
187						2024-04-09 17:31	603.7
188						2024-04-09 17:32	601.8
189						2024-04-09 17:33	599.2
190						2024-04-09 17:34	596.3
191						2024-04-09 17:35	596.0
192						2024-04-09 17:36	595.5
193						2024-04-09 17:37	592.8
194						2024-04-09 17:38	588.1
195						2024-04-09 17:39	582.1
196						2024-04-09 17:40	578.4
197						2024-04-09 17:41	576.1
198						2024-04-09 17:42	573.0
199						2024-04-09 17:43	570.9
200						2024-04-09 17:44	568.6
201						2024-04-09 17:45	567.1
202						2024-04-09 17:46	565.8
203						2024-04-09 17:47	564.1
204						2024-04-09 17:48	562.6
205						2024-04-09 17:49	561.0
206						2024-04-09 17:50	560.1
207						2024-04-09 17:51	559.2
208						2024-04-09 17:52	558.1
209						2024-04-09 17:53	555.0
210						2024-04-09 17:54	551.1
211						2024-04-09 17:55	548.0
212						2024-04-09 17:56	546.5
213						2024-04-09 17:57	545.0
214						2024-04-09 17:58	542.3
215						2024-04-09 17:59	539.6
216						2024-04-09 18:00	538.0
217						2024-04-09 18:01	536.0
218						2024-04-09 18:02	534.5
219						2024-04-09 18:03	532.5
220						2024-04-09 18:04	531.5
221						2024-04-09 18:05	528.9
222						2024-04-09 18:06	526.7
223						2024-04-09 18:07	526.7
224						2024-04-09 18:08	524.7
225						2024-04-09 18:09	523.2
226						2024-04-09 18:10	522.6
227						2024-04-09 18:11	521.4
228						2024-04-09 18:12	520.5
229						2024-04-09 18:13	517.2
230						2024-04-09 18:14	516.3
231						2024-04-09 18:15	515.9
232						2024-04-09 18:16	515.0
233						2024-04-09 18:17	513.7
234						2024-04-09 18:18	512.5
235						2024-04-09 18:19	512.0
236						2024-04-09 18:20	511.1
237						2024-04-09 18:21	510.7
238						2024-04-09 18:22	510.1
239						2024-04-09 18:23	508.9
240						2024-04-09 18:24	508.9
241						2024-04-09 18:25	508.7
242						2024-04-09 18:26	507.3
243						2024-04-09 18:27	507.0
244						2024-04-09 18:28	505.6
245						2024-04-09 18:29	505.2
246						2024-04-09 18:30	504.3
247						2024-04-09 18:31	503.2
248						2024-04-09 18:32	502.3
249						2024-04-09 18:33	501.4
250						2024-04-09 18:34	499.9
251						2024-04-09 18:35	498.7
252						2024-04-09 18:36	497.7
253						2024-04-09 18:37	497.4

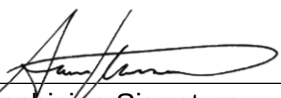
254						2024-04-09 18:38	496.9
255						2024-04-09 18:39	495.5
256						2024-04-09 18:40	493.9
257						2024-04-09 18:41	493.0
258						2024-04-09 18:42	492.1
259						2024-04-09 18:43	491.0
260						2024-04-09 18:44	490.2
261						2024-04-09 18:45	489.6
262						2024-04-09 18:46	488.3
263						2024-04-09 18:47	487.7
264						2024-04-09 18:48	487.0
265						2024-04-09 18:49	487.6
266						2024-04-09 18:50	486.4
267						2024-04-09 18:51	485.2
268						2024-04-09 18:52	485.2
269						2024-04-09 18:53	484.8
270						2024-04-09 18:54	484.2
271						2024-04-09 18:55	484.4
272						2024-04-09 18:56	483.8
273						2024-04-09 18:57	483.2
274						2024-04-09 18:58	483.8
275						2024-04-09 18:59	483.6
276						2024-04-09 19:00	482.8
277						2024-04-09 19:01	482.3
278						2024-04-09 19:02	483.2
279						2024-04-09 19:03	483.1
280						2024-04-09 19:04	482.9
281						2024-04-09 19:05	483.5
282						2024-04-09 19:06	482.9
283						2024-04-09 19:07	483.8
284						2024-04-09 19:08	483.8
285						2024-04-09 19:09	484.4
286						2024-04-09 19:10	483.7
287						2024-04-09 19:11	482.7
288						2024-04-09 19:12	482.4
289						2024-04-09 19:13	482.1
290						2024-04-09 19:14	481.3
291						2024-04-09 19:15	480.1
292						2024-04-09 19:16	478.4
293						2024-04-09 19:17	477.8
294						2024-04-09 19:18	476.8
295						2024-04-09 19:19	476.1
296						2024-04-09 19:20	474.9
297						2024-04-09 19:21	473.0
298						2024-04-09 19:22	472.8
299						2024-04-09 19:23	471.1
300						2024-04-09 19:24	471.6
301						2024-04-09 19:25	470.8
302						2024-04-09 19:26	470.0
303						2024-04-09 19:27	469.6
304						2024-04-09 19:28	469.1

WOOD STOVE TEST DATA PACKET
IDC / ASTM E2515



Run 1 Data Summary

Client:	SBI
Model:	Everest III
Job #:	23-241
Tracking #:	191
Test Date:	5/6/2024



Technician Signature

6/5/2024

Date

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: SBI
 Model: Everest III
 Run #: 1
 Test Start Time:

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Total Sampling Time (min): 544
 Recording Interval (min): 1

Meter Box γ Factor: 1.000 (A)
 Meter Box γ Factor: 1.003 (B)
 Meter Box γ Factor: - (C)
 Meter Box γ Factor: 1.013 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100%
 Date Flue Pipe Last Cleaned: 5/3/2024
 Test Fuel Scale Audit (lbs): 10.00
 Platform Scale Audit (lbs): 10.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.83	29.91	29.87
Relative Humidity (%)	39.2	31.1	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		68.181	ft ³

Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.000	cfm @	-8 in. Hg
(B)	0.000	0.000	cfm @	-8 in. Hg
(C)	-	-	cfm @	- in. Hg
(Ambient)	0.000	0.000	cfm @	-12 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.054	73
2	0.076	73
3	0.078	73
4	0.078	73
5	0.072	73
6	0.054	73
7	0.056	73
8	0.080	73
9	0.078	73
10	0.076	73
11	0.070	73
12	0.054	73
Center	0.080	73

Dilution Tunnel H₂O: 2.00 percent
 Tunnel Diameter: 12 inches
 Pitot Tube Cp: 0.99 [unitless]
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole
 Tunnel Area: 0.7854 ft²

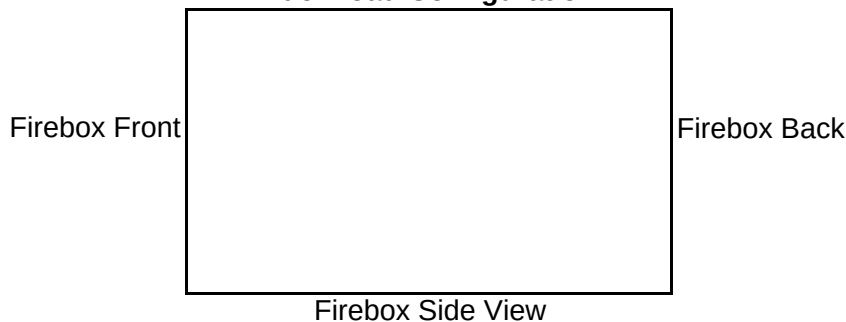
V_{strav} : 17.45 ft/sec
 V_{scent} : 18.87 ft/sec
 F_p : 0.925 [ratio]

Initial Tunnel Flow: 795.9 scf/min

Static Pressure: -0.260 in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type: D. Fir
 HHV (kJ/kg): 19,810
 %C: 48.73
 %H: 6.87
 %O: 43.9
 %Ash: 0.5
 MC (%DB): #DIV/0!

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 1

Technician: AK

Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	-0.064		0.070	0.01	75	-0.5		10.73		68	67	85	67
1	0.057	0.121	0.069	0.95	75	-1.4	-	10.47	-0.26	72	202	85	67
2	0.201	0.144	0.068	0.93	75	-1.3	-	10.02	-0.45	84	466	85	67
3	0.346	0.145	0.066	0.93	75	-1.3	-	9.44	-0.58	100	660	85	67
4	0.490	0.144	0.065	0.92	75	-1.4	-	8.74	-0.70	117	872	86	67
5	0.632	0.142	0.065	0.92	75	-1.3	-	8.27	-0.47	100	782	86	67
6	0.775	0.143	0.066	0.94	75	-1.4	-	8.01	-0.26	90	765	87	67
7	0.918	0.143	0.066	0.93	75	-1.4	-	7.76	-0.25	86	757	88	67
8	1.062	0.144	0.066	0.92	75	-1.2	-	7.50	-0.26	85	761	87	67
9	1.206	0.144	0.069	0.93	75	-1.3	-	7.28	-0.22	84	740	86	67
10	1.349	0.143	0.068	0.93	75	-1.2	100	7.06	-0.22	83	728	85	67
11	1.491	0.142	0.068	0.94	76	-1.3	-	6.84	-0.22	83	735	85	68
12	1.634	0.143	0.066	0.92	76	-1.3	-	6.64	-0.20	83	736	84	68
13	1.777	0.143	0.068	0.93	76	-1.3	-	6.44	-0.20	83	738	84	68
14	1.921	0.144	0.067	0.92	76	-1.3	-	6.24	-0.20	83	738	84	68
15	2.064	0.143	0.069	0.93	76	-1.2	-	6.03	-0.21	83	744	85	68
16	2.207	0.143	0.068	0.91	76	-1.2	-	5.83	-0.20	84	747	85	68
17	2.349	0.142	0.069	0.92	76	-1.3	-	5.63	-0.20	84	749	86	68
18	2.492	0.143	0.068	0.93	77	-1.3	-	5.42	-0.21	84	754	87	68
19	2.636	0.144	0.068	0.92	77	-1.3	-	5.22	-0.20	85	759	88	68
20	2.779	0.143	0.068	0.93	77	-1.3	103	5.01	-0.21	85	764	88	68
21	2.922	0.143	0.068	0.92	77	-1.2	-	4.80	-0.21	86	772	87	68
22	3.064	0.142	0.069	0.91	77	-1.2	-	4.61	-0.19	87	777	86	68
23	3.207	0.143	0.066	0.93	77	-1.3	-	4.41	-0.20	87	783	85	68
24	3.350	0.143	0.068	0.93	77	-1.2	-	4.22	-0.19	87	792	84	68
25	3.494	0.144	0.068	0.92	78	-1.3	-	4.02	-0.20	88	799	84	68
26	3.636	0.142	0.067	0.92	78	-1.2	-	3.80	-0.22	88	812	83	68
27	3.779	0.143	0.068	0.91	78	-1.2	-	3.59	-0.21	88	820	83	68
28	3.921	0.142	0.068	0.91	78	-1.2	-	3.37	-0.22	89	827	84	68
29	4.064	0.143	0.068	0.93	78	-1.3	-	3.18	-0.19	89	820	84	68
30	4.208	0.144	0.066	0.92	78	-1.2	104	21.01	17.83	103	726	85	68
31	4.350	0.142	0.066	0.92	78	-1.3	-	20.70	-0.31	93	816	86	68

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.493	0.143	0.065	0.92	78	-1.3	-	20.44	-0.26	90	827	86	68
33	4.635	0.142	0.066	0.93	79	-1.2	-	20.20	-0.24	89	813	87	68
34	4.777	0.142	0.069	0.93	79	-1.2	-	19.97	-0.23	89	814	88	68
35	4.922	0.145	0.067	0.92	79	-1.2	-	19.73	-0.24	89	819	88	68
36	5.064	0.142	0.067	0.92	79	-1.2	-	19.49	-0.24	90	837	89	68
37	5.206	0.142	0.068	0.93	79	-1.3	-	19.24	-0.25	90	855	90	68
38	5.348	0.142	0.068	0.92	79	-1.3	-	18.97	-0.27	90	867	90	68
39	5.490	0.142	0.066	0.93	79	-1.3	-	18.70	-0.27	91	883	89	68
40	5.635	0.145	0.066	0.91	79	-1.2	105	18.41	-0.29	92	904	88	68
41	5.777	0.142	0.066	0.92	79	-1.3	-	18.10	-0.31	92	931	87	68
42	5.919	0.142	0.067	0.91	80	-1.2	-	17.80	-0.30	93	948	86	68
43	6.061	0.142	0.065	0.92	80	-1.3	-	17.47	-0.33	93	969	85	68
44	6.204	0.143	0.065	0.91	80	-1.3	-	17.14	-0.33	95	1,011	85	68
45	6.348	0.144	0.065	0.93	80	-1.2	-	16.78	-0.36	96	1,035	85	69
46	6.490	0.142	0.066	0.91	80	-1.2	-	16.42	-0.36	96	1,052	85	69
47	6.632	0.142	0.065	0.92	80	-1.3	-	16.05	-0.37	97	1,052	86	69
48	6.774	0.142	0.065	0.91	80	-1.3	-	15.66	-0.39	98	1,054	87	69
49	6.917	0.143	0.067	0.91	80	-1.2	-	15.27	-0.39	99	1,058	87	69
50	7.061	0.144	0.065	0.93	80	-1.2	105	14.88	-0.39	99	1,057	88	69
51	7.203	0.142	0.065	0.92	81	-1.3	-	14.48	-0.40	99	1,058	87	69
52	7.344	0.141	0.065	0.91	81	-1.2	-	14.10	-0.38	100	1,064	87	69
53	7.487	0.143	0.065	0.92	81	-1.2	-	13.70	-0.40	100	1,050	87	69
54	7.629	0.142	0.067	0.91	81	-1.3	-	13.32	-0.38	100	1,048	87	69
55	7.773	0.144	0.066	0.93	81	-1.2	-	12.93	-0.39	100	1,046	86	69
56	7.915	0.142	0.066	0.91	81	-1.3	-	12.56	-0.37	100	1,045	86	69
57	8.057	0.142	0.066	0.91	81	-1.2	-	12.19	-0.37	99	1,031	87	69
58	8.199	0.142	0.066	0.91	81	-1.3	-	11.89	-0.30	96	1,002	87	69
59	8.342	0.143	0.066	0.92	81	-1.2	-	11.67	-0.22	94	978	88	69
60	8.485	0.143	0.065	0.91	81	-1.3	105	11.46	-0.21	93	931	88	69
61	8.627	0.142	0.067	0.92	81	-1.2	-	11.28	-0.18	92	905	88	69
62	8.769	0.142	0.065	0.91	82	-1.3	-	11.10	-0.18	92	888	86	69
63	8.912	0.143	0.066	0.91	82	-1.3	-	10.92	-0.18	91	876	86	69

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 1

Technician: AK

Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.055	0.143	0.065	0.91	82	-1.3	-	10.75	-0.17	91	864	85	69
65	9.198	0.143	0.067	0.90	82	-1.2	-	10.56	-0.19	91	854	85	69
66	9.340	0.142	0.066	0.92	82	-1.2	-	10.40	-0.16	91	845	85	69
67	9.483	0.143	0.067	0.91	82	-1.2	-	10.23	-0.17	91	836	85	69
68	9.625	0.142	0.067	0.92	82	-1.3	-	10.06	-0.17	91	830	85	69
69	9.769	0.144	0.065	0.92	82	-1.3	-	9.89	-0.17	91	821	86	69
70	9.912	0.143	0.067	0.90	82	-1.3	104	9.73	-0.16	90	813	86	69
71	10.055	0.143	0.067	0.92	82	-1.2	-	9.56	-0.17	90	807	85	69
72	10.197	0.142	0.067	0.92	82	-1.3	-	9.40	-0.16	89	804	85	69
73	10.339	0.142	0.066	0.92	82	-1.3	-	9.24	-0.16	89	801	86	69
74	10.483	0.144	0.065	0.92	82	-1.2	-	9.07	-0.17	89	800	87	69
75	10.626	0.143	0.067	0.91	82	-1.3	-	8.90	-0.17	89	801	87	69
76	10.768	0.142	0.068	0.93	82	-1.3	-	8.73	-0.17	89	804	87	69
77	10.910	0.142	0.068	0.93	82	-1.2	-	8.57	-0.16	89	804	86	69
78	11.053	0.143	0.068	0.91	82	-1.2	-	8.40	-0.17	89	801	85	69
79	11.196	0.143	0.068	0.91	83	-1.2	-	8.24	-0.16	88	797	85	69
80	11.339	0.143	0.068	0.91	83	-1.3	102	8.09	-0.15	88	794	84	70
81	11.482	0.143	0.067	0.91	83	-1.2	-	7.93	-0.16	88	792	85	70
82	11.624	0.142	0.069	0.91	83	-1.2	-	7.78	-0.15	88	793	85	70
83	11.766	0.142	0.069	0.91	83	-1.2	-	7.62	-0.16	88	792	86	70
84	11.909	0.143	0.068	0.92	83	-1.2	-	7.46	-0.16	88	794	87	70
85	12.053	0.144	0.067	0.90	83	-1.3	-	7.30	-0.16	88	798	88	70
86	12.195	0.142	0.068	0.91	83	-1.3	-	7.14	-0.16	88	797	87	70
87	12.337	0.142	0.067	0.92	83	-1.3	-	6.99	-0.15	88	794	86	70
88	12.479	0.142	0.069	0.91	83	-1.2	-	6.84	-0.15	88	791	86	70
89	12.623	0.144	0.068	0.90	83	-1.2	-	6.70	-0.14	87	789	86	70
90	12.766	0.143	0.069	0.92	83	-1.2	101	6.56	-0.14	87	790	86	70
91	12.908	0.142	0.068	0.91	83	-1.2	-	6.41	-0.15	87	788	86	70
92	13.050	0.142	0.069	0.91	83	-1.3	-	6.28	-0.13	87	784	87	70
93	13.193	0.143	0.067	0.91	83	-1.3	-	6.16	-0.12	87	783	86	70
94	13.336	0.143	0.068	0.92	83	-1.3	-	6.01	-0.15	87	783	86	70
95	13.479	0.143	0.068	0.92	83	-1.3	-	5.88	-0.13	87	781	85	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	13.622	0.143	0.069	0.90	83	-1.3	-	5.76	-0.12	87	776	85	70
97	13.761	0.139	0.069	0.90	83	-1.4	-	5.66	-0.10	87	770	85	70
98	13.904	0.143	0.069	0.91	83	-1.3	-	5.53	-0.13	87	774	85	70
99	14.048	0.144	0.069	0.92	83	-1.2	-	5.41	-0.12	87	780	85	70
100	14.190	0.142	0.069	0.92	83	-1.3	100	5.30	-0.11	87	780	86	70
101	14.332	0.142	0.067	0.91	84	-1.3	-	5.18	-0.12	87	777	87	70
102	14.474	0.142	0.067	0.91	84	-1.3	-	18.47	13.29	104	668	87	70
103	14.616	0.142	0.066	0.91	84	-1.3	-	18.22	-0.25	99	869	87	70
104	14.760	0.144	0.066	0.92	84	-1.2	-	17.92	-0.30	100	932	86	70
105	14.902	0.142	0.067	0.91	84	-1.3	-	17.63	-0.29	100	959	85	70
106	15.044	0.142	0.066	0.89	84	-1.3	-	17.33	-0.30	99	941	85	70
107	15.185	0.141	0.067	0.91	84	-1.3	-	17.13	-0.20	93	900	85	70
108	15.326	0.141	0.065	0.90	84	-1.2	-	16.95	-0.18	91	871	85	70
109	15.468	0.142	0.067	0.92	84	-1.4	-	16.78	-0.17	90	856	85	70
110	15.610	0.142	0.068	0.91	84	-1.2	100	16.60	-0.18	90	846	85	70
111	15.751	0.141	0.067	0.91	84	-1.3	-	16.44	-0.16	89	836	86	70
112	15.894	0.143	0.066	0.90	84	-1.3	-	16.28	-0.16	89	825	87	70
113	16.037	0.143	0.067	0.90	84	-1.4	-	16.13	-0.15	89	817	88	70
114	16.178	0.141	0.067	0.92	84	-1.3	-	15.98	-0.15	89	815	88	70
115	16.320	0.142	0.067	0.90	84	-1.3	-	15.82	-0.16	89	821	89	70
116	16.461	0.141	0.068	0.90	84	-1.3	-	15.67	-0.15	89	817	88	71
117	16.605	0.144	0.068	0.89	84	-1.2	-	15.52	-0.15	88	809	87	70
118	16.747	0.142	0.065	0.91	84	-1.4	-	15.38	-0.14	88	801	86	70
119	16.891	0.144	0.066	0.90	84	-1.2	-	15.24	-0.14	88	792	85	70
120	17.033	0.142	0.069	0.92	84	-1.4	101	15.09	-0.15	88	785	85	71
121	17.175	0.142	0.067	0.92	84	-1.3	-	14.97	-0.12	88	779	85	71
122	17.318	0.143	0.068	0.91	84	-1.2	-	14.83	-0.14	88	775	85	70
123	17.460	0.142	0.067	0.90	84	-1.3	-	14.69	-0.14	88	774	86	71
124	17.602	0.142	0.068	0.92	84	-1.3	-	14.56	-0.13	88	773	87	71
125	17.743	0.141	0.066	0.91	84	-1.3	-	14.41	-0.15	88	771	88	71
126	17.886	0.143	0.068	0.91	84	-1.3	-	14.28	-0.13	88	770	88	71
127	18.029	0.143	0.065	0.91	84	-1.3	-	14.15	-0.13	88	767	88	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	18.168	0.139	0.067	0.91	84	-1.2	-	14.02	-0.13	88	763	87	71
129	18.310	0.142	0.066	0.92	84	-1.3	-	13.89	-0.13	88	758	86	71
130	18.452	0.142	0.068	0.92	84	-1.2	100	13.76	-0.13	87	754	86	71
131	18.595	0.143	0.066	0.91	85	-1.3	-	13.64	-0.12	87	749	85	71
132	18.737	0.142	0.065	0.90	85	-1.2	-	13.50	-0.14	87	745	84	71
133	18.879	0.142	0.065	0.90	85	-1.4	-	13.38	-0.12	87	741	84	71
134	19.023	0.144	0.068	0.91	85	-1.2	-	13.26	-0.12	87	737	84	71
135	19.166	0.143	0.066	0.91	85	-1.3	-	13.14	-0.12	87	733	84	71
136	19.309	0.143	0.068	0.91	85	-1.4	-	13.02	-0.12	87	730	85	71
137	19.451	0.142	0.065	0.90	85	-1.2	-	12.90	-0.12	86	726	85	71
138	19.593	0.142	0.065	0.89	85	-1.2	-	12.79	-0.11	86	723	85	70
139	19.735	0.142	0.065	0.92	85	-1.3	-	12.66	-0.13	86	721	85	70
140	19.878	0.143	0.067	0.91	85	-1.3	101	12.55	-0.11	86	716	84	71
141	20.021	0.143	0.068	0.91	85	-1.3	-	12.43	-0.12	86	714	84	71
142	20.162	0.141	0.068	0.89	85	-1.3	-	12.32	-0.11	86	711	84	71
143	20.304	0.142	0.067	0.91	85	-1.3	-	12.21	-0.11	86	709	84	71
144	20.446	0.142	0.070	0.90	85	-1.3	-	12.09	-0.12	86	709	85	71
145	20.588	0.142	0.068	0.90	85	-1.3	-	11.99	-0.10	86	707	85	71
146	20.732	0.144	0.069	0.92	85	-1.3	-	11.88	-0.11	85	703	85	71
147	20.874	0.142	0.067	0.90	85	-1.3	-	11.76	-0.12	85	699	85	71
148	21.016	0.142	0.069	0.90	85	-1.3	-	11.66	-0.10	85	696	85	71
149	21.159	0.143	0.067	0.89	85	-1.3	-	11.55	-0.11	85	693	84	71
150	21.301	0.142	0.066	0.90	85	-1.4	102	11.45	-0.10	85	690	84	71
151	21.443	0.142	0.068	0.90	85	-1.3	-	11.35	-0.10	85	686	84	71
152	21.583	0.140	0.067	0.90	85	-1.3	-	11.25	-0.10	85	682	84	71
153	21.725	0.142	0.066	0.90	85	-1.3	-	11.15	-0.10	85	679	84	71
154	21.869	0.144	0.066	0.90	85	-1.3	-	11.06	-0.09	85	673	84	71
155	22.011	0.142	0.069	0.89	85	-1.2	-	10.96	-0.10	84	666	85	71
156	22.152	0.141	0.068	0.89	85	-1.3	-	10.87	-0.09	84	660	85	71
157	22.295	0.143	0.067	0.92	85	-1.3	-	10.77	-0.10	84	656	85	71
158	22.439	0.144	0.069	0.91	85	-1.2	-	10.68	-0.09	84	647	86	71
159	22.583	0.144	0.067	0.92	85	-1.2	-	10.59	-0.09	84	642	87	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	22.725	0.142	0.069	0.90	85	-1.2	101	10.50	-0.09	84	636	86	71
161	22.867	0.142	0.066	0.91	85	-1.3	-	10.41	-0.09	84	629	86	71
162	23.008	0.141	0.067	0.90	85	-1.3	-	10.33	-0.08	83	622	85	71
163	23.151	0.143	0.069	0.91	85	-1.4	-	10.25	-0.08	83	616	84	71
164	23.294	0.143	0.069	0.90	85	-1.2	-	10.16	-0.09	83	614	84	71
165	23.437	0.143	0.066	0.92	85	-1.3	-	10.07	-0.09	83	617	84	71
166	23.578	0.141	0.070	0.90	85	-1.4	-	9.99	-0.08	83	618	83	71
167	23.718	0.140	0.068	0.90	85	-1.3	-	9.90	-0.09	83	618	84	71
168	23.862	0.144	0.068	0.92	85	-1.3	-	9.82	-0.08	83	617	85	71
169	24.007	0.145	0.066	0.90	85	-1.4	-	9.74	-0.08	83	613	86	71
170	24.146	0.139	0.068	0.90	85	-1.4	100	9.65	-0.09	83	610	86	71
171	24.288	0.142	0.068	0.91	85	-1.4	-	9.57	-0.08	83	609	85	71
172	24.431	0.143	0.068	0.91	85	-1.3	-	9.50	-0.07	82	608	85	71
173	24.574	0.143	0.070	0.91	85	-1.2	-	9.41	-0.09	82	604	84	71
174	24.716	0.142	0.067	0.91	85	-1.2	-	9.34	-0.07	82	601	84	71
175	24.861	0.145	0.070	0.90	86	-1.3	-	9.26	-0.08	82	600	84	71
176	25.003	0.142	0.070	0.91	85	-1.3	-	9.18	-0.08	82	596	85	71
177	25.145	0.142	0.066	0.91	86	-1.2	-	9.11	-0.07	82	595	85	71
178	25.289	0.144	0.066	0.90	85	-1.2	-	9.03	-0.08	82	593	85	71
179	25.431	0.142	0.070	0.90	85	-1.3	-	8.95	-0.08	82	590	85	71
180	25.573	0.142	0.067	0.91	86	-1.3	101	8.88	-0.07	82	588	85	71
181	25.715	0.142	0.066	0.91	86	-1.3	-	8.80	-0.08	82	586	84	71
182	25.858	0.143	0.065	0.92	86	-1.3	-	8.73	-0.07	82	584	84	71
183	26.002	0.144	0.067	0.92	86	-1.3	-	8.65	-0.08	82	581	85	70
184	26.144	0.142	0.066	0.91	86	-1.4	-	8.58	-0.07	82	580	85	71
185	26.286	0.142	0.066	0.91	86	-1.3	-	8.50	-0.08	82	578	85	71
186	26.428	0.142	0.067	0.92	86	-1.3	-	8.44	-0.06	81	577	84	71
187	26.569	0.141	0.065	0.91	86	-1.3	-	8.37	-0.07	81	574	84	71
188	26.712	0.143	0.065	0.91	86	-1.3	-	8.30	-0.07	81	570	84	71
189	26.853	0.141	0.065	0.91	86	-1.2	-	8.23	-0.07	81	568	84	71
190	26.996	0.143	0.065	0.90	86	-1.3	102	8.16	-0.07	81	567	84	71
191	27.138	0.142	0.066	0.91	86	-1.3	-	8.09	-0.07	81	565	84	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	27.284	0.146	0.066	0.91	86	-1.3	-	8.01	-0.08	81	563	84	71
193	27.427	0.143	0.066	0.91	86	-1.2	-	7.95	-0.06	81	561	83	71
194	27.569	0.142	0.068	0.90	86	-1.3	-	7.88	-0.07	81	561	84	71
195	27.711	0.142	0.067	0.90	86	-1.4	-	7.81	-0.07	81	560	85	71
196	27.854	0.143	0.068	0.91	86	-1.2	-	7.74	-0.07	81	559	85	71
197	27.997	0.143	0.067	0.92	86	-1.3	-	7.67	-0.07	81	560	85	71
198	28.140	0.143	0.069	0.90	86	-1.3	-	7.60	-0.07	81	559	85	71
199	28.282	0.142	0.069	0.90	86	-1.4	-	7.53	-0.07	81	564	84	71
200	28.424	0.142	0.068	0.91	86	-1.4	101	7.46	-0.07	81	565	84	71
201	28.564	0.140	0.070	0.91	86	-1.4	-	7.39	-0.07	81	567	84	70
202	28.710	0.146	0.067	0.90	86	-1.3	-	7.31	-0.08	80	568	84	70
203	28.853	0.143	0.067	0.91	86	-1.3	-	7.24	-0.07	80	569	84	70
204	28.995	0.142	0.069	0.92	86	-1.2	-	7.17	-0.07	81	567	84	70
205	29.137	0.142	0.069	0.91	86	-1.4	-	7.09	-0.08	80	567	85	70
206	29.279	0.142	0.068	0.90	86	-1.3	-	7.02	-0.07	80	566	86	70
207	29.423	0.144	0.069	0.91	86	-1.4	-	6.95	-0.07	80	567	86	69
208	29.566	0.143	0.068	0.91	86	-1.3	-	6.88	-0.07	80	568	87	69
209	29.707	0.141	0.068	0.90	86	-1.4	-	6.80	-0.08	80	570	86	69
210	29.850	0.143	0.069	0.90	86	-1.4	100	6.74	-0.06	80	573	85	69
211	29.992	0.142	0.070	0.91	86	-1.4	-	6.66	-0.08	80	574	85	69
212	30.136	0.144	0.067	0.91	86	-1.4	-	6.59	-0.07	80	573	85	69
213	30.276	0.140	0.066	0.91	86	-1.4	-	6.52	-0.07	80	571	84	69
214	30.418	0.142	0.068	0.90	86	-1.3	-	6.46	-0.06	80	573	84	69
215	30.560	0.142	0.069	0.90	86	-1.3	-	6.39	-0.07	80	571	85	69
216	30.703	0.143	0.067	0.90	86	-1.3	-	6.33	-0.06	80	572	84	69
217	30.849	0.146	0.069	0.91	86	-1.3	-	6.27	-0.06	80	575	84	69
218	30.991	0.142	0.068	0.91	86	-1.3	-	35.54	29.27	98	414	84	69
219	31.133	0.142	0.068	0.90	86	-1.4	-	36.18	0.64	103	464	84	70
220	31.274	0.141	0.067	0.91	86	-1.3	101	35.82	-0.36	111	613	84	70
221	31.417	0.143	0.065	0.91	86	-1.4	-	35.32	-0.50	129	904	84	69
222	31.559	0.142	0.065	0.90	86	-1.4	-	34.72	-0.60	136	965	85	70
223	31.701	0.142	0.065	0.89	86	-1.3	-	34.43	-0.29	110	894	85	69

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	31.843	0.142	0.066	0.90	86	-1.4	-	34.16	-0.27	102	900	85	70
225	31.985	0.142	0.067	0.91	86	-1.4	-	33.89	-0.27	99	926	85	69
226	32.128	0.143	0.067	0.91	86	-1.4	-	33.58	-0.31	98	961	85	69
227	32.271	0.143	0.066	0.91	86	-1.3	-	33.29	-0.29	93	910	85	69
228	32.410	0.139	0.068	0.90	86	-1.3	-	33.08	-0.21	91	882	85	69
229	32.552	0.142	0.065	0.91	86	-1.3	-	32.88	-0.20	90	873	85	69
230	32.696	0.144	0.067	0.92	86	-1.4	102	32.68	-0.20	89	867	84	70
231	32.838	0.142	0.067	0.90	86	-1.3	-	32.50	-0.18	89	861	84	69
232	32.979	0.141	0.066	0.90	86	-1.2	-	32.31	-0.19	89	856	84	69
233	33.121	0.142	0.068	0.90	86	-1.2	-	32.14	-0.17	89	851	85	69
234	33.263	0.142	0.066	0.91	86	-1.3	-	31.95	-0.19	89	847	86	69
235	33.409	0.146	0.067	0.91	86	-1.3	-	31.76	-0.19	89	846	86	69
236	33.552	0.143	0.067	0.90	86	-1.2	-	31.58	-0.18	89	847	87	69
237	33.693	0.141	0.069	0.90	86	-1.2	-	31.38	-0.20	89	844	86	70
238	33.835	0.142	0.068	0.91	86	-1.3	-	31.20	-0.18	89	836	85	69
239	33.977	0.142	0.066	0.90	86	-1.2	-	31.02	-0.18	89	835	85	69
240	34.121	0.144	0.067	0.91	86	-1.3	102	30.82	-0.20	89	835	85	69
241	34.263	0.142	0.065	0.90	86	-1.3	-	30.64	-0.18	89	836	85	70
242	34.405	0.142	0.066	0.91	86	-1.3	-	30.44	-0.20	89	839	86	70
243	34.546	0.141	0.065	0.90	86	-1.2	-	30.24	-0.20	89	842	85	70
244	34.689	0.143	0.065	0.91	86	-1.3	-	30.04	-0.20	89	844	85	69
245	34.830	0.141	0.065	0.91	86	-1.2	-	29.84	-0.20	89	847	86	69
246	34.971	0.141	0.065	0.91	86	-1.3	-	29.64	-0.20	89	849	86	69
247	35.113	0.142	0.065	0.91	86	-1.3	-	29.44	-0.20	89	853	86	69
248	35.257	0.144	0.065	0.92	86	-1.3	-	29.24	-0.20	89	856	85	70
249	35.400	0.143	0.067	0.90	86	-1.3	-	29.05	-0.19	90	861	85	70
250	35.542	0.142	0.067	0.89	86	-1.2	101	28.85	-0.20	90	864	84	70
251	35.684	0.142	0.067	0.90	86	-1.2	-	28.66	-0.19	90	867	84	70
252	35.825	0.141	0.067	0.91	86	-1.2	-	28.47	-0.19	90	871	84	70
253	35.967	0.142	0.065	0.90	86	-1.3	-	28.27	-0.20	90	874	84	69
254	36.110	0.143	0.065	0.90	86	-1.3	-	28.06	-0.21	90	877	84	70
255	36.252	0.142	0.067	0.90	86	-1.2	-	27.85	-0.21	90	883	85	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>1</u>	Technician: <u>AK</u>
	Date: <u>5/6/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	36.393	0.141	0.067	0.91	86	-1.3	-	27.65	-0.20	90	889	84	70
257	36.535	0.142	0.066	0.90	86	-1.2	-	27.44	-0.21	90	894	84	70
258	36.678	0.143	0.067	0.90	86	-1.2	-	27.23	-0.21	91	901	84	70
259	36.820	0.142	0.067	0.90	86	-1.4	-	27.01	-0.22	91	907	84	70
260	36.958	0.138	0.065	0.90	86	-1.3	102	26.79	-0.22	91	900	84	70
261	37.099	0.141	0.067	0.90	86	-1.2	-	26.57	-0.22	91	901	85	70
262	37.242	0.143	0.068	0.90	86	-1.2	-	26.34	-0.23	91	900	85	70
263	37.386	0.144	0.067	0.90	86	-1.2	-	26.13	-0.21	91	907	85	70
264	37.527	0.141	0.067	0.89	86	-1.3	-	25.91	-0.22	92	908	86	70
265	37.668	0.141	0.068	0.90	86	-1.2	-	25.69	-0.22	92	916	86	70
266	37.810	0.142	0.066	0.90	86	-1.2	-	25.48	-0.21	92	920	86	70
267	37.951	0.141	0.067	0.89	86	-1.3	-	25.27	-0.21	92	923	85	70
268	38.089	0.138	0.065	0.89	86	-1.2	-	25.05	-0.22	92	930	85	70
269	38.231	0.142	0.065	0.89	86	-1.2	-	24.83	-0.22	92	936	84	70
270	38.373	0.142	0.066	0.89	86	-1.2	102	24.61	-0.22	92	943	84	70
271	38.516	0.143	0.065	0.89	86	-1.3	-	24.38	-0.23	93	948	84	70
272	38.656	0.140	0.066	0.89	86	-1.2	-	24.15	-0.23	93	953	84	70
273	38.797	0.141	0.066	0.89	86	-1.3	-	23.92	-0.23	93	956	84	70
274	38.939	0.142	0.065	0.89	86	-1.2	-	23.70	-0.22	93	961	84	70
275	39.079	0.140	0.065	0.90	86	-1.3	-	23.47	-0.23	93	967	84	71
276	39.219	0.140	0.065	0.89	86	-1.2	-	23.25	-0.22	94	974	84	71
277	39.361	0.142	0.067	0.89	86	-1.3	-	23.01	-0.24	94	978	84	71
278	39.502	0.141	0.068	0.90	86	-1.4	-	22.78	-0.23	94	983	84	71
279	39.641	0.139	0.065	0.88	86	-1.2	-	22.55	-0.23	94	984	85	71
280	39.781	0.140	0.064	0.89	87	-1.3	102	22.31	-0.24	94	983	85	71
281	39.921	0.140	0.066	0.88	86	-1.2	-	22.10	-0.21	94	986	86	71
282	40.060	0.139	0.065	0.89	86	-1.3	-	21.86	-0.24	94	987	86	71
283	40.200	0.140	0.065	0.88	86	-1.2	-	21.63	-0.23	94	987	86	71
284	40.344	0.144	0.065	0.89	87	-1.3	-	21.40	-0.23	95	989	85	71
285	40.483	0.139	0.066	0.89	86	-1.3	-	21.18	-0.22	94	987	85	71
286	40.622	0.139	0.066	0.89	86	-1.3	-	20.96	-0.22	94	985	85	71
287	40.763	0.141	0.065	0.90	86	-1.3	-	20.74	-0.22	94	982	85	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	40.904	0.141	0.065	0.88	87	-1.3	-	20.54	-0.20	94	979	84	71
289	41.043	0.139	0.067	0.89	86	-1.3	-	20.33	-0.21	94	973	85	71
290	41.183	0.140	0.065	0.88	87	-1.3	102	20.13	-0.20	94	966	85	71
291	41.324	0.141	0.065	0.88	87	-1.3	-	19.93	-0.20	94	960	85	71
292	41.463	0.139	0.067	0.89	87	-1.3	-	19.74	-0.19	94	957	85	71
293	41.601	0.138	0.065	0.88	87	-1.2	-	19.54	-0.20	94	953	85	71
294	41.741	0.140	0.065	0.88	87	-1.2	-	19.34	-0.20	94	948	86	71
295	41.881	0.140	0.066	0.89	87	-1.3	-	19.14	-0.20	94	945	86	71
296	42.023	0.142	0.066	0.88	87	-1.2	-	18.95	-0.19	94	943	86	71
297	42.164	0.141	0.067	0.89	87	-1.3	-	18.75	-0.20	94	941	86	71
298	42.303	0.139	0.065	0.89	87	-1.3	-	18.56	-0.19	94	936	86	71
299	42.442	0.139	0.065	0.89	87	-1.3	-	18.37	-0.19	94	934	86	71
300	42.583	0.141	0.065	0.87	87	-1.3	102	18.18	-0.19	94	930	85	71
301	42.723	0.140	0.065	0.89	87	-1.3	-	17.99	-0.19	94	929	85	71
302	42.862	0.139	0.065	0.87	87	-1.2	-	17.80	-0.19	94	928	85	71
303	43.002	0.140	0.066	0.89	87	-1.3	-	17.61	-0.19	93	923	85	72
304	43.142	0.140	0.066	0.87	87	-1.3	-	17.43	-0.18	94	920	86	71
305	43.278	0.136	0.065	0.88	87	-1.3	-	17.25	-0.18	93	919	86	72
306	43.419	0.141	0.065	0.87	87	-1.3	-	17.07	-0.18	93	915	86	71
307	43.561	0.142	0.068	0.88	87	-1.2	-	16.89	-0.18	93	911	86	71
308	43.699	0.138	0.065	0.86	87	-1.4	-	16.71	-0.18	93	908	85	71
309	43.839	0.140	0.065	0.88	87	-1.3	-	16.53	-0.18	93	908	85	71
310	43.980	0.141	0.065	0.88	87	-1.2	101	16.36	-0.17	93	906	84	71
311	44.118	0.138	0.067	0.87	87	-1.3	-	16.18	-0.18	93	906	84	72
312	44.258	0.140	0.065	0.87	87	-1.3	-	16.01	-0.17	93	904	84	71
313	44.398	0.140	0.066	0.86	87	-1.3	-	15.83	-0.18	93	902	85	72
314	44.537	0.139	0.065	0.88	87	-1.4	-	15.66	-0.17	92	903	86	71
315	44.676	0.139	0.065	0.88	87	-1.2	-	15.48	-0.18	93	903	87	71
316	44.815	0.139	0.068	0.88	87	-1.3	-	15.31	-0.17	92	904	87	71
317	44.953	0.138	0.065	0.87	87	-1.3	-	15.14	-0.17	92	900	86	71
318	45.095	0.142	0.067	0.88	87	-1.3	-	14.98	-0.16	92	891	86	72
319	45.236	0.141	0.065	0.89	87	-1.3	-	14.83	-0.15	92	886	85	72

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	45.374	0.138	0.065	0.88	87	-1.3	101	14.68	-0.15	92	880	85	72
321	45.513	0.139	0.068	0.87	87	-1.2	-	14.53	-0.15	92	873	84	72
322	45.654	0.141	0.066	0.87	87	-1.3	-	14.39	-0.14	92	868	84	72
323	45.793	0.139	0.067	0.88	87	-1.3	-	14.25	-0.14	91	862	84	72
324	45.932	0.139	0.065	0.86	87	-1.4	-	14.12	-0.13	91	856	84	72
325	46.070	0.138	0.065	0.87	87	-1.4	-	13.99	-0.13	91	848	84	72
326	46.209	0.139	0.065	0.88	87	-1.4	-	13.86	-0.13	91	843	84	72
327	46.351	0.142	0.065	0.87	87	-1.3	-	13.72	-0.14	91	838	84	72
328	46.491	0.140	0.065	0.88	87	-1.4	-	13.60	-0.12	91	829	84	72
329	46.630	0.139	0.066	0.89	87	-1.3	-	13.49	-0.11	90	819	85	72
330	46.769	0.139	0.065	0.89	87	-1.3	101	13.38	-0.11	90	810	85	72
331	46.910	0.141	0.065	0.88	87	-1.2	-	13.27	-0.11	90	804	85	72
332	47.049	0.139	0.065	0.86	87	-1.3	-	13.17	-0.10	90	798	85	72
333	47.188	0.139	0.068	0.88	87	-1.3	-	13.07	-0.10	90	793	85	72
334	47.329	0.141	0.068	0.87	87	-1.4	-	12.96	-0.11	89	789	86	72
335	47.467	0.138	0.067	0.87	87	-1.3	-	12.85	-0.11	89	788	86	72
336	47.604	0.137	0.066	0.89	87	-1.3	-	12.75	-0.10	89	788	85	72
337	47.748	0.144	0.067	0.90	87	-1.3	-	12.63	-0.12	89	789	85	72
338	47.886	0.138	0.066	0.88	87	-1.3	-	12.54	-0.09	89	777	85	72
339	48.025	0.139	0.066	0.89	87	-1.3	-	12.46	-0.08	88	761	85	72
340	48.166	0.141	0.067	0.88	87	-1.3	100	12.38	-0.08	88	749	84	72
341	48.305	0.139	0.066	0.86	87	-1.4	-	12.31	-0.07	88	736	84	72
342	48.444	0.139	0.067	0.89	87	-1.4	-	12.24	-0.07	88	728	84	72
343	48.585	0.141	0.066	0.89	87	-1.3	-	12.17	-0.07	87	719	84	72
344	48.724	0.139	0.065	0.88	87	-1.3	-	12.11	-0.06	87	714	84	72
345	48.860	0.136	0.067	0.87	87	-1.4	-	12.05	-0.06	87	713	85	72
346	49.003	0.143	0.068	0.88	87	-1.4	-	11.99	-0.06	87	707	84	72
347	49.143	0.140	0.066	0.87	87	-1.4	-	11.93	-0.06	86	701	85	72
348	49.281	0.138	0.065	0.88	87	-1.3	-	11.87	-0.06	86	696	85	72
349	49.422	0.141	0.066	0.88	87	-1.4	-	11.82	-0.05	86	687	86	72
350	49.562	0.140	0.067	0.87	87	-1.4	99	11.77	-0.05	86	682	87	71
351	49.700	0.138	0.066	0.88	87	-1.4	-	11.71	-0.06	86	676	87	72

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>1</u>	Technician: <u>AK</u>
	Date: <u>5/6/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	49.840	0.140	0.065	0.87	87	-1.3	-	11.65	-0.06	86	672	87	72
353	49.980	0.140	0.067	0.88	87	-1.4	-	11.60	-0.05	85	671	86	72
354	50.117	0.137	0.067	0.87	87	-1.4	-	11.55	-0.05	85	665	86	71
355	50.259	0.142	0.068	0.87	87	-1.4	-	11.49	-0.06	85	658	85	72
356	50.399	0.140	0.068	0.88	87	-1.4	-	11.44	-0.05	85	655	85	72
357	50.538	0.139	0.068	0.88	87	-1.4	-	11.38	-0.06	85	650	84	71
358	50.677	0.139	0.066	0.87	87	-1.4	-	11.33	-0.05	84	641	84	71
359	50.818	0.141	0.068	0.88	87	-1.5	-	11.28	-0.05	84	634	84	71
360	50.957	0.139	0.068	0.88	87	-1.3	99	11.23	-0.05	84	629	84	71
361	51.096	0.139	0.069	0.88	87	-1.3	-	11.17	-0.06	84	625	85	71
362	51.237	0.141	0.067	0.88	87	-1.4	-	11.13	-0.04	84	620	85	71
363	51.373	0.136	0.069	0.87	87	-1.3	-	11.07	-0.06	84	616	85	71
364	51.515	0.142	0.068	0.88	87	-1.4	-	11.02	-0.05	83	612	85	71
365	51.656	0.141	0.068	0.87	87	-1.3	-	10.97	-0.05	83	608	85	71
366	51.795	0.139	0.068	0.88	87	-1.4	-	10.92	-0.05	83	604	84	71
367	51.934	0.139	0.068	0.88	87	-1.3	-	10.88	-0.04	83	601	84	71
368	52.075	0.141	0.067	0.88	87	-1.4	-	10.82	-0.06	83	598	84	71
369	52.214	0.139	0.067	0.87	87	-1.4	-	10.79	-0.03	83	594	84	71
370	52.353	0.139	0.066	0.89	87	-1.4	99	10.74	-0.05	82	592	85	71
371	52.492	0.139	0.067	0.88	87	-1.4	-	10.68	-0.06	82	592	84	72
372	52.633	0.141	0.068	0.87	87	-1.3	-	10.63	-0.05	82	591	85	72
373	52.772	0.139	0.069	0.88	87	-1.4	-	10.59	-0.04	82	589	85	71
374	52.913	0.141	0.070	0.89	87	-1.4	-	10.54	-0.05	82	587	85	71
375	53.052	0.139	0.068	0.88	87	-1.4	-	10.49	-0.05	82	585	84	71
376	53.191	0.139	0.069	0.88	87	-1.4	-	10.44	-0.05	82	583	85	71
377	53.332	0.141	0.069	0.89	87	-1.4	-	10.40	-0.04	82	581	85	71
378	53.468	0.136	0.070	0.88	87	-1.5	-	10.35	-0.05	82	580	85	71
379	53.610	0.142	0.068	0.89	87	-1.3	-	10.30	-0.05	82	578	86	71
380	53.751	0.141	0.070	0.87	87	-1.4	98	10.25	-0.05	82	577	86	71
381	53.890	0.139	0.068	0.87	87	-1.5	-	10.21	-0.04	81	575	86	71
382	54.029	0.139	0.069	0.88	87	-1.4	-	10.16	-0.05	81	573	85	71
383	54.169	0.140	0.069	0.87	87	-1.4	-	10.11	-0.05	81	570	84	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	54.309	0.140	0.070	0.88	87	-1.4	-	10.06	-0.05	81	567	84	71
385	54.446	0.137	0.069	0.88	87	-1.4	-	10.02	-0.04	81	564	84	71
386	54.588	0.142	0.070	0.88	87	-1.4	-	9.98	-0.04	81	561	84	71
387	54.728	0.140	0.069	0.89	87	-1.4	-	9.92	-0.06	81	560	85	71
388	54.867	0.139	0.069	0.87	87	-1.4	-	9.88	-0.04	81	557	86	71
389	55.007	0.140	0.070	0.88	87	-1.4	-	9.83	-0.05	81	556	86	71
390	55.147	0.140	0.068	0.88	87	-1.4	97	9.78	-0.05	80	555	86	71
391	55.286	0.139	0.070	0.88	87	-1.4	-	9.73	-0.05	80	553	85	71
392	55.425	0.139	0.068	0.87	87	-1.4	-	9.68	-0.05	80	551	85	71
393	55.566	0.141	0.068	0.86	87	-1.5	-	9.63	-0.05	80	550	84	71
394	55.705	0.139	0.068	0.88	87	-1.4	-	9.59	-0.04	80	549	85	71
395	55.844	0.139	0.068	0.87	87	-1.4	-	9.54	-0.05	80	548	85	71
396	55.985	0.141	0.068	0.89	87	-1.5	-	9.49	-0.05	80	552	85	71
397	56.124	0.139	0.069	0.88	87	-1.4	-	9.44	-0.05	80	550	84	71
398	56.261	0.137	0.068	0.87	87	-1.4	-	9.41	-0.03	80	545	84	71
399	56.404	0.143	0.069	0.87	87	-1.5	-	9.36	-0.05	80	543	84	71
400	56.543	0.139	0.068	0.87	87	-1.4	98	9.32	-0.04	80	539	84	71
401	56.682	0.139	0.070	0.88	87	-1.4	-	9.27	-0.05	80	536	84	71
402	56.823	0.141	0.069	0.88	87	-1.4	-	9.22	-0.05	80	533	85	71
403	56.962	0.139	0.068	0.88	87	-1.5	-	9.18	-0.04	80	530	86	71
404	57.101	0.139	0.069	0.88	87	-1.4	-	9.14	-0.04	80	529	87	71
405	57.242	0.141	0.069	0.87	87	-1.4	-	9.09	-0.05	80	529	87	71
406	57.381	0.139	0.070	0.87	87	-1.4	-	9.03	-0.06	80	533	86	71
407	57.520	0.139	0.067	0.88	87	-1.5	-	8.98	-0.05	80	535	85	71
408	57.661	0.141	0.068	0.88	87	-1.5	-	8.95	-0.03	79	531	85	71
409	57.800	0.139	0.068	0.88	87	-1.5	-	8.91	-0.04	79	524	84	71
410	57.937	0.137	0.067	0.89	87	-1.4	98	8.87	-0.04	79	520	84	71
411	58.080	0.143	0.068	0.89	87	-1.4	-	8.85	-0.02	79	517	84	71
412	58.220	0.140	0.068	0.89	87	-1.4	-	8.81	-0.04	79	514	84	71
413	58.358	0.138	0.067	0.87	87	-1.5	-	8.78	-0.03	79	511	85	71
414	58.499	0.141	0.070	0.88	87	-1.5	-	8.76	-0.02	79	509	86	71
415	58.639	0.140	0.068	0.87	87	-1.4	-	8.73	-0.03	79	506	86	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 1

Technician: AK

Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	58.777	0.138	0.069	0.87	87	-1.4	-	8.71	-0.02	79	503	85	71
417	58.917	0.140	0.068	0.89	87	-1.4	-	8.68	-0.03	79	500	85	71
418	59.058	0.141	0.069	0.88	87	-1.5	-	8.65	-0.03	79	498	84	71
419	59.196	0.138	0.069	0.87	87	-1.4	-	8.62	-0.03	78	496	85	71
420	59.336	0.140	0.067	0.88	87	-1.4	99	8.60	-0.02	78	495	85	71
421	59.477	0.141	0.067	0.88	87	-1.5	-	8.58	-0.02	78	493	85	71
422	59.616	0.139	0.069	0.87	87	-1.4	-	8.54	-0.04	78	492	85	71
423	59.755	0.139	0.070	0.88	87	-1.4	-	8.52	-0.02	78	489	86	71
424	59.896	0.141	0.070	0.88	87	-1.4	-	8.49	-0.03	78	487	86	71
425	60.035	0.139	0.070	0.89	87	-1.5	-	8.47	-0.02	78	485	85	71
426	60.174	0.139	0.069	0.88	87	-1.4	-	8.43	-0.04	78	482	85	71
427	60.315	0.141	0.068	0.88	87	-1.5	-	8.41	-0.02	78	479	84	71
428	60.454	0.139	0.067	0.88	87	-1.5	-	8.38	-0.03	78	478	84	71
429	60.593	0.139	0.069	0.89	87	-1.5	-	8.36	-0.02	78	476	85	71
430	60.732	0.139	0.068	0.87	87	-1.4	98	8.33	-0.03	78	474	85	71
431	60.873	0.141	0.067	0.88	87	-1.5	-	8.31	-0.02	78	474	85	71
432	61.012	0.139	0.068	0.88	87	-1.5	-	8.28	-0.03	77	473	85	71
433	61.153	0.141	0.069	0.89	87	-1.5	-	8.25	-0.03	77	473	85	71
434	61.292	0.139	0.068	0.89	87	-1.4	-	8.23	-0.02	77	471	84	70
435	61.431	0.139	0.068	0.88	87	-1.5	-	8.21	-0.02	77	470	84	71
436	61.572	0.141	0.067	0.88	87	-1.5	-	8.18	-0.03	77	468	84	71
437	61.709	0.137	0.067	0.87	87	-1.5	-	8.15	-0.03	77	468	84	70
438	61.850	0.141	0.070	0.89	87	-1.5	-	8.13	-0.02	77	468	83	71
439	61.991	0.141	0.069	0.88	87	-1.5	-	8.11	-0.02	77	466	83	71
440	62.131	0.140	0.070	0.88	87	-1.5	97	8.08	-0.03	77	465	84	71
441	62.270	0.139	0.069	0.89	87	-1.5	-	8.05	-0.03	77	463	84	71
442	62.410	0.140	0.069	0.88	87	-1.5	-	8.03	-0.02	77	462	84	71
443	62.550	0.140	0.069	0.89	87	-1.4	-	8.01	-0.02	77	461	84	71
444	62.689	0.139	0.068	0.88	87	-1.5	-	7.98	-0.03	77	459	84	71
445	62.829	0.140	0.068	0.88	87	-1.5	-	7.96	-0.02	77	459	84	71
446	62.970	0.141	0.069	0.89	87	-1.5	-	7.93	-0.03	77	459	85	71
447	63.108	0.138	0.068	0.87	87	-1.5	-	7.91	-0.02	77	457	85	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>	
Model: <u>Everest III</u>	Tracking #: <u>191</u>	
Run #: <u>1</u>	Technician: <u>AK</u>	
	Date: <u>5/6/2024</u>	

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	63.248	0.140	0.070	0.88	87	-1.4	-	7.89	-0.02	77	455	84	71
449	63.389	0.141	0.068	0.89	87	-1.5	-	7.87	-0.02	77	452	84	71
450	63.528	0.139	0.070	0.88	87	-1.4	96	7.85	-0.02	77	450	83	71
451	63.667	0.139	0.068	0.88	87	-1.5	-	7.82	-0.03	77	448	83	71
452	63.808	0.141	0.070	0.88	87	-1.4	-	7.81	-0.01	77	446	83	70
453	63.947	0.139	0.069	0.88	87	-1.4	-	7.79	-0.02	77	444	84	70
454	64.087	0.140	0.070	0.88	87	-1.5	-	7.76	-0.03	77	443	84	70
455	64.228	0.141	0.069	0.87	87	-1.4	-	7.74	-0.02	77	441	84	70
456	64.366	0.138	0.070	0.90	87	-1.5	-	7.72	-0.02	77	441	84	70
457	64.506	0.140	0.070	0.89	87	-1.5	-	7.70	-0.02	77	439	84	70
458	64.647	0.141	0.070	0.88	87	-1.5	-	7.68	-0.02	77	438	85	70
459	64.786	0.139	0.070	0.87	87	-1.4	-	7.66	-0.02	76	436	86	70
460	64.925	0.139	0.070	0.87	86	-1.4	96	7.63	-0.03	76	436	86	70
461	65.066	0.141	0.069	0.88	86	-1.5	-	7.61	-0.02	76	435	86	70
462	65.206	0.140	0.070	0.89	86	-1.5	-	7.59	-0.02	76	435	85	70
463	65.344	0.138	0.069	0.88	86	-1.4	-	7.57	-0.02	76	434	84	70
464	65.485	0.141	0.069	0.88	86	-1.5	-	7.54	-0.03	76	433	84	70
465	65.625	0.140	0.069	0.88	86	-1.5	-	7.53	-0.01	76	434	84	70
466	65.764	0.139	0.070	0.88	86	-1.6	-	7.50	-0.03	76	434	84	70
467	65.904	0.140	0.069	0.88	86	-1.4	-	7.48	-0.02	76	433	84	70
468	66.045	0.141	0.069	0.88	86	-1.5	-	7.46	-0.02	76	433	84	70
469	66.184	0.139	0.070	0.87	86	-1.5	-	7.43	-0.03	76	433	85	70
470	66.323	0.139	0.070	0.88	86	-1.5	96	7.41	-0.02	76	434	85	70
471	66.464	0.141	0.070	0.88	86	-1.5	-	7.39	-0.02	76	434	86	70
472	66.603	0.139	0.070	0.87	86	-1.4	-	7.37	-0.02	76	434	87	70
473	66.742	0.139	0.070	0.89	86	-1.5	-	7.35	-0.02	76	434	86	70
474	66.883	0.141	0.070	0.88	86	-1.4	-	7.32	-0.03	76	435	86	69
475	67.022	0.139	0.069	0.89	86	-1.4	-	7.30	-0.02	76	436	85	69
476	67.162	0.140	0.070	0.88	86	-1.4	-	7.28	-0.02	76	435	84	69
477	67.303	0.141	0.070	0.88	86	-1.5	-	7.25	-0.03	76	435	84	69
478	67.442	0.139	0.070	0.88	86	-1.5	-	7.23	-0.02	76	434	84	69
479	67.581	0.139	0.071	0.89	86	-1.5	-	7.21	-0.02	76	433	84	69

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	67.722	0.141	0.070	0.88	86	-1.6	96	7.19	-0.02	76	433	85	69
481	67.862	0.140	0.070	0.89	86	-1.5	-	7.17	-0.02	76	432	86	69
482	68.001	0.139	0.070	0.87	86	-1.4	-	7.15	-0.02	76	432	86	69
483	68.141	0.140	0.070	0.89	86	-1.5	-	7.12	-0.03	76	432	86	69
484	68.281	0.140	0.070	0.87	86	-1.4	-	7.10	-0.02	76	432	85	69
485	68.420	0.139	0.070	0.87	86	-1.5	-	7.08	-0.02	76	431	85	69
486	68.560	0.140	0.070	0.88	86	-1.6	-	7.06	-0.02	76	431	84	69
487	68.701	0.141	0.070	0.88	86	-1.6	-	7.03	-0.03	76	431	83	69
488	68.840	0.139	0.070	0.88	86	-1.6	-	7.01	-0.02	76	431	83	69
489	68.979	0.139	0.070	0.88	86	-1.4	-	6.99	-0.02	76	430	83	69
490	69.121	0.142	0.070	0.88	86	-1.6	96	6.97	-0.02	76	429	83	69
491	69.260	0.139	0.070	0.87	86	-1.4	-	6.95	-0.02	76	428	84	69
492	69.399	0.139	0.070	0.88	86	-1.4	-	6.93	-0.02	76	427	84	69
493	69.540	0.141	0.070	0.89	86	-1.5	-	6.91	-0.02	76	427	85	69
494	69.679	0.139	0.070	0.87	86	-1.5	-	6.89	-0.02	76	426	85	69
495	69.819	0.140	0.070	0.88	86	-1.5	-	6.87	-0.02	76	426	85	69
496	69.960	0.141	0.070	0.89	86	-1.5	-	6.85	-0.02	76	426	84	69
497	70.099	0.139	0.069	0.87	86	-1.5	-	6.83	-0.02	75	422	84	69
498	70.238	0.139	0.069	0.88	86	-1.6	-	6.82	-0.01	75	418	83	69
499	70.379	0.141	0.070	0.88	86	-1.5	-	6.79	-0.03	75	415	83	69
500	70.519	0.140	0.071	0.89	86	-1.5	96	6.77	-0.02	75	414	83	69
501	70.658	0.139	0.070	0.87	86	-1.5	-	6.75	-0.02	75	412	83	68
502	70.798	0.140	0.070	0.89	85	-1.6	-	6.74	-0.01	76	410	84	69
503	70.939	0.141	0.069	0.89	86	-1.6	-	6.71	-0.03	76	408	85	69
504	71.078	0.139	0.070	0.88	86	-1.6	-	6.70	-0.01	76	407	86	69
505	71.218	0.140	0.070	0.89	85	-1.5	-	6.68	-0.02	76	406	87	69
506	71.358	0.140	0.070	0.88	85	-1.6	-	6.65	-0.03	76	405	86	69
507	71.498	0.140	0.070	0.88	85	-1.6	-	6.63	-0.02	76	404	85	68
508	71.637	0.139	0.070	0.89	85	-1.5	-	6.62	-0.01	76	403	85	68
509	71.778	0.141	0.070	0.87	85	-1.4	-	6.61	-0.01	76	401	84	68
510	71.917	0.139	0.070	0.88	85	-1.5	96	6.59	-0.02	75	399	83	68
511	72.057	0.140	0.070	0.89	85	-1.4	-	6.57	-0.02	75	397	83	68

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	72.198	0.141	0.071	0.89	85	-1.5	-	6.55	-0.02	75	395	84	68
513	72.337	0.139	0.070	0.88	85	-1.5	-	6.53	-0.02	75	394	84	68
514	72.476	0.139	0.070	0.87	85	-1.5	-	6.51	-0.02	76	392	84	68
515	72.617	0.141	0.070	0.88	85	-1.5	-	6.50	-0.01	76	391	84	68
516	72.757	0.140	0.070	0.89	85	-1.6	-	6.47	-0.03	76	390	85	68
517	72.896	0.139	0.070	0.88	85	-1.5	-	6.46	-0.01	75	389	85	68
518	73.037	0.141	0.070	0.88	85	-1.6	-	6.44	-0.02	75	387	84	68
519	73.177	0.140	0.070	0.89	85	-1.5	-	6.43	-0.01	75	387	84	68
520	73.315	0.138	0.068	0.89	85	-1.5	97	6.40	-0.03	75	386	84	68
521	73.456	0.141	0.068	0.89	85	-1.5	-	6.39	-0.01	75	385	84	68
522	73.596	0.140	0.070	0.89	85	-1.5	-	6.37	-0.02	75	384	84	68
523	73.735	0.139	0.069	0.88	85	-1.6	-	6.36	-0.01	75	384	85	68
524	73.875	0.140	0.069	0.88	85	-1.5	-	6.34	-0.02	76	383	86	68
525	74.016	0.141	0.070	0.88	85	-1.5	-	6.32	-0.02	76	382	86	68
526	74.155	0.139	0.070	0.88	85	-1.6	-	6.31	-0.01	75	381	85	69
527	74.294	0.139	0.070	0.89	85	-1.6	-	6.30	-0.01	75	380	85	69
528	74.435	0.141	0.069	0.89	85	-1.6	-	6.27	-0.03	75	379	84	69
529	74.574	0.139	0.069	0.88	85	-1.5	-	6.26	-0.01	75	379	84	69
530	74.713	0.139	0.069	0.88	85	-1.5	97	6.23	-0.03	75	378	83	69
531	74.855	0.142	0.070	0.89	85	-1.6	-	6.22	-0.01	75	377	83	69
532	74.993	0.138	0.070	0.89	85	-1.5	-	6.20	-0.02	75	376	83	69
533	75.133	0.140	0.069	0.88	85	-1.5	-	6.19	-0.01	75	376	84	69
534	75.274	0.141	0.070	0.88	85	-1.6	-	6.17	-0.02	75	374	85	69
535	75.413	0.139	0.067	0.88	85	-1.5	-	6.15	-0.02	74	374	85	69
536	75.552	0.139	0.069	0.88	85	-1.5	-	6.14	-0.01	74	373	85	69
537	75.693	0.141	0.069	0.88	85	-1.6	-	6.12	-0.02	74	372	84	69
538	75.833	0.140	0.070	0.89	85	-1.5	-	6.11	-0.01	74	371	83	69
539	75.971	0.138	0.068	0.89	85	-1.5	-	6.09	-0.02	74	371	83	69
540	76.112	0.141	0.069	0.89	85	-1.5	97	6.07	-0.02	74	370	82	69
541	76.252	0.140	0.070	0.88	85	-1.6	-	6.05	-0.02	75	369	83	69
542	76.390	0.138	0.070	0.87	84	-1.6	-	6.04	-0.01	75	368	83	69
543	76.531	0.141	0.070	0.89	85	-1.6	-	6.02	-0.02	75	367	84	69

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>1</u>	Technician: <u>AK</u>
	Date: <u>5/6/2024</u>

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
544	76.671	0.140	0.070	0.88	85	-1.5	96	6.01	-0.01	75	366	85	69
Avg/Tot	76.735	0.141	0.068	0.89	84.8	-1.3	100			85.1	680.0	85.0	70.0

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	-0.071		-0.03	77	-0.6		85	0.011	0.09	0.004
1	0.050	0.121	0.95	77	-1.3	-	85	0.045	0.08	0.006
2	0.194	0.144	0.98	77	-1.4	-	85	0.083	2.91	0.344
3	0.335	0.141	0.97	77	-1.3	-	86	0.097	5.80	0.237
4	0.476	0.141	0.95	77	-1.3	-	86	0.111	7.02	0.150
5	0.617	0.141	0.97	77	-1.4	-	85	0.086	9.85	0.264
6	0.759	0.142	0.98	77	-1.3	-	85	0.094	13.95	1.031
7	0.901	0.142	0.97	77	-1.2	-	84	0.093	12.84	0.533
8	1.042	0.141	0.97	78	-1.3	-	84	0.083	12.26	0.380
9	1.183	0.141	0.94	78	-1.3	-	84	0.088	11.73	0.252
10	1.325	0.142	0.97	78	-1.3	101	84	0.091	10.20	0.263
11	1.468	0.143	0.95	78	-1.3	-	85	0.084	9.66	0.287
12	1.609	0.141	0.97	78	-1.3	-	86	0.087	9.91	0.250
13	1.749	0.140	0.98	78	-1.4	-	86	0.082	9.67	0.275
14	1.891	0.142	0.96	79	-1.4	-	85	0.090	9.53	0.277
15	2.034	0.143	0.95	79	-1.4	-	85	0.088	9.37	0.272
16	2.174	0.140	0.94	79	-1.4	-	85	0.087	9.42	0.240
17	2.315	0.141	0.95	79	-1.2	-	84	0.086	9.64	0.230
18	2.456	0.141	0.96	80	-1.4	-	84	0.092	9.58	0.199
19	2.599	0.143	0.95	80	-1.3	-	84	0.085	10.25	0.180
20	2.740	0.141	0.94	80	-1.3	103	85	0.089	10.42	0.154
21	2.880	0.140	0.96	80	-1.2	-	86	0.088	10.68	0.126
22	3.021	0.141	0.95	80	-1.2	-	86	0.086	10.79	0.118
23	3.164	0.143	0.96	80	-1.4	-	85	0.090	10.77	0.113
24	3.305	0.141	0.97	81	-1.2	-	85	0.087	10.82	0.115
25	3.445	0.140	0.97	81	-1.4	-	85	0.084	10.82	0.103
26	3.586	0.141	0.98	81	-1.2	-	84	0.083	10.99	0.079
27	3.729	0.143	0.97	81	-1.4	-	84	0.095	11.81	0.053
28	3.870	0.141	0.94	81	-1.4	-	84	0.089	12.54	0.067
29	4.010	0.140	0.94	82	-1.2	-	84	0.089	12.58	0.071
30	4.150	0.140	0.96	82	-1.2	104	84	0.088	9.77	0.076
31	4.293	0.143	0.95	82	-1.4	-	85	0.089	10.27	1.220

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.433	0.140	0.95	82	-1.4	-	85	0.090	12.06	1.018
33	4.574	0.141	0.95	82	-1.2	-	85	0.089	10.92	0.366
34	4.715	0.141	0.94	83	-1.4	-	84	0.088	9.75	0.530
35	4.857	0.142	0.95	83	-1.4	-	84	0.091	10.12	0.432
36	4.998	0.141	0.97	83	-1.4	-	84	0.091	10.11	0.405
37	5.138	0.140	0.93	83	-1.2	-	85	0.094	10.85	0.254
38	5.279	0.141	0.97	83	-1.2	-	85	0.087	11.55	0.216
39	5.422	0.143	0.94	84	-1.3	-	85	0.094	11.97	0.222
40	5.562	0.140	0.96	84	-1.2	105	85	0.091	12.75	0.192
41	5.703	0.141	0.94	84	-1.2	-	85	0.094	13.66	0.240
42	5.844	0.141	0.94	84	-1.4	-	84	0.107	14.28	0.292
43	5.986	0.142	0.97	84	-1.3	-	84	0.100	14.48	0.294
44	6.127	0.141	0.93	85	-1.3	-	84	0.102	14.83	0.343
45	6.267	0.140	0.96	85	-1.3	-	85	0.101	15.64	0.649
46	6.409	0.142	0.94	85	-1.3	-	85	0.098	15.83	0.943
47	6.551	0.142	0.93	85	-1.3	-	85	0.100	16.06	1.403
48	6.691	0.140	0.94	85	-1.4	-	85	0.096	15.75	1.713
49	6.831	0.140	0.95	85	-1.4	-	85	0.098	15.20	1.897
50	6.973	0.142	0.95	86	-1.4	105	85	0.099	15.31	2.347
51	7.115	0.142	0.96	86	-1.3	-	85	0.106	13.45	2.271
52	7.255	0.140	0.94	86	-1.3	-	85	0.102	14.64	2.476
53	7.395	0.140	0.95	86	-1.3	-	85	0.101	14.20	2.199
54	7.537	0.142	0.94	86	-1.4	-	85	0.101	14.72	2.188
55	7.679	0.142	0.95	86	-1.4	-	86	0.096	15.06	2.272
56	7.819	0.140	0.96	87	-1.4	-	86	0.093	15.17	2.174
57	7.959	0.140	0.94	87	-1.4	-	86	0.100	15.27	2.137
58	8.101	0.142	0.95	87	-1.2	-	85	0.104	17.15	2.526
59	8.243	0.142	0.92	87	-1.3	-	85	0.101	16.96	1.221
60	8.383	0.140	0.97	87	-1.2	105	85	0.088	16.74	0.543
61	8.524	0.141	0.94	87	-1.2	-	85	0.091	14.98	0.440
62	8.666	0.142	0.96	87	-1.4	-	85	0.093	14.64	0.306
63	8.808	0.142	0.92	87	-1.3	-	85	0.096	14.54	0.348

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	8.949	0.141	0.97	88	-1.4	-	85	0.090	14.64	0.376
65	9.089	0.140	0.96	88	-1.4	-	85	0.093	14.52	0.354
66	9.231	0.142	0.94	88	-1.3	-	85	0.090	14.42	0.367
67	9.373	0.142	0.92	88	-1.3	-	84	0.090	14.50	0.340
68	9.514	0.141	0.94	88	-1.4	-	84	0.088	14.44	0.323
69	9.655	0.141	0.94	88	-1.2	-	84	0.086	14.41	0.341
70	9.797	0.142	0.96	88	-1.2	104	84	0.094	14.15	0.362
71	9.939	0.142	0.96	88	-1.3	-	84	0.093	14.16	0.397
72	10.080	0.141	0.95	89	-1.4	-	84	0.089	14.31	0.423
73	10.221	0.141	0.96	89	-1.3	-	85	0.087	14.43	0.446
74	10.362	0.141	0.94	89	-1.2	-	86	0.089	14.66	0.469
75	10.505	0.143	0.95	89	-1.4	-	86	0.087	15.11	0.476
76	10.646	0.141	0.95	89	-1.4	-	86	0.086	15.54	0.518
77	10.787	0.141	0.94	89	-1.2	-	86	0.093	15.12	0.429
78	10.928	0.141	0.96	89	-1.2	-	85	0.089	15.17	0.373
79	11.071	0.143	0.95	89	-1.4	-	85	0.090	15.09	0.517
80	11.212	0.141	0.96	90	-1.4	102	85	0.091	15.09	0.700
81	11.353	0.141	0.96	90	-1.4	-	85	0.085	15.03	0.607
82	11.494	0.141	0.94	90	-1.3	-	84	0.089	15.19	0.624
83	11.637	0.143	0.95	90	-1.4	-	84	0.084	15.10	0.709
84	11.778	0.141	0.94	90	-1.2	-	84	0.089	15.42	0.829
85	11.919	0.141	0.96	90	-1.2	-	84	0.095	15.82	0.926
86	12.060	0.141	0.95	90	-1.3	-	84	0.093	15.78	0.952
87	12.202	0.142	0.95	90	-1.3	-	85	0.084	15.51	0.834
88	12.344	0.142	0.94	90	-1.4	-	85	0.090	15.15	0.828
89	12.485	0.141	0.93	90	-1.2	-	85	0.083	14.75	0.770
90	12.626	0.141	0.94	90	-1.4	101	85	0.092	14.66	0.743
91	12.768	0.142	0.93	90	-1.4	-	85	0.091	14.75	0.640
92	12.910	0.142	0.95	91	-1.3	-	85	0.086	14.71	0.640
93	13.051	0.141	0.96	91	-1.2	-	85	0.082	14.65	0.656
94	13.192	0.141	0.95	91	-1.4	-	85	0.091	14.68	0.608
95	13.333	0.141	0.95	91	-1.2	-	85	0.087	14.75	0.523

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	13.476	0.143	0.95	91	-1.4	-	84	0.084	14.47	0.374
97	13.615	0.139	0.96	91	-1.2	-	84	0.082	13.62	0.204
98	13.756	0.141	0.96	91	-1.3	-	84	0.086	13.66	0.176
99	13.898	0.142	0.95	91	-1.3	-	85	0.087	14.29	0.210
100	14.040	0.142	0.93	91	-1.4	100	86	0.088	14.45	0.229
101	14.181	0.141	0.95	91	-1.3	-	85	0.082	14.29	0.204
102	14.322	0.141	0.95	91	-1.4	-	85	0.088	13.89	0.173
103	14.463	0.141	0.96	91	-1.3	-	85	0.094	12.08	0.386
104	14.605	0.142	0.93	91	-1.4	-	85	0.095	17.25	1.012
105	14.745	0.140	0.94	91	-1.2	-	85	0.095	17.27	1.733
106	14.885	0.140	0.96	92	-1.2	-	85	0.094	17.99	1.697
107	15.027	0.142	0.92	92	-1.4	-	85	0.094	17.50	1.930
108	15.166	0.139	0.93	92	-1.3	-	85	0.087	16.39	0.438
109	15.306	0.140	0.94	92	-1.3	-	85	0.090	15.27	0.159
110	15.447	0.141	0.93	92	-1.4	100	85	0.086	15.02	0.149
111	15.589	0.142	0.93	92	-1.4	-	85	0.083	14.87	0.154
112	15.730	0.141	0.94	92	-1.4	-	85	0.089	14.62	0.143
113	15.870	0.140	0.96	92	-1.2	-	85	0.090	14.24	0.137
114	16.011	0.141	0.93	92	-1.3	-	85	0.088	14.08	0.139
115	16.153	0.142	0.92	92	-1.4	-	85	0.086	14.67	0.263
116	16.294	0.141	0.93	92	-1.4	-	85	0.092	14.62	0.219
117	16.434	0.140	0.94	92	-1.2	-	85	0.089	14.41	0.227
118	16.575	0.141	0.95	92	-1.4	-	85	0.098	14.05	0.194
119	16.720	0.145	0.94	92	-1.2	-	85	0.088	13.93	0.163
120	16.861	0.141	0.94	92	-1.2	101	85	0.086	13.73	0.163
121	17.002	0.141	0.91	92	-1.4	-	85	0.093	13.60	0.164
122	17.142	0.140	0.93	92	-1.4	-	85	0.085	13.54	0.181
123	17.285	0.143	0.96	92	-1.3	-	86	0.093	13.50	0.178
124	17.426	0.141	0.95	93	-1.3	-	86	0.091	13.58	0.178
125	17.566	0.140	0.93	92	-1.3	-	86	0.085	13.66	0.177
126	17.707	0.141	0.98	93	-1.4	-	85	0.086	13.61	0.177
127	17.849	0.142	0.94	93	-1.4	-	85	0.089	13.63	0.201

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	17.988	0.139	0.95	93	-1.4	-	85	0.081	13.64	0.227
129	18.128	0.140	0.93	93	-1.2	-	85	0.088	13.53	0.270
130	18.269	0.141	0.92	93	-1.2	100	85	0.085	13.23	0.296
131	18.412	0.143	0.93	93	-1.3	-	85	0.083	13.03	0.358
132	18.552	0.140	0.93	93	-1.4	-	85	0.088	12.95	0.370
133	18.693	0.141	0.94	93	-1.4	-	85	0.084	12.92	0.372
134	18.836	0.143	0.94	93	-1.3	-	85	0.085	12.80	0.361
135	18.979	0.143	0.94	93	-1.4	-	86	0.086	12.76	0.342
136	19.120	0.141	0.95	93	-1.2	-	85	0.082	12.73	0.319
137	19.261	0.141	0.96	93	-1.3	-	85	0.087	12.67	0.332
138	19.402	0.141	0.95	93	-1.3	-	85	0.085	12.60	0.335
139	19.544	0.142	0.96	93	-1.3	-	85	0.083	12.67	0.288
140	19.686	0.142	0.93	93	-1.4	101	84	0.086	12.59	0.284
141	19.827	0.141	0.94	93	-1.3	-	84	0.082	12.56	0.282
142	19.967	0.140	0.97	93	-1.4	-	85	0.079	12.44	0.267
143	20.109	0.142	0.95	93	-1.2	-	85	0.084	12.41	0.258
144	20.251	0.142	0.93	93	-1.4	-	85	0.084	12.40	0.259
145	20.389	0.138	0.97	93	-1.4	-	85	0.082	12.38	0.260
146	20.532	0.143	0.92	93	-1.2	-	85	0.078	12.33	0.261
147	20.674	0.142	0.97	93	-1.4	-	85	0.079	12.21	0.279
148	20.816	0.142	0.95	93	-1.4	-	85	0.078	12.13	0.281
149	20.957	0.141	0.94	93	-1.3	-	84	0.085	12.03	0.306
150	21.098	0.141	0.93	94	-1.4	102	84	0.085	11.95	0.308
151	21.240	0.142	0.93	94	-1.4	-	84	0.085	11.81	0.348
152	21.379	0.139	0.93	93	-1.3	-	84	0.084	11.68	0.376
153	21.520	0.141	0.96	94	-1.3	-	85	0.083	11.50	0.382
154	21.661	0.141	0.94	94	-1.3	-	85	0.084	11.19	0.428
155	21.803	0.142	0.96	94	-1.4	-	85	0.081	10.94	0.503
156	21.945	0.142	0.95	94	-1.2	-	85	0.080	10.64	0.652
157	22.086	0.141	0.93	94	-1.2	-	85	0.083	10.52	0.676
158	22.229	0.143	0.93	94	-1.2	-	85	0.080	10.27	0.748
159	22.370	0.141	0.95	94	-1.3	-	85	0.074	10.03	0.841

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	22.513	0.143	0.95	94	-1.3	101	85	0.083	9.97	0.805
161	22.654	0.141	0.93	94	-1.2	-	85	0.077	9.82	0.851
162	22.794	0.140	0.92	94	-1.4	-	85	0.076	9.69	0.909
163	22.935	0.141	0.94	94	-1.3	-	85	0.080	9.63	0.895
164	23.079	0.144	0.96	94	-1.2	-	85	0.077	9.53	0.953
165	23.220	0.141	0.92	94	-1.4	-	85	0.084	9.57	0.960
166	23.360	0.140	0.95	94	-1.4	-	85	0.075	10.30	0.604
167	23.499	0.139	0.95	94	-1.4	-	84	0.080	10.30	0.567
168	23.642	0.143	0.94	94	-1.4	-	84	0.082	10.37	0.520
169	23.786	0.144	0.95	94	-1.4	-	84	0.079	10.16	0.500
170	23.924	0.138	0.96	94	-1.2	100	85	0.071	9.99	0.461
171	24.065	0.141	0.95	94	-1.4	-	85	0.069	10.10	0.458
172	24.208	0.143	0.96	94	-1.4	-	85	0.075	10.05	0.470
173	24.349	0.141	0.93	94	-1.4	-	84	0.081	9.94	0.499
174	24.490	0.141	0.94	94	-1.4	-	85	0.070	9.93	0.525
175	24.633	0.143	0.95	94	-1.3	-	85	0.079	9.91	0.546
176	24.775	0.142	0.92	94	-1.2	-	85	0.076	9.89	0.531
177	24.918	0.143	0.96	94	-1.2	-	85	0.080	9.87	0.510
178	25.059	0.141	0.95	94	-1.4	-	85	0.079	9.83	0.547
179	25.199	0.140	0.96	94	-1.3	-	85	0.083	9.78	0.533
180	25.341	0.142	0.95	94	-1.4	101	85	0.075	9.78	0.534
181	25.484	0.143	0.95	94	-1.4	-	85	0.074	9.77	0.537
182	25.625	0.141	0.93	94	-1.4	-	85	0.073	9.70	0.537
183	25.766	0.141	0.94	94	-1.4	-	86	0.073	9.67	0.531
184	25.907	0.141	0.95	94	-1.4	-	86	0.072	9.68	0.537
185	26.050	0.143	0.93	94	-1.2	-	85	0.079	9.65	0.542
186	26.192	0.142	0.93	94	-1.3	-	85	0.079	9.61	0.561
187	26.329	0.137	0.93	94	-1.4	-	85	0.078	9.44	0.654
188	26.471	0.142	0.93	94	-1.3	-	85	0.078	9.48	0.591
189	26.614	0.143	0.95	94	-1.4	-	85	0.074	9.41	0.611
190	26.755	0.141	0.96	94	-1.2	102	85	0.071	9.42	0.622
191	26.896	0.141	0.95	94	-1.2	-	85	0.078	9.43	0.605

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	27.040	0.144	0.94	94	-1.2	-	85	0.073	9.50	0.605
193	27.182	0.142	0.95	95	-1.4	-	85	0.079	9.35	0.655
194	27.324	0.142	0.95	94	-1.3	-	84	0.074	9.30	0.616
195	27.465	0.141	0.94	94	-1.3	-	85	0.073	9.37	0.598
196	27.606	0.141	0.94	95	-1.3	-	85	0.073	9.38	0.604
197	27.748	0.142	0.94	95	-1.2	-	86	0.071	9.43	0.585
198	27.891	0.143	0.94	95	-1.4	-	86	0.070	9.46	0.590
199	28.032	0.141	0.94	95	-1.2	-	86	0.069	9.74	0.508
200	28.173	0.141	0.94	95	-1.3	101	86	0.075	9.79	0.467
201	28.312	0.139	0.93	95	-1.2	-	85	0.077	9.93	0.459
202	28.457	0.145	0.95	95	-1.3	-	85	0.069	9.84	0.446
203	28.599	0.142	0.92	95	-1.4	-	84	0.081	10.64	0.472
204	28.740	0.141	0.95	95	-1.4	-	84	0.070	10.63	0.486
205	28.880	0.140	0.93	95	-1.4	-	84	0.075	10.46	0.525
206	29.023	0.143	0.96	95	-1.4	-	84	0.071	10.56	0.526
207	29.165	0.142	0.95	95	-1.4	-	84	0.068	10.47	0.585
208	29.306	0.141	0.93	95	-1.3	-	84	0.075	10.43	0.560
209	29.447	0.141	0.96	95	-1.4	-	85	0.064	10.54	0.522
210	29.589	0.142	0.95	95	-1.2	100	85	0.072	10.62	0.513
211	29.731	0.142	0.94	95	-1.4	-	85	0.076	10.34	0.707
212	29.873	0.142	0.93	95	-1.4	-	85	0.076	10.38	0.627
213	30.011	0.138	0.97	95	-1.3	-	85	0.073	10.19	0.694
214	30.153	0.142	0.92	95	-1.4	-	84	0.081	10.07	0.735
215	30.296	0.143	0.95	95	-1.3	-	84	0.072	9.91	0.760
216	30.437	0.141	0.92	95	-1.3	-	85	0.074	10.03	0.737
217	30.580	0.143	0.94	95	-1.4	-	86	0.076	10.22	0.633
218	30.721	0.141	0.93	95	-1.4	-	86	0.071	4.34	0.352
219	30.864	0.143	0.94	95	-1.3	-	86	0.080	1.72	0.332
220	31.005	0.141	0.94	95	-1.4	101	86	0.097	3.37	0.305
221	31.145	0.140	0.92	95	-1.4	-	85	0.110	6.18	0.236
222	31.285	0.140	0.95	95	-1.4	-	85	0.098	8.74	0.203
223	31.428	0.143	0.96	95	-1.3	-	85	0.092	16.56	1.630

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	31.569	0.141	0.94	95	-1.2	-	85	0.093	15.82	0.954
225	31.710	0.141	0.93	95	-1.2	-	85	0.102	16.26	0.943
226	31.850	0.140	0.96	95	-1.2	-	85	0.095	17.01	1.250
227	31.993	0.143	0.94	95	-1.4	-	85	0.096	17.26	2.431
228	32.132	0.139	0.96	95	-1.4	-	85	0.098	17.09	0.558
229	32.272	0.140	0.94	95	-1.2	-	85	0.090	16.03	0.203
230	32.416	0.144	0.93	95	-1.2	102	85	0.091	15.31	0.161
231	32.556	0.140	0.95	95	-1.2	-	85	0.088	14.96	0.156
232	32.698	0.142	0.92	95	-1.3	-	85	0.098	14.80	0.165
233	32.838	0.140	0.96	95	-1.4	-	85	0.089	14.80	0.180
234	32.979	0.141	0.95	95	-1.3	-	84	0.092	14.56	0.191
235	33.124	0.145	0.94	95	-1.4	-	84	0.087	14.55	0.192
236	33.266	0.142	0.96	95	-1.3	-	85	0.098	14.86	0.194
237	33.407	0.141	0.93	95	-1.3	-	86	0.093	15.02	0.220
238	33.547	0.140	0.93	95	-1.2	-	86	0.090	14.94	0.147
239	33.689	0.142	0.96	95	-1.4	-	86	0.093	15.15	0.145
240	33.831	0.142	0.93	95	-1.2	101	86	0.090	15.39	0.194
241	33.972	0.141	0.94	95	-1.4	-	85	0.092	15.61	0.201
242	34.113	0.141	0.93	95	-1.4	-	85	0.095	15.89	0.216
243	34.254	0.141	0.95	95	-1.2	-	85	0.091	16.02	0.255
244	34.397	0.143	0.94	95	-1.3	-	85	0.091	16.07	0.280
245	34.535	0.138	0.93	95	-1.4	-	85	0.099	16.24	0.255
246	34.676	0.141	0.93	95	-1.4	-	85	0.089	16.33	0.258
247	34.818	0.142	0.93	95	-1.4	-	85	0.095	16.24	0.269
248	34.962	0.144	0.94	95	-1.4	-	85	0.092	16.11	0.226
249	35.103	0.141	0.96	95	-1.4	-	86	0.091	15.95	0.280
250	35.243	0.140	0.93	95	-1.3	101	86	0.094	15.88	0.291
251	35.384	0.141	0.96	95	-1.2	-	86	0.094	15.85	0.295
252	35.526	0.142	0.95	95	-1.3	-	86	0.087	16.36	0.319
253	35.667	0.141	0.94	95	-1.3	-	85	0.095	16.50	0.382
254	35.807	0.140	0.94	95	-1.4	-	85	0.089	16.68	0.397
255	35.948	0.141	0.93	95	-1.4	-	85	0.093	16.93	0.458

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	36.090	0.142	0.95	95	-1.4	-	84	0.086	17.09	0.492
257	36.231	0.141	0.94	95	-1.4	-	84	0.093	17.24	0.505
258	36.371	0.140	0.95	95	-1.3	-	85	0.089	17.26	0.616
259	36.512	0.141	0.92	95	-1.3	-	85	0.093	17.65	0.723
260	36.651	0.139	0.94	95	-1.3	102	85	0.094	17.69	0.610
261	36.791	0.140	0.93	95	-1.4	-	86	0.092	17.73	0.472
262	36.931	0.140	0.95	95	-1.3	-	86	0.096	17.86	0.409
263	37.076	0.145	0.92	95	-1.3	-	86	0.091	17.86	0.434
264	37.216	0.140	0.93	95	-1.4	-	85	0.101	17.85	0.401
265	37.356	0.140	0.93	95	-1.4	-	85	0.096	17.78	0.519
266	37.496	0.140	0.93	95	-1.4	-	85	0.089	17.76	0.585
267	37.638	0.142	0.93	95	-1.4	-	85	0.100	17.67	0.599
268	37.775	0.137	0.93	95	-1.2	-	85	0.095	17.67	0.628
269	37.915	0.140	0.93	95	-1.3	-	85	0.092	17.66	0.731
270	38.057	0.142	0.91	95	-1.4	102	85	0.101	17.64	0.858
271	38.199	0.142	0.95	95	-1.2	-	85	0.092	17.63	0.886
272	38.338	0.139	0.93	95	-1.3	-	85	0.094	17.62	0.928
273	38.478	0.140	0.94	95	-1.4	-	85	0.098	17.60	0.934
274	38.619	0.141	0.94	95	-1.4	-	85	0.100	17.56	0.960
275	38.759	0.140	0.93	95	-1.4	-	85	0.100	17.54	1.089
276	38.898	0.139	0.91	95	-1.3	-	85	0.096	17.47	1.126
277	39.039	0.141	0.94	95	-1.4	-	85	0.092	17.57	1.183
278	39.178	0.139	0.90	95	-1.4	-	85	0.097	17.61	1.180
279	39.317	0.139	0.93	95	-1.4	-	85	0.096	17.74	1.210
280	39.458	0.141	0.92	95	-1.5	102	85	0.093	17.82	1.159
281	39.595	0.137	0.93	95	-1.2	-	85	0.098	17.87	1.180
282	39.733	0.138	0.91	95	-1.3	-	85	0.093	17.88	1.252
283	39.874	0.141	0.91	95	-1.3	-	85	0.091	17.95	1.273
284	40.016	0.142	0.91	95	-1.4	-	85	0.101	17.97	1.313
285	40.154	0.138	0.90	95	-1.3	-	85	0.096	17.96	1.180
286	40.294	0.140	0.90	95	-1.3	-	85	0.099	17.98	0.935
287	40.434	0.140	0.92	95	-1.4	-	85	0.098	17.96	0.831

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	40.572	0.138	0.91	95	-1.5	-	85	0.098	17.98	0.791
289	40.712	0.140	0.91	95	-1.3	-	85	0.094	17.99	0.718
290	40.851	0.139	0.92	95	-1.4	102	86	0.092	18.03	0.752
291	40.989	0.138	0.93	96	-1.3	-	86	0.096	18.06	0.648
292	41.129	0.140	0.89	96	-1.3	-	86	0.094	18.22	0.595
293	41.266	0.137	0.90	96	-1.4	-	86	0.098	18.38	0.575
294	41.404	0.138	0.92	96	-1.4	-	86	0.094	18.70	0.562
295	41.545	0.141	0.90	95	-1.3	-	85	0.102	19.00	0.616
296	41.686	0.141	0.91	96	-1.4	-	85	0.099	18.74	0.595
297	41.824	0.138	0.90	95	-1.4	-	85	0.092	18.48	0.576
298	41.964	0.140	0.90	96	-1.3	-	86	0.098	18.34	0.568
299	42.104	0.140	0.91	96	-1.3	-	86	0.096	18.30	0.500
300	42.242	0.138	0.93	96	-1.5	102	86	0.097	18.29	0.514
301	42.381	0.139	0.90	95	-1.3	-	85	0.098	18.35	0.488
302	42.521	0.140	0.91	95	-1.4	-	86	0.097	18.39	0.495
303	42.659	0.138	0.91	96	-1.4	-	86	0.093	18.47	0.527
304	42.798	0.139	0.90	96	-1.3	-	85	0.092	18.55	0.569
305	42.935	0.137	0.92	96	-1.3	-	85	0.095	18.45	0.563
306	43.073	0.138	0.92	96	-1.3	-	85	0.095	18.04	0.495
307	43.215	0.142	0.92	96	-1.4	-	85	0.096	17.64	0.466
308	43.354	0.139	0.94	96	-1.4	-	85	0.091	17.50	0.438
309	43.492	0.138	0.93	96	-1.4	-	85	0.095	17.25	0.519
310	43.632	0.140	0.90	96	-1.4	101	85	0.093	17.21	0.522
311	43.770	0.138	0.91	96	-1.4	-	86	0.091	17.22	0.515
312	43.908	0.138	0.91	96	-1.3	-	86	0.091	17.18	0.519
313	44.049	0.141	0.93	96	-1.3	-	86	0.093	17.08	0.560
314	44.186	0.137	0.93	96	-1.3	-	85	0.096	17.18	0.583
315	44.325	0.139	0.90	96	-1.5	-	86	0.096	17.16	0.583
316	44.462	0.137	0.90	96	-1.2	-	86	0.095	17.25	0.629
317	44.600	0.138	0.93	96	-1.4	-	86	0.097	17.15	0.585
318	44.741	0.141	0.92	96	-1.4	-	85	0.098	16.66	0.452
319	44.881	0.140	0.90	96	-1.3	-	85	0.098	16.49	0.477

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	45.019	0.138	0.90	96	-1.4	101	85	0.092	16.23	0.424
321	45.157	0.138	0.92	96	-1.4	-	85	0.095	16.00	0.355
322	45.297	0.140	0.90	96	-1.5	-	85	0.093	15.87	0.290
323	45.435	0.138	0.92	96	-1.3	-	85	0.093	15.71	0.260
324	45.574	0.139	0.93	96	-1.3	-	85	0.092	15.75	0.208
325	45.711	0.137	0.92	96	-1.4	-	86	0.089	15.47	0.184
326	45.849	0.138	0.92	96	-1.3	-	86	0.089	15.34	0.163
327	45.991	0.142	0.92	96	-1.4	-	86	0.092	15.10	0.153
328	46.130	0.139	0.91	96	-1.3	-	86	0.089	14.83	0.135
329	46.267	0.137	0.93	96	-1.3	-	85	0.089	14.06	0.099
330	46.407	0.140	0.90	96	-1.4	101	85	0.083	13.62	0.076
331	46.546	0.139	0.89	96	-1.3	-	85	0.087	13.61	0.079
332	46.684	0.138	0.94	96	-1.4	-	85	0.086	13.58	0.082
333	46.824	0.140	0.89	96	-1.4	-	85	0.088	13.58	0.082
334	46.962	0.138	0.92	96	-1.4	-	85	0.090	13.63	0.082
335	47.100	0.138	0.93	96	-1.4	-	85	0.093	13.78	0.085
336	47.238	0.138	0.88	96	-1.5	-	85	0.090	13.98	0.094
337	47.379	0.141	0.90	96	-1.4	-	85	0.089	14.44	0.134
338	47.517	0.138	0.91	96	-1.4	-	85	0.090	13.69	0.106
339	47.657	0.140	0.89	96	-1.4	-	86	0.089	12.19	0.071
340	47.795	0.138	0.91	96	-1.4	100	86	0.082	11.32	0.070
341	47.933	0.138	0.93	96	-1.3	-	86	0.084	11.45	0.108
342	48.073	0.140	0.92	96	-1.5	-	86	0.086	11.36	0.113
343	48.211	0.138	0.90	96	-1.4	-	85	0.082	11.38	0.098
344	48.349	0.138	0.90	96	-1.5	-	85	0.083	11.16	0.100
345	48.487	0.138	0.90	96	-1.5	-	86	0.080	10.78	0.090
346	48.627	0.140	0.92	96	-1.3	-	86	0.087	10.57	0.105
347	48.766	0.139	0.92	96	-1.3	-	86	0.079	10.48	0.112
348	48.906	0.140	0.92	96	-1.3	-	86	0.082	10.47	0.118
349	49.044	0.138	0.91	96	-1.5	-	86	0.075	10.54	0.138
350	49.183	0.139	0.93	96	-1.3	99	85	0.078	10.52	0.143
351	49.323	0.140	0.90	96	-1.4	-	86	0.076	10.55	0.152

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	49.460	0.137	0.92	96	-1.3	-	86	0.079	10.60	0.148
353	49.600	0.140	0.91	96	-1.3	-	86	0.081	10.67	0.134
354	49.737	0.137	0.91	96	-1.4	-	86	0.079	10.56	0.143
355	49.877	0.140	0.92	96	-1.3	-	85	0.081	10.48	0.167
356	50.017	0.140	0.88	96	-1.3	-	85	0.075	10.38	0.215
357	50.156	0.139	0.90	96	-1.3	-	85	0.077	10.36	0.246
358	50.294	0.138	0.92	96	-1.4	-	85	0.075	10.16	0.285
359	50.434	0.140	0.93	96	-1.3	-	86	0.074	10.21	0.306
360	50.572	0.138	0.91	96	-1.3	99	86	0.080	10.22	0.325
361	50.710	0.138	0.92	96	-1.3	-	86	0.079	10.16	0.323
362	50.851	0.141	0.93	96	-1.5	-	86	0.081	10.17	0.343
363	50.987	0.136	0.91	96	-1.4	-	86	0.072	10.13	0.330
364	51.127	0.140	0.91	96	-1.5	-	86	0.073	10.21	0.289
365	51.268	0.141	0.94	96	-1.5	-	85	0.078	10.11	0.339
366	51.406	0.138	0.93	96	-1.3	-	85	0.079	10.06	0.349
367	51.544	0.138	0.93	96	-1.3	-	85	0.078	10.11	0.361
368	51.684	0.140	0.92	96	-1.4	-	85	0.072	10.12	0.356
369	51.823	0.139	0.90	96	-1.5	-	85	0.073	9.98	0.386
370	51.961	0.138	0.92	96	-1.5	99	85	0.075	9.98	0.459
371	52.099	0.138	0.92	96	-1.3	-	85	0.075	10.34	0.345
372	52.240	0.141	0.92	96	-1.3	-	85	0.074	10.47	0.339
373	52.378	0.138	0.91	96	-1.4	-	85	0.074	10.29	0.376
374	52.518	0.140	0.91	96	-1.3	-	85	0.076	10.31	0.381
375	52.657	0.139	0.93	96	-1.5	-	85	0.066	10.27	0.385
376	52.794	0.137	0.91	96	-1.3	-	85	0.077	10.29	0.385
377	52.935	0.141	0.92	96	-1.3	-	85	0.074	10.26	0.398
378	53.070	0.135	0.89	96	-1.3	-	85	0.071	10.29	0.395
379	53.211	0.141	0.89	96	-1.3	-	85	0.074	10.28	0.419
380	53.352	0.141	0.93	96	-1.3	98	85	0.074	10.29	0.422
381	53.490	0.138	0.91	96	-1.4	-	85	0.072	10.12	0.383
382	53.629	0.139	0.90	96	-1.4	-	85	0.072	10.05	0.434
383	53.769	0.140	0.92	96	-1.3	-	85	0.074	9.95	0.476

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
384	53.907	0.138	0.92	96	-1.4	-	85	0.073	9.90	0.494
385	54.044	0.137	0.90	96	-1.4	-	85	0.069	9.86	0.537
386	54.186	0.142	0.92	96	-1.3	-	85	0.076	9.86	0.573
387	54.324	0.138	0.89	96	-1.4	-	85	0.069	9.83	0.592
388	54.463	0.139	0.92	96	-1.3	-	85	0.066	9.80	0.634
389	54.603	0.140	0.89	96	-1.3	-	85	0.069	9.78	0.639
390	54.741	0.138	0.89	96	-1.4	97	85	0.069	9.87	0.625
391	54.880	0.139	0.93	96	-1.3	-	85	0.066	9.87	0.638
392	55.020	0.140	0.92	96	-1.3	-	85	0.070	9.83	0.667
393	55.158	0.138	0.91	96	-1.3	-	85	0.070	9.83	0.663
394	55.297	0.139	0.92	96	-1.4	-	85	0.076	9.71	0.689
395	55.437	0.140	0.93	96	-1.4	-	85	0.070	9.77	0.710
396	55.574	0.137	0.89	96	-1.5	-	85	0.076	9.86	0.676
397	55.714	0.140	0.92	96	-1.3	-	85	0.070	9.90	0.579
398	55.851	0.137	0.93	96	-1.5	-	85	0.073	9.59	0.658
399	55.991	0.140	0.90	96	-1.4	-	85	0.073	9.39	0.721
400	56.131	0.140	0.93	96	-1.3	98	85	0.068	9.39	0.753
401	56.271	0.140	0.90	96	-1.4	-	85	0.072	9.26	0.767
402	56.408	0.137	0.90	96	-1.4	-	85	0.072	9.19	0.791
403	56.548	0.140	0.94	96	-1.3	-	85	0.069	9.02	0.835
404	56.687	0.139	0.91	96	-1.3	-	85	0.069	9.03	0.889
405	56.825	0.138	0.91	96	-1.4	-	86	0.067	9.12	0.936
406	56.966	0.141	0.91	96	-1.3	-	86	0.063	9.66	0.824
407	57.104	0.138	0.90	96	-1.4	-	86	0.075	9.94	0.746
408	57.242	0.138	0.92	96	-1.3	-	86	0.069	9.39	0.827
409	57.383	0.141	0.92	96	-1.3	-	85	0.073	8.60	0.877
410	57.519	0.136	0.91	96	-1.3	98	85	0.070	8.52	0.798
411	57.659	0.140	0.92	96	-1.3	-	85	0.067	8.45	0.777
412	57.800	0.141	0.91	96	-1.3	-	85	0.063	8.43	0.782
413	57.938	0.138	0.92	96	-1.4	-	86	0.068	8.10	0.659
414	58.076	0.138	0.93	96	-1.4	-	86	0.069	8.00	0.673
415	58.217	0.141	0.91	96	-1.3	-	86	0.069	8.03	0.670

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
416	58.355	0.138	0.88	96	-1.3	-	85	0.071	7.93	0.648
417	58.493	0.138	0.90	96	-1.5	-	85	0.066	8.06	0.646
418	58.633	0.140	0.92	96	-1.3	-	85	0.070	7.99	0.625
419	58.772	0.139	0.94	96	-1.3	-	85	0.069	7.90	0.613
420	58.910	0.138	0.90	96	-1.3	99	85	0.068	8.03	0.597
421	59.050	0.140	0.93	96	-1.3	-	85	0.065	7.92	0.590
422	59.189	0.139	0.92	96	-1.3	-	85	0.063	8.02	0.591
423	59.327	0.138	0.93	96	-1.3	-	85	0.072	7.91	0.597
424	59.467	0.140	0.91	96	-1.5	-	85	0.068	7.92	0.603
425	59.606	0.139	0.90	96	-1.4	-	85	0.065	8.13	0.603
426	59.744	0.138	0.91	96	-1.5	-	86	0.065	7.75	0.657
427	59.884	0.140	0.91	96	-1.5	-	86	0.061	7.73	0.642
428	60.023	0.139	0.92	96	-1.3	-	86	0.064	7.87	0.650
429	60.161	0.138	0.91	96	-1.4	-	86	0.062	7.75	0.640
430	60.299	0.138	0.94	96	-1.5	98	85	0.062	7.81	0.662
431	60.439	0.140	0.92	96	-1.3	-	85	0.069	7.77	0.662
432	60.578	0.139	0.92	96	-1.4	-	85	0.066	7.80	0.682
433	60.718	0.140	0.89	96	-1.4	-	85	0.075	7.95	0.675
434	60.856	0.138	0.90	96	-1.3	-	85	0.071	7.86	0.682
435	60.995	0.139	0.89	96	-1.3	-	85	0.068	7.85	0.676
436	61.135	0.140	0.93	96	-1.4	-	85	0.059	7.85	0.682
437	61.270	0.135	0.93	96	-1.3	-	85	0.070	7.80	0.686
438	61.412	0.142	0.92	96	-1.4	-	85	0.064	7.69	0.703
439	61.552	0.140	0.91	96	-1.3	-	85	0.064	7.63	0.706
440	61.690	0.138	0.92	96	-1.5	97	85	0.065	7.57	0.678
441	61.829	0.139	0.89	96	-1.3	-	85	0.063	7.53	0.669
442	61.969	0.140	0.91	96	-1.4	-	85	0.066	7.56	0.671
443	62.107	0.138	0.89	96	-1.3	-	85	0.064	7.62	0.666
444	62.246	0.139	0.92	96	-1.5	-	85	0.067	7.52	0.641
445	62.386	0.140	0.92	96	-1.3	-	85	0.064	7.54	0.643
446	62.524	0.138	0.93	96	-1.3	-	86	0.067	7.55	0.640
447	62.664	0.140	0.92	96	-1.4	-	86	0.061	7.51	0.646

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
448	62.803	0.139	0.89	96	-1.4	-	86	0.064	7.33	0.664
449	62.941	0.138	0.90	96	-1.4	-	85	0.058	6.85	0.683
450	63.081	0.140	0.92	96	-1.4	96	85	0.070	6.87	0.662
451	63.220	0.139	0.92	96	-1.3	-	85	0.060	6.85	0.646
452	63.358	0.138	0.90	96	-1.5	-	85	0.063	6.70	0.605
453	63.498	0.140	0.92	96	-1.3	-	85	0.065	6.75	0.598
454	63.637	0.139	0.89	96	-1.3	-	86	0.069	6.90	0.612
455	63.775	0.138	0.93	96	-1.3	-	86	0.062	6.63	0.592
456	63.915	0.140	0.91	96	-1.3	-	86	0.065	6.80	0.601
457	64.054	0.139	0.90	96	-1.3	-	86	0.067	6.74	0.621
458	64.192	0.138	0.93	96	-1.3	-	86	0.061	6.82	0.616
459	64.332	0.140	0.93	96	-1.3	-	85	0.065	6.81	0.603
460	64.471	0.139	0.91	96	-1.4	96	85	0.061	6.78	0.597
461	64.609	0.138	0.91	96	-1.4	-	85	0.064	6.99	0.611
462	64.749	0.140	0.90	96	-1.4	-	85	0.061	6.95	0.599
463	64.888	0.139	0.92	96	-1.3	-	85	0.060	6.97	0.608
464	65.026	0.138	0.93	96	-1.3	-	85	0.063	6.86	0.589
465	65.167	0.141	0.92	96	-1.5	-	85	0.058	7.15	0.639
466	65.305	0.138	0.92	96	-1.3	-	85	0.062	7.19	0.639
467	65.443	0.138	0.90	96	-1.3	-	86	0.061	7.17	0.630
468	65.584	0.141	0.93	96	-1.3	-	86	0.060	7.13	0.628
469	65.722	0.138	0.89	96	-1.4	-	86	0.064	7.15	0.627
470	65.860	0.138	0.91	96	-1.5	96	86	0.067	7.15	0.616
471	66.001	0.141	0.91	96	-1.4	-	85	0.058	7.27	0.627
472	66.139	0.138	0.91	96	-1.5	-	85	0.053	7.26	0.620
473	66.277	0.138	0.91	96	-1.4	-	85	0.056	7.26	0.616
474	66.418	0.141	0.92	96	-1.3	-	85	0.061	7.20	0.610
475	66.556	0.138	0.91	96	-1.3	-	85	0.065	7.08	0.565
476	66.694	0.138	0.91	96	-1.3	-	85	0.062	7.06	0.568
477	66.835	0.141	0.91	96	-1.3	-	85	0.061	7.04	0.580
478	66.973	0.138	0.91	96	-1.3	-	84	0.067	7.01	0.571
479	67.112	0.139	0.92	96	-1.5	-	84	0.062	6.93	0.577

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
480	67.252	0.140	0.92	96	-1.3	96	85	0.059	6.92	0.579
481	67.390	0.138	0.91	96	-1.5	-	86	0.066	6.85	0.576
482	67.529	0.139	0.93	96	-1.3	-	86	0.061	6.92	0.574
483	67.669	0.140	0.89	96	-1.3	-	85	0.067	6.91	0.587
484	67.808	0.139	0.92	96	-1.4	-	85	0.065	6.94	0.582
485	67.946	0.138	0.93	95	-1.3	-	85	0.069	6.89	0.579
486	68.086	0.140	0.90	96	-1.3	-	85	0.064	6.90	0.622
487	68.225	0.139	0.93	95	-1.3	-	84	0.060	6.93	0.605
488	68.363	0.138	0.91	95	-1.5	-	84	0.060	6.91	0.593
489	68.504	0.141	0.92	95	-1.5	-	84	0.061	6.85	0.599
490	68.642	0.138	0.92	95	-1.5	96	85	0.062	6.83	0.603
491	68.780	0.138	0.94	95	-1.4	-	85	0.065	6.64	0.587
492	68.921	0.141	0.91	95	-1.4	-	85	0.063	6.73	0.608
493	69.059	0.138	0.92	95	-1.3	-	85	0.057	6.68	0.599
494	69.197	0.138	0.94	95	-1.4	-	85	0.056	6.71	0.608
495	69.338	0.141	0.92	95	-1.3	-	84	0.059	6.71	0.611
496	69.477	0.139	0.90	95	-1.5	-	84	0.066	6.59	0.617
497	69.615	0.138	0.93	95	-1.3	-	84	0.064	6.25	0.609
498	69.755	0.140	0.94	95	-1.3	-	85	0.056	5.89	0.585
499	69.894	0.139	0.93	95	-1.4	-	86	0.057	5.66	0.553
500	70.032	0.138	0.92	95	-1.4	96	86	0.061	5.77	0.561
501	70.172	0.140	0.93	95	-1.4	-	85	0.056	5.80	0.578
502	70.311	0.139	0.91	95	-1.4	-	85	0.054	5.77	0.578
503	70.449	0.138	0.91	95	-1.3	-	84	0.062	5.74	0.572
504	70.590	0.141	0.90	95	-1.5	-	84	0.059	5.78	0.578
505	70.728	0.138	0.89	95	-1.3	-	84	0.065	5.81	0.585
506	70.866	0.138	0.92	95	-1.3	-	84	0.060	5.80	0.581
507	71.007	0.141	0.92	95	-1.4	-	83	0.050	5.71	0.576
508	71.145	0.138	0.90	95	-1.4	-	84	0.059	5.78	0.579
509	71.284	0.139	0.93	95	-1.3	-	85	0.057	5.61	0.596
510	71.424	0.140	0.91	95	-1.3	96	85	0.057	5.56	0.586
511	71.562	0.138	0.92	95	-1.3	-	85	0.064	5.51	0.583

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
512	71.701	0.139	0.93	95	-1.3	-	85	0.054	5.51	0.585
513	71.841	0.140	0.93	95	-1.3	-	84	0.063	5.54	0.594
514	71.979	0.138	0.95	95	-1.4	-	84	0.055	5.48	0.595
515	72.118	0.139	0.93	95	-1.4	-	84	0.056	5.55	0.602
516	72.258	0.140	0.93	95	-1.3	-	84	0.060	5.51	0.604
517	72.396	0.138	0.91	95	-1.3	-	84	0.055	5.51	0.615
518	72.536	0.140	0.92	95	-1.4	-	84	0.056	5.49	0.612
519	72.676	0.140	0.90	95	-1.4	-	84	0.057	5.48	0.610
520	72.814	0.138	0.91	95	-1.5	97	85	0.060	5.54	0.616
521	72.953	0.139	0.89	95	-1.5	-	86	0.058	5.52	0.600
522	73.093	0.140	0.92	95	-1.3	-	86	0.055	5.50	0.594
523	73.231	0.138	0.91	95	-1.4	-	85	0.059	5.52	0.589
524	73.370	0.139	0.93	95	-1.4	-	85	0.059	5.52	0.590
525	73.510	0.140	0.94	95	-1.5	-	84	0.061	5.52	0.581
526	73.648	0.138	0.93	95	-1.5	-	84	0.057	5.40	0.567
527	73.787	0.139	0.92	94	-1.4	-	84	0.051	5.50	0.579
528	73.927	0.140	0.88	95	-1.4	-	84	0.060	5.51	0.580
529	74.065	0.138	0.90	94	-1.3	-	84	0.056	5.51	0.577
530	74.204	0.139	0.93	94	-1.3	97	85	0.056	5.55	0.585
531	74.344	0.140	0.90	94	-1.3	-	86	0.059	5.46	0.580
532	74.482	0.138	0.92	94	-1.3	-	86	0.057	5.42	0.578
533	74.622	0.140	0.91	94	-1.5	-	85	0.056	5.40	0.575
534	74.761	0.139	0.89	94	-1.3	-	85	0.062	5.39	0.576
535	74.899	0.138	0.92	94	-1.4	-	85	0.057	5.41	0.579
536	75.039	0.140	0.95	94	-1.3	-	84	0.058	5.44	0.581
537	75.178	0.139	0.90	94	-1.3	-	84	0.054	5.41	0.582
538	75.316	0.138	0.92	94	-1.4	-	84	0.051	5.56	0.597
539	75.456	0.140	0.90	94	-1.4	-	85	0.061	5.51	0.594
540	75.595	0.139	0.93	94	-1.4	97	85	0.057	5.36	0.577
541	75.733	0.138	0.92	94	-1.3	-	85	0.061	5.35	0.572
542	75.873	0.140	0.93	94	-1.3	-	84	0.054	5.35	0.565
543	76.012	0.139	0.93	94	-4.4	-	85	0.053	5.30	0.554

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
544	76.150	0.138	0.93	94	-2.8	96	86	0.052	5.29	0.554
Avg/Tot	76.221	0.140	0.93	93.1	-1.3	100	85.0	0.080	11.46	0.545

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT : 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	67	67	67	67	67	66.9	N/A
1	68	70	67	69	68	68.4	N/A
2	72	91	69	81	75	77.6	N/A
3	82	125	75	108	92	96.5	N/A
4	97	133	84	153	119	117.1	N/A
5	112	149	93	218	146	143.6	N/A
6	125	155	101	282	174	167.3	N/A
7	135	162	108	337	198	188.1	N/A
8	140	172	115	385	221	206.5	N/A
9	143	182	122	425	241	222.6	N/A
10	147	192	128	455	260	236.2	N/A
11	152	202	132	478	276	247.9	N/A
12	157	212	136	497	290	258.3	N/A
13	165	220	139	513	303	267.9	N/A
14	171	228	143	526	315	276.6	N/A
15	177	235	146	538	327	284.3	N/A
16	182	242	148	547	338	291.5	N/A
17	188	248	151	557	348	298.3	N/A
18	193	255	157	565	358	305.5	N/A
19	198	262	162	572	367	312.3	N/A
20	204	269	168	579	375	318.8	N/A
21	210	276	173	586	383	325.3	N/A
22	216	283	177	593	390	331.8	N/A
23	222	290	182	599	398	338.3	N/A
24	229	297	187	605	405	344.3	N/A
25	236	304	191	612	412	350.7	N/A
26	243	310	195	617	419	356.8	N/A
27	250	317	200	623	426	363.2	N/A
28	259	323	206	630	434	370.3	N/A
29	268	330	211	638	442	377.8	N/A
30	275	336	207	634	454	381.2	N/A
31	284	344	193	628	468	383.4	N/A
32	293	351	185	626	485	387.9	N/A
33	302	357	179	626	499	392.8	N/A
34	310	364	176	623	510	396.6	N/A
35	317	369	174	621	518	399.8	N/A
36	322	375	173	620	525	403.0	N/A
37	328	380	172	622	530	406.5	N/A
38	333	385	172	626	534	409.9	N/A
39	337	389	173	631	537	413.2	N/A
40	341	393	174	637	538	416.7	N/A
41	345	398	175	646	538	420.2	N/A
42	350	402	177	657	535	424.1	N/A
43	355	407	179	668	533	428.3	N/A
44	360	412	180	682	531	432.8	N/A
45	365	417	182	697	527	437.6	N/A
46	371	421	184	713	525	442.8	N/A
47	377	426	186	728	523	447.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	382	430	188	741	522	452.7	N/A
49	388	435	190	753	522	457.5	N/A
50	394	440	191	764	522	462.3	N/A
51	400	445	193	773	523	466.8	N/A
52	405	449	195	779	525	470.8	N/A
53	411	454	197	783	528	474.7	N/A
54	417	460	199	785	529	478.1	N/A
55	423	465	202	786	532	481.7	N/A
56	429	470	204	788	536	485.2	N/A
57	436	476	206	789	539	489.0	N/A
58	442	482	208	787	544	492.6	N/A
59	448	488	210	782	550	495.6	N/A
60	455	494	212	773	553	497.1	N/A
61	460	499	213	758	555	496.9	N/A
62	466	503	214	741	555	495.9	N/A
63	470	507	215	726	556	494.8	N/A
64	475	511	216	712	555	493.7	N/A
65	478	513	217	698	554	492.2	N/A
66	482	516	218	687	553	491.1	N/A
67	485	517	219	677	553	490.1	N/A
68	488	519	220	668	552	489.1	N/A
69	490	520	220	660	550	488.1	N/A
70	492	521	221	652	549	487.1	N/A
71	494	522	221	645	547	485.8	N/A
72	496	522	222	639	546	485.0	N/A
73	498	523	222	635	546	484.6	N/A
74	499	523	223	630	545	484.0	N/A
75	501	523	223	628	544	483.9	N/A
76	502	523	224	627	544	484.0	N/A
77	503	523	224	626	544	484.3	N/A
78	505	524	225	627	544	484.8	N/A
79	506	525	225	628	545	485.6	N/A
80	508	525	226	629	545	486.3	N/A
81	509	525	226	631	545	487.3	N/A
82	510	525	227	631	547	488.1	N/A
83	512	526	228	633	548	489.1	N/A
84	513	526	228	636	550	490.5	N/A
85	515	527	229	639	551	492.0	N/A
86	517	528	229	641	553	493.6	N/A
87	518	528	230	644	556	495.2	N/A
88	520	529	231	646	557	496.7	N/A
89	522	530	232	647	560	498.1	N/A
90	524	530	232	648	562	499.2	N/A
91	526	531	233	647	563	500.2	N/A
92	528	531	234	647	566	501.2	N/A
93	530	532	235	646	569	502.5	N/A
94	532	532	236	646	572	503.6	N/A
95	533	533	237	644	575	504.5	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 1

Technician: AK

Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	534	533	238	643	578	505.2	N/A
97	536	534	239	640	581	505.9	N/A
98	536	535	240	637	584	506.2	N/A
99	537	536	240	636	587	507.2	N/A
100	538	537	241	636	590	508.4	N/A
101	538	538	242	636	594	509.7	N/A
102	539	537	262	634	601	514.5	N/A
103	538	536	279	629	610	518.5	N/A
104	538	536	292	641	625	526.4	N/A
105	538	536	303	665	642	536.8	N/A
106	537	537	299	691	658	544.5	N/A
107	537	539	283	711	671	548.3	N/A
108	538	541	275	721	678	550.6	N/A
109	539	543	268	722	683	551.0	N/A
110	539	544	263	719	684	549.9	N/A
111	540	546	259	715	684	548.6	N/A
112	540	547	256	708	683	546.8	N/A
113	541	547	254	701	684	545.3	N/A
114	541	547	252	694	682	543.2	N/A
115	541	547	250	688	681	541.2	N/A
116	541	547	249	681	679	539.4	N/A
117	541	547	247	676	677	537.6	N/A
118	540	547	246	670	676	535.7	N/A
119	539	547	245	664	673	533.5	N/A
120	538	546	244	657	672	531.4	N/A
121	537	545	243	650	670	529.2	N/A
122	536	545	243	644	668	527.2	N/A
123	536	544	242	638	666	525.0	N/A
124	534	543	241	633	662	522.8	N/A
125	534	542	241	629	660	521.2	N/A
126	533	542	240	626	659	519.9	N/A
127	532	541	240	623	657	518.4	N/A
128	531	540	239	622	655	517.3	N/A
129	531	539	239	620	653	516.2	N/A
130	530	538	239	618	651	515.3	N/A
131	530	537	239	617	650	514.5	N/A
132	529	536	239	615	649	513.4	N/A
133	529	535	238	613	647	512.4	N/A
134	528	533	238	611	647	511.4	N/A
135	527	531	238	609	645	510.2	N/A
136	527	530	238	607	644	509.3	N/A
137	527	529	238	605	644	508.3	N/A
138	526	527	238	602	644	507.4	N/A
139	526	526	238	600	642	506.3	N/A
140	526	524	238	598	641	505.4	N/A
141	526	523	238	595	641	504.5	N/A
142	526	522	238	592	640	503.5	N/A
143	526	521	238	590	640	502.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	527	520	238	588	639	502.2	N/A
145	527	519	238	585	639	501.6	N/A
146	527	517	238	584	638	500.7	N/A
147	527	516	238	581	639	500.4	N/A
148	527	516	237	580	639	499.7	N/A
149	527	515	237	577	638	498.7	N/A
150	527	514	237	574	638	498.1	N/A
151	527	513	237	572	638	497.3	N/A
152	527	512	237	569	637	496.5	N/A
153	527	511	237	567	638	496.1	N/A
154	527	510	237	564	639	495.2	N/A
155	526	509	237	561	639	494.4	N/A
156	526	508	237	557	639	493.2	N/A
157	526	507	237	553	640	492.5	N/A
158	525	506	236	548	641	491.4	N/A
159	525	505	236	543	641	490.1	N/A
160	524	504	236	537	642	488.6	N/A
161	524	503	235	532	642	487.2	N/A
162	523	502	235	526	643	485.8	N/A
163	522	501	235	520	644	484.1	N/A
164	520	499	234	514	644	482.5	N/A
165	519	498	234	509	645	481.0	N/A
166	517	497	234	507	646	480.2	N/A
167	516	496	233	505	647	479.3	N/A
168	515	495	233	503	648	478.9	N/A
169	514	493	232	502	649	478.1	N/A
170	513	492	232	501	649	477.4	N/A
171	513	491	232	499	649	476.5	N/A
172	512	491	231	497	649	475.8	N/A
173	511	489	231	495	649	475.1	N/A
174	511	488	231	493	650	474.5	N/A
175	510	488	231	491	650	473.7	N/A
176	509	487	231	489	649	472.8	N/A
177	509	486	230	486	650	472.4	N/A
178	509	485	230	484	652	472.0	N/A
179	508	484	230	482	651	471.1	N/A
180	507	484	230	480	652	470.5	N/A
181	507	483	230	478	652	469.9	N/A
182	506	482	229	476	652	469.1	N/A
183	506	482	229	474	653	468.6	N/A
184	505	481	229	472	652	467.7	N/A
185	504	480	229	470	653	467.4	N/A
186	504	480	229	469	653	467.0	N/A
187	504	479	229	467	655	466.7	N/A
188	503	479	229	465	656	466.3	N/A
189	503	478	229	464	656	465.8	N/A
190	502	478	229	463	657	465.5	N/A
191	502	477	228	461	657	465.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	501	476	228	460	657	464.4	N/A
193	501	476	228	459	657	464.0	N/A
194	500	475	228	457	655	463.1	N/A
195	500	474	228	456	656	462.7	N/A
196	500	474	228	454	656	462.5	N/A
197	500	473	228	453	657	462.2	N/A
198	500	473	228	453	657	462.1	N/A
199	499	473	228	452	659	462.2	N/A
200	499	472	228	452	659	462.1	N/A
201	499	472	228	452	659	462.0	N/A
202	499	472	228	453	660	462.2	N/A
203	499	472	228	454	659	462.4	N/A
204	499	471	228	455	659	462.2	N/A
205	498	471	228	456	658	462.3	N/A
206	498	471	228	456	658	462.2	N/A
207	498	471	228	456	657	462.2	N/A
208	498	471	228	457	657	462.3	N/A
209	498	472	228	456	657	462.2	N/A
210	499	472	228	456	658	462.6	N/A
211	499	473	229	457	657	462.7	N/A
212	499	474	229	457	658	463.0	N/A
213	498	474	229	458	659	463.4	N/A
214	498	475	229	458	660	463.9	N/A
215	498	475	229	459	660	464.0	N/A
216	498	475	229	459	659	464.0	N/A
217	498	475	229	460	660	464.5	N/A
218	502	473	250	458	666	469.8	N/A
219	500	469	264	447	670	470.1	N/A
220	498	465	275	437	675	469.9	N/A
221	495	461	284	440	682	472.3	N/A
222	493	458	291	468	690	480.0	N/A
223	490	457	296	509	697	489.8	N/A
224	489	459	301	548	707	500.8	N/A
225	488	463	306	584	717	511.5	N/A
226	487	467	309	618	728	521.8	N/A
227	487	473	289	648	735	526.3	N/A
228	488	478	275	669	740	529.9	N/A
229	488	481	264	683	742	531.7	N/A
230	489	484	255	693	743	532.7	N/A
231	489	486	247	699	742	532.7	N/A
232	490	487	241	701	741	531.9	N/A
233	490	488	236	702	739	531.0	N/A
234	489	489	232	702	737	529.7	N/A
235	488	489	229	701	734	528.0	N/A
236	487	489	226	699	732	526.5	N/A
237	486	488	224	698	729	524.8	N/A
238	484	487	222	695	727	522.9	N/A
239	483	487	220	691	724	520.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 1

Technician: AK

Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	482	486	218	688	721	519.1	N/A
241	481	485	217	686	719	517.7	N/A
242	480	485	216	686	716	516.7	N/A
243	479	484	215	686	714	515.5	N/A
244	479	483	214	687	711	514.8	N/A
245	478	483	213	689	709	514.3	N/A
246	478	483	213	691	706	513.9	N/A
247	477	482	212	693	704	513.7	N/A
248	477	482	212	695	702	513.6	N/A
249	477	482	211	697	700	513.4	N/A
250	476	482	210	698	699	512.9	N/A
251	476	482	210	698	697	512.5	N/A
252	476	482	209	699	694	512.0	N/A
253	475	482	209	700	692	511.7	N/A
254	475	483	208	701	690	511.3	N/A
255	474	483	208	702	688	511.2	N/A
256	474	484	208	704	685	511.1	N/A
257	474	485	208	706	683	511.3	N/A
258	474	486	207	709	681	511.6	N/A
259	475	487	207	712	679	512.0	N/A
260	475	488	207	715	677	512.5	N/A
261	475	489	207	718	675	512.9	N/A
262	476	490	207	720	673	513.3	N/A
263	477	491	207	723	671	513.9	N/A
264	478	492	207	726	670	514.6	N/A
265	479	493	208	729	668	515.3	N/A
266	480	494	208	732	666	515.9	N/A
267	481	495	208	735	664	516.4	N/A
268	481	496	208	737	662	516.7	N/A
269	482	497	208	740	660	517.4	N/A
270	483	498	208	743	659	518.1	N/A
271	484	500	208	746	657	519.0	N/A
272	485	501	208	748	655	519.5	N/A
273	486	503	208	751	653	520.2	N/A
274	487	504	208	753	651	520.7	N/A
275	488	506	209	757	649	521.6	N/A
276	489	508	209	759	645	522.1	N/A
277	491	510	209	762	643	523.0	N/A
278	492	511	210	765	640	523.6	N/A
279	494	513	210	768	639	524.6	N/A
280	496	515	210	770	637	525.6	N/A
281	498	517	211	771	637	526.7	N/A
282	499	520	211	772	635	527.5	N/A
283	502	522	212	774	635	528.7	N/A
284	503	524	212	775	634	529.5	N/A
285	505	526	213	775	633	530.2	N/A
286	507	528	213	775	632	531.0	N/A
287	509	530	213	773	631	531.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	511	532	214	771	629	531.5	N/A
289	514	534	214	770	629	532.1	N/A
290	515	536	215	769	628	532.5	N/A
291	517	537	215	766	627	532.6	N/A
292	519	539	215	763	626	532.6	N/A
293	521	541	216	761	625	532.8	N/A
294	523	542	216	758	622	532.3	N/A
295	524	544	216	756	622	532.5	N/A
296	526	545	217	753	619	531.7	N/A
297	528	546	217	751	618	531.8	N/A
298	530	548	217	750	618	532.5	N/A
299	532	549	218	748	617	532.4	N/A
300	534	550	218	746	615	532.5	N/A
301	536	551	218	744	613	532.4	N/A
302	537	553	218	742	613	532.6	N/A
303	539	554	219	741	612	532.8	N/A
304	541	555	219	740	611	533.1	N/A
305	543	556	219	739	611	533.6	N/A
306	545	557	220	738	609	533.8	N/A
307	547	558	220	736	609	533.9	N/A
308	549	559	220	734	609	534.2	N/A
309	550	561	220	733	609	534.5	N/A
310	552	562	221	732	607	534.6	N/A
311	553	563	221	730	606	534.5	N/A
312	554	564	222	728	605	534.2	N/A
313	555	565	222	727	603	534.4	N/A
314	556	566	222	726	601	534.2	N/A
315	558	567	222	726	602	535.0	N/A
316	559	568	223	726	601	535.3	N/A
317	560	570	223	726	599	535.5	N/A
318	561	571	223	724	599	535.8	N/A
319	562	573	224	723	600	536.2	N/A
320	563	574	224	719	600	536.2	N/A
321	564	575	224	715	600	535.8	N/A
322	565	576	225	711	600	535.3	N/A
323	567	577	225	708	602	535.6	N/A
324	568	578	225	704	603	535.4	N/A
325	569	579	225	699	602	534.8	N/A
326	570	580	225	695	602	534.4	N/A
327	570	580	226	691	602	533.7	N/A
328	571	580	226	687	603	533.3	N/A
329	572	581	226	681	602	532.3	N/A
330	572	581	226	675	602	531.2	N/A
331	573	581	226	669	601	530.0	N/A
332	573	581	227	662	602	529.0	N/A
333	573	582	227	656	600	527.4	N/A
334	573	581	227	651	599	526.3	N/A
335	573	581	227	646	598	525.3	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	574	581	227	642	598	524.5	N/A
337	574	581	227	640	598	523.9	N/A
338	574	581	228	638	597	523.7	N/A
339	574	581	228	635	597	522.9	N/A
340	574	581	228	628	596	521.3	N/A
341	573	581	228	621	595	519.6	N/A
342	573	580	228	614	596	518.2	N/A
343	573	580	227	606	598	516.6	N/A
344	572	579	227	598	598	514.8	N/A
345	572	578	227	592	599	513.4	N/A
346	571	576	227	587	599	512.0	N/A
347	570	575	226	580	598	510.0	N/A
348	570	574	226	575	597	508.4	N/A
349	569	573	226	569	597	506.6	N/A
350	568	571	226	564	597	505.0	N/A
351	566	570	225	558	596	503.0	N/A
352	565	568	225	553	596	501.2	N/A
353	564	566	225	549	596	499.9	N/A
354	563	565	225	545	596	498.6	N/A
355	562	563	224	541	597	497.4	N/A
356	561	561	224	537	598	496.1	N/A
357	559	560	224	532	598	494.7	N/A
358	558	558	224	528	598	493.2	N/A
359	557	556	224	523	599	491.9	N/A
360	556	554	223	519	600	490.4	N/A
361	555	553	223	514	601	489.0	N/A
362	554	551	223	509	600	487.4	N/A
363	554	549	223	505	603	486.6	N/A
364	552	548	223	501	604	485.5	N/A
365	552	546	223	497	604	484.3	N/A
366	552	544	222	494	605	483.2	N/A
367	550	542	222	490	606	482.0	N/A
368	550	540	222	486	605	480.8	N/A
369	550	539	222	483	605	479.6	N/A
370	549	537	222	480	606	478.8	N/A
371	548	535	222	477	607	477.8	N/A
372	547	534	221	476	608	477.2	N/A
373	547	532	221	474	607	476.3	N/A
374	546	531	221	473	608	475.6	N/A
375	546	529	221	471	607	474.8	N/A
376	545	528	221	469	607	473.9	N/A
377	543	527	221	468	607	473.1	N/A
378	543	525	221	466	608	472.5	N/A
379	541	524	221	465	609	471.8	N/A
380	540	523	221	463	609	471.1	N/A
381	540	522	220	462	609	470.4	N/A
382	539	521	220	460	610	469.9	N/A
383	537	520	220	459	610	469.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 1Technician: AKDate: 5/6/2024Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
384	536	519	220	457	610	468.3	N/A
385	535	518	220	455	609	467.4	N/A
386	534	516	220	453	610	466.5	N/A
387	533	516	220	451	610	465.7	N/A
388	532	514	220	449	609	464.7	N/A
389	531	513	220	447	608	463.8	N/A
390	530	512	219	445	608	462.9	N/A
391	529	512	219	443	608	462.2	N/A
392	528	511	219	442	608	461.5	N/A
393	527	510	219	440	609	460.8	N/A
394	526	509	219	438	610	460.3	N/A
395	525	508	219	437	611	459.7	N/A
396	524	507	219	436	611	459.2	N/A
397	523	506	219	436	612	459.0	N/A
398	522	505	219	436	612	458.8	N/A
399	521	504	219	435	613	458.4	N/A
400	520	503	219	434	614	458.0	N/A
401	520	502	219	433	614	457.5	N/A
402	518	501	218	431	615	456.6	N/A
403	517	500	218	429	615	455.9	N/A
404	516	499	218	427	615	455.0	N/A
405	515	498	218	425	616	454.3	N/A
406	515	497	218	424	615	453.8	N/A
407	514	496	218	424	615	453.3	N/A
408	513	495	218	425	615	453.1	N/A
409	512	494	218	424	615	452.4	N/A
410	511	493	218	422	615	451.6	N/A
411	510	492	218	419	615	450.6	N/A
412	509	490	218	416	614	449.2	N/A
413	507	489	217	413	614	447.9	N/A
414	506	488	217	410	613	446.8	N/A
415	504	486	216	408	613	445.6	N/A
416	503	485	216	405	613	444.2	N/A
417	501	484	216	402	612	442.9	N/A
418	499	483	215	399	612	441.6	N/A
419	498	481	215	397	611	440.4	N/A
420	496	480	215	395	611	439.3	N/A
421	494	479	214	392	610	437.8	N/A
422	493	477	214	390	610	436.8	N/A
423	491	476	214	388	609	435.5	N/A
424	489	475	213	386	608	434.3	N/A
425	487	473	213	385	608	433.3	N/A
426	485	472	213	382	608	432.0	N/A
427	484	471	212	380	607	430.8	N/A
428	482	469	212	378	607	429.6	N/A
429	481	468	212	376	606	428.5	N/A
430	479	467	212	375	605	427.4	N/A
431	477	465	211	373	605	426.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT : 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	476	464	211	372	605	425.4	N/A
433	474	463	211	370	605	424.6	N/A
434	473	461	210	369	605	423.6	N/A
435	471	460	210	368	604	422.7	N/A
436	470	459	210	367	604	421.8	N/A
437	468	458	209	366	604	420.9	N/A
438	467	456	209	365	603	420.2	N/A
439	466	455	209	364	603	419.4	N/A
440	465	454	209	363	604	418.8	N/A
441	463	453	209	361	604	417.9	N/A
442	462	452	208	360	604	417.3	N/A
443	460	451	208	359	604	416.5	N/A
444	459	450	208	358	604	415.6	N/A
445	458	449	208	358	604	415.0	N/A
446	457	448	207	357	603	414.4	N/A
447	455	447	207	356	603	413.6	N/A
448	454	446	207	356	602	412.9	N/A
449	453	445	207	355	601	412.1	N/A
450	452	444	207	354	600	411.3	N/A
451	451	442	206	353	599	410.4	N/A
452	451	442	206	352	596	409.2	N/A
453	449	441	206	350	597	408.4	N/A
454	448	440	205	349	595	407.4	N/A
455	447	439	205	348	593	406.2	N/A
456	446	438	205	346	592	405.2	N/A
457	444	437	204	345	590	404.1	N/A
458	443	436	204	344	589	403.1	N/A
459	442	435	204	343	588	402.3	N/A
460	441	434	203	342	587	401.4	N/A
461	439	433	203	341	586	400.4	N/A
462	438	432	203	340	585	399.5	N/A
463	437	431	202	339	583	398.5	N/A
464	436	430	202	339	582	397.8	N/A
465	435	429	202	338	582	397.1	N/A
466	434	428	201	338	581	396.5	N/A
467	433	427	201	339	582	396.1	N/A
468	432	426	201	339	581	395.7	N/A
469	431	425	201	339	581	395.2	N/A
470	430	424	200	339	582	395.0	N/A
471	429	423	200	339	581	394.4	N/A
472	429	423	200	339	581	394.2	N/A
473	428	422	200	339	580	393.5	N/A
474	427	421	199	339	580	393.1	N/A
475	426	420	199	340	579	392.7	N/A
476	425	419	199	340	578	392.2	N/A
477	425	418	199	340	578	391.9	N/A
478	424	417	198	340	580	391.8	N/A
479	423	416	198	340	579	391.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	423	416	198	340	578	390.8	N/A
481	422	415	198	339	578	390.2	N/A
482	421	414	197	339	578	389.9	N/A
483	420	414	197	339	576	389.2	N/A
484	420	413	197	339	576	388.8	N/A
485	419	412	197	339	575	388.2	N/A
486	418	411	196	338	574	387.6	N/A
487	418	411	196	338	573	387.2	N/A
488	417	410	196	338	573	386.7	N/A
489	417	409	196	338	572	386.2	N/A
490	416	409	195	337	570	385.4	N/A
491	415	408	195	337	569	385.0	N/A
492	415	407	195	336	569	384.4	N/A
493	414	407	195	336	569	384.0	N/A
494	414	406	195	336	567	383.3	N/A
495	413	405	195	335	566	382.8	N/A
496	412	405	194	335	566	382.4	N/A
497	412	404	194	334	565	381.8	N/A
498	411	404	194	332	564	380.8	N/A
499	411	403	194	330	563	380.0	N/A
500	410	403	193	328	562	379.2	N/A
501	409	402	193	326	562	378.4	N/A
502	409	401	193	324	560	377.2	N/A
503	408	401	192	322	559	376.3	N/A
504	407	400	192	320	559	375.5	N/A
505	406	400	192	318	556	374.2	N/A
506	405	399	192	316	555	373.3	N/A
507	404	398	192	315	554	372.3	N/A
508	403	397	192	313	552	371.3	N/A
509	402	396	191	312	551	370.3	N/A
510	401	395	191	311	550	369.4	N/A
511	400	394	191	309	550	368.6	N/A
512	399	393	190	308	549	367.8	N/A
513	398	393	190	306	549	367.0	N/A
514	397	392	190	305	548	366.1	N/A
515	396	391	189	303	547	365.2	N/A
516	395	390	189	302	545	364.2	N/A
517	393	389	189	301	544	363.1	N/A
518	392	388	189	299	543	362.2	N/A
519	391	387	188	298	541	361.1	N/A
520	390	385	188	297	542	360.5	N/A
521	390	384	188	296	540	359.6	N/A
522	389	383	187	294	540	358.7	N/A
523	388	382	187	294	538	357.7	N/A
524	387	381	187	293	537	357.0	N/A
525	386	380	187	292	536	356.2	N/A
526	385	379	187	291	535	355.4	N/A
527	384	378	187	290	535	354.7	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 1

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/6/2024

Stove ΔT: 276

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	383	377	186	289	535	354.0	N/A
529	382	376	186	288	534	353.3	N/A
530	381	376	186	287	533	352.7	N/A
531	380	375	186	287	533	352.0	N/A
532	380	374	185	286	532	351.2	N/A
533	379	373	185	285	531	350.6	N/A
534	378	373	185	284	530	350.0	N/A
535	377	372	185	284	530	349.4	N/A
536	376	371	184	283	529	348.6	N/A
537	376	370	184	282	528	347.9	N/A
538	375	369	184	281	527	347.2	N/A
539	374	368	184	281	526	346.5	N/A
540	373	368	184	280	525	345.9	N/A
541	372	367	183	279	524	345.1	N/A
542	372	367	183	278	523	344.4	N/A
543	371	366	183	277	522	343.7	N/A
544	370	365	183	276	520	342.9	N/A
Average	470.5	473.1	214.3	534.7	592.9	457.1	N/A

LAB SAMPLE DATA - ASTM E2515

Client: SBI
Model: Everest III
Run #: 1

Job #: 23-241
Tracking #: 191
Technician: AK
Date: 5/6/2024

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01005	240.8	244.6	3.8
	B	G01006	240.7	244.3	3.6
	Amb	G00994	241.5	241.5	0.0
Probes	A	8A	116633.4	116633.4	0.0
	B	8B	116665.7	116665.8	0.1
O-rings	A	8A	3552.5	3552.7	0.2
	B	8B	3557.6	3557.8	0.2

Placed in Dessicator on: 5/6/2024

Balance Audit (mg):		200.0		200.0		200.0			
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	244.8	5/6 21:10	244.7	5/10 13:30	244.6	5/13 9:00		
	B	244.5	5/6 21:10	244.3	5/10 13:30	244.3	5/13 9:00		
		241.5	5/6 21:10	241.5	5/10 13:30	241.5	5/13 9:00		
Probes	A	116633.4	5/6 21:10	116633.4	5/10 13:30	116633.4	5/13 9:00		
	B	116665.6	5/6 21:10	116665.8	5/10 13:30	116665.8	5/13 9:00		
O-Rings	A	3552.4	5/6 21:10	3552.6	5/10 13:30	3552.7	5/13 9:00		
	B	3557.6	5/6 21:10	3557.8	5/10 13:30	3557.8	5/13 9:00		

Train A Aggregate, mg:	4.0
Train B Aggregate, mg:	3.9
Ambient, mg:	0.0

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: SBI

Model: Everest III

Run #: 1

Job #: 23-241

Tracking #: 191

Technician: AK

Date: 5/6/2024

Total Fuel Burned (kg-dry) 24.53

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	68.181	76.735	76.221	-
Average Gas Velocity in Dilution Tunnel (ft/sec)	16.2			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	43385.4			
Average Gas Meter Temperature (°F)	70.0	84.8	93.1	-
Total Sample Volume (dscf)	68.668	74.376	72.997	-
Average Tunnel Temperature (°F)	85.1			
Total Time of Test (min)	544			
Total Particulate Catch (mg)	0.0	4.0	3.9	-
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000538	0.0000534	-
Total PM Emissions (g)	0.00	21.16	21.02	-
Particulate Emission Rate (g/hr)	0.00	2.33	2.32	-
Emissions Factor (g/kg)	-	0.86	0.86	-
Difference from Average Total Particulate Emissions (g)	-	0.07	0.07	-
Difference from Average Total Particulate Emissions (%)	-	0.3%	0.3%	-
Difference from Average Emissions Factor (g/kg)	-	0.00	0.00	-

Final Average Results	
Total Particulate Emissions (g)	21.09
Particulate Emission Rate (g/hr)	2.33
Emissions Factor (g/kg)	0.86

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	89.8	OK
Face Velocity	< 30 ft/min	7.8	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:67.2/Max:71.8	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

Test Input Data

Client: SBI
Model: Everest III
Run #: 1

Job #: 23-241
Tracking #: 191
Technician: AK
Date: 5/6/2024

Traverse Data

pt	dP (in WC)
1	0.054
2	0.076
3	0.078
4	0.078
5	0.072
6	0.054
7	0.056
8	0.080
9	0.078
10	0.076
11	0.070
12	0.054
Center	0.080

Tunnel Data

Tunnel dia. (in):	12
Pitot Cp	0.99
Vs,cent (ft/s):	18.81
Vs, trav (ft/s):	17.40
Fp	0.925

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	30.01	29.93
Lab Relative Humidity (%)	46.9	44.2

Traverse Temp:	73
Static Pressure:	-0.260

Fuel Data

Fuel Properties

Species	Maple
HHV (Btu/lb)	8587
%C	50.84%
%H	6.02%
%O	41.74%

	Wet Weight	MC (%db)	Dry Weight (lbs)
Kindling	2.67		
Starter	8.00	20.49	6.64
L2	18.25	21.50	15.02
L3	13.50	23.35	10.94
L4 _s	10.18	23.55	8.24
L4 _b	20.45	23.26	16.59
Avg. Moisture (%db)		22.43	

Run 1 Results Summary

Test Segments

	Clock	ET(min)
L1 Ignition	12:01 PM	0
L1 End	1:42 PM	29
L1 Duration		29
Fuel Consumed (lbs-wet)		7.49
Fuel Consumed (lbs-dry)		6.13

L2 Loaded	1:43 PM	30
L2 End	1:42 PM	101
L2 Duration		71
Fuel Consumed (lbs-wet)		16.25
Fuel Consumed (lbs-dry)		13.02

L3 Loaded	1:43 PM	102
L3 End	3:38 PM	217
L3 Duration		115
Fuel Consumed (lbs-wet)		12.41
Fuel Consumed (lbs-dry)		9.85

L4 Loaded	1:43 PM	218
L4 End	7:09 PM	544
L4 Duration		326
Fuel Consumed (lbs-wet)		30.89
Fuel Consumed (lbs-dry)		25.09

Total Fuel Burned (lbs-wet)	67.04		
Total Fuel Burned (lbs-dry)	54.10	24.54 (kg-dry)	2.71 kg/hr dry

Firebox Avg Temps (F)

L1TS _{avg(i)}	67
L1TS _{avg(f)}	378
L2TS _{avg(i)}	381
L2TS _{avg(f)}	510
L3TS _{avg(i)}	514
L3TS _{avg(f)}	464
L4TS _{avg(i)}	470
L14TS _{avg(f)}	343

Burn Time Rating (hrs)

BTR	6
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Burn Rate (lbs-wet/hr) (dry kg/hr)

BR _{L2}	15.50	5.75
BR _{L2}	13.73	4.99
BR _{L3}	6.47	2.33
BR _{L4}	5.69	2.58
OVERALL	7.39	2.71

PM Results

Burn Phase:	L1	L2	L3	L4	Total
E _T :	2.1	6.2	2.0	4.5	14.8
E _{g/hr} :	4.3	5.3	1.0	0.83	1.64
E _{g/kg} :	0.74	1.06	0.45	0.40	0.61
E _{g/MJ output} :	0.06	0.09	0.03	0.03	0.05
E _{lb/mmbtu output} :	0.14	0.21	0.08	0.07	0.11
CO (g):	93.6	410.4	211.6	542.9	1,258.6
CO (g/min):	3.23	5.78	1.84	1.67	2.31
Output (BTU/hr)	66,855	56,047	28,339	25,942	32,416
Efficiency (%)	60.8%	60.8%	65.2%	65.3%	63.7%

Rolling Average Max Values

	1-min Avg.	5-min Avg.	50-min Avg
PM (g/hr)	70.1	28.2	7.9

Quality Checks

Quality Checks	Requirement	Observed	Pass/Fail
Filter/Dewpt. Temp	Dewpoint must never exceed filter temp	Max Δ -15	PASS
Filter Temp	Must be between 80 and 90F at all times	82.3 / 89.8	PASS
Ambient Temp	Must be between 65 and 90F at all times	67.2 / 71.8	PASS
Minimum Tunnel Flow	>600 CFM	693.2	PASS
Weight Loss	Must be >0.1 lb per 20 min	Min -0.33 lb.	PASS

L1 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/06/24
Run: 1
Control #: 191
Test Duration: 29
Output Category: L1

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	60.8%	65.1%
Combustion Efficiency	97.8%	97.8%
Heat Transfer Efficiency	62.2%	66.5%

Output Rate (kJ/h)	70,477	66,855	(Btu/h)
Burn Rate (kg/h)	5.80	12.78	(lb/h)
Input (kJ/h)	115,848	109,894	(Btu/h)

Test Load Weight (dry kg)	2.80	6.18	dry lb
MC wet (%)	18.16		
MC dry (%)	22.19		
Particulate (g)	N/A		
CO (g)	94		
Test Duration (h)	0.48		

Emissions	Particulate	CO
g/MJ Output	N/A	2.75
g/kg Dry Fuel	N/A	33.39
g/h	N/A	193.68
g/min	N/A	3.23
lb/MM Btu Output	N/A	6.39

Air/Fuel Ratio (A/F)	11.46
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VERSION:

2.4

4/15/2010

L2 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/06/24
Run: 1
Control #: 191
Test Duration: 71
Output Category: L2

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	60.8%	65.1%
Combustion Efficiency	94.9%	94.9%
Heat Transfer Efficiency	64.1%	68.5%

Output Rate (kJ/h)	59,084	56,047	(Btu/h)
Burn Rate (kg/h)	4.86	10.72	(lb/h)
Input (kJ/h)	97,138	92,146	(Btu/h)

Test Load Weight (dry kg)	5.76	12.68	dry lb
MC wet (%)	19.87		
MC dry (%)	24.80		
Particulate (g)	N/A		
CO (g)	410		
Test Duration (h)	1.18		

Emissions	Particulate	CO
g/MJ Output	N/A	5.87
g/kg Dry Fuel	N/A	71.31
g/h	N/A	346.83
g/min	N/A	5.78
lb/MM Btu Output	N/A	13.64

Air/Fuel Ratio (A/F)	7.92
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VERSION:

2.4

4/15/2010

L3 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/06/24
Run: 1
Control #: 191
Test Duration: 115
Output Category: L3

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.2%	69.8%
Combustion Efficiency	96.7%	96.7%
Heat Transfer Efficiency	67.4%	72.1%

Output Rate (kJ/h)	29,874	28,339	(Btu/h)
Burn Rate (kg/h)	2.29	5.05	(lb/h)
Input (kJ/h)	45,805	43,451	(Btu/h)

Test Load Weight (dry kg)	4.40	9.69	dry lb
MC wet (%)	20.59		
MC dry (%)	25.93		
Particulate (g)	N/A		
CO (g)	212		
Test Duration (h)	1.92		

Emissions	Particulate	CO
g/MJ Output	N/A	3.70
g/kg Dry Fuel	N/A	48.14
g/h	N/A	110.41
g/min	N/A	1.84
lb/MM Btu Output	N/A	8.59

Air/Fuel Ratio (A/F)	10.41
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VERSION:

2.4

4/15/2010

L4 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/06/24
Run: 1
Control #: 191
Test Duration: 326
Output Category: L4

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.3%	69.9%
Combustion Efficiency	96.7%	96.7%
Heat Transfer Efficiency	67.6%	72.3%

Output Rate (kJ/h)	27,348	25,942	(Btu/h)
Burn Rate (kg/h)	2.10	4.62	(lb/h)
Input (kJ/h)	41,849	39,698	(Btu/h)

Test Load Weight (dry kg)	11.38	25.09	dry lb
MC wet (%)	18.77		
MC dry (%)	23.11		
Particulate (g)	N/A		
CO (g)	543		
Test Duration (h)	5.43		

Emissions	Particulate	CO
g/MJ Output	N/A	3.65
g/kg Dry Fuel	N/A	47.69
g/h	N/A	99.93
g/min	N/A	1.67
lb/MM Btu Output	N/A	8.49

Air/Fuel Ratio (A/F)	10.63
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VERSION:

2.4

4/15/2010

Run 1 TEOM Data

ET (min)	Ci - 1-min avg PM (ug/m ³)	Tunnel dP (in WC)	sqrtdP	Tunnel Temp (F)	Tunnel Temp - 10 minute Avg. (F)	Tunnel RH - 10 minute avg. (%)	Tunnel Velocity - Vsi (ft/s)	Tunnel Flow - Q _{sdi} (m ³ /min)	E _i (mg)	E _{g/hr, i} (g/hr)	PM 5-min Rolling Avg (g/hr)	PM 30-min Rolling Avg (g/hr)	PM (cumulative g)
0	-39	0.070	0.2646	67.6	-	-	16.201	21.646	-0.854	-0.05	-	-	0.00
1	2281	0.069	0.2627	71.9	-	-	16.150	21.403	48.819	2.93	-	-	0.05
2	55592	0.068	0.2608	84	-	-	16.214	21.010	1167.969	70.08	-	-	1.22
3	19010	0.066	0.2569	100	-	-	16.207	20.400	387.811	23.27	-	-	1.60
4	7312	0.065	0.2550	116.8	-	-	16.323	19.948	145.857	8.75	21.00	-	1.75
5	7978	0.065	0.2550	100	-	-	16.083	20.245	161.525	9.69	22.94	-	1.91
6	1072	0.066	0.2569	89.9	-	-	16.060	20.587	22.073	1.32	22.62	-	1.93
7	406	0.066	0.2569	86	-	-	16.003	20.661	8.394	0.50	8.71	-	1.94
8	271	0.066	0.2569	84.7	-	-	15.984	20.685	5.597	0.34	4.12	-	1.95
9	47	0.069	0.2627	83.5	88.44	-	16.325	21.173	0.985	0.06	2.38	-	1.95
10	575	0.068	0.2608	82.8	89.96	-	16.196	21.033	12.103	0.73	0.59	-	1.96
11	423	0.068	0.2608	82.7	91.04	-	16.194	21.035	8.899	0.53	0.43	-	1.97
12	358	0.066	0.2569	82.7	90.91	-	15.954	20.723	7.419	0.45	0.42	-	1.98
13	561	0.068	0.2608	82.9	89.2	-	16.197	21.031	11.805	0.71	0.49	-	1.99
14	457	0.067	0.2588	83.1	85.83	-	16.081	20.872	9.532	0.57	0.60	-	2.00
15	373	0.069	0.2627	83.4	84.17	-	16.324	21.175	7.893	0.47	0.55	-	2.01
16	487	0.068	0.2608	83.7	83.55	-	16.209	21.016	10.225	0.61	0.56	-	2.02
17	331	0.069	0.2627	83.8	83.33	-	16.330	21.168	7.011	0.42	0.56	-	2.02
18	363	0.068	0.2608	84.2	83.28	-	16.217	21.006	7.625	0.46	0.51	-	2.03
19	235	0.068	0.2608	84.5	83.38	-	16.221	21.000	4.939	0.30	0.45	-	2.04
20	151	0.068	0.2608	85	83.6	-	16.229	20.990	3.173	0.19	0.40	-	2.04
21	98	0.068	0.2608	85.8	83.91	-	16.241	20.975	2.050	0.12	0.30	-	2.04
22	100	0.069	0.2627	86.7	84.31	-	16.373	21.111	2.118	0.13	0.24	-	2.04
23	148	0.066	0.2569	87	84.72	-	16.018	20.642	3.045	0.18	0.18	-	2.05
24	188	0.068	0.2608	87.2	85.13	-	16.261	20.948	3.947	0.24	0.17	-	2.05
25	56	0.068	0.2608	87.5	85.54	-	16.266	20.942	1.174	0.07	0.15	-	2.05
26	201	0.067	0.2588	88	85.97	-	16.153	20.778	4.183	0.25	0.17	-	2.06
27	188	0.068	0.2608	88.4	86.43	-	16.279	20.925	3.942	0.24	0.20	-	2.06
28	245	0.068	0.2608	88.8	86.89	-	16.285	20.918	5.133	0.31	0.22	-	2.06
29	224	0.068	0.2608	88.9	87.33	-	16.287	20.916	4.691	0.28	0.23	-	2.07
30	20237	0.066	0.2569	102.6	89.09	-	16.244	20.353	411.885	24.71	5.16	-	2.48
31	8327	0.066	0.2569	93.2	89.83	-	16.108	20.490	170.628	10.24	7.16	-	2.65
32	1306	0.065	0.2550	90	90.16	-	15.939	20.429	26.672	1.60	7.43	-	2.68
33	1302	0.066	0.2569	88.7	90.33	-	16.042	20.610	26.840	1.61	7.69	-	2.71
34	1644	0.069	0.2627	88.7	90.48	-	16.403	21.073	34.646	2.08	8.05	-	2.74
35	872	0.067	0.2588	89	90.63	-	16.168	20.759	18.104	1.09	3.32	-	2.76
36	392	0.067	0.2588	89.6	90.79	-	16.177	20.748	8.127	0.49	1.37	-	2.77
37	369	0.068	0.2608	90.1	90.96	-	16.304	20.893	7.708	0.46	1.15	-	2.77
38	299	0.068	0.2608	90.4	91.12	-	16.309	20.887	6.237	0.37	0.90	-	2.78
39	294	0.066	0.2569	90.8	91.31	-	16.073	20.570	6.054	0.36	0.55	-	2.79
40	341	0.066	0.2569	91.5	90.2	-	16.083	20.557	7.005	0.42	0.42	-	2.79
41	410	0.066	0.2569	92.3	90.11	-	16.095	20.542	8.414	0.50	0.43	-	2.80
42	510	0.067	0.2588	92.7	90.38	-	16.222	20.690	10.557	0.63	0.46	-	2.81
43	661	0.065	0.2550	93.4	90.85	-	15.988	20.366	13.453	0.81	0.55	-	2.83
44	886	0.065	0.2550	94.5	91.43	-	16.004	20.345	18.031	1.08	0.69	-	2.84
45	1617	0.065	0.2550	95.6	92.09	-	16.020	20.325	32.870	1.97	1.00	-	2.88
46	4085	0.066	0.2569	96.4	92.77	-	16.155	20.466	83.607	5.02	1.90	-	2.96
47	7922	0.065	0.2550	97.2	93.48	-	16.043	20.296	160.781	9.65	3.70	-	3.12
48	11649	0.065	0.2550	97.8	94.22	-	16.052	20.285	236.309	14.18	6.38	-	3.36
49	15220	0.067	0.2588	98.5	94.99	-	16.307	20.582	313.264	18.80	9.92	-	3.67
50	22017	0.065	0.2550	99.1	95.75	-	16.071	20.261	446.095	26.77	14.88	-	4.12
51	23081	0.065	0.2550	99.4	96.46	-	16.075	20.256	467.540	28.05	19.49	-	4.58
52	20653	0.065	0.2550	99.7	97.16	-	16.079	20.251	418.231	25.09	22.58	-	5.00
53	21811	0.065	0.2550	99.9	97.81	-	16.082	20.247	441.602	26.50	25.04	-	5.44
54	25611	0.067	0.2588	100	98.36	-	16.329	20.554	526.416	31.58	27.60	-	5.97
55	24156	0.066	0.2569	100.1	98.81	-	16.208	20.399	492.741	29.56	28.16	-	6.46
56	21487	0.066	0.2569	100.4	99.21	-	16.213	20.393	438.190	26.29	27.81	-	6.90
57	21230	0.066	0.2569	99.3	99.42	-	16.197	20.413	433.368	26.00	27.99	-	7.33
58	16018	0.066	0.2569	95.9	99.23	-	16.147	20.476	327.974	19.68	26.62	-	7.66
59	3119	0.066	0.2569	94.2	98.8	-	16.123	20.507	63.962	3.84	21.07	7.59	7.73
60	828	0.065	0.2550	92.8	98.17	-	15.980	20.377	16.880	1.01	15.36	7.93	7.74
61	436	0.067	0.2588	92.3	97.46	-	16.216	20.697	9.018	0.54	10.21	7.94	7.75
62	368	0.065	0.2550	91.5	96.64	-	15.961	20.401	7.514	0.45	5.10	6.75	7.76
63	352	0.066	0.2569	91.3	95.78	-	16.080	20.561	7.245	0.43	1.26	6.36	7.77
64	184	0.065	0.2550	91	94.88	-	15.954	20.410	3.756	0.23	0.53	6.22	7.77
65	200	0.067	0.2588	90.7	93.94	-	16.193	20.727	4.136	0.25	0.38	6.06	7.77
66	257	0.066	0.2569	90.5	92.95	-	16.069	20.576	5.279	0.32	0.34	6.04	7.78
67	136	0.067	0.2588	90.8	92.1	-	16.194	20.725	2.827	0.17	0.28	6.03	7.78
68	278	0.067	0.2588	90.7	91.58	-	16.193	20.727	5.757	0.35	0.26	6.03	7.79
69	305	0.065	0.2550	90.7	91.23	-	15.949	20.416	6.217	0.37	0.29	6.04	7.80
70	249	0.067	0.2588	90.1	90.96	-	16.184	20.739	5.162	0.31	0.30	6.03	7.80
71	549	0.067	0.2588	89.5	90.68	-	16.175	20.750	11.401	0.68	0.38	6.03	7.81
72	527	0.067	0.2588	89.2	90.45	-	16.171	20.756	10.944	0.66	0.47	6.02	7.82
73	647	0.066	0.2569	89.2	90.24	-	16.050	20.600	13.333	0.80	0.56	6.02	7.84
74	753	0.065	0.2550	89	90.04	-	15.925	20.447	15.397	0.92	0.67	6.03	7.85
75	894	0.067	0.2588	88.8	89.85	-	16.165	20.763	18.562	1.11	0.84	6.03	7.87
76	1162	0.068	0.2608	88.8	89.68	-	16.285	20.918	24.299	1.46	0.99	6.04	7.89
77	1097	0.068	0.2608	88.6	89.46	-	16.282	20.921	22.951	1.38	1.13	6.05	7.92
78	1418	0.068	0.2608	88.5	89.24	-	16.281	20.923	29.662	1.78	1.33	6.07	7.95
79	2216	0.068	0.2608	88.4	89.01	-	16.279	20.925	46.380	2.78	1.70	6.08	7.99
80	1306	0.068	0.2608	88.2	88.82	-	16.276	20.929	27.340	1.64	1.81	6.11	8.02
81	821	0.067	0.2588	88.1	88.68	-	16.155	20.776	17.058	1.02	1.72	6.16	8.04
82	822	0.069	0.2627	87.9	88.55	-	16.391	21.088	17.344	1.04	1.65	6.18	8.05
83	1476	0.069	0.2627	87.8	88.41	-	16.389	21.090	31.130	1.87	1.67	6.20	8.09
84	2045	0.068	0.2608	87.8	88.29	-	16.270	20.937	42.826	2.57	1.63	6.21	8.13

Run 1 TEOM Data

85	2408	0.067	0.2588	87.8	88.19	16.150	20.782	50.048	3.00	1.90	6.24	8.18
86	2191	0.068	0.2608	87.6	88.07	16.267	20.941	45.887	2.75	2.25	6.28	8.22
87	1909	0.067	0.2588	87.5	87.96	16.146	20.788	39.692	2.38	2.51	6.33	8.26
88	1394	0.069	0.2627	87.5	87.86	16.385	21.096	29.408	1.76	2.49	6.37	8.29
89	536	0.068	0.2608	87.4	87.76	16.264	20.944	11.219	0.67	2.12	6.41	8.31
90		0.069	0.2627	87.3	87.67					1.89	6.01	
91		0.068	0.2608	87.2	87.58					1.61	5.85	
92		0.069	0.2627	87.1	87.5					1.22	5.92	
93		0.067	0.2588	87.1	87.43					0.67	6.00	
94		0.068	0.2608	87	87.35						6.07	
95		0.068	0.2608	86.9	87.26						6.16	
96	-291	0.069	0.2627	86.6	87.16	16.372	21.113	-6.135	-0.37	-0.37	6.27	8.30
97	-264	0.069	0.2627	86.5	87.06	16.370	21.115	-5.583	-0.34	-0.35	6.38	8.29
98	68	0.069	0.2627	86.5	86.96	16.370	21.115	1.430	0.09	-0.21	6.37	8.29
99	247	0.069	0.2627	86.5	86.87	16.370	21.115	5.206	0.31	-0.08	6.35	8.30
100	225	0.069	0.2627	86.5	86.79	16.370	21.115	4.747	0.28	0.00	6.35	8.30
101	234	0.067	0.2588	86.5	86.72	16.131	20.807	4.866	0.29	0.13	6.34	8.31
102	2883	0.067	0.2588	104.2	88.43	16.390	20.478	59.030	3.54	0.90	6.34	8.37
103	1693	0.066	0.2569	99.4	89.66	16.198	20.411	34.566	2.07	1.30	6.33	8.40
104	6948	0.066	0.2569	99.5	90.91	16.200	20.409	141.799	8.51	2.94	6.38	8.54
105	10524	0.067	0.2588	100.2	92.24	16.332	20.551	216.282	12.98	5.48	6.38	8.76
106	10717	0.066	0.2569	98.5	93.43	16.185	20.428	218.926	13.14	8.05	6.44	8.98
107	5309	0.067	0.2588	93.2	94.1	16.230	20.680	109.791	6.59	8.66	6.51	9.09
108	1464	0.065	0.2550	90.8	94.53	15.951	20.414	29.889	1.79	8.60	6.49	9.12
109	827	0.067	0.2588	90.1	94.89	16.184	20.739	17.142	1.03	7.10	6.25	9.14
110	699	0.068	0.2608	89.6	95.2	16.297	20.902	14.601	0.88	4.68	5.77	9.15
111	829	0.067	0.2588	89.3	95.48	16.172	20.754	17.196	1.03	2.26	5.25	9.17
112	722	0.066	0.2569	89.2	93.98	16.050	20.600	14.881	0.89	1.12	4.79	9.18
113	631	0.067	0.2588	88.9	92.93	16.166	20.761	13.110	0.79	0.92	4.30	9.20
114	643	0.067	0.2588	88.9	91.87	16.166	20.761	13.353	0.80	0.88	3.71	9.21
115	794	0.067	0.2588	88.7	90.72	16.163	20.765	16.481	0.99	0.90	3.15	9.23
116	774	0.068	0.2608	88.6	89.73	16.282	20.921	16.187	0.97	0.89	2.66	9.24
117	626	0.068	0.2608	88.4	89.25	16.279	20.925	13.107	0.79	0.87	2.18	9.26
118	446	0.065	0.2550	88.3	89	15.915	20.460	9.116	0.55	0.82	1.82	9.27
119	543	0.066	0.2569	88.2	88.81	16.035	20.619	11.189	0.67	0.79	1.76	9.28
120	393	0.069	0.2627	88	88.65	16.392	21.086	8.293	0.50	0.69	1.76	9.28
121	201	0.067	0.2588	88	88.52	16.153	20.778	4.179	0.25	0.55	1.76	9.29
122	61	0.068	0.2608	87.8	88.38	16.270	20.937	1.275	0.08	0.41	1.76	9.29
123	25	0.067	0.2588	87.8	88.27	16.150	20.782	0.512	0.03	0.31	1.76	9.29
124	12	0.068	0.2608	87.7	88.15	16.269	20.939	0.253	0.02	0.17	1.75	9.29
125	13	0.066	0.2569	87.6	88.04	16.026	20.630	0.269	0.02	0.08	1.75	9.29
126	50	0.068	0.2608	87.5	87.93	16.266	20.942	1.049	0.06	0.04	1.74	9.29
127	112	0.065	0.2550	87.5	87.84	15.903	20.475	2.303	0.14	0.05	1.74	9.29
128	120	0.067	0.2588	87.5	87.76	16.146	20.788	2.484	0.15	0.08	1.73	9.30
129	92	0.066	0.2569	87.5	87.69	16.025	20.632	1.888	0.11	0.10	1.73	9.30
130	109	0.068	0.2608	87.4	87.63	16.264	20.944	2.290	0.14	0.12	1.73	9.30
131	218	0.066	0.2569	87.2	87.55	16.020	20.638	4.505	0.27	0.16	1.72	9.31
132	179	0.065	0.2550	87.1	87.48	15.897	20.483	3.665	0.22	0.18	1.71	9.31
133	88	0.065	0.2550	86.8	87.38	15.893	20.488	1.793	0.11	0.17	1.70	9.31
134	111	0.068	0.2608	86.6	87.27	16.252	20.960	2.329	0.14	0.17	1.68	9.31
135	75	0.066	0.2569	86.6	87.17	16.012	20.649	1.548	0.09	0.17	1.66	9.31
136	57	0.068	0.2608	86.6	87.08	16.252	20.960	1.190	0.07	0.13	1.64	9.32
137	75	0.065	0.2550	86.4	86.97	15.887	20.496	1.544	0.09	0.10	1.61	9.32
138	55	0.065	0.2550	86.2	86.84	15.884	20.500	1.133	0.07	0.09	1.58	9.32
139	108	0.065	0.2550	86.1	86.7	15.883	20.502	2.206	0.13	0.09	1.53	9.32
140	33	0.067	0.2588	85.9	86.55	16.122	20.818	0.683	0.04	0.08	1.50	9.32
141	18	0.068	0.2608	85.8	86.41	16.241	20.975	0.384	0.02	0.07	1.48	9.32
142	111	0.068	0.2608	85.7	86.27	16.239	20.977	2.325	0.14	0.08	1.46	9.32
143	49	0.067	0.2588	85.7	86.16	16.119	20.822	1.026	0.06	0.08	1.43	9.33
144	43	0.070	0.2646	85.7	86.07	16.476	21.283	0.906	0.05	0.06	1.38	9.33
145	106	0.068	0.2608	85.6	85.97	16.238	20.979	2.217	0.13	0.08	1.32	9.33
146	23	0.069	0.2627	85.3	85.84	16.352	21.138	0.494	0.03	0.08	1.27	9.33
147	100	0.067	0.2588	85.4	85.74	16.115	20.828	2.081	0.12	0.08	1.23	9.33
148	125	0.069	0.2627	85.4	85.66	16.354	21.136	2.640	0.16	0.10	1.19	9.33
149	98	0.067	0.2588	85.2	85.57	16.112	20.832	2.036	0.12	0.11	1.18	9.34
150	159	0.066	0.2569	85	85.48	15.988	20.679	3.291	0.20	0.13	1.16	9.34
151	111	0.068	0.2608	85	85.4	16.229	20.990	2.331	0.14	0.15	1.15	9.34
152	153	0.067	0.2588	84.9	85.32	16.107	20.837	3.192	0.19	0.16	1.13	9.34
153	84	0.066	0.2569	84.8	85.23	15.985	20.683	1.739	0.10	0.15	1.11	9.35
154	174	0.066	0.2569	84.6	85.12	15.982	20.687	3.595	0.22	0.17	1.09	9.35
155	321	0.069	0.2627	84.3	84.99	16.337	21.158	6.802	0.41	0.21	1.08	9.36
156	583	0.068	0.2608	84.2	84.88	16.217	21.006	12.242	0.73	0.33	1.09	9.37
157	759	0.067	0.2588	84.1	84.75	16.096	20.853	15.821	0.95	0.48	1.10	9.38
158	1143	0.069	0.2627	84	84.61	16.333	21.164	24.185	1.45	0.75	1.11	9.41
159	1159	0.067	0.2588	84	84.49	16.094	20.855	24.171	1.45	1.00	1.12	9.43
160	1127	0.069	0.2627	83.8	84.37	16.330	21.168	23.857	1.43	1.20	1.14	9.46
161	1684	0.066	0.2569	83.5	84.22	15.966	20.708	34.865	2.09	1.47	1.16	9.49
162	2114	0.067	0.2588	83.4	84.07	16.085	20.866	44.115	2.65	1.81	1.13	9.54
163	2186	0.069	0.2627	83.2	83.91	16.321	21.179	46.304	2.78	2.08	1.13	9.58
164	1966	0.069	0.2627	83.3	83.78	16.322	21.177	41.636	2.50	2.29	1.03	9.62
165	1471	0.066	0.2569	83.2	83.67	15.962	20.714	30.469	1.83	2.37	0.85	9.65
166	909	0.070	0.2646	83	83.55	16.435	21.336	19.404	1.16	2.18	0.67	9.67
167	765	0.068	0.2608	82.8	83.42	16.196	21.033	16.099	0.97	1.85	0.58	9.69
168	688	0.068	0.2608	82.8	83.3	16.196	21.033	14.470	0.87	1.46	0.57	9.70
169	438	0.066	0.2569	82.7	83.17	15.954	20.723	9.077	0.54	1.07	0.57	9.71
170	407	0.068	0.2608	82.6	83.05	16.193	21.037	8.570	0.51	0.81	0.57	9.72
171	351	0.068	0.2608	82.5	82.95	16.191	21.039	7.390	0.44	0.67	0.56	9.73
172	456	0.068	0.2608	82.4	82.85	16.190	21.041	9.589	0.58	0.59	0.56	9.74

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173	333	0.070	0.2646	82.4	82.77		16.426	21.348	7.105	0.43	0.50	0.55	9.75
174	364	0.067	0.2588	82.2	82.66		16.067	20.889	7.610	0.46	0.48	0.55	9.75
175	400	0.070	0.2646	82.1	82.55		16.422	21.354	8.549	0.51	0.48	0.54	9.76
176	485	0.070	0.2646	82	82.45		16.420	21.356	10.363	0.62	0.52	0.53	9.77
177	490	0.066	0.2569	82.1	82.38		15.946	20.735	10.155	0.61	0.53	0.52	9.78
178	508	0.066	0.2569	82	82.3		15.944	20.737	10.538	0.63	0.57	0.53	9.79
179	485	0.070	0.2646	81.9	82.22		16.419	21.358	10.351	0.62	0.60	0.52	9.80
180	575	0.067	0.2588	81.8	82.14		16.062	20.897	12.022	0.72	0.64	0.53	9.82
181	632	0.066	0.2569	81.7	82.06		15.940	20.742	13.115	0.79	0.67	0.53	9.83
182	523	0.065	0.2550	81.6	81.98		15.817	20.587	10.772	0.65	0.68	0.54	9.84
183	522	0.067	0.2588	81.7	81.91		16.060	20.899	10.918	0.66	0.69	0.56	9.85
184	428	0.066	0.2569	81.5	81.84		15.937	20.746	8.870	0.53	0.67	0.57	9.86
185	505	0.066	0.2569	81.5	81.78		15.937	20.746	10.478	0.63	0.65	0.58	9.87
186	615	0.067	0.2588	81.3	81.71		16.054	20.907	12.851	0.77	0.65	0.59	9.88
187	702	0.065	0.2550	81.3	81.63		15.813	20.592	14.447	0.87	0.69	0.60	9.90
188	738	0.065	0.2550	81.2	81.55		15.811	20.594	15.208	0.91	0.74	0.61	9.91
189	726	0.065	0.2550	81.2	81.48		15.811	20.594	14.955	0.90	0.82	0.62	9.93
190	826	0.065	0.2550	81.1	81.41		15.810	20.596	17.004	1.02	0.89	0.63	9.94
191	727	0.066	0.2569	81	81.34		15.929	20.756	15.085	0.91	0.92	0.64	9.96
192	599	0.066	0.2569	80.9	81.27		15.928	20.758	12.437	0.75	0.90	0.66	9.97
193	751	0.066	0.2569	80.8	81.18		15.926	20.760	15.584	0.94	0.90	0.67	9.99
194	685	0.068	0.2608	80.8	81.11		16.166	21.072	14.438	0.87	0.89	0.68	10.00
195	588	0.067	0.2588	80.8	81.04		16.047	20.916	12.296	0.74	0.84	0.70	10.01
196	571	0.068	0.2608	80.7	80.98		16.165	21.074	12.042	0.72	0.80	0.71	10.03
197	535	0.067	0.2588	80.7	80.92		16.045	20.918	11.202	0.67	0.79	0.72	10.04
198	498	0.069	0.2627	80.6	80.86		16.281	21.230	10.579	0.63	0.73	0.73	10.05
199	348	0.069	0.2627	80.7	80.81		16.283	21.228	7.398	0.44	0.64	0.74	10.06
200	264	0.068	0.2608	80.7	80.77		16.165	21.074	5.557	0.33	0.56	0.75	10.06
201	270	0.070	0.2646	80.7	80.74		16.400	21.382	5.783	0.35	0.49	0.76	10.07
202		0.067	0.2588	80.3	80.68						0.44	0.76	
203		0.067	0.2588	80.4	80.64						0.37	0.77	
204		0.069	0.2627	80.5	80.61						0.34	0.78	
205	-238	0.069	0.2627	80.4	80.57		16.278	21.234	-5.050	-0.30	0.02	0.79	10.06
206	-156	0.068	0.2608	80.3	80.53		16.159	21.082	-3.285	-0.20	-0.25	0.80	10.06
207	37	0.069	0.2627	80.4	80.5		16.278	21.234	0.785	0.05	-0.15	0.80	10.06
208	131	0.068	0.2608	80.4	80.48		16.160	21.080	2.766	0.17	-0.07	0.79	10.06
209	182	0.068	0.2608	80.4	80.45		16.160	21.080	3.827	0.23	-0.01	0.79	10.07
210	481	0.069	0.2627	80.4	80.42		16.278	21.234	10.206	0.61	0.17	0.79	10.08
211	509	0.070	0.2646	80.4	80.39		16.396	21.387	10.880	0.65	0.34	0.79	10.09
212	684	0.067	0.2588	80.3	80.39		16.039	20.926	14.308	0.86	0.50	0.80	10.10
213	581	0.066	0.2569	80.3	80.38		15.919	20.769	12.070	0.72	0.62	0.81	10.11
214	741	0.068	0.2608	80.3	80.36		16.159	21.082	15.613	0.94	0.76	0.82	10.13
215	722	0.069	0.2627	80.1	80.33		16.274	21.240	15.338	0.92	0.82	0.83	10.14
216	659	0.067	0.2588	80.3	80.33		16.039	20.926	13.792	0.83	0.85	0.83	10.16
217	7387	0.069	0.2627	80.3	80.32		16.277	21.236	156.862	9.41	2.56	0.83	10.31
218	38757	0.068	0.2608	98.2	82.1		16.424	20.741	803.850	48.23	12.07	0.82	11.12
219	24914	0.068	0.2608	103.2	84.38		16.497	20.648	514.425	30.87	18.05	0.96	11.63
220	9419	0.067	0.2588	111.4	87.48		16.494	20.348	191.652	11.50	20.17	1.81	11.82
221	2942	0.065	0.2550	129	92.34		16.495	19.740	58.067	3.48	20.70	2.34	11.88
222	3000	0.065	0.2550	135.6	97.87		16.587	19.630	58.886	3.53	19.52	2.50	11.94
223	1650	0.065	0.2550	109.7	100.81		16.222	20.072	33.124	1.99	10.27	2.51	11.97
224	1162	0.066	0.2569	101.5	102.93		16.228	20.373	23.679	1.42	4.38	2.53	12.00
225	3210	0.067	0.2588	98.9	104.81		16.313	20.575	66.037	3.96	2.88	2.53	12.06
226	5034	0.067	0.2588	98.2	106.6		16.303	20.587	103.642	6.22	3.42	2.54	12.17
227	1183	0.066	0.2569	93.2	107.89		16.108	20.525	24.283	1.46	3.01	2.59	12.19
228	57	0.068	0.2608	90.6	107.13		16.312	20.883	1.191	0.07	2.63	2.69	12.19
229	-174	0.065	0.2550	89.6	105.77		15.933	20.436	-3.552	-0.21	2.30	2.70	12.19
230	-217	0.067	0.2588	88.9	103.52		16.166	20.761	-4.508	-0.27	1.45	2.70	12.19
231	-210	0.067	0.2588	89	99.52		16.168	20.759	-4.369	-0.26	0.16	2.68	12.18
232	-181	0.066	0.2569	88.5	94.81		16.039	20.613	-3.737	-0.22	-0.18	2.67	12.18
233	-151	0.068	0.2608	88.6	92.7		16.282	20.921	-3.153	-0.19	-0.23	2.66	12.17
234	-156	0.066	0.2569	88.6	91.41		16.041	20.611	-3.212	-0.19	-0.23	2.64	12.17
235	-89	0.067	0.2588	88.7	90.39		16.163	20.765	-1.856	-0.11	-0.20	2.63	12.17
236	22	0.067	0.2588	88.8	89.45		16.165	20.763	0.459	0.03	-0.14	2.62	12.17
237	134	0.069	0.2627	88.6	88.99		16.401	21.075	2.826	0.17	-0.06	2.60	12.17
238	438	0.068	0.2608	88.9	88.82		16.287	20.916	9.159	0.55	0.09	2.59	12.18
239	399	0.066	0.2569	89	88.76		16.047	20.604	8.214	0.49	0.23	2.58	12.19
240	573	0.067	0.2588	89	88.77		16.168	20.759	11.890	0.71	0.39	2.58	12.20
241	679	0.065	0.2550	89	88.77		15.925	20.447	13.881	0.83	0.55	2.58	12.22
242	842	0.066	0.2569	89	88.82		16.047	20.604	17.355	1.04	0.73	2.58	12.23
243	912	0.065	0.2550	89.2	88.88		15.928	20.444	18.638	1.12	0.84	2.58	12.25
244	973	0.065	0.2550	89.1	88.93		15.926	20.445	19.887	1.19	0.98	2.59	12.27
245	926	0.065	0.2550	89.3	88.99		15.929	20.442	18.929	1.14	1.06	2.60	12.29
246	753	0.065	0.2550	89.4	89.05		15.931	20.440	15.382	0.92	1.08	2.61	12.31
247	912	0.065	0.2550	89.4	89.13		15.931	20.440	18.641	1.12	1.10	2.61	12.32
248	1355	0.065	0.2550	89.3	89.17		15.929	20.442	27.693	1.66	1.21	2.61	12.35
249	999	0.067	0.2588	89.5	89.22		16.175	20.750	20.738	1.24	1.22	2.62	12.37
250	834	0.067	0.2588	89.7	89.29		16.178	20.746	17.305	1.04	1.20	2.63	12.39
251	596	0.067	0.2588	89.7	89.36		16.178	20.746	12.366	0.74	1.16	2.63	12.40
252	721	0.067	0.2588	89.8	89.44		16.180	20.744	14.955	0.90	1.12	2.64	12.42
253	744	0.065	0.2550	89.9	89.51		15.938	20.430	15.193	0.91	0.97	2.63	12.43
254	984	0.065	0.2550	89.9	89.59		15.938	20.430	20.101	1.21	0.96	2.64	12.45
255	973	0.067	0.2588	90.1	89.67		16.184	20.739	20.184	1.21	0.99	2.64	12.47
256	1243	0.067	0.2588	90.3	89.76		16.187	20.735	25.765	1.55	1.15	2.65	12.50
257	1711	0.066	0.2569	90.3	89.85		16.066	20.580	35.204	2.11	1.40	2.66	12.53
258	2130	0.067	0.2588	90.7	89.99		16.193	20.727	44.146	2.65	1.74	2.67	12.58
259	1351	0.067	0.2588	90.8	90.12		16.194	20.725	28.010	1.68	1.84	2.70	12.61
260	1519	0.065	0.2550	91.1	90.26		15.955	20.408	31.009	1.86	1.97	2.75	12.64

Run 1 TEOM Data

261	1369	0.067	0.2588	91.1	90.4	16.199	20.720	28.364	1.70	2.00	2.77	12.67
262	1658	0.068	0.2608	91.2	90.54	16.321	20.872	34.595	2.08	1.99	2.75	12.70
263	1392	0.067	0.2588	91.4	90.69	16.203	20.714	28.832	1.73	1.81	2.74	12.73
264	1363	0.067	0.2588	91.7	90.87	16.208	20.709	28.235	1.69	1.81	2.72	12.76
265	2365	0.068	0.2608	91.7	91.03	16.328	20.862	49.331	2.96	2.03	2.76	12.81
266	2159	0.066	0.2569	91.8	91.18	16.088	20.552	44.365	2.66	2.22	2.79	12.85
267	2331	0.067	0.2588	92.1	91.36	16.213	20.701	48.261	2.90	2.39	2.84	12.90
268	2871	0.065	0.2550	92.1	91.5	15.970	20.390	58.546	3.51	2.74	2.89	12.96
269	2809	0.065	0.2550	92.4	91.66	15.974	20.384	57.263	3.44	3.09	2.93	13.01
270	2962	0.066	0.2569	92.3	91.78	16.095	20.542	60.843	3.65	3.23	2.98	13.08
271	2838	0.065	0.2550	92.5	91.92	15.975	20.382	57.837	3.47	3.39	3.03	13.13
272	2140	0.066	0.2569	92.7	92.07	16.101	20.535	43.944	2.64	3.34	3.08	13.18
273	2908	0.066	0.2569	92.9	92.22	16.104	20.531	59.710	3.58	3.36	3.12	13.24
274	3351	0.065	0.2550	93.1	92.36	15.984	20.371	68.261	4.10	3.49	3.15	13.31
275	3270	0.065	0.2550	93.3	92.52	15.987	20.368	66.598	4.00	3.56	3.20	13.37
276	3382	0.065	0.2550	93.7	92.71	15.993	20.360	68.866	4.13	3.69	3.26	13.44
277	3424	0.067	0.2588	93.9	92.89	16.240	20.667	70.764	4.25	4.01	3.16	13.51
278	3097	0.068	0.2608	93.8	93.06	16.359	20.823	64.492	3.87	4.07	2.40	13.58
279	2958	0.065	0.2550	93.9	93.21	15.996	20.356	60.217	3.61	3.97	1.94	13.64
280	3206	0.064	0.2530	94.1	93.39	15.875	20.196	64.757	3.89	3.95	1.81	13.70
281	2829	0.066	0.2569	94.2	93.56	16.123	20.507	58.022	3.48	3.82	1.81	13.76
282	3406	0.065	0.2550	94.3	93.72	16.001	20.349	69.311	4.16	3.80	1.82	13.83
283	3647	0.065	0.2550	94.4	93.87	16.003	20.347	74.199	4.45	3.92	1.85	13.90
284	2337	0.065	0.2550	94.5	94.01	16.004	20.345	47.548	2.85	3.77	1.89	13.95
285	1500	0.066	0.2569	94.4	94.12	16.126	20.503	30.745	1.84	3.36	1.90	13.98
286	1231	0.066	0.2569	94.2	94.17	16.123	20.507	25.254	1.52	2.96	1.84	14.01
287	1011	0.065	0.2550	94.4	94.22	16.003	20.347	20.564	1.23	2.38	1.85	14.03
288	906	0.065	0.2550	94.4	94.28	16.003	20.347	18.425	1.11	1.71	1.88	14.05
289	1043	0.067	0.2588	94.2	94.31	16.244	20.662	21.551	1.29	1.40	1.90	14.07
290	948	0.065	0.2550	94.2	94.32	16.000	20.351	19.285	1.16	1.26	1.92	14.09
291	881	0.065	0.2550	94.2	94.32	16.000	20.351	17.938	1.08	1.17	1.95	14.10
292	876	0.067	0.2588	94	94.29	16.241	20.665	18.110	1.09	1.14	1.97	14.12
293	900	0.065	0.2550	94.1	94.26	15.999	20.353	18.313	1.10	1.14	2.00	14.14
294	903	0.065	0.2550	93.8	94.19	15.994	20.358	18.376	1.10	1.10	2.02	14.16
295	959	0.066	0.2569	93.9	94.14	16.118	20.512	19.676	1.18	1.11	2.04	14.18
296	1005	0.066	0.2569	93.9	94.11	16.118	20.512	20.612	1.24	1.14	2.06	14.20
297	799	0.067	0.2588	93.8	94.05	16.238	20.669	16.523	0.99	1.12	2.08	14.22
298	909	0.065	0.2550	93.6	93.97	15.991	20.362	18.508	1.11	1.12	2.09	14.23
299	930	0.065	0.2550	93.5	93.9	15.990	20.364	18.942	1.14	1.13	2.10	14.25
300	851	0.065	0.2550	93.7	93.85	15.993	20.360	17.333	1.04	1.10	2.10	14.27
301	943	0.065	0.2550	93.6	93.79	15.991	20.362	19.197	1.15	1.09	2.11	14.29
302	990	0.065	0.2550	93.5	93.74	15.990	20.364	20.168	1.21	1.13	2.11	14.31
303	1147	0.066	0.2569	93.4	93.67	16.111	20.522	23.529	1.41	1.19	2.11	14.33
304	1106	0.066	0.2569	93.5	93.64	16.112	20.520	22.695	1.36	1.24	2.11	14.36
305	765	0.065	0.2550	93.4	93.59	15.988	20.366	15.581	0.93	1.21	2.11	14.37
306	713	0.065	0.2550	93.1	93.51	15.984	20.371	14.516	0.87	1.16	2.12	14.39
307	675	0.068	0.2608	93	93.43	16.347	20.838	14.058	0.84	1.08	2.12	14.40
308	681	0.065	0.2550	92.9	93.36	15.981	20.375	13.879	0.83	0.97	2.10	14.41
309	719	0.065	0.2550	93.1	93.32	15.984	20.371	14.647	0.88	0.87	2.10	14.43
310	833	0.065	0.2550	92.8	93.23	15.980	20.377	16.978	1.02	0.89	2.09	14.45
311	791	0.067	0.2588	92.5	93.12	16.219	20.694	16.360	0.98	0.91	2.10	14.46
312	810	0.065	0.2550	92.7	93.04	15.978	20.379	16.500	0.99	0.94	2.10	14.48
313	997	0.066	0.2569	92.5	92.95	16.098	20.538	20.478	1.23	1.02	2.10	14.50
314	921	0.065	0.2550	92.4	92.84	15.974	20.384	18.767	1.13	1.07	2.10	14.52
315	1110	0.065	0.2550	92.5	92.75	15.975	20.382	22.630	1.36	1.14	2.10	14.54
316	841	0.068	0.2608	92.3	92.67	16.337	20.851	17.528	1.05	1.15	2.09	14.56
317	550	0.065	0.2550	92.4	92.61	15.974	20.384	11.203	0.67	1.09	2.08	14.57
318	766	0.067	0.2588	92.4	92.56	16.218	20.695	15.850	0.95	1.03	2.05	14.59
319	558	0.065	0.2550	92.1	92.46	15.970	20.390	11.383	0.68	0.94	2.03	14.60
320	508	0.065	0.2550	91.8	92.36	15.965	20.395	10.360	0.62	0.80	2.02	14.61
321	476	0.068	0.2608	91.8	92.29	16.330	20.861	9.927	0.60	0.70	2.00	14.62
322	410	0.066	0.2569	91.7	92.19	16.086	20.553	8.420	0.51	0.67	1.97	14.63
323	349	0.067	0.2588	91.4	92.08	16.203	20.714	7.235	0.43	0.57	1.95	14.63
324	401	0.065	0.2550	91.3	91.97	15.958	20.404	8.186	0.49	0.53	1.93	14.64
325	180	0.065	0.2550	91	91.82	15.954	20.410	3.684	0.22	0.45	1.89	14.64
326	322	0.065	0.2550	90.8	91.67	15.951	20.414	6.579	0.39	0.41	1.85	14.65
327	182	0.065	0.2550	90.8	91.51	15.951	20.414	3.721	0.22	0.35	1.81	14.65
328	78	0.065	0.2550	90.5	91.32	15.946	20.419	1.596	0.10	0.29	1.75	14.66
329	116	0.066	0.2569	90.2	91.13	16.064	20.581	2.387	0.14	0.22	1.70	14.66
330	139	0.065	0.2550	90.1	90.96	15.941	20.427	2.849	0.17	0.21	1.63	14.66
331	48	0.065	0.2550	89.9	90.77	15.938	20.430	0.978	0.06	0.14	1.58	14.66
332	158	0.065	0.2550	89.7	90.57	15.935	20.434	3.229	0.19	0.13	1.53	14.67
333	133	0.068	0.2608	89.5	90.38	16.296	20.904	2.783	0.17	0.15	1.47	14.67
334	130	0.068	0.2608	89.3	90.18	16.293	20.908	2.710	0.16	0.15	1.41	14.67
335	265	0.067	0.2588	89.2	90	16.171	20.756	5.504	0.33	0.18	1.34	14.68
336	353	0.066	0.2569	89.1	89.83	16.048	20.602	7.268	0.44	0.26	1.27	14.68
337	205	0.067	0.2588	89.1	89.66	16.169	20.758	4.261	0.26	0.27	1.20	14.69
338	146	0.066	0.2569	88.9	89.5	16.045	20.606	3.012	0.18	0.27	1.15	14.69
339	194	0.066	0.2569	88.3	89.31	16.037	20.617	3.999	0.24	0.29	1.09	14.70
340	79	0.067	0.2588	88	89.1	16.153	20.778	1.635	0.10	0.24	1.02	14.70
341	154	0.066	0.2569	87.7	88.88	16.028	20.628	3.186	0.19	0.19	0.97	14.70
342	235	0.067	0.2588	87.5	88.66	16.146	20.788	4.879	0.29	0.20	0.90	14.70
343	52	0.066	0.2569	87.4	88.45	16.023	20.634	1.077	0.06	0.18	0.82	14.71
344	8	0.065	0.2550	87	88.22	15.896	20.485	0.167	0.01	0.13	0.78	14.71
345	45	0.067	0.2588	86.8	87.98	16.135	20.801	0.936	0.06	0.12	0.75	14.71
346	35	0.068	0.2608	86.6	87.73	16.252	20.960	0.726	0.04	0.09	0.72	14.71
347	43	0.066	0.2569	86.4	87.46	16.009	20.653	0.880	0.05	0.05	0.70	14.71
348	59	0.065	0.2550	86.3	87.2	15.886	20.498	1.205	0.07	0.05	0.69	14.71

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349	34	0.066	0.2569	86	86.97		16.003	20.661	0.692	0.04	0.05	0.66	14.71
350	-65	0.067	0.2588	85.8	86.75		16.121	20.820	-1.360	-0.08	0.03	0.65	14.71
351	-51	0.066	0.2569	85.7	86.55		15.998	20.666	-1.059	-0.06	0.00	0.63	14.71
352	14	0.065	0.2550	85.6	86.36		15.875	20.511	0.292	0.02	0.00	0.61	14.71
353	-2	0.067	0.2588	85.4	86.16		16.115	20.828	-0.037	0.00	-0.02	0.59	14.71
354	32	0.067	0.2588	85.2	85.98		16.112	20.832	0.666	0.04	-0.02	0.57	14.71
355	86	0.068	0.2608	84.9	85.79		16.227	20.992	1.800	0.11	0.02	0.55	14.71
356	53	0.068	0.2608	84.7	85.6		16.224	20.996	1.105	0.07	0.05	0.53	14.71
357	-7	0.068	0.2608	84.6	85.42		16.223	20.998	-0.150	-0.01	0.04	0.51	14.71
358	52	0.066	0.2569	84.3	85.22		15.978	20.693	1.081	0.06	0.05	0.49	14.71
359	91	0.068	0.2608	84.2	85.04		16.217	21.006	1.904	0.11	0.07	0.47	14.71
360	26	0.068	0.2608	84.2	84.88		16.217	21.006	0.556	0.03	0.05	0.46	14.72
361	73	0.069	0.2627	83.9	84.7		16.331	21.166	1.551	0.09	0.06	0.44	14.72
362	46	0.067	0.2588	83.8	84.52		16.091	20.859	0.953	0.06	0.07	0.42	14.72
363	60	0.069	0.2627	83.5	84.33		16.325	21.173	1.280	0.08	0.07	0.40	14.72
364	37	0.068	0.2608	83.3	84.14		16.203	21.023	0.785	0.05	0.06	0.37	14.72
365	64	0.068	0.2608	83.1	83.96		16.200	21.027	1.354	0.08	0.07	0.36	14.72
366	49	0.068	0.2608	83	83.79		16.199	21.029	1.031	0.06	0.06	0.35	14.72
367	40	0.068	0.2608	82.8	83.61		16.196	21.033	0.847	0.05	0.06	0.33	14.72
368	93	0.067	0.2588	82.8	83.46		16.076	20.878	1.942	0.12	0.07	0.32	14.73
369	40	0.067	0.2588	82.6	83.3		16.073	20.882	0.842	0.05	0.07	0.30	14.73
370	16	0.066	0.2569	82.4	83.12		15.950	20.729	0.336	0.02	0.06	0.29	14.73
371	107	0.067	0.2588	82.2	82.95		16.067	20.889	2.239	0.13	0.07	0.27	14.73
372	25	0.068	0.2608	82.2	82.79		16.187	21.045	0.520	0.03	0.07	0.26	14.73
373	68	0.069	0.2627	82.2	82.66		16.305	21.199	1.437	0.09	0.06	0.24	14.73
374	37	0.070	0.2646	82	82.53		16.420	21.356	0.794	0.05	0.06	0.22	14.73
375	77	0.068	0.2608	81.9	82.41		16.182	21.051	1.629	0.10	0.08	0.20	14.73
376	120	0.069	0.2627	81.9	82.3		16.301	21.205	2.546	0.15	0.08	0.18	14.74
377	54	0.069	0.2627	81.8	82.2		16.299	21.207	1.153	0.07	0.09	0.17	14.74
378	61	0.070	0.2646	81.7	82.09		16.416	21.362	1.302	0.08	0.09	0.16	14.74
379	132	0.068	0.2608	81.5	81.98		16.176	21.058	2.776	0.17	0.11	0.14	14.74
380	157	0.070	0.2646	81.5	81.89		16.413	21.366	3.362	0.20	0.13	0.14	14.74
381	76	0.068	0.2608	81.4	81.81		16.175	21.060	1.592	0.10	0.12	0.13	14.75
382	153	0.069	0.2627	81.1	81.7		16.289	21.220	3.252	0.20	0.15	0.12	14.75
383	113	0.069	0.2627	81	81.58		16.287	21.222	2.406	0.14	0.16	0.12	14.75
384	148	0.070	0.2646	80.9	81.47		16.404	21.378	3.155	0.19	0.17	0.11	14.75
385	162	0.069	0.2627	80.9	81.37		16.286	21.224	3.438	0.21	0.17	0.11	14.76
386	156	0.070	0.2646	80.8	81.26		16.402	21.380	3.346	0.20	0.19	0.11	14.76
387	254	0.069	0.2627	80.7	81.15		16.283	21.228	5.392	0.32	0.21	0.11	14.77
388	208	0.069	0.2627	80.6	81.04		16.281	21.230	4.411	0.26	0.24	0.11	14.77
389	190	0.070	0.2646	80.6	80.95		16.399	21.384	4.071	0.24	0.25	0.11	14.78
390	178	0.068	0.2608	80.4	80.84		16.160	21.080	3.750	0.23	0.25	0.11	14.78
391	206	0.070	0.2646	80.3	80.73		16.394	21.389	4.415	0.26	0.26	0.12	14.78
392	242	0.068	0.2608	80.4	80.66		16.160	21.080	5.095	0.31	0.26	0.12	14.79
393	351	0.068	0.2608	80.3	80.59		16.159	21.082	7.398	0.44	0.30	0.12	14.80
394	329	0.068	0.2608	80.2	80.52		16.157	21.084	6.934	0.42	0.33	0.12	14.80
395	251	0.068	0.2608	80.2	80.45		16.157	21.084	5.302	0.32	0.35	0.12	14.81
396	282	0.068	0.2608	80.2	80.39		16.157	21.084	5.944	0.36	0.37	0.12	14.81
397	323	0.069	0.2627	80.1	80.33		16.274	21.240	6.856	0.41	0.39	0.12	14.82
398	371	0.068	0.2608	80	80.27		16.154	21.088	7.829	0.47	0.39	0.13	14.83
399	401	0.069	0.2627	79.9	80.2		16.271	21.244	8.510	0.51	0.41	0.13	14.84
400	419	0.068	0.2608	79.9	80.15		16.153	21.090	8.844	0.53	0.46	0.14	14.85
401	358	0.070	0.2646	79.8	80.1		16.387	21.399	7.657	0.46	0.48	0.14	14.85
402	827	0.069	0.2627	79.7	80.03		16.268	21.248	17.579	1.05	0.61	0.15	14.87
403	904	0.068	0.2608	79.6	79.96		16.148	21.095	19.070	1.14	0.74	0.15	14.89
404	1293	0.069	0.2627	79.6	79.9		16.266	21.250	27.484	1.65	0.97	0.17	14.92
405	1181	0.069	0.2627	79.5	79.83		16.265	21.252	25.092	1.51	1.16	0.19	14.94
406	1193	0.070	0.2646	79.5	79.76		16.382	21.405	25.538	1.53	1.38	0.22	14.97
407	1522	0.067	0.2588	79.5	79.7		16.027	20.942	31.877	1.91	1.55	0.24	15.00
408	1001	0.068	0.2608	79.3	79.63		16.144	21.101	21.125	1.27	1.57	0.27	15.02
409	440	0.068	0.2608	79.2	79.56		16.142	21.103	9.275	0.56	1.35	0.30	15.03
410	227	0.067	0.2588	79.1	79.48		16.021	20.949	4.760	0.29	1.11	0.32	15.04
411	103	0.068	0.2608	79	79.4		16.139	21.107	2.167	0.13	0.83	0.33	15.04
412	41	0.068	0.2608	78.9	79.32		16.138	21.109	0.867	0.05	0.46	0.34	15.04
413	-5	0.067	0.2588	78.8	79.24		16.017	20.955	-0.108	-0.01	0.20	0.34	15.04
414	-38	0.070	0.2646	78.7	79.15		16.370	21.421	-0.813	-0.05	0.08	0.34	15.04
415	-16	0.068	0.2608	78.6	79.06		16.133	21.115	-0.337	-0.02	0.02	0.34	15.04
416	-36	0.069	0.2627	78.6	78.97		16.251	21.270	-0.773	-0.05	-0.01	0.34	15.04
417	-18	0.068	0.2608	78.6	78.88		16.133	21.115	-0.381	-0.02	-0.03	0.34	15.04
418	-54	0.069	0.2627	78.5	78.8		16.250	21.272	-1.143	-0.07	-0.04	0.33	15.03
419	25	0.069	0.2627	78.4	78.72		16.248	21.274	0.538	0.03	-0.03	0.33	15.04
420	3	0.067	0.2588	78.3	78.64		16.010	20.965	0.065	0.00	-0.02	0.33	15.04
421	47	0.067	0.2588	78.2	78.56		16.008	20.967	0.976	0.06	0.00	0.33	15.04
422	-32	0.069	0.2627	78.2	78.49		16.245	21.278	-0.672	-0.04	0.00	0.33	15.04
423	11	0.070	0.2646	78.1	78.42		16.361	21.433	0.229	0.01	0.01	0.33	15.04
424	11	0.070	0.2646	78	78.35		16.359	21.435	0.232	0.01	0.01	0.33	15.04
425	8	0.070	0.2646	77.9	78.28		16.358	21.437	0.163	0.01	0.01	0.33	15.04
426	73	0.069	0.2627	77.8	78.2		16.239	21.286	1.549	0.09	0.02	0.32	15.04
427	10	0.068	0.2608	77.8	78.12		16.121	21.131	0.211	0.01	0.03	0.32	15.04
428	-45	0.067	0.2588	77.7	78.04		16.001	20.977	-0.943	-0.06	0.01	0.32	15.04
429	-25	0.069	0.2627	77.7	77.97		16.238	21.287	-0.529	-0.03	0.01	0.32	15.04
430	-31	0.068	0.2608	77.5	77.89		16.117	21.137	-0.664	-0.04	0.00	0.32	15.04
431	-12	0.067	0.2588	77.5	77.82		15.998	20.981	-0.253	-0.02	-0.03	0.32	15.04
432	-18	0.068	0.2608	77.4	77.74		16.115	21.139	-0.374	-0.02	-0.03	0.32	15.04
433	5	0.069	0.2627	77.4	77.67		16.233	21.293	0.114	0.01	-0.02	0.32	15.04
434	64	0.068	0.2608	77.3	77.6		16.114	21.141	1.345	0.08	0.00	0.31	15.04
435	28	0.068	0.2608	77.4	77.55		16.115	21.139	0.596	0.04	0.02	0.31	15.04
436	22	0.067	0.2588	77.2	77.49		15.993	20.986	0.458	0.03	0.03	0.31	15.04

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437	-25	0.067	0.2588	77.2	77.43	15.993	20.986	-0.518	-0.03	0.02	0.31	15.04
438	-23	0.070	0.2646	77.2	77.38	16.347	21.451	-0.489	-0.03	0.02	0.31	15.04
439	-70	0.069	0.2627	77	77.31	16.227	21.301	-1.484	-0.09	-0.02	0.31	15.04
440	-13	0.070	0.2646	76.9	77.25	16.343	21.457	-0.278	-0.02	-0.03	0.30	15.04
441	-2	0.069	0.2627	76.9	77.19	16.226	21.303	-0.043	0.00	-0.03	0.30	15.04
442	25	0.069	0.2627	76.9	77.14	16.226	21.303	0.532	0.03	-0.02	0.30	15.04
443	30	0.069	0.2627	76.9	77.09	16.226	21.303	0.631	0.04	-0.01	0.29	15.04
444	-15	0.068	0.2608	76.8	77.04	16.106	21.150	-0.321	-0.02	0.01	0.29	15.04
445	-18	0.068	0.2608	76.8	76.98	16.106	21.150	-0.375	-0.02	0.01	0.29	15.04
446	-41	0.069	0.2627	76.8	76.94	16.224	21.305	-0.873	-0.05	0.00	0.28	15.03
447	-34	0.068	0.2608	76.7	76.89	16.105	21.152	-0.714	-0.04	-0.02	0.28	15.03
448	20	0.070	0.2646	76.7	76.84	16.340	21.461	0.428	0.03	-0.02	0.27	15.03
449	-16	0.068	0.2608	76.6	76.8	16.103	21.154	-0.332	-0.02	-0.02	0.27	15.03
450	-21	0.070	0.2646	76.6	76.77	16.338	21.463	-0.456	-0.03	-0.02	0.26	15.03
451	1	0.068	0.2608	76.6	76.74	16.103	21.154	0.017	0.00	-0.01	0.26	15.03
452	-31	0.070	0.2646	76.6	76.71	16.338	21.463	-0.660	-0.04	-0.01	0.25	15.03
453	-74	0.069	0.2627	76.7	76.69	16.223	21.307	-1.572	-0.09	-0.04	0.25	15.03
454	-141	0.070	0.2646	76.6	76.67	16.338	21.463	-3.032	-0.18	-0.07	0.24	15.03
455	-223	0.069	0.2627	76.7	76.66	16.223	21.307	-4.747	-0.28	-0.12	0.23	15.02
456	-187	0.070	0.2646	76.6	76.64	16.338	21.463	-4.023	-0.24	-0.17	0.22	15.02
457	-205	0.070	0.2646	76.5	76.62	16.337	21.465	-4.390	-0.26	-0.21	0.21	15.02
458	-236	0.070	0.2646	76.5	76.6	16.337	21.465	-5.075	-0.30	-0.26	0.20	15.01
459	-182	0.070	0.2646	76.4	76.58	16.335	21.467	-3.915	-0.23	-0.27	0.18	15.01
460	-179	0.070	0.2646	76.3	76.55	16.334	21.469	-3.843	-0.23	-0.25	0.17	15.00
461	-203	0.069	0.2627	76.3	76.52	16.217	21.315	-4.332	-0.26	-0.26	0.16	15.00
462	-163	0.070	0.2646	76.3	76.49	16.334	21.469	-3.503	-0.21	-0.25	0.14	14.99
463	-187	0.069	0.2627	76.2	76.44	16.215	21.317	-3.982	-0.24	-0.23	0.11	14.99
464	-188	0.069	0.2627	76.3	76.41	16.217	21.315	-4.005	-0.24	-0.24	0.08	14.99
465	-144	0.069	0.2627	76.3	76.37	16.217	21.315	-3.062	-0.18	-0.23	0.05	14.98
466	-134	0.070	0.2646	76.2	76.33	16.332	21.471	-2.880	-0.17	-0.21	0.02	14.98
467	-100	0.069	0.2627	76.2	76.3	16.215	21.317	-2.142	-0.13	-0.19	-0.02	14.98
468	-87	0.069	0.2627	76.2	76.27	16.215	21.317	-1.851	-0.11	-0.17	-0.04	14.98
469	-66	0.070	0.2646	76.1	76.24	16.331	21.473	-1.423	-0.09	-0.14	-0.05	14.98
470	-122	0.070	0.2646	76.2	76.23	16.332	21.471	-2.616	-0.16	-0.13	-0.06	14.97
471	-142	0.070	0.2646	76.1	76.21	16.331	21.473	-3.050	-0.18	-0.13	-0.06	14.97
472	-98	0.070	0.2646	76.1	76.19	16.331	21.473	-2.095	-0.13	-0.13	-0.07	14.97
473	-62	0.070	0.2646	76.1	76.18	16.331	21.473	-1.341	-0.08	-0.13	-0.07	14.97
474	-33	0.070	0.2646	76.1	76.16	16.331	21.473	-0.701	-0.04	-0.12	-0.07	14.97
475	-110	0.069	0.2627	76	76.13	16.212	21.321	-2.339	-0.14	-0.11	-0.07	14.96
476	-71	0.070	0.2646	76	76.11	16.329	21.475	-1.517	-0.09	-0.10	-0.07	14.96
477	-95	0.070	0.2646	75.9	76.08	16.328	21.477	-2.047	-0.12	-0.10	-0.08	14.96
478	-135	0.070	0.2646	75.9	76.05	16.328	21.477	-2.909	-0.17	-0.11	-0.08	14.96
479	-150	0.071	0.2665	75.9	76.03	16.444	21.630	-3.244	-0.19	-0.14	-0.08	14.95
480	-119	0.070	0.2646	75.8	75.99	16.326	21.479	-2.562	-0.15	-0.15	-0.08	14.95
481	-131	0.070	0.2646	75.8	75.96	16.326	21.479	-2.811	-0.17	-0.16	-0.09	14.95
482	-125	0.070	0.2646	75.8	75.93	16.326	21.479	-2.682	-0.16	-0.17	-0.09	14.95
483	-130	0.070	0.2646	75.8	75.9	16.326	21.479	-2.790	-0.17	-0.17	-0.09	14.94
484	-165	0.070	0.2646	75.8	75.87	16.326	21.479	-3.545	-0.21	-0.17	-0.09	14.94
485	-116	0.070	0.2646	75.8	75.85	16.326	21.479	-2.491	-0.15	-0.17	-0.10	14.94
486	-142	0.070	0.2646	75.7	75.82	16.324	21.481	-3.056	-0.18	-0.17	-0.10	14.93
487	-114	0.070	0.2646	75.7	75.8	16.324	21.481	-2.445	-0.15	-0.17	-0.11	14.93
488	-103	0.070	0.2646	75.7	75.78	16.324	21.481	-2.207	-0.13	-0.16	-0.11	14.93
489	-59	0.070	0.2646	75.7	75.76	16.324	21.481	-1.276	-0.08	-0.14	-0.11	14.93
490	-73	0.070	0.2646	75.7	75.75	16.324	21.481	-1.558	-0.09	-0.13	-0.11	14.93
491	-78	0.070	0.2646	75.6	75.73	16.323	21.483	-1.673	-0.10	-0.11	-0.11	14.92
492	-58	0.070	0.2646	75.6	75.71	16.323	21.483	-1.236	-0.07	-0.10	-0.11	14.92
493	-85	0.070	0.2646	75.5	75.68	16.321	21.485	-1.835	-0.11	-0.09	-0.12	14.92
494	-84	0.070	0.2646	75.5	75.65	16.321	21.485	-1.814	-0.11	-0.10	-0.12	14.92
495	-113	0.070	0.2646	75.5	75.62	16.321	21.485	-2.434	-0.15	-0.11	-0.12	14.92
496	-92	0.070	0.2646	75.5	75.6	16.321	21.485	-1.973	-0.12	-0.11	-0.12	14.91
497	-84	0.069	0.2627	75.4	75.57	16.203	21.333	-1.800	-0.11	-0.12	-0.12	14.91
498	-73	0.069	0.2627	75.4	75.54	16.203	21.333	-1.558	-0.09	-0.11	-0.13	14.91
499	-9	0.070	0.2646	75.3	75.5	16.318	21.489	-0.186	-0.01	-0.10	-0.13	14.91
500	-57	0.071	0.2665	75.2	75.45	16.433	21.644	-1.225	-0.07	-0.08	-0.13	14.91
501	-112	0.070	0.2646	75.4	75.43	16.320	21.487	-2.397	-0.14	-0.09	-0.13	14.91
502	-104	0.070	0.2646	75.7	75.44	16.324	21.481	-2.230	-0.13	-0.09	-0.13	14.91
503	-130	0.069	0.2627	76	75.49	16.212	21.321	-2.774	-0.17	-0.11	-0.13	14.90
504	-72	0.070	0.2646	75.9	75.53	16.328	21.477	-1.552	-0.09	-0.12	-0.13	14.90
505	-89	0.070	0.2646	75.8	75.56	16.326	21.479	-1.904	-0.11	-0.13	-0.14	14.90
506	-67	0.070	0.2646	75.8	75.59	16.326	21.479	-1.440	-0.09	-0.12	-0.14	14.90
507	-104	0.070	0.2646	75.8	75.63	16.326	21.479	-2.233	-0.13	-0.12	-0.14	14.90
508	-109	0.070	0.2646	75.6	75.65	16.323	21.483	-2.335	-0.14	-0.11	-0.14	14.89
509	-121	0.070	0.2646	75.5	75.67	16.321	21.485	-2.598	-0.16	-0.13	-0.14	14.89
510	-82	0.070	0.2646	75.3	75.68	16.318	21.489	-1.772	-0.11	-0.12	-0.15	14.89
511	-93	0.070	0.2646	75.2	75.66	16.317	21.491	-2.004	-0.12	-0.13	-0.15	14.89
512	-61	0.071	0.2665	75.2	75.61	16.433	21.644	-1.323	-0.08	-0.12	-0.15	14.89
513	-90	0.070	0.2646	75.1	75.52	16.315	21.493	-1.939	-0.12	-0.12	-0.15	14.88
514	-70	0.070	0.2646	75.6	75.49	16.323	21.483	-1.494	-0.09	-0.10	-0.15	14.88
515	-102	0.070	0.2646	75.5	75.46	16.321	21.485	-2.193	-0.13	-0.11	-0.14	14.88
516	-69	0.070	0.2646	75.5	75.43	16.321	21.485	-1.493	-0.09	-0.10	-0.14	14.88
517	-112	0.070	0.2646	75.4	75.39	16.320	21.487	-2.411	-0.14	-0.11	-0.14	14.88
518	-67	0.070	0.2646	75.3	75.36	16.318	21.489	-1.436	-0.09	-0.11	-0.14	14.87
519	-21	0.070	0.2646	75.2	75.33	16.317	21.491	-0.454	-0.03	-0.10	-0.13	14.87
520	-79	0.068	0.2608	75.1	75.31	16.081	21.184	-1.679	-0.10	-0.09	-0.13	14.87
521	-163	0.068	0.2608	75	75.29	16.079	21.186	-3.455	-0.21	-0.11	-0.13	14.87
522	-41	0.070	0.2646	74.9	75.26	16.312	21.497	-0.892	-0.05	-0.09	-0.13	14.87
523	-90	0.069	0.2627	75.1	75.26	16.198	21.339	-1.921	-0.12	-0.10	-0.13	14.87
524	-47	0.069	0.2627	75.5	75.25	16.204	21.331	-1.002	-0.06	-0.11	-0.12	14.87

Run 1 TEOM Data

525	-44	0.070	0.2646	75.5	75.25		16.321	21.485	-0.950	-0.06	-0.10	-0.12	14.86
526	-32	0.070	0.2646	75.4	75.24		16.320	21.487	-0.686	-0.04	-0.07	-0.12	14.86
527	-35	0.070	0.2646	75.3	75.23		16.318	21.489	-0.754	-0.05	-0.06	-0.12	14.86
528	-70	0.069	0.2627	75.2	75.22		16.200	21.337	-1.487	-0.09	-0.06	-0.12	14.86
529	-27	0.069	0.2627	75	75.2		16.197	21.341	-0.566	-0.03	-0.05	-0.12	14.86
530	-33	0.069	0.2627	74.9	75.18		16.195	21.343	-0.703	-0.04	-0.05	-0.12	14.86
531	-15	0.070	0.2646	74.7	75.15		16.309	21.501	-0.330	-0.02	-0.05	-0.11	14.86
532	-53	0.070	0.2646	74.6	75.12		16.308	21.503	-1.139	-0.07	-0.05	-0.11	14.86
533	-29	0.069	0.2627	74.6	75.07		16.191	21.349	-0.611	-0.04	-0.04	-0.11	14.86
534	-135	0.070	0.2646	74.5	74.97		16.306	21.505	-2.900	-0.17	-0.07	-0.11	14.86
535	-27	0.067	0.2588	74.4	74.86		15.951	21.041	-0.566	-0.03	-0.07	-0.11	14.85
536	-32	0.069	0.2627	74.3	74.75		16.186	21.355	-0.687	-0.04	-0.07	-0.11	14.85
537	-17	0.069	0.2627	74.3	74.65		16.186	21.355	-0.365	-0.02	-0.06	-0.11	14.85
538	-66	0.070	0.2646	74.2	74.55		16.302	21.511	-1.429	-0.09	-0.07	-0.11	14.85
539	-47	0.068	0.2608	74.2	74.47		16.067	21.202	-0.997	-0.06	-0.05	-0.10	14.85
540	-51	0.069	0.2627	74.2	74.4		16.185	21.357	-1.093	-0.07	-0.05	-0.10	14.85
541	-102	0.070	0.2646	74.8	74.41		16.311	21.499	-2.191	-0.13	-0.07	-0.10	14.85
542	-12	0.070	0.2646	74.7	74.42		16.309	21.501	-0.256	-0.02	-0.07	-0.10	14.85
543	-44	0.070	0.2646	74.7	74.43		16.309	21.501	-0.954	-0.06	-0.07	-0.10	14.85
544	61	0.070	0.2646	74.7	74.45		16.309	21.501	1.302	0.08	-0.04	-0.09	14.85

WOOD STOVE TEST DATA PACKET
IDC / ASTM E2515



Run 2 Data Summary

Client:	SBI
Model:	Everest III
Job #:	23-241
Tracking #:	191
Test Date:	5/7/2024



Technician Signature

6/5/2024

Date

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: SBI
 Model: Everest III
 Run #: 2
 Test Start Time:

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Total Sampling Time (min): 578
 Recording Interval (min): 1

Meter Box γ Factor: 1.000 (A)
 Meter Box γ Factor: 1.003 (B)
 Meter Box γ Factor: - (C)
 Meter Box γ Factor: 1.013 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100%
 Date Flue Pipe Last Cleaned: 5/3/2024
 Test Fuel Scale Audit (lbs): 10.00
 Platform Scale Audit (lbs): 10.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.13	30.18	30.16
Relative Humidity (%)	32.4	29.1	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		71.833	ft ³

Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.000	cfm @	-7 in. Hg
(B)	0.000	0.000	cfm @	-8 in. Hg
(C)	-	-	cfm @	- in. Hg
(Ambient)	0.000	0.000	cfm @	-13 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.066	75
2	0.088	75
3	0.090	75
4	0.092	75
5	0.086	75
6	0.064	75
7	0.072	75
8	0.086	75
9	0.092	75
10	0.094	75
11	0.090	75
12	0.062	75
Center	0.094	75

Dilution Tunnel H₂O: 2.00 percent
 Tunnel Diameter: 12 inches
 Pitot Tube Cp: 0.99 [unitless]
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole
 Tunnel Area: 0.7854 ft²

V_{strav}: 18.97 ft/sec

V_{scnt}: 20.39 ft/sec

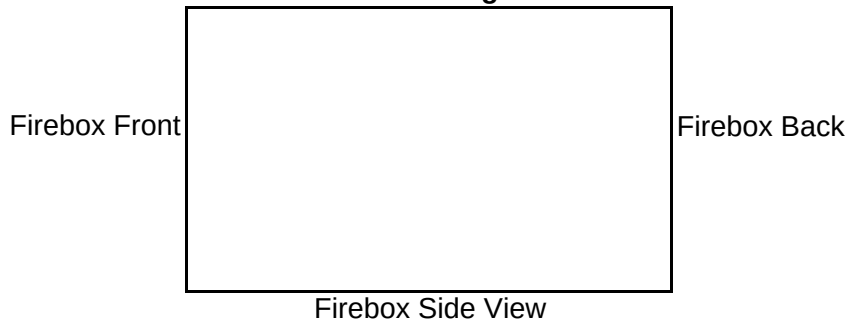
F_p: 0.931 [ratio]

Initial Tunnel Flow: 870.6 scf/min

Static Pressure: -0.290 in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type: D. Fir
 HHV (kJ/kg): 19,810
 %C: 48.73
 %H: 6.87
 %O: 43.9
 %Ash: 0.5
 MC (%DB): #DIV/0!

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	-0.249		0.090	0.01	67	-0.5		10.78		72	77	86	67
1	-0.127		0.089	0.97	67	-1.4	-	10.38	-0.40	81	337	85	67
2	0.019	0.146	0.086	0.95	67	-1.3	-	14.64	4.26	115	976	84	67
3	0.163	0.144	0.086	0.95	67	-1.3	-	9.13	-5.51	94	653	83	67
4	0.307	0.144	0.088	0.95	67	-1.1	-	8.73	-0.40	89	692	82	67
5	0.450	0.143	0.089	0.93	68	-1.1	-	8.38	-0.35	89	743	82	67
6	0.593	0.143	0.090	0.94	68	-1.1	-	8.10	-0.28	89	741	82	67
7	0.736	0.143	0.090	0.93	68	-1.0	-	7.85	-0.25	88	742	82	67
8	0.880	0.144	0.091	0.94	68	-1.0	-	7.57	-0.28	88	750	82	67
9	1.024	0.144	0.090	0.94	68	-1.1	-	7.31	-0.26	88	747	82	66
10	1.166	0.142	0.088	0.94	68	-1.2	105	7.05	-0.26	88	748	82	66
11	1.309	0.143	0.090	0.93	68	-1.2	-	6.77	-0.28	89	773	82	66
12	1.451	0.142	0.091	0.93	69	-1.2	-	6.50	-0.27	89	798	82	67
13	1.594	0.143	0.091	0.94	69	-1.1	-	6.25	-0.25	90	808	83	67
14	1.737	0.143	0.090	0.94	69	-1.2	-	6.01	-0.24	90	815	84	67
15	1.879	0.142	0.087	0.94	69	-1.1	-	5.76	-0.25	91	815	85	67
16	2.021	0.142	0.087	0.94	69	-1.2	-	5.54	-0.22	92	812	85	67
17	2.163	0.142	0.092	0.93	70	-1.3	-	5.31	-0.23	92	812	85	67
18	2.306	0.143	0.091	0.93	70	-1.1	-	5.10	-0.21	93	815	85	67
19	2.448	0.142	0.090	0.92	70	-1.2	-	4.88	-0.22	93	817	84	67
20	2.590	0.142	0.091	0.92	70	-1.2	107	4.65	-0.23	93	812	84	67
21	2.731	0.141	0.090	0.92	70	-1.2	-	4.45	-0.20	94	813	82	67
22	2.873	0.142	0.090	0.92	71	-1.3	-	4.24	-0.21	94	814	83	67
23	3.017	0.144	0.090	0.92	71	-1.3	-	4.04	-0.20	94	821	82	67
24	3.159	0.142	0.095	0.93	71	-1.2	-	3.83	-0.21	94	823	81	67
25	3.300	0.141	0.094	0.92	71	-1.3	-	3.62	-0.21	94	824	82	67
26	3.442	0.142	0.093	0.93	72	-1.2	-	3.41	-0.21	94	824	83	67
27	3.585	0.143	0.096	0.92	72	-1.2	-	3.22	-0.19	95	827	83	67
28	3.727	0.142	0.094	0.93	72	-1.2	-	21.39	18.17	106	756	84	68
29	3.868	0.141	0.094	0.93	72	-1.2	-	21.07	-0.32	99	855	85	68
30	4.009	0.141	0.093	0.91	72	-1.3	105	20.74	-0.33	97	897	85	68
31	4.151	0.142	0.093	0.93	73	-1.3	-	20.38	-0.36	98	948	85	68

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.294	0.143	0.093	0.93	73	-1.2	-	20.01	-0.37	100	971	84	67
33	4.435	0.141	0.094	0.92	73	-1.2	-	19.65	-0.36	101	998	84	68
34	4.576	0.141	0.093	0.91	74	-1.2	-	19.25	-0.40	101	1,009	84	68
35	4.718	0.142	0.092	0.91	74	-1.3	-	18.88	-0.37	102	1,029	83	68
36	4.860	0.142	0.093	0.93	74	-1.2	-	18.52	-0.36	102	1,041	83	68
37	5.001	0.141	0.095	0.92	74	-1.2	-	18.17	-0.35	103	1,049	83	68
38	5.142	0.141	0.093	0.92	74	-1.3	-	17.81	-0.36	103	1,054	82	68
39	5.284	0.142	0.091	0.91	74	-1.2	-	17.47	-0.34	104	1,057	83	68
40	5.427	0.143	0.093	0.92	75	-1.2	104	17.11	-0.36	104	1,060	83	68
41	5.568	0.141	0.092	0.92	75	-1.2	-	16.75	-0.36	105	1,064	84	68
42	5.709	0.141	0.095	0.91	75	-1.3	-	16.39	-0.36	105	1,067	84	68
43	5.850	0.141	0.093	0.91	75	-1.3	-	16.04	-0.35	105	1,072	84	68
44	5.993	0.143	0.091	0.91	76	-1.2	-	15.69	-0.35	106	1,071	84	68
45	6.133	0.140	0.093	0.91	76	-1.2	-	15.33	-0.36	106	1,074	83	68
46	6.274	0.141	0.093	0.90	76	-1.3	-	14.99	-0.34	107	1,074	82	68
47	6.416	0.142	0.092	0.90	76	-1.4	-	14.67	-0.32	108	1,076	82	69
48	6.558	0.142	0.092	0.90	76	-1.2	-	14.33	-0.34	108	1,078	82	69
49	6.699	0.141	0.092	0.91	76	-1.2	-	14.01	-0.32	107	1,079	82	69
50	6.840	0.141	0.091	0.91	77	-1.2	104	13.70	-0.31	107	1,077	83	69
51	6.981	0.141	0.091	0.91	77	-1.2	-	13.39	-0.31	107	1,070	84	69
52	7.124	0.143	0.094	0.91	77	-1.2	-	13.10	-0.29	107	1,059	84	69
53	7.264	0.140	0.095	0.92	77	-1.3	-	12.84	-0.26	104	1,023	85	69
54	7.405	0.141	0.095	0.91	77	-1.2	-	12.63	-0.21	101	963	86	69
55	7.547	0.142	0.094	0.92	78	-1.3	-	12.45	-0.18	100	924	85	69
56	7.690	0.143	0.095	0.90	78	-1.2	-	12.28	-0.17	99	894	84	69
57	7.831	0.141	0.094	0.92	78	-1.2	-	12.12	-0.16	98	871	83	69
58	7.972	0.141	0.095	0.92	78	-1.2	-	11.97	-0.15	97	852	83	69
59	8.113	0.141	0.093	0.91	78	-1.3	-	11.82	-0.15	97	837	83	69
60	8.257	0.144	0.093	0.93	78	-1.3	104	11.67	-0.15	96	822	83	69
61	8.398	0.141	0.095	0.92	78	-1.2	-	11.52	-0.15	96	810	82	69
62	8.539	0.141	0.095	0.92	79	-1.2	-	11.37	-0.15	95	801	83	69
63	8.681	0.142	0.095	0.92	79	-1.2	-	11.23	-0.14	95	793	83	69

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>2</u>	Technician: <u>AK</u>
	Date: <u>5/7/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	8.824	0.143	0.093	0.91	79	-1.2	-	11.08	-0.15	94	785	84	69
65	8.966	0.142	0.097	0.91	79	-1.3	-	10.93	-0.15	94	779	84	69
66	9.107	0.141	0.094	0.92	79	-1.3	-	10.78	-0.15	94	775	84	69
67	9.248	0.141	0.094	0.91	80	-1.2	-	10.63	-0.15	93	774	83	69
68	9.391	0.143	0.095	0.92	79	-1.2	-	10.47	-0.16	93	776	83	69
69	9.533	0.142	0.096	0.92	80	-1.3	-	10.32	-0.15	93	778	83	69
70	9.675	0.142	0.097	0.91	80	-1.3	102	10.17	-0.15	93	780	83	69
71	9.816	0.141	0.095	0.91	80	-1.3	-	10.01	-0.16	93	781	83	69
72	9.958	0.142	0.097	0.91	80	-1.3	-	9.87	-0.14	93	773	84	69
73	10.102	0.144	0.096	0.92	80	-1.2	-	9.73	-0.14	92	765	84	69
74	10.243	0.141	0.094	0.92	80	-1.2	-	9.59	-0.14	92	758	85	69
75	10.385	0.142	0.095	0.92	80	-1.2	-	9.46	-0.13	92	753	86	69
76	10.526	0.141	0.096	0.91	80	-1.4	-	9.33	-0.13	92	748	87	69
77	10.669	0.143	0.096	0.92	81	-1.3	-	9.20	-0.13	92	744	85	69
78	10.812	0.143	0.096	0.91	81	-1.3	-	9.08	-0.12	91	739	85	70
79	10.953	0.141	0.096	0.91	81	-1.4	-	8.96	-0.12	91	733	84	70
80	11.095	0.142	0.097	0.93	81	-1.3	100	8.84	-0.12	91	730	84	70
81	11.237	0.142	0.097	0.92	81	-1.3	-	8.72	-0.12	91	726	83	69
82	11.380	0.143	0.096	0.92	81	-1.3	-	8.60	-0.12	90	723	83	69
83	11.522	0.142	0.096	0.92	81	-1.3	-	8.48	-0.12	90	720	83	69
84	11.664	0.142	0.095	0.92	81	-1.3	-	8.36	-0.12	90	721	82	69
85	11.806	0.142	0.097	0.91	81	-1.3	-	8.24	-0.12	90	719	82	69
86	11.949	0.143	0.097	0.91	81	-1.2	-	8.12	-0.12	90	720	83	69
87	12.092	0.143	0.097	0.92	81	-1.4	-	8.00	-0.12	90	722	82	69
88	12.233	0.141	0.094	0.91	81	-1.3	-	7.88	-0.12	90	722	84	69
89	12.375	0.142	0.096	0.91	82	-1.3	-	7.74	-0.14	90	726	84	70
90	12.517	0.142	0.095	0.92	82	-1.3	100	7.63	-0.11	90	726	84	70
91	12.661	0.144	0.095	0.91	82	-1.3	-	7.50	-0.13	90	729	84	70
92	12.803	0.142	0.097	0.92	82	-1.2	-	7.39	-0.11	90	724	83	70
93	12.945	0.142	0.096	0.92	82	-1.3	-	7.28	-0.11	90	723	83	70
94	13.087	0.142	0.095	0.92	82	-1.4	-	7.17	-0.11	90	722	84	70
95	13.229	0.142	0.098	0.91	82	-1.4	-	7.06	-0.11	89	714	83	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	13.373	0.144	0.095	0.94	82	-1.2	-	6.95	-0.11	89	711	84	70
97	13.515	0.142	0.096	0.91	82	-1.3	-	6.84	-0.11	89	714	84	70
98	13.656	0.141	0.096	0.92	82	-1.4	-	6.72	-0.12	89	717	85	70
99	13.798	0.142	0.095	0.91	82	-1.4	-	6.61	-0.11	89	713	86	70
100	13.941	0.143	0.095	0.92	82	-1.3	101	6.51	-0.10	89	707	86	70
101	14.084	0.143	0.096	0.93	82	-1.3	-	6.41	-0.10	89	703	85	70
102	14.226	0.142	0.096	0.92	83	-1.3	-	6.31	-0.10	89	699	84	70
103	14.368	0.142	0.094	0.92	83	-1.4	-	6.22	-0.09	89	696	84	70
104	14.510	0.142	0.097	0.91	83	-1.4	-	6.13	-0.09	88	691	83	70
105	14.654	0.144	0.096	0.91	83	-1.4	-	6.05	-0.08	88	689	83	70
106	14.796	0.142	0.095	0.91	83	-1.4	-	5.96	-0.09	88	686	83	70
107	14.938	0.142	0.095	0.91	83	-1.4	-	5.88	-0.08	88	680	83	70
108	15.080	0.142	0.097	0.92	83	-1.4	-	5.81	-0.07	88	670	84	70
109	15.222	0.142	0.095	0.91	83	-1.3	-	5.74	-0.07	88	661	84	70
110	15.366	0.144	0.097	0.92	83	-1.3	100	5.67	-0.07	88	658	85	70
111	15.508	0.142	0.096	0.91	83	-1.3	-	5.61	-0.06	88	653	85	70
112	15.650	0.142	0.096	0.92	83	-1.3	-	5.54	-0.07	87	649	85	70
113	15.792	0.142	0.096	0.91	83	-1.4	-	5.47	-0.07	87	645	84	70
114	15.935	0.143	0.098	0.91	83	-1.2	-	5.40	-0.07	88	644	84	70
115	16.079	0.144	0.096	0.92	83	-1.3	-	5.33	-0.07	87	641	84	70
116	16.221	0.142	0.095	0.92	83	-1.4	-	5.27	-0.06	87	641	83	70
117	16.363	0.142	0.096	0.91	83	-1.3	-	5.19	-0.08	87	638	83	70
118	16.505	0.142	0.095	0.91	83	-1.4	-	5.12	-0.07	87	638	83	70
119	16.648	0.143	0.095	0.91	83	-1.3	-	5.06	-0.06	87	635	84	70
120	16.791	0.143	0.094	0.92	84	-1.4	101	18.02	12.96	93	589	85	70
121	16.933	0.142	0.096	0.92	84	-1.3	-	17.84	-0.18	95	675	84	70
122	17.075	0.142	0.096	0.93	84	-1.3	-	17.61	-0.23	96	766	85	70
123	17.217	0.142	0.094	0.93	84	-1.4	-	17.36	-0.25	98	835	85	70
124	17.360	0.143	0.095	0.91	84	-1.3	-	17.09	-0.27	99	880	83	70
125	17.503	0.143	0.095	0.91	84	-1.3	-	16.86	-0.23	94	814	84	70
126	17.645	0.142	0.095	0.92	84	-1.3	-	16.70	-0.16	92	784	84	70
127	17.787	0.142	0.097	0.92	84	-1.4	-	16.54	-0.16	91	769	84	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	17.929	0.142	0.095	0.92	84	-1.4	-	16.38	-0.16	91	767	85	70
129	18.073	0.144	0.093	0.91	84	-1.4	-	16.24	-0.14	90	760	84	70
130	18.215	0.142	0.095	0.92	84	-1.3	101	16.10	-0.14	90	760	84	70
131	18.356	0.141	0.097	0.93	84	-1.4	-	15.94	-0.16	90	758	84	70
132	18.498	0.142	0.094	0.91	84	-1.3	-	15.78	-0.16	91	761	84	70
133	18.641	0.143	0.095	0.90	84	-1.3	-	15.63	-0.15	91	764	84	70
134	18.785	0.144	0.096	0.91	84	-1.4	-	15.45	-0.18	91	765	84	70
135	18.927	0.142	0.097	0.92	84	-1.3	-	15.30	-0.15	91	767	85	70
136	19.068	0.141	0.095	0.92	84	-1.3	-	15.13	-0.17	91	766	86	70
137	19.210	0.142	0.095	0.92	84	-1.3	-	14.98	-0.15	91	766	85	70
138	19.353	0.143	0.096	0.91	84	-1.3	-	14.83	-0.15	91	765	84	70
139	19.497	0.144	0.097	0.92	84	-1.2	-	14.67	-0.16	91	764	84	70
140	19.639	0.142	0.095	0.91	84	-1.4	101	14.52	-0.15	91	760	83	70
141	19.780	0.141	0.097	0.92	84	-1.3	-	14.38	-0.14	91	756	83	70
142	19.923	0.143	0.095	0.92	84	-1.3	-	14.24	-0.14	91	753	84	70
143	20.066	0.143	0.094	0.92	84	-1.4	-	14.10	-0.14	91	748	84	70
144	20.209	0.143	0.097	0.91	84	-1.2	-	13.96	-0.14	91	745	84	70
145	20.351	0.142	0.094	0.93	84	-1.4	-	13.82	-0.14	91	742	85	70
146	20.493	0.142	0.095	0.93	85	-1.3	-	13.69	-0.13	90	739	85	70
147	20.635	0.142	0.093	0.92	84	-1.4	-	13.55	-0.14	90	736	85	70
148	20.779	0.144	0.097	0.91	84	-1.3	-	13.42	-0.13	90	733	84	70
149	20.921	0.142	0.096	0.92	84	-1.3	-	13.30	-0.12	90	728	83	70
150	21.063	0.142	0.096	0.91	85	-1.4	100	13.19	-0.11	90	722	83	70
151	21.205	0.142	0.095	0.93	85	-1.4	-	13.05	-0.14	90	717	83	70
152	21.347	0.142	0.095	0.91	85	-1.4	-	12.94	-0.11	90	712	83	70
153	21.492	0.145	0.097	0.91	85	-1.4	-	12.82	-0.12	90	709	84	70
154	21.634	0.142	0.096	0.91	85	-1.4	-	12.70	-0.12	90	706	85	70
155	21.776	0.142	0.095	0.92	85	-1.3	-	12.58	-0.12	90	703	84	70
156	21.918	0.142	0.094	0.91	85	-1.4	-	12.48	-0.10	90	700	84	70
157	22.060	0.142	0.095	0.91	85	-1.4	-	12.35	-0.13	90	697	84	70
158	22.204	0.144	0.097	0.93	85	-1.3	-	12.24	-0.11	90	696	83	70
159	22.346	0.142	0.094	0.92	85	-1.3	-	12.13	-0.11	90	693	83	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>2</u>	Technician: <u>AK</u>
	Date: <u>5/7/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	22.488	0.142	0.097	0.91	85	-1.3	100	12.01	-0.12	89	691	83	70
161	22.630	0.142	0.096	0.92	85	-1.3	-	11.90	-0.11	89	689	83	70
162	22.773	0.143	0.096	0.91	85	-1.3	-	11.79	-0.11	89	686	85	70
163	22.917	0.144	0.097	0.91	85	-1.3	-	11.68	-0.11	89	683	85	71
164	23.059	0.142	0.094	0.92	85	-1.2	-	11.57	-0.11	89	681	85	71
165	23.200	0.141	0.096	0.91	85	-1.3	-	11.46	-0.11	89	679	85	70
166	23.343	0.143	0.095	0.91	85	-1.4	-	11.35	-0.11	89	677	85	71
167	23.486	0.143	0.097	0.92	85	-1.3	-	11.25	-0.10	89	674	84	71
168	23.629	0.143	0.096	0.91	85	-1.3	-	11.14	-0.11	89	671	83	71
169	23.771	0.142	0.096	0.91	85	-1.3	-	11.04	-0.10	89	669	83	71
170	23.913	0.142	0.097	0.93	85	-1.4	99	10.94	-0.10	89	666	83	71
171	24.056	0.143	0.096	0.92	85	-1.3	-	10.84	-0.10	89	665	82	70
172	24.199	0.143	0.096	0.92	85	-1.4	-	10.74	-0.10	89	664	83	71
173	24.342	0.143	0.097	0.92	85	-1.3	-	10.63	-0.11	89	663	83	70
174	24.484	0.142	0.097	0.92	85	-1.4	-	10.53	-0.10	89	661	84	70
175	24.626	0.142	0.098	0.92	85	-1.3	-	10.43	-0.10	88	658	84	70
176	24.769	0.143	0.096	0.91	85	-1.4	-	10.34	-0.09	88	657	84	71
177	24.912	0.143	0.095	0.91	85	-1.3	-	10.24	-0.10	88	656	84	70
178	25.055	0.143	0.097	0.92	85	-1.3	-	10.13	-0.11	88	653	85	70
179	25.197	0.142	0.095	0.91	85	-1.4	-	10.03	-0.10	88	651	85	71
180	25.339	0.142	0.096	0.92	85	-1.3	100	9.94	-0.09	88	648	85	71
181	25.482	0.143	0.096	0.91	85	-1.3	-	9.85	-0.09	88	646	86	70
182	25.625	0.143	0.096	0.91	85	-1.3	-	9.77	-0.08	88	643	86	71
183	25.768	0.143	0.097	0.92	85	-1.4	-	9.67	-0.10	88	640	84	71
184	25.910	0.142	0.096	0.92	85	-1.4	-	9.58	-0.09	88	639	85	71
185	26.052	0.142	0.095	0.92	85	-1.4	-	9.49	-0.09	88	636	84	71
186	26.194	0.142	0.096	0.92	85	-1.3	-	9.41	-0.08	88	633	83	71
187	26.338	0.144	0.096	0.93	85	-1.4	-	9.32	-0.09	87	630	83	71
188	26.481	0.143	0.095	0.91	85	-1.3	-	9.23	-0.09	87	629	83	71
189	26.623	0.142	0.095	0.92	86	-1.3	-	9.15	-0.08	87	626	83	71
190	26.765	0.142	0.097	0.91	85	-1.4	100	9.07	-0.08	87	624	83	71
191	26.907	0.142	0.097	0.91	86	-1.3	-	8.98	-0.09	87	621	82	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	27.051	0.144	0.096	0.91	86	-1.3	-	8.91	-0.07	87	619	83	70
193	27.194	0.143	0.097	0.91	85	-1.3	-	8.83	-0.08	87	616	84	70
194	27.336	0.142	0.096	0.92	86	-1.3	-	8.75	-0.08	87	614	84	70
195	27.478	0.142	0.094	0.92	86	-1.3	-	8.66	-0.09	87	609	84	71
196	27.621	0.143	0.096	0.91	86	-1.3	-	8.59	-0.07	87	606	85	70
197	27.765	0.144	0.096	0.91	86	-1.4	-	8.51	-0.08	87	604	85	70
198	27.907	0.142	0.096	0.92	86	-1.3	-	8.43	-0.08	86	600	86	70
199	28.049	0.142	0.096	0.92	86	-1.4	-	8.36	-0.07	86	601	86	70
200	28.191	0.142	0.097	0.92	86	-1.4	99	8.28	-0.08	86	601	86	70
201	28.333	0.142	0.097	0.92	86	-1.3	-	8.21	-0.07	86	598	84	70
202	28.478	0.145	0.096	0.91	86	-1.4	-	8.14	-0.07	86	592	84	70
203	28.620	0.142	0.097	0.91	86	-1.3	-	8.06	-0.08	86	590	84	70
204	28.762	0.142	0.098	0.91	86	-1.3	-	8.00	-0.06	86	589	83	70
205	28.904	0.142	0.095	0.91	86	-1.3	-	7.92	-0.08	86	588	82	70
206	29.047	0.143	0.096	0.90	86	-1.3	-	7.85	-0.07	86	586	82	70
207	29.191	0.144	0.096	0.92	86	-1.3	-	7.78	-0.07	86	585	83	71
208	29.333	0.142	0.097	0.92	86	-1.3	-	7.71	-0.07	86	584	83	71
209	29.475	0.142	0.095	0.92	86	-1.3	-	7.64	-0.07	86	584	84	71
210	29.617	0.142	0.097	0.92	86	-1.3	99	7.57	-0.07	86	583	85	71
211	29.760	0.143	0.096	0.92	86	-1.3	-	7.49	-0.08	86	584	85	71
212	29.904	0.144	0.096	0.91	86	-1.4	-	7.43	-0.06	86	584	85	71
213	30.046	0.142	0.096	0.92	86	-1.4	-	7.35	-0.08	86	584	85	71
214	30.188	0.142	0.097	0.92	86	-1.4	-	7.28	-0.07	86	583	86	71
215	30.331	0.143	0.097	0.91	86	-1.4	-	7.22	-0.06	86	583	86	71
216	30.473	0.142	0.097	0.92	86	-1.3	-	7.14	-0.08	86	585	85	71
217	30.617	0.144	0.096	0.92	86	-1.3	-	7.08	-0.06	86	586	85	71
218	30.759	0.142	0.097	0.93	86	-1.3	-	7.00	-0.08	86	589	84	71
219	30.902	0.143	0.098	0.91	86	-1.4	-	6.93	-0.07	86	591	84	71
220	31.044	0.142	0.097	0.91	86	-1.3	99	6.85	-0.08	86	594	84	71
221	31.186	0.142	0.096	0.92	86	-1.3	-	6.79	-0.06	86	595	84	71
222	31.331	0.145	0.095	0.92	86	-1.4	-	6.72	-0.07	86	600	83	71
223	31.473	0.142	0.096	0.91	86	-1.3	-	6.64	-0.08	86	604	83	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	31.615	0.142	0.096	0.92	86	-1.4	-	6.57	-0.07	86	603	84	71
225	31.757	0.142	0.097	0.91	86	-1.3	-	6.50	-0.07	86	599	84	71
226	31.900	0.143	0.098	0.92	86	-1.4	-	6.44	-0.06	86	596	85	71
227	32.044	0.144	0.096	0.92	86	-1.4	-	6.38	-0.06	86	595	84	71
228	32.186	0.142	0.096	0.91	86	-1.3	-	6.32	-0.06	86	592	84	71
229	32.328	0.142	0.095	0.92	86	-1.3	-	6.26	-0.06	86	589	83	71
230	32.470	0.142	0.096	0.92	86	-1.4	99	6.20	-0.06	86	587	83	71
231	32.613	0.143	0.096	0.91	86	-1.3	-	6.14	-0.06	86	585	83	71
232	32.757	0.144	0.094	0.92	86	-1.4	-	38.97	32.83	107	426	84	71
233	32.899	0.142	0.092	0.92	86	-1.4	-	35.71	-3.26	124	859	84	71
234	33.039	0.140	0.091	0.92	86	-1.3	-	35.03	-0.68	147	1,168	84	71
235	33.181	0.142	0.093	0.91	86	-1.4	-	34.69	-0.34	119	993	85	71
236	33.324	0.143	0.094	0.92	86	-1.3	-	34.37	-0.32	111	1,027	85	71
237	33.466	0.142	0.094	0.91	86	-1.3	-	34.02	-0.35	109	1,031	85	71
238	33.607	0.141	0.093	0.92	86	-1.4	-	33.69	-0.33	109	1,078	84	71
239	33.749	0.142	0.094	0.90	86	-1.4	-	33.37	-0.32	109	1,103	84	71
240	33.891	0.142	0.095	0.90	86	-1.3	100	33.04	-0.33	110	1,129	86	71
241	34.033	0.142	0.094	0.91	86	-1.3	-	32.72	-0.32	111	1,157	86	71
242	34.174	0.141	0.094	0.90	86	-1.4	-	32.41	-0.31	106	1,072	86	71
243	34.316	0.142	0.094	0.90	86	-1.3	-	32.18	-0.23	102	1,037	86	71
244	34.458	0.142	0.095	0.92	86	-1.3	-	31.96	-0.22	100	1,002	86	71
245	34.600	0.142	0.095	0.90	86	-1.4	-	31.76	-0.20	99	975	85	71
246	34.742	0.142	0.096	0.92	86	-1.2	-	31.55	-0.21	99	953	85	71
247	34.883	0.141	0.094	0.91	86	-1.2	-	31.35	-0.20	98	938	84	71
248	35.025	0.142	0.095	0.90	86	-1.3	-	31.14	-0.21	98	928	84	71
249	35.168	0.143	0.095	0.92	86	-1.3	-	30.95	-0.19	98	914	84	71
250	35.310	0.142	0.095	0.91	86	-1.2	101	30.76	-0.19	98	903	85	71
251	35.451	0.141	0.093	0.90	86	-1.3	-	30.56	-0.20	98	893	85	71
252	35.593	0.142	0.094	0.91	86	-1.2	-	30.39	-0.17	97	882	85	71
253	35.736	0.143	0.097	0.92	86	-1.2	-	30.20	-0.19	97	874	85	72
254	35.878	0.142	0.093	0.91	86	-1.2	-	30.01	-0.19	97	874	86	71
255	36.019	0.141	0.095	0.92	86	-1.2	-	29.83	-0.18	97	869	85	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 2

Technician: AK

Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	36.160	0.141	0.095	0.91	87	-1.2	-	29.64	-0.19	97	868	85	71
257	36.303	0.143	0.096	0.90	86	-1.2	-	29.45	-0.19	97	868	84	72
258	36.446	0.143	0.095	0.90	86	-1.3	-	29.27	-0.18	97	868	84	72
259	36.587	0.141	0.093	0.92	86	-1.3	-	29.07	-0.20	97	871	84	72
260	36.729	0.142	0.096	0.91	86	-1.3	100	28.88	-0.19	97	870	84	72
261	36.870	0.141	0.094	0.90	86	-1.3	-	28.69	-0.19	97	874	84	71
262	37.014	0.144	0.094	0.92	86	-1.2	-	28.49	-0.20	97	875	83	72
263	37.155	0.141	0.094	0.91	87	-1.2	-	28.29	-0.20	97	874	84	72
264	37.297	0.142	0.095	0.91	86	-1.3	-	28.10	-0.19	97	874	84	72
265	37.439	0.142	0.095	0.91	87	-1.3	-	27.90	-0.20	97	876	84	72
266	37.583	0.144	0.094	0.90	87	-1.3	-	27.70	-0.20	97	876	84	72
267	37.724	0.141	0.094	0.92	87	-1.2	-	27.51	-0.19	97	878	84	72
268	37.865	0.141	0.094	0.91	87	-1.2	-	27.30	-0.21	97	882	84	72
269	38.006	0.141	0.093	0.92	87	-1.2	-	27.11	-0.19	97	886	85	72
270	38.148	0.142	0.094	0.92	87	-1.2	100	26.91	-0.20	97	890	84	72
271	38.292	0.144	0.093	0.92	87	-1.2	-	26.70	-0.21	97	895	83	72
272	38.433	0.141	0.093	0.91	87	-1.3	-	26.49	-0.21	98	898	84	72
273	38.574	0.141	0.094	0.92	87	-1.3	-	26.29	-0.20	98	901	85	72
274	38.716	0.142	0.095	0.91	87	-1.4	-	26.08	-0.21	98	902	84	72
275	38.859	0.143	0.094	0.91	87	-1.2	-	25.88	-0.20	98	901	84	72
276	39.001	0.142	0.094	0.92	87	-1.3	-	25.68	-0.20	98	897	84	71
277	39.142	0.141	0.095	0.92	87	-1.2	-	25.49	-0.19	98	894	83	71
278	39.283	0.141	0.095	0.91	87	-1.4	-	25.29	-0.20	98	893	84	71
279	39.426	0.143	0.094	0.91	87	-1.3	-	25.09	-0.20	98	893	84	71
280	39.571	0.145	0.094	0.91	87	-1.3	101	24.89	-0.20	98	892	84	71
281	39.709	0.138	0.094	0.91	87	-1.3	-	24.70	-0.19	98	892	83	71
282	39.851	0.142	0.094	0.92	87	-1.3	-	24.51	-0.19	98	893	84	71
283	39.993	0.142	0.093	0.92	87	-1.2	-	24.32	-0.19	98	895	83	71
284	40.136	0.143	0.096	0.91	87	-1.3	-	24.12	-0.20	98	900	84	71
285	40.277	0.141	0.095	0.92	87	-1.3	-	23.91	-0.21	98	904	85	70
286	40.418	0.141	0.093	0.90	87	-1.2	-	23.71	-0.20	98	907	85	70
287	40.560	0.142	0.095	0.92	87	-1.2	-	23.52	-0.19	99	911	83	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 2

Technician: AK

Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	40.703	0.143	0.093	0.93	87	-1.3	-	23.32	-0.20	99	915	84	70
289	40.845	0.142	0.094	0.92	87	-1.3	-	23.12	-0.20	99	917	84	70
290	40.986	0.141	0.092	0.91	87	-1.2	101	22.92	-0.20	99	922	84	70
291	41.127	0.141	0.094	0.91	87	-1.4	-	22.72	-0.20	99	923	84	70
292	41.270	0.143	0.094	0.91	87	-1.4	-	22.52	-0.20	99	927	84	71
293	41.412	0.142	0.094	0.91	87	-1.3	-	22.33	-0.19	99	931	84	71
294	41.553	0.141	0.094	0.91	87	-1.3	-	22.13	-0.20	98	934	85	71
295	41.694	0.141	0.092	0.91	87	-1.3	-	21.93	-0.20	98	934	86	71
296	41.836	0.142	0.092	0.90	87	-1.3	-	21.73	-0.20	98	935	87	71
297	41.978	0.142	0.095	0.91	87	-1.4	-	21.53	-0.20	99	935	86	71
298	42.119	0.141	0.094	0.90	87	-1.3	-	21.34	-0.19	98	937	85	71
299	42.260	0.141	0.092	0.90	87	-1.4	-	21.14	-0.20	99	938	85	71
300	42.402	0.142	0.094	0.90	87	-1.3	101	20.95	-0.19	99	938	84	71
301	42.544	0.142	0.095	0.90	87	-1.4	-	20.75	-0.20	99	939	84	71
302	42.685	0.141	0.092	0.91	87	-1.4	-	20.55	-0.20	99	942	83	71
303	42.825	0.140	0.092	0.90	87	-1.3	-	20.36	-0.19	99	943	83	71
304	42.967	0.142	0.094	0.90	87	-1.2	-	20.19	-0.17	98	934	84	71
305	43.109	0.142	0.093	0.91	87	-1.3	-	20.01	-0.18	98	925	83	71
306	43.252	0.143	0.094	0.90	87	-1.3	-	19.83	-0.18	98	924	83	71
307	43.390	0.138	0.092	0.90	87	-1.3	-	19.66	-0.17	98	919	83	71
308	43.532	0.142	0.092	0.91	87	-1.4	-	19.49	-0.17	98	913	84	71
309	43.673	0.141	0.093	0.91	87	-1.2	-	19.32	-0.17	98	908	85	71
310	43.814	0.141	0.092	0.90	87	-1.3	101	19.16	-0.16	98	900	85	72
311	43.954	0.140	0.092	0.89	87	-1.2	-	18.99	-0.17	98	891	86	72
312	44.097	0.143	0.092	0.90	87	-1.3	-	18.85	-0.14	98	886	85	71
313	44.237	0.140	0.094	0.90	87	-1.4	-	18.69	-0.16	97	881	84	72
314	44.378	0.141	0.093	0.90	87	-1.3	-	18.53	-0.16	97	877	84	72
315	44.519	0.141	0.094	0.90	87	-1.4	-	18.37	-0.16	97	873	84	72
316	44.661	0.142	0.094	0.90	87	-1.2	-	18.23	-0.14	97	869	84	72
317	44.801	0.140	0.095	0.90	87	-1.3	-	18.08	-0.15	97	865	83	72
318	44.942	0.141	0.093	0.90	87	-1.2	-	17.93	-0.15	97	860	84	72
319	45.085	0.143	0.093	0.90	87	-1.3	-	17.78	-0.15	97	855	84	72

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	45.225	0.140	0.093	0.90	87	-1.3	101	17.64	-0.14	96	853	84	72
321	45.365	0.140	0.092	0.89	87	-1.4	-	17.50	-0.14	96	849	85	72
322	45.506	0.141	0.093	0.90	87	-1.3	-	17.36	-0.14	96	845	86	72
323	45.648	0.142	0.093	0.90	87	-1.3	-	17.23	-0.13	96	837	86	72
324	45.789	0.141	0.093	0.89	87	-1.4	-	17.10	-0.13	96	825	86	72
325	45.929	0.140	0.094	0.90	87	-1.4	-	16.99	-0.11	95	813	86	72
326	46.069	0.140	0.095	0.90	87	-1.3	-	16.88	-0.11	95	802	85	71
327	46.212	0.143	0.093	0.90	87	-1.3	-	16.77	-0.11	95	795	84	72
328	46.352	0.140	0.093	0.90	87	-1.4	-	16.66	-0.11	95	789	84	71
329	46.493	0.141	0.094	0.90	87	-1.3	-	16.55	-0.11	95	786	84	72
330	46.634	0.141	0.095	0.90	87	-1.3	100	16.43	-0.12	94	782	83	71
331	46.776	0.142	0.094	0.90	87	-1.3	-	16.33	-0.10	94	781	84	72
332	46.916	0.140	0.094	0.90	87	-1.3	-	16.22	-0.11	94	778	84	72
333	47.059	0.143	0.093	0.89	87	-1.3	-	16.11	-0.11	94	775	84	72
334	47.198	0.139	0.092	0.91	87	-1.3	-	16.01	-0.10	94	775	83	72
335	47.340	0.142	0.093	0.90	87	-1.3	-	15.91	-0.10	94	769	83	72
336	47.480	0.140	0.094	0.90	87	-1.3	-	15.80	-0.11	93	764	83	72
337	47.620	0.140	0.094	0.90	87	-1.3	-	15.71	-0.09	93	762	84	72
338	47.763	0.143	0.094	0.90	87	-1.3	-	15.63	-0.08	93	757	83	72
339	47.904	0.141	0.093	0.91	87	-1.3	-	15.53	-0.10	93	752	83	72
340	48.044	0.140	0.094	0.90	87	-1.3	100	15.45	-0.08	93	748	84	72
341	48.184	0.140	0.094	0.89	87	-1.3	-	15.36	-0.09	93	742	84	72
342	48.327	0.143	0.093	0.91	87	-1.3	-	15.28	-0.08	92	733	84	72
343	48.470	0.143	0.093	0.91	87	-1.4	-	15.20	-0.08	92	726	84	72
344	48.607	0.137	0.095	0.90	87	-1.4	-	15.13	-0.07	92	718	84	72
345	48.749	0.142	0.094	0.89	87	-1.3	-	15.05	-0.08	92	713	84	71
346	48.891	0.142	0.095	0.91	87	-1.3	-	14.97	-0.08	92	707	85	71
347	49.031	0.140	0.095	0.90	87	-1.3	-	14.90	-0.07	91	699	85	72
348	49.172	0.141	0.096	0.90	87	-1.4	-	14.83	-0.07	91	694	84	72
349	49.314	0.142	0.093	0.88	87	-1.4	-	14.76	-0.07	91	689	85	71
350	49.455	0.141	0.095	0.90	87	-1.3	100	14.69	-0.07	91	682	84	71
351	49.595	0.140	0.094	0.89	87	-1.4	-	14.62	-0.07	90	678	84	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	49.736	0.141	0.093	0.90	87	-1.4	-	14.55	-0.07	90	673	83	72
353	49.878	0.142	0.093	0.90	87	-1.4	-	14.48	-0.07	90	669	83	72
354	50.019	0.141	0.095	0.90	87	-1.4	-	14.41	-0.07	90	663	84	72
355	50.161	0.142	0.094	0.90	87	-1.4	-	14.34	-0.07	90	659	84	72
356	50.302	0.141	0.094	0.91	87	-1.4	-	14.26	-0.08	90	654	84	71
357	50.442	0.140	0.095	0.90	87	-1.4	-	14.20	-0.06	89	651	84	71
358	50.582	0.140	0.095	0.89	87	-1.3	-	14.14	-0.06	89	648	84	72
359	50.723	0.141	0.094	0.89	87	-1.4	-	14.07	-0.07	89	646	85	71
360	50.864	0.141	0.094	0.91	87	-1.4	99	14.00	-0.07	89	642	84	71
361	51.006	0.142	0.095	0.89	87	-1.4	-	13.94	-0.06	89	640	84	71
362	51.146	0.140	0.095	0.90	87	-1.3	-	13.88	-0.06	89	638	84	71
363	51.287	0.141	0.093	0.90	87	-1.4	-	13.81	-0.07	89	636	84	71
364	51.429	0.142	0.096	0.90	87	-1.4	-	13.74	-0.07	89	635	84	71
365	51.570	0.141	0.096	0.90	87	-1.3	-	13.68	-0.06	88	632	84	71
366	51.710	0.140	0.094	0.90	87	-1.4	-	13.61	-0.07	88	631	84	71
367	51.851	0.141	0.096	0.90	87	-1.4	-	13.54	-0.07	88	630	84	71
368	51.995	0.144	0.094	0.90	87	-1.5	-	13.48	-0.06	88	628	85	71
369	52.134	0.139	0.095	0.90	87	-1.5	-	13.41	-0.07	88	625	85	71
370	52.274	0.140	0.096	0.89	87	-1.3	99	13.35	-0.06	88	623	84	71
371	52.415	0.141	0.095	0.90	87	-1.3	-	13.28	-0.07	88	621	83	72
372	52.557	0.142	0.095	0.91	87	-1.4	-	13.21	-0.07	88	620	83	71
373	52.698	0.141	0.095	0.91	87	-1.4	-	13.14	-0.07	88	623	83	72
374	52.838	0.140	0.094	0.89	87	-1.4	-	13.08	-0.06	87	624	83	71
375	52.980	0.142	0.095	0.90	87	-1.3	-	13.01	-0.07	87	624	83	71
376	53.122	0.142	0.096	0.90	87	-1.4	-	12.95	-0.06	87	624	83	71
377	53.262	0.140	0.096	0.89	87	-1.4	-	12.88	-0.07	87	624	82	71
378	53.403	0.141	0.094	0.90	87	-1.3	-	12.81	-0.07	87	624	83	71
379	53.546	0.143	0.095	0.91	87	-1.3	-	12.75	-0.06	87	624	83	71
380	53.688	0.142	0.094	0.90	87	-1.5	99	12.68	-0.07	87	624	82	71
381	53.826	0.138	0.094	0.89	87	-1.4	-	12.62	-0.06	87	624	83	71
382	53.967	0.141	0.096	0.91	87	-1.4	-	12.55	-0.07	87	624	83	71
383	54.109	0.142	0.094	0.90	87	-1.4	-	12.48	-0.07	87	621	83	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	54.250	0.141	0.096	0.90	87	-1.4	-	12.41	-0.07	87	620	83	71
385	54.391	0.141	0.096	0.91	87	-1.4	-	12.34	-0.07	87	620	83	71
386	54.531	0.140	0.096	0.89	87	-1.4	-	12.28	-0.06	87	619	83	71
387	54.674	0.143	0.096	0.90	87	-1.5	-	12.21	-0.07	87	619	84	71
388	54.814	0.140	0.094	0.90	87	-1.4	-	12.14	-0.07	87	619	83	71
389	54.955	0.141	0.094	0.90	87	-1.4	-	12.07	-0.07	87	618	83	71
390	55.096	0.141	0.094	0.89	87	-1.5	99	12.01	-0.06	87	616	83	71
391	55.238	0.142	0.095	0.90	87	-1.4	-	11.95	-0.06	87	615	83	71
392	55.382	0.144	0.095	0.90	87	-1.4	-	11.88	-0.07	87	615	84	71
393	55.519	0.137	0.095	0.91	87	-1.4	-	11.81	-0.07	87	614	84	71
394	55.661	0.142	0.095	0.90	87	-1.4	-	11.75	-0.06	87	609	83	71
395	55.803	0.142	0.094	0.90	87	-1.4	-	11.69	-0.06	86	606	84	71
396	55.943	0.140	0.093	0.90	87	-1.4	-	11.62	-0.07	86	606	84	71
397	56.084	0.141	0.097	0.90	87	-1.4	-	11.55	-0.07	86	605	83	71
398	56.226	0.142	0.096	0.90	87	-1.5	-	11.49	-0.06	86	605	84	71
399	56.367	0.141	0.095	0.90	88	-1.5	-	11.43	-0.06	86	603	85	71
400	56.507	0.140	0.094	0.90	88	-1.4	99	11.37	-0.06	86	602	86	71
401	56.648	0.141	0.095	0.90	87	-1.5	-	11.30	-0.07	86	602	85	71
402	56.791	0.143	0.094	0.91	87	-1.4	-	11.23	-0.07	86	603	85	71
403	56.931	0.140	0.095	0.89	87	-1.5	-	11.17	-0.06	86	603	84	71
404	57.074	0.143	0.094	0.89	87	-1.5	-	11.10	-0.07	86	603	84	71
405	57.212	0.138	0.095	0.89	87	-1.5	-	11.03	-0.07	86	603	83	71
406	57.355	0.143	0.095	0.90	87	-1.4	-	10.97	-0.06	86	604	83	71
407	57.495	0.140	0.095	0.91	87	-1.5	-	10.91	-0.06	86	606	83	71
408	57.636	0.141	0.096	0.92	87	-1.4	-	10.83	-0.08	86	604	83	71
409	57.777	0.141	0.097	0.91	87	-1.5	-	10.77	-0.06	86	604	83	71
410	57.919	0.142	0.096	0.90	87	-1.5	99	10.70	-0.07	86	607	85	71
411	58.059	0.140	0.096	0.90	87	-1.5	-	10.62	-0.08	86	610	85	71
412	58.200	0.141	0.095	0.89	87	-1.4	-	10.55	-0.07	86	611	84	71
413	58.342	0.142	0.093	0.90	87	-1.4	-	10.48	-0.07	86	612	84	71
414	58.486	0.144	0.096	0.91	87	-1.5	-	10.41	-0.07	86	614	83	71
415	58.623	0.137	0.096	0.90	87	-1.5	-	10.33	-0.08	86	618	83	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	58.764	0.141	0.095	0.90	87	-1.4	-	10.25	-0.08	86	624	83	71
417	58.906	0.142	0.096	0.91	87	-1.4	-	10.17	-0.08	86	635	84	71
418	59.047	0.141	0.096	0.91	87	-1.4	-	10.08	-0.09	86	640	85	71
419	59.187	0.140	0.096	0.90	87	-1.5	-	10.01	-0.07	86	637	86	71
420	59.328	0.141	0.096	0.89	87	-1.4	98	9.94	-0.07	86	633	86	71
421	59.471	0.143	0.095	0.91	87	-1.4	-	9.88	-0.06	86	625	85	71
422	59.611	0.140	0.095	0.90	87	-1.5	-	9.82	-0.06	86	618	84	71
423	59.751	0.140	0.097	0.92	87	-1.5	-	9.77	-0.05	86	611	83	71
424	59.893	0.142	0.093	0.89	87	-1.4	-	9.72	-0.05	85	605	83	71
425	60.037	0.144	0.095	0.90	87	-1.4	-	9.66	-0.06	85	599	83	71
426	60.178	0.141	0.095	0.90	87	-1.5	-	9.61	-0.05	85	594	83	71
427	60.315	0.137	0.096	0.90	87	-1.5	-	9.56	-0.05	85	590	83	71
428	60.457	0.142	0.094	0.89	87	-1.4	-	9.51	-0.05	85	586	85	71
429	60.599	0.142	0.094	0.91	87	-1.5	-	9.47	-0.04	85	578	84	71
430	60.739	0.140	0.095	0.89	87	-1.4	98	9.43	-0.04	85	570	85	71
431	60.880	0.141	0.095	0.91	87	-1.4	-	9.40	-0.03	85	558	85	71
432	61.022	0.142	0.095	0.90	87	-1.4	-	9.36	-0.04	84	545	86	71
433	61.163	0.141	0.095	0.91	87	-1.4	-	9.33	-0.03	84	536	85	71
434	61.303	0.140	0.095	0.88	87	-1.4	-	9.30	-0.03	84	531	85	71
435	61.446	0.143	0.096	0.92	87	-1.4	-	9.27	-0.03	84	527	84	71
436	61.588	0.142	0.096	0.89	87	-1.5	-	9.24	-0.03	84	523	84	71
437	61.727	0.139	0.096	0.90	87	-1.5	-	9.22	-0.02	84	519	83	71
438	61.867	0.140	0.095	0.91	87	-1.5	-	9.19	-0.03	84	518	83	71
439	62.008	0.141	0.098	0.89	87	-1.4	-	9.16	-0.03	84	514	83	71
440	62.150	0.142	0.095	0.89	87	-1.4	99	9.13	-0.03	84	510	83	71
441	62.291	0.141	0.094	0.90	87	-1.4	-	9.11	-0.02	83	508	83	71
442	62.431	0.140	0.096	0.89	87	-1.5	-	9.08	-0.03	83	505	84	71
443	62.573	0.142	0.096	0.91	87	-1.4	-	9.05	-0.03	83	502	85	70
444	62.715	0.142	0.097	0.90	87	-1.4	-	9.03	-0.02	83	498	85	71
445	62.855	0.140	0.096	0.89	87	-1.5	-	9.00	-0.03	83	495	87	70
446	62.998	0.143	0.097	0.91	87	-1.4	-	8.98	-0.02	83	492	86	70
447	63.139	0.141	0.096	0.88	87	-1.4	-	8.95	-0.03	83	488	86	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	63.279	0.140	0.095	0.90	87	-1.5	-	8.93	-0.02	83	488	86	70
449	63.419	0.140	0.095	0.89	87	-1.4	-	8.90	-0.03	83	485	85	70
450	63.560	0.141	0.096	0.90	87	-1.5	98	8.87	-0.03	82	483	84	70
451	63.703	0.143	0.096	0.91	87	-1.4	-	8.84	-0.03	82	481	83	70
452	63.843	0.140	0.096	0.90	87	-1.4	-	8.82	-0.02	82	478	83	70
453	63.983	0.140	0.094	0.91	87	-1.5	-	8.79	-0.03	82	475	83	70
454	64.124	0.141	0.096	0.89	87	-1.4	-	8.76	-0.03	82	473	83	70
455	64.267	0.143	0.095	0.90	87	-1.4	-	8.74	-0.02	82	472	83	70
456	64.407	0.140	0.095	0.91	87	-1.5	-	8.71	-0.03	82	469	84	70
457	64.550	0.143	0.096	0.90	87	-1.4	-	8.68	-0.03	82	467	85	70
458	64.691	0.141	0.095	0.89	87	-1.4	-	8.66	-0.02	82	466	86	70
459	64.831	0.140	0.096	0.90	87	-1.5	-	8.63	-0.03	82	466	86	70
460	64.972	0.141	0.097	0.91	87	-1.5	98	8.60	-0.03	82	467	87	70
461	65.112	0.140	0.095	0.91	87	-1.5	-	8.58	-0.02	82	467	86	70
462	65.254	0.142	0.094	0.89	87	-1.4	-	8.55	-0.03	81	466	85	70
463	65.395	0.141	0.097	0.89	87	-1.5	-	8.53	-0.02	81	465	85	70
464	65.536	0.141	0.096	0.89	87	-1.5	-	8.50	-0.03	81	465	84	70
465	65.677	0.141	0.096	0.90	87	-1.4	-	8.47	-0.03	81	464	83	70
466	65.819	0.142	0.095	0.90	87	-1.4	-	8.45	-0.02	81	463	82	70
467	65.962	0.143	0.094	0.89	87	-1.4	-	8.42	-0.03	81	465	82	70
468	66.103	0.141	0.096	0.91	87	-1.5	-	8.39	-0.03	81	465	83	70
469	66.241	0.138	0.095	0.90	87	-1.5	-	8.36	-0.03	81	464	83	70
470	66.384	0.143	0.095	0.90	87	-1.4	98	8.34	-0.02	81	465	83	70
471	66.524	0.140	0.096	0.89	87	-1.6	-	8.31	-0.03	81	465	83	70
472	66.664	0.140	0.095	0.90	87	-1.4	-	8.28	-0.03	81	465	84	70
473	66.805	0.141	0.094	0.90	87	-1.5	-	8.25	-0.03	81	465	84	70
474	66.948	0.143	0.096	0.90	87	-1.5	-	8.23	-0.02	81	465	84	70
475	67.088	0.140	0.094	0.90	87	-1.4	-	8.20	-0.03	81	463	84	70
476	67.229	0.141	0.097	0.91	87	-1.5	-	8.18	-0.02	81	461	83	70
477	67.372	0.143	0.096	0.90	87	-1.5	-	8.16	-0.02	81	458	83	70
478	67.515	0.143	0.095	0.91	87	-1.4	-	8.13	-0.03	81	456	83	70
479	67.653	0.138	0.096	0.88	87	-1.5	-	8.11	-0.02	81	456	84	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	67.793	0.140	0.096	0.89	87	-1.5	98	8.08	-0.03	81	455	84	70
481	67.935	0.142	0.097	0.90	87	-1.5	-	8.06	-0.02	81	454	84	70
482	68.077	0.142	0.096	0.89	87	-1.6	-	8.03	-0.03	80	452	84	70
483	68.217	0.140	0.095	0.90	87	-1.5	-	8.00	-0.03	80	451	84	70
484	68.358	0.141	0.095	0.92	86	-1.5	-	7.98	-0.02	80	450	84	70
485	68.502	0.144	0.094	0.91	87	-1.5	-	7.96	-0.02	80	449	83	70
486	68.644	0.142	0.095	0.90	87	-1.6	-	7.94	-0.02	80	447	83	70
487	68.781	0.137	0.096	0.89	87	-1.5	-	7.91	-0.03	80	445	83	70
488	68.922	0.141	0.096	0.90	86	-1.5	-	7.89	-0.02	80	444	83	70
489	69.065	0.143	0.097	0.90	86	-1.5	-	7.87	-0.02	80	443	84	70
490	69.205	0.140	0.095	0.90	86	-1.6	98	7.85	-0.02	80	441	83	70
491	69.346	0.141	0.095	0.90	86	-1.5	-	7.83	-0.02	80	439	83	70
492	69.487	0.141	0.096	0.90	86	-1.6	-	7.80	-0.03	80	437	83	70
493	69.631	0.144	0.094	0.91	86	-1.5	-	7.77	-0.03	80	436	85	70
494	69.772	0.141	0.096	0.89	86	-1.5	-	7.75	-0.02	80	434	86	70
495	69.910	0.138	0.096	0.89	86	-1.5	-	7.74	-0.01	80	433	86	70
496	70.051	0.141	0.095	0.89	86	-1.5	-	7.71	-0.03	80	432	86	70
497	70.193	0.142	0.097	0.90	86	-1.5	-	7.69	-0.02	80	430	85	70
498	70.333	0.140	0.096	0.90	86	-1.6	-	7.66	-0.03	80	429	85	70
499	70.474	0.141	0.098	0.90	86	-1.6	-	7.63	-0.03	80	429	84	70
500	70.616	0.142	0.096	0.91	86	-1.6	98	7.62	-0.01	80	428	83	70
501	70.760	0.144	0.096	0.90	86	-1.5	-	7.61	-0.01	80	428	83	70
502	70.898	0.138	0.097	0.89	86	-1.6	-	7.58	-0.03	80	427	83	70
503	71.038	0.140	0.097	0.90	86	-1.5	-	7.56	-0.02	80	426	84	70
504	71.181	0.143	0.096	0.90	86	-1.6	-	7.53	-0.03	80	426	83	70
505	71.321	0.140	0.096	0.91	86	-1.5	-	7.52	-0.01	80	426	83	70
506	71.461	0.140	0.096	0.91	86	-1.5	-	7.49	-0.03	80	425	85	70
507	71.602	0.141	0.096	0.90	86	-1.6	-	7.47	-0.02	80	424	85	70
508	71.747	0.145	0.095	0.90	86	-1.6	-	7.45	-0.02	80	424	86	70
509	71.888	0.141	0.097	0.89	86	-1.5	-	7.43	-0.02	80	425	87	70
510	72.025	0.137	0.096	0.89	86	-1.5	98	7.41	-0.02	80	426	86	70
511	72.167	0.142	0.097	0.91	86	-1.5	-	7.39	-0.02	80	426	85	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	72.309	0.142	0.097	0.91	86	-1.5	-	7.37	-0.02	80	426	84	70
513	72.449	0.140	0.097	0.90	86	-1.6	-	7.35	-0.02	80	426	84	70
514	72.590	0.141	0.096	0.89	86	-1.6	-	7.32	-0.03	80	425	83	70
515	72.732	0.142	0.096	0.90	86	-1.5	-	7.30	-0.02	80	425	83	70
516	72.875	0.143	0.097	0.90	86	-1.6	-	7.28	-0.02	80	424	83	70
517	73.016	0.141	0.095	0.90	86	-1.6	-	7.25	-0.03	80	425	83	70
518	73.154	0.138	0.097	0.89	86	-1.5	-	7.23	-0.02	80	424	84	70
519	73.296	0.142	0.097	0.91	86	-1.6	-	7.21	-0.02	80	424	84	70
520	73.437	0.141	0.097	0.90	86	-1.6	98	7.18	-0.03	80	423	83	70
521	73.577	0.140	0.094	0.91	86	-1.5	-	7.16	-0.02	80	423	83	70
522	73.718	0.141	0.097	0.90	86	-1.5	-	7.14	-0.02	80	422	83	70
523	73.863	0.145	0.095	0.89	86	-1.6	-	7.12	-0.02	80	422	83	70
524	74.001	0.138	0.098	0.90	86	-1.5	-	7.09	-0.03	80	422	84	70
525	74.141	0.140	0.097	0.90	86	-1.5	-	7.08	-0.01	79	422	85	70
526	74.283	0.142	0.095	0.90	86	-1.6	-	7.05	-0.03	79	421	85	70
527	74.425	0.142	0.095	0.90	86	-1.6	-	7.02	-0.03	79	421	86	70
528	74.565	0.140	0.096	0.90	86	-1.6	-	7.00	-0.02	79	420	84	70
529	74.705	0.140	0.096	0.89	86	-1.5	-	6.98	-0.02	79	420	84	70
530	74.849	0.144	0.098	0.89	86	-1.5	97	6.95	-0.03	79	420	83	70
531	74.991	0.142	0.096	0.90	86	-1.6	-	6.94	-0.01	79	420	82	70
532	75.129	0.138	0.097	0.89	86	-1.5	-	6.91	-0.03	79	420	82	70
533	75.270	0.141	0.096	0.89	86	-1.5	-	6.89	-0.02	79	419	82	70
534	75.412	0.142	0.096	0.91	86	-1.5	-	6.86	-0.03	79	419	82	70
535	75.553	0.141	0.096	0.92	86	-1.5	-	6.84	-0.02	79	418	83	70
536	75.693	0.140	0.097	0.90	86	-1.6	-	6.81	-0.03	79	419	83	70
537	75.836	0.143	0.096	0.90	86	-1.5	-	6.79	-0.02	79	419	83	70
538	75.976	0.140	0.095	0.90	86	-1.5	-	6.76	-0.03	79	419	84	70
539	76.117	0.141	0.096	0.91	86	-1.6	-	6.75	-0.01	79	418	85	70
540	76.257	0.140	0.095	0.90	86	-1.6	97	6.72	-0.03	79	418	85	70
541	76.398	0.141	0.097	0.90	86	-1.5	-	6.69	-0.03	79	417	86	70
542	76.540	0.142	0.097	0.90	86	-1.6	-	6.67	-0.02	79	416	85	69
543	76.683	0.143	0.099	0.90	86	-1.5	-	6.65	-0.02	79	416	85	69

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>2</u>	Technician: <u>AK</u>
	Date: <u>5/7/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
544	76.823	0.140	0.097	0.90	86	-1.6	-	6.63	-0.02	79	415	84	70
Avg/Tot	81.866	0.142	0.095	0.91	84.2	-1.4	100			89.3	673.2	83.9	70.1

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	-0.273		0.00	68	-3.1		83	0.014	0.08	0.007
1	-0.150		1.01	68	-4.1	-	82	0.074	2.81	0.265
2	-0.007		1.00	68	-2.9	-	84	0.117	9.84	0.163
3	0.137	0.144	0.98	68	-1.7	-	83	0.076	13.15	4.613
4	0.280	0.143	0.99	68	-2.9	-	82	0.080	16.19	4.025
5	0.424	0.144	1.00	68	-1.2	-	83	0.083	17.35	2.520
6	0.568	0.144	1.00	68	-2.8	-	82	0.078	17.37	0.927
7	0.711	0.143	0.98	68	-1.3	-	82	0.084	15.58	0.278
8	0.853	0.142	0.99	68	-3.0	-	83	0.084	15.23	0.177
9	0.995	0.142	0.98	68	-3.0	-	83	0.089	14.76	0.145
10	1.137	0.142	0.98	69	-3.2	107	85	0.081	14.21	0.256
11	1.281	0.144	0.97	69	-2.5	-	85	0.085	15.77	0.569
12	1.423	0.142	0.97	69	-0.9	-	86	0.086	16.55	0.635
13	1.565	0.142	0.97	69	-1.5	-	86	0.089	15.50	0.316
14	1.705	0.140	0.96	69	-3.0	-	85	0.097	15.47	0.244
15	1.847	0.142	0.96	70	-2.3	-	85	0.090	14.96	0.159
16	1.990	0.143	0.96	69	-1.5	-	85	0.093	14.54	0.099
17	2.131	0.141	0.97	70	-3.5	-	84	0.092	14.37	0.080
18	2.272	0.141	0.95	69	-1.1	-	84	0.082	14.20	0.075
19	2.413	0.141	0.96	70	-1.9	-	84	0.091	14.13	0.063
20	2.556	0.143	0.96	70	-1.5	108	83	0.083	14.01	0.103
21	2.697	0.141	0.99	71	-2.2	-	83	0.093	13.96	0.078
22	2.837	0.140	0.97	71	-3.0	-	84	0.092	13.75	0.045
23	2.978	0.141	0.95	72	-1.1	-	84	0.091	13.86	0.057
24	3.121	0.143	0.97	72	-2.0	-	84	0.086	14.12	0.069
25	3.262	0.141	0.96	72	-2.2	-	84	0.084	14.45	0.101
26	3.402	0.140	0.96	73	-1.3	-	84	0.085	14.46	0.097
27	3.542	0.140	0.98	73	-1.2	-	85	0.092	14.53	0.105
28	3.685	0.143	0.97	73	-3.2	-	87	0.093	4.56	0.265
29	3.825	0.140	0.96	74	-2.0	-	86	0.093	15.52	0.827
30	3.965	0.140	0.96	71	-0.8	106	85	0.092	16.52	0.732
31	4.106	0.141	0.96	72	-0.5	-	84	0.093	18.38	1.225

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.248	0.142	0.96	74	-0.8	-	85	0.097	18.51	1.178
33	4.388	0.140	0.95	75	-1.9	-	84	0.098	18.73	1.261
34	4.527	0.139	0.96	73	-1.5	-	83	0.107	19.00	1.768
35	4.669	0.142	0.97	75	-0.4	-	85	0.104	18.91	1.778
36	4.810	0.141	0.94	76	-0.7	-	86	0.101	18.73	1.289
37	4.949	0.139	0.96	76	-1.1	-	85	0.107	18.74	1.374
38	5.089	0.140	0.97	76	-1.5	-	86	0.097	18.71	1.437
39	5.231	0.142	0.95	76	-1.5	-	84	0.101	18.78	1.505
40	5.371	0.140	0.96	77	-1.3	105	85	0.097	18.80	1.665
41	5.511	0.140	0.98	77	-1.6	-	85	0.099	18.82	1.676
42	5.652	0.141	0.97	77	-2.0	-	85	0.104	18.80	1.625
43	5.793	0.141	0.96	77	-0.5	-	84	0.101	18.77	1.650
44	5.932	0.139	0.97	78	-2.5	-	85	0.108	18.71	1.570
45	6.072	0.140	0.98	78	-2.5	-	85	0.101	18.85	1.671
46	6.213	0.141	0.97	77	-1.5	-	85	0.101	18.77	1.595
47	6.353	0.140	0.98	79	-2.6	-	84	0.106	18.74	1.458
48	6.492	0.139	0.96	79	-1.3	-	86	0.104	18.66	1.297
49	6.634	0.142	0.95	79	-2.0	-	86	0.103	18.63	1.272
50	6.774	0.140	0.94	80	-1.2	105	86	0.103	18.50	1.014
51	6.913	0.139	0.96	78	-1.0	-	85	0.113	18.26	0.955
52	7.053	0.140	0.97	80	-1.1	-	85	0.100	18.01	0.754
53	7.195	0.142	0.95	80	-1.1	-	85	0.101	18.10	1.654
54	7.334	0.139	0.94	81	-2.9	-	85	0.100	17.11	0.601
55	7.474	0.140	0.98	81	-3.4	-	84	0.097	15.08	0.234
56	7.616	0.142	0.95	81	-1.5	-	85	0.093	13.94	0.160
57	7.756	0.140	0.96	81	-2.2	-	85	0.097	13.43	0.123
58	7.896	0.140	0.95	82	-1.9	-	86	0.091	13.15	0.138
59	8.036	0.140	0.95	82	-1.8	-	85	0.092	13.03	0.118
60	8.178	0.142	0.96	82	-2.5	104	84	0.092	13.10	0.155
61	8.318	0.140	0.98	82	-3.3	-	85	0.084	13.29	0.166
62	8.458	0.140	0.96	82	-1.8	-	84	0.094	13.59	0.228
63	8.599	0.141	0.96	83	-3.2	-	85	0.090	13.13	0.216

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	8.741	0.142	0.96	83	-1.6	-	84	0.087	13.01	0.210
65	8.881	0.140	0.97	83	-2.4	-	85	0.085	13.22	0.222
66	9.021	0.140	0.96	82	-3.1	-	84	0.088	13.54	0.198
67	9.163	0.142	0.97	83	-2.2	-	85	0.083	13.72	0.243
68	9.304	0.141	0.98	84	-3.3	-	84	0.093	14.11	0.320
69	9.444	0.140	0.96	83	-3.2	-	85	0.098	14.14	0.324
70	9.585	0.141	0.97	84	-2.6	102	85	0.088	14.22	0.314
71	9.727	0.142	0.98	85	-2.0	-	86	0.087	14.60	0.367
72	9.868	0.141	0.97	85	-2.5	-	85	0.086	14.30	0.278
73	10.008	0.140	0.96	84	-2.7	-	85	0.086	13.64	0.257
74	10.148	0.140	0.94	85	-3.3	-	85	0.087	13.46	0.203
75	10.291	0.143	0.97	85	-1.9	-	84	0.084	13.20	0.194
76	10.432	0.141	0.97	85	-3.5	-	84	0.081	13.51	0.218
77	10.572	0.140	0.94	86	-1.4	-	84	0.088	13.67	0.206
78	10.713	0.141	0.95	86	-3.8	-	83	0.082	13.09	0.130
79	10.855	0.142	0.93	86	-2.4	-	84	0.088	12.75	0.158
80	10.996	0.141	0.95	86	-1.3	100	84	0.084	12.83	0.142
81	11.136	0.140	0.96	86	-3.6	-	84	0.088	12.74	0.115
82	11.277	0.141	0.96	86	-1.6	-	84	0.081	12.78	0.106
83	11.420	0.143	0.96	86	-2.3	-	84	0.087	12.98	0.121
84	11.561	0.141	0.99	87	-3.4	-	85	0.087	13.00	0.123
85	11.702	0.141	0.96	87	-2.6	-	85	0.085	13.10	0.123
86	11.842	0.140	0.96	87	-2.4	-	85	0.084	13.17	0.118
87	11.986	0.144	0.97	87	-0.9	-	86	0.082	13.31	0.131
88	12.127	0.141	0.99	87	-1.7	-	85	0.087	13.41	0.138
89	12.267	0.140	0.98	87	-0.7	-	85	0.089	13.53	0.162
90	12.408	0.141	0.96	88	-1.7	100	85	0.087	13.64	0.174
91	12.551	0.143	0.97	88	-1.8	-	85	0.089	13.58	0.217
92	12.692	0.141	0.95	88	-2.5	-	85	0.088	13.15	0.339
93	12.833	0.141	0.96	88	-3.3	-	84	0.085	12.92	0.489
94	12.974	0.141	0.97	88	-1.7	-	84	0.082	12.95	0.379
95	13.117	0.143	0.98	87	-1.5	-	85	0.087	12.71	0.332

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	13.258	0.141	0.97	88	-2.2	-	84	0.081	12.66	0.288
97	13.399	0.141	0.95	89	-1.8	-	85	0.088	13.04	0.337
98	13.540	0.141	0.99	88	-2.1	-	85	0.083	13.49	0.496
99	13.682	0.142	0.96	89	-2.9	-	84	0.089	12.96	0.360
100	13.825	0.143	0.96	88	-1.5	101	85	0.082	12.60	0.263
101	13.966	0.141	0.98	89	-3.2	-	85	0.087	12.53	0.205
102	14.106	0.140	0.97	89	-3.4	-	85	0.076	12.31	0.191
103	14.248	0.142	0.94	89	-1.8	-	85	0.084	12.12	0.162
104	14.391	0.143	0.99	88	-1.0	-	84	0.080	11.85	0.140
105	14.532	0.141	0.97	89	-2.9	-	85	0.080	11.74	0.142
106	14.673	0.141	0.97	88	-1.3	-	85	0.081	11.70	0.139
107	14.814	0.141	0.96	90	-1.9	-	86	0.083	11.22	0.139
108	14.958	0.144	0.93	89	-3.2	-	85	0.087	10.35	0.209
109	15.099	0.141	0.99	89	-2.3	-	85	0.083	9.91	0.268
110	15.240	0.141	0.99	90	-1.4	100	86	0.080	9.96	0.290
111	15.381	0.141	0.96	86	-2.4	-	84	0.085	9.98	0.293
112	15.524	0.143	0.95	89	-2.8	-	84	0.074	10.01	0.284
113	15.666	0.142	0.96	90	-0.9	-	84	0.082	9.97	0.315
114	15.807	0.141	0.98	90	-2.3	-	85	0.080	10.05	0.290
115	15.949	0.142	0.95	90	-1.2	-	84	0.083	10.04	0.302
116	16.090	0.141	0.97	90	-2.5	-	85	0.076	10.28	0.241
117	16.234	0.144	0.96	90	-3.2	-	85	0.083	10.36	0.232
118	16.375	0.141	0.95	91	-1.6	-	85	0.079	10.40	0.235
119	16.517	0.142	0.96	90	-3.7	-	84	0.081	10.25	0.229
120	16.658	0.141	0.96	90	-3.5	100	84	0.083	4.18	0.402
121	16.800	0.142	0.95	91	-3.2	-	85	0.080	9.76	0.543
122	16.943	0.143	0.96	89	-2.6	-	85	0.083	14.51	0.114
123	17.084	0.141	0.95	91	-2.1	-	86	0.087	16.48	0.337
124	17.225	0.141	0.98	91	-2.5	-	86	0.095	17.51	0.820
125	17.367	0.142	0.96	91	-1.3	-	86	0.088	17.05	1.558
126	17.510	0.143	0.94	91	-1.2	-	85	0.093	14.81	0.443
127	17.651	0.141	0.96	91	-1.4	-	85	0.088	14.11	0.364

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	17.792	0.141	0.96	91	-1.3	-	84	0.087	14.22	0.247
129	17.934	0.142	0.96	91	-1.4	-	85	0.089	13.56	0.172
130	18.077	0.143	0.94	91	-1.4	101	84	0.088	13.83	0.178
131	18.219	0.142	0.95	91	-1.4	-	85	0.088	14.13	0.197
132	18.360	0.141	0.95	92	-1.2	-	85	0.093	14.67	0.268
133	18.501	0.141	0.94	92	-1.3	-	85	0.091	14.98	0.298
134	18.643	0.142	0.94	92	-1.3	-	85	0.091	15.05	0.314
135	18.786	0.143	0.96	91	-1.3	-	84	0.088	14.97	0.308
136	18.928	0.142	0.97	92	-1.2	-	84	0.095	14.92	0.343
137	19.069	0.141	0.94	92	-1.4	-	84	0.089	14.81	0.309
138	19.210	0.141	0.95	92	-1.3	-	85	0.090	14.61	0.313
139	19.354	0.144	0.95	92	-1.4	-	86	0.083	14.46	0.264
140	19.496	0.142	0.95	92	-1.3	101	86	0.087	14.13	0.232
141	19.637	0.141	0.95	92	-1.4	-	85	0.086	13.84	0.221
142	19.778	0.141	0.97	92	-1.4	-	85	0.089	13.67	0.209
143	19.920	0.142	0.96	92	-1.2	-	84	0.089	13.45	0.220
144	20.064	0.144	0.94	92	-1.4	-	85	0.087	13.41	0.199
145	20.206	0.142	0.98	91	-1.3	-	84	0.089	13.37	0.205
146	20.347	0.141	0.96	92	-1.3	-	85	0.087	13.15	0.207
147	20.488	0.141	0.96	92	-1.2	-	85	0.087	12.93	0.179
148	20.631	0.143	0.99	92	-1.3	-	85	0.083	12.60	0.157
149	20.774	0.143	0.99	92	-1.4	-	85	0.086	12.33	0.130
150	20.915	0.141	0.96	93	-1.4	100	85	0.084	12.16	0.131
151	21.057	0.142	0.94	92	-1.4	-	85	0.088	12.01	0.143
152	21.199	0.142	0.97	93	-1.2	-	85	0.082	11.91	0.147
153	21.342	0.143	0.96	92	-1.2	-	85	0.082	11.85	0.157
154	21.484	0.142	0.98	93	-1.3	-	85	0.084	11.82	0.160
155	21.626	0.142	0.95	92	-1.2	-	85	0.086	11.85	0.158
156	21.767	0.141	0.98	93	-1.3	-	85	0.086	11.82	0.144
157	21.909	0.142	0.97	93	-1.2	-	85	0.083	11.82	0.145
158	22.053	0.144	0.96	93	-1.2	-	85	0.087	11.73	0.145
159	22.194	0.141	0.96	93	-1.4	-	85	0.085	11.73	0.138

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	22.336	0.142	0.96	93	-1.4	100	85	0.083	11.72	0.131
161	22.477	0.141	0.96	93	-1.2	-	85	0.076	11.70	0.135
162	22.620	0.143	0.96	93	-1.3	-	85	0.082	11.65	0.120
163	22.763	0.143	0.97	93	-1.4	-	84	0.088	11.61	0.145
164	22.904	0.141	0.96	93	-1.4	-	85	0.078	11.52	0.143
165	23.045	0.141	0.94	93	-1.3	-	85	0.080	11.42	0.144
166	23.187	0.142	0.97	93	-1.4	-	84	0.083	11.34	0.153
167	23.331	0.144	0.96	93	-1.4	-	85	0.077	11.33	0.149
168	23.473	0.142	0.96	93	-1.3	-	85	0.081	11.27	0.154
169	23.615	0.142	0.97	93	-1.4	-	84	0.082	11.24	0.179
170	23.756	0.141	0.97	93	-1.2	99	84	0.081	11.27	0.162
171	23.898	0.142	0.94	93	-1.4	-	84	0.082	11.17	0.171
172	24.042	0.144	0.97	93	-1.2	-	84	0.081	11.23	0.161
173	24.184	0.142	0.97	93	-1.3	-	84	0.079	11.20	0.148
174	24.326	0.142	0.95	94	-1.3	-	85	0.078	11.17	0.156
175	24.467	0.141	0.96	94	-1.3	-	85	0.079	11.10	0.158
176	24.610	0.143	0.98	94	-1.3	-	85	0.078	10.96	0.159
177	24.753	0.143	0.97	94	-1.4	-	85	0.078	10.89	0.175
178	24.895	0.142	0.97	94	-1.4	-	84	0.086	10.51	0.172
179	25.036	0.141	0.96	94	-1.3	-	84	0.076	10.66	0.191
180	25.178	0.142	0.94	94	-1.4	99	84	0.082	10.51	0.214
181	25.321	0.143	0.99	94	-1.4	-	84	0.077	9.38	0.208
182	25.464	0.143	0.98	94	-1.4	-	85	0.084	10.67	0.270
183	25.605	0.141	0.97	94	-1.3	-	85	0.087	10.73	0.228
184	25.747	0.142	0.95	94	-1.2	-	85	0.084	10.72	0.236
185	25.889	0.142	0.97	94	-1.4	-	85	0.081	10.69	0.244
186	26.032	0.143	0.96	94	-1.4	-	85	0.073	10.50	0.302
187	26.175	0.143	0.94	94	-1.4	-	85	0.082	10.39	0.331
188	26.316	0.141	0.97	94	-1.2	-	84	0.082	10.43	0.311
189	26.458	0.142	0.96	94	-1.4	-	85	0.078	10.38	0.318
190	26.600	0.142	0.96	94	-1.4	99	85	0.082	10.24	0.386
191	26.744	0.144	0.96	94	-1.3	-	85	0.082	10.24	0.353

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	26.886	0.142	0.96	94	-1.4	-	84	0.078	10.01	0.421
193	27.027	0.141	0.96	94	-1.2	-	84	0.079	9.97	0.405
194	27.169	0.142	0.98	94	-1.3	-	85	0.082	9.91	0.431
195	27.311	0.142	0.95	94	-1.4	-	85	0.079	9.76	0.467
196	27.455	0.144	0.95	94	-1.4	-	85	0.076	9.76	0.474
197	27.597	0.142	0.98	94	-1.4	-	85	0.076	9.77	0.449
198	27.739	0.142	0.97	94	-1.3	-	85	0.084	9.69	0.457
199	27.880	0.141	0.96	94	-1.4	-	83	0.075	9.84	0.445
200	28.023	0.143	0.96	94	-1.4	99	84	0.081	9.77	0.446
201	28.166	0.143	0.95	94	-1.4	-	85	0.076	9.70	0.466
202	28.309	0.143	0.97	94	-1.2	-	85	0.076	9.49	0.494
203	28.450	0.141	0.96	95	-1.4	-	85	0.072	9.41	0.537
204	28.592	0.142	0.97	94	-1.2	-	84	0.077	9.41	0.535
205	28.735	0.143	0.99	94	-1.3	-	85	0.077	9.50	0.483
206	28.878	0.143	0.98	94	-1.4	-	85	0.081	9.60	0.470
207	29.020	0.142	0.97	94	-1.4	-	84	0.071	9.59	0.491
208	29.161	0.141	0.97	94	-1.2	-	85	0.073	9.69	0.460
209	29.303	0.142	0.95	94	-1.4	-	85	0.069	9.71	0.456
210	29.446	0.143	0.97	94	-1.2	99	84	0.077	9.76	0.438
211	29.589	0.143	0.94	94	-1.4	-	84	0.079	9.74	0.439
212	29.731	0.142	0.98	94	-1.4	-	83	0.078	9.83	0.428
213	29.873	0.142	0.97	94	-1.4	-	85	0.079	10.04	0.364
214	30.015	0.142	0.97	94	-1.3	-	84	0.075	9.81	0.452
215	30.158	0.143	0.97	95	-1.3	-	84	0.080	9.87	0.439
216	30.301	0.143	0.98	94	-1.4	-	84	0.079	10.30	0.295
217	30.443	0.142	0.97	95	-1.3	-	86	0.079	10.36	0.258
218	30.584	0.141	0.96	95	-1.3	-	86	0.072	10.40	0.261
219	30.726	0.142	0.94	95	-1.4	-	86	0.074	10.49	0.219
220	30.870	0.144	0.97	95	-1.4	99	85	0.077	10.47	0.228
221	31.012	0.142	0.96	95	-1.4	-	84	0.076	10.54	0.219
222	31.154	0.142	0.94	95	-1.4	-	85	0.077	10.72	0.195
223	31.296	0.142	0.94	95	-1.2	-	85	0.077	11.03	0.163

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	31.438	0.142	0.96	95	-1.3	-	84	0.078	10.70	0.192
225	31.581	0.143	0.98	95	-1.4	-	84	0.077	10.26	0.266
226	31.724	0.143	0.97	95	-1.3	-	83	0.083	10.19	0.197
227	31.865	0.141	0.95	95	-1.4	-	84	0.081	10.06	0.188
228	32.007	0.142	0.97	95	-1.2	-	85	0.076	9.83	0.257
229	32.149	0.142	0.97	95	-1.3	-	85	0.074	9.74	0.272
230	32.293	0.144	0.95	95	-1.2	99	85	0.070	9.69	0.317
231	32.435	0.142	0.95	94	-1.3	-	86	0.076	9.59	0.353
232	32.577	0.142	0.96	95	-1.3	-	87	0.062	2.98	0.201
233	32.718	0.141	0.94	95	-1.4	-	86	0.110	3.46	0.267
234	32.860	0.142	0.95	95	-1.4	-	88	0.099	10.53	0.151
235	33.002	0.142	0.94	95	-1.4	-	86	0.097	16.61	1.729
236	33.143	0.141	0.94	95	-1.4	-	85	0.101	17.26	1.517
237	33.284	0.141	0.97	95	-1.3	-	85	0.107	18.02	1.898
238	33.426	0.142	0.94	95	-1.3	-	84	0.110	18.13	1.502
239	33.568	0.142	0.96	92	-1.3	-	85	0.105	18.27	0.477
240	33.710	0.142	0.94	94	-1.4	100	85	0.107	18.45	0.288
241	33.850	0.140	0.93	94	-1.2	-	85	0.105	18.81	0.207
242	33.991	0.141	0.95	95	-1.3	-	86	0.100	18.42	0.866
243	34.135	0.144	0.95	95	-1.3	-	86	0.104	17.83	0.571
244	34.276	0.141	0.93	95	-1.2	-	85	0.099	16.64	0.345
245	34.417	0.141	0.95	94	-1.4	-	85	0.099	15.95	0.299
246	34.558	0.141	0.94	95	-1.3	-	85	0.099	15.57	0.271
247	34.701	0.143	0.95	95	-1.2	-	85	0.099	15.35	0.222
248	34.843	0.142	0.97	95	-1.3	-	85	0.096	15.12	0.219
249	34.984	0.141	0.94	95	-1.4	-	86	0.098	14.98	0.222
250	35.125	0.141	0.95	95	-1.2	101	86	0.095	14.75	0.224
251	35.267	0.142	0.98	94	-1.4	-	86	0.096	14.53	0.192
252	35.410	0.143	0.97	95	-1.2	-	86	0.098	14.34	0.159
253	35.551	0.141	0.95	95	-1.4	-	87	0.093	14.13	0.194
254	35.692	0.141	0.94	94	-1.3	-	85	0.090	14.27	0.185
255	35.834	0.142	0.95	95	-1.4	-	86	0.096	14.40	0.196

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	35.977	0.143	0.96	94	-1.4	-	85	0.093	14.46	0.187
257	36.118	0.141	0.95	95	-1.3	-	86	0.094	14.62	0.193
258	36.260	0.142	0.97	95	-1.4	-	85	0.097	14.78	0.205
259	36.401	0.141	0.94	95	-1.4	-	85	0.096	14.96	0.217
260	36.543	0.142	0.95	95	-1.4	100	86	0.095	15.12	0.204
261	36.686	0.143	0.96	95	-1.4	-	85	0.092	15.20	0.202
262	36.827	0.141	0.96	95	-1.4	-	86	0.094	15.25	0.206
263	36.968	0.141	0.93	95	-1.2	-	85	0.092	15.32	0.222
264	37.109	0.141	0.94	95	-1.3	-	86	0.094	15.32	0.234
265	37.253	0.144	0.96	95	-1.4	-	86	0.095	15.30	0.239
266	37.397	0.144	0.95	95	-1.4	-	86	0.091	15.31	0.234
267	37.535	0.138	0.95	95	-1.3	-	86	0.096	15.45	0.256
268	37.676	0.141	0.96	95	-1.4	-	86	0.093	15.51	0.275
269	37.819	0.143	0.95	94	-1.4	-	84	0.093	15.69	0.320
270	37.961	0.142	0.94	95	-1.4	100	86	0.095	15.85	0.327
271	38.102	0.141	0.95	95	-1.2	-	86	0.089	16.02	0.356
272	38.243	0.141	0.97	95	-1.4	-	85	0.095	16.15	0.367
273	38.385	0.142	0.93	96	-1.4	-	85	0.091	16.13	0.394
274	38.528	0.143	0.94	95	-1.2	-	86	0.095	16.22	0.383
275	38.670	0.142	0.93	94	-1.4	-	86	0.095	16.16	0.350
276	38.810	0.140	0.95	94	-1.3	-	86	0.095	15.95	0.332
277	38.952	0.142	0.94	96	-1.4	-	86	0.090	15.79	0.319
278	39.095	0.143	0.96	96	-1.3	-	86	0.089	15.78	0.318
279	39.236	0.141	0.96	95	-1.3	-	85	0.087	15.80	0.307
280	39.380	0.144	0.94	96	-1.4	101	85	0.095	15.84	0.335
281	39.518	0.138	0.95	96	-1.3	-	85	0.093	15.80	0.297
282	39.661	0.143	0.94	96	-1.4	-	85	0.096	15.88	0.298
283	39.803	0.142	0.94	96	-1.4	-	86	0.092	16.00	0.298
284	39.944	0.141	0.96	96	-1.4	-	85	0.093	16.14	0.316
285	40.085	0.141	0.94	96	-1.3	-	84	0.097	16.25	0.305
286	40.227	0.142	0.96	96	-1.3	-	85	0.098	16.32	0.298
287	40.370	0.143	0.97	96	-1.2	-	85	0.092	16.33	0.304

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	40.511	0.141	0.95	96	-1.4	-	84	0.099	16.33	0.293
289	40.651	0.140	0.94	96	-1.4	-	85	0.094	16.40	0.304
290	40.793	0.142	0.95	96	-1.3	101	85	0.096	16.47	0.333
291	40.936	0.143	0.95	96	-1.4	-	85	0.098	16.55	0.363
292	41.077	0.141	0.96	96	-1.4	-	85	0.097	16.50	0.351
293	41.218	0.141	0.95	96	-1.2	-	85	0.100	16.54	0.419
294	41.359	0.141	0.94	96	-1.2	-	86	0.095	16.56	0.449
295	41.502	0.143	0.93	96	-1.4	-	86	0.094	16.51	0.487
296	41.643	0.141	0.98	95	-1.4	-	85	0.100	16.61	0.489
297	41.784	0.141	0.96	96	-1.4	-	85	0.100	16.56	0.602
298	41.925	0.141	0.95	96	-1.2	-	85	0.092	16.67	0.438
299	42.067	0.142	0.96	96	-1.4	-	86	0.099	16.55	0.427
300	42.209	0.142	0.96	96	-1.4	101	85	0.094	16.57	0.410
301	42.350	0.141	0.97	96	-1.4	-	86	0.098	16.53	0.419
302	42.490	0.140	0.95	96	-1.3	-	86	0.101	16.63	0.448
303	42.632	0.142	0.96	96	-1.2	-	86	0.101	16.84	0.496
304	42.774	0.142	0.95	96	-1.2	-	85	0.098	16.43	0.354
305	42.914	0.140	0.97	96	-1.4	-	86	0.103	15.91	0.305
306	43.057	0.143	0.92	96	-1.4	-	86	0.097	15.72	0.312
307	43.197	0.140	0.93	94	-1.4	-	85	0.094	16.08	0.550
308	43.338	0.141	0.94	96	-1.2	-	85	0.097	15.84	0.413
309	43.478	0.140	0.96	96	-1.3	-	85	0.093	15.71	0.341
310	43.618	0.140	0.94	96	-1.4	101	86	0.092	15.55	0.311
311	43.761	0.143	0.94	96	-1.3	-	85	0.094	15.34	0.298
312	43.902	0.141	0.96	96	-1.3	-	85	0.087	15.13	0.306
313	44.042	0.140	0.94	96	-1.4	-	86	0.092	15.07	0.262
314	44.182	0.140	0.95	96	-1.4	-	86	0.097	14.98	0.263
315	44.325	0.143	0.94	96	-1.2	-	86	0.097	14.93	0.242
316	44.466	0.141	0.94	96	-1.3	-	86	0.096	14.92	0.222
317	44.606	0.140	0.95	96	-1.4	-	85	0.095	14.94	0.193
318	44.746	0.140	0.94	96	-1.3	-	85	0.094	14.79	0.171
319	44.891	0.145	0.95	96	-1.3	-	86	0.098	14.66	0.147

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	45.029	0.138	0.96	96	-1.4	101	85	0.096	14.55	0.140
321	45.169	0.140	0.96	96	-1.2	-	85	0.092	14.45	0.141
322	45.310	0.141	0.95	96	-1.4	-	85	0.087	14.16	0.141
323	45.453	0.143	0.94	96	-1.4	-	86	0.092	13.90	0.130
324	45.593	0.140	0.94	96	-1.3	-	86	0.084	13.33	0.089
325	45.733	0.140	0.96	96	-1.3	-	85	0.086	12.74	0.081
326	45.874	0.141	0.94	96	-1.4	-	85	0.085	12.71	0.112
327	46.016	0.142	0.94	96	-1.4	-	85	0.093	12.36	0.091
328	46.157	0.141	0.94	96	-1.4	-	85	0.087	12.40	0.057
329	46.297	0.140	0.93	96	-1.4	-	85	0.086	12.51	0.059
330	46.439	0.142	0.96	96	-1.3	100	85	0.090	12.39	0.068
331	46.580	0.141	0.94	96	-1.3	-	85	0.089	12.53	0.065
332	46.721	0.141	0.95	96	-1.4	-	85	0.091	12.46	0.066
333	46.864	0.143	0.95	96	-1.3	-	85	0.088	12.50	0.071
334	47.003	0.139	0.93	96	-1.3	-	85	0.091	12.49	0.095
335	47.144	0.141	0.95	96	-1.4	-	85	0.094	12.23	0.085
336	47.285	0.141	0.95	96	-1.4	-	85	0.087	11.97	0.088
337	47.425	0.140	0.94	95	-1.4	-	85	0.086	11.78	0.072
338	47.567	0.142	0.94	96	-1.3	-	86	0.086	11.66	0.076
339	47.708	0.141	0.93	96	-1.3	-	86	0.083	11.59	0.081
340	47.849	0.141	0.93	96	-1.3	100	86	0.085	11.49	0.086
341	47.989	0.140	0.97	96	-1.3	-	85	0.090	11.28	0.087
342	48.131	0.142	0.94	96	-1.4	-	85	0.089	10.73	0.076
343	48.275	0.144	0.94	96	-1.3	-	85	0.089	10.48	0.091
344	48.412	0.137	0.95	96	-1.3	-	84	0.090	10.35	0.110
345	48.553	0.141	0.93	96	-1.4	-	85	0.089	10.34	0.115
346	48.695	0.142	0.95	96	-1.3	-	85	0.077	10.18	0.135
347	48.836	0.141	0.96	96	-1.3	-	85	0.080	9.94	0.135
348	48.976	0.140	0.95	96	-1.4	-	86	0.085	9.89	0.146
349	49.117	0.141	0.95	96	-1.3	-	85	0.084	9.82	0.156
350	49.259	0.142	0.95	96	-1.4	99	85	0.083	10.04	0.164
351	49.400	0.141	0.94	95	-1.3	-	84	0.084	10.22	0.165

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	49.540	0.140	0.97	96	-1.4	-	86	0.079	10.14	0.174
353	49.681	0.141	0.95	93	-1.4	-	85	0.079	10.15	0.169
354	49.823	0.142	0.95	96	-1.3	-	85	0.078	10.12	0.185
355	49.967	0.144	0.93	96	-1.4	-	85	0.081	10.15	0.188
356	50.107	0.140	0.93	96	-1.3	-	86	0.076	10.12	0.196
357	50.245	0.138	0.95	96	-1.3	-	86	0.079	10.06	0.208
358	50.388	0.143	0.94	95	-1.4	-	86	0.081	10.16	0.186
359	50.528	0.140	0.97	94	-1.3	-	85	0.076	10.15	0.185
360	50.668	0.140	0.92	96	-1.4	99	85	0.085	10.17	0.190
361	50.810	0.142	0.94	96	-1.3	-	85	0.081	10.15	0.182
362	50.951	0.141	0.95	96	-1.3	-	85	0.083	10.15	0.179
363	51.092	0.141	0.93	96	-1.3	-	85	0.076	10.11	0.197
364	51.232	0.140	0.93	95	-1.4	-	85	0.078	10.17	0.211
365	51.374	0.142	0.95	96	-1.4	-	86	0.082	10.14	0.225
366	51.516	0.142	0.94	96	-1.3	-	86	0.074	10.14	0.233
367	51.656	0.140	0.92	96	-1.4	-	86	0.073	10.16	0.229
368	51.799	0.143	0.93	96	-1.3	-	86	0.070	10.19	0.211
369	51.938	0.139	0.96	96	-1.4	-	84	0.074	10.08	0.210
370	52.080	0.142	0.96	95	-1.3	99	84	0.083	10.02	0.236
371	52.220	0.140	0.93	96	-1.3	-	85	0.082	10.04	0.256
372	52.360	0.140	0.94	96	-1.2	-	85	0.075	10.02	0.287
373	52.503	0.143	0.94	96	-1.4	-	86	0.086	10.33	0.280
374	52.644	0.141	0.96	94	-1.3	-	85	0.079	10.37	0.270
375	52.784	0.140	0.96	96	-1.4	-	85	0.076	10.39	0.284
376	52.925	0.141	0.94	95	-1.3	-	84	0.081	10.47	0.268
377	53.067	0.142	0.95	96	-1.3	-	85	0.073	10.50	0.263
378	53.208	0.141	0.94	94	-1.4	-	84	0.078	10.61	0.239
379	53.351	0.143	0.96	96	-1.4	-	85	0.081	10.64	0.226
380	53.491	0.140	0.96	95	-1.3	99	85	0.077	10.65	0.215
381	53.632	0.141	0.95	96	-1.3	-	85	0.079	10.63	0.220
382	53.772	0.140	0.93	96	-1.4	-	85	0.074	10.70	0.219
383	53.913	0.141	0.95	95	-1.4	-	84	0.074	10.54	0.254

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
384	54.053	0.140	0.95	96	-1.5	-	85	0.080	10.51	0.240
385	54.196	0.143	0.97	96	-1.3	-	85	0.078	10.56	0.246
386	54.337	0.141	0.95	96	-1.3	-	86	0.077	10.60	0.235
387	54.477	0.140	0.95	96	-1.4	-	85	0.080	10.58	0.233
388	54.617	0.140	0.95	96	-1.4	-	85	0.079	10.56	0.207
389	54.760	0.143	0.93	96	-1.4	-	85	0.081	10.53	0.207
390	54.901	0.141	0.95	95	-1.4	99	85	0.075	10.44	0.212
391	55.041	0.140	0.94	96	-1.3	-	85	0.076	10.44	0.221
392	55.184	0.143	0.96	96	-1.4	-	85	0.077	10.44	0.227
393	55.324	0.140	0.94	96	-1.3	-	85	0.078	10.47	0.241
394	55.465	0.141	0.93	96	-1.4	-	85	0.077	10.18	0.233
395	55.605	0.140	0.94	96	-1.4	-	84	0.077	10.13	0.250
396	55.746	0.141	0.93	96	-1.3	-	85	0.070	10.15	0.250
397	55.889	0.143	0.94	96	-1.3	-	86	0.078	10.19	0.266
398	56.029	0.140	0.92	96	-1.4	-	86	0.077	10.16	0.271
399	56.169	0.140	0.97	94	-1.3	-	84	0.075	10.17	0.291
400	56.311	0.142	0.93	95	-1.4	99	85	0.084	10.13	0.288
401	56.453	0.142	0.95	96	-1.2	-	85	0.078	10.15	0.298
402	56.593	0.140	0.94	97	-1.4	-	85	0.080	10.18	0.274
403	56.734	0.141	0.96	96	-1.2	-	84	0.076	10.25	0.313
404	56.877	0.143	0.95	96	-1.3	-	84	0.080	10.23	0.301
405	57.017	0.140	0.97	94	-1.3	-	84	0.078	10.32	0.291
406	57.157	0.140	0.94	96	-1.4	-	85	0.079	10.31	0.279
407	57.298	0.141	0.95	96	-1.4	-	85	0.076	10.32	0.286
408	57.440	0.142	0.92	96	-1.4	-	85	0.078	10.34	0.274
409	57.581	0.141	0.94	96	-1.4	-	85	0.071	10.41	0.260
410	57.722	0.141	0.94	95	-1.2	99	85	0.080	10.53	0.255
411	57.862	0.140	0.94	96	-1.4	-	85	0.077	10.63	0.247
412	58.004	0.142	0.97	96	-1.4	-	85	0.076	10.52	0.216
413	58.145	0.141	0.95	96	-1.3	-	85	0.076	10.66	0.206
414	58.288	0.143	0.93	96	-1.3	-	85	0.078	10.76	0.195
415	58.426	0.138	0.94	96	-1.4	-	85	0.073	10.98	0.172

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
416	58.568	0.142	0.93	96	-1.4	-	85	0.078	11.23	0.156
417	58.709	0.141	0.95	96	-1.4	-	84	0.083	11.57	0.148
418	58.850	0.141	0.93	96	-1.4	-	85	0.081	12.03	0.120
419	58.990	0.140	0.95	96	-1.3	-	84	0.082	11.44	0.143
420	59.132	0.142	0.95	96	-1.4	98	84	0.087	10.89	0.147
421	59.273	0.141	0.92	96	-1.4	-	85	0.081	10.34	0.164
422	59.414	0.141	0.92	96	-1.3	-	85	0.085	9.82	0.213
423	59.554	0.140	0.91	96	-1.4	-	85	0.079	9.39	0.257
424	59.697	0.143	0.94	94	-1.4	-	85	0.080	9.17	0.287
425	59.840	0.143	0.95	96	-1.3	-	85	0.074	8.98	0.327
426	59.980	0.140	0.93	94	-1.3	-	85	0.081	8.90	0.369
427	60.118	0.138	0.95	96	-1.4	-	85	0.076	8.87	0.388
428	60.261	0.143	0.96	96	-1.4	-	85	0.081	8.78	0.414
429	60.401	0.140	0.95	96	-1.4	-	86	0.079	8.35	0.515
430	60.541	0.140	0.97	95	-1.4	98	85	0.073	7.99	0.636
431	60.682	0.141	0.94	96	-1.3	-	85	0.073	7.34	0.932
432	60.825	0.143	0.94	95	-1.4	-	85	0.079	6.96	1.007
433	60.965	0.140	0.93	96	-1.3	-	85	0.072	6.78	1.038
434	61.106	0.141	0.95	96	-1.3	-	85	0.075	6.86	0.941
435	61.249	0.143	0.96	96	-1.3	-	85	0.067	6.99	0.852
436	61.391	0.142	0.95	95	-1.4	-	84	0.071	7.01	0.840
437	61.529	0.138	0.94	96	-1.4	-	85	0.068	7.04	0.807
438	61.670	0.141	0.94	96	-1.4	-	85	0.068	7.15	0.798
439	61.811	0.141	0.95	96	-1.3	-	85	0.073	7.13	0.824
440	61.953	0.142	0.96	96	-1.2	99	85	0.064	7.06	0.798
441	62.094	0.141	0.95	96	-1.4	-	85	0.073	7.08	0.801
442	62.234	0.140	0.96	96	-1.4	-	85	0.065	7.05	0.780
443	62.375	0.141	0.94	96	-1.2	-	85	0.067	7.06	0.792
444	62.517	0.142	0.92	96	-1.2	-	85	0.066	6.96	0.829
445	62.658	0.141	0.97	96	-1.5	-	84	0.066	6.99	0.866
446	62.801	0.143	0.93	96	-1.4	-	85	0.069	6.98	0.883
447	62.941	0.140	0.96	96	-1.4	-	85	0.070	6.92	0.924

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
448	63.082	0.141	0.92	96	-1.4	-	84	0.073	7.06	0.861
449	63.222	0.140	0.97	96	-1.3	-	85	0.062	7.09	0.849
450	63.362	0.140	0.97	96	-1.3	98	84	0.068	7.07	0.867
451	63.504	0.142	0.96	96	-1.3	-	84	0.069	7.03	0.882
452	63.646	0.142	0.97	96	-1.4	-	85	0.065	7.05	0.887
453	63.787	0.141	0.93	96	-1.3	-	85	0.070	6.98	0.898
454	63.927	0.140	0.96	96	-1.3	-	85	0.070	7.01	0.915
455	64.069	0.142	0.93	96	-1.3	-	86	0.072	6.96	0.877
456	64.210	0.141	0.94	96	-1.3	-	85	0.064	6.97	0.924
457	64.353	0.143	0.94	96	-1.5	-	85	0.065	6.98	0.924
458	64.494	0.141	0.95	96	-1.4	-	84	0.067	7.01	0.915
459	64.633	0.139	0.95	96	-1.3	-	85	0.066	7.16	0.878
460	64.775	0.142	0.93	96	-1.4	98	85	0.069	7.26	0.820
461	64.915	0.140	0.92	96	-1.4	-	85	0.073	7.17	0.814
462	65.056	0.141	0.95	96	-1.4	-	85	0.063	7.25	0.826
463	65.198	0.142	0.97	96	-1.3	-	85	0.065	7.20	0.811
464	65.339	0.141	0.95	96	-1.3	-	85	0.071	7.17	0.784
465	65.480	0.141	0.93	96	-1.3	-	85	0.061	7.22	0.792
466	65.620	0.140	0.93	96	-1.4	-	85	0.063	7.23	0.789
467	65.764	0.144	0.96	96	-1.3	-	85	0.063	7.47	0.742
468	65.906	0.142	0.95	96	-1.4	-	84	0.063	7.43	0.746
469	66.044	0.138	0.96	96	-1.3	-	84	0.068	7.38	0.784
470	66.185	0.141	0.94	96	-1.3	98	84	0.065	7.60	0.734
471	66.327	0.142	0.95	96	-1.3	-	84	0.064	7.54	0.709
472	66.468	0.141	0.94	96	-1.3	-	84	0.069	7.74	0.692
473	66.608	0.140	0.95	96	-1.4	-	84	0.066	7.66	0.682
474	66.749	0.141	0.94	96	-1.3	-	84	0.070	7.55	0.671
475	66.892	0.143	0.96	96	-1.4	-	84	0.068	7.57	0.632
476	67.033	0.141	0.94	96	-1.4	-	84	0.072	7.21	0.738
477	67.175	0.142	0.95	96	-1.5	-	85	0.066	7.12	0.782
478	67.316	0.141	0.93	96	-1.2	-	85	0.059	7.14	0.778
479	67.456	0.140	0.96	96	-1.4	-	84	0.061	7.15	0.699

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
480	67.597	0.141	0.96	96	-1.5	98	85	0.065	7.12	0.712
481	67.737	0.140	0.94	96	-1.4	-	84	0.060	7.09	0.716
482	67.878	0.141	0.95	96	-1.4	-	85	0.064	7.08	0.719
483	68.021	0.143	0.96	96	-1.3	-	85	0.066	7.07	0.722
484	68.161	0.140	0.94	96	-1.4	-	85	0.069	7.07	0.717
485	68.304	0.143	0.94	96	-1.3	-	86	0.065	7.06	0.712
486	68.444	0.140	0.93	96	-1.4	-	87	0.064	6.96	0.812
487	68.585	0.141	0.94	96	-1.4	-	86	0.066	6.90	0.808
488	68.725	0.140	0.95	96	-1.4	-	85	0.059	6.90	0.768
489	68.865	0.140	0.94	96	-1.4	-	85	0.068	6.92	0.737
490	69.006	0.141	0.94	96	-1.3	98	84	0.068	6.68	0.684
491	69.149	0.143	0.94	96	-1.5	-	85	0.068	6.65	0.618
492	69.289	0.140	0.96	96	-1.3	-	84	0.064	6.62	0.629
493	69.432	0.143	0.94	96	-1.4	-	83	0.064	6.62	0.614
494	69.573	0.141	0.96	96	-1.4	-	83	0.061	6.63	0.624
495	69.713	0.140	0.95	96	-1.4	-	84	0.068	6.59	0.631
496	69.853	0.140	0.95	96	-1.4	-	84	0.066	6.55	0.650
497	69.993	0.140	0.95	96	-1.4	-	84	0.057	6.59	0.678
498	70.135	0.142	0.93	96	-1.3	-	84	0.062	6.55	0.666
499	70.277	0.142	0.95	96	-1.4	-	83	0.059	6.58	0.650
500	70.417	0.140	0.94	96	-1.4	98	84	0.062	6.60	0.589
501	70.560	0.143	0.96	96	-1.4	-	83	0.065	6.62	0.548
502	70.699	0.139	0.97	96	-1.4	-	83	0.066	6.63	0.540
503	70.841	0.142	0.93	96	-1.3	-	83	0.054	6.61	0.554
504	70.982	0.141	0.93	96	-1.3	-	85	0.060	6.59	0.531
505	71.122	0.140	0.93	96	-1.3	-	86	0.068	6.63	0.525
506	71.264	0.142	0.94	96	-1.3	-	86	0.064	6.63	0.521
507	71.405	0.141	0.94	96	-1.3	-	86	0.061	6.58	0.525
508	71.548	0.143	0.95	96	-1.3	-	85	0.061	6.59	0.547
509	71.688	0.140	0.98	96	-1.4	-	84	0.058	6.85	0.508
510	71.828	0.140	0.96	96	-1.4	98	84	0.062	6.91	0.523
511	71.969	0.141	0.92	96	-1.3	-	84	0.059	6.89	0.524

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
512	72.110	0.141	0.94	96	-1.2	-	84	0.063	6.92	0.522
513	72.250	0.140	0.94	96	-1.3	-	84	0.064	6.99	0.458
514	72.392	0.142	0.94	96	-1.4	-	83	0.064	6.94	0.466
515	72.533	0.141	0.95	95	-1.4	-	83	0.059	6.90	0.476
516	72.676	0.143	0.95	96	-1.5	-	84	0.064	6.87	0.502
517	72.817	0.141	0.94	95	-1.4	-	84	0.063	6.84	0.496
518	72.957	0.140	0.93	95	-1.3	-	84	0.063	6.92	0.491
519	73.098	0.141	0.93	96	-1.4	-	84	0.058	6.93	0.501
520	73.238	0.140	0.94	96	-1.4	97	84	0.060	6.93	0.510
521	73.379	0.141	0.93	96	-1.4	-	84	0.063	6.93	0.517
522	73.521	0.142	0.97	95	-1.4	-	84	0.061	6.89	0.524
523	73.664	0.143	0.95	95	-1.3	-	84	0.056	6.92	0.528
524	73.802	0.138	0.92	95	-1.3	-	84	0.073	6.92	0.536
525	73.942	0.140	0.94	95	-1.4	-	85	0.064	6.95	0.530
526	74.085	0.143	0.94	96	-1.4	-	85	0.058	6.96	0.548
527	74.226	0.141	0.96	95	-1.3	-	85	0.062	6.91	0.549
528	74.366	0.140	0.93	95	-1.4	-	85	0.060	6.88	0.547
529	74.506	0.140	0.96	95	-1.3	-	85	0.057	6.87	0.543
530	74.651	0.145	0.94	95	-1.4	97	85	0.064	6.94	0.541
531	74.792	0.141	0.94	95	-1.4	-	84	0.058	6.97	0.548
532	74.930	0.138	0.94	95	-1.3	-	84	0.059	6.98	0.555
533	75.071	0.141	0.94	95	-1.4	-	85	0.061	6.89	0.560
534	75.213	0.142	0.96	95	-1.4	-	84	0.060	6.85	0.561
535	75.353	0.140	0.93	95	-1.3	-	84	0.059	6.86	0.584
536	75.493	0.140	0.95	95	-1.4	-	85	0.061	6.87	0.585
537	75.637	0.144	0.95	95	-1.5	-	85	0.066	6.77	0.616
538	75.777	0.140	0.93	95	-1.4	-	85	0.062	6.72	0.605
539	75.917	0.140	0.94	95	-1.3	-	85	0.059	6.71	0.609
540	76.057	0.140	0.96	95	-1.3	97	85	0.060	6.69	0.617
541	76.199	0.142	0.93	95	-1.4	-	84	0.059	6.68	0.611
542	76.341	0.142	0.95	95	-1.3	-	84	0.058	6.66	0.611
543	76.484	0.143	0.95	95	-1.4	-	84	0.060	6.61	0.618

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
544	76.624	0.140	0.94	95	-1.3	-	84	0.061	6.64	0.641
Avg/Tot	81.690	0.141	0.95	91.9	-1.5	100	84.7	0.080	11.25	0.434

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024Stove ΔT : 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	90	88	89	80	109	91.0	N/A
1	91	92	89	83	109	92.6	N/A
2	101	120	92	108	116	107.2	N/A
3	119	146	99	163	132	131.7	N/A
4	130	153	105	216	152	151.1	N/A
5	136	158	112	274	173	170.5	N/A
6	144	163	118	331	192	189.7	N/A
7	150	175	124	378	207	206.8	N/A
8	153	188	130	418	222	221.9	N/A
9	159	200	135	451	234	235.6	N/A
10	168	211	139	476	244	247.7	N/A
11	178	220	144	501	256	259.7	N/A
12	187	228	149	526	269	271.7	N/A
13	196	237	155	549	279	283.4	N/A
14	206	247	162	570	290	294.8	N/A
15	214	257	168	588	300	305.5	N/A
16	223	266	175	603	311	315.2	N/A
17	230	274	181	615	321	324.1	N/A
18	240	283	187	624	333	333.2	N/A
19	248	291	193	632	345	341.8	N/A
20	256	300	200	640	357	350.6	N/A
21	264	310	207	646	369	359.0	N/A
22	273	320	214	651	380	367.4	N/A
23	280	330	222	654	392	375.6	N/A
24	289	339	229	657	404	383.5	N/A
25	297	348	235	660	415	391.2	N/A
26	305	356	242	663	427	398.6	N/A
27	314	364	249	666	438	405.9	N/A
28	322	372	246	661	452	410.6	N/A
29	331	382	226	656	466	412.2	N/A
30	340	391	215	661	480	417.2	N/A
31	349	399	208	670	491	423.2	N/A
32	357	407	203	683	500	429.9	N/A
33	366	414	201	697	506	436.6	N/A
34	374	421	199	712	509	443.1	N/A
35	381	428	199	725	513	449.2	N/A
36	388	434	199	735	516	454.4	N/A
37	395	440	199	744	519	459.6	N/A
38	402	446	200	751	522	464.2	N/A
39	408	452	201	758	526	468.9	N/A
40	414	458	201	763	530	473.3	N/A
41	420	464	202	768	534	477.6	N/A
42	425	469	203	773	539	481.7	N/A
43	430	476	204	776	542	485.6	N/A
44	436	482	205	779	547	489.6	N/A
45	441	487	207	782	550	493.5	N/A
46	446	493	208	784	555	497.0	N/A
47	452	498	210	787	559	501.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT: 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	457	504	211	788	563	504.6	N/A
49	462	510	213	788	567	508.0	N/A
50	467	516	215	789	570	511.2	N/A
51	472	522	216	789	573	514.4	N/A
52	477	527	218	787	576	517.1	N/A
53	483	533	220	784	579	519.7	N/A
54	487	537	221	779	583	521.5	N/A
55	492	542	222	767	585	521.5	N/A
56	496	546	223	750	584	519.9	N/A
57	500	550	223	732	582	517.5	N/A
58	503	553	224	713	580	514.8	N/A
59	507	556	224	696	578	512.0	N/A
60	509	557	225	679	576	509.2	N/A
61	511	559	225	665	573	506.7	N/A
62	513	561	225	652	571	504.3	N/A
63	514	562	226	641	569	502.5	N/A
64	516	563	226	632	567	500.8	N/A
65	516	564	226	625	565	499.2	N/A
66	518	564	226	619	563	497.9	N/A
67	517	564	227	615	561	496.8	N/A
68	518	565	227	612	561	496.4	N/A
69	517	565	227	611	558	495.7	N/A
70	518	566	227	612	557	495.9	N/A
71	517	566	228	613	555	495.7	N/A
72	517	567	228	615	555	496.4	N/A
73	517	567	228	616	553	496.3	N/A
74	518	567	229	612	552	495.5	N/A
75	518	567	229	608	550	494.3	N/A
76	518	567	229	604	549	493.3	N/A
77	519	566	230	601	549	492.9	N/A
78	519	566	230	597	550	492.3	N/A
79	520	565	230	594	552	492.1	N/A
80	520	564	231	591	553	491.8	N/A
81	520	564	231	588	554	491.4	N/A
82	521	564	231	585	554	490.8	N/A
83	521	563	231	582	555	490.3	N/A
84	521	563	231	581	555	490.2	N/A
85	522	562	231	580	555	490.0	N/A
86	522	562	232	579	556	490.1	N/A
87	522	562	232	580	556	490.3	N/A
88	522	562	232	581	557	490.7	N/A
89	522	561	232	582	556	490.8	N/A
90	521	562	233	584	558	491.3	N/A
91	521	562	233	585	559	491.9	N/A
92	521	562	233	588	561	493.1	N/A
93	522	562	234	590	566	494.6	N/A
94	523	561	234	592	568	495.5	N/A
95	523	560	234	592	571	496.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT: 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	523	559	235	592	572	496.2	N/A
97	524	558	235	592	574	496.4	N/A
98	525	556	235	593	575	496.8	N/A
99	525	555	235	594	578	497.5	N/A
100	526	554	235	594	579	497.7	N/A
101	526	552	236	593	581	497.5	N/A
102	527	551	236	591	582	497.5	N/A
103	529	550	236	589	584	497.6	N/A
104	529	548	236	586	586	497.0	N/A
105	529	546	236	583	588	496.4	N/A
106	530	545	236	578	589	495.5	N/A
107	530	543	236	575	591	495.2	N/A
108	531	542	236	570	593	494.3	N/A
109	531	540	236	564	595	493.2	N/A
110	531	539	235	558	596	491.9	N/A
111	532	537	235	551	598	490.6	N/A
112	531	536	235	545	600	489.3	N/A
113	531	534	234	540	602	488.1	N/A
114	530	532	234	534	605	486.9	N/A
115	530	531	233	529	607	486.1	N/A
116	528	529	233	526	609	484.9	N/A
117	527	527	233	523	610	484.1	N/A
118	526	525	233	520	611	482.8	N/A
119	526	524	232	517	612	482.2	N/A
120	526	520	255	513	617	486.1	N/A
121	523	516	270	508	623	487.8	N/A
122	521	513	280	512	630	491.1	N/A
123	519	511	289	530	640	497.6	N/A
124	518	511	296	557	649	506.3	N/A
125	515	513	274	588	658	509.5	N/A
126	516	515	262	609	664	513.2	N/A
127	517	516	254	621	667	515.0	N/A
128	518	518	248	627	668	515.6	N/A
129	519	519	244	628	669	515.5	N/A
130	519	520	240	628	667	514.7	N/A
131	521	520	238	628	666	514.3	N/A
132	521	520	236	628	664	513.6	N/A
133	521	521	234	628	663	513.3	N/A
134	521	521	233	629	661	513.0	N/A
135	522	520	232	631	660	512.9	N/A
136	522	520	231	633	659	513.0	N/A
137	522	520	231	634	657	512.8	N/A
138	522	519	230	635	657	512.7	N/A
139	522	519	230	635	656	512.5	N/A
140	522	519	230	635	654	512.2	N/A
141	523	519	230	633	653	511.7	N/A
142	523	519	230	632	652	511.2	N/A
143	524	519	230	630	650	510.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024Stove ΔT : 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	523	519	231	627	649	509.7	N/A
145	523	519	230	623	648	508.6	N/A
146	523	519	231	619	647	507.8	N/A
147	523	519	231	616	646	506.8	N/A
148	523	519	231	612	645	505.8	N/A
149	522	518	231	608	644	504.6	N/A
150	522	519	231	604	643	503.7	N/A
151	522	518	231	600	642	502.5	N/A
152	521	518	231	595	642	501.3	N/A
153	520	517	231	590	639	499.5	N/A
154	520	517	232	585	639	498.4	N/A
155	519	516	232	580	639	497.1	N/A
156	519	515	232	576	638	496.0	N/A
157	518	515	232	573	638	494.9	N/A
158	517	513	232	569	637	493.8	N/A
159	517	512	232	566	636	492.7	N/A
160	516	512	232	563	636	491.7	N/A
161	516	511	232	560	636	490.8	N/A
162	517	511	232	557	635	490.3	N/A
163	516	510	232	554	635	489.3	N/A
164	515	509	232	552	634	488.5	N/A
165	515	509	233	550	633	487.5	N/A
166	514	508	232	547	632	486.8	N/A
167	514	507	232	545	632	485.9	N/A
168	513	507	232	543	631	485.2	N/A
169	513	506	232	540	630	484.4	N/A
170	512	506	232	538	630	483.6	N/A
171	512	505	232	536	630	483.0	N/A
172	512	505	233	535	629	482.6	N/A
173	511	504	233	532	629	481.8	N/A
174	510	504	233	531	629	481.4	N/A
175	509	503	233	530	629	480.7	N/A
176	509	503	233	528	627	480.0	N/A
177	509	503	233	527	628	479.8	N/A
178	508	502	233	524	627	478.8	N/A
179	508	502	233	523	625	478.0	N/A
180	508	501	233	521	626	477.7	N/A
181	507	501	233	519	625	477.0	N/A
182	506	500	233	518	626	476.6	N/A
183	506	500	233	515	625	475.7	N/A
184	506	499	233	513	624	475.0	N/A
185	506	499	233	511	624	474.5	N/A
186	505	498	233	509	624	473.8	N/A
187	505	498	233	507	624	473.2	N/A
188	504	497	233	505	623	472.4	N/A
189	504	497	233	503	623	471.9	N/A
190	503	495	233	501	623	470.9	N/A
191	502	495	233	499	623	470.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT: 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	502	494	233	496	623	469.7	N/A
193	502	494	233	494	621	468.7	N/A
194	501	493	233	493	623	468.4	N/A
195	500	492	233	490	623	467.8	N/A
196	500	492	233	488	624	467.2	N/A
197	499	491	233	486	625	466.6	N/A
198	498	490	233	484	625	465.9	N/A
199	499	489	233	481	626	465.3	N/A
200	498	488	233	480	626	464.8	N/A
201	497	487	233	478	629	464.6	N/A
202	496	486	232	476	631	464.1	N/A
203	496	485	232	473	631	463.4	N/A
204	495	484	232	471	633	462.9	N/A
205	494	483	232	469	635	462.5	N/A
206	494	482	232	467	636	462.1	N/A
207	494	481	232	465	637	461.7	N/A
208	492	480	232	464	639	461.5	N/A
209	492	480	232	463	641	461.2	N/A
210	491	479	232	461	642	461.1	N/A
211	491	478	232	461	644	461.0	N/A
212	490	478	232	460	645	460.8	N/A
213	488	477	232	460	647	460.9	N/A
214	488	477	232	459	649	461.0	N/A
215	487	477	232	459	650	461.0	N/A
216	486	476	232	459	652	461.0	N/A
217	485	477	232	460	654	461.4	N/A
218	485	477	232	460	655	461.7	N/A
219	484	478	232	461	657	462.3	N/A
220	484	478	232	462	659	462.8	N/A
221	483	478	232	463	660	463.3	N/A
222	483	479	232	465	663	464.3	N/A
223	481	480	233	467	664	465.1	N/A
224	482	481	233	470	667	466.4	N/A
225	481	482	233	471	667	466.9	N/A
226	481	483	233	472	671	468.0	N/A
227	481	484	233	472	674	468.7	N/A
228	480	485	234	472	675	469.1	N/A
229	480	486	234	471	675	469.2	N/A
230	480	488	234	470	675	469.3	N/A
231	479	488	235	469	674	469.0	N/A
232	482	487	259	465	679	474.1	N/A
233	480	482	274	457	680	474.6	N/A
234	479	478	282	479	682	480.1	N/A
235	478	476	287	531	684	491.2	N/A
236	478	475	292	578	688	502.3	N/A
237	480	476	297	620	694	513.5	N/A
238	482	477	302	659	702	524.3	N/A
239	483	479	307	693	710	534.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT : 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	485	481	311	722	719	543.4	N/A
241	487	483	314	748	726	551.5	N/A
242	489	486	300	768	730	554.6	N/A
243	492	490	283	778	733	555.2	N/A
244	495	493	271	782	734	554.9	N/A
245	496	496	261	780	733	553.0	N/A
246	498	498	253	775	732	550.9	N/A
247	498	499	246	768	730	548.2	N/A
248	500	501	242	761	727	546.0	N/A
249	501	501	237	753	724	543.3	N/A
250	503	503	234	745	720	540.9	N/A
251	503	503	231	736	718	538.0	N/A
252	503	503	229	727	715	535.4	N/A
253	503	503	227	719	712	532.7	N/A
254	504	503	225	712	710	530.5	N/A
255	503	502	223	707	707	528.5	N/A
256	503	502	222	702	704	526.6	N/A
257	503	502	220	698	703	525.1	N/A
258	503	501	219	696	701	524.0	N/A
259	503	500	218	694	698	522.7	N/A
260	503	500	217	695	696	522.1	N/A
261	503	499	216	695	694	521.3	N/A
262	502	498	215	695	692	520.5	N/A
263	503	497	214	696	690	520.1	N/A
264	503	497	214	698	688	519.9	N/A
265	503	496	213	699	686	519.4	N/A
266	503	496	213	700	684	519.1	N/A
267	503	496	212	701	682	518.8	N/A
268	503	495	211	702	681	518.5	N/A
269	503	495	211	704	678	518.1	N/A
270	503	495	211	706	676	518.0	N/A
271	503	495	210	709	673	518.1	N/A
272	504	495	210	712	670	518.1	N/A
273	504	495	210	714	668	518.4	N/A
274	505	495	210	717	667	518.6	N/A
275	506	495	210	719	664	518.8	N/A
276	507	496	210	721	661	518.6	N/A
277	508	496	209	721	661	518.9	N/A
278	508	496	209	721	661	519.0	N/A
279	510	497	209	720	659	518.9	N/A
280	510	497	209	720	657	518.7	N/A
281	510	498	209	720	655	518.4	N/A
282	511	498	209	720	653	518.3	N/A
283	512	499	209	721	647	517.7	N/A
284	512	500	209	722	645	517.6	N/A
285	514	500	209	724	643	517.9	N/A
286	515	501	209	726	641	518.3	N/A
287	515	502	210	729	641	519.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT : 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	516	503	210	731	641	520.1	N/A
289	517	504	210	734	638	520.5	N/A
290	517	506	210	736	637	521.3	N/A
291	519	506	210	737	635	521.5	N/A
292	519	507	210	739	634	521.9	N/A
293	520	508	211	741	633	522.4	N/A
294	521	509	211	743	630	522.6	N/A
295	522	511	211	744	628	523.1	N/A
296	524	512	211	744	626	523.3	N/A
297	525	513	212	745	624	523.7	N/A
298	526	514	212	746	622	524.0	N/A
299	527	516	212	748	620	524.6	N/A
300	528	517	212	749	619	525.0	N/A
301	530	518	213	750	618	525.5	N/A
302	530	519	213	750	617	525.9	N/A
303	532	520	213	752	616	526.4	N/A
304	533	521	213	751	616	526.8	N/A
305	534	522	214	750	616	527.1	N/A
306	535	523	214	748	616	527.2	N/A
307	536	524	214	744	615	526.6	N/A
308	538	525	215	742	615	526.6	N/A
309	539	526	215	738	615	526.4	N/A
310	540	527	215	735	615	526.3	N/A
311	541	528	215	731	614	525.6	N/A
312	542	528	215	727	615	525.3	N/A
313	542	529	215	722	615	524.9	N/A
314	543	530	216	718	615	524.6	N/A
315	544	531	216	715	615	524.1	N/A
316	545	532	216	710	614	523.3	N/A
317	545	532	216	707	615	523.1	N/A
318	546	533	216	705	614	522.7	N/A
319	546	534	216	701	614	522.1	N/A
320	547	535	216	699	614	521.9	N/A
321	548	536	216	696	613	521.6	N/A
322	548	536	216	694	613	521.3	N/A
323	549	537	216	691	613	520.9	N/A
324	549	538	216	687	612	520.2	N/A
325	549	538	216	681	611	518.8	N/A
326	549	539	216	673	611	517.4	N/A
327	549	539	216	666	611	516.0	N/A
328	549	538	215	659	608	513.9	N/A
329	550	538	215	652	609	512.6	N/A
330	549	537	215	646	609	511.1	N/A
331	548	537	215	641	608	509.8	N/A
332	548	537	215	637	608	508.8	N/A
333	547	537	215	633	607	507.6	N/A
334	546	537	215	631	606	506.9	N/A
335	546	537	215	629	606	506.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT : 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	545	537	215	626	605	505.5	N/A
337	545	537	214	622	604	504.3	N/A
338	544	537	214	619	601	503.2	N/A
339	543	536	214	616	600	502.1	N/A
340	543	536	214	614	599	501.0	N/A
341	542	534	215	610	598	499.9	N/A
342	541	533	215	606	598	498.6	N/A
343	541	532	215	601	598	497.3	N/A
344	540	531	215	595	597	495.6	N/A
345	539	530	215	589	596	493.8	N/A
346	538	528	215	583	595	491.9	N/A
347	537	527	215	577	593	489.7	N/A
348	536	525	215	572	593	488.1	N/A
349	536	524	215	566	591	486.3	N/A
350	534	522	215	560	590	484.2	N/A
351	533	521	214	554	589	482.2	N/A
352	531	519	215	549	587	480.2	N/A
353	531	518	215	544	586	478.6	N/A
354	530	517	215	539	586	477.1	N/A
355	528	515	215	535	586	475.8	N/A
356	526	514	215	530	586	474.3	N/A
357	525	512	215	526	586	472.8	N/A
358	524	511	215	522	586	471.6	N/A
359	523	510	215	518	587	470.4	N/A
360	522	509	215	515	587	469.4	N/A
361	521	508	215	512	587	468.6	N/A
362	520	506	215	510	587	467.5	N/A
363	519	506	215	507	586	466.5	N/A
364	517	504	215	505	585	465.3	N/A
365	516	504	215	503	584	464.4	N/A
366	515	502	214	501	585	463.4	N/A
367	514	502	214	499	585	462.8	N/A
368	513	501	214	498	585	462.2	N/A
369	513	500	214	496	586	461.6	N/A
370	512	499	214	495	586	460.9	N/A
371	510	498	214	493	586	460.2	N/A
372	509	497	214	492	586	459.5	N/A
373	509	497	213	491	585	458.9	N/A
374	508	496	213	490	584	458.1	N/A
375	507	496	212	490	584	457.8	N/A
376	507	495	212	489	583	457.2	N/A
377	506	495	211	490	582	456.7	N/A
378	505	495	211	489	582	456.4	N/A
379	504	494	211	490	581	456.0	N/A
380	503	494	211	489	581	455.6	N/A
381	503	494	211	490	581	455.6	N/A
382	503	493	210	490	581	455.5	N/A
383	502	493	210	489	581	455.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024Stove ΔT: 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	502	493	210	490	582	455.3	N/A
385	501	493	211	490	581	455.1	N/A
386	501	492	211	490	581	455.0	N/A
387	502	492	211	489	581	454.9	N/A
388	501	492	211	489	581	454.8	N/A
389	500	492	212	489	580	454.7	N/A
390	500	492	212	489	581	454.5	N/A
391	500	492	212	487	581	454.4	N/A
392	500	492	212	487	581	454.3	N/A
393	499	491	212	487	581	454.1	N/A
394	499	491	212	485	581	453.8	N/A
395	500	491	212	484	581	453.6	N/A
396	499	491	213	483	581	453.4	N/A
397	499	491	213	481	581	453.0	N/A
398	498	492	213	480	581	452.9	N/A
399	498	492	213	479	581	452.7	N/A
400	498	493	213	478	582	452.9	N/A
401	497	493	214	478	583	452.8	N/A
402	497	493	214	477	583	452.8	N/A
403	497	493	214	477	583	452.8	N/A
404	496	494	214	477	583	452.8	N/A
405	496	494	214	477	583	452.8	N/A
406	495	494	214	477	583	452.7	N/A
407	495	495	214	477	584	453.0	N/A
408	494	495	214	477	583	452.7	N/A
409	494	495	214	477	583	452.8	N/A
410	494	495	215	478	583	452.9	N/A
411	493	496	215	479	583	453.1	N/A
412	493	495	215	481	583	453.5	N/A
413	493	496	215	483	582	453.8	N/A
414	493	495	215	485	582	454.0	N/A
415	493	495	216	487	582	454.6	N/A
416	493	495	216	490	582	455.1	N/A
417	494	495	216	493	581	456.0	N/A
418	493	495	217	499	581	456.9	N/A
419	494	496	217	504	580	458.2	N/A
420	495	496	218	508	580	459.3	N/A
421	495	497	218	510	580	460.0	N/A
422	496	497	219	509	580	460.1	N/A
423	496	496	219	506	580	459.4	N/A
424	497	496	219	502	580	458.8	N/A
425	497	496	219	499	581	458.2	N/A
426	496	495	219	493	581	456.9	N/A
427	496	495	219	489	581	456.1	N/A
428	497	494	219	484	581	455.1	N/A
429	496	493	219	479	581	453.7	N/A
430	495	493	219	473	581	452.3	N/A
431	494	491	219	467	581	450.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT: 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	494	490	219	460	582	449.0	N/A
433	493	489	218	453	583	447.0	N/A
434	493	488	217	445	582	445.0	N/A
435	491	486	216	437	583	442.7	N/A
436	490	485	215	430	584	440.8	N/A
437	488	483	215	424	584	438.7	N/A
438	487	481	214	418	585	437.0	N/A
439	486	480	213	413	586	435.5	N/A
440	484	478	212	408	587	434.0	N/A
441	483	476	212	404	589	432.6	N/A
442	481	475	211	400	590	431.4	N/A
443	480	473	210	397	591	430.1	N/A
444	478	471	210	393	592	428.9	N/A
445	477	470	209	390	593	427.8	N/A
446	475	468	209	387	595	426.7	N/A
447	474	467	208	384	596	425.6	N/A
448	473	465	207	381	596	424.6	N/A
449	471	464	207	379	598	423.6	N/A
450	470	462	206	376	599	422.6	N/A
451	468	461	206	374	600	421.5	N/A
452	467	460	206	372	599	420.6	N/A
453	465	458	205	370	600	419.7	N/A
454	464	457	205	368	601	418.8	N/A
455	463	456	204	366	601	417.8	N/A
456	462	454	204	364	601	416.8	N/A
457	460	453	203	362	602	415.9	N/A
458	459	452	203	360	602	415.2	N/A
459	458	451	203	359	602	414.5	N/A
460	457	450	202	358	603	413.9	N/A
461	455	448	202	357	604	413.3	N/A
462	453	447	202	357	605	412.8	N/A
463	452	447	201	357	606	412.5	N/A
464	451	445	201	356	606	411.9	N/A
465	450	444	201	356	607	411.5	N/A
466	448	444	201	356	608	411.2	N/A
467	448	443	201	355	608	410.9	N/A
468	447	442	200	355	609	410.5	N/A
469	446	441	200	355	610	410.2	N/A
470	445	440	200	355	611	410.1	N/A
471	444	440	200	355	611	410.0	N/A
472	443	439	200	355	612	409.8	N/A
473	442	438	200	356	613	409.6	N/A
474	442	437	199	356	613	409.5	N/A
475	441	437	199	357	613	409.3	N/A
476	440	436	199	357	614	409.1	N/A
477	440	436	199	356	613	408.7	N/A
478	439	435	199	356	613	408.3	N/A
479	439	434	199	354	613	407.7	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 2Technician: AKDate: 5/7/2024Stove ΔT: 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	438	434	199	354	612	407.2	N/A
481	438	433	199	353	611	406.6	N/A
482	437	432	199	352	610	406.0	N/A
483	437	432	199	351	608	405.3	N/A
484	436	431	199	350	607	404.4	N/A
485	435	431	199	349	607	404.0	N/A
486	435	430	198	348	606	403.4	N/A
487	434	429	198	348	605	402.7	N/A
488	434	428	198	346	604	402.0	N/A
489	433	428	198	345	604	401.5	N/A
490	432	427	198	344	604	400.8	N/A
491	432	426	198	343	603	400.3	N/A
492	431	426	198	342	602	399.6	N/A
493	431	425	198	340	601	398.9	N/A
494	430	424	198	338	602	398.4	N/A
495	429	424	198	337	602	398.0	N/A
496	428	423	198	336	602	397.5	N/A
497	428	423	198	335	601	396.9	N/A
498	427	422	198	334	602	396.5	N/A
499	427	422	197	333	601	395.9	N/A
500	425	421	197	332	602	395.5	N/A
501	425	420	197	331	602	394.9	N/A
502	425	419	197	330	601	394.3	N/A
503	424	418	197	329	601	393.8	N/A
504	423	418	197	328	602	393.5	N/A
505	422	417	197	328	601	392.9	N/A
506	422	417	197	327	600	392.5	N/A
507	421	416	197	326	601	392.0	N/A
508	420	415	197	326	599	391.5	N/A
509	419	414	197	325	600	391.0	N/A
510	419	414	197	325	600	390.9	N/A
511	418	414	196	324	601	390.6	N/A
512	418	413	196	324	601	390.5	N/A
513	418	413	196	324	601	390.5	N/A
514	417	413	196	324	602	390.2	N/A
515	417	412	196	323	602	390.1	N/A
516	416	412	196	324	602	390.0	N/A
517	416	412	196	323	602	389.8	N/A
518	416	411	196	323	602	389.6	N/A
519	415	411	196	323	602	389.4	N/A
520	414	410	196	323	603	389.2	N/A
521	414	410	196	323	602	389.0	N/A
522	414	409	196	322	602	388.5	N/A
523	413	409	196	322	601	388.4	N/A
524	413	409	197	322	601	388.1	N/A
525	412	408	197	322	600	387.9	N/A
526	412	408	197	322	600	387.6	N/A
527	412	408	197	322	599	387.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Stove ΔT: 270

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	411	407	197	321	598	386.8	N/A
529	411	407	197	321	598	386.7	N/A
530	411	406	198	321	598	386.6	N/A
531	410	406	198	320	598	386.4	N/A
532	410	406	198	321	597	386.4	N/A
533	409	406	199	320	597	386.1	N/A
534	409	405	199	319	597	385.7	N/A
535	409	406	199	318	596	385.7	N/A
536	409	405	200	318	596	385.5	N/A
537	408	405	200	318	596	385.3	N/A
538	407	404	201	318	596	385.1	N/A
539	408	404	201	318	597	385.3	N/A
540	407	403	201	317	597	385.1	N/A
541	407	403	202	317	597	385.1	N/A
542	406	402	202	316	597	384.8	N/A
543	406	401	203	316	597	384.5	N/A
544	405	401	203	316	598	384.5	N/A
Average	471.6	474.4	216.5	526.1	592.9	456.3	N/A

LAB SAMPLE DATA - ASTM E2515

Client: SBI
Model: Everest III
Run #: 2

Job #: 23-241
Tracking #: 191
Technician: AK
Date: 5/7/2024

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01007	242.0	244.7	2.7
	B	G01008	239.4	241.8	2.4
	Amb	G00995	240.5	240.6	0.1
Probes	A	8C	116662.7	116662.7	0.0
	B	9A	116530.4	116530.6	0.2
O-rings	A	8C	3586.6	3586.7	0.1
	B	9A	3580.0	3580.3	0.3

Placed in Dessicator on: 5/6/2024

Balance Audit (mg):		200.0		200.0		200.0			
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	244.8	5/7 22:00	244.7	5/10 13:30	244.7	5/13 9:00		
	B	241.7	5/7 22:00	241.6	5/10 13:30	241.8	5/13 9:00		
		240.7	5/7 22:00	240.6	5/10 13:30	240.6	5/13 9:00		
Probes	A	116661.8	5/7 22:00	116662.7	5/10 13:30	116662.7	5/13 9:00		
	B	116529.2	5/7 22:00	116530.7	5/10 13:30	116530.6	5/13 9:00		
O-Rings	A	3586.4	5/7 22:00	3586.8	5/10 13:30	3586.7	5/13 9:00		
	B	3580.2	5/7 22:00	3580.3	5/10 13:30	3580.3	5/13 9:00		

Train A Aggregate, mg:	2.8
Train B Aggregate, mg:	2.9
Ambient, mg:	0.1

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: SBI

Model: Everest III

Run #: 2

Job #: 23-241

Tracking #: 191

Technician: AK

Date: 5/7/2024

Total Fuel Burned (kg-dry) 24.42

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	71.833	81.866	81.690	-
Average Gas Velocity in Dilution Tunnel (ft/sec)	19.3			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	51800.0			
Average Gas Meter Temperature (°F)	70.1	84.2	91.9	-
Total Sample Volume (dscf)	73.013	80.192	79.155	-
Average Tunnel Temperature (°F)	89.3			
Total Time of Test (min)	578			
Total Particulate Catch (mg)	0.1	2.8	2.9	-
Particulate Concentration, dry-standard (g/dscf)	0.0000014	0.0000349	0.0000366	-
Total PM Emissions (g)	0.68	16.74	17.60	-
Particulate Emission Rate (g/hr)	0.07	1.74	1.83	-
Emissions Factor (g/kg)	-	0.69	0.72	-
Difference from Average Total Particulate Emissions (g)	-	0.43	0.43	-
Difference from Average Total Particulate Emissions (%)	-	2.5%	2.5%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	17.17
Particulate Emission Rate (g/hr)	1.78
Emissions Factor (g/kg)	0.70

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	87.5	OK
Face Velocity	< 30 ft/min	7.8	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:66.2/Max:72	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

Test Input Data

Client: SBI
 Model: Everest III
 Run #: 2

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/7/2024

Traverse Data

pt	dP (in WC)
1	0.066
2	0.088
3	0.090
4	0.092
5	0.086
6	0.064
7	0.072
8	0.086
9	0.092
10	0.094
11	0.090
12	0.062
Center	0.094

Tunnel Data

Tunnel dia. (in):	12
Pitot Cp	0.99
Vs,cent (ft/s):	20.43
Vs, trav (ft/s):	19.01
Fp	0.931

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	30.01	29.93
Lab Relative Humidity (%)	46.9	44.2

Traverse Temp:	75
Static Pressure:	-0.290

Fuel Data

Fuel Properties

Species	Maple
HHV (Btu/lb)	8587
%C	50.84%
%H	6.02%
%O	41.74%

	Wet Weight	MC (%db)	Dry Weight (lbs)
Kindling	2.67		
Starter	8.00	21.18	6.60
L2	18.68	22.91	15.20
L3	13.17	23.97	10.62
L4 _s	10.37	23.09	8.42
L4 _b	19.91	22.08	16.31
Avg. Moisture (%db)		22.65	

Run 2 Results Summary

Test Segments

	Clock	ET(min)
L1 Ignition	12:02 PM	0
L1 End	2:01 PM	27
L1 Duration		27
Fuel Consumed (lbs-wet)		7.45
Fuel Consumed (lbs-dry)		6.05

L2 Loaded	2:02 PM	28
L2 End	2:01 PM	119
L2 Duration		91
Fuel Consumed (lbs-wet)		16.84
Fuel Consumed (lbs-dry)		13.36

L3 Loaded	2:02 PM	120
L3 End	3:53 PM	231
L3 Duration		111
Fuel Consumed (lbs-wet)		12.09
Fuel Consumed (lbs-dry)		9.54

L4 Loaded	2:02 PM	232
L4 End	7:48 PM	578
L4 Duration		346
Fuel Consumed (lbs-wet)		30.42
Fuel Consumed (lbs-dry)		24.87

Total Fuel Burned (lbs-wet) 66.80

Total Fuel Burned (lbs-dry) 53.83 24.42 (kg-dry) 2.53 kg/hr dry

Firebox Avg Temps (F)

L1TS _{avg(i)}	91
L1TS _{avg(f)}	406
L2TS _{avg(i)}	411
L2TS _{avg(f)}	482
L3TS _{avg(i)}	486
L3TS _{avg(f)}	469
L4TS _{avg(i)}	474
L14TS _{avg(f)}	362

Burn Time Rating (hrs)

BTR	6
-----	---

Burn Rate (lbs-wet/hr) (dry kg/hr)

BR _{L1}	45.88	6.10
BR _{L2}	11.10	4.00
BR _{L3}	6.54	2.34
BR _{L4}	5.28	2.39
OVERALL	6.93	2.53

PM Results

Burn Phase:	L1	L2	L3	L4	Total
E _T :	4.1	2.8	0.9	2.6	10.3
E _{g/hr} :	9.1	1.8	0.47	0.45	1.07
E _{g/kg} :	1.49	0.46	0.20	0.23	0.42
E _{g/MJ output} :	0.11	0.04	0.02	0.02	0.03
E _{lb/mmbtu output} :	0.26	0.09	0.04	0.04	0.08
CO (g):	128.1	298.4	129.1	414.5	970.1
CO (g/min):	4.75	3.28	1.16	1.20	1.68
Output (BTU/hr)	77,050	46,569	28,859	23,936	30,802
Efficiency (%)	65.7%	63.4%	66.2%	65.0%	64.9%

Rolling Average Max Values

	1-min Avg.	5-min Avg.	50-min Avg
PM (g/hr)	148.5	51.6	7.0

Quality Checks

Quality Checks	Requirement	Observed	Pass/Fail
Max Tunnel Temp	10-minute average <104F, excluding door open periods	Max Δ -12.3	PASS
Filter Temp	Must be between 80 and 90F at all times	81.4 / 87.5	PASS
Ambient Temp	Must be between 65 and 90F at all times	66.2 / 72	PASS
Minimum Tunnel Flow	>600 CFM	748.0	PASS
Weight Loss	Must be >0.1 lb per 20 min	Min -0.35 lb	PASS

L1 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/07/24
Run: 2
Control #: 191
Test Duration: 27
Output Category: L1

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.7%	70.2%
Combustion Efficiency	96.8%	96.8%
Heat Transfer Efficiency	67.9%	72.6%

Output Rate (kJ/h)	81,224	77,050	(Btu/h)
Burn Rate (kg/h)	6.19	13.65	(lb/h)
Input (kJ/h)	123,673	117,317	(Btu/h)

Test Load Weight (dry kg)	2.79	6.14	dry lb
MC wet (%)	18.77		
MC dry (%)	23.10		
Particulate (g)	N/A		
CO (g)	128		
Test Duration (h)	0.45		

Emissions	Particulate	CO
g/MJ Output	N/A	3.51
g/kg Dry Fuel	N/A	45.98
g/h	N/A	284.71
g/min	N/A	4.75
lb/MM Btu Output	N/A	8.15

Air/Fuel Ratio (A/F)	8.06
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VERSION:

2.4

4/15/2010

L2 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/07/24
Run: 2
Control #: 191
Test Duration: 91
Output Category: L2

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	63.4%	67.8%
Combustion Efficiency	96.4%	96.4%
Heat Transfer Efficiency	65.8%	70.4%

Output Rate (kJ/h)	49,092	46,569	(Btu/h)
Burn Rate (kg/h)	3.88	8.54	(lb/h)
Input (kJ/h)	77,400	73,422	(Btu/h)

Test Load Weight (dry kg)	5.88	12.95	dry lb
MC wet (%)	20.68		
MC dry (%)	26.07		
Particulate (g)	N/A		
CO (g)	298		
Test Duration (h)	1.52		

Emissions	Particulate	CO
g/MJ Output	N/A	4.01
g/kg Dry Fuel	N/A	50.76
g/h	N/A	196.72
g/min	N/A	3.28
lb/MM Btu Output	N/A	9.31

Air/Fuel Ratio (A/F)	8.40
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VERSION:

2.4

4/15/2010

L3 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/07/24
Run: 2
Control #: 191
Test Duration: 111
Output Category: L3

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	66.2%	70.8%
Combustion Efficiency	98.0%	98.0%
Heat Transfer Efficiency	67.6%	72.3%

Output Rate (kJ/h)	30,423	28,859	(Btu/h)
Burn Rate (kg/h)	2.30	5.07	(lb/h)
Input (kJ/h)	45,938	43,577	(Btu/h)

Test Load Weight (dry kg)	4.25	9.38	dry lb
MC wet (%)	21.06		
MC dry (%)	26.68		
Particulate (g)	N/A		
CO (g)	129		
Test Duration (h)	1.85		

Emissions	Particulate	CO
g/MJ Output	N/A	2.29
g/kg Dry Fuel	N/A	30.33
g/h	N/A	69.77
g/min	N/A	1.16
lb/MM Btu Output	N/A	5.33

Air/Fuel Ratio (A/F)	10.46
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VERSION:

2.4

4/15/2010

L4 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/07/24
Run: 2
Control #: 191
Test Duration: 346
Output Category: L4

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.0%	69.5%
Combustion Efficiency	97.5%	97.5%
Heat Transfer Efficiency	66.7%	71.3%

Output Rate (kJ/h)	25,233	23,936	(Btu/h)
Burn Rate (kg/h)	1.94	4.28	(lb/h)
Input (kJ/h)	38,806	36,812	(Btu/h)

Test Load Weight (dry kg)	11.20	24.69	dry lb
MC wet (%)	18.23		
MC dry (%)	22.30		
Particulate (g)	N/A		
CO (g)	415		
Test Duration (h)	5.77		

Emissions	Particulate	CO
g/MJ Output	N/A	2.85
g/kg Dry Fuel	N/A	37.00
g/h	N/A	71.88
g/min	N/A	1.20
lb/MM Btu Output	N/A	6.62

Air/Fuel Ratio (A/F)	11.55
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VERSION:

2.4

4/15/2010

Run 2 TEOM Data

ET (min)	Ci - 1-min avg PM (ug/m ³)	Tunnel dP (in WC)	sqrtdP	Tunnel Temp (F)	Tunnel Temp - 10 minute Avg. (F)	Tunnel RH - 10 minute avg. (%)	Tunnel Velocity - Vsi (ft/s)	Tunnel Flow - Q _{sdi} (m ³ /min)	E _i (mg)	E _{g/hr, i} (g/hr)	PM 5-min Rolling Avg (g/hr)	PM 30-min Rolling Avg (g/hr)	PM (cumulative g)
0	-85	0.090	0.3000	72	-	-	18.562	24.594	-2.095	-0.13	-	-	0.00
1	12310	0.089	0.2983	80.9	-	-	18.613	24.255	298.569	17.91	-	-	0.30
2	20525	0.086	0.2933	114.5	-	-	18.856	23.134	474.824	28.49	-	-	0.77
3	105041	0.086	0.2933	93.9	-	-	18.515	23.561	2474.833	148.49	-	-	3.25
4	33496	0.088	0.2966	88.6	-	-	18.639	23.948	802.168	48.13	48.58	-	4.05
5	10454	0.089	0.2983	88.7	-	-	18.746	24.082	251.755	15.11	51.63	-	4.30
6	63	0.090	0.3000	88.5	-	-	18.848	24.221	1.531	0.09	48.06	-	4.30
7	-1459	0.090	0.3000	88.2	-	-	18.843	24.228	-35.349	-2.12	41.94	-	4.27
8	-1385	0.091	0.3017	88	-	-	18.944	24.366	-33.757	-2.03	11.84	-	4.23
9	-1392	0.090	0.3000	87.8	89.11	-	18.836	24.236	-33.743	-2.02	1.81	-	4.20
10	-329	0.088	0.2966	88.2	90.73	-	18.632	23.957	-7.884	-0.47	-1.31	-	4.19
11	883	0.090	0.3000	88.7	91.51	-	18.851	24.216	21.392	1.28	-1.07	-	4.21
12	151	0.091	0.3017	89.3	88.99	-	18.966	24.337	3.686	0.22	-0.60	-	4.22
13	-209	0.091	0.3017	89.6	88.56	-	18.971	24.331	-5.078	-0.30	-0.26	-	4.21
14	-496	0.090	0.3000	90.2	88.72	-	18.877	24.183	-12.003	-0.72	0.00	-	4.20
15	-551	0.087	0.2950	90.8	88.93	-	18.570	23.764	-13.090	-0.79	-0.06	-	4.19
16	-684	0.087	0.2950	91.6	89.24	-	18.583	23.747	-16.248	-0.97	-0.51	-	4.17
17	-527	0.092	0.3033	92.4	89.66	-	19.124	24.402	-12.853	-0.77	-0.71	-	4.16
18	-417	0.091	0.3017	93.1	90.17	-	19.032	24.253	-10.105	-0.61	-0.77	-	4.15
19	-394	0.090	0.3000	93.3	90.72	-	18.930	24.115	-9.499	-0.57	-0.74	-	4.14
20	-413	0.091	0.3017	93.4	91.24	-	19.037	24.247	-10.024	-0.60	-0.70	-	4.13
21	-343	0.090	0.3000	93.6	91.73	-	18.935	24.109	-8.277	-0.50	-0.61	-	4.12
22	-296	0.090	0.3000	93.8	92.18	-	18.939	24.105	-7.124	-0.43	-0.54	-	4.11
23	-197	0.090	0.3000	94	92.62	-	18.942	24.100	-4.746	-0.28	-0.48	-	4.11
24	-250	0.095	0.3082	94.3	93.03	-	19.467	24.754	-6.188	-0.37	-0.44	-	4.10
25	-155	0.094	0.3066	94.2	93.37	-	19.362	24.625	-3.826	-0.23	-0.36	-	4.10
26	105	0.093	0.3050	94.2	93.63	-	19.259	24.494	2.578	0.15	-0.23	-	4.10
27	170	0.096	0.3098	94.7	93.86	-	19.576	24.875	4.218	0.25	-0.10	-	4.10
28	15061	0.094	0.3066	106.2	95.17	-	19.571	24.363	366.919	22.02	4.36	-	4.47
29	3528	0.094	0.3066	98.6	95.7	-	19.439	24.528	86.527	5.19	5.48	-	4.56
30	1226	0.093	0.3050	97.3	96.09	-	19.313	24.426	29.943	1.80	5.88	-	4.59
31	2424	0.093	0.3050	98.4	96.57	-	19.332	21.180	51.335	3.08	6.47	-	4.64
32	2998	0.093	0.3050	99.6	97.15	-	19.352	24.376	73.087	4.39	7.29	-	4.71
33	3621	0.094	0.3066	100.6	97.81	-	19.474	24.484	88.659	5.32	3.95	-	4.80
34	7664	0.093	0.3050	101.2	98.5	-	19.380	24.341	186.538	11.19	5.15	-	4.99
35	5810	0.092	0.3033	101.7	99.25	-	19.284	24.199	140.595	8.44	6.48	-	5.13
36	2867	0.093	0.3050	102.3	100.06	-	19.399	24.317	69.718	4.18	6.70	-	5.20
37	3018	0.095	0.3082	102.7	100.86	-	19.613	24.568	74.158	4.45	6.72	-	5.27
38	3743	0.093	0.3050	103.2	100.56	-	19.415	24.297	90.950	5.46	6.74	-	5.36
39	4295	0.091	0.3017	103.7	101.07	-	19.213	24.024	103.193	6.19	5.74	-	5.47
40	5787	0.093	0.3050	104.1	101.75	-	19.430	24.278	140.486	8.43	5.74	-	5.61
41	5505	0.092	0.3033	104.5	102.36	-	19.332	24.139	132.883	7.97	6.50	-	5.74
42	5845	0.095	0.3082	104.7	102.87	-	19.648	24.525	143.344	8.60	7.33	-	5.88
43	5849	0.093	0.3050	105.1	103.32	-	19.447	24.257	141.874	8.51	7.94	-	6.02
44	5737	0.091	0.3017	105.5	103.75	-	19.244	23.986	137.609	8.26	8.35	-	6.16
45	5719	0.093	0.3050	106.1	104.19	-	19.464	24.235	138.593	8.32	8.33	-	6.30
46	4801	0.093	0.3050	107	104.66	-	19.480	24.216	116.266	6.98	8.13	-	6.42
47	3431	0.092	0.3033	107.9	105.18	-	19.390	24.066	82.581	4.95	7.40	-	6.50
48	2961	0.092	0.3033	107.6	105.62	-	19.385	24.072	71.270	4.28	6.56	-	6.57
49	2067	0.092	0.3033	107.4	105.99	-	19.382	24.077	49.763	2.99	5.50	-	6.62
50	1563	0.091	0.3017	107.4	106.32	-	19.276	23.946	37.434	2.25	4.29	-	6.66
51	1574	0.091	0.3017	107.2	106.59	-	19.273	23.950	37.690	2.26	3.34	-	6.70
52	737	0.094	0.3066	107.2	106.84	-	19.588	24.341	17.938	1.08	2.57	-	6.71
53	945	0.095	0.3082	103.5	106.68	-	19.627	24.551	23.192	1.39	1.99	-	6.74
54	65	0.095	0.3082	101.3	106.26	-	19.589	24.599	1.605	0.10	1.41	-	6.74
55	-45	0.094	0.3066	99.6	105.61	-	19.456	24.506	-1.097	-0.07	0.95	-	6.74
56	-94	0.095	0.3082	98.5	104.76	-	19.540	24.661	-2.320	-0.14	0.47	-	6.73
57	-79	0.094	0.3066	97.7	103.74	-	19.423	24.548	-1.940	-0.12	0.23	-	6.73
58	-139	0.095	0.3082	97.1	102.69	-	19.516	24.692	-3.428	-0.21	-0.09	-	6.73
59	-118	0.093	0.3050	96.6	101.61	-	19.300	24.441	-2.872	-0.17	-0.14	6.96	6.73
60	9	0.093	0.3050	95.9	100.46	-	19.288	24.457	0.218	0.01	-0.12	6.96	6.73
61	51	0.095	0.3082	95.5	99.29	-	19.488	24.727	1.262	0.08	-0.08	6.65	6.73
62	261	0.095	0.3082	95.2	98.09	-	19.482	24.734	6.448	0.39	0.02	6.16	6.73
63	7	0.095	0.3082	94.7	97.21	-	19.474	24.745	0.161	0.01	0.06	3.60	6.73
64	-30	0.093	0.3050	94.4	96.52	-	19.262	24.490	-0.737	-0.04	0.09	2.78	6.73
65	26	0.097	0.3114	94.1	95.97	-	19.667	25.018	0.656	0.04	0.09	2.52	6.73
66	70	0.094	0.3066	93.7	95.49	-	19.353	24.637	1.727	0.10	0.10	2.52	6.74
67	270	0.094	0.3066	93.4	95.06	-	19.348	24.643	6.652	0.40	0.10	2.55	6.74
68	292	0.095	0.3082	93.4	94.69	-	19.451	24.774	7.236	0.43	0.19	2.59	6.75
69	191	0.096	0.3098	93.2	94.35	-	19.549	24.909	4.768	0.29	0.25	2.63	6.75
70	143	0.097	0.3114	93	94.06	-	19.647	25.043	3.588	0.22	0.29	2.65	6.76
71	204	0.095	0.3082	92.9	93.8	-	19.442	24.785	5.058	0.30	0.33	2.63	6.76
72	115	0.097	0.3114	92.6	93.54	-	19.640	25.052	2.883	0.17	0.28	2.63	6.77
73	77	0.096	0.3098	92.4	93.31	-	19.535	24.927	1.907	0.11	0.22	2.64	6.77
74	70	0.094	0.3066	92.1	93.08	-	19.325	24.672	1.719	0.10	0.18	2.66	6.77
75	121	0.095	0.3082	91.9	92.86	-	19.424	24.808	2.990	0.18	0.17	2.67	6.77
76	-4	0.096	0.3098	91.7	92.66	-	19.523	24.942	-0.092	-0.01	0.11	2.69	6.77
77	-5	0.096	0.3098	91.5	92.47	-	19.519	24.947	-0.118	-0.01	0.08	2.71	6.77
78	-11	0.096	0.3098	91.2	92.25	-	19.514	24.954	-0.272	-0.02	0.05	2.72	6.77
79	57	0.096	0.3098	90.9	92.02	-	19.509	24.961	1.413	0.08	0.05	2.73	6.77
80	8	0.097	0.3114	90.8	91.8	-	19.608	25.093	0.197	0.01	0.01	2.74	6.77
81	-6	0.097	0.3114	90.5	91.56	-	19.603	25.099	-0.151	-0.01	0.01	2.75	6.77
82	-25	0.096	0.3098	90.3	91.33	-	19.498	24.974	-0.612	-0.04	0.01	2.75	6.77
83	12	0.096	0.3098	90.2	91.11	-	19.496	24.976	0.300	0.02	0.01	2.76	6.77
84	63	0.095	0.3082	90.1	90.91	-	19.393	24.848	1.573	0.09	0.02	2.76	6.77

Run 2 TEOM Data

85	-7	0.097	0.3114	90.2	90.74	19.597	25.106	-0.169	-0.01	0.01	2.77	6.77
86	6	0.097	0.3114	89.8	90.55	19.590	25.115	0.142	0.01	0.01	2.77	6.77
87	97	0.097	0.3114	89.8	90.38	19.590	25.115	2.442	0.15	0.05	2.76	6.78
88	78	0.094	0.3066	89.9	90.25	19.287	24.722	1.926	0.12	0.07	2.38	6.78
89	63	0.096	0.3098	89.9	90.15	19.491	24.983	1.583	0.09	0.07	2.30	6.78
90	95	0.095	0.3082	89.8	90.05	19.387	24.855	2.351	0.14	0.10	2.27	6.78
91	200	0.095	0.3082	89.7	89.97	19.386	24.857	4.971	0.30	0.16	2.22	6.79
92	376	0.097	0.3114	89.6	89.9	19.587	25.120	9.447	0.57	0.24	2.14	6.80
93	423	0.096	0.3098	89.6	89.84	19.486	24.990	10.569	0.63	0.35	2.06	6.81
94	186	0.095	0.3082	89.6	89.79	19.384	24.860	4.631	0.28	0.38	1.87	6.81
95	241	0.098	0.3130	89.2	89.69	19.680	25.258	6.076	0.36	0.43	1.74	6.82
96	194	0.095	0.3082	89.2	89.63	19.377	24.869	4.817	0.29	0.43	1.67	6.82
97	395	0.096	0.3098	89.1	89.56	19.477	25.002	9.873	0.59	0.43	1.60	6.83
98	630	0.096	0.3098	89.1	89.48	19.477	25.002	15.761	0.95	0.49	1.51	6.85
99		0.095	0.3082	89.3	89.42					0.55	1.42	
100		0.095	0.3082	89.2	89.36					0.61	1.29	
101		0.096	0.3098	88.9	89.28					0.77	1.17	
102		0.096	0.3098	88.8	89.2					0.95	1.04	
103		0.094	0.3066	88.7	89.11						0.90	
104	-309	0.097	0.3114	88.4	88.99	19.565	25.147	-7.776	-0.47	-0.47	0.76	6.84
105	-1531	0.096	0.3098	88.4	88.91	19.464	25.018	-38.305	-2.30	-1.38	0.62	6.80
106	833	0.095	0.3082	88.2	88.81	19.359	24.891	20.746	1.24	-0.51	0.48	6.82
107	82	0.095	0.3082	88.2	88.72	19.359	24.891	2.051	0.12	-0.35	0.34	6.83
108	222	0.097	0.3114	88	88.61	19.558	25.157	5.594	0.34	-0.21	0.29	6.83
109	-61	0.095	0.3082	87.7	88.45	19.350	24.903	-1.521	-0.09	-0.14	0.23	6.83
110	-791	0.097	0.3114	87.5	88.28	19.549	25.168	-19.899	-1.19	0.08	0.20	6.81
111	113	0.096	0.3098	87.5	88.14	19.448	25.038	2.822	0.17	-0.13	0.15	6.81
112	264	0.096	0.3098	87.4	88	19.447	25.040	6.613	0.40	-0.08	0.11	6.82
113	364	0.096	0.3098	87.3	87.86	19.445	25.043	9.116	0.55	-0.03	0.09	6.83
114	314	0.098	0.3130	87.5	87.77	19.650	25.298	7.941	0.48	0.08	0.09	6.84
115	343	0.096	0.3098	87.2	87.65	19.443	25.045	8.580	0.51	0.42	0.10	6.85
116	377	0.095	0.3082	87	87.53	19.338	24.919	9.405	0.56	0.50	0.12	6.85
117	403	0.096	0.3098	87	87.41	19.439	25.050	10.107	0.61	0.54	0.13	6.86
118	392	0.095	0.3082	87	87.31	19.338	24.919	9.778	0.59	0.55	0.14	6.87
119	457	0.095	0.3082	86.9	87.23	19.336	24.921	11.397	0.68	0.59	0.16	6.89
120	6180	0.094	0.3066	93.3	87.81	19.346	24.646	152.316	9.14	2.32	0.17	7.04
121	4311	0.096	0.3098	94.6	88.52	19.574	24.877	107.253	6.44	3.49	0.18	7.15
122	948	0.096	0.3098	96	89.38	19.599	24.846	23.556	1.41	3.65	0.34	7.17
123	1392	0.094	0.3066	97.8	90.43	19.425	24.546	34.162	2.05	3.94	0.47	7.20
124	4788	0.095	0.3082	99.1	91.59	19.551	24.647	118.002	7.08	5.22	0.49	7.32
125	3150	0.095	0.3082	94.3	92.3	19.467	24.754	77.986	4.68	4.33	0.53	7.40
126	693	0.095	0.3082	91.6	92.76	19.419	24.814	17.207	1.03	3.25	0.66	7.42
127	163	0.097	0.3114	90.8	93.14	19.608	25.093	4.081	0.24	3.02	0.74	7.42
128	-28	0.095	0.3082	90.5	93.49	19.400	24.839	-0.686	-0.04	2.60	0.75	7.42
129	-152	0.093	0.3050	90.3	93.83	19.191	24.581	-3.726	-0.22	1.14	0.75	7.42
130	-81	0.095	0.3082	90.4	93.54	19.398	24.842	-2.008	-0.12	0.18	0.75	7.41
131	-76	0.097	0.3114	90.4	93.12	19.601	25.102	-1.914	-0.11	-0.05	0.74	7.41
132	29	0.094	0.3066	90.5	92.57	19.297	24.708	0.723	0.04	-0.09	0.73	7.41
133	63	0.095	0.3082	90.6	91.85	19.401	24.837	1.555	0.09	-0.06	0.73	7.41
134	117	0.096	0.3098	90.6	91	19.503	24.967	2.912	0.17	0.02	0.73	7.42
135	91	0.097	0.3114	90.6	90.63	19.605	25.097	2.279	0.14	0.07	0.73	7.42
136	94	0.095	0.3082	90.7	90.54	19.403	24.835	2.337	0.14	0.12	0.73	7.42
137	34	0.095	0.3082	90.8	90.54	19.405	24.833	0.851	0.05	0.12	0.73	7.42
138	-3	0.096	0.3098	90.8	90.57	19.507	24.963	-0.073	0.00	0.10	0.74	7.42
139	167	0.097	0.3114	90.7	90.61	19.606	25.095	4.201	0.25	0.12	0.74	7.43
140	61	0.095	0.3082	90.5	90.62	19.400	24.839	1.514	0.09	0.11	0.73	7.43
141	-60	0.097	0.3114	90.6	90.64	19.605	25.097	-1.511	-0.09	0.06	0.74	7.43
142	-37	0.095	0.3082	90.7	90.66	19.403	24.835	-0.916	-0.05	0.04	0.74	7.43
143	-43	0.094	0.3066	90.7	90.67	19.301	24.704	-1.053	-0.06	0.03	0.74	7.43
144	1	0.097	0.3114	90.6	90.67	19.605	25.097	0.037	0.00	-0.02	0.74	7.43
145	52	0.094	0.3066	90.6	90.67	19.299	24.706	1.289	0.08	-0.03	0.74	7.43
146	-41	0.095	0.3082	90.4	90.64	19.398	24.842	-1.029	-0.06	-0.02	0.74	7.43
147	-2	0.093	0.3050	90.4	90.6	19.193	24.579	-0.053	0.00	-0.01	0.73	7.43
148	-99	0.097	0.3114	90.3	90.55	19.599	25.104	-2.489	-0.15	-0.03	0.73	7.42
149	60	0.096	0.3098	90.1	90.49	19.494	24.979	1.501	0.09	-0.01	0.73	7.42
150	671	0.096	0.3098	90.1	90.45	19.494	24.979	16.757	1.01	0.18	0.72	7.44
151	74	0.095	0.3082	90.2	90.41	19.394	24.846	1.840	0.11	0.21	0.72	7.44
152	65	0.095	0.3082	90.1	90.35	19.393	24.848	1.608	0.10	0.23	0.73	7.44
153	1741	0.097	0.3114	90	90.28	19.594	25.111	43.708	2.62	0.78	0.72	7.49
154	187	0.096	0.3098	89.9	90.21	19.491	24.983	4.664	0.28	0.82	0.72	7.49
155	10	0.095	0.3082	89.7	90.12	19.386	24.857	0.238	0.01	0.62	0.76	7.49
156	-56	0.094	0.3066	89.8	90.06	19.285	24.724	-1.395	-0.08	0.59	0.76	7.49
157	17	0.095	0.3082	89.7	89.99	19.386	24.857	0.425	0.03	0.57	0.75	7.49
158	-47	0.097	0.3114	89.5	89.91	19.585	25.122	-1.186	-0.07	0.03	0.73	7.49
159	-49	0.094	0.3066	89.6	89.86	19.282	24.728	-1.205	-0.07	-0.04	0.71	7.49
160	-6	0.097	0.3114	89.4	89.79	19.583	25.125	-0.147	-0.01	-0.04	0.70	7.49
161	6	0.096	0.3098	89.4	89.71	19.482	24.995	0.148	0.01	-0.02	0.69	7.49
162	5	0.096	0.3098	89.2	89.62	19.478	24.999	0.114	0.01	-0.03	0.67	7.49
163	-9	0.097	0.3114	89.4	89.56	19.583	25.125	-0.232	-0.01	-0.02	0.66	7.49
164	-8	0.094	0.3066	89.3	89.5	19.276	24.735	-0.209	-0.01	0.00	0.67	7.49
165	-15	0.096	0.3098	89.2	89.45	19.478	24.999	-0.386	-0.02	-0.01	0.71	7.49
166	3	0.095	0.3082	89.1	89.38	19.375	24.871	0.075	0.00	-0.01	0.69	7.49
167	-15	0.097	0.3114	89	89.31	19.576	25.134	-0.378	-0.02	-0.01	0.69	7.49
168	54	0.096	0.3098	88.9	89.25	19.473	25.006	1.349	0.08	0.01	0.68	7.49
169	21	0.096	0.3098	88.8	89.17	19.471	25.008	0.535	0.03	0.01	0.68	7.49
170	42	0.097	0.3114	88.7	89.1	19.571	25.141	1.057	0.06	0.03	0.70	7.49
171	-13	0.096	0.3098	88.6	89.02	19.468	25.013	-0.319	-0.02	0.03	0.70	7.49
172	41	0.096	0.3098	88.6	88.96	19.468	25.013	1.032	0.06	0.04	0.70	7.49

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173	-3	0.097	0.3114	88.5	88.87	19.567	25.145	-0.068	0.00	0.03	0.69	7.49
174	-39	0.097	0.3114	88.5	88.79	19.567	25.145	-0.982	-0.06	0.01	0.68	7.49
175	-6	0.098	0.3130	88.3	88.7	19.664	25.279	-0.159	-0.01	-0.01	0.67	7.49
176	-32	0.096	0.3098	88.2	88.61	19.461	25.022	-0.811	-0.05	-0.01	0.66	7.49
177	-56	0.095	0.3082	88.2	88.53	19.359	24.891	-1.385	-0.08	-0.04	0.65	7.49
178	-39	0.097	0.3114	88.2	88.46	19.562	25.152	-0.971	-0.06	-0.05	0.64	7.49
179	-3	0.095	0.3082	88.2	88.4	19.359	24.891	-0.066	0.00	-0.04	0.62	7.49
180	25	0.096	0.3098	88.1	88.34	19.459	25.024	0.637	0.04	-0.03	0.47	7.49
181	-17	0.096	0.3098	88	88.28	19.457	25.027	-0.435	-0.03	-0.03	0.35	7.49
182	18	0.096	0.3098	87.9	88.21	19.455	25.029	0.452	0.03	0.00	0.33	7.49
183	63	0.097	0.3114	87.8	88.14	19.555	25.161	1.592	0.10	0.03	0.29	7.49
184	8	0.096	0.3098	87.8	88.07	19.454	25.031	0.191	0.01	0.03	0.17	7.49
185	5	0.095	0.3082	87.6	88	19.349	24.905	0.127	0.01	0.02	0.09	7.49
186	14	0.096	0.3098	87.5	87.93	19.448	25.038	0.349	0.02	0.03	0.08	7.49
187	105	0.096	0.3098	87.4	87.85	19.447	25.040	2.623	0.16	0.06	0.07	7.49
188	54	0.095	0.3082	87.4	87.77	19.345	24.910	1.348	0.08	0.06	0.07	7.49
189	149	0.095	0.3082	87.2	87.67	19.341	24.914	3.704	0.22	0.10	0.08	7.50
190	151	0.097	0.3114	87.1	87.57	19.542	25.177	3.805	0.23	0.14	0.08	7.50
191	-98	0.097	0.3114	87	87.47	19.540	25.180	-2.479	-0.15	0.11	0.09	7.50
192	99	0.096	0.3098	87	87.38	19.439	25.050	2.487	0.15	0.11	0.09	7.50
193	210	0.097	0.3114	86.9	87.29	19.539	25.182	5.299	0.32	0.15	0.09	7.51
194	269	0.096	0.3098	86.8	87.19	19.436	25.054	6.746	0.40	0.19	0.09	7.51
195	351	0.094	0.3066	86.7	87.1	19.231	24.794	8.708	0.52	0.25	0.09	7.52
196	394	0.096	0.3098	86.6	87.01	19.432	25.059	9.876	0.59	0.40	0.10	7.53
197	685	0.096	0.3098	86.5	86.92	19.431	25.061	17.161	1.03	0.57	0.10	7.55
198	656	0.096	0.3098	86.4	86.82	19.429	25.063	16.445	0.99	0.71	0.11	7.57
199	332	0.096	0.3098	86.3	86.73	19.427	25.066	8.329	0.50	0.73	0.13	7.57
200	279	0.097	0.3114	86.3	86.65	19.528	25.196	7.033	0.42	0.71	0.14	7.58
201	455	0.097	0.3114	86.2	86.57	19.526	25.198	11.457	0.69	0.73	0.15	7.59
202	787	0.096	0.3098	86.2	86.49	19.425	25.068	19.733	1.18	0.76	0.16	7.61
203	888	0.097	0.3114	86.1	86.41	19.524	25.200	22.376	1.34	0.83	0.17	7.64
204	782	0.098	0.3130	86	86.33	19.623	25.332	19.805	1.19	0.96	0.19	7.66
205	466	0.095	0.3082	86	86.26	19.320	24.942	11.634	0.70	1.02	0.22	7.67
206	456	0.096	0.3098	86	86.2	19.422	25.072	11.442	0.69	1.02	0.24	7.68
207	485	0.096	0.3098	86	86.15	19.422	25.072	12.149	0.73	0.93	0.25	7.69
208	460	0.097	0.3114	86	86.11	19.523	25.203	11.582	0.69	0.80	0.26	7.70
209	510	0.095	0.3082	85.9	86.07	19.318	24.944	12.714	0.76	0.71	0.28	7.71
210	352	0.097	0.3114	85.9	86.03	19.521	25.205	8.879	0.53	0.68	0.27	7.72
211	475	0.096	0.3098	85.9	86	19.420	25.075	11.900	0.71	0.69	0.28	7.74
212		0.096	0.3098	85.8	85.96					0.68	0.29	
213		0.096	0.3098	85.9	85.94					0.67	0.26	
214		0.097	0.3114	85.7	85.91					0.62	0.26	
215		0.097	0.3114	85.7	85.88					0.71	0.26	
216		0.097	0.3114	85.7	85.85						0.27	
217		0.096	0.3098	85.6	85.81						0.27	
218		0.097	0.3114	85.5	85.76						0.28	
219	-782	0.098	0.3130	85.6	85.73	19.616	25.342	-19.818	-1.19	-1.19	0.28	7.72
220	-516	0.097	0.3114	85.7	85.71	19.517	25.210	-13.004	-0.78	-0.98	0.29	7.70
221	-313	0.096	0.3098	85.7	85.69	19.416	25.079	-7.840	-0.47	-0.81	0.27	7.69
222	-130	0.095	0.3082	85.8	85.69	19.317	24.946	-3.241	-0.19	-0.66	0.25	7.69
223	57	0.096	0.3098	85.8	85.68	19.418	25.077	1.435	0.09	-0.51	0.24	7.69
224	105	0.096	0.3098	85.8	85.69	19.418	25.077	2.643	0.16	-0.24	0.24	7.70
225	148	0.097	0.3114	85.8	85.7	19.519	25.207	3.724	0.22	-0.04	0.24	7.70
226	170	0.098	0.3130	85.7	85.7	19.618	25.339	4.295	0.26	0.11	0.24	7.70
227	232	0.096	0.3098	85.7	85.71	19.416	25.079	5.829	0.35	0.22	0.25	7.71
228	222	0.096	0.3098	85.6	85.72	19.415	25.082	5.579	0.33	0.26	0.25	7.72
229	420	0.095	0.3082	85.5	85.71	19.311	24.953	10.480	0.63	0.36	0.26	7.73
230	400	0.096	0.3098	85.7	85.71	19.416	25.079	10.032	0.60	0.43	0.26	7.74
231	774	0.096	0.3098	85.6	85.7	19.415	25.082	19.418	1.17	0.62	0.28	7.76
232	9171	0.094	0.3066	106.5	87.77	19.576	24.356	223.376	13.40	3.23	0.29	7.98
233	11999	0.092	0.3033	123.7	91.56	19.658	23.738	284.829	17.09	6.58	0.31	8.26
234	4013	0.091	0.3017	147	97.68	19.937	23.150	92.900	5.57	7.57	0.57	8.36
235	3830	0.093	0.3050	118.5	100.95	19.676	23.974	91.813	5.51	8.55	0.91	8.45
236	4361	0.094	0.3066	110.7	103.45	19.648	24.266	105.832	6.35	9.58	1.02	8.55
237	6940	0.094	0.3066	108.9	105.77	19.617	24.305	168.683	10.12	8.93	1.13	8.72
238	3011	0.093	0.3050	108.8	108.09	19.511	24.177	72.792	4.37	6.38	1.25	8.80
239	1083	0.094	0.3066	109	110.44	19.619	24.303	26.329	1.58	5.59	1.45	8.82
240	785	0.095	0.3082	110	112.87	19.740	24.410	19.151	1.15	4.71	1.54	8.84
241	774	0.094	0.3066	110.6	115.37	19.646	24.269	18.785	1.13	3.67	1.57	8.86
242	1813	0.094	0.3066	105.6	115.28	19.560	24.376	44.184	2.65	2.17	1.59	8.90
243	827	0.094	0.3066	101.6	113.07	19.491	24.463	20.236	1.21	1.54	1.61	8.92
244	405	0.095	0.3082	100.2	108.39	19.570	24.623	9.979	0.60	1.35	1.66	8.93
245	373	0.095	0.3082	99.1	106.45	19.551	24.647	9.182	0.55	1.23	1.69	8.94
246	303	0.096	0.3098	98.5	105.23	19.643	24.790	7.518	0.45	1.09	1.70	8.95
247	128	0.094	0.3066	98.1	104.15	19.430	24.539	3.151	0.19	0.60	1.71	8.95
248	36	0.095	0.3082	98	103.07	19.531	24.672	0.878	0.05	0.37	1.71	8.95
249	-76	0.095	0.3082	97.7	101.94	19.526	24.678	-1.868	-0.11	0.23	1.71	8.95
250	-74	0.095	0.3082	97.7	100.71	19.526	24.678	-1.833	-0.11	0.09	1.71	8.95
251	-67	0.093	0.3050	97.5	99.4	19.316	24.421	-1.628	-0.10	-0.02	1.71	8.95
252	-85	0.094	0.3066	97.4	98.58	19.418	24.555	-2.080	-0.12	-0.08	1.70	8.95
253	-56	0.097	0.3114	97	98.12	19.718	24.952	-1.388	-0.08	-0.11	1.70	8.95
254	-59	0.093	0.3050	97	97.8	19.307	24.432	-1.435	-0.09	-0.10	1.69	8.94
255	-604	0.095	0.3082	96.9	97.58	19.512	24.696	-14.909	-0.89	-0.26	1.67	8.93
256	-74	0.095	0.3082	97	97.43	19.514	24.694	-1.835	-0.11	-0.26	1.66	8.93
257	-54	0.096	0.3098	96.9	97.31	19.615	24.826	-1.344	-0.08	-0.25	1.62	8.93
258	12	0.095	0.3082	96.8	97.19	19.510	24.698	0.297	0.02	-0.23	1.60	8.93
259	83	0.093	0.3050	96.9	97.11	19.306	24.435	2.023	0.12	-0.19	1.59	8.93
260	67	0.096	0.3098	96.9	97.03	19.615	24.826	1.666	0.10	0.01	1.58	8.93

Run 2 TEOM Data

261	0	0.094	0.3066	97	96.98		19.411	24.563	-0.006	0.00	0.03	1.57	8.93
262	45	0.094	0.3066	97	96.94		19.411	24.563	1.103	0.07	0.06	1.55	8.93
263	132	0.094	0.3066	97.1	96.95		19.413	24.561	3.234	0.19	0.10	1.52	8.93
264	69	0.095	0.3082	96.9	96.94		19.512	24.696	1.707	0.10	0.09	1.50	8.94
265	327	0.095	0.3082	97.1	96.96		19.516	24.692	8.079	0.48	0.17	1.49	8.94
266	35	0.094	0.3066	96.9	96.95		19.409	24.566	0.850	0.05	0.18	1.48	8.95
267	99	0.094	0.3066	97	96.96		19.411	24.563	2.430	0.15	0.20	1.48	8.95
268	273	0.094	0.3066	97.1	96.99		19.413	24.561	6.694	0.40	0.24	1.46	8.95
269	291	0.093	0.3050	97.3	97.03		19.313	24.426	7.115	0.43	0.30	1.45	8.96
270	323	0.094	0.3066	97.1	97.05		19.413	24.561	7.944	0.48	0.30	1.45	8.97
271	406	0.093	0.3050	97.2	97.07		19.311	24.428	9.926	0.60	0.41	1.44	8.98
272	333	0.093	0.3050	97.5	97.12		19.316	24.421	8.123	0.49	0.48	1.42	8.99
273	476	0.094	0.3066	97.6	97.17		19.421	24.550	11.697	0.70	0.54	1.41	9.00
274	525	0.095	0.3082	97.7	97.25		19.526	24.678	12.963	0.78	0.61	1.39	9.01
275	389	0.094	0.3066	97.9	97.33		19.427	24.544	9.555	0.57	0.63	1.38	9.02
276	362	0.094	0.3066	98	97.44		19.428	24.541	8.878	0.53	0.61	1.37	9.03
277	475	0.095	0.3082	98	97.54		19.531	24.672	11.716	0.70	0.66	1.35	9.04
278	479	0.095	0.3082	97.9	97.62		19.530	24.674	11.827	0.71	0.66	1.34	9.05
279	396	0.094	0.3066	97.9	97.68		19.427	24.544	9.709	0.58	0.62	1.37	9.06
280	357	0.094	0.3066	98	97.77		19.428	24.541	8.754	0.53	0.61	1.40	9.07
281	452	0.094	0.3066	98.2	97.87		19.432	24.537	11.088	0.67	0.64	1.42	9.08
282	362	0.094	0.3066	98.3	97.95		19.434	24.535	8.890	0.53	0.60	1.43	9.09
283	578	0.093	0.3050	98.3	98.02		19.330	24.404	14.105	0.85	0.63	1.44	9.11
284	509	0.096	0.3098	98.3	98.08		19.639	24.794	12.615	0.76	0.67	1.45	9.12
285	505	0.095	0.3082	98.3	98.12		19.537	24.665	12.467	0.75	0.71	1.46	9.13
286	627	0.093	0.3050	98.4	98.16		19.332	24.402	15.310	0.92	0.76	1.46	9.15
287	721	0.095	0.3082	98.5	98.21		19.540	24.661	17.786	1.07	0.87	1.47	9.16
288	707	0.093	0.3050	98.8	98.3		19.339	24.393	17.238	1.03	0.91	1.48	9.18
289	729	0.094	0.3066	98.7	98.38		19.441	24.526	17.878	1.07	0.97	1.49	9.20
290	812	0.092	0.3033	98.6	98.44		19.231	24.266	19.705	1.18	1.06	1.50	9.22
291	880	0.094	0.3066	98.5	98.47		19.437	24.530	21.586	1.30	1.13	1.49	9.24
292	904	0.094	0.3066	98.6	98.5		19.439	24.528	22.167	1.33	1.18	1.28	9.26
293	998	0.094	0.3066	98.6	98.53		19.439	24.528	24.468	1.47	1.27	1.01	9.29
294	1178	0.094	0.3066	98.4	98.54		19.435	24.533	28.904	1.73	1.40	0.94	9.32
295	1398	0.092	0.3033	98.4	98.55		19.227	24.270	33.923	2.04	1.57	0.87	9.35
296	1506	0.092	0.3033	98.4	98.55		19.227	24.270	36.541	2.19	1.75	0.79	9.39
297	1219	0.095	0.3082	98.5	98.55		19.540	24.661	30.066	1.80	1.85	0.65	9.42
298	947	0.094	0.3066	98.4	98.51		19.435	24.533	23.228	1.39	1.83	0.61	9.44
299	1043	0.092	0.3033	98.5	98.49		19.229	24.268	25.310	1.52	1.79	0.62	9.47
300	1042	0.094	0.3066	98.6	98.49		19.439	24.528	25.563	1.53	1.69	0.62	9.49
301	1094	0.095	0.3082	98.5	98.49		19.540	24.661	26.986	1.62	1.57	0.63	9.52
302	1149	0.092	0.3033	98.6	98.49		19.231	24.266	27.883	1.67	1.55	0.61	9.55
303	1056	0.092	0.3033	98.7	98.5		19.233	24.264	25.633	1.54	1.58	0.61	9.57
304	728	0.094	0.3066	98.4	98.5		19.435	24.533	17.854	1.07	1.49	0.63	9.59
305	543	0.093	0.3050	98.4	98.5		19.332	24.402	13.244	0.79	1.34	0.65	9.60
306	926	0.094	0.3066	98.4	98.5		19.435	24.533	22.721	1.36	1.29	0.66	9.63
307	919	0.092	0.3033	98.2	98.47		19.224	24.275	22.306	1.34	1.22	0.67	9.65
308	529	0.092	0.3033	98.3	98.46		19.226	24.272	12.828	0.77	1.07	0.69	9.66
309	495	0.093	0.3050	98.1	98.42	-3.901	19.326	24.408	12.086	0.73	1.00	0.72	9.67
310	420	0.092	0.3033	97.8	98.34	-3.883	19.217	24.283	10.208	0.61	0.96	0.73	9.68
311	400	0.092	0.3033	97.8	98.27	-3.861	19.217	24.283	9.710	0.58	0.81	0.75	9.69
312	506	0.092	0.3033	97.7	98.18	-3.832	19.215	24.285	12.276	0.74	0.69	0.76	9.71
313	435	0.094	0.3066	97.4	98.05	-3.8	19.418	24.555	10.677	0.64	0.66	0.77	9.72
314	306	0.093	0.3050	97.3	97.94	-3.767	19.313	24.426	7.468	0.45	0.60	0.79	9.72
315	368	0.094	0.3066	97.1	97.81	-3.733	19.413	24.561	9.039	0.54	0.59	0.81	9.73
316	295	0.094	0.3066	96.9	97.66	-3.695	19.409	24.566	7.256	0.44	0.56	0.82	9.74
317	154	0.095	0.3082	96.7	97.51	-3.654	19.509	24.700	3.804	0.23	0.46	0.83	9.74
318	325	0.093	0.3050	96.6	97.34	-3.612	19.300	24.441	7.933	0.48	0.43	0.84	9.75
319	161	0.093	0.3050	96.5	97.18	-3.568	19.299	24.443	3.926	0.24	0.38	0.84	9.76
320	242	0.093	0.3050	96.4	97.04	-3.523	19.297	24.446	5.914	0.35	0.35	0.85	9.76
321	265	0.092	0.3033	96.2	96.88	-3.475	19.189	24.318	6.449	0.39	0.34	0.85	9.77
322	302	0.093	0.3050	96.3	96.74	-3.427	19.295	24.448	7.384	0.44	0.38	0.86	9.78
323	167	0.093	0.3050	96	96.6	-3.376	19.290	24.454	4.076	0.24	0.33	0.86	9.78
324	187	0.093	0.3050	95.7	96.44	-3.325	19.285	24.461	4.575	0.27	0.34	0.87	9.78
325	124	0.094	0.3066	95.4	96.27	-3.271	19.383	24.599	3.057	0.18	0.31	0.86	9.79
326	324	0.095	0.3082	95.1	96.09	-3.216	19.481	24.736	8.003	0.48	0.33	0.87	9.79
327	81	0.093	0.3050	95	95.92	-3.16	19.273	24.476	1.979	0.12	0.26	0.87	9.80
328	116	0.093	0.3050	94.7	95.73	-3.102	19.267	24.483	2.835	0.17	0.25	0.87	9.80
329	112	0.094	0.3066	94.6	95.54	-3.043	19.369	24.617	2.747	0.16	0.22	0.86	9.80
330	201	0.095	0.3082	94.3	95.33	-2.985	19.467	24.754	4.982	0.30	0.25	0.86	9.81
331	207	0.094	0.3066	94.2	95.13	-2.926	19.362	24.625	5.106	0.31	0.21	0.85	9.81
332	130	0.094	0.3066	94.1	94.91	-2.87	19.360	24.628	3.200	0.19	0.23	0.85	9.82
333	283	0.093	0.3050	93.8	94.69	-2.815	19.252	24.503	6.932	0.42	0.28	0.84	9.82
334	141	0.092	0.3033	93.7	94.49	-2.758	19.146	24.373	3.441	0.21	0.28	0.83	9.83
335	153	0.093	0.3050	93.6	94.31	-2.702	19.248	24.507	3.745	0.22	0.27	0.83	9.83
336	94	0.094	0.3066	93.3	94.13	-2.65	19.346	24.646	2.316	0.14	0.24	0.82	9.83
337	115	0.094	0.3066	93.1	93.94	-2.598	19.343	24.650	2.835	0.17	0.23	0.81	9.83
338	124	0.094	0.3066	93	93.77	-2.545	19.341	24.652	3.062	0.18	0.18	0.80	9.84
339	50	0.093	0.3050	92.7	93.58	-2.493	19.233	24.527	1.218	0.07	0.16	0.80	9.84
340	146	0.094	0.3066	92.6	93.41	-2.439	19.334	24.661	3.599	0.22	0.16	0.79	9.84
341	85	0.094	0.3066	92.5	93.24	-2.387	19.332	24.663	2.104	0.13	0.15	0.78	9.84
342	78	0.093	0.3050	92.3	93.06	-2.332	19.226	24.536	1.921	0.12	0.14	0.78	9.85
343	-9	0.093	0.3050	92.1	92.89	-2.277	19.222	24.541	-0.219	-0.01	0.10	0.76	9.85
344	-115	0.095	0.3082	91.8	92.7	-2.222	19.423	24.810	-2.854	-0.17	0.05	0.75	9.84
345	53	0.094	0.3066	91.8	92.52	-2.17	19.320	24.679	1.299	0.08	0.03	0.74	9.85
346	41	0.095	0.3082	91.5	92.34	-2.118	19.417	24.817	1.008	0.06	0.01	0.72	9.85
347	26	0.095	0.3082	91.3	92.16	-2.068	19.414	24.821	0.643	0.04	0.00	0.70	9.85
348	35	0.096	0.3098	91.1	91.97	-2.021	19.512	24.956	0.884	0.05	0.01	0.69	9.85

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349	25	0.093	0.3050	90.9	91.79	-1.975	19.201	24.568	0.614	0.04	0.05	0.67	9.85
350	-4	0.095	0.3082	90.8	91.61	-1.93	19.405	24.833	-0.093	-0.01	0.04	0.65	9.85
351	-27	0.094	0.3066	90.4	91.4	-1.887	19.296	24.710	-0.675	-0.04	0.02	0.63	9.85
352	61	0.093	0.3050	90.3	91.2	-1.846	19.191	24.581	1.503	0.09	0.03	0.60	9.85
353	44	0.093	0.3050	90	90.99	-1.806	19.186	24.588	1.075	0.06	0.03	0.58	9.85
354	79	0.095	0.3082	89.9	90.8	-1.769	19.389	24.853	1.974	0.12	0.05	0.55	9.85
355	80	0.094	0.3066	89.7	90.59	-1.732	19.283	24.726	1.979	0.12	0.07	0.52	9.85
356	-227	0.094	0.3066	89.6	90.4	-1.695	19.282	24.728	-5.622	-0.34	0.01	0.48	9.85
357	64	0.095	0.3082	89.3	90.2	-1.659	19.379	24.866	1.581	0.09	0.01	0.45	9.85
358	164	0.095	0.3082	89.2	90.01	-1.625	19.377	24.869	4.072	0.24	0.05	0.42	9.85
359	39	0.094	0.3066	89.1	89.83	-1.592	19.273	24.740	0.971	0.06	0.04	0.40	9.86
360	28	0.094	0.3066	89.1	89.66	-1.563	19.273	24.740	0.683	0.04	0.02	0.37	9.86
361	57	0.095	0.3082	89	89.52	-1.534	19.373	24.873	1.407	0.08	0.10	0.35	9.86
362	142	0.095	0.3082	88.8	89.37	-1.507	19.370	24.878	3.528	0.21	0.13	0.32	9.86
363	144	0.093	0.3050	88.6	89.23	-1.483	19.161	24.619	3.543	0.21	0.12	0.29	9.86
364	43	0.096	0.3098	88.5	89.09	-1.462	19.466	25.015	1.068	0.06	0.12	0.28	9.87
365	130	0.096	0.3098	88.3	88.95	-1.442	19.463	25.020	3.249	0.19	0.15	0.27	9.87
366	72	0.094	0.3066	88.1	88.8	-1.424	19.255	24.762	1.775	0.11	0.16	0.25	9.87
367	177	0.096	0.3098	88.1	88.68	-1.409	19.459	25.024	4.420	0.27	0.17	0.23	9.87
368	114	0.094	0.3066	88.1	88.57	-1.395	19.255	24.762	2.830	0.17	0.16	0.22	9.88
369	109	0.095	0.3082	87.9	88.45	-1.384	19.354	24.898	2.714	0.16	0.18	0.21	9.88
370	108	0.096	0.3098	87.7	88.31	-1.373	19.452	25.034	2.707	0.16	0.17	0.20	9.88
371	112	0.095	0.3082	87.6	88.17	-1.365	19.349	24.905	2.786	0.17	0.19	0.19	9.89
372	140	0.095	0.3082	87.6	88.05	-1.359	19.349	24.905	3.494	0.21	0.17	0.18	9.89
373	78	0.095	0.3082	87.6	87.95	-1.354	19.349	24.905	1.930	0.12	0.16	0.18	9.89
374	83	0.094	0.3066	87.4	87.84	-1.348	19.243	24.778	2.063	0.12	0.16	0.17	9.89
375	139	0.095	0.3082	87.4	87.75	-1.344	19.345	24.910	3.452	0.21	0.16	0.16	9.90
376	90	0.096	0.3098	87.4	87.68	-1.339	19.447	25.040	2.246	0.13	0.16	0.16	9.90
377	52	0.096	0.3098	87.3	87.6	-1.335	19.445	25.043	1.305	0.08	0.13	0.16	9.90
378	122	0.094	0.3066	87.2	87.51	-1.333	19.239	24.783	3.012	0.18	0.14	0.15	9.90
379	102	0.095	0.3082	87.2	87.44	-1.33	19.341	24.914	2.550	0.15	0.15	0.15	9.91
380	78	0.094	0.3066	87	87.37	-1.328	19.236	24.787	1.924	0.12	0.13	0.15	9.91
381	106	0.094	0.3066	87.3	87.34	-1.326	19.241	24.780	2.616	0.16	0.14	0.14	9.91
382	157	0.096	0.3098	87	87.28	-1.325	19.439	25.050	3.931	0.24	0.17	0.14	9.91
383	108	0.094	0.3066	86.8	87.2	-1.324	19.232	24.792	2.685	0.16	0.16	0.14	9.92
384	165	0.096	0.3098	86.8	87.14	-1.324	19.436	25.054	4.128	0.25	0.18	0.13	9.92
385	98	0.096	0.3098	86.8	87.08	-1.325	19.436	25.054	2.463	0.15	0.19	0.13	9.92
386	164	0.096	0.3098	86.8	87.02	-1.327	19.436	25.054	4.104	0.25	0.21	0.13	9.93
387	113	0.096	0.3098	86.8	86.97	-1.328	19.436	25.054	2.833	0.17	0.19	0.13	9.93
388	97	0.094	0.3066	86.8	86.93	-1.329	19.232	24.792	2.412	0.14	0.19	0.13	9.93
389	120	0.094	0.3066	86.7	86.88	-1.331	19.231	24.794	2.972	0.18	0.18	0.13	9.94
390	81	0.094	0.3066	86.5	86.83	-1.333	19.227	24.799	2.004	0.12	0.17	0.13	9.94
391	104	0.095	0.3082	86.7	86.77	-1.334	19.333	24.926	2.597	0.16	0.15	0.13	9.94
392	212	0.095	0.3082	86.5	86.72	-1.334	19.329	24.930	5.278	0.32	0.18	0.13	9.95
393	8	0.095	0.3082	86.5	86.69	-1.334	19.329	24.930	0.201	0.01	0.16	0.12	9.95
394	84	0.095	0.3082	86.5	86.66	-1.334	19.329	24.930	2.104	0.13	0.15	0.12	9.95
395	144	0.094	0.3066	86.3	86.61	-1.332	19.224	24.803	3.565	0.21	0.16	0.12	9.95
396	87	0.093	0.3050	86.2	86.55	-1.332	19.119	24.673	2.148	0.13	0.16	0.12	9.95
397	154	0.097	0.3114	86	86.47	-1.332	19.523	25.203	3.892	0.23	0.14	0.12	9.96
398	148	0.096	0.3098	86	86.39	-1.33	19.422	25.072	3.714	0.22	0.19	0.12	9.96
399	122	0.095	0.3082	86.1	86.33	-1.328	19.322	24.939	3.051	0.18	0.20	0.12	9.96
400	174	0.094	0.3066	86.1	86.29	-1.325	19.220	24.808	4.305	0.26	0.21	0.12	9.97
401	224	0.095	0.3082	86.1	86.23	-1.324	19.322	24.939	5.593	0.34	0.25	0.12	9.97
402	55	0.094	0.3066	85.9	86.17	-1.323	19.217	24.812	1.363	0.08	0.22	0.13	9.98
403	145	0.095	0.3082	86	86.12	-1.321	19.320	24.942	3.618	0.22	0.22	0.13	9.98
404	168	0.094	0.3066	86	86.07	-1.319	19.218	24.810	4.156	0.25	0.23	0.14	9.98
405	171	0.095	0.3082	85.8	86.02	-1.318	19.317	24.946	4.263	0.26	0.23	0.14	9.99
406	174	0.095	0.3082	85.8	85.98	-1.316	19.317	24.946	4.330	0.26	0.21	0.14	9.99
407	204	0.095	0.3082	85.9	85.97	-1.313	19.318	24.944	5.087	0.31	0.26	0.15	10.00
408	133	0.096	0.3098	85.7	85.94	-1.312	19.416	25.079	3.340	0.20	0.25	0.15	10.00
409	129	0.097	0.3114	85.7	85.9	-1.31	19.517	25.210	3.241	0.19	0.24	0.15	10.00
410	181	0.096	0.3098	85.8	85.87	-1.31	19.418	25.077	4.540	0.27	0.25	0.16	10.01
411	120	0.096	0.3098	85.9	85.85	-1.311	19.420	25.075	3.017	0.18	0.23	0.16	10.01
412	115	0.095	0.3082	85.9	85.85	-1.312	19.318	24.944	2.879	0.17	0.20	0.16	10.01
413	185	0.093	0.3050	86	85.85	-1.314	19.116	24.678	4.575	0.27	0.22	0.17	10.02
414	123	0.096	0.3098	85.7	85.82	-1.317	19.416	25.079	3.074	0.18	0.22	0.17	10.02
415	147	0.096	0.3098	85.8	85.82	-1.322	19.418	25.077	3.698	0.22	0.21	0.17	10.03
416	163	0.095	0.3082	86	85.84	-1.328	19.320	24.942	4.067	0.24	0.22	0.18	10.03
417	299	0.096	0.3098	86	85.85	-1.336	19.422	25.072	7.497	0.45	0.27	0.18	10.04
418	219	0.096	0.3098	86.2	85.9	-1.346	19.425	25.068	5.480	0.33	0.29	0.18	10.04
419	237	0.096	0.3098	86.1	85.94	-1.358	19.423	25.070	5.942	0.36	0.32	0.19	10.05
420	89	0.096	0.3098	86.1	85.97	-1.37	19.423	25.070	2.240	0.13	0.30	0.19	10.05
421	135	0.095	0.3082	85.9	85.97	-1.379	19.318	24.944	3.367	0.20	0.29	0.20	10.05
422	8	0.095	0.3082	85.9	85.97	-1.387	19.318	24.944	0.209	0.01	0.21	0.20	10.05
423	16	0.097	0.3114	85.6	85.93	-1.394	19.515	25.212	0.396	0.02	0.15	0.20	10.05
424	-141	0.093	0.3050	85.4	85.9	-1.398	19.105	24.691	-3.476	-0.21	0.03	0.20	10.05
425	68	0.095	0.3082	85.4	85.86	-1.399	19.310	24.955	1.693	0.10	0.03	0.19	10.05
426	126	0.095	0.3082	85.2	85.78	-1.398	19.306	24.960	3.151	0.19	0.02	0.19	10.06
427	181	0.096	0.3098	85.3	85.71	-1.395	19.409	25.089	4.539	0.27	0.08	0.18	10.06
428	221	0.094	0.3066	85.3	85.62	-1.386	19.206	24.826	5.479	0.33	0.14	0.18	10.07
429	502	0.094	0.3066	85.1	85.52	-1.374	19.202	24.830	12.473	0.75	0.33	0.19	10.08
430	715	0.095	0.3082	84.9	85.4	-1.358	19.301	24.967	17.852	1.07	0.52	0.19	10.10
431	2137	0.095	0.3082	84.7	85.28	-1.338	19.297	24.971	53.363	3.20	1.12	0.20	10.15
432	1665	0.095	0.3082	84.4	85.13	-1.316	19.292	24.978	41.599	2.50	1.57	0.21	10.19
433	614	0.095	0.3082	84.3	85	-1.291	19.290	24.981	15.341	0.92	1.69	0.27	10.21
434	125	0.095	0.3082	84.2	84.88	-1.264	19.288	24.983	3.111	0.19	1.58	0.31	10.21
435	123	0.096	0.3098	83.9	84.73	-1.233	19.384	25.121	3.089	0.19	1.40	0.32	10.21
436	82	0.096	0.3098	83.8	84.59	-1.198	19.382	25.123	2.050	0.12	0.78	0.32	10.21

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437	-17	0.096	0.3098	83.8	84.44	-1.158	19.382	25.123	-0.426	-0.03	0.28	0.32	10.21
438	39	0.095	0.3082	83.9	84.3	-1.115	19.283	24.990	0.972	0.06	0.11	0.32	10.22
439	31	0.098	0.3130	83.8	84.17	-1.07	19.583	25.384	0.785	0.05	0.08	0.32	10.22
440	25	0.095	0.3082	83.6	84.04	-1.024	19.278	24.997	0.625	0.04	0.05	0.32	10.22
441	28	0.094	0.3066	83.3	83.9	-0.979	19.171	24.872	0.705	0.04	0.03	0.32	10.22
442	-39	0.096	0.3098	83.2	83.78	-0.934	19.372	25.137	-0.987	-0.06	0.03	0.31	10.22
443	-12	0.096	0.3098	83.1	83.66	-0.891	19.370	25.139	-0.297	-0.02	0.01	0.31	10.22
444	25	0.097	0.3114	83	83.54	-0.849	19.469	25.272	0.632	0.04	0.01	0.31	10.22
445	125	0.096	0.3098	82.8	83.43	-0.809	19.365	25.146	3.132	0.19	0.04	0.30	10.22
446	21	0.097	0.3114	82.8	83.33	-0.771	19.465	25.277	0.533	0.03	0.04	0.30	10.22
447	1	0.096	0.3098	82.7	83.22	-0.737	19.363	25.149	0.020	0.00	0.05	0.30	10.22
448	-9	0.095	0.3082	82.6	83.09	-0.706	19.260	25.020	-0.214	-0.01	0.05	0.30	10.22
449	-13	0.095	0.3082	82.5	82.96	-0.678	19.258	25.022	-0.321	-0.02	0.04	0.29	10.22
450	10	0.096	0.3098	82.3	82.83	-0.653	19.356	25.158	0.262	0.02	0.00	0.29	10.22
451	20	0.096	0.3098	82.3	82.73	-0.632	19.356	25.158	0.510	0.03	0.00	0.29	10.22
452	89	0.096	0.3098	82.2	82.63	-0.612	19.354	25.160	2.244	0.13	0.03	0.28	10.22
453	-378	0.094	0.3066	82.1	82.53	-0.594	19.150	24.899	-9.406	-0.56	-0.08	0.28	10.21
454	-69	0.096	0.3098	82.1	82.44	-0.579	19.352	25.163	-1.741	-0.10	-0.10	0.28	10.21
455	35	0.095	0.3082	81.9	82.35	-0.566	19.248	25.036	0.864	0.05	-0.09	0.27	10.21
456	32	0.095	0.3082	81.8	82.25	-0.556	19.246	25.038	0.795	0.05	-0.09	0.27	10.21
457	36	0.096	0.3098	81.8	82.16	-0.549	19.347	25.170	0.918	0.06	-0.10	0.26	10.21
458	11	0.095	0.3082	81.7	82.07	-0.544	19.244	25.040	0.279	0.02	0.01	0.26	10.21
459	-1	0.096	0.3098	81.7	81.99	-0.54	19.345	25.172	-0.026	0.00	0.03	0.26	10.21
460	56	0.097	0.3114	81.6	81.92	-0.537	19.444	25.305	1.424	0.09	0.04	0.25	10.22
461	71	0.095	0.3082	81.5	81.84	-0.534	19.240	25.045	1.772	0.11	0.05	0.25	10.22
462	67	0.094	0.3066	81.3	81.75	-0.533	19.135	24.918	1.672	0.10	0.06	0.25	10.22
463	37	0.097	0.3114	81.4	81.68	-0.531	19.440	25.310	0.931	0.06	0.07	0.25	10.22
464	9	0.096	0.3098	81.3	81.6	-0.53	19.338	25.181	0.223	0.01	0.07	0.24	10.22
465	44	0.096	0.3098	81.2	81.53	-0.53	19.336	25.184	1.120	0.07	0.07	0.24	10.22
466	-29	0.095	0.3082	81.2	81.47	-0.53	19.235	25.052	-0.718	-0.04	0.04	0.24	10.22
467	40	0.094	0.3066	81.2	81.41	-0.529	19.134	24.920	0.992	0.06	0.03	0.23	10.22
468	50	0.096	0.3098	81	81.34	-0.53	19.333	25.188	1.272	0.08	0.03	0.23	10.22
469	84	0.095	0.3082	81	81.27	-0.531	19.232	25.057	2.104	0.13	0.06	0.23	10.23
470	84	0.095	0.3082	81	81.21	-0.531	19.232	25.057	2.116	0.13	0.07	0.22	10.23
471	86	0.096	0.3098	81	81.16	-0.531	19.333	25.188	2.155	0.13	0.10	0.22	10.23
472	95	0.095	0.3082	81	81.13	-0.532	19.232	25.057	2.370	0.14	0.12	0.22	10.23
473	33	0.094	0.3066	80.9	81.08	-0.534	19.128	24.927	0.818	0.05	0.11	0.22	10.23
474	97	0.096	0.3098	80.9	81.04	-0.534	19.331	25.191	2.452	0.15	0.12	0.22	10.24
475	52	0.094	0.3066	80.8	81	-0.535	19.127	24.929	1.307	0.08	0.11	0.21	10.24
476	106	0.097	0.3114	80.7	80.95	-0.535	19.428	25.326	2.692	0.16	0.12	0.21	10.24
477	134	0.096	0.3098	80.6	80.89	-0.534	19.325	25.198	3.378	0.20	0.13	0.21	10.24
478	-32	0.095	0.3082	80.6	80.85	-0.533	19.224	25.066	-0.799	-0.05	0.11	0.20	10.24
479	79	0.096	0.3098	80.5	80.8	-0.531	19.324	25.200	1.991	0.12	0.10	0.20	10.24
480	29	0.096	0.3098	80.5	80.75	-0.53	19.324	25.200	0.729	0.04	0.10	0.20	10.24
481	62	0.097	0.3114	80.5	80.7	-0.529	19.424	25.331	1.562	0.09	0.08	0.20	10.25
482	10	0.096	0.3098	80.4	80.64	-0.527	19.322	25.202	0.250	0.01	0.04	0.20	10.25
483	99	0.095	0.3082	80.4	80.59	-0.526	19.221	25.071	2.489	0.15	0.08	0.20	10.25
484	24	0.095	0.3082	80.4	80.54	-0.525	19.221	25.071	0.590	0.04	0.07	0.20	10.25
485	99	0.094	0.3066	80.3	80.49	-0.522	19.118	24.941	2.464	0.15	0.09	0.20	10.25
486	46	0.095	0.3082	80.3	80.45	-0.52	19.219	25.073	1.161	0.07	0.08	0.20	10.25
487	52	0.096	0.3098	80.3	80.42	-0.519	19.320	25.205	1.316	0.08	0.10	0.20	10.25
488	1	0.096	0.3098	80.2	80.38	-0.516	19.318	25.207	0.032	0.00	0.07	0.19	10.25
489	60	0.097	0.3114	80.2	80.35	-0.513	19.419	25.338	1.527	0.09	0.08	0.18	10.26
490	49	0.095	0.3082	80.1	80.31	-0.51	19.216	25.078	1.225	0.07	0.06	0.16	10.26
491	27	0.095	0.3082	80.2	80.28	-0.506	19.217	25.075	0.686	0.04	0.06	0.11	10.26
492	27	0.096	0.3098	80.1	80.25	-0.502	19.316	25.209	0.691	0.04	0.05	0.07	10.26
493	0	0.094	0.3066	80.2	80.23	-0.497	19.116	24.943	0.008	0.00	0.05	0.05	10.26
494	82	0.096	0.3098	80.1	80.2	-0.493	19.316	25.209	2.078	0.12	0.06	0.05	10.26
495	-12	0.096	0.3098	80.1	80.18	-0.488	19.316	25.209	-0.309	-0.02	0.04	0.05	10.26
496	117	0.095	0.3082	80	80.15	-0.484	19.214	25.080	2.930	0.18	0.06	0.05	10.26
497	53	0.097	0.3114	79.9	80.11	-0.48	19.413	25.345	1.351	0.08	0.07	0.05	10.26
498	16	0.096	0.3098	80	80.09	-0.477	19.315	25.212	0.392	0.02	0.08	0.05	10.27
499	58	0.098	0.3130	79.9	80.06	-0.476	19.513	25.475	1.471	0.09	0.07	0.05	10.27
500	49	0.096	0.3098	79.9	80.04	-0.473	19.313	25.214	1.225	0.07	0.09	0.05	10.27
501	70	0.096	0.3098	79.9	80.01	-0.47	19.313	25.214	1.759	0.11	0.07	0.05	10.27
502	50	0.097	0.3114	79.9	79.99	-0.467	19.413	25.345	1.255	0.08	0.07	0.05	10.27
503	72	0.097	0.3114	79.9	79.96	-0.463	19.413	25.345	1.833	0.11	0.09	0.06	10.27
504	-2	0.096	0.3098	79.9	79.94	-0.46	19.313	25.214	-0.057	0.00	0.07	0.06	10.27
505	49	0.096	0.3098	79.9	79.92	-0.458	19.313	25.214	1.241	0.07	0.07	0.05	10.27
506	-2	0.096	0.3098	79.8	79.9	-0.456	19.311	25.216	-0.055	0.00	0.05	0.05	10.27
507	17	0.096	0.3098	79.9	79.9	-0.453	19.313	25.214	0.432	0.03	0.04	0.06	10.27
508	16	0.095	0.3082	79.8	79.88	-0.45	19.210	25.085	0.402	0.02	0.02	0.06	10.27
509	63	0.097	0.3114	79.8	79.87	-0.446	19.411	25.347	1.607	0.10	0.04	0.06	10.28
510	103	0.096	0.3098	79.7	79.85	-0.444	19.309	25.219	2.594	0.16	0.06	0.06	10.28
511	39	0.097	0.3114	79.7	79.83	-0.443	19.410	25.350	0.980	0.06	0.07	0.06	10.28
512	70	0.097	0.3114	79.7	79.81	-0.441	19.410	25.350	1.781	0.11	0.09	0.06	10.28
513	39	0.097	0.3114	79.7	79.79	-0.439	19.410	25.350	0.982	0.06	0.10	0.07	10.28
514	19	0.096	0.3098	79.7	79.77	-0.437	19.309	25.219	0.476	0.03	0.08	0.07	10.28
515	22	0.096	0.3098	79.6	79.74	-0.437	19.307	25.221	0.564	0.03	0.06	0.07	10.28
516	57	0.097	0.3114	79.7	79.73	-0.435	19.410	25.350	1.449	0.09	0.06	0.07	10.29
517	79	0.095	0.3082	79.7	79.71	-0.435	19.208	25.087	1.991	0.12	0.07	0.07	10.29
518	58	0.097	0.3114	79.7	79.7	-0.434	19.410	25.350	1.463	0.09	0.07	0.07	10.29
519	11	0.097	0.3114	79.6	79.68	-0.432	19.408	25.352	0.277	0.02	0.07	0.07	10.29
520	68	0.097	0.3114	79.6	79.67	-0.432	19.408	25.352	1.713	0.10	0.08	0.07	10.29
521	109	0.094	0.3066	79.5	79.65	-0.433	19.104	24.959	2.712	0.16	0.10	0.07	10.29
522	-6	0.097	0.3114	79.6	79.64	-0.434	19.408	25.352	-0.154	-0.01	0.07	0.07	10.29
523	88	0.095	0.3082	79.5	79.62	-0.436	19.205	25.092	2.206	0.13	0.08	0.08	10.30
524	2	0.098	0.3130	79.5	79.6	-0.437	19.506	25.485	0.043	0.00	0.08	0.07	10.30

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525	58	0.097	0.3114	79.4	79.58	-0.437	19.404	25.357	1.481	0.09	0.08	0.08	10.30
526	67	0.095	0.3082	79.4	79.55	-0.438	19.203	25.094	1.686	0.10	0.06	0.08	10.30
527	32	0.095	0.3082	79.3	79.51	-0.439	19.201	25.096	0.802	0.05	0.07	0.08	10.30
528	98	0.096	0.3098	79.3	79.47	-0.441	19.302	25.228	2.461	0.15	0.08	0.08	10.30
529	26	0.096	0.3098	79.4	79.45	-0.444	19.304	25.226	0.664	0.04	0.09	0.08	10.30
530	2	0.098	0.3130	79.4	79.43	-0.446	19.504	25.487	0.058	0.00	0.07	0.08	10.30
531	43	0.096	0.3098	79.4	79.42	-0.446	19.304	25.226	1.086	0.07	0.06	0.08	10.30
532	55	0.097	0.3114	79.4	79.4	-0.448	19.404	25.357	1.390	0.08	0.07	0.07	10.31
533	31	0.096	0.3098	79.4	79.39	-0.45	19.304	25.226	0.783	0.05	0.05	0.07	10.31
534	21	0.096	0.3098	79.3	79.37	-0.452	19.302	25.228	0.523	0.03	0.05	0.07	10.31
535	13	0.096	0.3098	79.3	79.36	-0.454	19.302	25.228	0.331	0.02	0.05	0.07	10.31
536	63	0.097	0.3114	79.3	79.35	-0.457	19.402	25.359	1.591	0.10	0.06	0.07	10.31
537	145	0.096	0.3098	79.3	79.35	-0.458	19.302	25.228	3.671	0.22	0.08	0.07	10.31
538	-5	0.095	0.3082	79.3	79.35	-0.46	19.201	25.096	-0.116	-0.01	0.07	0.07	10.31
539	87	0.096	0.3098	79.3	79.34	-0.461	19.302	25.228	2.191	0.13	0.09	0.07	10.31
540	6	0.095	0.3082	79.3	79.33	-0.461	19.201	25.096	0.142	0.01	0.09	0.07	10.31
541	90	0.097	0.3114	79.2	79.31	-0.463	19.401	25.361	2.282	0.14	0.10	0.07	10.32
542	-4	0.097	0.3114	79.1	79.28	-0.464	19.399	25.364	-0.104	-0.01	0.05	0.07	10.32
543	0	0.099	0.3146	79.1	79.25	-0.465	19.598	25.624	0.002	0.00	0.05	0.07	10.32
544	22	0.097	0.3114	79	79.22	-0.465	19.397	25.366	0.550	0.03	0.03	0.07	10.32
545	-10	0.096	0.3098	79	79.19	-0.466	19.297	25.235	-0.261	-0.02	0.03	0.07	10.32
546	120	0.097	0.3114	79	79.16	-0.465	19.397	25.366	3.052	0.18	0.04	0.07	10.32
547	85	0.097	0.3114	79	79.13	-0.464	19.397	25.366	2.160	0.13	0.07	0.06	10.32
548	40	0.097	0.3114	79	79.1	-0.462	19.397	25.366	1.015	0.06	0.08	0.07	10.32
549	69	0.097	0.3114	79	79.07	-0.461	19.397	25.366	1.753	0.11	0.09	0.07	10.32
550	10	0.096	0.3098	78.9	79.03	-0.459	19.295	25.237	0.260	0.02	0.10	0.07	10.32
551	22	0.096	0.3098	78.8	78.99	-0.458	19.293	25.240	0.567	0.03	0.07	0.07	10.33
552	21	0.095	0.3082	78.9	78.97	-0.455	19.194	25.106	0.523	0.03	0.05	0.07	10.33
553	-8	0.096	0.3098	78.9	78.95	-0.452	19.295	25.237	-0.202	-0.01	0.03	0.07	10.33
554	24	0.098	0.3130	78.9	78.94	-0.449	19.495	25.499	0.603	0.04	0.02	0.07	10.33
555	48	0.097	0.3114	78.8	78.92	-0.445	19.393	25.371	1.226	0.07	0.03	0.07	10.33
556	13	0.097	0.3114	78.8	78.9	-0.441	19.393	25.371	0.330	0.02	0.03	0.07	10.33
557	-29	0.096	0.3098	78.7	78.87	-0.437	19.291	25.242	-0.733	-0.04	0.01	0.06	10.33
558	29	0.095	0.3082	78.7	78.84	-0.432	19.191	25.110	0.728	0.04	0.03	0.06	10.33
559	37	0.097	0.3114	78.7	78.81	-0.428	19.392	25.373	0.949	0.06	0.03	0.06	10.33
560	-3	0.096	0.3098	78.7	78.79	-0.424	19.291	25.242	-0.067	0.00	0.01	0.06	10.33
561	-26	0.096	0.3098	78.6	78.77	-0.416	19.290	25.244	-0.647	-0.04	0.00	0.06	10.33
562	9	0.094	0.3066	78.6	78.74	-0.41	19.088	24.980	0.216	0.01	0.01	0.06	10.33
563	11	0.098	0.3130	78.5	78.7	-0.405	19.488	25.508	0.283	0.02	0.01	0.06	10.33
564	31	0.095	0.3082	78.5	78.66	-0.4	19.187	25.115	0.775	0.05	0.01	0.06	10.33
565	30	0.097	0.3114	78.5	78.63	-0.394	19.388	25.378	0.751	0.05	0.02	0.06	10.33
566	22	0.097	0.3114	78.4	78.59	-0.389	19.386	25.380	0.562	0.03	0.03	0.06	10.33
567	12	0.098	0.3130	78.4	78.56	-0.385	19.486	25.511	0.304	0.02	0.03	0.06	10.33
568	-6	0.096	0.3098	78.3	78.52	-0.382	19.284	25.251	-0.148	-0.01	0.03	0.06	10.33
569	22	0.097	0.3114	78.3	78.48	-0.378	19.384	25.383	0.560	0.03	0.02	0.06	10.33
570	27	0.098	0.3130	78.3	78.44	-0.374	19.484	25.513	0.681	0.04	0.02	0.05	10.33
571	-19	0.097	0.3114	78.3	78.41	-0.372	19.384	25.383	-0.487	-0.03	0.01	0.05	10.33
572	13	0.097	0.3114	78.2	78.37	-0.37	19.383	25.385	0.321	0.02	0.01	0.05	10.33
573	-40	0.098	0.3130	78.1	78.33	-0.367	19.480	25.518	-1.022	-0.06	0.00	0.05	10.33
574	61	0.096	0.3098	78.1	78.29	-0.365	19.281	25.256	1.532	0.09	0.01	0.05	10.33
575	-31	0.096	0.3098	78.1	78.25	-0.364	19.281	25.256	-0.786	-0.05	-0.01	0.05	10.33
576	43	0.096	0.3098	78	78.21	-0.362	19.279	25.258	1.098	0.07	0.01	0.05	10.33
577	-31	0.097	0.3114	78	78.17	-0.361	19.379	25.390	-0.787	-0.05	0.00	0.05	10.33
578	38	0.096	0.3098	78	78.14	-0.36	19.279	25.258	0.965	0.06	0.02	0.05	10.33

WOOD STOVE TEST DATA PACKET
IDC / ASTM E2515



Run 3 Data Summary

Client:	SBI
Model:	Everest III
Job #:	23-241
Tracking #:	191
Test Date:	5/8/2024

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

Techician Signature

6/5/2024
Date

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: SBI
 Model: Everest III
 Run #: 3
 Test Start Time:

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Total Sampling Time (min): 542
 Recording Interval (min): 1

Meter Box γ Factor: 1.000 (A)
 Meter Box γ Factor: 1.003 (B)
 Meter Box γ Factor: - (C)
 Meter Box γ Factor: 1.013 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100%
 Date Flue Pipe Last Cleaned: 5/3/2024
 Test Fuel Scale Audit (lbs): 10.00
 Platform Scale Audit (lbs): 10.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.24	30.12	30.18
Relative Humidity (%)	30.2	22.2	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		67.601	ft ³

Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.000	cfm @	7 in. Hg
(B)	0.000	0.000	cfm @	7 in. Hg
(C)	-	-	cfm @	- in. Hg
(Ambient)	0.000	0.000	cfm @	-13 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.062	73
2	0.090	73
3	0.092	73
4	0.090	73
5	0.088	73
6	0.066	73
7	0.064	73
8	0.088	73
9	0.094	73
10	0.094	73
11	0.088	73
12	0.064	73
Center	0.093	73

Dilution Tunnel H₂O: 2.00 percent

Tunnel Diameter: 12 inches

Pitot Tube Cp: 0.99 [unitless]

Dilution Tunnel MW(dry): 29.00 lb/lb-mole

Dilution Tunnel MW(wet): 28.78 lb/lb-mole

Tunnel Area: 0.7854 ft²

V_{strav}: 18.87 ft/sec

V_{scnt}: 20.21 ft/sec

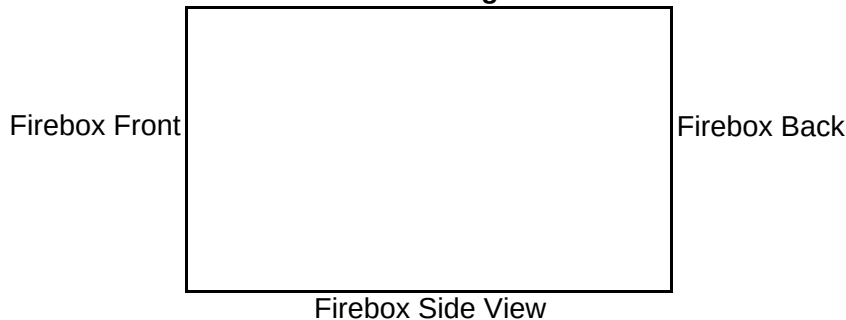
F_p: 0.934 [ratio]

Initial Tunnel Flow: 871.2 scf/min

Static Pressure: -0.290 in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type: D. Fir
 HHV (kJ/kg): 19,810
 %C: 48.73
 %H: 6.87
 %O: 43.9
 %Ash: 0.5
 MC (%DB): #DIV/0!

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 3

Technician: AK

Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	-0.057		0.094	0.01	68	-0.7		10.58		72	77	82	67
1	0.068	0.125	0.092	0.97	68	-1.5	-	10.08	-0.50	85	451	83	68
2	0.212	0.144	0.090	0.95	68	-1.5	-	9.41	-0.67	111	796	84	67
3	0.356	0.144	0.091	0.95	68	-1.4	-	8.74	-0.67	111	797	86	68
4	0.499	0.143	0.091	0.94	68	-1.3	-	8.37	-0.37	97	782	87	68
5	0.643	0.144	0.093	0.93	69	-1.1	-	8.08	-0.29	92	791	87	68
6	0.786	0.143	0.093	0.94	69	-1.0	-	7.81	-0.27	90	796	86	68
7	0.930	0.144	0.093	0.94	69	-1.0	-	7.54	-0.27	90	807	85	68
8	1.074	0.144	0.093	0.94	69	-1.0	-	7.26	-0.28	90	798	85	68
9	1.216	0.142	0.093	0.94	69	-1.0	-	7.01	-0.25	89	782	84	68
10	1.359	0.143	0.093	0.92	69	-1.1	101	6.76	-0.25	89	790	83	68
11	1.501	0.142	0.092	0.93	69	-1.1	-	6.50	-0.26	90	800	82	68
12	1.644	0.143	0.093	0.93	70	-1.0	-	6.26	-0.24	90	804	81	68
13	1.788	0.144	0.093	0.93	70	-1.1	-	5.99	-0.27	91	827	80	68
14	1.930	0.142	0.092	0.94	70	-1.1	-	5.72	-0.27	93	830	80	68
15	2.072	0.142	0.094	0.93	70	-1.2	-	5.47	-0.25	93	824	80	68
16	2.214	0.142	0.093	0.93	70	-1.2	-	5.22	-0.25	93	831	80	68
17	2.357	0.143	0.093	0.94	71	-1.1	-	4.97	-0.25	94	833	80	68
18	2.500	0.143	0.092	0.93	71	-1.1	-	4.74	-0.23	94	831	81	68
19	2.642	0.142	0.093	0.93	71	-1.2	-	4.52	-0.22	94	824	82	68
20	2.784	0.142	0.095	0.91	71	-1.2	103	4.31	-0.21	94	821	82	68
21	2.926	0.142	0.094	0.93	71	-1.1	-	4.09	-0.22	94	818	82	68
22	3.069	0.143	0.091	0.93	72	-1.2	-	3.88	-0.21	94	820	82	68
23	3.211	0.142	0.094	0.93	72	-1.3	-	3.68	-0.20	95	816	81	68
24	3.353	0.142	0.093	0.92	72	-1.2	-	3.48	-0.20	95	816	80	68
25	3.495	0.142	0.094	0.92	72	-1.2	-	3.30	-0.18	95	810	81	68
26	3.637	0.142	0.093	0.92	73	-1.3	-	3.12	-0.18	95	804	83	68
27	3.780	0.143	0.091	0.93	73	-1.2	-	20.90	17.78	102	739	85	69
28	3.922	0.142	0.092	0.93	73	-1.2	-	20.68	-0.22	96	792	87	69
29	4.063	0.141	0.093	0.92	73	-1.2	-	20.42	-0.26	96	825	87	69
30	4.205	0.142	0.092	0.93	74	-1.3	103	20.15	-0.27	96	849	86	68
31	4.348	0.143	0.092	0.92	74	-1.3	-	19.89	-0.26	97	863	85	69

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>3</u>	Technician: <u>AK</u>
	Date: <u>5/8/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.489	0.141	0.092	0.93	74	-1.2	-	19.61	-0.28	97	872	84	69
33	4.631	0.142	0.091	0.92	74	-1.3	-	19.33	-0.28	97	888	83	69
34	4.772	0.141	0.092	0.92	74	-1.2	-	19.03	-0.30	98	910	82	69
35	4.915	0.143	0.092	0.93	75	-1.2	-	18.72	-0.31	99	928	82	69
36	5.057	0.142	0.092	0.92	75	-1.2	-	18.40	-0.32	99	950	83	69
37	5.198	0.141	0.091	0.92	75	-1.3	-	18.08	-0.32	100	970	82	69
38	5.340	0.142	0.091	0.92	75	-1.3	-	17.75	-0.33	101	989	81	69
39	5.482	0.142	0.092	0.92	76	-1.2	-	17.41	-0.34	101	1,000	81	69
40	5.625	0.143	0.093	0.93	76	-1.2	103	17.10	-0.31	101	991	81	69
41	5.766	0.141	0.092	0.91	76	-1.3	-	16.78	-0.32	101	979	82	69
42	5.907	0.141	0.093	0.91	76	-1.2	-	16.48	-0.30	101	969	82	69
43	6.049	0.142	0.091	0.91	76	-1.2	-	16.19	-0.29	101	961	81	69
44	6.193	0.144	0.092	0.92	77	-1.3	-	15.90	-0.29	101	952	81	69
45	6.334	0.141	0.091	0.93	77	-1.3	-	15.61	-0.29	102	956	82	69
46	6.476	0.142	0.091	0.91	77	-1.3	-	15.32	-0.29	102	962	82	69
47	6.617	0.141	0.093	0.93	77	-1.3	-	15.04	-0.28	102	960	83	70
48	6.760	0.143	0.093	0.92	77	-1.3	-	14.77	-0.27	102	957	83	70
49	6.902	0.142	0.093	0.93	78	-1.3	-	14.49	-0.28	102	967	83	70
50	7.043	0.141	0.093	0.90	78	-1.2	103	14.20	-0.29	102	975	83	70
51	7.185	0.142	0.094	0.91	78	-1.4	-	13.90	-0.30	103	992	82	70
52	7.327	0.142	0.091	0.93	78	-1.3	-	13.60	-0.30	104	994	81	70
53	7.470	0.143	0.092	0.92	78	-1.4	-	13.31	-0.29	104	997	80	70
54	7.611	0.141	0.093	0.92	78	-1.3	-	13.00	-0.31	104	1,014	81	70
55	7.752	0.141	0.094	0.91	79	-1.2	-	12.70	-0.30	105	1,031	82	70
56	7.894	0.142	0.092	0.90	79	-1.2	-	12.42	-0.28	103	994	82	70
57	8.037	0.143	0.091	0.92	79	-1.3	-	12.21	-0.21	100	945	83	70
58	8.179	0.142	0.091	0.93	79	-1.3	-	12.02	-0.19	99	906	82	70
59	8.320	0.141	0.092	0.90	79	-1.2	-	11.85	-0.17	98	879	81	70
60	8.462	0.142	0.093	0.90	79	-1.3	102	11.69	-0.16	97	859	81	70
61	8.605	0.143	0.093	0.90	80	-1.3	-	11.53	-0.16	96	842	82	70
62	8.747	0.142	0.093	0.92	80	-1.3	-	11.38	-0.15	96	829	82	70
63	8.888	0.141	0.095	0.92	80	-1.3	-	11.22	-0.16	96	819	82	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.030	0.142	0.092	0.91	80	-1.3	-	11.05	-0.17	95	813	82	70
65	9.172	0.142	0.094	0.91	80	-1.2	-	10.90	-0.15	95	807	81	70
66	9.315	0.143	0.092	0.92	80	-1.3	-	10.73	-0.17	95	805	81	70
67	9.457	0.142	0.093	0.92	80	-1.3	-	10.57	-0.16	95	800	81	70
68	9.598	0.141	0.095	0.92	81	-1.2	-	10.41	-0.16	95	797	82	70
69	9.740	0.142	0.093	0.91	81	-1.3	-	10.25	-0.16	94	795	82	70
70	9.884	0.144	0.094	0.93	81	-1.2	102	10.09	-0.16	94	791	82	70
71	10.026	0.142	0.093	0.91	81	-1.2	-	9.94	-0.15	94	786	82	70
72	10.167	0.141	0.093	0.91	81	-1.3	-	9.78	-0.16	94	784	81	70
73	10.309	0.142	0.092	0.91	81	-1.4	-	9.62	-0.16	94	783	81	70
74	10.451	0.142	0.094	0.92	81	-1.3	-	9.45	-0.17	94	785	82	70
75	10.595	0.144	0.093	0.92	81	-1.3	-	9.29	-0.16	94	784	82	70
76	10.737	0.142	0.094	0.92	82	-1.3	-	9.13	-0.16	94	782	82	70
77	10.878	0.141	0.093	0.92	82	-1.3	-	8.98	-0.15	93	775	82	70
78	11.020	0.142	0.092	0.92	82	-1.3	-	8.85	-0.13	93	784	81	71
79	11.163	0.143	0.093	0.92	82	-1.4	-	8.70	-0.15	93	783	81	71
80	11.306	0.143	0.093	0.91	82	-1.2	101	8.58	-0.12	93	780	81	70
81	11.448	0.142	0.093	0.92	82	-1.2	-	8.43	-0.15	93	777	82	70
82	11.590	0.142	0.094	0.91	82	-1.2	-	8.30	-0.13	93	778	82	70
83	11.732	0.142	0.093	0.92	82	-1.4	-	8.16	-0.14	93	778	82	71
84	11.875	0.143	0.094	0.92	82	-1.3	-	8.01	-0.15	93	779	82	71
85	12.018	0.143	0.093	0.92	82	-1.3	-	7.88	-0.13	93	783	81	71
86	12.159	0.141	0.094	0.90	82	-1.3	-	7.74	-0.14	93	785	81	71
87	12.301	0.142	0.094	0.92	83	-1.3	-	7.60	-0.14	93	786	82	71
88	12.444	0.143	0.093	0.92	83	-1.3	-	7.45	-0.15	93	790	82	71
89	12.587	0.143	0.094	0.91	83	-1.3	-	7.31	-0.14	93	788	83	71
90	12.729	0.142	0.093	0.91	83	-1.4	101	7.18	-0.13	93	784	83	71
91	12.868	0.139	0.094	0.92	83	-1.3	-	7.06	-0.12	93	783	83	71
92	13.011	0.143	0.095	0.91	83	-1.2	-	6.92	-0.14	93	784	82	71
93	13.152	0.141	0.093	0.92	83	-1.3	-	6.79	-0.13	93	785	81	71
94	13.296	0.144	0.092	0.91	83	-1.3	-	6.67	-0.12	92	783	81	71
95	13.438	0.142	0.092	0.93	83	-1.3	-	6.55	-0.12	92	779	82	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 3Technician: AKDate: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	13.580	0.142	0.093	0.91	83	-1.3	-	6.44	-0.11	92	778	82	71
97	13.723	0.143	0.094	0.91	83	-1.3	-	6.33	-0.11	92	775	83	71
98	13.866	0.143	0.094	0.93	84	-1.3	-	6.22	-0.11	92	770	83	71
99	14.009	0.143	0.094	0.91	84	-1.3	-	6.13	-0.09	92	763	83	71
100	14.150	0.141	0.094	0.91	84	-1.3	101	6.02	-0.11	92	759	82	71
101	14.292	0.142	0.092	0.91	84	-1.4	-	5.92	-0.10	92	760	81	71
102	14.435	0.143	0.094	0.91	84	-1.3	-	5.81	-0.11	92	755	81	71
103	14.579	0.144	0.095	0.91	84	-1.3	-	5.72	-0.09	92	747	82	71
104	14.720	0.141	0.095	0.92	84	-1.3	-	5.64	-0.08	91	739	82	71
105	14.862	0.142	0.091	0.92	84	-1.4	-	5.56	-0.08	91	731	83	71
106	15.005	0.143	0.093	0.92	84	-1.4	-	5.47	-0.09	91	718	83	71
107	15.148	0.143	0.095	0.92	84	-1.3	-	5.40	-0.07	91	712	82	71
108	15.291	0.143	0.093	0.92	84	-1.4	-	5.32	-0.08	91	710	81	71
109	15.433	0.142	0.093	0.92	84	-1.3	-	5.23	-0.09	91	714	81	71
110	15.575	0.142	0.094	0.91	84	-1.4	101	5.15	-0.08	91	707	82	71
111	15.717	0.142	0.093	0.91	84	-1.4	-	5.08	-0.07	91	695	83	71
112	15.861	0.144	0.092	0.92	84	-1.4	-	17.54	12.46	98	661	84	71
113	16.003	0.142	0.094	0.93	84	-1.4	-	17.34	-0.20	99	746	85	71
114	16.145	0.142	0.092	0.91	85	-1.3	-	17.09	-0.25	101	836	84	71
115	16.287	0.142	0.091	0.92	85	-1.3	-	16.81	-0.28	103	885	84	71
116	16.429	0.142	0.092	0.93	85	-1.3	-	16.51	-0.30	103	888	83	71
117	16.573	0.144	0.092	0.92	85	-1.4	-	16.30	-0.21	97	843	83	71
118	16.715	0.142	0.092	0.93	85	-1.4	-	16.11	-0.19	95	823	83	71
119	16.856	0.141	0.094	0.92	85	-1.3	-	15.93	-0.18	95	815	84	71
120	16.998	0.142	0.093	0.92	85	-1.4	101	15.76	-0.17	94	806	84	71
121	17.139	0.141	0.094	0.92	85	-1.4	-	15.59	-0.17	94	801	83	71
122	17.284	0.145	0.093	0.92	85	-1.4	-	15.42	-0.17	94	794	82	71
123	17.425	0.141	0.091	0.91	85	-1.4	-	15.27	-0.15	94	787	83	71
124	17.567	0.142	0.094	0.92	85	-1.4	-	15.12	-0.15	94	782	84	71
125	17.709	0.142	0.092	0.92	85	-1.4	-	14.97	-0.15	93	776	84	71
126	17.853	0.144	0.091	0.91	85	-1.3	-	14.83	-0.14	93	771	83	71
127	17.994	0.141	0.092	0.92	85	-1.3	-	14.68	-0.15	93	770	82	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	18.136	0.142	0.092	0.92	85	-1.3	-	14.53	-0.15	93	770	83	71
129	18.278	0.142	0.093	0.91	85	-1.3	-	14.40	-0.13	93	769	84	71
130	18.420	0.142	0.092	0.90	85	-1.4	101	14.25	-0.15	93	761	84	71
131	18.563	0.143	0.092	0.93	85	-1.4	-	14.11	-0.14	93	761	83	72
132	18.705	0.142	0.093	0.92	85	-1.4	-	13.97	-0.14	93	763	83	71
133	18.847	0.142	0.092	0.91	85	-1.3	-	13.82	-0.15	93	763	83	71
134	18.989	0.142	0.092	0.92	85	-1.3	-	13.68	-0.14	93	761	84	72
135	19.132	0.143	0.092	0.91	86	-1.4	-	13.54	-0.14	93	759	84	71
136	19.274	0.142	0.092	0.91	86	-1.3	-	13.40	-0.14	93	753	84	72
137	19.416	0.142	0.093	0.92	86	-1.4	-	13.27	-0.13	93	749	84	72
138	19.558	0.142	0.093	0.91	86	-1.3	-	13.14	-0.13	93	748	83	72
139	19.700	0.142	0.094	0.92	86	-1.4	-	13.00	-0.14	93	744	83	72
140	19.843	0.143	0.092	0.90	86	-1.3	101	12.87	-0.13	93	742	83	72
141	19.985	0.142	0.094	0.90	86	-1.4	-	12.74	-0.13	93	739	84	72
142	20.127	0.142	0.094	0.91	86	-1.3	-	12.62	-0.12	93	735	84	72
143	20.269	0.142	0.093	0.91	86	-1.3	-	12.49	-0.13	93	732	83	72
144	20.412	0.143	0.092	0.91	86	-1.3	-	12.36	-0.13	93	728	83	72
145	20.555	0.143	0.092	0.91	86	-1.3	-	12.24	-0.12	92	724	84	72
146	20.696	0.141	0.094	0.92	86	-1.3	-	12.12	-0.12	92	720	84	72
147	20.838	0.142	0.092	0.91	86	-1.4	-	12.00	-0.12	92	714	83	72
148	20.980	0.142	0.093	0.92	86	-1.4	-	11.90	-0.10	92	709	83	72
149	21.124	0.144	0.092	0.91	86	-1.4	-	11.79	-0.11	92	704	83	72
150	21.266	0.142	0.094	0.92	86	-1.3	101	11.68	-0.11	92	698	84	72
151	21.408	0.142	0.093	0.91	86	-1.4	-	11.57	-0.11	92	693	84	72
152	21.549	0.141	0.094	0.92	86	-1.4	-	11.46	-0.11	92	687	85	72
153	21.692	0.143	0.093	0.92	86	-1.4	-	11.35	-0.11	91	684	84	72
154	21.835	0.143	0.094	0.91	86	-1.4	-	11.25	-0.10	91	679	83	72
155	21.977	0.142	0.095	0.92	86	-1.4	-	11.14	-0.11	91	676	82	71
156	22.119	0.142	0.094	0.91	86	-1.3	-	11.04	-0.10	91	669	83	71
157	22.261	0.142	0.093	0.91	86	-1.3	-	10.94	-0.10	91	665	84	71
158	22.404	0.143	0.092	0.91	86	-1.4	-	10.85	-0.09	91	661	84	71
159	22.547	0.143	0.093	0.90	86	-1.3	-	10.75	-0.10	91	659	83	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 3

Technician: AK

Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	22.688	0.141	0.093	0.92	86	-1.4	100	10.66	-0.09	91	656	83	71
161	22.830	0.142	0.093	0.92	86	-1.3	-	10.56	-0.10	91	654	84	72
162	22.972	0.142	0.094	0.91	86	-1.4	-	10.47	-0.09	91	650	84	72
163	23.116	0.144	0.094	0.91	87	-1.3	-	10.37	-0.10	90	645	83	72
164	23.258	0.142	0.093	0.92	87	-1.3	-	10.28	-0.09	90	643	83	72
165	23.400	0.142	0.094	0.91	87	-1.4	-	10.18	-0.10	90	641	84	72
166	23.542	0.142	0.094	0.91	87	-1.4	-	10.09	-0.09	90	639	84	72
167	23.685	0.143	0.093	0.91	87	-1.3	-	9.99	-0.10	90	637	84	72
168	23.828	0.143	0.092	0.90	87	-1.3	-	9.90	-0.09	90	636	84	72
169	23.970	0.142	0.095	0.92	87	-1.4	-	9.81	-0.09	90	634	84	72
170	24.111	0.141	0.093	0.91	87	-1.4	100	9.71	-0.10	90	632	83	72
171	24.253	0.142	0.094	0.92	87	-1.3	-	9.62	-0.09	90	629	82	72
172	24.397	0.144	0.094	0.91	87	-1.3	-	9.53	-0.09	90	627	83	72
173	24.539	0.142	0.093	0.91	87	-1.4	-	9.44	-0.09	89	627	84	72
174	24.681	0.142	0.093	0.92	87	-1.3	-	9.35	-0.09	89	627	84	72
175	24.823	0.142	0.094	0.91	87	-1.4	-	9.27	-0.08	89	626	83	72
176	24.965	0.142	0.092	0.90	87	-1.4	-	9.18	-0.09	89	625	83	72
177	25.109	0.144	0.093	0.92	87	-1.3	-	9.09	-0.09	89	626	84	72
178	25.251	0.142	0.094	0.92	87	-1.3	-	9.00	-0.09	89	627	84	72
179	25.392	0.141	0.092	0.91	87	-1.4	-	8.91	-0.09	89	630	84	72
180	25.534	0.142	0.094	0.93	87	-1.3	100	8.84	-0.07	89	631	83	72
181	25.677	0.143	0.094	0.92	87	-1.3	-	8.75	-0.09	89	631	83	72
182	25.820	0.143	0.096	0.91	87	-1.3	-	8.66	-0.09	89	632	83	72
183	25.962	0.142	0.094	0.91	87	-1.4	-	8.58	-0.08	89	635	84	72
184	26.104	0.142	0.093	0.92	87	-1.4	-	8.49	-0.09	89	637	83	72
185	26.246	0.142	0.092	0.91	87	-1.4	-	8.41	-0.08	89	638	83	72
186	26.389	0.143	0.092	0.90	87	-1.4	-	8.32	-0.09	89	640	83	72
187	26.532	0.143	0.095	0.91	87	-1.4	-	8.23	-0.09	89	641	83	72
188	26.673	0.141	0.094	0.92	87	-1.4	-	8.14	-0.09	89	644	83	72
189	26.815	0.142	0.093	0.91	87	-1.5	-	8.04	-0.10	89	649	83	72
190	26.957	0.142	0.094	0.91	87	-1.4	100	7.94	-0.10	89	655	83	72
191	27.101	0.144	0.093	0.92	87	-1.4	-	7.84	-0.10	90	662	83	72

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	27.243	0.142	0.095	0.92	87	-1.4	-	7.76	-0.08	89	658	84	72
193	27.385	0.142	0.094	0.93	87	-1.4	-	7.69	-0.07	89	647	84	72
194	27.527	0.142	0.092	0.91	87	-1.4	-	7.62	-0.07	89	638	83	72
195	27.670	0.143	0.093	0.90	87	-1.5	-	7.55	-0.07	89	635	83	72
196	27.813	0.143	0.093	0.92	87	-1.4	-	7.48	-0.07	89	630	83	72
197	27.955	0.142	0.096	0.92	87	-1.4	-	7.42	-0.06	89	625	84	72
198	28.096	0.141	0.094	0.92	87	-1.5	-	7.35	-0.07	89	620	84	72
199	28.239	0.143	0.092	0.92	87	-1.3	-	7.28	-0.07	89	622	83	73
200	28.382	0.143	0.093	0.91	87	-1.3	100	7.22	-0.06	89	618	83	73
201	28.524	0.142	0.093	0.91	87	-1.5	-	7.16	-0.06	89	616	83	72
202	28.666	0.142	0.095	0.92	87	-1.5	-	7.10	-0.06	89	613	84	72
203	28.808	0.142	0.094	0.91	87	-1.4	-	7.04	-0.06	89	606	84	72
204	28.950	0.142	0.094	0.91	87	-1.3	-	6.99	-0.05	89	595	84	72
205	29.094	0.144	0.095	0.92	88	-1.4	-	6.94	-0.05	88	584	84	72
206	29.236	0.142	0.094	0.91	88	-1.4	-	6.89	-0.05	88	575	83	73
207	29.377	0.141	0.095	0.91	88	-1.3	-	6.84	-0.05	88	569	83	73
208	29.519	0.142	0.096	0.92	88	-1.5	-	6.80	-0.04	88	565	83	72
209	29.662	0.143	0.095	0.92	88	-1.5	-	6.75	-0.05	88	560	84	73
210	29.805	0.143	0.094	0.91	88	-1.4	100	6.70	-0.05	88	554	84	72
211	29.947	0.142	0.097	0.93	88	-1.4	-	6.66	-0.04	88	549	84	72
212	30.089	0.142	0.096	0.90	88	-1.4	-	6.61	-0.05	88	545	83	72
213	30.231	0.142	0.094	0.91	88	-1.5	-	6.56	-0.05	88	539	83	72
214	30.374	0.143	0.096	0.91	88	-1.4	-	6.52	-0.04	88	534	83	72
215	30.517	0.143	0.095	0.91	88	-1.4	-	6.47	-0.05	87	529	84	72
216	30.659	0.142	0.095	0.91	88	-1.4	-	6.43	-0.04	87	527	84	72
217	30.801	0.142	0.092	0.91	88	-1.5	-	6.38	-0.05	87	523	84	72
218	30.944	0.143	0.094	0.91	88	-1.5	-	6.34	-0.04	87	520	83	72
219	31.088	0.144	0.094	0.91	88	-1.4	-	6.30	-0.04	87	515	83	72
220	31.231	0.143	0.094	0.91	88	-1.4	100	6.25	-0.05	87	512	83	72
221	31.373	0.142	0.094	0.92	88	-1.5	-	6.21	-0.04	87	507	84	72
222	31.515	0.142	0.093	0.92	88	-1.4	-	6.16	-0.05	87	504	84	72
223	31.658	0.143	0.092	0.91	88	-1.4	-	41.58	35.42	100	347	84	72

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>3</u>	Technician: <u>AK</u>
	Date: <u>5/8/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	31.802	0.144	0.091	0.91	88	-1.4	-	36.02	-5.56	106	435	83	72
225	31.945	0.143	0.093	0.92	88	-1.5	-	35.66	-0.36	116	625	83	72
226	32.086	0.141	0.091	0.92	88	-1.4	-	35.19	-0.47	134	863	84	72
227	32.228	0.142	0.089	0.91	88	-1.4	-	34.64	-0.55	151	1,031	84	72
228	32.370	0.142	0.089	0.90	88	-1.4	-	34.24	-0.40	123	939	85	72
229	32.514	0.144	0.093	0.92	88	-1.5	-	33.97	-0.27	112	920	85	72
230	32.656	0.142	0.092	0.92	88	-1.4	101	33.70	-0.27	108	941	85	72
231	32.798	0.142	0.092	0.92	88	-1.4	-	33.42	-0.28	107	979	84	72
232	32.939	0.141	0.093	0.92	88	-1.4	-	33.12	-0.30	107	1,023	83	72
233	33.082	0.143	0.092	0.91	88	-1.5	-	32.82	-0.30	103	962	83	72
234	33.225	0.143	0.096	0.90	88	-1.4	-	32.61	-0.21	100	927	84	72
235	33.367	0.142	0.093	0.92	88	-1.4	-	32.40	-0.21	98	904	84	72
236	33.509	0.142	0.092	0.92	88	-1.3	-	32.19	-0.21	97	889	84	73
237	33.651	0.142	0.093	0.90	88	-1.4	-	32.00	-0.19	97	882	83	73
238	33.794	0.143	0.092	0.90	88	-1.4	-	31.81	-0.19	97	880	83	73
239	33.937	0.143	0.093	0.91	88	-1.3	-	31.62	-0.19	97	876	83	73
240	34.078	0.141	0.093	0.90	88	-1.3	101	31.42	-0.20	97	871	84	73
241	34.220	0.142	0.094	0.92	88	-1.3	-	31.25	-0.17	97	864	84	73
242	34.362	0.142	0.091	0.91	88	-1.2	-	31.05	-0.20	97	857	84	73
243	34.506	0.144	0.094	0.90	88	-1.2	-	30.88	-0.17	97	853	85	73
244	34.647	0.141	0.093	0.92	88	-1.4	-	30.71	-0.17	97	848	84	73
245	34.789	0.142	0.094	0.92	88	-1.3	-	30.52	-0.19	97	845	84	73
246	34.930	0.141	0.094	0.91	88	-1.2	-	30.35	-0.17	97	845	83	73
247	35.073	0.143	0.093	0.91	88	-1.2	-	30.17	-0.18	97	845	83	73
248	35.216	0.143	0.096	0.90	88	-1.3	-	29.99	-0.18	97	842	84	73
249	35.357	0.141	0.093	0.91	88	-1.3	-	29.82	-0.17	97	839	84	73
250	35.498	0.141	0.093	0.90	88	-1.2	101	29.65	-0.17	97	837	84	73
251	35.640	0.142	0.094	0.91	88	-1.3	-	29.47	-0.18	97	835	84	73
252	35.784	0.144	0.095	0.91	88	-1.3	-	29.29	-0.18	98	834	83	73
253	35.925	0.141	0.094	0.90	88	-1.2	-	29.12	-0.17	97	833	83	73
254	36.066	0.141	0.095	0.92	88	-1.3	-	28.93	-0.19	97	834	84	73
255	36.208	0.142	0.095	0.91	88	-1.2	-	28.76	-0.17	98	833	85	73

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 3Technician: AKDate: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	36.352	0.144	0.093	0.92	88	-1.2	-	28.58	-0.18	98	832	85	72
257	36.494	0.142	0.092	0.91	88	-1.3	-	28.40	-0.18	97	831	85	72
258	36.635	0.141	0.093	0.92	88	-1.3	-	28.22	-0.18	97	832	84	72
259	36.777	0.142	0.093	0.92	88	-1.2	-	28.04	-0.18	97	832	83	72
260	36.919	0.142	0.093	0.91	88	-1.2	101	27.86	-0.18	97	833	83	72
261	37.062	0.143	0.094	0.92	88	-1.3	-	27.68	-0.18	97	835	84	72
262	37.204	0.142	0.093	0.91	88	-1.3	-	27.49	-0.19	98	835	84	72
263	37.345	0.141	0.093	0.90	88	-1.3	-	27.31	-0.18	98	837	84	72
264	37.487	0.142	0.093	0.90	88	-1.3	-	27.12	-0.19	98	837	83	72
265	37.630	0.143	0.094	0.90	88	-1.2	-	26.94	-0.18	98	836	83	72
266	37.772	0.142	0.094	0.91	88	-1.3	-	26.76	-0.18	98	837	83	72
267	37.914	0.142	0.096	0.91	88	-1.2	-	26.57	-0.19	98	838	84	72
268	38.055	0.141	0.094	0.92	88	-1.3	-	26.39	-0.18	98	837	84	72
269	38.198	0.143	0.093	0.90	88	-1.4	-	26.21	-0.18	98	838	84	72
270	38.341	0.143	0.095	0.90	88	-1.3	100	26.02	-0.19	98	838	83	72
271	38.482	0.141	0.092	0.90	88	-1.3	-	25.84	-0.18	98	839	83	72
272	38.624	0.142	0.092	0.91	88	-1.3	-	25.66	-0.18	98	837	84	72
273	38.766	0.142	0.093	0.91	88	-1.3	-	25.48	-0.18	98	836	84	72
274	38.909	0.143	0.092	0.91	88	-1.3	-	25.30	-0.18	98	835	85	72
275	39.051	0.142	0.092	0.91	88	-1.4	-	25.12	-0.18	98	835	85	72
276	39.192	0.141	0.092	0.90	88	-1.3	-	24.95	-0.17	98	834	85	72
277	39.334	0.142	0.092	0.91	88	-1.3	-	24.77	-0.18	98	834	84	72
278	39.477	0.143	0.093	0.90	88	-1.3	-	24.58	-0.19	98	834	83	72
279	39.619	0.142	0.092	0.89	88	-1.2	-	24.41	-0.17	98	833	83	72
280	39.760	0.141	0.091	0.91	88	-1.3	101	24.24	-0.17	98	833	83	73
281	39.902	0.142	0.092	0.91	88	-1.2	-	24.06	-0.18	97	831	83	73
282	40.044	0.142	0.093	0.91	88	-1.3	-	23.89	-0.17	98	830	83	73
283	40.188	0.144	0.093	0.90	88	-1.4	-	23.72	-0.17	98	829	84	73
284	40.329	0.141	0.092	0.92	88	-1.4	-	23.54	-0.18	98	832	84	73
285	40.470	0.141	0.093	0.91	88	-1.2	-	23.37	-0.17	98	834	84	73
286	40.612	0.142	0.092	0.89	88	-1.2	-	23.19	-0.18	98	832	83	73
287	40.755	0.143	0.093	0.90	88	-1.3	-	23.02	-0.17	98	832	83	73

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 3

Technician: AK

Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	40.897	0.142	0.093	0.92	88	-1.4	-	22.85	-0.17	98	832	84	73
289	41.038	0.141	0.092	0.90	88	-1.2	-	22.68	-0.17	98	831	84	73
290	41.179	0.141	0.093	0.91	88	-1.2	101	22.51	-0.17	98	831	84	73
291	41.322	0.143	0.090	0.91	88	-1.3	-	22.34	-0.17	98	828	84	73
292	41.464	0.142	0.093	0.90	88	-1.3	-	22.17	-0.17	98	828	83	73
293	41.605	0.141	0.092	0.91	88	-1.3	-	22.00	-0.17	98	827	83	73
294	41.746	0.141	0.092	0.90	88	-1.3	-	21.84	-0.16	98	827	84	73
295	41.888	0.142	0.093	0.90	88	-1.3	-	21.66	-0.18	98	825	85	73
296	42.031	0.143	0.093	0.91	88	-1.3	-	21.50	-0.16	98	824	85	73
297	42.172	0.141	0.094	0.91	88	-1.3	-	21.33	-0.17	98	823	84	73
298	42.313	0.141	0.092	0.91	88	-1.3	-	21.17	-0.16	98	823	83	73
299	42.454	0.141	0.094	0.90	88	-1.3	-	21.00	-0.17	98	824	83	73
300	42.598	0.144	0.093	0.91	88	-1.4	100	20.84	-0.16	97	825	83	73
301	42.739	0.141	0.092	0.91	88	-1.3	-	20.66	-0.18	97	827	84	73
302	42.880	0.141	0.091	0.89	88	-1.3	-	20.50	-0.16	98	827	85	73
303	43.021	0.141	0.091	0.90	88	-1.3	-	20.33	-0.17	98	829	85	73
304	43.164	0.143	0.092	0.91	88	-1.4	-	20.16	-0.17	98	829	84	73
305	43.305	0.141	0.090	0.91	88	-1.4	-	20.00	-0.16	98	829	83	74
306	43.446	0.141	0.090	0.89	88	-1.3	-	19.83	-0.17	98	830	83	73
307	43.587	0.141	0.091	0.89	88	-1.3	-	19.66	-0.17	98	831	84	73
308	43.730	0.143	0.092	0.91	88	-1.3	-	19.49	-0.17	98	834	84	73
309	43.871	0.141	0.092	0.91	88	-1.4	-	19.32	-0.17	97	836	84	73
310	44.012	0.141	0.093	0.90	88	-1.4	100	19.15	-0.17	97	838	85	74
311	44.153	0.141	0.093	0.91	88	-1.4	-	18.99	-0.16	98	841	85	74
312	44.295	0.142	0.090	0.90	88	-1.3	-	18.81	-0.18	98	843	84	74
313	44.436	0.141	0.092	0.91	88	-1.3	-	18.63	-0.18	98	847	83	74
314	44.577	0.141	0.091	0.90	88	-1.4	-	18.45	-0.18	98	854	83	74
315	44.717	0.140	0.091	0.89	88	-1.3	-	18.27	-0.18	98	859	83	74
316	44.860	0.143	0.091	0.89	88	-1.3	-	18.09	-0.18	98	861	84	74
317	45.000	0.140	0.090	0.89	88	-1.4	-	17.93	-0.16	98	859	84	74
318	45.141	0.141	0.093	0.88	88	-1.3	-	17.76	-0.17	98	856	84	74
319	45.282	0.141	0.091	0.89	88	-1.4	-	17.60	-0.16	98	853	84	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>3</u>	Technician: <u>AK</u>
	Date: <u>5/8/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	45.424	0.142	0.091	0.90	88	-1.3	100	17.43	-0.17	98	852	83	74
321	45.564	0.140	0.093	0.88	88	-1.4	-	17.27	-0.16	98	849	83	74
322	45.704	0.140	0.091	0.89	88	-1.4	-	17.11	-0.16	98	848	83	74
323	45.846	0.142	0.094	0.89	88	-1.3	-	16.95	-0.16	98	849	84	74
324	45.987	0.141	0.091	0.91	88	-1.3	-	16.79	-0.16	98	848	84	74
325	46.127	0.140	0.092	0.90	88	-1.4	-	16.63	-0.16	98	848	85	74
326	46.267	0.140	0.092	0.89	88	-1.4	-	16.48	-0.15	98	847	85	74
327	46.410	0.143	0.089	0.90	88	-1.3	-	16.33	-0.15	98	844	85	74
328	46.550	0.140	0.090	0.90	88	-1.3	-	16.18	-0.15	98	841	84	74
329	46.690	0.140	0.091	0.90	88	-1.3	-	16.03	-0.15	98	839	83	74
330	46.831	0.141	0.091	0.91	88	-1.4	101	15.88	-0.15	98	837	83	74
331	46.972	0.141	0.092	0.90	88	-1.4	-	15.73	-0.15	97	838	84	74
332	47.112	0.140	0.092	0.89	88	-1.3	-	15.57	-0.16	97	841	85	74
333	47.253	0.141	0.091	0.90	88	-1.4	-	15.42	-0.15	98	842	85	74
334	47.395	0.142	0.090	0.89	88	-1.4	-	15.27	-0.15	98	844	85	74
335	47.534	0.139	0.093	0.89	88	-1.4	-	15.12	-0.15	98	845	84	74
336	47.674	0.140	0.092	0.90	88	-1.3	-	14.96	-0.16	98	846	83	74
337	47.816	0.142	0.092	0.90	88	-1.4	-	14.81	-0.15	98	848	83	74
338	47.956	0.140	0.093	0.89	88	-1.3	-	14.65	-0.16	98	850	84	74
339	48.096	0.140	0.092	0.90	88	-1.3	-	14.50	-0.15	98	850	84	74
340	48.236	0.140	0.091	0.89	88	-1.4	100	14.36	-0.14	98	844	84	74
341	48.378	0.142	0.092	0.89	88	-1.3	-	14.22	-0.14	97	837	85	74
342	48.517	0.139	0.093	0.89	89	-1.4	-	14.08	-0.14	97	834	85	74
343	48.657	0.140	0.093	0.89	89	-1.3	-	13.95	-0.13	97	830	85	74
344	48.798	0.141	0.093	0.88	89	-1.4	-	13.83	-0.12	97	825	85	74
345	48.938	0.140	0.093	0.88	89	-1.3	-	13.70	-0.13	97	822	85	74
346	49.077	0.139	0.093	0.89	89	-1.3	-	13.57	-0.13	97	815	85	74
347	49.218	0.141	0.092	0.89	89	-1.3	-	13.46	-0.11	97	807	84	74
348	49.359	0.141	0.091	0.88	89	-1.3	-	13.35	-0.11	97	802	83	74
349	49.498	0.139	0.092	0.89	89	-1.3	-	13.23	-0.12	97	797	83	74
350	49.638	0.140	0.093	0.89	89	-1.4	100	13.12	-0.11	97	794	84	74
351	49.780	0.142	0.092	0.89	89	-1.3	-	13.02	-0.10	96	792	84	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI

Job #: 23-241

Model: Everest III

Tracking #: 191

Run #: 3

Technician: AK

Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	49.919	0.139	0.092	0.88	89	-1.3	-	12.92	-0.10	96	783	85	74
353	50.059	0.140	0.092	0.89	89	-1.3	-	12.83	-0.09	96	776	85	74
354	50.200	0.141	0.093	0.88	89	-1.4	-	12.73	-0.10	96	772	85	74
355	50.340	0.140	0.092	0.89	89	-1.3	-	12.65	-0.08	96	768	85	74
356	50.480	0.140	0.093	0.89	89	-1.4	-	12.57	-0.08	96	761	85	74
357	50.620	0.140	0.094	0.90	89	-1.3	-	12.48	-0.09	95	758	84	74
358	50.761	0.141	0.091	0.89	89	-1.4	-	12.40	-0.08	95	754	83	74
359	50.901	0.140	0.092	0.89	89	-1.3	-	12.31	-0.09	95	750	83	74
360	51.040	0.139	0.090	0.89	89	-1.3	100	12.23	-0.08	95	744	84	74
361	51.182	0.142	0.091	0.89	89	-1.3	-	12.16	-0.07	95	740	84	74
362	51.321	0.139	0.092	0.88	89	-1.4	-	12.08	-0.08	95	736	84	74
363	51.461	0.140	0.092	0.90	89	-1.3	-	12.00	-0.08	94	732	83	74
364	51.603	0.142	0.092	0.90	89	-1.4	-	11.92	-0.08	94	728	83	74
365	51.743	0.140	0.093	0.90	89	-1.3	-	11.85	-0.07	94	724	84	74
366	51.882	0.139	0.092	0.88	89	-1.5	-	11.78	-0.07	94	720	84	74
367	52.023	0.141	0.091	0.89	89	-1.5	-	11.71	-0.07	94	716	84	74
368	52.164	0.141	0.091	0.89	89	-1.4	-	11.65	-0.06	94	712	83	74
369	52.303	0.139	0.091	0.89	89	-1.3	-	11.58	-0.07	94	708	83	74
370	52.443	0.140	0.093	0.87	89	-1.4	100	11.51	-0.07	93	704	83	74
371	52.585	0.142	0.094	0.88	89	-1.4	-	11.45	-0.06	93	702	84	74
372	52.724	0.139	0.093	0.88	89	-1.4	-	11.39	-0.06	93	698	85	74
373	52.864	0.140	0.094	0.88	89	-1.5	-	11.33	-0.06	93	694	85	74
374	53.005	0.141	0.092	0.89	89	-1.5	-	11.26	-0.07	93	690	85	74
375	53.145	0.140	0.093	0.89	89	-1.4	-	11.20	-0.06	93	689	84	74
376	53.285	0.140	0.093	0.88	89	-1.4	-	11.14	-0.06	93	686	83	74
377	53.425	0.140	0.093	0.89	89	-1.4	-	11.08	-0.06	93	683	83	74
378	53.566	0.141	0.093	0.90	89	-1.5	-	11.02	-0.06	92	682	84	74
379	53.706	0.140	0.093	0.89	89	-1.5	-	10.95	-0.07	92	679	85	74
380	53.846	0.140	0.090	0.87	89	-1.5	100	10.89	-0.06	92	677	85	74
381	53.988	0.142	0.093	0.89	89	-1.4	-	10.83	-0.06	92	676	84	74
382	54.127	0.139	0.094	0.88	89	-1.4	-	10.77	-0.06	92	672	83	74
383	54.267	0.140	0.093	0.90	89	-1.4	-	10.71	-0.06	92	671	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	54.408	0.141	0.091	0.89	89	-1.4	-	10.65	-0.06	92	668	83	74
385	54.548	0.140	0.092	0.89	89	-1.4	-	10.60	-0.05	92	665	84	74
386	54.688	0.140	0.091	0.89	89	-1.4	-	10.54	-0.06	92	663	84	74
387	54.828	0.140	0.093	0.88	89	-1.5	-	10.49	-0.05	91	660	84	74
388	54.969	0.141	0.092	0.89	89	-1.5	-	10.43	-0.06	91	658	83	74
389	55.109	0.140	0.095	0.89	89	-1.4	-	10.37	-0.06	91	656	83	74
390	55.249	0.140	0.096	0.90	89	-1.5	99	10.32	-0.05	91	654	84	74
391	55.390	0.141	0.095	0.91	89	-1.4	-	10.27	-0.05	91	651	85	74
392	55.530	0.140	0.091	0.88	89	-1.5	-	10.22	-0.05	91	648	85	74
393	55.670	0.140	0.092	0.88	89	-1.4	-	10.15	-0.07	91	644	85	74
394	55.810	0.140	0.093	0.89	89	-1.5	-	10.11	-0.04	91	641	86	74
395	55.951	0.141	0.091	0.89	89	-1.4	-	10.06	-0.05	91	638	86	74
396	56.090	0.139	0.092	0.88	89	-1.4	-	10.01	-0.05	91	635	85	74
397	56.230	0.140	0.093	0.88	89	-1.4	-	9.97	-0.04	90	633	84	74
398	56.372	0.142	0.093	0.89	89	-1.4	-	9.91	-0.06	90	631	83	74
399	56.511	0.139	0.091	0.89	89	-1.4	-	9.88	-0.03	90	629	83	74
400	56.651	0.140	0.093	0.90	89	-1.5	98	9.82	-0.06	90	627	84	74
401	56.793	0.142	0.092	0.90	89	-1.4	-	9.77	-0.05	90	624	84	74
402	56.933	0.140	0.093	0.89	89	-1.5	-	9.72	-0.05	90	621	84	74
403	57.072	0.139	0.094	0.88	89	-1.5	-	9.67	-0.05	90	618	84	74
404	57.213	0.141	0.093	0.90	89	-1.5	-	9.63	-0.04	90	616	84	74
405	57.354	0.141	0.093	0.89	89	-1.5	-	9.58	-0.05	90	613	85	74
406	57.493	0.139	0.094	0.89	89	-1.5	-	9.55	-0.03	90	612	84	74
407	57.633	0.140	0.092	0.89	89	-1.5	-	9.49	-0.06	90	610	83	74
408	57.774	0.141	0.091	0.90	89	-1.4	-	9.46	-0.03	90	610	83	74
409	57.914	0.140	0.092	0.90	89	-1.4	-	9.41	-0.05	90	608	83	74
410	58.054	0.140	0.095	0.89	89	-1.4	98	9.37	-0.04	89	607	84	74
411	58.195	0.141	0.092	0.88	89	-1.5	-	9.32	-0.05	89	605	85	74
412	58.335	0.140	0.094	0.90	89	-1.4	-	9.28	-0.04	89	603	85	74
413	58.475	0.140	0.092	0.89	89	-1.5	-	9.24	-0.04	89	601	85	74
414	58.615	0.140	0.092	0.89	89	-1.4	-	9.21	-0.03	89	599	84	74
415	58.756	0.141	0.092	0.89	89	-1.5	-	9.17	-0.04	89	595	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	58.896	0.140	0.093	0.88	89	-1.6	-	9.13	-0.04	89	591	83	74
417	59.036	0.140	0.092	0.88	89	-1.5	-	9.09	-0.04	89	588	84	74
418	59.177	0.141	0.093	0.89	89	-1.6	-	9.06	-0.03	89	584	84	74
419	59.317	0.140	0.093	0.90	89	-1.4	-	9.02	-0.04	89	580	85	74
420	59.456	0.139	0.093	0.89	89	-1.6	98	9.00	-0.02	89	576	84	74
421	59.598	0.142	0.094	0.89	89	-1.6	-	8.96	-0.04	88	573	83	74
422	59.738	0.140	0.092	0.89	89	-1.5	-	8.93	-0.03	88	570	83	74
423	59.877	0.139	0.093	0.89	89	-1.5	-	8.90	-0.03	88	569	84	74
424	60.018	0.141	0.092	0.88	89	-1.5	-	8.87	-0.03	88	567	84	74
425	60.159	0.141	0.094	0.88	89	-1.6	-	8.83	-0.04	88	564	85	74
426	60.299	0.140	0.094	0.89	89	-1.6	-	8.80	-0.03	88	563	85	74
427	60.439	0.140	0.092	0.89	89	-1.5	-	8.77	-0.03	88	560	84	74
428	60.580	0.141	0.091	0.89	89	-1.6	-	8.74	-0.03	88	559	83	74
429	60.720	0.140	0.092	0.89	89	-1.6	-	8.71	-0.03	88	557	83	73
430	60.859	0.139	0.092	0.88	89	-1.5	99	8.67	-0.04	88	556	84	74
431	61.000	0.141	0.094	0.88	89	-1.6	-	8.64	-0.03	88	554	84	74
432	61.141	0.141	0.093	0.89	89	-1.6	-	8.61	-0.03	88	553	85	74
433	61.281	0.140	0.093	0.90	89	-1.6	-	8.59	-0.02	87	551	85	74
434	61.420	0.139	0.093	0.87	89	-1.5	-	8.55	-0.04	87	550	84	74
435	61.562	0.142	0.095	0.89	89	-1.5	-	8.52	-0.03	87	549	83	74
436	61.702	0.140	0.094	0.90	89	-1.6	-	8.49	-0.03	87	548	83	74
437	61.842	0.140	0.092	0.88	89	-1.6	-	8.46	-0.03	87	547	83	74
438	61.983	0.141	0.095	0.89	89	-1.5	-	8.42	-0.04	87	546	84	73
439	62.123	0.140	0.092	0.89	89	-1.5	-	8.39	-0.03	87	545	84	74
440	62.263	0.140	0.093	0.89	89	-1.6	99	8.36	-0.03	87	543	84	74
441	62.403	0.140	0.097	0.88	89	-1.5	-	8.33	-0.03	87	542	83	73
442	62.544	0.141	0.095	0.89	89	-1.6	-	8.31	-0.02	87	540	83	74
443	62.684	0.140	0.094	0.89	89	-1.5	-	8.28	-0.03	87	536	83	73
444	62.824	0.140	0.093	0.87	89	-1.6	-	8.25	-0.03	87	535	84	74
445	62.966	0.142	0.096	0.90	89	-1.5	-	8.22	-0.03	87	533	84	74
446	63.105	0.139	0.092	0.88	89	-1.6	-	8.19	-0.03	87	532	84	73
447	63.245	0.140	0.093	0.89	89	-1.6	-	8.16	-0.03	87	531	84	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	63.386	0.141	0.094	0.89	89	-1.5	-	8.13	-0.03	87	530	84	73
449	63.526	0.140	0.094	0.90	89	-1.5	-	8.09	-0.04	87	529	83	74
450	63.666	0.140	0.093	0.88	89	-1.6	98	8.06	-0.03	86	529	83	73
451	63.806	0.140	0.093	0.90	89	-1.6	-	8.03	-0.03	86	529	84	74
452	63.948	0.142	0.094	0.89	89	-1.6	-	8.01	-0.02	86	527	84	74
453	64.087	0.139	0.092	0.90	89	-1.6	-	7.98	-0.03	86	526	84	73
454	64.227	0.140	0.094	0.89	89	-1.6	-	7.95	-0.03	86	525	84	73
455	64.369	0.142	0.093	0.89	89	-1.6	-	7.92	-0.03	86	523	83	73
456	64.509	0.140	0.094	0.89	89	-1.7	-	7.90	-0.02	86	520	83	73
457	64.648	0.139	0.093	0.88	89	-1.5	-	7.86	-0.04	86	518	84	73
458	64.789	0.141	0.093	0.89	89	-1.5	-	7.84	-0.02	86	516	84	73
459	64.930	0.141	0.093	0.90	89	-1.6	-	7.81	-0.03	86	514	84	73
460	65.069	0.139	0.094	0.90	89	-1.6	98	7.78	-0.03	86	511	83	73
461	65.209	0.140	0.094	0.89	89	-1.6	-	7.75	-0.03	86	509	83	73
462	65.351	0.142	0.094	0.89	89	-1.7	-	7.73	-0.02	86	506	84	73
463	65.490	0.139	0.094	0.89	89	-1.6	-	7.70	-0.03	86	504	84	73
464	65.630	0.140	0.094	0.89	89	-1.6	-	7.67	-0.03	86	502	84	73
465	65.772	0.142	0.094	0.89	89	-1.5	-	7.65	-0.02	86	501	83	73
466	65.912	0.140	0.094	0.88	89	-1.6	-	7.62	-0.03	86	499	83	73
467	66.051	0.139	0.093	0.89	89	-1.6	-	7.59	-0.03	86	498	84	73
468	66.192	0.141	0.095	0.90	89	-1.6	-	7.56	-0.03	86	496	83	73
469	66.333	0.141	0.095	0.88	89	-1.7	-	7.54	-0.02	86	495	83	73
470	66.473	0.140	0.094	0.89	89	-1.6	98	7.50	-0.04	86	495	84	73
471	66.613	0.140	0.095	0.88	89	-1.7	-	7.48	-0.02	86	494	84	73
472	66.755	0.142	0.095	0.88	89	-1.6	-	7.45	-0.03	86	493	85	73
473	66.894	0.139	0.091	0.89	89	-1.7	-	7.42	-0.03	86	492	85	73
474	67.034	0.140	0.093	0.89	89	-1.7	-	7.39	-0.03	86	490	84	73
475	67.175	0.141	0.095	0.89	89	-1.6	-	7.37	-0.02	86	489	83	73
476	67.316	0.141	0.094	0.89	89	-1.7	-	7.34	-0.03	85	488	83	73
477	67.455	0.139	0.094	0.88	89	-1.6	-	7.32	-0.02	85	487	84	72
478	67.595	0.140	0.094	0.89	89	-1.6	-	7.29	-0.03	85	486	84	72
479	67.737	0.142	0.095	0.89	89	-1.7	-	7.27	-0.02	85	484	84	72

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>3</u>	Technician: <u>AK</u>
	Date: <u>5/8/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	67.877	0.140	0.094	0.89	89	-1.7	98	7.24	-0.03	85	482	84	72
481	68.017	0.140	0.094	0.89	89	-1.7	-	7.21	-0.03	85	481	83	72
482	68.158	0.141	0.097	0.89	89	-1.6	-	7.18	-0.03	85	479	83	72
483	68.298	0.140	0.094	0.90	89	-1.7	-	7.16	-0.02	85	477	84	72
484	68.438	0.140	0.095	0.89	89	-1.6	-	7.13	-0.03	85	476	84	72
485	68.578	0.140	0.094	0.90	89	-1.7	-	7.11	-0.02	85	474	84	72
486	68.720	0.142	0.094	0.90	88	-1.6	-	7.09	-0.02	85	473	84	72
487	68.859	0.139	0.095	0.90	88	-1.7	-	7.05	-0.04	85	472	83	72
488	68.999	0.140	0.095	0.89	88	-1.7	-	7.03	-0.02	85	470	83	72
489	69.141	0.142	0.096	0.89	88	-1.7	-	7.01	-0.02	85	469	84	72
490	69.281	0.140	0.095	0.90	88	-1.6	97	6.99	-0.02	85	466	84	72
491	69.421	0.140	0.095	0.88	88	-1.6	-	6.96	-0.03	85	465	84	72
492	69.561	0.140	0.095	0.88	88	-1.6	-	6.94	-0.02	85	464	83	72
493	69.702	0.141	0.096	0.89	88	-1.7	-	6.91	-0.03	85	463	83	72
494	69.842	0.140	0.095	0.89	88	-1.7	-	6.90	-0.01	85	462	83	72
495	69.982	0.140	0.094	0.90	88	-1.6	-	6.87	-0.03	85	460	84	72
496	70.124	0.142	0.095	0.89	88	-1.7	-	6.85	-0.02	84	459	84	72
497	70.264	0.140	0.094	0.88	88	-1.6	-	6.82	-0.03	85	457	84	72
498	70.403	0.139	0.095	0.89	88	-1.6	-	6.80	-0.02	84	455	85	72
499	70.544	0.141	0.094	0.89	88	-1.7	-	6.78	-0.02	84	453	84	72
500	70.685	0.141	0.094	0.90	88	-1.7	97	6.76	-0.02	84	450	83	72
501	70.825	0.140	0.095	0.89	88	-1.6	-	6.74	-0.02	84	448	83	72
502	70.964	0.139	0.095	0.89	88	-1.6	-	6.72	-0.02	84	445	84	71
503	71.106	0.142	0.093	0.88	88	-1.7	-	6.70	-0.02	84	442	84	71
504	71.246	0.140	0.093	0.89	88	-1.7	-	6.67	-0.03	84	441	83	72
505	71.386	0.140	0.095	0.91	88	-1.6	-	6.66	-0.01	84	439	83	72
506	71.527	0.141	0.095	0.88	88	-1.6	-	6.63	-0.03	84	438	83	72
507	71.668	0.141	0.095	0.87	88	-1.7	-	6.61	-0.02	84	436	84	71
508	71.807	0.139	0.096	0.89	88	-1.7	-	6.59	-0.02	84	435	84	71
509	71.947	0.140	0.095	0.90	88	-1.7	-	6.57	-0.02	84	433	83	71
510	72.089	0.142	0.096	0.91	88	-1.6	97	6.55	-0.02	84	430	83	71
511	72.228	0.139	0.093	0.89	88	-1.7	-	6.53	-0.02	84	429	83	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 3Technician: AKDate: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	72.368	0.140	0.094	0.88	88	-1.8	-	6.51	-0.02	84	427	84	71
513	72.510	0.142	0.094	0.90	88	-1.8	-	6.49	-0.02	83	426	84	71
514	72.650	0.140	0.095	0.90	88	-1.7	-	6.47	-0.02	83	424	84	71
515	72.790	0.140	0.094	0.90	88	-1.8	-	6.45	-0.02	83	423	83	71
516	72.931	0.141	0.095	0.89	88	-1.7	-	6.43	-0.02	83	422	83	71
517	73.071	0.140	0.095	0.90	88	-1.7	-	6.41	-0.02	83	421	84	71
518	73.211	0.140	0.095	0.89	88	-1.7	-	6.39	-0.02	83	421	84	71
519	73.351	0.140	0.096	0.90	88	-1.8	-	6.37	-0.02	83	420	84	71
520	73.492	0.141	0.096	0.89	88	-1.7	97	6.35	-0.02	83	419	84	71
521	73.632	0.140	0.096	0.90	88	-1.8	-	6.32	-0.03	83	418	83	71
522	73.772	0.140	0.097	0.90	88	-1.7	-	6.30	-0.02	83	417	83	71
523	73.913	0.141	0.094	0.90	88	-1.8	-	6.27	-0.03	83	416	83	71
524	74.054	0.141	0.094	0.89	88	-1.8	-	6.26	-0.01	83	416	84	71
525	74.193	0.139	0.095	0.89	87	-1.7	-	6.24	-0.02	83	414	83	71
526	74.333	0.140	0.093	0.89	87	-1.8	-	6.22	-0.02	83	414	83	71
527	74.475	0.142	0.095	0.90	87	-1.8	-	6.19	-0.03	83	413	83	71
528	74.614	0.139	0.095	0.89	87	-1.7	-	6.17	-0.02	83	412	84	71
529	74.754	0.140	0.096	0.88	87	-1.8	-	6.15	-0.02	83	412	84	71
530	74.896	0.142	0.097	0.89	87	-1.8	96	6.13	-0.02	83	412	84	71
531	75.035	0.139	0.097	0.88	87	-1.7	-	6.12	-0.01	83	411	83	71
532	75.175	0.140	0.094	0.89	87	-1.7	-	6.09	-0.03	83	410	83	71
533	75.316	0.141	0.095	0.90	87	-1.8	-	6.08	-0.01	83	409	84	71
534	75.457	0.141	0.095	0.90	87	-1.8	-	6.06	-0.02	82	408	84	71
535	75.596	0.139	0.095	0.89	87	-1.7	-	6.04	-0.02	82	408	84	71
536	75.736	0.140	0.096	0.89	87	-1.7	-	6.02	-0.02	82	407	85	71
537	75.878	0.142	0.096	0.89	87	-1.7	-	6.00	-0.02	82	406	84	71
538	76.017	0.139	0.094	0.90	87	-1.8	-	5.98	-0.02	82	406	84	71
539	76.157	0.140	0.095	0.89	87	-1.7	-	5.96	-0.02	82	406	83	71
540	76.299	0.142	0.094	0.89	87	-1.7	97	5.94	-0.02	82	405	83	71
541	76.439	0.140	0.094	0.88	87	-1.8	-	5.91	-0.03	82	405	83	71
542	76.578	0.139	0.095	0.89	87	-1.8	97	5.90	-0.01	82	404	84	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>SBI</u>	Job #: <u>23-241</u>
Model: <u>Everest III</u>	Tracking #: <u>191</u>
Run #: <u>3</u>	Technician: <u>AK</u>
	Date: <u>5/8/2024</u>

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
Avg/Tot	76.635	0.141	0.093	0.90	85.7	-1.4	100			92.5	697.7	83.3	72.0

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	-0.059		-0.01	69	-0.6		83	0.008	0.08	0.003
1	0.062	0.121	1.00	69	-1.4	-	83	0.092	3.06	0.413
2	0.205	0.143	0.95	69	-1.4	-	82	0.106	8.60	0.219
3	0.344	0.139	0.95	69	-1.4	-	83	0.086	10.90	0.222
4	0.484	0.140	0.94	69	-1.4	-	83	0.086	16.70	2.104
5	0.624	0.140	0.97	69	-1.4	-	84	0.084	16.88	1.231
6	0.765	0.141	0.96	69	-1.4	-	84	0.089	15.27	0.470
7	0.903	0.138	0.96	69	-1.4	-	85	0.091	15.75	0.503
8	1.042	0.139	0.95	69	-1.3	-	85	0.087	15.08	0.238
9	1.183	0.141	0.93	69	-1.3	-	85	0.087	14.26	0.143
10	1.321	0.138	0.94	69	-1.4	102	85	0.086	14.35	0.111
11	1.460	0.139	0.95	70	-1.3	-	85	0.088	15.00	0.118
12	1.600	0.140	0.95	70	-1.3	-	84	0.088	14.82	0.108
13	1.737	0.137	0.95	70	-1.5	-	84	0.087	14.82	0.182
14	1.876	0.139	0.93	70	-1.3	-	84	0.093	15.60	0.177
15	2.015	0.139	0.95	71	-1.4	-	84	0.088	15.17	0.136
16	2.152	0.137	0.95	71	-1.3	-	84	0.090	15.10	0.164
17	2.292	0.140	0.94	71	-1.4	-	84	0.092	15.10	0.303
18	2.430	0.138	0.97	71	-1.3	-	85	0.092	14.60	0.147
19	2.567	0.137	0.93	72	-1.5	-	86	0.091	14.14	0.102
20	2.706	0.139	0.94	72	-1.5	104	87	0.089	13.79	0.064
21	2.843	0.137	0.92	72	-1.3	-	87	0.089	13.61	0.059
22	2.981	0.138	0.92	72	-1.3	-	88	0.089	13.70	0.065
23	3.120	0.139	0.91	73	-1.4	-	87	0.088	13.51	0.061
24	3.256	0.136	0.92	73	-1.3	-	86	0.086	13.42	0.067
25	3.395	0.139	0.92	73	-1.5	-	86	0.094	13.06	0.041
26	3.532	0.137	0.93	74	-1.3	-	86	0.090	12.74	0.042
27	3.679	0.147	0.94	74	-1.3	-	85	0.090	4.58	0.213
28	3.818	0.139	0.94	74	-1.4	-	85	0.089	11.10	0.402
29	3.954	0.136	0.94	74	-3.1	-	85	0.090	13.02	0.170
30	4.093	0.139	0.93	75	-2.7	104	84	0.093	14.21	0.134
31	4.230	0.137	0.94	75	-2.9	-	85	0.088	14.40	0.163

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.367	0.137	0.93	75	-2.3	-	86	0.101	14.81	0.220
33	4.505	0.138	0.93	76	-1.7	-	87	0.094	14.88	0.286
34	4.641	0.136	0.92	76	-2.1	-	87	0.092	15.68	0.409
35	4.781	0.140	0.92	76	-1.2	-	87	0.103	16.34	0.469
36	4.917	0.136	0.94	77	-0.6	-	86	0.100	16.70	0.569
37	5.054	0.137	0.94	77	-1.7	-	86	0.098	17.20	0.587
38	5.193	0.139	0.95	77	-0.4	-	86	0.103	17.52	0.722
39	5.329	0.136	0.92	78	-1.2	-	86	0.098	17.85	0.799
40	5.468	0.139	0.92	78	-1.5	104	86	0.097	17.22	0.688
41	5.605	0.137	0.92	78	-0.8	-	86	0.099	17.20	0.311
42	5.742	0.137	0.93	78	-2.5	-	86	0.098	16.75	0.227
43	5.880	0.138	0.94	79	-1.8	-	86	0.095	16.45	0.173
44	6.016	0.136	0.94	79	-1.1	-	86	0.099	15.99	0.129
45	6.156	0.140	0.92	79	-2.5	-	86	0.094	15.95	0.128
46	6.292	0.136	0.94	79	-0.8	-	86	0.102	16.45	0.127
47	6.429	0.137	0.94	80	-3.1	-	86	0.101	15.89	0.236
48	6.568	0.139	0.94	80	-3.2	-	86	0.098	15.77	0.215
49	6.704	0.136	0.94	80	-2.2	-	87	0.101	16.18	0.283
50	6.844	0.140	0.93	80	-3.1	103	87	0.096	16.47	0.366
51	6.980	0.136	0.93	81	-2.8	-	87	0.100	16.73	0.397
52	7.117	0.137	0.95	81	-1.4	-	86	0.099	17.18	0.502
53	7.256	0.139	0.93	81	-2.5	-	86	0.095	17.25	0.475
54	7.392	0.136	0.93	82	-1.9	-	86	0.098	17.38	0.526
55	7.531	0.139	0.90	82	-1.6	-	86	0.101	17.88	0.677
56	7.668	0.137	0.94	82	-2.0	-	86	0.099	17.28	0.549
57	7.805	0.137	0.94	82	-2.7	-	86	0.095	17.15	0.536
58	7.944	0.139	0.92	83	-3.3	-	86	0.097	14.59	0.301
59	8.080	0.136	0.93	83	-2.9	-	87	0.095	13.38	0.199
60	8.219	0.139	0.92	83	-3.5	102	87	0.098	12.87	0.219
61	8.356	0.137	0.95	83	-3.4	-	88	0.090	12.88	0.189
62	8.493	0.137	0.93	83	-2.8	-	88	0.093	12.67	0.262
63	8.633	0.140	0.93	84	-2.8	-	87	0.094	12.85	0.141

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	8.769	0.136	0.94	84	-3.9	-	87	0.093	13.29	0.097
65	8.908	0.139	0.93	84	-3.7	-	87	0.084	13.66	0.150
66	9.046	0.138	0.93	84	-1.6	-	86	0.090	13.48	0.215
67	9.183	0.137	0.93	85	-1.9	-	86	0.094	13.60	0.181
68	9.323	0.140	0.94	85	-1.6	-	86	0.092	13.72	0.199
69	9.460	0.137	0.94	85	-1.6	-	86	0.090	13.73	0.220
70	9.597	0.137	0.93	85	-2.5	101	86	0.096	13.92	0.209
71	9.737	0.140	0.94	85	-3.7	-	86	0.094	13.76	0.205
72	9.874	0.137	0.95	85	-2.2	-	87	0.090	13.72	0.232
73	10.013	0.139	0.95	86	-1.3	-	87	0.087	14.20	0.177
74	10.151	0.138	0.92	86	-1.6	-	86	0.088	14.68	0.217
75	10.288	0.137	0.93	86	-2.5	-	86	0.089	14.86	0.202
76	10.428	0.140	0.93	86	-1.3	-	86	0.090	14.94	0.203
77	10.565	0.137	0.93	86	-1.2	-	86	0.087	14.07	0.178
78	10.702	0.137	0.92	87	-1.1	-	87	0.087	14.04	0.204
79	10.842	0.140	0.92	87	-1.9	-	88	0.091	13.58	0.286
80	10.979	0.137	0.90	87	-3.5	101	88	0.089	13.55	0.372
81	11.118	0.139	0.92	87	-2.0	-	87	0.095	13.62	0.377
82	11.257	0.139	0.95	87	-2.2	-	87	0.086	13.78	0.337
83	11.394	0.137	0.92	88	-2.2	-	87	0.093	13.86	0.377
84	11.534	0.140	0.91	88	-1.4	-	86	0.086	14.14	0.341
85	11.671	0.137	0.94	88	-1.3	-	86	0.092	14.46	0.284
86	11.809	0.138	0.93	88	-0.9	-	86	0.087	14.56	0.308
87	11.949	0.140	0.92	88	-3.0	-	86	0.095	14.79	0.271
88	12.086	0.137	0.90	88	-3.0	-	87	0.093	14.86	0.254
89	12.224	0.138	0.95	88	-3.3	-	88	0.085	14.71	0.255
90	12.364	0.140	0.93	88	-2.8	101	87	0.086	14.35	0.270
91	12.499	0.135	0.91	89	-3.3	-	87	0.086	14.28	0.306
92	12.639	0.140	0.94	89	-1.3	-	86	0.089	14.27	0.355
93	12.774	0.135	0.95	89	-3.1	-	86	0.087	14.31	0.304
94	12.914	0.140	0.94	89	-2.9	-	86	0.091	14.15	0.265
95	13.054	0.140	0.93	89	-2.4	-	86	0.089	13.71	0.213

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	13.192	0.138	0.93	89	-1.2	-	86	0.092	13.57	0.193
97	13.330	0.138	0.94	89	-3.7	-	87	0.088	13.38	0.193
98	13.470	0.140	0.93	90	-3.5	-	87	0.083	13.03	0.127
99	13.607	0.137	0.92	90	-2.3	-	87	0.090	12.56	0.110
100	13.746	0.139	0.93	90	-1.5	100	86	0.086	12.39	0.106
101	13.886	0.140	0.93	90	-3.1	-	86	0.094	12.72	0.155
102	14.023	0.137	0.94	90	-1.7	-	86	0.076	12.62	0.176
103	14.163	0.140	0.92	90	-3.9	-	86	0.091	12.08	0.118
104	14.302	0.139	0.93	90	-2.3	-	86	0.095	11.72	0.104
105	14.439	0.137	0.93	90	-2.2	-	86	0.084	11.36	0.110
106	14.579	0.140	0.91	91	-4.1	-	86	0.085	11.15	0.126
107	14.717	0.138	0.92	91	-2.0	-	86	0.082	11.22	0.111
108	14.855	0.138	0.94	91	-3.3	-	86	0.083	11.43	0.099
109	14.996	0.141	0.94	91	-2.7	-	86	0.081	11.96	0.103
110	15.134	0.138	0.94	91	-4.4	100	86	0.083	12.14	0.085
111	15.272	0.138	0.94	91	-4.2	-	86	0.080	11.27	0.114
112	15.412	0.140	0.93	91	-4.4	-	86	0.085	4.59	0.358
113	15.551	0.139	0.93	91	-4.1	-	86	0.082	10.48	0.336
114	15.689	0.138	0.92	91	-4.0	-	86	0.098	15.51	0.356
115	15.829	0.140	0.94	91	-2.7	-	86	0.093	16.51	0.808
116	15.967	0.138	0.92	92	-3.3	-	87	0.092	16.78	1.069
117	16.104	0.137	0.93	92	-1.4	-	87	0.092	16.81	1.387
118	16.245	0.141	0.93	92	-3.5	-	87	0.090	15.38	0.406
119	16.382	0.137	0.95	92	-2.9	-	86	0.091	15.27	0.353
120	16.521	0.139	0.90	92	-3.3	100	86	0.092	14.81	0.278
121	16.658	0.137	0.94	92	-2.4	-	86	0.091	14.64	0.298
122	16.798	0.140	0.94	92	-1.9	-	86	0.084	14.14	0.254
123	16.937	0.139	0.93	92	-3.9	-	86	0.092	13.71	0.291
124	17.076	0.139	0.93	92	-2.8	-	86	0.086	13.39	0.313
125	17.214	0.138	0.92	92	-4.0	-	86	0.087	12.97	0.302
126	17.354	0.140	0.90	92	-3.7	-	87	0.087	12.62	0.278
127	17.492	0.138	0.91	92	-3.2	-	87	0.086	13.44	0.077

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	17.630	0.138	0.93	92	-3.3	-	87	0.091	13.76	0.083
129	17.770	0.140	0.93	93	-3.8	-	86	0.090	13.69	0.063
130	17.908	0.138	0.94	93	-2.4	101	86	0.091	12.91	0.264
131	18.046	0.138	0.93	93	-1.8	-	86	0.090	13.49	0.084
132	18.186	0.140	0.90	93	-3.9	-	86	0.087	13.56	0.071
133	18.325	0.139	0.92	93	-2.9	-	86	0.082	13.73	0.075
134	18.462	0.137	0.92	93	-2.1	-	86	0.086	13.72	0.081
135	18.603	0.141	0.94	93	-1.9	-	86	0.083	13.58	0.071
136	18.741	0.138	0.91	93	-2.1	-	86	0.086	13.27	0.071
137	18.879	0.138	0.93	93	-2.9	-	86	0.088	13.04	0.076
138	19.019	0.140	0.92	93	-3.8	-	86	0.088	13.08	0.080
139	19.157	0.138	0.94	93	-3.6	-	86	0.078	13.01	0.080
140	19.296	0.139	0.93	93	-2.1	101	86	0.081	12.95	0.075
141	19.436	0.140	0.94	93	-1.7	-	86	0.088	12.87	0.082
142	19.573	0.137	0.90	93	-2.2	-	86	0.089	12.65	0.088
143	19.713	0.140	0.94	94	-4.1	-	86	0.092	12.61	0.078
144	19.852	0.139	0.95	93	-4.0	-	86	0.088	12.44	0.079
145	19.990	0.138	0.91	94	-2.2	-	86	0.088	12.30	0.079
146	20.130	0.140	0.91	94	-2.6	-	86	0.086	12.08	0.087
147	20.269	0.139	0.93	94	-2.2	-	86	0.083	11.84	0.127
148	20.406	0.137	0.92	94	-4.4	-	86	0.086	11.45	0.164
149	20.547	0.141	0.93	94	-4.4	-	86	0.085	11.23	0.173
150	20.685	0.138	0.93	94	-4.5	100	86	0.079	11.04	0.203
151	20.823	0.138	0.95	94	-3.1	-	86	0.080	11.13	0.236
152	20.964	0.141	0.93	94	-2.6	-	86	0.083	11.27	0.248
153	21.102	0.138	0.93	94	-2.1	-	86	0.083	11.16	0.273
154	21.240	0.138	0.92	94	-3.9	-	86	0.080	11.02	0.276
155	21.381	0.141	0.91	94	-4.0	-	86	0.084	10.80	0.223
156	21.519	0.138	0.94	94	-2.4	-	86	0.079	10.51	0.263
157	21.657	0.138	0.93	94	-4.4	-	86	0.088	10.46	0.273
158	21.798	0.141	0.93	94	-4.5	-	86	0.080	10.40	0.294
159	21.936	0.138	0.91	94	-4.1	-	86	0.080	10.42	0.307

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	22.074	0.138	0.92	94	-2.6	100	86	0.082	10.68	0.249
161	22.214	0.140	0.92	94	-3.4	-	86	0.077	10.89	0.213
162	22.353	0.139	0.94	95	-2.4	-	86	0.076	10.62	0.307
163	22.491	0.138	0.94	95	-2.0	-	86	0.087	10.58	0.347
164	22.631	0.140	0.93	95	-2.6	-	86	0.080	10.60	0.339
165	22.770	0.139	0.93	95	-2.9	-	86	0.079	10.62	0.355
166	22.908	0.138	0.94	95	-3.7	-	86	0.080	10.56	0.359
167	23.048	0.140	0.93	95	-2.9	-	86	0.076	10.57	0.347
168	23.187	0.139	0.93	95	-3.3	-	86	0.086	10.61	0.345
169	23.325	0.138	0.92	95	-2.0	-	86	0.080	10.60	0.323
170	23.465	0.140	0.92	95	-4.3	100	86	0.080	10.44	0.369
171	23.604	0.139	0.92	95	-4.1	-	87	0.084	10.43	0.367
172	23.742	0.138	0.92	95	-2.2	-	87	0.077	10.43	0.369
173	23.883	0.141	0.92	95	-3.8	-	87	0.086	10.51	0.354
174	24.021	0.138	0.92	95	-2.5	-	86	0.079	10.53	0.346
175	24.159	0.138	0.93	95	-2.6	-	86	0.072	10.56	0.344
176	24.300	0.141	0.93	95	-3.6	-	86	0.075	10.58	0.339
177	24.438	0.138	0.94	95	-2.2	-	86	0.077	10.56	0.336
178	24.576	0.138	0.93	95	-3.2	-	86	0.074	10.52	0.354
179	24.717	0.141	0.91	95	-2.4	-	86	0.075	10.54	0.334
180	24.855	0.138	0.91	95	-1.9	100	86	0.079	10.56	0.325
181	24.994	0.139	0.93	95	-4.0	-	87	0.080	10.56	0.314
182	25.134	0.140	0.90	95	-3.0	-	87	0.076	10.59	0.296
183	25.272	0.138	0.91	95	-2.1	-	87	0.084	10.68	0.266
184	25.411	0.139	0.94	95	-2.6	-	87	0.078	10.72	0.259
185	25.551	0.140	0.94	95	-4.2	-	86	0.083	10.89	0.297
186	25.690	0.139	0.91	95	-3.4	-	86	0.078	11.16	0.277
187	25.828	0.138	0.92	95	-3.4	-	86	0.074	11.26	0.264
188	25.969	0.141	0.92	95	-2.7	-	86	0.076	11.59	0.252
189	26.107	0.138	0.92	95	-3.1	-	86	0.080	11.94	0.236
190	26.245	0.138	0.94	96	-2.0	99	86	0.082	12.34	0.225
191	26.386	0.141	0.91	95	-2.7	-	86	0.082	12.95	0.151

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	26.524	0.138	0.93	96	-3.8	-	86	0.079	11.69	0.170
193	26.663	0.139	0.90	96	-2.4	-	86	0.079	10.46	0.325
194	26.803	0.140	0.94	96	-2.8	-	86	0.076	9.90	0.425
195	26.942	0.139	0.93	96	-3.6	-	86	0.076	10.00	0.467
196	27.080	0.138	0.89	96	-3.1	-	86	0.082	9.84	0.360
197	27.221	0.141	0.93	96	-2.5	-	86	0.079	9.52	0.371
198	27.359	0.138	0.92	96	-4.5	-	86	0.075	9.32	0.489
199	27.498	0.139	0.93	96	-4.2	-	86	0.078	9.62	0.464
200	27.638	0.140	0.91	96	-2.9	100	86	0.076	9.55	0.462
201	27.776	0.138	0.91	96	-2.9	-	86	0.075	9.50	0.493
202	27.915	0.139	0.93	96	-3.0	-	86	0.084	9.39	0.551
203	28.055	0.140	0.92	96	-3.1	-	86	0.075	9.14	0.617
204	28.193	0.138	0.92	96	-3.7	-	86	0.078	8.50	0.757
205	28.332	0.139	0.91	96	-2.8	-	86	0.075	8.09	0.837
206	28.473	0.141	0.92	96	-3.3	-	86	0.081	8.01	0.860
207	28.611	0.138	0.92	96	-4.1	-	86	0.075	8.04	0.849
208	28.750	0.139	0.92	96	-3.5	-	86	0.076	8.10	0.839
209	28.890	0.140	0.91	96	-3.1	-	86	0.068	8.07	0.864
210	29.028	0.138	0.91	96	-3.5	99	86	0.072	8.02	0.861
211	29.167	0.139	0.91	96	-4.1	-	86	0.076	7.97	0.909
212	29.307	0.140	0.91	96	-2.3	-	86	0.074	7.97	0.906
213	29.446	0.139	0.91	96	-4.5	-	86	0.067	7.92	0.911
214	29.585	0.139	0.93	96	-4.2	-	86	0.070	7.81	0.937
215	29.725	0.140	0.91	96	-2.5	-	86	0.070	7.80	0.966
216	29.864	0.139	0.92	96	-4.1	-	86	0.072	7.81	0.968
217	30.003	0.139	0.95	96	-2.6	-	86	0.070	7.87	0.938
218	30.143	0.140	0.92	96	-3.6	-	86	0.070	7.81	0.961
219	30.282	0.139	0.90	96	-4.2	-	86	0.071	7.74	1.001
220	30.421	0.139	0.95	96	-4.6	99	86	0.068	7.73	1.010
221	30.562	0.141	0.92	96	-2.6	-	86	0.064	7.77	1.014
222	30.701	0.139	0.94	96	-3.5	-	86	0.069	7.75	1.012
223	30.840	0.139	0.94	96	-4.6	-	86	0.061	2.61	0.356

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	30.981	0.141	0.95	96	-5.4	-	86	0.072	2.42	0.421
225	31.119	0.138	0.92	96	-3.1	-	86	0.098	4.11	0.514
226	31.257	0.138	0.93	96	-4.1	-	86	0.114	7.02	0.400
227	31.398	0.141	0.92	96	-4.2	-	86	0.120	8.61	0.345
228	31.536	0.138	0.94	96	-1.2	-	86	0.096	18.16	1.922
229	31.675	0.139	0.92	96	-1.8	-	86	0.097	16.47	0.592
230	31.815	0.140	0.93	96	-3.0	101	86	0.095	16.52	0.526
231	31.954	0.139	0.93	96	-1.9	-	87	0.093	17.39	0.380
232	32.092	0.138	0.93	96	-1.7	-	87	0.106	18.23	0.565
233	32.233	0.141	0.91	96	-2.6	-	87	0.093	18.65	1.126
234	32.371	0.138	0.94	96	-1.8	-	87	0.096	17.69	0.281
235	32.510	0.139	0.91	96	-1.6	-	87	0.095	16.59	0.127
236	32.650	0.140	0.91	97	-3.1	-	87	0.095	16.05	0.107
237	32.789	0.139	0.94	96	-1.7	-	87	0.092	15.75	0.094
238	32.927	0.138	0.94	97	-3.2	-	87	0.101	16.04	0.097
239	33.068	0.141	0.92	97	-2.5	-	87	0.089	16.39	0.106
240	33.206	0.138	0.94	97	-1.7	101	87	0.094	16.18	0.106
241	33.345	0.139	0.92	97	-3.1	-	87	0.090	15.60	0.094
242	33.485	0.140	0.92	97	-1.9	-	87	0.096	15.45	0.087
243	33.624	0.139	0.92	97	-3.3	-	86	0.089	15.25	0.086
244	33.762	0.138	0.91	97	-2.3	-	86	0.094	15.02	0.087
245	33.903	0.141	0.93	97	-3.1	-	86	0.091	15.03	0.091
246	34.041	0.138	0.93	97	-3.5	-	87	0.098	15.01	0.089
247	34.179	0.138	0.92	97	-2.0	-	86	0.097	15.16	0.093
248	34.320	0.141	0.92	97	-3.6	-	86	0.090	14.99	0.100
249	34.458	0.138	0.93	97	-3.6	-	86	0.093	14.85	0.109
250	34.597	0.139	0.94	97	-3.5	100	86	0.096	14.71	0.088
251	34.737	0.140	0.90	97	-3.3	-	86	0.097	14.79	0.100
252	34.875	0.138	0.94	97	-2.7	-	86	0.091	14.80	0.100
253	35.013	0.138	0.94	97	-2.0	-	86	0.092	14.84	0.115
254	35.154	0.141	0.90	97	-3.7	-	86	0.092	14.92	0.120
255	35.292	0.138	0.91	97	-3.6	-	87	0.092	14.87	0.111

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	35.430	0.138	0.92	97	-3.5	-	87	0.093	14.95	0.117
257	35.571	0.141	0.93	97	-2.0	-	86	0.089	14.79	0.111
258	35.709	0.138	0.91	97	-2.6	-	86	0.093	14.92	0.105
259	35.847	0.138	0.92	97	-1.9	-	86	0.091	14.99	0.119
260	35.988	0.141	0.94	97	-2.4	100	86	0.101	15.08	0.137
261	36.126	0.138	0.91	97	-3.1	-	86	0.095	15.21	0.142
262	36.264	0.138	0.93	97	-3.9	-	86	0.100	15.25	0.151
263	36.405	0.141	0.94	97	-2.3	-	86	0.091	15.34	0.141
264	36.544	0.139	0.92	97	-3.1	-	87	0.093	15.34	0.154
265	36.682	0.138	0.95	97	-2.6	-	87	0.096	15.24	0.145
266	36.822	0.140	0.91	97	-3.1	-	87	0.090	15.26	0.134
267	36.961	0.139	0.92	97	-3.3	-	86	0.093	15.20	0.136
268	37.099	0.138	0.95	97	-2.4	-	86	0.093	15.23	0.129
269	37.240	0.141	0.92	97	-3.4	-	86	0.094	15.23	0.121
270	37.378	0.138	0.92	97	-1.9	100	86	0.094	15.38	0.115
271	37.516	0.138	0.93	97	-2.6	-	86	0.096	15.25	0.111
272	37.657	0.141	0.92	97	-2.1	-	86	0.094	15.21	0.092
273	37.795	0.138	0.92	97	-3.9	-	86	0.089	15.09	0.093
274	37.934	0.139	0.95	97	-1.9	-	86	0.093	15.13	0.085
275	38.074	0.140	0.93	97	-1.9	-	86	0.096	15.10	0.092
276	38.212	0.138	0.93	97	-3.7	-	86	0.090	15.15	0.092
277	38.351	0.139	0.92	97	-3.3	-	86	0.087	15.10	0.087
278	38.491	0.140	0.93	97	-1.6	-	86	0.090	15.14	0.083
279	38.630	0.139	0.92	97	-1.8	-	86	0.093	15.26	0.078
280	38.768	0.138	0.93	97	-1.9	100	86	0.092	15.17	0.074
281	38.909	0.141	0.92	97	-2.8	-	86	0.093	15.05	0.092
282	39.047	0.138	0.93	97	-2.1	-	86	0.100	14.98	0.097
283	39.186	0.139	0.93	97	-3.5	-	86	0.093	15.03	0.085
284	39.326	0.140	0.90	97	-2.5	-	86	0.092	15.14	0.114
285	39.464	0.138	0.91	97	-1.6	-	87	0.088	15.17	0.109
286	39.603	0.139	0.91	97	-2.9	-	87	0.091	15.20	0.129
287	39.743	0.140	0.93	97	-1.7	-	86	0.091	15.25	0.109

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	39.880	0.137	0.90	97	-1.6	-	86	0.091	15.11	0.113
289	40.020	0.140	0.94	97	-2.8	-	86	0.090	15.10	0.101
290	40.159	0.139	0.92	97	-1.5	101	86	0.095	15.12	0.093
291	40.297	0.138	0.92	97	-2.5	-	86	0.090	15.05	0.102
292	40.437	0.140	0.90	97	-2.8	-	86	0.094	14.99	0.079
293	40.576	0.139	0.93	97	-3.1	-	86	0.089	14.98	0.074
294	40.714	0.138	0.93	97	-2.2	-	87	0.092	14.92	0.081
295	40.854	0.140	0.90	97	-2.0	-	86	0.091	14.84	0.070
296	40.993	0.139	0.91	97	-2.3	-	87	0.090	14.80	0.067
297	41.130	0.137	0.92	97	-1.5	-	87	0.093	14.85	0.071
298	41.271	0.141	0.92	97	-1.6	-	86	0.094	14.97	0.080
299	41.409	0.138	0.93	97	-2.3	-	86	0.089	14.96	0.087
300	41.547	0.138	0.92	97	-2.0	100	87	0.092	15.02	0.083
301	41.687	0.140	0.92	97	-1.9	-	87	0.095	15.05	0.089
302	41.825	0.138	0.92	97	-1.5	-	87	0.088	15.08	0.091
303	41.963	0.138	0.93	97	-2.8	-	86	0.087	15.08	0.102
304	42.103	0.140	0.92	97	-2.2	-	86	0.097	15.10	0.095
305	42.242	0.139	0.92	97	-2.6	-	87	0.091	15.12	0.094
306	42.379	0.137	0.92	97	-3.0	-	87	0.090	15.11	0.104
307	42.520	0.141	0.92	97	-1.6	-	87	0.092	15.19	0.097
308	42.657	0.137	0.90	97	-2.1	-	87	0.089	15.46	0.097
309	42.795	0.138	0.92	97	-3.2	-	87	0.092	15.44	0.107
310	42.935	0.140	0.91	97	-2.7	100	87	0.092	15.52	0.106
311	43.073	0.138	0.91	97	-2.1	-	87	0.097	15.64	0.111
312	43.212	0.139	0.93	97	-1.9	-	87	0.099	15.77	0.119
313	43.351	0.139	0.92	97	-2.9	-	87	0.092	16.04	0.141
314	43.488	0.137	0.92	97	-1.7	-	87	0.086	16.33	0.164
315	43.628	0.140	0.92	97	-1.7	-	87	0.096	16.74	0.252
316	43.765	0.137	0.93	97	-2.6	-	87	0.094	16.66	0.190
317	43.903	0.138	0.93	97	-2.9	-	87	0.089	16.19	0.138
318	44.042	0.139	0.92	97	-1.6	-	87	0.097	15.87	0.145
319	44.180	0.138	0.91	97	-2.6	-	87	0.090	15.72	0.117

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	44.318	0.138	0.91	97	-1.8	100	87	0.095	15.70	0.108
321	44.457	0.139	0.90	97	-1.8	-	87	0.094	15.65	0.110
322	44.594	0.137	0.92	97	-1.4	-	87	0.089	15.65	0.109
323	44.733	0.139	0.93	97	-1.7	-	87	0.092	15.70	0.109
324	44.871	0.138	0.91	97	-2.0	-	86	0.090	15.67	0.105
325	45.008	0.137	0.89	97	-3.3	-	86	0.092	15.62	0.107
326	45.147	0.139	0.91	97	-1.3	-	86	0.091	15.66	0.111
327	45.284	0.137	0.90	97	-2.6	-	86	0.086	15.53	0.088
328	45.422	0.138	0.91	97	-2.7	-	86	0.085	15.31	0.079
329	45.561	0.139	0.91	97	-1.6	-	87	0.093	15.40	0.066
330	45.698	0.137	0.89	97	-2.7	101	87	0.093	15.54	0.078
331	45.838	0.140	0.93	97	-2.2	-	87	0.091	15.69	0.085
332	45.975	0.137	0.91	97	-3.1	-	87	0.096	15.80	0.107
333	46.112	0.137	0.90	97	-2.4	-	87	0.087	16.01	0.108
334	46.251	0.139	0.91	97	-2.4	-	87	0.092	16.11	0.127
335	46.388	0.137	0.89	97	-2.9	-	87	0.093	16.16	0.139
336	46.526	0.138	0.90	97	-3.0	-	87	0.091	16.35	0.147
337	46.664	0.138	0.89	97	-1.8	-	87	0.088	16.51	0.152
338	46.801	0.137	0.91	97	-1.8	-	87	0.095	16.46	0.168
339	46.940	0.139	0.90	97	-1.8	-	87	0.092	16.29	0.186
340	47.077	0.137	0.89	97	-2.9	101	87	0.094	16.02	0.210
341	47.215	0.138	0.92	98	-2.7	-	87	0.090	15.56	0.124
342	47.353	0.138	0.90	97	-1.4	-	87	0.085	15.25	0.072
343	47.489	0.136	0.91	97	-1.8	-	87	0.086	15.13	0.075
344	47.628	0.139	0.91	98	-3.1	-	87	0.094	14.87	0.070
345	47.765	0.137	0.90	97	-1.5	-	87	0.083	14.85	0.073
346	47.902	0.137	0.90	97	-1.5	-	87	0.086	14.41	0.087
347	48.041	0.139	0.91	98	-2.2	-	87	0.087	13.98	0.066
348	48.177	0.136	0.88	98	-1.9	-	87	0.092	13.80	0.068
349	48.316	0.139	0.89	98	-2.8	-	87	0.089	13.68	0.081
350	48.453	0.137	0.91	98	-2.1	100	86	0.091	13.70	0.057
351	48.590	0.137	0.90	98	-2.9	-	86	0.088	13.77	0.062

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	48.729	0.139	0.93	98	-1.8	-	86	0.090	13.03	0.059
353	48.865	0.136	0.91	98	-2.2	-	87	0.083	12.33	0.114
354	49.004	0.139	0.90	98	-3.0	-	87	0.088	12.25	0.152
355	49.141	0.137	0.90	98	-1.7	-	87	0.081	12.23	0.131
356	49.278	0.137	0.90	98	-2.0	-	87	0.082	12.16	0.129
357	49.417	0.139	0.90	98	-2.5	-	86	0.091	12.07	0.131
358	49.553	0.136	0.91	98	-2.4	-	87	0.084	12.05	0.153
359	49.692	0.139	0.91	98	-2.4	-	87	0.083	11.94	0.159
360	49.829	0.137	0.91	98	-2.8	100	86	0.088	11.91	0.149
361	49.966	0.137	0.91	98	-3.1	-	87	0.088	11.80	0.141
362	50.105	0.139	0.90	98	-2.3	-	87	0.087	11.79	0.155
363	50.241	0.136	0.89	98	-3.8	-	87	0.085	11.80	0.147
364	50.380	0.139	0.89	98	-2.8	-	87	0.087	11.73	0.196
365	50.517	0.137	0.88	98	-2.3	-	86	0.086	11.47	0.172
366	50.654	0.137	0.91	98	-3.2	-	86	0.087	11.45	0.176
367	50.793	0.139	0.90	98	-3.3	-	87	0.080	11.37	0.165
368	50.929	0.136	0.91	98	-1.9	-	87	0.086	11.46	0.118
369	51.068	0.139	0.91	98	-3.0	-	87	0.075	11.32	0.117
370	51.205	0.137	0.91	98	-2.5	100	87	0.081	11.27	0.117
371	51.342	0.137	0.90	98	-3.7	-	87	0.084	11.21	0.123
372	51.481	0.139	0.93	98	-2.3	-	87	0.085	11.20	0.120
373	51.617	0.136	0.91	98	-2.3	-	87	0.079	11.15	0.125
374	51.756	0.139	0.88	98	-2.7	-	87	0.081	11.21	0.131
375	51.893	0.137	0.92	98	-2.9	-	87	0.078	11.34	0.137
376	52.030	0.137	0.90	98	-2.1	-	87	0.086	11.44	0.131
377	52.169	0.139	0.90	98	-2.4	-	87	0.083	11.51	0.127
378	52.306	0.137	0.91	98	-2.7	-	87	0.083	11.49	0.140
379	52.444	0.138	0.90	98	-3.1	-	87	0.087	11.54	0.146
380	52.582	0.138	0.93	98	-2.0	100	87	0.083	11.51	0.158
381	52.718	0.136	0.89	98	-2.0	-	87	0.083	11.48	0.151
382	52.857	0.139	0.87	98	-3.1	-	87	0.090	11.40	0.159
383	52.994	0.137	0.91	98	-3.4	-	87	0.078	11.37	0.165

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
384	53.132	0.138	0.89	98	-2.9	-	87	0.083	11.37	0.160
385	53.270	0.138	0.91	98	-2.5	-	87	0.079	11.31	0.169
386	53.407	0.137	0.90	98	-2.1	-	87	0.077	11.29	0.186
387	53.546	0.139	0.91	98	-2.9	-	87	0.085	11.27	0.193
388	53.683	0.137	0.90	98	-2.8	-	87	0.083	11.45	0.187
389	53.820	0.137	0.91	98	-2.1	-	87	0.083	11.27	0.209
390	53.958	0.138	0.90	98	-3.3	99	87	0.075	11.29	0.216
391	54.095	0.137	0.89	98	-2.7	-	87	0.084	11.26	0.218
392	54.234	0.139	0.90	98	-3.8	-	87	0.086	11.12	0.234
393	54.371	0.137	0.90	98	-3.5	-	87	0.079	11.09	0.240
394	54.508	0.137	0.92	98	-2.5	-	87	0.079	10.99	0.240
395	54.646	0.138	0.90	98	-3.2	-	87	0.076	11.00	0.252
396	54.783	0.137	0.88	98	-3.0	-	87	0.076	10.97	0.277
397	54.922	0.139	0.92	98	-2.2	-	87	0.078	10.97	0.269
398	55.059	0.137	0.89	98	-2.9	-	87	0.080	10.98	0.269
399	55.196	0.137	0.89	98	-2.1	-	86	0.075	11.08	0.282
400	55.334	0.138	0.87	98	-2.8	98	86	0.077	11.05	0.277
401	55.471	0.137	0.90	98	-3.0	-	86	0.078	10.94	0.294
402	55.610	0.139	0.93	98	-2.0	-	86	0.078	10.82	0.315
403	55.747	0.137	0.90	98	-2.5	-	86	0.077	10.81	0.314
404	55.884	0.137	0.90	98	-3.0	-	86	0.079	10.72	0.342
405	56.022	0.138	0.92	98	-3.5	-	86	0.078	10.66	0.341
406	56.159	0.137	0.90	98	-2.6	-	86	0.076	10.59	0.341
407	56.298	0.139	0.89	98	-3.1	-	86	0.078	10.69	0.340
408	56.435	0.137	0.88	98	-2.6	-	86	0.079	10.78	0.348
409	56.571	0.136	0.89	98	-2.5	-	86	0.075	10.67	0.325
410	56.711	0.140	0.90	98	-2.9	98	86	0.084	10.58	0.324
411	56.847	0.136	0.91	98	-2.3	-	86	0.079	10.59	0.348
412	56.986	0.139	0.88	98	-2.5	-	86	0.075	10.54	0.347
413	57.123	0.137	0.90	98	-3.0	-	86	0.072	10.45	0.366
414	57.260	0.137	0.91	98	-3.9	-	86	0.075	10.16	0.360
415	57.399	0.139	0.91	98	-4.1	-	86	0.080	9.96	0.398

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
416	57.535	0.136	0.88	98	-2.4	-	86	0.077	9.87	0.441
417	57.674	0.139	0.91	98	-3.1	-	86	0.079	9.87	0.465
418	57.811	0.137	0.89	98	-2.9	-	87	0.076	9.71	0.458
419	57.948	0.137	0.91	98	-3.3	-	87	0.071	9.51	0.467
420	58.087	0.139	0.91	98	-2.6	98	87	0.070	9.41	0.487
421	58.223	0.136	0.92	98	-3.8	-	86	0.072	9.42	0.481
422	58.362	0.139	0.89	98	-3.3	-	86	0.076	9.45	0.497
423	58.500	0.138	0.88	98	-3.5	-	87	0.076	9.46	0.472
424	58.636	0.136	0.91	98	-2.2	-	87	0.071	9.49	0.489
425	58.775	0.139	0.92	98	-3.7	-	87	0.077	9.46	0.466
426	58.912	0.137	0.90	98	-3.7	-	87	0.075	9.51	0.477
427	59.050	0.138	0.89	98	-2.8	-	87	0.071	9.41	0.481
428	59.188	0.138	0.90	98	-4.0	-	86	0.077	9.39	0.493
429	59.325	0.137	0.90	98	-2.9	-	86	0.072	9.40	0.520
430	59.464	0.139	0.92	98	-2.4	99	86	0.074	9.40	0.498
431	59.601	0.137	0.90	98	-4.0	-	86	0.076	9.38	0.508
432	59.738	0.137	0.92	98	-3.0	-	86	0.075	9.40	0.513
433	59.877	0.139	0.90	98	-3.7	-	86	0.074	9.40	0.499
434	60.013	0.136	0.89	98	-2.4	-	86	0.069	9.48	0.475
435	60.152	0.139	0.90	98	-3.0	-	86	0.069	9.45	0.498
436	60.289	0.137	0.91	98	-2.1	-	86	0.065	9.46	0.494
437	60.426	0.137	0.92	98	-2.0	-	86	0.077	9.51	0.491
438	60.565	0.139	0.88	98	-2.4	-	86	0.070	9.49	0.514
439	60.701	0.136	0.90	98	-2.6	-	86	0.074	9.46	0.520
440	60.841	0.140	0.94	98	-2.4	99	86	0.072	9.49	0.510
441	60.977	0.136	0.92	98	-3.4	-	87	0.072	9.49	0.529
442	61.114	0.137	0.89	98	-3.3	-	87	0.070	9.33	0.593
443	61.253	0.139	0.92	98	-2.8	-	86	0.072	9.24	0.627
444	61.390	0.137	0.91	98	-3.0	-	86	0.068	9.19	0.607
445	61.529	0.139	0.88	98	-3.1	-	87	0.070	9.19	0.633
446	61.666	0.137	0.89	98	-4.2	-	87	0.067	9.24	0.652
447	61.803	0.137	0.91	98	-3.6	-	87	0.064	9.23	0.656

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
448	61.942	0.139	0.88	98	-3.8	-	86	0.076	9.23	0.642
449	62.078	0.136	0.88	98	-3.1	-	86	0.063	9.26	0.660
450	62.217	0.139	0.93	98	-2.3	98	86	0.067	9.32	0.580
451	62.354	0.137	0.92	98	-2.1	-	86	0.066	9.25	0.579
452	62.491	0.137	0.90	98	-2.0	-	86	0.066	9.18	0.620
453	62.630	0.139	0.93	98	-4.1	-	86	0.075	9.05	0.614
454	62.767	0.137	0.90	98	-3.9	-	86	0.068	9.09	0.625
455	62.905	0.138	0.90	98	-2.7	-	86	0.066	9.00	0.635
456	63.043	0.138	0.91	98	-4.0	-	86	0.070	8.91	0.673
457	63.180	0.137	0.90	98	-3.9	-	86	0.074	8.87	0.685
458	63.319	0.139	0.90	98	-3.9	-	86	0.064	8.74	0.698
459	63.455	0.136	0.89	98	-2.5	-	86	0.066	8.74	0.677
460	63.593	0.138	0.90	98	-2.3	98	86	0.074	8.57	0.654
461	63.731	0.138	0.90	98	-3.2	-	86	0.062	8.48	0.689
462	63.868	0.137	0.92	98	-3.1	-	86	0.073	8.49	0.707
463	64.007	0.139	0.89	98	-4.0	-	86	0.067	8.45	0.721
464	64.144	0.137	0.90	98	-1.9	-	86	0.067	8.47	0.704
465	64.281	0.137	0.89	98	-2.2	-	87	0.072	8.47	0.709
466	64.420	0.139	0.90	98	-2.7	-	86	0.072	8.46	0.706
467	64.556	0.136	0.92	98	-3.9	-	86	0.071	8.37	0.708
468	64.696	0.140	0.91	98	-3.4	-	86	0.061	8.39	0.700
469	64.833	0.137	0.90	98	-3.5	-	86	0.072	8.42	0.702
470	64.969	0.136	0.89	98	-3.4	98	86	0.071	8.42	0.683
471	65.109	0.140	0.90	98	-2.4	-	86	0.070	8.42	0.680
472	65.245	0.136	0.90	98	-3.3	-	86	0.069	8.40	0.687
473	65.384	0.139	0.90	98	-4.0	-	86	0.072	8.46	0.695
474	65.521	0.137	0.91	98	-2.4	-	86	0.069	8.31	0.688
475	65.658	0.137	0.90	98	-3.2	-	86	0.059	8.31	0.679
476	65.797	0.139	0.92	98	-3.1	-	86	0.067	8.31	0.664
477	65.934	0.137	0.91	98	-3.9	-	86	0.061	8.37	0.681
478	66.072	0.138	0.90	98	-2.8	-	86	0.066	8.29	0.671
479	66.210	0.138	0.91	98	-2.4	-	86	0.069	8.19	0.660

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
480	66.347	0.137	0.90	98	-3.1	98	86	0.062	7.90	0.631
481	66.486	0.139	0.89	98	-3.3	-	86	0.067	7.87	0.628
482	66.623	0.137	0.89	98	-4.3	-	86	0.065	7.83	0.620
483	66.761	0.138	0.89	98	-3.7	-	87	0.062	7.80	0.615
484	66.899	0.138	0.91	98	-4.0	-	86	0.064	7.78	0.602
485	67.035	0.136	0.90	98	-2.4	-	86	0.062	7.81	0.612
486	67.175	0.140	0.88	98	-2.9	-	86	0.069	7.79	0.609
487	67.312	0.137	0.90	98	-2.8	-	86	0.072	7.79	0.597
488	67.449	0.137	0.92	98	-3.0	-	86	0.068	7.64	0.587
489	67.588	0.139	0.91	98	-4.2	-	86	0.064	7.59	0.585
490	67.724	0.136	0.89	98	-3.1	97	86	0.067	7.60	0.586
491	67.863	0.139	0.89	98	-3.8	-	86	0.064	7.56	0.587
492	68.000	0.137	0.89	98	-3.9	-	86	0.068	7.60	0.595
493	68.137	0.137	0.90	98	-4.3	-	86	0.065	7.54	0.597
494	68.276	0.139	0.92	98	-4.5	-	86	0.064	7.59	0.600
495	68.413	0.137	0.91	98	-4.5	-	86	0.065	7.52	0.597
496	68.552	0.139	0.89	98	-3.1	-	86	0.059	7.41	0.592
497	68.689	0.137	0.92	98	-3.8	-	86	0.065	7.40	0.591
498	68.826	0.137	0.90	98	-4.3	-	86	0.062	7.35	0.586
499	68.965	0.139	0.89	98	-3.3	-	86	0.065	6.96	0.602
500	69.101	0.136	0.91	98	-3.7	97	86	0.063	6.88	0.592
501	69.240	0.139	0.90	97	-3.2	-	86	0.068	6.88	0.586
502	69.378	0.138	0.90	98	-2.8	-	86	0.065	6.82	0.572
503	69.514	0.136	0.91	98	-2.9	-	86	0.063	6.86	0.567
504	69.653	0.139	0.91	98	-2.9	-	86	0.066	6.81	0.574
505	69.790	0.137	0.89	97	-4.4	-	86	0.064	6.84	0.577
506	69.928	0.138	0.90	98	-2.8	-	87	0.066	6.87	0.567
507	70.066	0.138	0.92	97	-4.6	-	86	0.064	6.88	0.570
508	70.203	0.137	0.91	97	-3.9	-	86	0.061	6.90	0.569
509	70.342	0.139	0.90	97	-3.9	-	86	0.062	6.98	0.575
510	70.479	0.137	0.90	97	-3.7	97	86	0.056	6.80	0.612
511	70.616	0.137	0.89	97	-2.5	-	86	0.062	6.81	0.614

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
512	70.755	0.139	0.91	97	-3.5	-	86	0.061	6.84	0.613
513	70.891	0.136	0.91	97	-3.2	-	86	0.059	6.83	0.622
514	71.031	0.140	0.91	97	-4.0	-	85	0.059	6.83	0.619
515	71.168	0.137	0.89	97	-3.6	-	86	0.063	6.84	0.639
516	71.304	0.136	0.93	97	-4.7	-	87	0.059	6.84	0.643
517	71.444	0.140	0.90	97	-3.1	-	87	0.057	6.91	0.637
518	71.580	0.136	0.90	97	-3.3	-	87	0.059	6.94	0.623
519	71.719	0.139	0.90	97	-2.7	-	86	0.059	6.89	0.612
520	71.856	0.137	0.90	97	-3.8	97	86	0.062	6.88	0.606
521	71.993	0.137	0.92	97	-3.3	-	86	0.065	6.86	0.605
522	72.132	0.139	0.92	97	-3.6	-	86	0.051	6.84	0.599
523	72.268	0.136	0.91	97	-2.7	-	86	0.062	6.83	0.606
524	72.407	0.139	0.92	97	-2.6	-	87	0.061	6.80	0.606
525	72.544	0.137	0.89	97	-3.1	-	87	0.065	6.82	0.597
526	72.681	0.137	0.89	97	-2.8	-	87	0.055	6.81	0.594
527	72.820	0.139	0.90	97	-3.0	-	86	0.062	6.86	0.590
528	72.957	0.137	0.90	97	-3.3	-	86	0.063	6.85	0.621
529	73.095	0.138	0.92	97	-2.5	-	86	0.066	6.82	0.622
530	73.233	0.138	0.92	97	-4.3	96	86	0.062	6.67	0.608
531	73.370	0.137	0.92	97	-2.7	-	85	0.059	6.69	0.608
532	73.509	0.139	0.91	97	-4.1	-	85	0.062	6.65	0.607
533	73.645	0.136	0.86	97	-3.1	-	85	0.066	6.69	0.614
534	73.783	0.138	0.90	97	-3.7	-	85	0.057	6.67	0.611
535	73.922	0.139	0.92	97	-3.6	-	86	0.057	6.67	0.629
536	74.058	0.136	0.88	97	-4.6	-	87	0.056	6.67	0.628
537	74.197	0.139	0.90	97	-4.4	-	87	0.064	6.68	0.638
538	74.334	0.137	0.90	97	-4.0	-	87	0.057	6.67	0.625
539	74.471	0.137	0.91	97	-4.3	-	86	0.062	6.68	0.624
540	74.610	0.139	0.91	97	-3.3	97	86	0.061	6.67	0.616
541	74.746	0.136	0.92	97	-4.4	-	86	0.065	6.73	0.619
542	74.886	0.140	0.91	97	-3.9	97	85	0.054	6.79	0.610

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 3Technician: AKDate: 5/8/2024

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
Avg/Tot	74.945	0.138	0.92	93.3	-2.8	100	86.2	0.082	11.94	0.340

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 3Technician: AKDate: 5/8/2024Stove ΔT: 291

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	91	90	90	80	104	90.9	N/A
1	94	93	90	84	104	93.2	N/A
2	107	116	95	113	112	108.6	N/A
3	120	142	105	172	130	133.8	N/A
4	131	152	113	241	150	157.3	N/A
5	138	160	120	306	166	178.0	N/A
6	142	173	127	366	180	197.8	N/A
7	146	192	134	422	194	217.5	N/A
8	153	210	140	467	207	235.5	N/A
9	160	228	146	502	222	251.7	N/A
10	168	243	154	529	236	265.9	N/A
11	177	256	160	552	249	278.8	N/A
12	186	267	168	572	262	290.7	N/A
13	194	277	174	591	274	301.8	N/A
14	203	285	180	606	286	311.9	N/A
15	212	292	185	618	299	321.2	N/A
16	222	299	191	628	312	330.2	N/A
17	231	306	197	636	325	339.1	N/A
18	241	313	203	643	338	347.5	N/A
19	251	320	210	649	350	355.9	N/A
20	260	328	216	653	363	364.1	N/A
21	269	336	223	656	374	371.7	N/A
22	279	344	228	658	386	378.9	N/A
23	288	352	233	658	397	385.5	N/A
24	297	360	239	659	407	392.2	N/A
25	306	367	245	659	417	398.8	N/A
26	314	374	251	659	428	405.3	N/A
27	322	382	239	651	440	406.8	N/A
28	330	389	221	642	452	406.6	N/A
29	339	395	210	635	462	408.3	N/A
30	347	402	203	634	469	410.8	N/A
31	355	408	199	636	476	414.7	N/A
32	363	414	197	642	481	419.2	N/A
33	370	419	195	648	485	423.1	N/A
34	376	424	194	654	487	427.0	N/A
35	382	428	194	661	489	430.9	N/A
36	388	433	195	670	489	434.7	N/A
37	393	436	196	679	488	438.6	N/A
38	399	440	197	690	488	442.7	N/A
39	405	443	198	699	487	446.5	N/A
40	410	447	200	709	487	450.3	N/A
41	415	450	201	715	486	453.2	N/A
42	420	453	202	720	486	456.3	N/A
43	425	457	204	725	486	459.3	N/A
44	430	461	205	726	487	461.5	N/A
45	434	466	207	725	487	463.7	N/A
46	439	470	208	726	487	465.8	N/A
47	443	474	209	726	487	468.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 3Technician: AKDate: 5/8/2024Stove ΔT: 291

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	447	478	211	726	488	470.0	N/A
49	451	483	212	727	489	472.1	N/A
50	455	486	214	728	489	474.3	N/A
51	458	490	215	729	490	476.5	N/A
52	462	494	216	733	491	479.3	N/A
53	466	498	218	738	492	482.2	N/A
54	469	502	220	742	493	485.2	N/A
55	473	507	221	747	495	488.5	N/A
56	477	511	223	753	497	492.0	N/A
57	480	516	225	754	502	495.2	N/A
58	483	519	226	748	507	496.6	N/A
59	486	523	227	736	510	496.3	N/A
60	489	526	228	721	511	494.9	N/A
61	491	528	228	706	511	492.9	N/A
62	493	530	228	691	512	491.0	N/A
63	495	531	229	677	512	488.7	N/A
64	496	532	228	665	512	486.6	N/A
65	497	532	228	655	512	484.8	N/A
66	498	532	229	646	512	483.3	N/A
67	499	532	229	640	511	482.1	N/A
68	500	532	229	635	512	481.5	N/A
69	501	532	228	631	513	481.0	N/A
70	501	532	228	628	514	480.7	N/A
71	502	532	229	625	516	480.7	N/A
72	502	532	229	623	518	480.8	N/A
73	503	532	229	620	520	480.8	N/A
74	503	531	229	619	523	481.1	N/A
75	504	531	229	620	526	482.0	N/A
76	505	531	230	622	527	482.9	N/A
77	506	530	230	623	530	483.8	N/A
78	507	530	230	624	532	484.6	N/A
79	508	529	230	626	535	485.5	N/A
80	509	529	230	627	537	486.2	N/A
81	510	529	231	626	539	486.9	N/A
82	511	528	232	626	541	487.4	N/A
83	512	528	232	626	543	487.9	N/A
84	513	527	232	626	545	488.6	N/A
85	514	527	233	626	546	489.2	N/A
86	516	527	233	628	547	490.1	N/A
87	517	527	234	631	548	491.3	N/A
88	518	528	234	634	549	492.7	N/A
89	520	528	234	638	551	494.0	N/A
90	521	528	235	641	552	495.2	N/A
91	522	528	235	643	554	496.4	N/A
92	524	528	236	645	556	497.6	N/A
93	525	528	236	646	559	498.8	N/A
94	526	528	237	648	561	500.0	N/A
95	528	528	238	649	564	501.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: **291**

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	529	528	238	648	566	501.8	N/A
97	530	528	239	647	568	502.2	N/A
98	531	527	239	644	570	502.5	N/A
99	532	527	240	640	572	502.3	N/A
100	533	527	240	636	573	501.8	N/A
101	533	527	241	632	575	501.5	N/A
102	533	527	241	629	577	501.5	N/A
103	533	527	242	627	578	501.1	N/A
104	532	527	242	622	579	500.5	N/A
105	531	528	242	617	579	499.4	N/A
106	531	528	242	611	581	498.5	N/A
107	530	527	242	604	585	497.6	N/A
108	529	527	242	597	588	496.8	N/A
109	529	526	242	592	592	496.3	N/A
110	528	526	242	589	596	496.3	N/A
111	527	525	243	585	600	496.0	N/A
112	527	523	267	578	606	500.0	N/A
113	524	520	283	571	613	502.0	N/A
114	523	517	295	575	622	506.2	N/A
115	520	516	304	593	631	512.9	N/A
116	519	516	300	616	640	518.3	N/A
117	518	517	283	639	648	521.1	N/A
118	519	519	273	653	652	523.3	N/A
119	520	520	267	661	654	524.5	N/A
120	521	522	262	665	654	524.7	N/A
121	522	523	258	667	654	524.7	N/A
122	523	524	255	667	652	524.0	N/A
123	524	524	253	665	650	523.2	N/A
124	525	523	251	662	648	522.1	N/A
125	526	523	250	659	646	520.8	N/A
126	527	522	249	655	644	519.3	N/A
127	527	521	249	649	642	517.5	N/A
128	528	520	248	644	640	515.7	N/A
129	527	519	248	640	638	514.3	N/A
130	527	518	247	638	635	513.0	N/A
131	527	518	246	635	633	511.8	N/A
132	527	517	246	630	631	510.3	N/A
133	527	517	246	626	629	508.9	N/A
134	527	517	245	623	627	507.7	N/A
135	526	517	245	620	625	506.6	N/A
136	526	517	245	617	624	505.8	N/A
137	526	517	244	614	623	504.9	N/A
138	525	518	244	611	622	503.8	N/A
139	524	518	244	608	620	502.9	N/A
140	524	518	244	605	618	501.8	N/A
141	523	518	244	602	616	500.6	N/A
142	523	519	243	599	614	499.7	N/A
143	522	519	243	596	613	498.5	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: **291**

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	522	519	243	593	611	497.5	N/A
145	521	519	242	590	609	496.3	N/A
146	520	520	242	586	607	495.0	N/A
147	520	519	242	583	605	493.8	N/A
148	520	519	241	581	603	492.7	N/A
149	519	518	241	579	602	491.6	N/A
150	518	517	241	576	600	490.3	N/A
151	518	516	240	572	599	489.1	N/A
152	518	515	240	568	598	487.5	N/A
153	517	513	239	565	597	486.2	N/A
154	516	511	239	560	597	484.7	N/A
155	516	510	239	556	596	483.2	N/A
156	515	508	238	552	596	481.7	N/A
157	514	507	238	546	595	479.8	N/A
158	513	505	237	542	594	478.1	N/A
159	512	504	237	538	593	476.5	N/A
160	511	502	237	533	592	475.0	N/A
161	511	500	237	530	591	473.7	N/A
162	510	498	237	526	591	472.3	N/A
163	508	497	237	523	590	470.9	N/A
164	507	495	237	520	590	469.8	N/A
165	506	494	237	517	590	468.8	N/A
166	505	492	237	515	589	467.6	N/A
167	504	491	237	512	590	466.7	N/A
168	503	490	238	510	590	465.9	N/A
169	502	489	238	508	591	465.3	N/A
170	501	487	238	506	591	464.6	N/A
171	500	486	238	504	591	463.9	N/A
172	499	485	238	502	592	463.2	N/A
173	498	484	238	501	592	462.8	N/A
174	497	483	238	500	593	462.2	N/A
175	497	482	238	499	594	461.8	N/A
176	496	481	238	498	594	461.4	N/A
177	495	480	238	497	595	461.2	N/A
178	494	480	238	497	596	461.0	N/A
179	493	479	238	497	597	460.9	N/A
180	493	478	238	497	598	460.8	N/A
181	492	478	237	497	599	460.7	N/A
182	491	478	237	497	600	460.5	N/A
183	490	477	236	497	601	460.4	N/A
184	489	477	236	498	601	460.3	N/A
185	488	477	236	499	602	460.3	N/A
186	488	477	235	501	602	460.7	N/A
187	486	478	235	504	603	461.3	N/A
188	485	480	235	508	604	462.2	N/A
189	484	482	234	511	604	463.0	N/A
190	483	484	234	515	605	464.3	N/A
191	482	486	234	520	606	465.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT : 291

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	481	488	234	525	607	466.9	N/A
193	480	490	234	526	607	467.4	N/A
194	479	492	234	524	608	467.2	N/A
195	478	493	234	521	608	466.7	N/A
196	478	493	234	517	609	466.0	N/A
197	478	493	233	513	609	465.1	N/A
198	477	493	233	509	609	464.1	N/A
199	477	493	233	506	608	463.3	N/A
200	476	493	233	503	609	462.7	N/A
201	476	492	233	501	608	461.9	N/A
202	476	491	232	499	609	461.2	N/A
203	476	490	232	497	609	460.5	N/A
204	475	488	232	493	608	459.3	N/A
205	475	487	231	488	609	458.0	N/A
206	474	486	231	481	609	456.2	N/A
207	474	484	231	474	609	454.1	N/A
208	473	483	230	468	609	452.4	N/A
209	472	481	230	462	609	450.8	N/A
210	471	479	230	456	609	448.9	N/A
211	469	478	230	450	609	447.3	N/A
212	468	477	230	445	610	445.9	N/A
213	467	475	229	440	611	444.6	N/A
214	466	474	229	435	611	442.9	N/A
215	465	472	229	430	612	441.6	N/A
216	464	471	229	425	613	440.3	N/A
217	463	469	228	421	613	438.7	N/A
218	461	468	228	417	614	437.4	N/A
219	460	466	227	413	614	436.0	N/A
220	458	465	227	409	615	434.8	N/A
221	457	463	227	406	615	433.5	N/A
222	456	462	226	402	615	432.3	N/A
223	459	459	248	398	618	436.4	N/A
224	456	455	260	388	621	436.0	N/A
225	453	451	270	381	623	435.5	N/A
226	451	448	281	387	626	438.5	N/A
227	449	445	289	413	631	445.2	N/A
228	447	446	296	458	635	456.3	N/A
229	448	449	302	507	639	469.0	N/A
230	448	452	308	553	645	481.3	N/A
231	449	456	313	595	652	493.1	N/A
232	451	459	317	636	659	504.5	N/A
233	452	465	291	670	664	508.4	N/A
234	455	470	273	695	669	512.3	N/A
235	458	474	263	710	671	515.3	N/A
236	461	478	253	717	672	516.3	N/A
237	464	481	246	719	673	516.4	N/A
238	466	483	241	719	672	516.1	N/A
239	467	485	237	720	670	515.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: **291**

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	468	486	233	720	668	515.2	N/A
241	469	487	231	718	666	514.4	N/A
242	470	488	228	716	665	513.2	N/A
243	470	488	226	713	662	512.0	N/A
244	470	489	225	709	660	510.5	N/A
245	470	488	224	705	658	509.0	N/A
246	470	488	223	702	654	507.3	N/A
247	470	488	222	700	650	505.6	N/A
248	469	487	221	697	649	504.6	N/A
249	469	487	220	694	648	503.7	N/A
250	469	486	220	691	647	502.5	N/A
251	468	486	219	688	645	501.2	N/A
252	467	485	218	686	644	500.1	N/A
253	467	485	218	682	642	498.8	N/A
254	466	484	217	681	640	497.8	N/A
255	466	484	217	680	637	496.7	N/A
256	465	483	217	679	636	496.0	N/A
257	464	483	216	678	634	495.2	N/A
258	464	483	216	677	631	494.1	N/A
259	463	483	215	676	630	493.6	N/A
260	463	483	215	676	628	493.0	N/A
261	462	483	215	676	626	492.3	N/A
262	462	483	215	676	623	491.8	N/A
263	462	484	214	676	621	491.4	N/A
264	462	484	214	677	620	491.2	N/A
265	461	484	214	678	616	490.7	N/A
266	461	485	214	679	615	490.7	N/A
267	461	485	214	679	613	490.4	N/A
268	461	486	214	680	610	490.1	N/A
269	461	486	214	680	609	490.1	N/A
270	462	487	214	681	607	490.1	N/A
271	462	488	214	682	605	490.0	N/A
272	462	489	214	683	603	490.0	N/A
273	462	489	214	683	601	490.0	N/A
274	462	490	214	684	600	490.1	N/A
275	463	491	214	684	598	490.0	N/A
276	463	492	214	684	597	490.0	N/A
277	463	493	214	684	595	489.8	N/A
278	463	494	215	683	593	489.7	N/A
279	464	496	215	684	592	489.8	N/A
280	463	497	215	684	591	489.9	N/A
281	464	498	215	684	589	489.8	N/A
282	464	499	215	683	588	489.8	N/A
283	465	500	215	683	586	489.7	N/A
284	465	501	215	683	584	489.7	N/A
285	466	502	215	683	583	489.7	N/A
286	466	503	215	683	581	489.7	N/A
287	467	505	215	683	580	489.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: 291

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	467	506	215	683	579	489.9	N/A
289	468	507	215	683	578	490.1	N/A
290	469	508	216	682	577	490.1	N/A
291	470	509	216	681	576	490.3	N/A
292	470	510	216	681	576	490.5	N/A
293	471	511	216	681	575	490.8	N/A
294	472	512	216	679	575	490.8	N/A
295	474	513	216	679	574	491.0	N/A
296	475	513	216	678	573	491.0	N/A
297	476	514	217	677	572	491.1	N/A
298	477	515	217	676	570	490.9	N/A
299	478	516	217	676	568	491.0	N/A
300	479	516	217	676	567	491.0	N/A
301	480	517	217	676	566	491.2	N/A
302	482	518	217	677	564	491.6	N/A
303	483	518	218	678	563	491.8	N/A
304	484	519	218	679	561	492.1	N/A
305	485	520	218	680	559	492.4	N/A
306	486	520	218	681	558	492.6	N/A
307	487	521	219	682	556	492.9	N/A
308	488	522	219	683	555	493.3	N/A
309	490	522	219	684	554	493.7	N/A
310	491	523	219	685	553	494.1	N/A
311	492	524	220	687	552	494.8	N/A
312	494	525	220	689	551	495.6	N/A
313	495	525	220	691	550	496.2	N/A
314	496	526	221	693	550	497.2	N/A
315	498	527	221	697	549	498.4	N/A
316	500	528	222	702	549	499.9	N/A
317	501	529	222	706	548	501.2	N/A
318	503	529	223	708	548	502.3	N/A
319	505	530	223	709	548	503.1	N/A
320	506	531	224	708	549	503.7	N/A
321	508	532	224	707	550	504.1	N/A
322	510	533	225	706	550	504.5	N/A
323	511	534	225	704	551	505.0	N/A
324	513	534	226	704	551	505.5	N/A
325	515	535	226	703	551	506.2	N/A
326	517	536	226	703	552	506.9	N/A
327	519	537	226	703	553	507.7	N/A
328	521	538	227	701	553	507.8	N/A
329	522	538	227	700	553	508.2	N/A
330	524	539	228	699	553	508.5	N/A
331	525	540	228	698	552	508.6	N/A
332	527	541	228	697	552	508.8	N/A
333	528	542	229	697	552	509.5	N/A
334	529	543	229	698	552	510.1	N/A
335	531	544	230	699	551	510.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: **291**

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	532	545	230	699	551	511.5	N/A
337	534	546	231	700	551	512.3	N/A
338	535	547	232	701	551	513.2	N/A
339	537	549	232	703	550	514.1	N/A
340	539	550	233	703	550	514.9	N/A
341	541	551	233	702	549	515.4	N/A
342	543	552	234	701	549	515.8	N/A
343	545	553	234	699	549	516.1	N/A
344	547	554	235	697	549	516.0	N/A
345	548	554	235	694	549	515.9	N/A
346	550	555	236	691	548	515.8	N/A
347	551	555	236	686	548	515.3	N/A
348	553	556	236	681	548	514.7	N/A
349	554	556	236	676	547	514.0	N/A
350	554	556	237	671	547	513.1	N/A
351	556	556	237	668	547	512.7	N/A
352	557	556	237	663	548	512.0	N/A
353	557	556	237	657	547	511.0	N/A
354	558	556	237	652	548	510.1	N/A
355	558	555	237	647	547	509.1	N/A
356	559	555	237	642	548	508.1	N/A
357	559	554	237	637	548	506.9	N/A
358	559	553	237	633	548	505.9	N/A
359	559	552	237	628	548	504.9	N/A
360	560	551	237	624	549	504.0	N/A
361	559	550	237	619	549	502.9	N/A
362	560	549	237	615	549	502.0	N/A
363	559	548	237	611	549	501.0	N/A
364	559	548	237	608	550	500.3	N/A
365	559	547	237	603	551	499.5	N/A
366	559	546	237	599	552	498.6	N/A
367	559	546	237	595	554	498.0	N/A
368	559	545	237	590	555	497.1	N/A
369	559	544	237	586	556	496.3	N/A
370	559	544	237	582	557	495.6	N/A
371	559	543	237	578	558	494.8	N/A
372	559	543	236	575	559	494.3	N/A
373	558	542	236	571	560	493.5	N/A
374	558	541	236	568	561	492.9	N/A
375	557	541	236	565	561	492.2	N/A
376	557	541	236	562	563	491.7	N/A
377	557	540	236	560	564	491.3	N/A
378	557	539	236	558	565	490.9	N/A
379	556	539	236	556	566	490.7	N/A
380	556	538	236	554	567	490.2	N/A
381	555	538	236	552	568	489.8	N/A
382	554	537	236	550	568	489.1	N/A
383	554	537	236	548	570	489.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: **291**

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	553	536	236	546	571	488.5	N/A
385	553	536	236	544	572	488.1	N/A
386	552	536	236	542	573	487.5	N/A
387	551	535	236	539	574	487.1	N/A
388	551	535	236	537	574	486.5	N/A
389	551	534	236	535	575	486.1	N/A
390	549	534	236	533	575	485.5	N/A
391	549	533	236	531	575	484.8	N/A
392	549	533	236	529	576	484.3	N/A
393	548	532	236	526	577	483.8	N/A
394	547	532	236	524	578	483.3	N/A
395	546	532	236	521	578	482.6	N/A
396	545	531	236	519	579	481.9	N/A
397	545	530	236	517	579	481.2	N/A
398	544	530	236	514	579	480.4	N/A
399	543	529	236	512	579	479.9	N/A
400	542	529	236	510	581	479.4	N/A
401	542	528	235	508	580	478.6	N/A
402	541	528	235	506	581	478.2	N/A
403	541	527	235	504	582	477.9	N/A
404	540	527	235	502	582	477.1	N/A
405	539	526	235	499	583	476.3	N/A
406	538	526	235	497	583	475.8	N/A
407	538	525	235	495	584	475.4	N/A
408	537	525	235	493	585	474.9	N/A
409	536	524	235	492	585	474.3	N/A
410	535	523	235	491	586	473.9	N/A
411	535	523	235	489	587	473.5	N/A
412	534	522	235	488	587	473.0	N/A
413	533	521	235	487	588	472.7	N/A
414	532	521	235	485	588	472.1	N/A
415	532	520	234	483	589	471.7	N/A
416	531	519	235	481	590	471.0	N/A
417	530	518	235	478	590	470.2	N/A
418	529	517	235	476	589	469.2	N/A
419	528	517	235	473	589	468.3	N/A
420	527	516	235	470	589	467.2	N/A
421	526	515	235	467	588	466.1	N/A
422	525	514	234	464	588	465.0	N/A
423	524	513	235	461	588	464.1	N/A
424	523	512	234	459	588	463.2	N/A
425	523	511	234	456	588	462.3	N/A
426	521	510	234	454	588	461.3	N/A
427	520	509	234	451	590	460.8	N/A
428	519	508	234	449	591	460.1	N/A
429	518	507	234	446	593	459.5	N/A
430	517	506	234	444	594	458.9	N/A
431	516	505	234	442	596	458.3	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: **291**

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	515	504	234	440	597	457.7	N/A
433	514	503	233	438	598	457.2	N/A
434	513	502	234	436	599	456.8	N/A
435	511	502	233	434	601	456.2	N/A
436	510	501	233	433	602	455.9	N/A
437	509	500	233	432	604	455.5	N/A
438	508	499	233	431	605	455.2	N/A
439	507	499	233	430	607	454.9	N/A
440	505	498	233	429	608	454.6	N/A
441	505	497	233	427	608	454.1	N/A
442	504	497	233	427	610	453.9	N/A
443	502	496	233	425	611	453.5	N/A
444	501	495	234	424	611	453.0	N/A
445	500	494	233	423	612	452.6	N/A
446	499	494	234	421	613	452.0	N/A
447	499	493	234	420	613	451.6	N/A
448	497	492	234	419	613	451.0	N/A
449	496	492	234	418	613	450.4	N/A
450	495	491	234	417	614	450.2	N/A
451	495	491	234	416	614	449.8	N/A
452	494	490	234	415	614	449.1	N/A
453	493	489	234	414	613	448.6	N/A
454	492	489	234	414	612	448.0	N/A
455	491	488	234	413	612	447.5	N/A
456	490	487	234	412	611	446.7	N/A
457	489	487	233	410	610	445.9	N/A
458	488	486	233	409	610	445.2	N/A
459	487	486	233	407	609	444.5	N/A
460	486	485	233	406	609	443.8	N/A
461	485	484	233	404	608	442.9	N/A
462	485	484	233	402	607	442.0	N/A
463	484	483	233	400	606	441.1	N/A
464	482	483	233	398	605	440.1	N/A
465	481	482	233	396	603	439.0	N/A
466	480	481	233	395	603	438.4	N/A
467	479	481	233	393	601	437.4	N/A
468	478	480	233	391	601	436.6	N/A
469	478	479	233	390	600	436.0	N/A
470	477	479	233	388	600	435.3	N/A
471	476	478	232	387	599	434.4	N/A
472	475	477	232	386	600	433.8	N/A
473	474	476	232	385	600	433.3	N/A
474	473	475	232	384	599	432.6	N/A
475	472	475	232	383	600	432.1	N/A
476	471	474	232	382	599	431.3	N/A
477	470	473	231	381	598	430.7	N/A
478	469	472	231	380	595	429.6	N/A
479	468	472	231	379	597	429.3	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBIJob #: 23-241Model: Everest IIITracking #: 191Run #: 3Technician: AKDate: 5/8/2024Stove ΔT: 291

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	468	471	231	378	596	428.7	N/A
481	467	470	231	377	595	428.0	N/A
482	466	469	231	376	594	427.1	N/A
483	465	469	231	375	594	426.5	N/A
484	464	468	231	374	592	425.6	N/A
485	463	467	231	372	591	424.8	N/A
486	462	466	230	371	589	423.8	N/A
487	462	466	230	370	588	423.1	N/A
488	460	465	230	369	586	422.0	N/A
489	460	464	230	368	585	421.2	N/A
490	459	463	230	367	582	420.0	N/A
491	457	462	230	365	582	419.3	N/A
492	456	462	229	364	580	418.3	N/A
493	455	461	229	363	579	417.4	N/A
494	454	460	229	362	577	416.5	N/A
495	453	459	229	361	576	415.4	N/A
496	453	458	228	359	574	414.3	N/A
497	451	457	228	358	572	413.4	N/A
498	450	456	228	357	571	412.6	N/A
499	449	456	228	356	570	411.7	N/A
500	448	455	228	355	570	410.9	N/A
501	447	454	228	353	569	410.0	N/A
502	446	453	227	351	568	409.0	N/A
503	445	452	227	350	567	408.0	N/A
504	444	451	227	348	566	406.9	N/A
505	443	450	227	346	564	405.8	N/A
506	441	448	226	344	565	405.1	N/A
507	440	447	226	342	565	404.3	N/A
508	439	446	226	341	565	403.3	N/A
509	438	445	226	339	565	402.5	N/A
510	437	444	226	338	564	401.6	N/A
511	435	443	226	336	563	400.6	N/A
512	434	442	225	334	563	399.8	N/A
513	433	441	226	333	564	399.1	N/A
514	432	440	225	332	563	398.3	N/A
515	430	438	225	331	564	397.5	N/A
516	429	437	225	329	563	396.6	N/A
517	428	437	225	328	563	396.0	N/A
518	426	435	224	327	564	395.5	N/A
519	425	434	224	326	564	394.8	N/A
520	424	433	224	326	564	394.2	N/A
521	423	432	224	325	565	393.7	N/A
522	422	431	224	324	566	393.3	N/A
523	421	430	223	323	567	392.8	N/A
524	420	429	223	323	567	392.4	N/A
525	419	428	223	322	567	391.8	N/A
526	418	427	223	322	567	391.3	N/A
527	417	426	223	321	567	390.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: SBI
 Model: Everest III
 Run #: 3

Job #: 23-241
 Tracking #: 191
 Technician: AK
 Date: 5/8/2024

Stove ΔT: **291**

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	416	425	222	320	568	390.2	N/A
529	415	424	222	320	567	389.7	N/A
530	414	423	222	318	568	389.1	N/A
531	413	422	222	318	569	388.6	N/A
532	413	421	222	317	568	388.0	N/A
533	412	420	222	316	568	387.5	N/A
534	411	419	222	315	568	386.8	N/A
535	410	418	222	315	567	386.2	N/A
536	409	417	222	314	567	385.5	N/A
537	408	416	222	313	566	384.9	N/A
538	407	415	221	312	565	384.1	N/A
539	407	414	222	311	564	383.6	N/A
540	406	414	222	311	564	383.2	N/A
541	405	413	222	310	563	382.5	N/A
542	404	412	222	310	562	382.0	N/A
Average	476.3	486.1	228.7	552.9	565.1	461.8	N/A

LAB SAMPLE DATA - ASTM E2515

Client: SBI
Model: Everest III
Run #: 3

Job #: 23-241
Tracking #: 191
Technician: AK
Date: 5/8/2024

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01009	241.3	243.4	2.1
	B	G01010	239.3	241.2	1.9
	Amb	G00996	241.4	241.6	0.2
Probes	A	9B	117737.4	117737.7	0.3
	B	9C	116602.6	116602.8	0.2
O-rings	A	9B	3523.3	3523.5	0.2
	B	9C	3430.8	3431.2	0.4

Placed in Dessicator on: 5/6/2024

Balance Audit (mg):		200.0		200.0		200.0			
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	243.7	5/8 21:30	243.3	5/10 13:30	243.4	5/13 9:00		
	B	241.5	5/8 21:30	241.2	5/10 13:30	241.2	5/13 9:00		
		241.8	5/8 21:30	241.5	5/10 13:30	241.6	5/13 9:00		
Probes	A	117737.6	5/8 21:30	117737.7	5/10 13:30	117737.7	5/13 9:00		
	B	116602.5	5/8 21:30	116602.7	5/10 13:30	116602.8	5/13 9:00		
O-Rings	A	3523.6	5/8 21:30	3523.7	5/10 13:30	3523.5	5/13 9:00		
	B	3431.1	5/8 21:30	3431.3	5/10 13:30	3431.2	5/13 9:00		

Train A Aggregate, mg:	2.6
Train B Aggregate, mg:	2.5
Ambient, mg:	0.2

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: SBI

Model: Everest III

Run #: 3

Job #: 23-241

Tracking #: 191

Technician: AK

Date: 5/8/2024

Total Fuel Burned (kg-dry) 23.97

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	67.601	76.635	74.945	-
Average Gas Velocity in Dilution Tunnel (ft/sec)	19.2			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	51372.4			
Average Gas Meter Temperature (°F)	72.0	85.7	93.3	-
Total Sample Volume (dscf)	68.533	74.933	72.487	-
Average Tunnel Temperature (°F)	92.5			
Total Time of Test (min)	542			
Total Particulate Catch (mg)	0.2	2.6	2.5	-
Particulate Concentration, dry-standard (g/dscf)	0.0000029	0.0000347	0.0000345	-
Total PM Emissions (g)	1.35	14.75	14.65	-
Particulate Emission Rate (g/hr)	0.15	1.63	1.62	-
Emissions Factor (g/kg)	-	0.62	0.61	-
Difference from Average Total Particulate Emissions (g)	-	0.05	0.05	-
Difference from Average Total Particulate Emissions (%)	-	0.3%	0.3%	-
Difference from Average Emissions Factor (g/kg)	-	0.00	0.00	-

Final Average Results	
Total Particulate Emissions (g)	14.70
Particulate Emission Rate (g/hr)	1.63
Emissions Factor (g/kg)	0.61

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	87.8	OK
Face Velocity	< 30 ft/min	7.9	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:67.4/Max:74	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

Test Input Data

Client: SBI
Model: Everest III
Run #: 3

Job #: 23-241
Tracking #: 191
Technician: AK
Date: 5/8/2024

Traverse Data

pt	dP (in WC)
1	0.062
2	0.090
3	0.092
4	0.090
5	0.088
6	0.066
7	0.064
8	0.088
9	0.094
10	0.094
11	0.088
12	0.064
Center	0.093

Tunnel Data

Tunnel dia. (in):	12
Pitot Cp	0.99
Vs,cent (ft/s):	20.28
Vs, trav (ft/s):	18.95
Fp	0.934

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	30.01	29.93
Lab Relative Humidity (%)	46.9	44.2

Traverse Temp:	73
Static Pressure:	-0.290

Fuel Data

Fuel Properties

Species	Maple
HHV (Btu/lb)	8587
%C	50.84%
%H	6.02%
%O	41.74%

	Wet Weight	MC (%db)	Dry Weight (lbs)
Kindling	2.72		
Starter	7.79	21.53	6.41
L2	18.13	23.02	14.74
L3	12.66	24.03	10.21
L4 _s	10.22	22.50	8.34
L4 _b	20.07	23.01	16.32
Avg. Moisture (%db)		22.82	

RESULTS SUMMARY

Test Segments

	Clock	ET(min)
L1 Ignition	12:03 PM	0
L1 End	12:29 PM	26
L1 Duration		26
Fuel Consumed (lbs-wet)		7.39
Fuel Consumed (lbs-dry)		6.01

L2 Loaded	12:30 PM	27
L2 End	1:54 PM	111
L2 Duration		84
Fuel Consumed (lbs-wet)		16.17
Fuel Consumed (lbs-dry)		12.78

L3 Loaded	1:55 PM	112
L3 End	3:45 PM	222
L3 Duration		110
Fuel Consumed (lbs-wet)		11.58
Fuel Consumed (lbs-dry)		9.13

L4 Loaded	3:46 PM	223
L4 End	9:05 PM	542
L4 Duration		319
Fuel Consumed (lbs-wet)		30.55
Fuel Consumed (lbs-dry)		24.92

Total Fuel Burned (lbs-wet) 65.69

Total Fuel Burned (lbs-dry) 52.83 23.96 (kg-dry) 2.65292564 kg/hr dry

PM Results

Burn Phase:	L1	L2	L3	L4	Total
E_T :	1.8	1.2	2.4	3.3	8.7
$E_{g/hr}$:	4.2	0.8	1.3	0.62	0.96
$E_{g/kg}$:	0.66	0.20	0.59	0.29	0.36
$E_{g/MJ \text{ output}}$:	0.05	0.02	0.04	0.02	0.03
$E_{lb/mmBtu \text{ output}}$:	0.12	0.04	0.10	0.05	0.06
CO (g):	62.9	142.1	157.4	265.2	627.6
CO (g/min):	2.42	1.69	1.43	0.83	1.16
Output (BTU/hr):	78,249	50,595	27,934	26,972	33,139
Efficiency (%):	65.6%	64.5%	65.3%	66.9%	65.9%

Rolling Average Max Values

	1-min Avg.	5-min Avg.	50-min Avg
PM (g/hr)	45.2	24.0	4.2

Firebox Avg Temps (F)

L1TS _{avg(i)}	91
L1TS _{avg(f)}	405
L2TS _{avg(i)}	407
L2TS _{avg(f)}	496
L3TS _{avg(i)}	500
L3TS _{avg(f)}	432
L4TS _{avg(i)}	436
L14TS _{avg(f)}	382

Burn Time Rating (hrs)

BTR	6
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Burn Rate (lbs-wet/hr) (dry kg/hr)

BR _{L1}	17.05	6.29
BR _{L2}	11.55	4.14
BR _{L3}	6.32	2.26
BR _{L4}	5.75	2.61
OVERALL	7.27	2.65

Quality Checks

Quality Checks	Requirement	Observed	Pass/Fail
Filter/Dewpt. Temp	Dewpoint must never exceed filter temp	Max Δ -15	PASS
Filter Temp	Must be between 80 and 90F at all times	80.1 / 87.8	PASS
Ambient Temp	Must be between 65 and 90F at all times	67.4 / 74	PASS
Minimum Tunnel Flow	>600 CFM	760.3	PASS
Weight Loss	Must be >0.1 lb per 20 min	Min -0.4 lb.	PASS

L1 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/08/24
Run: 3
Control #: 191
Test Duration: 26
Output Category: L1

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.6%	70.2%
Combustion Efficiency	98.5%	98.5%
Heat Transfer Efficiency	66.7%	71.3%

Output Rate (kJ/h)	82,488	78,249	(Btu/h)
Burn Rate (kg/h)	6.29	13.87	(lb/h)
Input (kJ/h)	125,686	119,227	(Btu/h)

Test Load Weight (dry kg)	2.73	6.01	dry lb
MC wet (%)	18.67		
MC dry (%)	22.96		
Particulate (g)	N/A		
CO (g)	63		
Test Duration (h)	0.43		

Emissions	Particulate	CO
g/MJ Output	N/A	1.76
g/kg Dry Fuel	N/A	23.07
g/h	N/A	145.20
g/min	N/A	2.42
lb/MM Btu Output	N/A	4.09

Air/Fuel Ratio (A/F)	8.72
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VERSION:

2.4

4/15/2010

L2 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/08/24
Run: 3
Control #: 191
Test Duration: 84
Output Category: L2

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	64.5%	69.0%
Combustion Efficiency	98.3%	98.3%
Heat Transfer Efficiency	65.6%	70.1%

Output Rate (kJ/h)	53,336	50,595	(Btu/h)
Burn Rate (kg/h)	4.14	9.13	(lb/h)
Input (kJ/h)	82,710	78,459	(Btu/h)

Test Load Weight (dry kg)	5.80	12.78	dry lb
MC wet (%)	20.98		
MC dry (%)	26.55		
Particulate (g)	N/A		
CO (g)	142		
Test Duration (h)	1.40		

Emissions	Particulate	CO
g/MJ Output	N/A	1.90
g/kg Dry Fuel	N/A	24.51
g/h	N/A	101.51
g/min	N/A	1.69
lb/MM Btu Output	N/A	4.42

Air/Fuel Ratio (A/F)	8.36
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VERSION:

2.4

4/15/2010

L3 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/08/24
Run: 3
Control #: 191
Test Duration: 110
Output Category: L3

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	65.3%	69.8%
Combustion Efficiency	97.4%	97.4%
Heat Transfer Efficiency	67.0%	71.6%

Output Rate (kJ/h)	29,448	27,934	(Btu/h)
Burn Rate (kg/h)	2.26	4.98	(lb/h)
Input (kJ/h)	45,117	42,798	(Btu/h)

Test Load Weight (dry kg)	4.14	9.13	dry lb
MC wet (%)	21.18		
MC dry (%)	26.87		
Particulate (g)	N/A		
CO (g)	157		
Test Duration (h)	1.83		

Emissions	Particulate	CO
g/MJ Output	N/A	2.92
g/kg Dry Fuel	N/A	38.01
g/h	N/A	85.87
g/min	N/A	1.43
lb/MM Btu Output	N/A	6.78

Air/Fuel Ratio (A/F)	10.88
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VERSION:

2.4

4/15/2010

L4 Efficiency Results

Manufacturer: SBI
Model: Everest III
Date: 05/08/24
Run: 3
Control #: 191
Test Duration: 319
Output Category: L4

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	66.9%	71.6%
Combustion Efficiency	98.4%	98.4%
Heat Transfer Efficiency	68.0%	72.7%

Output Rate (kJ/h)	28,434	26,972	(Btu/h)
Burn Rate (kg/h)	2.13	4.69	(lb/h)
Input (kJ/h)	42,474	40,291	(Btu/h)

Test Load Weight (dry kg)	11.31	24.92	dry lb
MC wet (%)	18.43		
MC dry (%)	22.60		
Particulate (g)	N/A		
CO (g)	265		
Test Duration (h)	5.32		

Emissions	Particulate	CO
g/MJ Output	N/A	1.75
g/kg Dry Fuel	N/A	23.45
g/h	N/A	49.87
g/min	N/A	0.83
lb/MM Btu Output	N/A	4.08

Air/Fuel Ratio (A/F)	10.32
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VERSION:

2.4

4/15/2010

Run 3 TEOM Data

ET (min)	Ci - 1-min avg PM (ug/m ³)	Tunnel dP (in WC)	sqrtdP	Tunnel Temp (F)	Tunnel Temp - 10 minute Avg. (F)	Tunnel RH - 10 minute avg. (%)	Tunnel Velocity - Vsi (ft/s)	Tunnel Flow - Q _{sdi} (m ³ /min)	E _i (mg)	E _{g/hr, i} (g/hr)	PM 5-min Rolling Avg (g/hr)	PM 30-min Rolling Avg (g/hr)	PM (cumulative g)
0	-55	0.094	0.3066	71.6	-	-	19.035	25.240	-1.380	-0.08	-	-	0.00
1	25046	0.092	0.3033	84.7	-	-	19.062	24.668	617.825	37.07	-	-	0.62
2	13395	0.090	0.3000	110.7	-	-	19.299	23.835	319.281	19.16	-	-	0.94
3	25980	0.091	0.3017	111.4	-	-	19.418	23.952	622.276	37.34	-	-	1.56
4	7695	0.091	0.3017	96.8	-	-	19.168	24.265	186.707	11.20	20.94	-	1.74
5	1131	0.093	0.3050	91.9	-	-	19.292	24.639	27.861	1.67	21.29	-	1.77
6	582	0.093	0.3050	90.2	-	-	19.262	24.677	14.350	0.86	14.05	-	1.79
7	212	0.093	0.3050	89.7	-	-	19.254	24.688	5.238	0.31	10.28	-	1.79
8	-37	0.093	0.3050	89.5	-	-	19.250	24.693	-0.920	-0.06	2.80	-	1.79
9	-109	0.093	0.3050	89.1	92.56	-	19.243	24.702	-2.685	-0.16	0.53	-	1.79
10	-90	0.093	0.3050	89.3	94.33	-	19.247	24.697	-2.233	-0.13	0.16	-	1.79
11	-89	0.092	0.3033	89.6	94.82	-	19.148	24.557	-2.195	-0.13	-0.03	-	1.78
12	-127	0.093	0.3050	90.2	92.77	-	19.262	24.677	-3.122	-0.19	-0.13	-	1.78
13	81	0.093	0.3050	91.4	90.77	-	19.283	24.650	1.995	0.12	-0.10	-	1.78
14	139	0.092	0.3033	92.9	90.38	-	19.205	24.484	3.398	0.20	-0.03	-	1.79
15	43	0.094	0.3066	93	90.49	-	19.415	24.746	1.069	0.06	0.01	-	1.79
16	-6	0.093	0.3050	93.4	90.81	-	19.318	24.605	-0.146	-0.01	0.04	-	1.79
17	-19	0.093	0.3050	93.7	91.21	-	19.323	24.599	-0.457	-0.03	0.07	-	1.79
18	23	0.092	0.3033	93.9	91.65	-	19.223	24.462	0.559	0.03	0.05	-	1.79
19	58	0.093	0.3050	93.9	92.13	-	19.327	24.594	1.424	0.09	0.03	-	1.79
20	-56	0.095	0.3082	93.9	92.59	-	19.534	24.857	-1.388	-0.08	0.00	-	1.79
21	22	0.094	0.3066	94.1	93.04	-	19.434	24.722	0.545	0.03	0.01	-	1.79
22	8	0.091	0.3017	94.3	93.45	-	19.125	24.319	0.204	0.01	0.02	-	1.79
23	102	0.094	0.3066	94.7	93.78	-	19.445	24.708	2.509	0.15	0.04	-	1.79
24	-86	0.093	0.3050	94.7	93.96	-	19.341	24.576	-2.114	-0.13	0.00	-	1.79
25	90	0.094	0.3066	94.7	94.13	-	19.445	24.708	2.219	0.13	0.04	-	1.79
26	448	0.093	0.3050	94.9	94.28	-	19.344	24.572	11.008	0.66	0.17	-	1.80
27	9737	0.091	0.3017	102.3	95.14	-	19.262	24.146	235.094	14.11	2.98	-	2.04
28	2413	0.092	0.3033	96	95.35	-	19.259	24.415	58.918	3.54	3.66	-	2.10
29	421	0.093	0.3050	95.6	95.52	-	19.357	24.556	10.337	0.62	3.81	-	2.11
30	192	0.092	0.3033	96.1	95.74	-	19.261	24.413	4.677	0.28	3.84	-	2.11
31	114	0.092	0.3033	96.7	96	-	19.271	21.530	2.450	0.15	3.74	-	2.11
32	97	0.092	0.3033	96.9	96.26	-	19.275	24.396	2.362	0.14	0.94	-	2.12
33	401	0.091	0.3017	97.3	96.52	-	19.177	24.254	9.715	0.58	0.35	-	2.13
34	348	0.092	0.3033	97.7	96.82	-	19.289	24.378	8.476	0.51	0.33	-	2.13
35	522	0.092	0.3033	98.5	97.2	-	19.302	24.360	12.719	0.76	0.43	-	2.15
36	590	0.092	0.3033	99.2	97.63	-	19.314	24.345	14.361	0.86	0.57	-	2.16
37	959	0.091	0.3017	100	97.4	-	19.223	24.195	23.209	1.39	0.82	-	2.18
38	1257	0.091	0.3017	100.6	97.86	-	19.233	24.182	30.396	1.82	1.07	-	2.21
39	1132	0.092	0.3033	101.3	98.43	-	19.351	24.300	27.502	1.65	1.30	-	2.24
40	1031	0.093	0.3050	101.4	98.96	-	19.457	24.429	25.184	1.51	1.45	-	2.27
41	813	0.092	0.3033	101.4	99.43	-	19.352	24.297	19.759	1.19	1.51	-	2.29
42	499	0.093	0.3050	101.4	99.88	-	19.457	24.429	12.196	0.73	1.38	-	2.30
43	435	0.091	0.3017	101.3	100.28	-	19.245	24.167	10.520	0.63	1.14	-	2.31
44	242	0.092	0.3033	101.3	100.64	-	19.351	24.300	5.884	0.35	0.88	-	2.32
45	300	0.091	0.3017	101.6	100.95	-	19.250	24.161	7.249	0.43	0.67	-	2.32
46	436	0.091	0.3017	101.7	101.2	-	19.252	24.159	10.530	0.63	0.56	-	2.33
47	473	0.093	0.3050	101.7	101.37	-	19.463	24.423	11.561	0.69	0.55	-	2.34
48	319	0.093	0.3050	101.7	101.48	-	19.463	24.423	7.793	0.47	0.52	-	2.35
49	604	0.093	0.3050	102.2	101.57	-	19.471	24.412	14.750	0.88	0.62	-	2.37
50	1047	0.093	0.3050	102.4	101.67	-	19.475	24.407	25.548	1.53	0.84	-	2.39
51	1390	0.094	0.3066	103	101.83	-	19.590	24.525	34.082	2.04	1.12	-	2.43
52	1450	0.091	0.3017	103.5	102.04	-	19.283	24.120	34.968	2.10	1.41	-	2.46
53	1612	0.092	0.3033	103.8	102.29	-	19.394	24.246	39.077	2.34	1.78	-	2.50
54	2863	0.093	0.3050	104.1	102.57	-	19.504	24.371	69.777	4.19	2.44	-	2.57
55	3169	0.094	0.3066	104.7	102.88	-	19.619	24.488	77.600	4.66	3.07	-	2.65
56	2002	0.092	0.3033	102.7	102.98	-	19.375	24.269	48.589	2.92	3.24	-	2.70
57	321	0.091	0.3017	100	102.81	-	19.223	24.195	7.757	0.47	2.91	-	2.70
58	197	0.091	0.3017	98.6	102.5	-	19.199	24.226	4.776	0.29	2.50	-	2.71
59	90	0.092	0.3033	97.5	102.03	-	19.285	24.382	2.183	0.13	1.69	2.80	2.71
60	71	0.093	0.3050	96.9	101.48	-	19.379	24.528	1.739	0.10	0.78	2.80	2.71
61	62	0.093	0.3050	96.1	100.79	-	19.365	24.545	1.516	0.09	0.22	2.17	2.72
62	41	0.093	0.3050	95.7	100.01	-	19.358	24.554	1.003	0.06	0.13	1.84	2.72
63	112	0.095	0.3082	95.6	99.19	-	19.564	24.819	2.780	0.17	0.11	1.20	2.72
64	126	0.092	0.3033	95.3	98.31	-	19.247	24.431	3.072	0.18	0.12	1.00	2.72
65	153	0.094	0.3066	95.1	97.35	-	19.452	24.699	3.780	0.23	0.15	0.98	2.73
66	86	0.092	0.3033	95	96.58	-	19.242	24.437	2.108	0.13	0.15	0.97	2.73
67	198	0.093	0.3050	94.7	96.05	-	19.341	24.576	4.877	0.29	0.20	0.97	2.73
68	114	0.095	0.3082	94.6	95.65	-	19.546	24.841	2.820	0.17	0.20	0.97	2.74
69	177	0.093	0.3050	94.3	95.33	-	19.334	24.585	4.363	0.26	0.22	0.98	2.74
70	221	0.094	0.3066	94	95.04	-	19.432	24.724	5.455	0.33	0.24	0.98	2.75
71	110	0.093	0.3050	93.9	94.82	-	19.327	24.594	2.703	0.16	0.24	0.99	2.75
72	108	0.093	0.3050	93.8	94.63	-	19.325	24.596	2.654	0.16	0.22	1.00	2.75
73	166	0.092	0.3033	93.9	94.46	-	19.223	24.462	4.050	0.24	0.23	1.00	2.75
74	577	0.094	0.3066	93.8	94.31	-	19.429	24.728	14.269	0.86	0.35	1.00	2.77
75	450	0.093	0.3050	93.7	94.17	-	19.323	24.599	11.068	0.66	0.42	1.00	2.78
76	250	0.094	0.3066	93.5	94.02	-	19.424	24.735	6.194	0.37	0.46	1.02	2.79
77	45	0.093	0.3050	93.2	93.87	-	19.315	24.610	1.098	0.07	0.44	1.03	2.79
78	261	0.092	0.3033	93	93.71	-	19.207	24.481	6.383	0.38	0.47	1.03	2.79
79	308	0.093	0.3050	93	93.58	-	19.311	24.614	7.593	0.46	0.39	1.03	2.80
80	328	0.093	0.3050	92.8	93.46	-	19.308	24.619	8.077	0.48	0.35	1.04	2.81
81	413	0.093	0.3050	92.7	93.34	-	19.306	24.621	10.160	0.61	0.40	1.05	2.82
82	409	0.094	0.3066	92.7	93.23	-	19.409	24.753	10.127	0.61	0.51	1.06	2.83
83	310	0.093	0.3050	92.5	93.09	-	19.302	24.625	7.644	0.46	0.52	1.06	2.84
84	306	0.094	0.3066	92.5	92.96	-	19.406	24.757	7.587	0.46	0.52	1.08	2.84

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85	414	0.093	0.3050	92.6	92.85	19.304	24.623	10.203	0.61	0.55	1.08	2.86
86	253	0.094	0.3066	92.6	92.76	19.408	24.755	6.259	0.38	0.50	1.08	2.86
87	366	0.094	0.3066	92.7	92.71	19.409	24.753	9.070	0.54	0.49	0.85	2.87
88	489	0.093	0.3050	92.7	92.68	19.306	24.621	12.034	0.72	0.54	0.79	2.88
89	413	0.094	0.3066	92.5	92.63	19.406	24.757	10.227	0.61	0.57	0.79	2.89
90	306	0.093	0.3050	92.5	92.6	19.302	24.625	7.535	0.45	0.54	0.80	2.90
91	422	0.094	0.3066	92.5	92.58	19.406	24.757	10.451	0.63	0.59	0.81	2.91
92	532	0.095	0.3082	92.5	92.56	19.509	24.889	13.231	0.79	0.64	0.81	2.92
93	436	0.093	0.3050	92.5	92.56	19.302	24.625	10.743	0.64	0.63	0.81	2.93
94	299	0.092	0.3033	92.3	92.54	19.195	24.497	7.328	0.44	0.59	0.82	2.94
95	163	0.092	0.3033	92.3	92.51	19.195	24.497	4.000	0.24	0.55	0.82	2.95
96	186	0.093	0.3050	92.1	92.46	19.295	24.634	4.575	0.27	0.48	0.81	2.95
97	220	0.094	0.3066	92	92.39	19.397	24.769	5.450	0.33	0.39	0.79	2.96
98		0.094	0.3066	92.2	92.34					0.32	0.76	
99		0.094	0.3066	92	92.29					0.28	0.74	
100		0.094	0.3066	91.8	92.22					0.30	0.73	
101		0.092	0.3033	92	92.17					0.33	0.72	
102		0.094	0.3066	91.6	92.08						0.72	
103	-625	0.095	0.3082	91.5	91.98	19.491	24.911	-15.569	-0.93	-0.93	0.72	2.94
104	-402	0.095	0.3082	91.4	91.89	19.490	24.914	-10.010	-0.60	-0.77	0.73	2.93
105	-105	0.091	0.3017	91.2	91.78	19.071	24.388	-2.553	-0.15	-0.56	0.70	2.93
106	-60	0.093	0.3050	91	91.67	19.276	24.659	-1.491	-0.09	-0.44	0.68	2.93
107	-15	0.095	0.3082	90.9	91.56	19.481	24.925	-0.379	-0.02	-0.36	0.66	2.93
108	329	0.093	0.3050	90.8	91.42	19.273	24.663	8.118	0.49	-0.08	0.65	2.93
109	318	0.093	0.3050	90.9	91.31	19.275	24.661	7.849	0.47	0.14	0.63	2.94
110	355	0.094	0.3066	91	91.23	19.380	24.791	8.790	0.53	0.27	0.61	2.95
111	627	0.093	0.3050	90.5	91.08	19.268	24.670	15.472	0.93	0.48	0.58	2.97
112	7484	0.092	0.3033	98.3	91.75	19.299	24.365	182.344	10.94	2.67	0.55	3.15
113	1175	0.094	0.3066	98.8	92.48	19.516	24.617	28.935	1.74	2.92	0.53	3.18
114	3241	0.092	0.3033	100.6	93.4	19.339	24.315	78.793	4.73	3.77	0.65	3.26
115	7050	0.091	0.3017	102.7	94.55	19.269	24.137	170.157	10.21	5.71	0.60	3.43
116	7605	0.092	0.3033	102.5	95.7	19.371	24.274	184.605	11.08	7.74	0.63	3.61
117	3657	0.092	0.3033	97.2	96.33	19.280	24.389	89.191	5.35	6.62	0.82	3.70
118	1299	0.092	0.3033	95.2	96.77	19.245	24.433	31.726	1.90	6.65	1.02	3.73
119	1336	0.094	0.3066	94.5	97.13	19.441	24.713	33.007	1.98	6.10	1.12	3.77
120	1207	0.093	0.3050	94.1	97.44	19.330	24.590	29.668	1.78	4.42	1.15	3.79
121	1020	0.094	0.3066	93.9	97.78	19.431	24.726	25.211	1.51	2.51	1.19	3.82
122	695	0.093	0.3050	93.8	97.33	19.325	24.596	17.096	1.03	1.64	1.22	3.84
123	626	0.091	0.3017	93.7	96.82	19.115	24.333	15.221	0.91	1.44	1.25	3.85
124	476	0.094	0.3066	93.5	96.11	19.424	24.735	11.766	0.71	1.19	1.26	3.86
125	373	0.092	0.3033	93.4	95.18	19.214	24.473	9.129	0.55	0.94	1.28	3.87
126	292	0.091	0.3017	93.2	94.25	19.106	24.344	7.100	0.43	0.72	1.29	3.88
127	239	0.092	0.3033	93.4	93.87	19.214	24.473	5.849	0.35	0.59	1.29	3.89
128	96	0.092	0.3033	93.2	93.67	19.211	24.477	2.342	0.14	0.43	1.30	3.89
129	106	0.093	0.3050	93.2	93.54	19.315	24.610	2.599	0.16	0.32	1.30	3.89
130	214	0.092	0.3033	93.1	93.44	19.209	24.479	5.242	0.31	0.28	1.29	3.90
131	-29	0.092	0.3033	93.2	93.37	19.211	24.477	-0.709	-0.04	0.18	1.29	3.90
132	-132	0.093	0.3050	93.2	93.31	19.315	24.610	-3.247	-0.19	0.07	1.30	3.89
133	-37	0.092	0.3033	93.2	93.26	19.211	24.477	-0.902	-0.05	0.04	1.29	3.89
134	-46	0.092	0.3033	93.2	93.23	19.211	24.477	-1.125	-0.07	-0.01	1.27	3.89
135	41	0.092	0.3033	93.1	93.2	19.209	24.479	1.013	0.06	-0.06	1.26	3.89
136	1	0.092	0.3033	93	93.18	19.207	24.481	0.032	0.00	-0.05	1.25	3.89
137	-4	0.093	0.3050	93	93.14	19.311	24.614	-0.091	-0.01	-0.01	1.25	3.89
138	-15	0.093	0.3050	92.9	93.11	19.309	24.616	-0.378	-0.02	-0.01	1.24	3.89
139	33	0.094	0.3066	92.8	93.07	19.411	24.751	0.828	0.05	0.02	1.23	3.89
140	-56	0.092	0.3033	92.8	93.04	19.204	24.486	-1.371	-0.08	-0.01	1.22	3.89
141	-19	0.094	0.3066	92.8	93	19.411	24.751	-0.482	-0.03	-0.02	1.21	3.89
142	-23	0.094	0.3066	92.5	92.93	19.406	24.757	-0.562	-0.03	-0.02	1.20	3.89
143	-14	0.093	0.3050	92.6	92.87	19.304	24.623	-0.355	-0.02	-0.02	1.19	3.89
144	19	0.092	0.3033	92.6	92.81	19.200	24.490	0.457	0.03	-0.03	1.18	3.89
145	11	0.092	0.3033	92.4	92.74	19.197	24.495	0.265	0.02	-0.01	1.17	3.89
146	75	0.094	0.3066	92.2	92.66	19.401	24.764	1.857	0.11	0.02	1.16	3.89
147	18	0.092	0.3033	92.1	92.57	19.191	24.501	0.444	0.03	0.03	1.15	3.89
148	-33	0.093	0.3050	92	92.48	19.294	24.636	-0.824	-0.05	0.03	1.14	3.89
149	54	0.092	0.3033	92	92.4	19.190	24.504	1.328	0.08	0.04	1.13	3.89
150	30	0.094	0.3066	91.6	92.28	19.390	24.778	0.751	0.05	0.04	1.12	3.89
151	3	0.093	0.3050	91.5	92.15	19.285	24.648	0.079	0.00	0.02	1.11	3.89
152	115	0.094	0.3066	91.5	92.05	19.388	24.780	2.851	0.17	0.05	1.10	3.90
153	103	0.093	0.3050	91.4	91.93	19.283	24.650	2.550	0.15	0.09	1.09	3.90
154	24	0.094	0.3066	91.2	91.79	19.383	24.787	0.595	0.04	0.08	1.08	3.90
155	34	0.095	0.3082	91.1	91.66	19.484	24.920	0.847	0.05	0.08	1.08	3.90
156	72	0.094	0.3066	91	91.54	19.380	24.791	1.796	0.11	0.10	1.07	3.90
157	68	0.093	0.3050	91	91.43	19.276	24.659	1.666	0.10	0.09	1.07	3.90
158	195	0.092	0.3033	90.7	91.3	19.167	24.533	4.781	0.29	0.12	1.05	3.91
159	39	0.093	0.3050	90.8	91.18	19.273	24.663	0.956	0.06	0.12	1.03	3.91
160	35	0.093	0.3050	90.7	91.09	19.271	24.666	0.862	0.05	0.12	1.02	3.91
161	73	0.093	0.3050	90.5	90.99	19.268	24.670	1.797	0.11	0.12	1.00	3.91
162	68	0.094	0.3066	90.5	90.89	19.371	24.802	1.692	0.10	0.12	0.99	3.91
163	208	0.094	0.3066	90.4	90.79	19.369	24.805	5.149	0.31	0.13	1.00	3.92
164	239	0.093	0.3050	90.3	90.7	19.264	24.675	5.889	0.35	0.18	1.02	3.92
165	154	0.094	0.3066	90.1	90.6	19.364	24.811	3.830	0.23	0.22	1.03	3.93
166	189	0.094	0.3066	90	90.5	19.362	24.814	4.700	0.28	0.26	1.03	3.93
167	144	0.093	0.3050	89.9	90.39	19.257	24.684	3.564	0.21	0.28	1.04	3.94
168	187	0.092	0.3033	89.8	90.3	19.151	24.553	4.583	0.27	0.27	1.03	3.94
169	173	0.095	0.3082	89.7	90.19	19.459	24.952	4.318	0.26	0.25	1.03	3.95
170	336	0.093	0.3050	89.7	90.09	19.254	24.688	8.306	0.50	0.31	1.02	3.95
171	256	0.094	0.3066	89.6	90	19.355	24.823	6.364	0.38	0.33	1.01	3.96
172	317	0.094	0.3066	89.5	89.9	19.353	24.825	7.871	0.47	0.38	0.83	3.97

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173	202	0.093	0.3050	89.4	89.8		19.248	24.695	4.976	0.30	0.38	0.81	3.97
174	192	0.093	0.3050	89.3	89.7		19.247	24.697	4.744	0.28	0.39	0.74	3.98
175	284	0.094	0.3066	89.4	89.63		19.351	24.827	7.039	0.42	0.37	0.57	3.98
176	79	0.092	0.3033	89.4	89.57		19.144	24.562	1.928	0.12	0.32	0.38	3.99
177	106	0.093	0.3050	89.2	89.5		19.245	24.699	2.622	0.16	0.26	0.29	3.99
178	188	0.094	0.3066	89.3	89.45		19.350	24.829	4.678	0.28	0.25	0.26	3.99
179	175	0.092	0.3033	89.2	89.4		19.141	24.566	4.303	0.26	0.25	0.23	4.00
180	145	0.094	0.3066	89.1	89.34		19.346	24.834	3.613	0.22	0.21	0.21	4.00
181	223	0.094	0.3066	89.2	89.3		19.348	24.832	5.535	0.33	0.25	0.18	4.01
182	71	0.096	0.3098	89.1	89.26		19.551	25.097	1.794	0.11	0.24	0.17	4.01
183	126	0.094	0.3066	89.1	89.23		19.346	24.834	3.119	0.19	0.22	0.16	4.01
184	99	0.093	0.3050	89.1	89.21		19.243	24.702	2.453	0.15	0.20	0.15	4.02
185	42	0.092	0.3033	89.1	89.18		19.139	24.568	1.042	0.06	0.17	0.14	4.02
186	199	0.092	0.3033	89.2	89.16		19.141	24.566	4.891	0.29	0.16	0.14	4.02
187	113	0.095	0.3082	89.2	89.16		19.451	24.963	2.813	0.17	0.17	0.13	4.02
188	164	0.094	0.3066	89.2	89.15		19.348	24.832	4.079	0.24	0.18	0.14	4.03
189	263	0.093	0.3050	89.4	89.17		19.248	24.695	6.498	0.39	0.23	0.14	4.03
190	240	0.094	0.3066	89.4	89.2		19.351	24.827	5.956	0.36	0.29	0.14	4.04
191	598	0.093	0.3050	89.5	89.23		19.250	24.693	14.762	0.89	0.41	0.14	4.06
192	231	0.095	0.3082	89.4	89.26		19.454	24.959	5.759	0.35	0.44	0.15	4.06
193	59	0.094	0.3066	89.2	89.27		19.348	24.832	1.461	0.09	0.41	0.17	4.06
194		0.092	0.3033	89.1	89.27						0.42	0.18	
195		0.093	0.3050	89.1	89.27						0.44	0.18	
196		0.093	0.3050	89	89.25						0.22	0.18	
197		0.096	0.3098	88.9	89.22						0.09	0.18	
198		0.094	0.3066	88.7	89.17							0.19	
199		0.092	0.3033	88.8	89.11							0.19	
200	-277	0.093	0.3050	88.8	89.05		19.238	24.708	-6.834	-0.41	-0.41	0.19	4.06
201	-127	0.093	0.3050	88.7	88.97		19.236	24.711	-3.139	-0.19	-0.30	0.20	4.05
202	237	0.095	0.3082	88.7	88.9		19.442	24.975	5.922	0.36	-0.08	0.19	4.06
203	416	0.094	0.3066	88.6	88.84		19.337	24.845	10.337	0.62	0.09	0.19	4.07
204	986	0.094	0.3066	88.5	88.78		19.336	24.848	24.488	1.47	0.37	0.19	4.09
205	1572	0.095	0.3082	88.3	88.7		19.435	24.984	39.283	2.36	0.92	0.21	4.13
206	1679	0.094	0.3066	88.2	88.62		19.330	24.854	41.740	2.50	1.46	0.23	4.17
207	1915	0.095	0.3082	88	88.53		19.429	24.991	47.858	2.87	1.96	0.28	4.22
208	1838	0.096	0.3098	87.9	88.45		19.530	25.124	46.176	2.77	2.39	0.33	4.27
209	2079	0.095	0.3082	87.7	88.34		19.424	24.998	51.962	3.12	2.72	0.38	4.32
210	2403	0.094	0.3066	87.6	88.22		19.320	24.868	59.755	3.59	2.97	0.43	4.38
211	2377	0.097	0.3114	87.7	88.12		19.627	25.259	60.034	3.60	3.19	0.49	4.44
212	2539	0.096	0.3098	87.6	88.01		19.524	25.131	63.805	3.83	3.38	0.56	4.50
213	3000	0.094	0.3066	87.6	87.91		19.320	24.868	74.599	4.48	3.72	0.62	4.58
214	3281	0.096	0.3098	87.5	87.81		19.522	25.133	82.454	4.95	4.09	0.70	4.66
215	3268	0.095	0.3082	87.4	87.72		19.419	25.005	81.723	4.90	4.35	0.78	4.74
216	3283	0.095	0.3082	87.2	87.62		19.415	25.009	82.107	4.93	4.62	0.88	4.82
217	3111	0.092	0.3033	87.1	87.53		19.104	24.613	76.564	4.59	4.77	0.97	4.90
218	3307	0.094	0.3066	87	87.44		19.309	24.882	82.272	4.94	4.86	1.06	4.98
219	3823	0.094	0.3066	86.9	87.36		19.307	24.884	95.142	5.71	5.01	1.14	5.08
220	3906	0.094	0.3066	86.8	87.28		19.306	24.886	97.215	5.83	5.20	1.24	5.18
221	4228	0.094	0.3066	86.6	87.17		19.302	24.891	105.250	6.32	5.48	1.35	5.28
222	4484	0.093	0.3050	86.5	87.06		19.197	24.760	111.022	6.66	5.89	1.46	5.39
223	7042	0.092	0.3033	100.2	88.32		19.332	24.323	171.294	10.28	6.96	1.57	5.56
224	26919	0.091	0.3017	106.3	90.2		19.331	24.060	647.675	38.86	13.59	1.69	6.21
225	31237	0.093	0.3050	116.3	93.09		19.714	24.111	753.159	45.19	21.46	1.89	6.96
226	13444	0.091	0.3017	134.4	97.81		19.805	23.484	315.717	18.94	23.99	2.63	7.28
227	2213	0.089	0.2983	151.4	104.24		19.864	22.899	50.670	3.04	23.26	3.49	7.33
228	3386	0.089	0.2983	123.4	107.88		19.404	23.443	79.381	4.76	22.16	3.85	7.41
229	1044	0.093	0.3050	111.6	110.35		19.633	24.210	25.281	1.52	14.69	3.91	7.44
230	978	0.092	0.3033	107.9	112.46		19.464	24.158	23.632	1.42	5.94	3.99	7.46
231	905	0.092	0.3033	107.1	114.51		19.450	24.175	21.890	1.31	2.41	4.01	7.48
232	2757	0.093	0.3050	107.4	116.6		19.561	24.299	66.986	4.02	2.61	4.03	7.55
233	2480	0.092	0.3033	103	116.88		19.380	24.263	60.169	3.61	2.38	4.05	7.61
234	259	0.096	0.3098	99.6	116.21		19.737	24.860	6.451	0.39	2.15	4.12	7.61
235	-366	0.093	0.3050	98.2	114.4		19.402	24.499	-8.959	-0.54	1.76	4.18	7.61
236	-438	0.092	0.3033	97.4	110.7		19.283	24.385	-10.690	-0.64	1.37	4.19	7.59
237	-214	0.093	0.3050	97	105.26		19.381	24.526	-5.239	-0.31	0.50	4.17	7.59
238	71	0.092	0.3033	97	102.62		19.276	24.393	1.739	0.10	-0.20	4.15	7.59
239	437	0.093	0.3050	96.9	101.15		19.379	24.528	10.715	0.64	-0.15	4.14	7.60
240	430	0.093	0.3050	96.9	100.05		19.379	24.528	10.546	0.63	0.08	4.14	7.61
241	612	0.094	0.3066	96.8	99.02		19.481	24.661	15.093	0.91	0.39	4.15	7.63
242	520	0.091	0.3017	96.8	97.96		19.168	24.265	12.622	0.76	0.61	4.16	7.64
243	443	0.094	0.3066	97	97.36		19.485	24.657	10.926	0.66	0.72	4.17	7.65
244	290	0.093	0.3050	96.9	97.09		19.379	24.528	7.117	0.43	0.68	4.18	7.66
245	216	0.094	0.3066	97	96.97		19.485	24.657	5.330	0.32	0.61	4.19	7.66
246	103	0.094	0.3066	96.9	96.92		19.483	24.659	2.531	0.15	0.46	4.20	7.67
247	145	0.093	0.3050	97	96.92		19.381	24.526	3.547	0.21	0.35	4.20	7.67
248	77	0.096	0.3098	97.1	96.93		19.693	24.916	1.907	0.11	0.25	4.20	7.67
249	10	0.093	0.3050	97.2	96.96		19.384	24.521	0.253	0.02	0.16	4.19	7.67
250	-78	0.093	0.3050	97.4	97.01		19.388	24.517	-1.923	-0.12	0.08	4.19	7.67
251	-139	0.094	0.3066	97.4	97.07		19.492	24.648	-3.420	-0.21	0.00	4.17	7.67
252	-136	0.095	0.3082	97.5	97.14		19.597	24.777	-3.380	-0.20	-0.08	4.16	7.66
253	-206	0.094	0.3066	97.4	97.18		19.492	24.648	-5.076	-0.30	-0.16	4.16	7.66
254	-105	0.095	0.3082	97.4	97.23		19.595	24.779	-2.594	-0.16	-0.20	4.08	7.66
255	-143	0.095	0.3082	97.5	97.28		19.597	24.777	-3.531	-0.21	-0.22	4.00	7.65
256	-218	0.093	0.3050	97.5	97.34		19.390	24.515	-5.346	-0.32	-0.24	3.92	7.65
257	-132	0.092	0.3033	97.3	97.37		19.282	24.387	-3.217	-0.19	-0.24	3.85	7.64
258	-211	0.093	0.3050	97.4	97.4		19.388	24.517	-5.170	-0.31	-0.24	3.77	7.64
259	-70	0.093	0.3050	97.4	97.42		19.388	24.517	-1.722	-0.10	-0.23	3.70	7.64
260	-155	0.093	0.3050	97.4	97.42		19.388	24.517	-3.793	-0.23	-0.23	3.71	7.63

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261	-183	0.094	0.3066	97.4	97.42		19.492	24.648	-4.518	-0.27	-0.22	3.71	7.63
262	-130	0.093	0.3050	97.5	97.42		19.390	24.515	-3.176	-0.19	-0.22	3.70	7.62
263	-173	0.093	0.3050	97.7	97.45		19.393	24.510	-4.242	-0.25	-0.21	3.68	7.62
264	-117	0.093	0.3050	97.7	97.48		19.393	24.510	-2.867	-0.17	-0.22	3.65	7.62
265	-134	0.094	0.3066	97.6	97.49		19.495	24.644	-3.293	-0.20	-0.22	3.61	7.61
266	-129	0.094	0.3066	97.7	97.51		19.497	24.642	-3.178	-0.19	-0.20	3.56	7.61
267	-74	0.096	0.3098	97.8	97.56		19.705	24.900	-1.850	-0.11	-0.19	3.51	7.61
268	-124	0.094	0.3066	97.7	97.59		19.497	24.642	-3.048	-0.18	-0.17	3.46	7.61
269	-112	0.093	0.3050	97.8	97.63		19.395	24.508	-2.750	-0.17	-0.17	3.40	7.60
270	-58	0.095	0.3082	97.9	97.68		19.604	24.768	-1.427	-0.09	-0.15	3.34	7.60
271	-141	0.092	0.3033	97.8	97.72		19.290	24.376	-3.444	-0.21	-0.15	3.27	7.60
272	-151	0.092	0.3033	97.9	97.76		19.292	24.374	-3.669	-0.22	-0.17	3.21	7.60
273	-83	0.093	0.3050	97.9	97.78		19.397	24.506	-2.032	-0.12	-0.16	3.12	7.59
274	-176	0.092	0.3033	97.9	97.8		19.292	24.374	-4.295	-0.26	-0.18	3.04	7.59
275	-68	0.092	0.3033	97.8	97.82		19.290	24.376	-1.653	-0.10	-0.18	2.95	7.59
276	-24	0.092	0.3033	97.8	97.83		19.290	24.376	-0.585	-0.04	-0.15	2.86	7.59
277	-13	0.092	0.3033	97.7	97.82		19.289	24.378	-0.325	-0.02	-0.11	2.78	7.59
278	76	0.093	0.3050	97.7	97.82		19.393	24.510	1.852	0.11	-0.06	2.69	7.59
279	67	0.092	0.3033	97.7	97.81		19.289	24.378	1.623	0.10	0.01	2.59	7.59
280	68	0.091	0.3017	97.6	97.78		19.182	24.247	1.637	0.10	0.05	2.50	7.59
281	54	0.092	0.3033	97.4	97.74		19.283	24.385	1.324	0.08	0.07	2.39	7.59
282	179	0.093	0.3050	97.5	97.7		19.390	24.515	4.377	0.26	0.13	2.28	7.60
283	83	0.093	0.3050	97.7	97.68		19.393	24.510	2.034	0.12	0.13	2.10	7.60
284	142	0.092	0.3033	97.6	97.65		19.287	24.380	3.473	0.21	0.15	1.43	7.60
285	249	0.093	0.3050	97.6	97.63		19.391	24.512	6.097	0.37	0.21	0.66	7.61
286	308	0.092	0.3033	97.7	97.62		19.289	24.378	7.497	0.45	0.28	0.33	7.62
287	264	0.093	0.3050	97.6	97.61		19.391	24.512	6.475	0.39	0.31	0.29	7.62
288	294	0.093	0.3050	97.6	97.6		19.391	24.512	7.201	0.43	0.37	0.21	7.63
289	180	0.092	0.3033	97.9	97.62		19.292	24.374	4.398	0.26	0.38	0.19	7.63
290	261	0.093	0.3050	97.7	97.63		19.393	24.510	6.394	0.38	0.38	0.18	7.64
291	269	0.090	0.3000	97.7	97.66		19.078	24.112	6.485	0.39	0.37	0.16	7.65
292	226	0.093	0.3050	97.8	97.69		19.395	24.508	5.547	0.33	0.36	0.10	7.65
293	254	0.092	0.3033	97.7	97.69		19.289	24.378	6.183	0.37	0.35	0.04	7.66
294	232	0.092	0.3033	97.6	97.69		19.287	24.380	5.651	0.34	0.36	0.04	7.66
295	221	0.093	0.3050	97.5	97.68		19.390	24.515	5.423	0.33	0.35	0.06	7.67
296	227	0.093	0.3050	97.5	97.66		19.390	24.515	5.573	0.33	0.34	0.07	7.68
297	240	0.094	0.3066	97.5	97.65		19.494	24.646	5.918	0.36	0.34	0.08	7.68
298	361	0.092	0.3033	97.6	97.65		19.287	24.380	8.812	0.53	0.38	0.09	7.69
299	306	0.094	0.3066	97.5	97.61		19.494	24.646	7.552	0.45	0.40	0.08	7.70
300	388	0.093	0.3050	97.4	97.58		19.388	24.517	9.517	0.57	0.45	0.08	7.71
301	558	0.092	0.3033	97.3	97.54		19.282	24.387	13.619	0.82	0.55	0.07	7.72
302	378	0.091	0.3017	97.5	97.51		19.180	24.249	9.159	0.55	0.58	0.07	7.73
303	566	0.091	0.3017	97.5	97.49		19.180	24.249	13.714	0.82	0.64	0.07	7.74
304	567	0.092	0.3033	97.5	97.48		19.285	24.382	13.818	0.83	0.72	0.07	7.76
305	731	0.090	0.3000	97.6	97.49		19.076	24.114	17.625	1.06	0.82	0.08	7.78
306	738	0.090	0.3000	97.6	97.5		19.076	24.114	17.797	1.07	0.87	0.09	7.79
307	590	0.091	0.3017	97.6	97.51		19.182	24.247	14.314	0.86	0.93	0.11	7.81
308	591	0.092	0.3033	97.5	97.5		19.285	24.382	14.414	0.86	0.94	0.13	7.82
309	980	0.092	0.3033	97.3	97.48		19.282	24.387	23.897	1.43	1.06	0.14	7.85
310	802	0.093	0.3050	97.4	97.48		19.388	24.517	19.672	1.18	1.08	0.16	7.87
311	726	0.093	0.3050	97.5	97.5		19.390	24.515	17.792	1.07	1.08	0.19	7.88
312	815	0.090	0.3000	97.5	97.5		19.074	24.116	19.658	1.18	1.15	0.21	7.90
313	1344	0.092	0.3033	97.5	97.5		19.285	24.382	32.758	1.97	1.37	0.23	7.94
314	1379	0.091	0.3017	97.7	97.52		19.183	24.245	33.434	2.01	1.48	0.26	7.97
315	2047	0.091	0.3017	97.9	97.55		19.187	24.241	49.610	2.98	1.84	0.29	8.02
316	1501	0.091	0.3017	98	97.59		19.189	24.239	36.379	2.18	2.06	0.33	8.05
317	1022	0.090	0.3000	97.9	97.62		19.081	24.107	24.645	1.48	2.12	0.39	8.08
318	951	0.093	0.3050	97.9	97.66		19.397	24.506	23.311	1.40	2.01	0.43	8.10
319	654	0.091	0.3017	97.8	97.71		19.185	24.243	15.847	0.95	1.80	0.46	8.12
320	564	0.091	0.3017	97.7	97.74		19.183	24.245	13.667	0.82	1.37	0.49	8.13
321	489	0.093	0.3050	97.6	97.75		19.391	24.512	11.978	0.72	1.07	0.51	8.14
322	652	0.091	0.3017	97.5	97.75		19.180	24.249	15.805	0.95	0.97	0.53	8.16
323	684	0.094	0.3066	97.5	97.75		19.494	24.646	16.866	1.01	0.89	0.54	8.18
324	903	0.091	0.3017	97.5	97.73		19.180	24.249	21.891	1.31	0.96	0.56	8.20
325	807	0.092	0.3033	97.7	97.71		19.289	24.378	19.662	1.18	1.03	0.58	8.22
326	922	0.092	0.3033	97.7	97.68		19.289	24.378	22.475	1.35	1.16	0.61	8.24
327	792	0.089	0.2983	97.6	97.65		18.970	23.979	19.000	1.14	1.20	0.63	8.26
328	849	0.090	0.3000	97.5	97.61		19.074	24.116	20.469	1.23	1.24	0.66	8.28
329	525	0.091	0.3017	97.6	97.59		19.182	24.247	12.730	0.76	1.13	0.68	8.29
330	619	0.091	0.3017	97.5	97.57		19.180	24.249	15.006	0.90	1.08	0.70	8.31
331	862	0.092	0.3033	97.4	97.55		19.283	24.385	21.010	1.26	1.06	0.72	8.33
332	1039	0.092	0.3033	97.4	97.54		19.283	24.385	25.334	1.52	1.13	0.74	8.35
333	919	0.091	0.3017	97.5	97.54		19.180	24.249	22.294	1.34	1.16	0.76	8.38
334	974	0.090	0.3000	97.6	97.55		19.076	24.114	23.488	1.41	1.29	0.79	8.40
335	925	0.093	0.3050	97.5	97.53		19.390	24.515	22.680	1.36	1.38	0.82	8.42
336	1122	0.092	0.3033	97.6	97.52		19.287	24.380	27.367	1.64	1.45	0.84	8.45
337	1073	0.092	0.3033	97.5	97.51		19.285	24.382	26.162	1.57	1.46	0.87	8.48
338	1335	0.093	0.3050	97.5	97.51		19.390	24.515	32.720	1.96	1.59	0.89	8.51
339	1457	0.092	0.3033	97.6	97.51		19.287	24.380	35.519	2.13	1.73	0.92	8.54
340	1557	0.091	0.3017	97.5	97.51		19.180	24.249	37.750	2.27	1.91	0.95	8.58
341	861	0.092	0.3033	97.4	97.51		19.283	24.385	21.001	1.26	1.84	0.99	8.60
342	768	0.093	0.3050	97.2	97.49		19.384	24.521	18.830	1.13	1.75	1.02	8.62
343	592	0.093	0.3050	97.2	97.46		19.384	24.521	14.510	0.87	1.53	1.04	8.64
344	700	0.093	0.3050	97.2	97.42		19.384	24.521	17.158	1.03	1.31	1.06	8.65
345	648	0.093	0.3050	97.1	97.38		19.383	24.523	15.896	0.95	1.05	1.06	8.67
346	261	0.093	0.3050	97.1	97.33		19.383	24.523	6.388	0.38	0.87	1.07	8.68
347	310	0.092	0.3033	97	97.28		19.276	24.393	7.560	0.45	0.74	1.08	8.68
348	218	0.091	0.3017	96.8	97.21		19.168	24.265	5.292	0.32	0.63	1.08	8.69

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349	357	0.092	0.3033	96.6	97.11		19.270	24.402	8.711	0.52	0.53	1.09	8.70
350	471	0.093	0.3050	96.5	97.01		19.372	24.537	11.551	0.69	0.47	1.08	8.71
351	426	0.092	0.3033	96.3	96.9		19.264	24.409	10.404	0.62	0.52	1.09	8.72
352	86	0.092	0.3033	96.2	96.8		19.263	24.411	2.103	0.13	0.46	1.09	8.72
353	-6	0.092	0.3033	95.9	96.67		19.257	24.417	-0.148	-0.01	0.39	1.10	8.72
354	-18	0.093	0.3050	95.8	96.53		19.360	24.552	-0.454	-0.03	0.28	1.09	8.72
355	29	0.092	0.3033	95.8	96.4		19.256	24.420	0.702	0.04	0.15	1.09	8.72
356	128	0.093	0.3050	95.6	96.25		19.357	24.556	3.133	0.19	0.06	1.08	8.73
357	58	0.094	0.3066	95.4	96.09		19.457	24.693	1.435	0.09	0.06	1.08	8.73
358	87	0.091	0.3017	95.2	95.93		19.140	24.300	2.103	0.13	0.08	1.07	8.73
359	47	0.092	0.3033	95	95.77		19.242	24.437	1.147	0.07	0.10	1.06	8.73
360	65	0.090	0.3000	94.9	95.61		19.030	24.172	1.560	0.09	0.11	1.06	8.73
361	58	0.091	0.3017	94.8	95.46		19.134	24.308	1.399	0.08	0.09	1.04	8.73
362	124	0.092	0.3033	94.6	95.3		19.235	24.446	3.021	0.18	0.11	1.04	8.74
363	194	0.092	0.3033	94.4	95.15		19.231	24.451	4.742	0.28	0.14	1.02	8.74
364	109	0.092	0.3033	94.2	94.99		19.228	24.455	2.676	0.16	0.16	1.01	8.74
365	-34	0.093	0.3050	94.2	94.83		19.332	24.587	-0.836	-0.05	0.13	1.00	8.74
366	12	0.092	0.3033	94	94.67		19.224	24.459	0.300	0.02	0.12	0.98	8.74
367	55	0.091	0.3017	93.6	94.49		19.113	24.335	1.348	0.08	0.10	0.97	8.74
368	49	0.091	0.3017	93.7	94.34		19.115	24.333	1.197	0.07	0.06	0.95	8.75
369	-30	0.091	0.3017	93.5	94.19		19.111	24.337	-0.739	-0.04	0.02	0.93	8.74
370	-8	0.093	0.3050	93.3	94.03		19.316	24.607	-0.208	-0.01	0.02	0.91	8.74
371	40	0.094	0.3066	93.1	93.86		19.417	24.744	0.983	0.06	0.03	0.89	8.75
372	-34	0.093	0.3050	93.1	93.71		19.313	24.612	-0.847	-0.05	0.00	0.87	8.74
373	42	0.094	0.3066	92.9	93.56		19.413	24.748	1.046	0.06	0.00	0.84	8.75
374	31	0.092	0.3033	92.7	93.41		19.202	24.488	0.754	0.05	0.02	0.80	8.75
375	20	0.093	0.3050	92.7	93.26		19.306	24.621	0.502	0.03	0.03	0.75	8.75
376	-8	0.093	0.3050	92.5	93.11		19.302	24.625	-0.203	-0.01	0.02	0.72	8.75
377	66	0.093	0.3050	92.5	93		19.302	24.625	1.624	0.10	0.04	0.69	8.75
378	58	0.093	0.3050	92.4	92.87		19.301	24.628	1.429	0.09	0.05	0.67	8.75
379	83	0.093	0.3050	92.3	92.75		19.299	24.630	2.042	0.12	0.06	0.65	8.75
380	67	0.090	0.3000	92	92.62		18.980	24.236	1.623	0.10	0.08	0.64	8.75
381	39	0.093	0.3050	92	92.51		19.294	24.636	0.967	0.06	0.09	0.63	8.75
382	18	0.094	0.3066	91.9	92.39		19.395	24.771	0.447	0.03	0.08	0.61	8.75
383	95	0.093	0.3050	91.8	92.28		19.290	24.641	2.333	0.14	0.09	0.60	8.76
384	27	0.091	0.3017	91.6	92.17		19.078	24.379	0.653	0.04	0.07	0.57	8.76
385	-37	0.092	0.3033	91.6	92.06		19.183	24.513	-0.909	-0.05	0.04	0.56	8.76
386	-12	0.091	0.3017	91.5	91.96		19.077	24.381	-0.283	-0.02	0.03	0.53	8.76
387	18	0.093	0.3050	91.4	91.85		19.283	24.650	0.440	0.03	0.03	0.51	8.76
388	63	0.092	0.3033	91.2	91.73		19.176	24.521	1.554	0.09	0.02	0.49	8.76
389	50	0.095	0.3082	91.2	91.62		19.486	24.918	1.251	0.08	0.02	0.48	8.76
390	71	0.096	0.3098	91.1	91.53		19.586	25.051	1.776	0.11	0.06	0.47	8.76
391	16	0.095	0.3082	91.1	91.44		19.484	24.920	0.390	0.02	0.06	0.45	8.76
392	35	0.091	0.3017	90.9	91.34		19.066	24.394	0.844	0.05	0.07	0.42	8.76
393	42	0.092	0.3033	90.9	91.25		19.171	24.528	1.034	0.06	0.06	0.40	8.76
394	-24	0.093	0.3050	90.7	91.16		19.271	24.666	-0.586	-0.04	0.04	0.37	8.76
395	23	0.091	0.3017	90.6	91.06		19.061	24.401	0.567	0.03	0.03	0.35	8.76
396	53	0.092	0.3033	90.6	90.97		19.165	24.535	1.294	0.08	0.04	0.32	8.77
397	33	0.093	0.3050	90.3	90.86		19.264	24.675	0.821	0.05	0.04	0.30	8.77
398	29	0.093	0.3050	90.3	90.77		19.264	24.675	0.709	0.04	0.03	0.26	8.77
399	19	0.091	0.3017	90.3	90.68		19.056	24.408	0.465	0.03	0.05	0.23	8.77
400	58	0.093	0.3050	90.2	90.59		19.262	24.677	1.432	0.09	0.06	0.19	8.77
401	16	0.092	0.3033	90.1	90.49		19.157	24.546	0.402	0.02	0.05	0.17	8.77
402	29	0.093	0.3050	90	90.4		19.259	24.681	0.725	0.04	0.04	0.15	8.77
403	48	0.094	0.3066	90	90.31		19.362	24.814	1.194	0.07	0.05	0.14	8.77
404	55	0.093	0.3050	89.9	90.23		19.257	24.684	1.370	0.08	0.06	0.12	8.77
405	16	0.093	0.3050	89.7	90.14		19.254	24.688	0.405	0.02	0.05	0.10	8.77
406	115	0.094	0.3066	89.8	90.06		19.359	24.818	2.846	0.17	0.08	0.10	8.78
407	124	0.092	0.3033	89.7	90		19.150	24.555	3.052	0.18	0.11	0.09	8.78
408	126	0.091	0.3017	89.6	89.93		19.044	24.423	3.079	0.18	0.13	0.09	8.78
409	67	0.092	0.3033	89.5	89.85		19.146	24.559	1.639	0.10	0.13	0.08	8.78
410	120	0.095	0.3082	89.3	89.76		19.452	24.961	2.996	0.18	0.16	0.07	8.79
411	108	0.092	0.3033	89.3	89.68		19.143	24.564	2.642	0.16	0.16	0.07	8.79
412	50	0.094	0.3066	89.1	89.59		19.346	24.834	1.246	0.07	0.14	0.07	8.79
413	77	0.092	0.3033	89.1	89.5		19.139	24.568	1.887	0.11	0.12	0.07	8.79
414	72	0.092	0.3033	89.1	89.42		19.139	24.568	1.776	0.11	0.13	0.07	8.79
415	72	0.092	0.3033	89	89.35		19.138	24.571	1.762	0.11	0.11	0.07	8.80
416	36	0.093	0.3050	88.9	89.26		19.239	24.706	0.891	0.05	0.09	0.07	8.80
417	70	0.092	0.3033	88.8	89.17		19.134	24.575	1.730	0.10	0.10	0.07	8.80
418	-2	0.093	0.3050	88.7	89.08		19.236	24.711	-0.048	0.00	0.07	0.07	8.80
419	53	0.093	0.3050	88.5	88.98		19.232	24.715	1.312	0.08	0.07	0.07	8.80
420	-64	0.093	0.3050	88.5	88.9		19.232	24.715	-1.589	-0.10	0.03	0.07	8.80
421	12	0.094	0.3066	88.4	88.81		19.334	24.850	0.286	0.02	0.02	0.07	8.80
422	46	0.092	0.3033	88.3	88.73		19.125	24.586	1.131	0.07	0.01	0.06	8.80
423	0	0.093	0.3050	88.2	88.64		19.227	24.722	0.009	0.00	0.01	0.06	8.80
424	10	0.092	0.3033	88.1	88.54		19.122	24.591	0.254	0.02	0.00	0.06	8.80
425	29	0.094	0.3066	88	88.44		19.327	24.859	0.722	0.04	0.03	0.06	8.80
426	70	0.094	0.3066	87.9	88.34		19.325	24.861	1.735	0.10	0.05	0.06	8.80
427	-57	0.092	0.3033	87.8	88.24		19.117	24.598	-1.396	-0.08	0.02	0.06	8.80
428	-18	0.091	0.3017	87.8	88.15		19.012	24.463	-0.447	-0.03	0.01	0.06	8.80
429	41	0.092	0.3033	87.7	88.07		19.115	24.600	1.016	0.06	0.02	0.06	8.80
430	9	0.092	0.3033	87.6	87.98		19.113	24.602	0.225	0.01	0.01	0.06	8.80
431	54	0.094	0.3066	87.6	87.9		19.320	24.868	1.349	0.08	0.01	0.06	8.80
432	74	0.093	0.3050	87.6	87.83		19.217	24.735	1.840	0.11	0.05	0.06	8.80
433	21	0.093	0.3050	87.4	87.75		19.213	24.740	0.523	0.03	0.06	0.06	8.81
434	13	0.093	0.3050	87.4	87.68		19.213	24.740	0.310	0.02	0.05	0.06	8.81
435	20	0.095	0.3082	87.3	87.61		19.417	25.007	0.509	0.03	0.05	0.06	8.81
436	36	0.094	0.3066	87.3	87.55		19.314	24.875	0.894	0.05	0.05	0.06	8.81

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437	51	0.092	0.3033	87.3	87.5	19.108	24.609	1.261	0.08	0.04	0.06	8.81
438	-3	0.095	0.3082	87.3	87.45	19.417	25.007	-0.082	0.00	0.03	0.06	8.81
439	34	0.092	0.3033	87.1	87.39	19.104	24.613	0.827	0.05	0.04	0.06	8.81
440	23	0.093	0.3050	87	87.33	19.206	24.749	0.578	0.03	0.04	0.06	8.81
441	75	0.097	0.3114	87	87.27	19.615	25.276	1.903	0.11	0.05	0.06	8.81
442	94	0.095	0.3082	86.8	87.19	19.408	25.018	2.347	0.14	0.07	0.06	8.81
443	70	0.094	0.3066	86.8	87.13	19.306	24.886	1.736	0.10	0.09	0.06	8.82
444	106	0.093	0.3050	86.7	87.06	19.201	24.756	2.618	0.16	0.11	0.06	8.82
445	71	0.096	0.3098	86.7	87	19.508	25.152	1.778	0.11	0.12	0.06	8.82
446	30	0.092	0.3033	86.8	86.95	19.099	24.620	0.733	0.04	0.11	0.06	8.82
447	38	0.093	0.3050	86.6	86.88	19.199	24.758	0.932	0.06	0.09	0.06	8.82
448	68	0.094	0.3066	86.5	86.8	19.300	24.893	1.683	0.10	0.09	0.06	8.82
449	50	0.094	0.3066	86.5	86.74	19.300	24.893	1.238	0.07	0.08	0.06	8.82
450	139	0.093	0.3050	86.4	86.68	19.196	24.763	3.437	0.21	0.10	0.06	8.83
451	33	0.093	0.3050	86.4	86.62	19.196	24.763	0.825	0.05	0.10	0.06	8.83
452	46	0.094	0.3066	86.3	86.57	19.297	24.898	1.138	0.07	0.10	0.07	8.83
453	74	0.092	0.3033	86.2	86.51	19.089	24.634	1.822	0.11	0.10	0.07	8.83
454	50	0.094	0.3066	86.2	86.46	19.295	24.900	1.257	0.08	0.10	0.07	8.83
455	15	0.093	0.3050	86.2	86.41	19.192	24.767	0.364	0.02	0.06	0.07	8.83
456	117	0.094	0.3066	86	86.33	19.291	24.904	2.909	0.17	0.09	0.07	8.84
457	47	0.093	0.3050	86	86.27	19.189	24.772	1.159	0.07	0.09	0.07	8.84
458	61	0.093	0.3050	86	86.22	19.189	24.772	1.520	0.09	0.09	0.07	8.84
459	48	0.093	0.3050	85.9	86.16	19.187	24.774	1.183	0.07	0.09	0.07	8.84
460	27	0.094	0.3066	85.9	86.11	19.290	24.907	0.662	0.04	0.09	0.07	8.84
461	4	0.094	0.3066	85.8	86.05	19.288	24.909	0.110	0.01	0.06	0.07	8.84
462	22	0.094	0.3066	85.9	86.01	19.290	24.907	0.550	0.03	0.05	0.07	8.84
463	138	0.094	0.3066	85.7	85.96	19.286	24.911	3.439	0.21	0.07	0.07	8.84
464	-4	0.094	0.3066	85.6	85.9	19.284	24.914	-0.111	-0.01	0.06	0.07	8.84
465	-10	0.094	0.3066	85.9	85.87	19.290	24.907	-0.257	-0.02	0.04	0.07	8.84
466	-29	0.094	0.3066	86	85.87	19.291	24.904	-0.720	-0.04	0.03	0.07	8.84
467	69	0.093	0.3050	85.8	85.85	19.185	24.776	1.712	0.10	0.05	0.07	8.85
468	4	0.095	0.3082	85.9	85.84	19.392	25.039	0.100	0.01	0.01	0.06	8.85
469	-8	0.095	0.3082	85.8	85.83	19.390	25.041	-0.202	-0.01	0.01	0.06	8.85
470	37	0.094	0.3066	85.8	85.82	19.288	24.909	0.927	0.06	0.02	0.06	8.85
471	-22	0.095	0.3082	85.8	85.82	19.390	25.041	-0.544	-0.03	0.02	0.06	8.85
472	-72	0.095	0.3082	85.7	85.8	19.389	25.043	-1.799	-0.11	-0.02	0.06	8.84
473	-24	0.091	0.3017	85.6	85.79	18.974	24.513	-0.592	-0.04	-0.03	0.06	8.84
474	25	0.093	0.3050	85.6	85.79	19.182	24.781	0.620	0.04	-0.02	0.05	8.84
475	-165	0.095	0.3082	85.5	85.75	19.385	25.048	-4.143	-0.25	-0.08	0.05	8.84
476	-241	0.094	0.3066	85.4	85.69	19.281	24.918	-6.017	-0.36	-0.14	0.05	8.83
477	-231	0.094	0.3066	85.4	85.65	19.281	24.918	-5.768	-0.35	-0.19	0.04	8.83
478	-200	0.094	0.3066	85.4	85.6	19.281	24.918	-4.975	-0.30	-0.24	0.04	8.82
479	-251	0.095	0.3082	85.3	85.55	19.381	25.053	-6.281	-0.38	-0.33	0.03	8.82
480	-203	0.094	0.3066	85.2	85.49	19.277	24.923	-5.068	-0.30	-0.34	0.03	8.81
481	-236	0.094	0.3066	85.1	85.42	19.276	24.925	-5.891	-0.35	-0.34	0.02	8.81
482	-159	0.097	0.3114	85	85.35	19.579	25.322	-4.025	-0.24	-0.31	0.01	8.80
483	-213	0.094	0.3066	85.1	85.3	19.276	24.925	-5.309	-0.32	-0.32	0.01	8.80
484	-137	0.095	0.3082	85	85.24	19.376	25.060	-3.431	-0.21	-0.28	0.00	8.79
485	-136	0.094	0.3066	84.9	85.18	19.272	24.930	-3.383	-0.20	-0.26	0.00	8.79
486	-145	0.094	0.3066	84.9	85.13	19.272	24.930	-3.619	-0.22	-0.24	-0.01	8.79
487	-169	0.095	0.3082	84.9	85.08	19.374	25.062	-4.239	-0.25	-0.24	-0.01	8.78
488	-190	0.095	0.3082	84.9	85.03	19.374	25.062	-4.770	-0.29	-0.23	-0.01	8.78
489	-145	0.096	0.3098	84.7	84.97	19.472	25.198	-3.665	-0.22	-0.24	-0.02	8.77
490	-96	0.095	0.3082	84.8	84.93	19.373	25.064	-2.402	-0.14	-0.22	-0.03	8.77
491	-147	0.095	0.3082	84.7	84.89	19.371	25.066	-3.675	-0.22	-0.23	-0.03	8.77
492	-156	0.095	0.3082	84.6	84.85	19.369	25.069	-3.902	-0.23	-0.22	-0.03	8.76
493	-52	0.096	0.3098	84.6	84.8	19.471	25.200	-1.309	-0.08	-0.18	-0.04	8.76
494	-50	0.095	0.3082	84.6	84.76	19.369	25.069	-1.261	-0.08	-0.15	-0.04	8.76
495	-82	0.094	0.3066	84.6	84.73	19.267	24.936	-2.034	-0.12	-0.15	-0.05	8.76
496	-45	0.095	0.3082	84.4	84.68	19.365	25.073	-1.133	-0.07	-0.12	-0.05	8.76
497	-41	0.094	0.3066	84.5	84.64	19.265	24.939	-1.015	-0.06	-0.08	-0.05	8.76
498	-83	0.095	0.3082	84.3	84.58	19.364	25.076	-2.091	-0.13	-0.09	-0.05	8.75
499	22	0.094	0.3066	84.3	84.54	19.261	24.943	0.559	0.03	-0.07	-0.05	8.76
500	-104	0.094	0.3066	84.2	84.48	19.260	24.946	-2.604	-0.16	-0.08	-0.06	8.75
501	-2	0.095	0.3082	84.2	84.43	19.362	25.078	-0.059	0.00	-0.06	-0.06	8.75
502	-126	0.095	0.3082	84.1	84.38	19.360	25.080	-3.153	-0.19	-0.09	-0.06	8.75
503	-62	0.093	0.3050	84.1	84.33	19.155	24.815	-1.550	-0.09	-0.08	-0.07	8.75
504	-9	0.093	0.3050	84	84.27	19.153	24.817	-0.234	-0.01	-0.09	-0.07	8.75
505	-88	0.095	0.3082	83.9	84.2	19.357	25.085	-2.196	-0.13	-0.09	-0.07	8.75
506	-41	0.095	0.3082	83.8	84.14	19.355	25.087	-1.021	-0.06	-0.10	-0.08	8.74
507	14	0.095	0.3082	83.8	84.07	19.355	25.087	0.360	0.02	-0.06	-0.08	8.74
508	-55	0.096	0.3098	83.8	84.02	19.456	25.219	-1.384	-0.08	-0.05	-0.08	8.74
509	-54	0.095	0.3082	83.7	83.96	19.353	25.090	-1.348	-0.08	-0.07	-0.08	8.74
510	-36	0.096	0.3098	83.7	83.91	19.455	25.221	-0.908	-0.05	-0.05	-0.09	8.74
511	-28	0.093	0.3050	83.5	83.84	19.145	24.829	-0.687	-0.04	-0.05	-0.09	8.74
512	41	0.094	0.3066	83.5	83.78	19.247	24.962	1.035	0.06	-0.04	-0.09	8.74
513	-65	0.094	0.3066	83.4	83.71	19.246	24.964	-1.634	-0.10	-0.04	-0.09	8.74
514	-96	0.095	0.3082	83.4	83.65	19.348	25.096	-2.415	-0.14	-0.06	-0.09	8.74
515	-47	0.094	0.3066	83.3	83.59	19.244	24.966	-1.176	-0.07	-0.06	-0.10	8.74
516	-122	0.095	0.3082	83.3	83.54	19.346	25.099	-3.073	-0.18	-0.09	-0.10	8.73
517	-68	0.095	0.3082	83.3	83.49	19.346	25.099	-1.709	-0.10	-0.12	-0.10	8.73
518	-13	0.095	0.3082	83.3	83.44	19.346	25.099	-0.339	-0.02	-0.10	-0.11	8.73
519	-51	0.096	0.3098	83.2	83.39	19.446	25.233	-1.289	-0.08	-0.09	-0.11	8.73
520	-42	0.096	0.3098	83.1	83.33	19.444	25.235	-1.054	-0.06	-0.09	-0.11	8.73
521	-84	0.096	0.3098	83	83.28	19.442	25.238	-2.118	-0.13	-0.08	-0.11	8.73
522	-45	0.097	0.3114	83	83.23	19.543	25.369	-1.136	-0.07	-0.07	-0.12	8.73
523	-10	0.094	0.3066	82.9	83.18	19.237	24.976	-0.251	-0.02	-0.07	-0.12	8.73
524	-93	0.094	0.3066	82.9	83.13	19.237	24.976	-2.311	-0.14	-0.08	-0.12	8.72

Run 3 TEOM Data

525	-70	0.095	0.3082	82.8	83.08		19.337	25.110	-1.768	-0.11	-0.09	-0.12	8.72
526	0	0.093	0.3050	82.8	83.03		19.132	24.845	0.000	0.00	-0.07	-0.13	8.72
527	-126	0.095	0.3082	82.8	82.98		19.337	25.110	-3.155	-0.19	-0.09	-0.13	8.72
528	-114	0.095	0.3082	82.7	82.92		19.335	25.113	-2.865	-0.17	-0.12	-0.13	8.72
529	-100	0.096	0.3098	82.7	82.87		19.437	25.245	-2.520	-0.15	-0.12	-0.13	8.71
530	-101	0.097	0.3114	82.6	82.82		19.536	25.378	-2.576	-0.15	-0.13	-0.14	8.71
531	-141	0.097	0.3114	82.6	82.78		19.536	25.378	-3.576	-0.21	-0.18	-0.14	8.71
532	-71	0.094	0.3066	82.6	82.74		19.231	24.982	-1.770	-0.11	-0.16	-0.14	8.70
533	-102	0.095	0.3082	82.5	82.7		19.332	25.117	-2.556	-0.15	-0.16	-0.14	8.70
534	-48	0.095	0.3082	82.4	82.65		19.330	25.120	-1.211	-0.07	-0.14	-0.14	8.70
535	-109	0.095	0.3082	82.4	82.61		19.330	25.120	-2.726	-0.16	-0.14	-0.14	8.70
536	-81	0.096	0.3098	82.4	82.57		19.431	25.251	-2.052	-0.12	-0.12	-0.14	8.70
537	-23	0.096	0.3098	82.4	82.53		19.431	25.251	-0.574	-0.03	-0.11	-0.13	8.70
538	-64	0.094	0.3066	82.3	82.49		19.226	24.989	-1.594	-0.10	-0.10	-0.13	8.69
539	-43	0.095	0.3082	82.3	82.45		19.328	25.122	-1.077	-0.06	-0.10	-0.13	8.69
540	-34	0.094	0.3066	82.2	82.41		19.224	24.992	-0.848	-0.05	-0.07	-0.12	8.69
541	-5	0.094	0.3066	82.2	82.37		19.224	24.992	-0.122	-0.01	-0.05	-0.12	8.69
542	-71	0.095	0.3082	82.1	82.32		19.324	25.127	-1.786	-0.11	-0.07	-0.11	8.69

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
 Model: Everest III Run Number: 1 Test Date: 5/6/2024

Pre-Test Set-up Check List

Perform the following checks after a minimum of 30 minutes of warmup time

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.34	.34	0.0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	.15	0.01	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-.12	-.13	0.01	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.0	0.99		1	☒ Pass ☐ Fail
PM-Course	±2%	1.0	1.01		1	☒ Pass ☐ Fail
Ambient	±2%	3.0	2.96		1.3	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 197, which indicates flow at 21.1°C, 1

atm ³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Initial Filter Setup

Use **black** filter tool when changing filters

	1 min. requirement	5 min. requirement	Result
PM-2.5	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
PM- Course	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
Ambient	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail

Pre-Fire Verifications	Time probe in Tunnel	Result
Place probe in tunnel at least 10 min prior to test start	11:30	
Verify Data is recording [In RPCOMM] - Dichot		☒ Okay
Verify Data is recording [In RPCOMM] - Ambient		☒ Okay

Pre-Test Conditions

		Requirements	Result
Room RH (%)	39.2		
Barometric Pressure	29.83		
Room Air Velocity (ft/min)	<50	Must be <50 ft/min within 2 ft of stove	☒ Pass ☐ Fail
Room Temperature (°F)	67	<87 °F	☒ Pass ☐ Fail
Average External Stove Temp (°F)	67	Within 2 °F of ambient (Run #1 only)	☒ Pass ☐ Fail ☐ N/A
Average Internal Stove Temp (°F)	68	Within 2 °F of ambient (Run #1 only)	☒ Pass ☐ Fail ☐ N/A
Time Coals Removed from Stove & Firebox Vacuumed	N/A	>1 hr before test (Runs #2 & 3 only)	☐ Pass ☐ Fail ☒ N/A
Earliest possible start time	N/A	24 hours from start of Run #1 (Runs #2 & 3 only)	☐ Pass ☐ Fail ☒ N/A

Technician Signature: 

Date: 6/21/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 1 Test Date: 5/6/2024

IDC FUELING NOTES

Fuel & Moisture Measurement

Fuel Type	Maple Cordwood
Moisture Meter Calibration 22%:	22.0
Moisture Meter Calibration 12%:	12.0
Moisture Reading Start Time:	9:03

L1 Test Notes

Scale Weight Prior to Loading (lbs):	0.00
Test Burn Start Time:	12:01
Air Control Setting (open/closed):	Open
Door Closed Time (5 min from start):	12:06
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.03-3.35
Actual End Weight (lbs):	3.18
Phase End Time:	12:30

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

L2 Test Notes

Scale Weight Prior to Loading (lbs):	3.18
Load Time:	12:31
Air Control Setting (open/closed):	Open
Door Closed Time (immediately after loading):	12:32
Bypass Closed Time:	N/A
50% Target Weight (lbs):	11.69-12.92
Actual 50% Weight (lbs):	12.19
Air control closed time:	12:58
Target End Weight (lbs):	4.75-5.26
Actual End Weight (lbs):	5.18
Phase End Time:	13:42

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
13:32	Changed TEOM Filters

Technician Signature: 

Date: 6/21/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
 Model: Everest III Run Number: 1 Test Date: 5/6/2024

L3 Test Notes

Scale Weight Prior to Loading (lbs):	5.18
Load Time:	13:42
Air Control Setting (5 min start-up allowed):	
Door Closed Time (immediately after loading):	13:43
Bypass Closed Time:	N/A
Target End Weight (lbs):	6.20-6.86
Actual End Weight (lbs):	6.27
Phase End Time:	15:38

Open @	13:42	Closed @	13:47
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Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
16:59	Changed TEOM filters

L4 Test Notes

Scale Weight Prior to Loading (lbs):	6.27
Load Time:	15:28
Air Control Setting (10 min start-up allowed):	
Door Closed Time (5 min after loading):	15:33
Bypass Closed Time:	N/A
Target End Weight (lbs):	5.96-6.58
Actual End Weight (lbs):	6.01
Phase End Time:	21:05

Open @	15:28	Closed @	15:38
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Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

Post-Test Conditions

Room Air Velocity (ft/min)	<50
Room RH (%)	31.1
Barometric Pressure	29.91

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
 Model: Everest III Run Number: 1 Test Date: 5/6/2024

Post-Test Check List

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.34	.34	0.0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	.16	0.02	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	0.02	-.14	0.02	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.0	0.98		2	☒ Pass ☐ Fail
PM-Course	±2%	1.0	1.00		1	☒ Pass ☐ Fail
Ambient	±2%	3.0	2.96		1.3	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 134, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Flue Gas Analyzer Calibration Check

Calibration Gas Values: Span Gas Cylinder#: CC505834 CO₂ (%): 16.98 CO (%): 4.300
 Mid Gas Cylinder#: SG9199309 CO₂ (%): 10.06 CO (%): 2.538

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	11:10	11:11	11:13	21:07	21:08	21:09
CO ₂	0.00	17.02	10.05	0.00	16.69	10.15
CO	0.000	4.306	2.544	-0.001	4.325	2.523

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

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 1 Test Date: 5/6/2024

Test Fuel Photos



L1 Fuel Load



L2 Fuel Load



L3 Fuel Load



L4 Fuel Load

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
 Model: Everest III Run Number: 2 Test Date: 5/7/2024

Pre-Test Set-up Check List

Perform the following checks after a minimum of 30 minutes of warmup time

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.34	.34	0.0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	.16	0.02	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-.12	-.14	0.02	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.0	0.98		2	☒ Pass ☐ Fail
PM-Course	±2%	1.0	1.00		1	☒ Pass ☐ Fail
Ambient	±2%	3.0	2.96		1.3	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 197, which indicates flow at 21.1°C, 1

atm ³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Initial Filter Setup

Use **black** filter tool when changing filters

	1 min. requirement	5 min. requirement	Result
PM-2.5	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
PM- Course	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
Ambient	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail

Pre-Fire Verifications	Time probe in Tunnel	Result
Place probe in tunnel at least 10 min prior to test start	11:20	
Verify Data is recording [In RPCOMM] - Dichot		☒ Okay
Verify Data is recording [In RPCOMM] - Ambient		☒ Okay

Pre-Test Conditions

	Requirements	Result
Room RH (%)	32.4	
Barometric Pressure	30.13	
Room Air Velocity (ft/min)	<50	Must be <50 ft/min within 2 ft of stove ☒ Pass ☐ Fail
Room Temperature (°F)	67	<87 °F ☒ Pass ☐ Fail
Average External Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only) ☐ Pass ☐ Fail ☒ N/A
Average Internal Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only) ☐ Pass ☐ Fail ☒ N/A
Time Coals Removed from Stove & Firebox Vacuumed	10:35	>1 hr before test (Runs #2 & 3 only) ☒ Pass ☐ Fail ☐ N/A
Earliest possible start time	12:01	24 hours from start of Run #1 (Runs #2 & 3 only) ☒ Pass ☐ Fail ☐ N/A

Technician Signature: 

Date: 6/21/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 2 Test Date: 5/7/2024

IDC FUELING NOTES

Fuel & Moisture Measurement

Fuel Type	Maple Cordwood
Moisture Meter Calibration 22%:	22.0
Moisture Meter Calibration 12%:	12.0
Moisture Reading Start Time:	8:27

L1 Test Notes

Scale Weight Prior to Loading (lbs):	0.00
Test Burn Start Time:	12:02
Air Control Setting (open/closed):	Open
Door Closed Time (5 min from start):	12:07
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.11-3.43
Actual End Weight (lbs):	3.22
Phase End Time:	12:29

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

L2 Test Notes

Scale Weight Prior to Loading (lbs):	3.22
Load Time:	12:29
Air Control Setting (open/closed):	Open
Door Closed Time (immediately after loading):	12:30
Bypass Closed Time:	N/A
50% Target Weight (lbs):	11.93-13.19
Actual 50% Weight (lbs):	13.10
Air control closed time:	12:54
Target End Weight (lbs):	4.83-5.34
Actual End Weight (lbs):	5.06
Phase End Time:	14:01

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
13:42	Changed TEOM Filters

Technician Signature: 

Date: 6/21/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 2 Test Date: 5/7/2024

L3 Test Notes

Scale Weight Prior to Loading (lbs):	5.06
Load Time:	14:01
Air Control Setting (5 min start-up allowed):	
Door Closed Time (immediately after loading):	14:02
Bypass Closed Time:	N/A
Target End Weight (lbs):	6.06-6.70
Actual End Weight (lbs):	6.14
Phase End Time:	15:53

Open @	14:01	Closed @	14:06
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Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
15:34	Changed TEOM filters

L4 Test Notes

Scale Weight Prior to Loading (lbs):	6.14
Load Time:	15:53
Air Control Setting (10 min start-up allowed):	
Door Closed Time (5 min after loading):	15:58
Bypass Closed Time:	N/A
Target End Weight (lbs):	5.81-6.43
Actual End Weight (lbs):	6.00
Phase End Time:	21:40

Open @	15:53	Closed @	16:03
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Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes

Post-Test Conditions

Room Air Velocity (ft/min)	<50
Room RH (%)	29.1
Barometric Pressure	30.18

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
 Model: Everest III Run Number: 2 Test Date: 5/7/2024

Post-Test Check List

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.34	0.34	0.0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	0.17	0.03	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-0.12	-0.14	0.02	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.0	0.99		1	☒ Pass ☐ Fail
PM-Course	±2%	1.0	1.01		1	☒ Pass ☐ Fail
Ambient	±2%	3.0	2.96		1.3	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 134, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Flue Gas Analyzer Calibration Check

Calibration Gas Values: Span Gas Cylinder#: CC505834 CO₂ (%): 16.98 CO (%): 4.300
 Mid Gas Cylinder#: CC341544 CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	11:22	11:23	11:27	21:41	21:42	21:43
CO ₂	0.00	16.96	10.09	0.02	16.84	9.98
CO	0.000	4.285	2.512	0.007	4.262	2.465

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

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 2 Test Date: 5/7/2024

Test Fuel Photos



L1 Fuel Load



L2 Fuel Load



L3 Fuel Load



L4 Fuel Load

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
 Model: Everest III Run Number: 3 Test Date: 5/8/2024

Pre-Test Set-up Check List

Perform the following checks after a minimum of 30 minutes of warmup time

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.34	0.34	0.0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	0.17	0.03	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-0.12	-0.14	0.02	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.0	0.99		1	☒ Pass ☐ Fail
PM-Course	±2%	1.0	1.01		1	☒ Pass ☐ Fail
Ambient	±2%	3.0	2.96		1.3	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 197, which indicates flow at 21.1°C, 1

atm ³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Initial Filter Setup

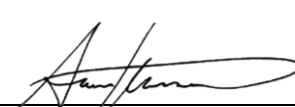
Use **black** filter tool when changing filters

	1 min. requirement	5 min. requirement	Result
PM-2.5	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
PM- Course	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
Ambient	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail

Pre-Fire Verifications	Time probe in Tunnel	Result
Place probe in tunnel at least 10 min prior to test start	11:20	
Verify Data is recording [In RPCOMM] - Dichot		☒ Okay
Verify Data is recording [In RPCOMM] - Ambient		☒ Okay

Pre-Test Conditions

		Requirements	Result
Room RH (%)	30.2		
Barometric Pressure	30.24		
Room Air Velocity (ft/min)	<50	Must be <50 ft/min within 2 ft of stove	☒ Pass ☐ Fail
Room Temperature (°F)	67	<87 °F	☒ Pass ☐ Fail
Average External Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Average Internal Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Time Coals Removed from Stove & Firebox Vacuumed	10:15	>1 hr before test (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A
Earliest possible start time	12:02	24 hours from start of Run #1 (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A

Technician Signature: 

Date: 6/21/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 3 Test Date: 5/8/2024

IDC FUELING NOTES

Fuel & Moisture Measurement

Fuel Type	Maple Cordwood
Moisture Meter Calibration 22%:	22.0
Moisture Meter Calibration 12%:	12.0
Moisture Reading Start Time:	8:49

L1 Test Notes

Scale Weight Prior to Loading (lbs):	10:51
Test Burn Start Time:	12:03
Air Control Setting (open/closed):	Open
Door Closed Time (5 min from start):	12:08
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.01-3.33
Actual End Weight (lbs):	3.12
Phase End Time:	12:29

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

L2 Test Notes

Scale Weight Prior to Loading (lbs):	3.12
Load Time:	12:29
Air Control Setting (open/closed):	Open
Door Closed Time (immediately after loading):	12:30
Bypass Closed Time:	N/A
50% Target Weight (lbs):	11.58-12.79
Actual 50% Weight (lbs):	12.70
Air control closed time:	12:58
Target End Weight (lbs):	4.69-5.18
Actual End Weight (lbs):	5.08
Phase End Time:	13:54

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
13:42	Changed TEOM Filters

Technician Signature: 

Date: 6/21/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 3 Test Date: 5/8/2024

L3 Test Notes

Scale Weight Prior to Loading (lbs):	5.08
Load Time:	13:54
Air Control Setting (5 min start-up allowed):	
Door Closed Time (immediately after loading):	13:55
Bypass Closed Time:	N/A
Target End Weight (lbs):	6.03-6.66
Actual End Weight (lbs):	6.16
Phase End Time:	15:45

Open @	13:54	Closed @	13:59
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Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
15:17	Changed TEOM filters

L4 Test Notes

Scale Weight Prior to Loading (lbs):	6.16
Load Time:	15:45
Air Control Setting (10 min start-up allowed):	
Door Closed Time (5 min after loading):	15:50
Bypass Closed Time:	N/A
Target End Weight (lbs):	5.85-6.47
Actual End Weight (lbs):	5.90
Phase End Time:	21:05

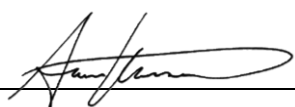
Open @	15:45	Closed @	15:55
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Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

Post-Test Conditions

Room Air Velocity (ft/min)	<50
Room RH (%)	22.2
Barometric Pressure	30.12

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
 Model: Everest III Run Number: 3 Test Date: 5/8/2024

Post-Test Check List

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.34	0.34	0.0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	0.17	0.03	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-0.12,	-014	0.02	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.0	0.99		1	☒ Pass ☐ Fail
PM-Course	±2%	1.0	1.01		1	☒ Pass ☐ Fail
Ambient	±2%	3.0	2.97		1	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 134, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Flue Gas Analyzer Calibration Check

Calibration Gas Values: Span Gas Cylinder#: CC505834 CO₂ (%): 16.98 CO (%): 4.300
 Mid Gas Cylinder#: CC341544 CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	11:51	11:52	11:54	21:07	21:08	21:09
CO ₂	0.00	16.98	10.08	0.00	17.02	10.13
CO	0.000	4.299	2.502	0.005	4.331	2.524

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

Technician Signature: 

Date: 5/15/2024

IDC Wood Heater Run Sheets

Client: SBI Job Number: 23-241 Tracking #: 191
Model: Everest III Run Number: 3 Test Date: 5/8/2024

Test Fuel Photos



L1 Fuel Load



L2 Fuel Load



L3 Fuel Load



L4 Fuel Load

Technician Signature: 

Date: 5/15/2024

NYSERDA 2015 NSPS Fuel Calculator

3.1 Run #1 Details

Detailed Fuel Information

Enter the number of fuel pieces first, then enter the weight and MC details in Tables 3.2 through 3.6 ↓↓

3.1 Fuel Load Data					
	Target load (lb)	Actual weight (lb)	Target # of pieces	Actual # of pieces	
L1 - Kindling weight	2.48 – 2.74	2.67	18	18	Go to table
L1 - Starter	7.43 – 8.22	8.00	5	5	Go to table
L2 - Small pieces	17.35 – 19.17	18.25	6	6	Go to table
L3 - Large pieces	12.39 – 13.70	13.50	2	2	Go to table
L4 - Small pieces	9.91 – 10.96	10.18	3	3	Go to table
L4 - Large pieces	19.83 – 21.91	20.45	3	3	Go to table
Total fuel load:	69.39 – 76.70	73.05	37	37	
Total fuel burnt wet-basis: 65.74 lb		Total fuel burnt dry-basis: 53.62 lb			

3.2 Load 1 - Kindling and starter fuel							
set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Kindling total:	2.67	Not applicable					
Piece 1:	1.47	18.2	24.9	18.2	19.5	20.8	20.3
Piece 2:	1.97	19.6	20.2	19.7	18.9	19.0	19.5
Piece 3:	1.31	18.5	25.7	26.1	22.9	20.8	22.8
Piece 4:	1.55	22.8	19.0	19.6	18.3	20.9	20.1
Piece 5:	1.70	22.9	21.0	18.9	20.9	18.2	20.4
Piece 6:							
Piece 7:							
Piece 8:							
Piece 9:							
Piece 10:							
Starter total:	8.00	L1 Total: 10.67 lb					20.49

✓ Total load weight is currently in the target range of 9.91–10.96 lb.
Allowed weight of each starter piece: 1.00–2.28 lb.

3.3 Load 2 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	3.28	20.9	20.6	18.4	18.2	19.0	19.4
Piece 2:	3.39	24.0	23.4	21.9	21.9	22.7	22.8
Piece 3:	3.58	23.5	18.6	18.8	20.3	21.2	20.5
Piece 4:	2.37	18.8	24.0	19.9	19.0	25.4	21.4
Piece 5:	2.77	19.8	22.1	26.5	26.1	19.8	22.9
Piece 6:	2.86	19.1	22.5	25.3	25.4	19.8	22.4
Piece 7:							
Piece 8:							
Piece 9:							
Piece 10:							
Load total:	18.25						21.50

✓ Total load weight is in the target range of 17.35–19.17 lb.

Allowed weight of each piece: 2.30–4.78 lb.

3.4 Load 3 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	6.78	22.9	19.8	26.4	19.6	25.1	22.8
Piece 2:	6.72	26.3	21.4	22.8	22.3	26.9	23.9
Piece 3:							
Load total:	13.50						23.35

✓ Load weight is in the target range of 12.39–13.70 lb.

Allowed weight of each piece: 5.22–7.83 lb.

3.5 Load 4 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	3.81	25.2	26.7	24.9	22.9	23.1	24.6
Piece 2:	4.02	25.3	24.9	23.8	22.8	21.7	23.7
Piece 3:	2.35	18.0	24.2	23.9	19.7	22.4	21.6
Piece 4:							
Piece 5:							
Piece 6:							
Load total:	10.18						23.55

✓ Load weight is in the target range of 9.91–10.96 lb.

Allowed weight of each piece: 2.30–4.78 lb.

3.6 Load 4 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	7.28	26.2	25.9	18.4	19.1	26.9	23.3
Piece 2:	5.44	23.8	24.0	25.6	26.7	19.7	24.0
Piece 3:	7.73	19.3	25.2	25.8	19.4	23.9	22.7
Piece 4:							
Piece 5:							
Piece 6:							
Load total:	20.45						23.26

✓ Load weight is in the target range of 19.83–21.91 lb.

Allowed weight of each piece: 4.83–9.09 lb.

Total L4 load weight (small+large):	30.63	Average MC%:	23.35
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Other Testing Information

3.7 Run Information

Run date:	
Run number:	1
Testing staff:	
Witnesses or others present for test:	
Start time:	
End time:	Fill out Table 3.10

3.8 Test Lab Condition

	pre-test	post-test	
Ambient temperature:			F
Barometric pressure:			in. Hg
Relative humidity:			%
Mean Stove T		F (±2 of the ambient temp)	
Mean Stack T		F (±2 of the ambient temp)	

 Elapsed Time  Clock Time Method

3.9 Run Operation Data

Load	Scale reading at start of phase before loading (lb)	Calculated scale at start of phase after loading (lb)	Target scale range at end of phase (lb)	Scale reading at end of phase (lb)	Fuel Burnt - db (lb)		Fuel Burnt - wb (lb)
L1 (Full High)	0.00	10.67	3.03 – 3.35	3.18	5.68		6.84
L2(A) (Full High)	3.18	21.43	11.69 – 12.92	12.24	Not applicable		
L2(B) (Full Low)	12.24	Not applicable	4.75 – 5.26	5.18	13.02		15.82
L3 (Full Low)	5.18	18.68	6.20 – 6.86	6.27	9.85		12.16
L4 (Full Low)	6.27	36.90	5.96 – 6.58	6.03	25.07		30.93

NYSERDA 2015 NSPS Fuel Calculator

3.2 Run #2 Details

Detailed Fuel Information

Enter the number of fuel pieces first, then enter the weight and MC details in Tables 3.2 through 3.6 ↓↓

3.1 Fuel Load Data					
	Target load (lb)	Actual weight (lb)	Target # of pieces	Actual # of pieces	
L1 - Kindling weight	2.48 – 2.74	2.73	18	18	Go to table
L1 - Starter	7.43 – 8.22	8.00	5	5	Go to table
L2 - Small pieces	17.35 – 19.17	18.68	6	6	Go to table
L3 - Large pieces	12.39 – 13.70	13.17	2	2	Go to table
L4 - Small pieces	9.91 – 10.96	10.37	3	3	Go to table
L4 - Large pieces	19.83 – 21.91	19.91	3	3	Go to table
Total fuel load:	69.39 – 76.70	72.86	37	37	
Total fuel burnt wet-basis: 65.53 lb		Total fuel burnt dry-basis: 53.41 lb			

3.2 Load 1 - Kindling and starter fuel							
set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Kindling total:	2.73	Not applicable					
Piece 1:	1.10	19.5	22.0	19.9	18.8	19.7	20.0
Piece 2:	1.24	23.8	23.5	18.4	21.5	25.8	22.6
Piece 3:	1.83	23.4	18.0	18.4	23.2	21.3	20.9
Piece 4:	1.72	22.4	19.3	19.6	23.7	24.9	22.0
Piece 5:	2.11	23.1	18.4	19.5	20.6	21.4	20.6
Piece 6:							
Piece 7:							
Piece 8:							
Piece 9:							
Piece 10:							
Starter total:	8.00	L1 Total: 10.73 lb					21.18

✓ Total load weight is currently in the target range of 9.91–10.96 lb.
Allowed weight of each starter piece: 1.00–2.28 lb.

3.3 Load 2 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	2.79	18.9	21.9	25.5	25.3	19.2	22.2
Piece 2:	4.41	20.9	22.8	26.6	26.1	22.7	23.8
Piece 3:	3.15	25.3	19.6	20.1	25.9	23.1	22.8
Piece 4:	3.08	22.5	22.8	26.3	19.2	20.4	22.2
Piece 5:	2.44	19.4	26.5	19.7	20.7	19.4	21.1
Piece 6:	2.81	25.8	25.6	25.9	23.0	22.8	24.6
Piece 7:							
Piece 8:							
Piece 9:							
Piece 10:							
Load total:	18.68						22.91

✓ Total load weight is in the target range of 17.35–19.17 lb.

Allowed weight of each piece: 2.30–4.78 lb.

3.4 Load 3 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	6.26	25.3	26.8	23.0	21.0	24.9	24.2
Piece 2:	6.91	26.7	26.2	24.3	19.9	21.7	23.8
Piece 3:							
Load total:	13.17						23.97

✓ Load weight is in the target range of 12.39–13.70 lb.

Allowed weight of each piece: 5.22–7.83 lb.

3.5 Load 4 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	3.24	21.5	25.2	25.3	24.0	24.9	24.2
Piece 2:	3.97	21.0	24.9	21.4	25.6	19.3	22.4
Piece 3:	3.16	26.9	20.2	24.9	21.2	20.8	22.8
Piece 4:							
Piece 5:							
Piece 6:							
Load total:	10.37						23.09

✓ Load weight is in the target range of 9.91–10.96 lb.

Allowed weight of each piece: 2.30–4.78 lb.

3.6 Load 4 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	6.85	21.2	25.4	26.3	26.0	20.3	23.8
Piece 2:	7.92	23.0	22.9	21.9	22.4	19.7	22.0
Piece 3:	5.14	18.9	20.4	22.8	18.0	19.4	19.9
Piece 4:							
Piece 5:							
Piece 6:							
Load total:	19.91						22.08

✓ Load weight is in the target range of 19.83–21.91 lb.

Allowed weight of each piece: 4.83–9.09 lb.

Total L4 load weight (small+large):	30.28	Average MC%:	22.43
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Other Testing Information

3.7 Run Information

Run date:	
Run number:	2
Testing staff:	
Witnesses or others present for test:	
Start time:	
End time:	Fill out Table 3.10

☐ Elapsed Time Method ☐ Clock Time Method

3.8 Test Lab Condition

	pre-test	post-test	
Ambient temperature:			F
Barometric pressure:			in. Hg
Relative humidity:			%
Mean Stove T		F (±2 of the ambient temp)	
Mean Stack T		F (±2 of the ambient temp)	

3.9 Run Operation Data

Load	Scale reading at start of phase before loading (lb)	Calculated scale at start of phase after loading (lb)	Target scale range at end of phase (lb)	Scale reading at end of phase (lb)	Fuel Burnt - db (lb)		Fuel Burnt - wb (lb)
L1 (Full High)	0.00	10.73	3.11 – 3.43	3.22	5.63		6.83
L2(A) (Full High)	3.22	21.90	11.93 – 13.19	13.10	Not applicable		
L2(B) (Full Low)	13.10	Not applicable	4.83 – 5.34	5.06	13.36		16.42
L3 (Full Low)	5.06	18.23	6.06 – 6.70	6.12	9.56		11.86
L4 (Full Low)	6.12	36.40	5.81 – 6.43	6.00	24.85		30.43

NYSERDA 2015 NSPS Fuel Calculator

3.3 Run #3 Details

Detailed Fuel Information

Enter the number of fuel pieces first, then enter the weight and MC details in Tables 3.2 through 3.6 ↓↓

3.1 Fuel Load Data					
	Target load (lb)	Actual weight (lb)	Target # of pieces	Actual # of pieces	
L1 - Kindling weight	2.48 – 2.74	2.72	18	18	Go to table
L1 - Starter	7.43 – 8.22	7.79	5	5	Go to table
L2 - Small pieces	17.35 – 19.17	18.13	6	6	Go to table
L3 - Large pieces	12.39 – 13.70	12.66	2	2	Go to table
L4 - Small pieces	9.91 – 10.96	10.22	3	3	Go to table
L4 - Large pieces	19.83 – 21.91	20.07	3	3	Go to table
Total fuel load:	69.39 – 76.70	71.59	37	37	
Total fuel burnt wet-basis: 64.37 lb		Total fuel burnt dry-basis: 52.35 lb			

3.2 Load 1 - Kindling and starter fuel							
set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Kindling total:	2.72	Not applicable					
Piece 1:	1.51	19.6	19.8	21.8	20.5	21.6	20.7
Piece 2:	1.42	22.8	22.7	25.8	23.0	24.0	23.7
Piece 3:	1.27	20.5	23.6	24.9	18.3	20.2	21.5
Piece 4:	1.97	18.9	19.4	21.0	19.4	19.0	19.5
Piece 5:	1.62	25.1	19.7	26.0	19.5	24.2	22.9
Piece 6:							
Piece 7:							
Piece 8:							
Piece 9:							
Piece 10:							
Starter total:	7.79	L1 Total: 10.51 lb					21.53

✓ Total load weight is currently in the target range of 9.91–10.96 lb.
Allowed weight of each starter piece: 1.00–2.28 lb.

3.3 Load 2 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	3.82	26.1	19.7	21.9	20.6	21.3	21.9
Piece 2:	3.83	24.9	25.9	26.9	21.3	22.2	24.2
Piece 3:	2.42	23.1	20.0	25.6	26.0	19.1	22.8
Piece 4:	2.46	25.1	20.6	23.2	24.9	25.3	23.8
Piece 5:	3.24	23.0	24.3	19.3	20.9	26.7	22.8
Piece 6:	2.36	24.8	20.6	21.4	26.0	19.6	22.5
Piece 7:							
Piece 8:							
Piece 9:							
Piece 10:							
Load total:	18.13						23.02

✓ Total load weight is in the target range of 17.35–19.17 lb.

Allowed weight of each piece: 2.30–4.78 lb.

3.4 Load 3 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	7.10	25.7	26.9	25.2	23.1	19.4	24.1
Piece 2:	5.56	26.1	22.9	20.0	25.4	25.6	24.0
Piece 3:							
Load total:	12.66						24.03

✓ Load weight is in the target range of 12.39–13.70 lb.

Allowed weight of each piece: 5.22–7.83 lb.

3.5 Load 4 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	3.52	22.8	25.4	25.7	26.0	23.1	24.6
Piece 2:	3.87	21.8	18.4	20.6	20.7	19.8	20.3
Piece 3:	2.83	21.6	26.8	19.5	21.3	25.5	22.9
Piece 4:							
Piece 5:							
Piece 6:							
Load total:	10.22						22.50

✓ Load weight is in the target range of 9.91–10.96 lb.

Allowed weight of each piece: 2.30–4.78 lb.

3.6 Load 4 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)		Avg moisture
Piece 1:	5.65	26.7	26.8	22.7	23.1	25.0	24.9
Piece 2:	5.49	19.8	20.8	19.7	24.9	22.4	21.5
Piece 3:	8.93	26.5	19.8	22.6	19.0	25.9	22.8
Piece 4:							
Piece 5:							
Piece 6:							
Load total:	20.07						23.01

✓ Load weight is in the target range of 19.83–21.91 lb.

Allowed weight of each piece: 4.83–9.09 lb.

Total L4 load weight (small+large):	30.29	Average MC%:	22.84
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Other Testing Information

3.7 Run Information

Run date:	
Run number:	3
Testing staff:	
Witnesses or others present for test:	
Start time:	
End time:	Fill out Table 3.10

☐ Elapsed Time Method ☐ Clock Time Method

3.8 Test Lab Condition

	pre-test	post-test	
Ambient temperature:			F
Barometric pressure:			in. Hg
Relative humidity:			%
Mean Stove T		F (±2 of the ambient temp)	
Mean Stack T		F (±2 of the ambient temp)	

3.9 Run Operation Data

Load	Scale reading at start of phase before loading (lb)	Calculated scale at start of phase after loading (lb)	Target scale range at end of phase (lb)	Scale reading at end of phase (lb)	Fuel Burnt - db (lb)		Fuel Burnt - wb (lb)
L1 (Full High)	0.00	10.51	3.01 – 3.33	3.12	5.53		6.72
L2(A) (Full High)	3.12	21.25	11.58 – 12.79	12.70	Not applicable		
L2(B) (Full Low)	12.70	Not applicable	4.69 – 5.18	5.06	12.80		15.74
L3 (Full Low)	5.06	17.72	6.01 – 6.64	6.16	9.11		11.30
L4 (Full Low)	6.16	36.45	5.85 – 6.47	5.90	24.92		30.61



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Bernard Blouin
Mechanical Engineer
Stove Builder International, Inc.
250, De Copenhague
St-Augustin-de-Desmaures (Qc)
G3A 2H3, Canada

02/06/2024

Dear Mr. Blouin,

This letter is in response to your correspondence, which started November 17th, 2023, went through several iterations, email discussions and resulted in a final letter dated January 11th, 2024. In your letters, you request the use of alternative testing procedures to demonstrate compliance with the cord wood emissions standard published in 40 CFR part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters (Subpart AAA). 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 testing procedures and our approval decisions are discussed below.

According to the information provided in your correspondence, you seek an alternative test method and testing procedures for use when conducting testing on the Stove Builder International Inc. (SBI) Everest III Series residential wood heater. Currently, as required by section 60.534(a)(2) of Subpart AAA, a manufacturer, when using the 2020 cord wood alternative compliance option, must have their appliance tested by an EPA-approved test laboratory and the testing conducted with cord wood using an alternative cord wood test method approved by the EPA Administrator or their delegated authority to establish the certification test conditions and the particulate matter (PM) emission values.

Your request seeks to use the specified modifications, detailed below, coupled with **NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard (attached)** as the alternative cord wood test method to certify the SBI Everest III Series model line. In your request, you state that the SBI Everest III Series is a room heater and that you are seeking a cord wood alternative test method to use for compliance testing. You also state, in your request letter, that your appliance has a usable firebox volume of 2.61 ft³ and an overall firebox volume of 3.04 ft³.

Because the longest length (nominal width) of your usable firebox is 18.28 inches, you state that you will use cord wood fuel with a nominal length of 16.0in length, loaded in East-West fashion, for testing which represents 80% to 95% of the usable firebox width (the longest dimension). In your request, you state that you would like to use Big Leaf Maple cord wood for compliance testing. This fuel is among the allowable

fuel species specified in the fuel load calculator that accompanies the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard.

We understand from your request, that you also seek use of several alternative testing procedures, detailed in the second list below, when conducting sampling as required by 40 CFR 60.534(c), which requires that PM emission concentrations be measured using ASTM E2515-11 *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel* (ASTM E2515-11). Additionally, in your request, you seek to use a separate ASTM E2515-11 sampling train for collecting the first hour of PM emissions, as is required by 40 CFR 60.534(d) that states the “approved test laboratory must also measure the first hour of PM emissions for each test run using a separate filter in one of the two parallel trains.” This third, identical and independent sampling train when used to sample concurrently for the first hour of the PM compliance testing will independently measure the first hour of PM emissions for each test run, thus avoiding the need to change filters in one of the paired trains.

Based on the information provided and with the caveats set forth below, we are approving your request to use NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard (attached) as the alternative cord wood test method when conducting certification testing as required by Subpart AAA, section 60.534(a)(2) on the SBI Everest III Series room heater with the modifications detailed below.

When using NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard as the alternative cord wood test method to certify the SBI Everest III Series, these changes and modifications must be made:

1. Owner’s Manual Requirements:

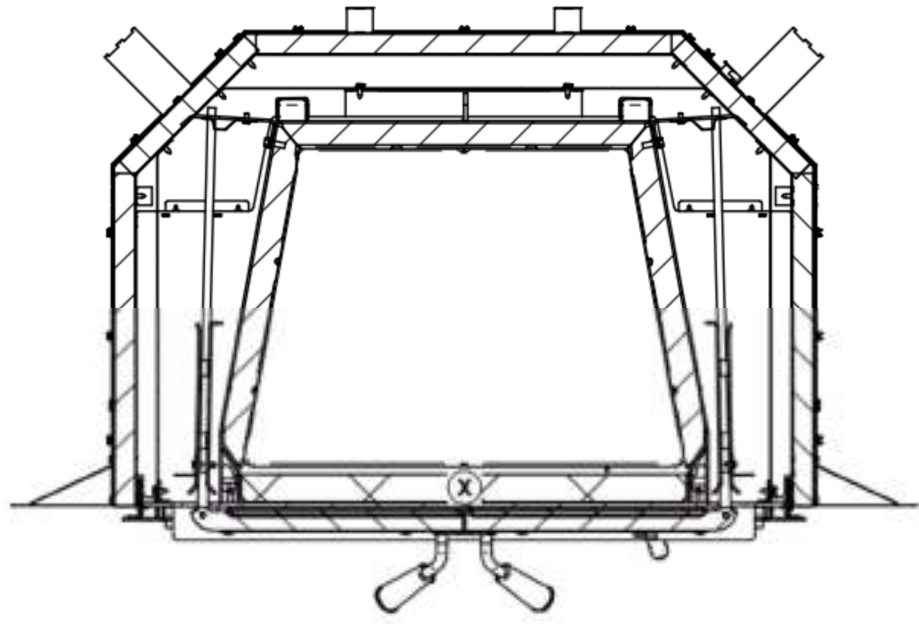
- A. A complete and final copy of the Owner’s manual must be provided to the test laboratory one day prior to the day of testing. This Owner’s manual must be the same manual provided to all owners upon purchase and all fuel loading details must meet the requirements of Section 11 in the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard.
- B. All certification test procedures must be consistent with the Owner’s manual and the manufacturer may not provide other operating instructions to the test lab.
- C. All fuel loading procedures and air control / door closing procedures must be included in the Owner’s manual. This includes necessary bypass operating instructions/ information required in Section 11.6.5.1 of The NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard, as well as required fuel piece length information required in section 11.3.4.1.3 of that test method.
- D. Kindling and start-up instructions in the owner’s manual are limited to top-down start, or bottom-up start direction. For the purposes of this testing, a bottom-up start will be required. There must be no discussion regarding fuel spacing and piece size in the instructions to the lab. However, general guidance on kindling and start-up fuel arrangement can be supplied (e.g., Split the start-up fuel piece into 6 pieces, use between 10-15 pieces of kindling, put the biggest pieces on the bottom and the smallest on top, stack into 5 to 7 layers).

- E. The Owner's manual information may inform the test laboratory on appliance operation however NO INSTRUCTIONS IN THE OWNER'S MANUAL MAY OVERRIDE ANY REQUIREMENT OF THIS TEST METHOD, ASTM E-2515, The NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard OR ANY provision stipulated in 40 CFR 60, Subpart AAA.

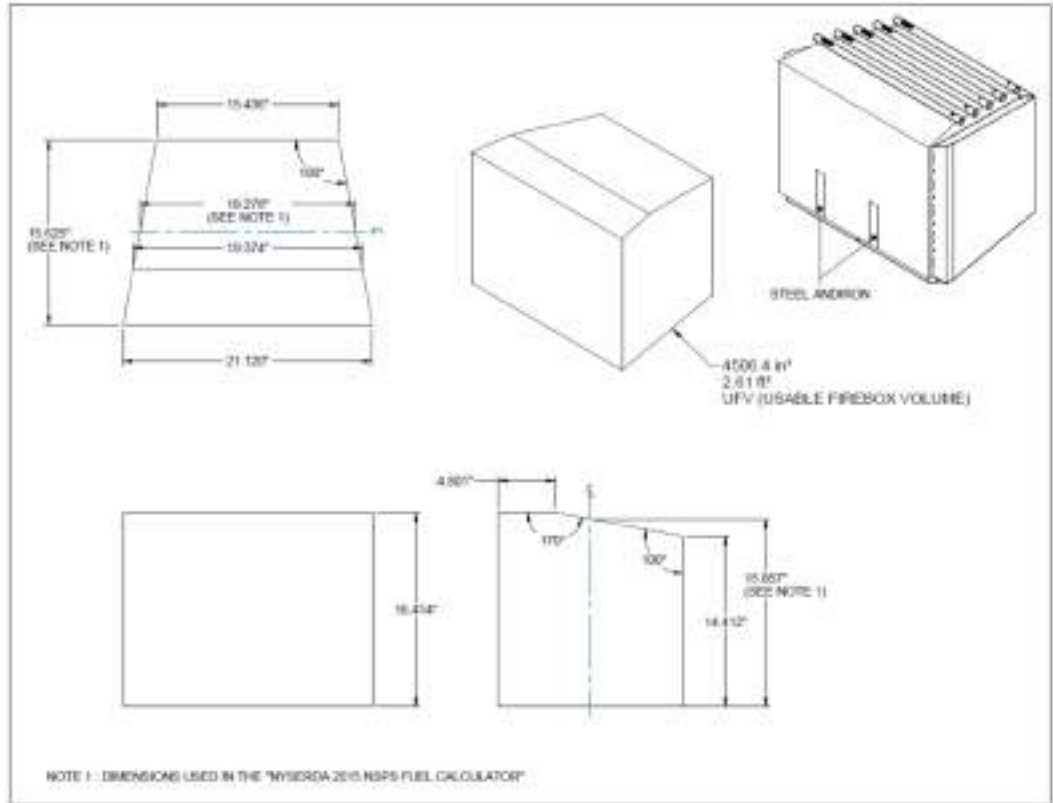
2. Section 8.3 – Additional firebox documentation requirements:

- A. Overall firebox dimensions and usable firebox dimensions must have been provided to EPA prior to alternative method approval. In addition, the usable firebox dimensions must be illustrated in the Owner's Manual with instructions to the end user for appropriate fueling/loading.
- B. Overall firebox volume and usable firebox volume must also be reported in the test report and must agree with dimensions stated in this letter.
- C. Fuel load density must be based on the usable firebox dimensions as determined below in this alternative test method approval.
- i. On the SBI Everest III Series, the Usable Firebox Volume (UFV) is smaller than the Overall Firebox Volume. The reason for this is because wood should not be placed on the lower primary air intake channel. As provided, the User's Owner's Manual section 2.4 for the SBI Everest III Series specifies:

"The images below show the space in the firebox where the logs are to be placed. It is important to always respect this space and not to put logs in the grid area marked with an X. The marked area is defined by the space between the glass and the steel andiron (not removable) supplied with the unit. Leave enough space between the logs for good air circulation. Using more than the usable firebox volume for loading wood will result in poor combustion. The Usable firebox volume of 2.61 ft³ shown below is the one used during EPA emissions certification. The recommended log length for this stove is 16 inches and the fuel species used for the EPA certification will be Big Leaf maple. "



ii. SBI Everest III Series UFV schematic:



iii. SBI Everest III Series UFV calculation:

$$UFV = UFV_{front} + UFV_{rear} + UFV_{rear,tri}$$

$$UFV_{front} = \frac{(21.120 + 19.374)}{2} \times 4.801 \times 16.414 = 1595.5 \text{ in}^3$$

$$UFV_{rear} = \frac{(19.374 + 15.436)}{2} \times 14.412 \times (15.625 - 4.801) = 2715.3 \text{ in}^3$$

$$UFV_{rear,top,center} = \frac{1}{2} \times 15.436 \times (16.414 - 14.412) \times (15.625 - 4.801) = 167.2 \text{ in}^3$$

$$UFV_{rear,top,side} = \frac{1}{3} \times \frac{19.374 - 15.436}{2} \times (16.414 - 14.412) \times (15.625 - 4.801) = 14.2 \text{ in}^3$$

$$UFV = 1595.5 + 2715.3 + 167.2 + (2 \times 14.2) = 4506.4 \text{ in}^3$$

$$UFV = \frac{4506.4}{12^3} = 2.61 \text{ ft}^3$$

- D. UFV calculation from “The NYSERDA 2015 NSPS Fuel Calculator (8/07/2023) would require an adjustment of 0.012 ft³ to match the above UFV calculation of 2.61 ft³. If there is any difference in fuel loading determined by this volume difference, you will use the loading requirements for the larger of these two values for this testing (2.61 ft³).

1.3 Firebox Information		
Firebox Shape:	☒ Cubic	☐ Cylindrical
Firebox width:	18.28	in.
Firebox depth:	15.63	in.
Firebox height:	15.86	in.
Volume adjustment:	0.012	ft ³
Firebox Net Volume:	2.609	ft ³

- i. The firebox width of 18.28 inches is measured at the center of the UFV. This represents the average width of the firebox (the UFV drawing above has more details). Taking the average width creates a small error to the calculation (underestimate of 21.1 in³). This error is highlighted in the calculations below:

$$h_{adj,top,tri} = 16.414 + (4.801 \tan(10^\circ)) - 14.412 = 2.849 \text{ in}$$

$$V_{adj,estimated} = \frac{2.849 \times 15.625}{2} \times 18.278 = 406.8 \text{ in}^3$$

$$V_{adj,real} = V_{adj,center} + 2 \times V_{adj,side}$$

$$V_{adj,center} = \frac{2.849 \times 15.625}{2} \times 15.436 = 343.6 \text{ in}^3$$

$$V_{adj,side} = \frac{2.849}{3} \times \frac{(21.120 - 15.436)}{2} \times 15.625 = 42.2 \text{ in}^3$$

$$V_{adj,real} = 343.6 + 2 \times 42.2 = 427.9 \text{ in}^3$$

$$V_{fireboxshape,error} = 406.8 - 427.9 = 21.1 \text{ in}^3$$

- ii. The firebox depth of 15.63 inches is measured from the back of the firebox up to the steel andiron (non-removable) at the front of the firebox. Again, the UFV schematic above has additional details.

- iii. The firebox height of 15.86 inches is the dimension measured at the center of the firebox, from the bottom of the firebox up to the secondary air tubes. This represents the average height of the firebox. Once more, the UFV schematic above has additional details.
- iv. The volume to be removed represents the small triangle above the front secondary air tube, and is calculated as:

$$Height_{triangle} = 4.801 \times \tan(10^\circ) = 0.847 \text{ in}$$

$$V_{tri,center} = \frac{0.847 \times 4.801}{2} \times 19.374 = 39.4 \text{ in}^3$$

$$V_{tri,side} = \frac{1}{3} \times \frac{(21.120 - 19.374)}{2} \times 0.847 \times 4.801 = 1.2 \text{ in}^3$$

$$V_{tri,adj} = V_{tri,center} + 2 \times V_{tri,side}$$

$$V_{tri,adj} = 39.4 + 2 \times 1.2 = 41.8 \text{ in}^3$$

- v. Finally, the volume adjustment necessary for the fuel load calculator is shown by the following calculation:

$$V_{adj} = V_{tri,adj} - V_{firebox_shape_error}$$

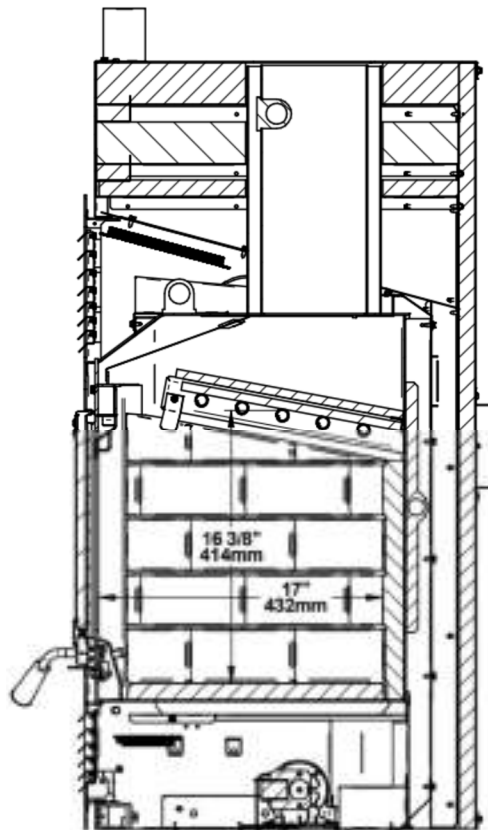
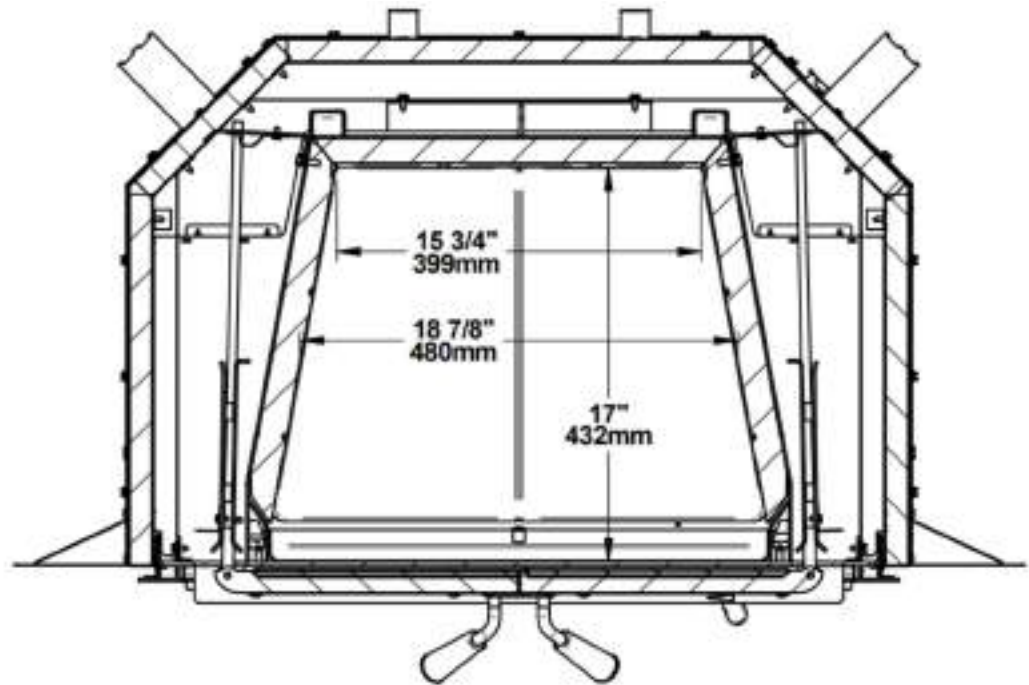
$$V_{adj} = 41.8 - 21.1 = 20.7 \text{ in}^3$$

$$V_{adj} = \frac{20.7}{12^3} = 0.012 \text{ ft}^3$$

- E. The overall firebox volume (OFV) is for marketing purposes only. The overall firebox calculation is not intended to be used for testing, as it includes areas of the firebox into which the test fuel load is not permitted to be placed. This area is a buffer zone to allow an easier fuel insertion, to prevent ash spillage and to allow the air wash to work properly. The calculation presented below approximates the volume a consumer could easily confirm using a measuring tape. As provided, the User's Owner's Manual section 2.1 for the Everest III series specifies:

“The overall firebox calculation is an approximation and is not intended to be used for loading. This volume includes a buffer zone to allow an easier fuel insertion, prevent ash spillage and allow the air wash to work properly.”

i. SBI Everest III Series overall firebox volume (OFV) calculation:



$$OFV = 18.875 \times 17.000 \times 16.375 = 5254.330 \text{ in}^3 OFV = \frac{5257.33}{12^3} = 3.04 \text{ ft}^3$$

3. Additional requirements:

- A. Emissions must be measured and reported from all test runs.
- B. The NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards is meant to be run in triplicate, with no test runs excluded (no option to replace one test run with two others) and the reported test result is the average value of these three replicate tests.
- C. The trains must not be disassembled until after a post-test leak check is performed.
- D. The blower of the SBI Everest III Series is operated manually. Per section 11.6.5.2 of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards. Section 11.11.1.1 states: “All test runs should have the fan “ON” at the highest setting except for 1) the duration of L1, and 2) When the door is open in all loads (L1, L2, L3, and L4) and, 3) From the end of L3 to when the air control is set to the lowest position for L4.
- E. Be advised that per section 11.6.7.1 of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 11.6.7.2 all test runs must be video recorded in their entirety or at least at 1-minute intervals, and remote witness capability must be made available by the test lab upon request.
- F. Follow Technical Information Document 024 - Memo on Rounding and Significant Figures for rounding conventions: <https://www.epa.gov/emc/technical-information-document-024-memo-rounding-and-significant-figures>

Additionally, based on the information provided, and with the modifications listed below and the caveats set forth at the end, we are approving your request to use a modified version of ASTM E2515-11 when conducting PM emission sampling as required by 40 CFR 60.534(c) including an alternative sampling procedure when conducting first hour PM emission sampling as required by 40 CFR 60.534(d).

When using ASTM E2515-11 to conduct PM sampling as required by 60.534(c), the following changes and modifications must be made:

1. Section 9.2.2 - Modification of requirement:

- a. Tunnel flow rate must be sufficient to maintain tunnel temperature below 125 °F (maximum) and 104 °F on a 10-minute rolling average, excluding periods when the appliance door is open. Two exceedances are allowed of the 10-minute rolling average points in each test run. The tunnel relative humidity must be below 90% humidity at 80°F (ASTM E2515-11 minimum filter temperature as required in this alternative test method) based on 1-minute data excluding periods when the appliance door is open.
 - i. Optionally, real-time tunnel dewpoint temperature measurements recorded at a minimum rate of one reading per minute can be made to override the maximum

tunnel temperature requirement (125°F maximum and 104°F on a 10-minute rolling average). One-minute dewpoint temperature measurements in the dilution tunnel must be below the one-minute ASTM E2515-11 filter temperature measurement. If there is an exceedance of the tunnel dewpoint temperature above the ASTM E2515-11 filter temperature, then the test run is invalid and must be repeated.

- ii. As an alternative to 1.a.i, the tunnel relative humidity may be measured using a psychrometer to measure the wet bulb temperature in the dilution tunnel. These measurements must be taken and recorded, at a minimum of every 2 minutes. ASTM E0377-15 Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry- Bulb Temperatures) may be followed for these purposes.
 - b. With respect to the last sentence in ASTM E2515-11 section 9.2.2, you are excluded from the following requirement: “The maximum tunnel flow rate shall not exceed five times the minimum flow rate determined as shown in 9.2.4.”
2. Sections 9.8.1, 10.2.1 and 11.7 - Additional requirements:
- a. **The filter temperature must be maintained between 80 and 90 °F during testing.**
 - b. Filters must be weighed in pairs using EPA [ALT-154](#).
 - c. Only one point per sampling train is allowed outside the ± 10 percent proportionality range per test run.
 - d. **Non-desiccated post-test filter weights must be taken within an hour after the post-test leak check. These initial weights must be included in the test report.**
 - e. Oven drying desiccation, at any temperature, is not allowed.
 - f. Dual train comparison (precision) must be calculated in terms of percent difference between the two sample trains and in terms of calculated emissions difference on a g/kg basis. These values must both be clearly reported for each test run.
 - g. Negative filter weights must be discussed in the test report. Where negative mass (i.e., filter material left on O-rings and gaskets) is subtracted from the overall PM mass, the resultant PM mass must be reported with the mass subtracted and with the mass not subtracted for comparison purposes. Given the gravimetric procedures in ALT-154 we do not expect to encounter any negative mass issues with the filters but if any should be present there must be a full discussion in the test report on how this may have come to be the case and what impact it may have on the measured emissions.
3. Sections 9.5.2 through 11.4.2 - Additional requirement:
- a. Ambient background sampling and filter collection must be conducted per the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, Section 11.12ASTM E2515-11, section 4.3 and all other method specific room air sampling requirements.
4. Sections 9.6.4 through 9.6.5.1 - Additional requirement:
- a. Particulate matter emission concentrations must be measured with ASTM E2515-11 with the following exceptions, eliminate section 9.6.5.1 of ASTM E2515-11 and perform the post-test leak checks as specified below:

- i. Post-Test Leak Check: A leak check of each sampling train is mandatory at the conclusion of each sampling run before sample recovery. The leak check must be performed in accordance with the procedures of ASTM E2515-11, section 9.6.4.1, except that it must be conducted at a vacuum equal to or greater than the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.0003 m³/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
- b. Additionally, if a component change of either sampling train is needed during sampling, then perform the leak check specified below:
 - i. Leak Checks During Sample Run: If, during a sampling run, a component (e.g., filter assembly) change becomes necessary, a leak check must be conducted immediately before the change is made. Record the sample volume before and after the leak test. The sample volume collected during any leak checks must not be included in the total sample volume for the test run. The leak check must be done according to the procedure outlined in ASTM E2515-11, section 9.6.4.1, except that it must be done at a vacuum equal to or greater than the maximum value recorded up to that point in the sampling run. If the leakage rate is found to be no greater than 0.0003 m³/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
- c. NOTE: Immediately after component changes, leak checks are optional but highly recommended. If such leak checks are done, the post-test leak check procedure referenced above shall be used.

When using ASTM E2515-11 to conduct first hour PM sampling as required by 60.534(d), these changes and modifications must be made:

1. To determine the first hour PM emissions as required by 60.534(d), the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 10.2.3, requires the use of a TEOM to report the first-hour emission rate, to provide data for phased emissions, and real-time data reporting requirements. All TEOM measurements shall run through the entirety of the test to obtain full run data.

All other requirements of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards and ASTM E2515-11 must be followed during the testing, and all requirements of 40 CFR part 60, Subpart AAA must be satisfied and described in your test report. This approval is based on the understanding that the lowest heat output (Btu/hr) setting on the Everest III Series room heater available to the user will correspond to the lowest burn rate to be evaluated during certification testing and the test report will fully document that the certification testing was conducted as such. This is consistent with section 60.534(a)(1) of Subpart AAA, which states, "the burn rate for the low burn category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer."

A copy of this letter must be included in any certification test report where this alternative test method determination is utilized.

If you have additional questions regarding this approval, please contact me at 919-541-4790 or johnson.steffan@epa.gov.

Sincerely,

Steffan M. Johnson
Group Leader
Measurement Technology Group

cc:

Shannon Banner – EPA/OAQPS/SPPD
James Hemby – EPA/OAQPS/AQAD
Rafael Sanchez – EPA/OECA
Bill Schrock - EPA/OAQPS/SPPD
Robert Scinta – EPA/OECA
Nick Swanson – EPA/OAQPS/SPPD
Michael Toney – EPA/OAQPS/AQAD
Mark Turner – EPA/OAQPS/SPPD
Chet Wayland – EPA/OAQPS/AQAD

APPENDIX

NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard

Note: This method does not include all the specifications (e.g. equipment and supplies) and procedures (e.g., sample and analytical) essential to its performance. Some material is incorporated by reference from other methods. Therefore, to obtain reliable results, persons using this method shall have a thorough knowledge of at least the following EPA Tests:

- Method 1- Sample and Velocity Traverses for Stationary Sources
- Method 2- Determination of Stack Gas Velocity and Volumetric Flow Rate (Standard Type Pitot Tube)
- Method 3 – Gas Analysis for the Determination of Dry Molecular Weight
- Method 4 – Determination of Moisture Content in Stack Gases
- Method 5G – Determination of Particulate Matter from Wood Heaters (Dilution Tunnel Sampling Location)
- Method 10 - Carbon Monoxide - Instrumental Analyzer
- Method 28 – Certification and Auditing of Wood Heaters

1. Scope and Application

- 1.1. This test method specifies operation and fueling for certification and auditing of manually fed wood-fired stoves and heaters with manual or automatic controls.
- 1.2. This test method measures particulate matter (PM) emissions, heat output, and efficiency.
- 1.3. Carbon monoxide emissions are measured per CSA B415.1 *Performance Testing of Solid-Fuel-Burning Heating Appliances*.
- 1.4. Particulate emissions are measured using the dilution tunnel method.
 - 1.4.1. As specified in ASTM E2515-11, *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel*, with modifications described in Section 10.1 of this test method.
 - 1.4.2. Using the Tapered Element Oscillating Microbalance (TEOM) continuous PM method as detailed in this test method.
- 1.5. Efficiency using CSA B415.1 with the following exceptions:
 - 1.5.1. No substitution of data is allowed.

- 1.5.2. 10-minute average data must be used to calculate efficiency
- 1.6. Analyte. Particulate matter (PM). No CAS number assigned.
- 1.7. Applicability. This method is applicable for the certification and auditing of wood space heaters that burn cordwood fuel. The test quantifies PM and CO emissions and provides overall efficiency ratings, maximum burn time, and heat output.
- 1.8. Data Quality Objectives. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.
- 1.9. Distinguishing features of appliances covered by this standard include:
 - 1.9.1. Cordwood fuel is hand-fed into the firebox.
 - 1.9.2. A chimney or vent that exhausts combustion products from the appliance.
- 1.10. The values stated are to be regarded as the standard, whether in I-P (British) or SI units. The values given in parentheses are for information only.
- 1.11. Data Quality Objectives.
 - 1.11.1. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.
 - 1.11.2. Measurement of emissions and heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to useful heat production.
 - 1.11.3. This is a laboratory method intended to capture operating periods that are representative of actual field use without excessive test burden.

2. Referenced Methods

- 2.1. NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces
- 2.2. ASTM 2515-11: Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.
- 2.3. CSA B415.1 Performance Testing of Solid-Fuel-Burning Heating Appliances.

3. Definitions

- 3.1. Aborted Test Run – The run shall be considered aborted if a force majeure event occurs, such as a power outage or equipment operation failure. Aborted test runs are treated differently than incomplete or invalid test runs.

- 3.2. Active Period – the active period of a test is defined as the following events: (1) Door opening and closing, damper adjustments, adjustments of air controls, (2) Kindling and start-up wood within the stove and prior to ignition; (3) Coal bed raking, ((4) Fuel pieces before loading; (5) Fuel in firebox immediately after loading, (6) Fuel adjustments; (7) End of the test run coal bed conditions (this requires opening the door at the end of test), or (8) any other event where the user engages with the appliance.
- 3.3. Appliance – a wood heater capable of and intended for space heating defined in the applicable regulation. The appliance includes a combustion chamber, combustion air settings, operating controls, and a thermostat if specified, and any other accessory required for standard operation, such as a barometric damper.
- 3.4. Automatically controlled appliance – an appliance whose air controls are controlled automatically controlled throughout the appliance operation and can only be disabled by a technician or when in a power-out mode. Appliances controlling air for portions of a burn cycle are not automatically controlled appliances for this test method.
- 3.5. Centroidal Area – means the central area of the stack or duct that is no greater than 1 percent of the stack or duct cross-section. This area has the same geometric shape as the stack or duct.
- 3.6. Certification or audit test – a series of at least three test runs (four runs, if use of a fan is an option) conducted for certification or audit purposes that meets the specifications detailed in this protocol.
- 3.7. Chop – using a poker or another piece of wood to strike a piece of the fuel charge to break it into smaller pieces.
- 3.8. Coal-bed Stirring – prior to adding a new fuel charge, using a poker or piece of wood to stir or level the coal bed of the appliance for the sole purpose of ensuring ease of loading of the fuel charge. No special formations can be made, such as creating coal bed formations or pushing coals to one side or creating slopes with the coals.
- 3.9. Data recorder – The equipment that permanently records the concentrations reported by the analyzers.
- 3.10. Drift – Difference between pre and post run calibration system bias (or system calibration error) checks at a specific calibration concentration level.
- 3.11. East-west stove – a stove where the firebox dimension parallel to the loading door is greater or equal to the stove depth measurement. Logs are loaded so that they are viewed on the long length of the stove.
- 3.12. Emission factor – the emission of a pollutant expressed in mass per unit of energy (typically) output from the appliance.
- 3.13. Firebox – the portion of the chamber in the wood heater in which the test fuel charge is placed and combusted.

- 3.14. Firebox depth – the horizontal length of the fire chamber dimension measured perpendicular to the loading door. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. If the manufacturer believes that a portion of the firebox depth is not usable for firebox volume calculation, photo documentation and a written basis must be included in the test report.
- 3.15. Firebox Height – the vertical distance extending above the top of the firebox to the floor of the firebox. Firebox height is not necessarily uniform. The measurement must account for variations caused by internal baffles, air channels, or other permanent obstructions. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume.
- 3.16. Firebox width – the horizontal fire chamber dimension that is parallel to the loading door. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. If the manufacturer believes that a portion of the firebox width is not usable for firebox volume calculation, photo documentation and a written basis must be included in the test report.
- 3.17. Flue Gas Measurement System – All the equipment used to measure stack gas components of interest. This system comprises five major subsystems: sample acquisition, sample transport, sample conditioning, gas analyzer, and data recorder.
- 3.18. Fuel Adjustment – manipulations to the fuel charge to reflect typical owner practices that allow the cordwood fuel to burn appropriately during the test period. A fuel adjustment includes minor changes in fuel placement. It does not include chopping the wood, stirring the coal bed, or reorganizing fuel placement.
- 3.19. Fuel load calculator – The locked excel spreadsheet tool that determines the allowable test fuel load weights and required piece sizes for each individual load.
- 3.20. Fuel loading direction – For loads 2, 3, and 4 fuel shall be loaded based parallel to the dimension with the largest value. If the firebox length and width are within 2”, fuel shall be loaded in an east/west fashion, parallel to the loading door. A crisscross configuration is allowed for L1 but cannot be used as a load configuration for loads 2, 3, or 4.
- 3.21. Gas analyzer – Instrument that measures and transmits an output proportional to a gas concentration.
- 3.22. Incomplete Test Run – Any test run that does not successfully complete all six test phases continuously due to stopped fuel combustion or other appliance issues, as detailed in Section 12.24.11.
- 3.23. Invalid Test Run – Any complete or partial test that does not meet the specifications detailed in this test method as the fault of the system operation.

- 3.24. Kindling pieces – small pieces of wood less than 1” in diameter. No bark or moisture requirements for these pieces, however kindling pieces shall not be dried or stored anywhere but in laboratory ambient conditions. Kindling length shall be of the same wood species as the fuel charge length. Individual kindling pieces may weigh no less than 1.5 ounces.
- 3.25. Large fuel pieces – pieces that are larger for the appliance as defined by the fuel load calculator.
- 3.26. L1 Start-up – period of the test when the unit has kindling and startup fuel under the conditions described in Section 11.6.7.
- 3.27. L2 High-fire Phase – period of the test when the unit has a small coal bed and the stoves air settings are fully open. It is intended to replicate periods when homeowners are trying to quickly heat an area, shortly after starting or restarting the appliance.
- 3.28. L3 Maintenance-fire phase– period of the test when a fire is maintained with a medium-sized coal bed, and a smaller batch of wood made up of two large pieces. This is intended to simulate a period when the operator is trying to maintain consistent heat output.
- 3.29. L4 Low-burn Rate Phase – period of the test when the stove has a large coal bed, the stove is fully loaded, and the adjustable air settings are set to produce the lowest possible burn rate and have the lowest air settings. It is intended to simulate when the operator is trying to maintain heat over a long time, such as overnight or while away for significant periods of time.
- 3.30. North-south stove – a firebox that has its longest dimension measurement perpendicular to the loading door. In this stove type, logs are loaded so that the ends of the fuel are viewed when loaded.
- 3.31. Phase – A distinct period in the test run with its own operational procedures and conditions.
- 3.32. Primary air supply – air supply that introduces air to the wood heater in the combustion chamber and is adjusted to target a desired burn rate. The wood heater manufacturer or test facility can document this through design drawings.
- 3.33. Secondary air supply – air supply that introduces air to the wood heater such that the burn rate is not altered by more than 10 percent when the secondary air supply is adjusted during the test run. The wood heater manufacturer or test facility can document this through design drawings that show the secondary air is introduced only into a mixing chamber or secondary chamber outside the firebox.
- 3.34. Significant figure – is any digit that is necessary to define the specific value or quantity. Zeros may be used either to indicate a specific value, like any other digit or to indicate the magnitude of a number.
- 3.35. Small fuel pieces – pieces that are small for the appliance as defined by the fuel load calculator.
- 3.36. Starter fuel – pieces of cordwood that can be smaller than small and large pieces but larger than kindling, as defined by the fuel load calculator.

- 3.37. System calibration mode – The introduction of calibration gases into the measurement system at the flue gas inlet probe upstream of conditioning components, filtration, and flue gas sample transport equipment.
- 3.38. Test data – means the data for all test runs conducted on the wood heater, including any data collected during failed and invalid runs and includes records of preparation of standards, identification of equipment used and personnel present, records of calibrations, raw data sheets for field sampling, raw data sheets for field and laboratory analyses, chain-of-custody documentation, and example calculations for reported results.
- 3.39. Test facility – the area in which the wood heater is installed, operated, and sampled for emissions.
- 3.40. Test fuel charge– the collection of test fuel pieces used in each of the four phases of the test run. L2, L3, and L4 recommend that at least 75% of the individual pieces with at least 80% bark on one side of the fuel piece. Bark shall not be removed for certification testing. Any fuel charge that suggests bark was purposely removed or shaped shall be deemed invalid. Examples of fuel piece manipulation are provided in Section 11. If 75% of the fuel load pieces for L2, L3, and L4 do not have bark, document in the test report, and provide a basis for the lack of bark.
- 3.41. Test fuel load – the group of test fuel pieces that are loaded, as specified by phase, throughout the test run.
- 3.42. Test fuel loading – the arrangement of the test fuel charge.
- 3.43. Total run fuel load – the amount of wood burned during the entire test run.
- 3.44. Test fuel loading density – the calculation determining the weight of the as-fired test fuel load. The calculation is based on the usable volume of the firebox.
- 3.45. Test run – an individual emission test that includes the four operational phases required by the fueling protocol.
- 3.46. Usable firebox volume – the calculated volume of the firebox determined using its height, width, and depth as defined in this section. This calculation represents the area where wood is likely to be loaded. If the manufacturer claims that portions of the firebox may not be used in the calculation, a justification must be submitted with the test report. If the justification is not approved, the test results will be deemed unrepresentative for certification purposes. It is highly recommended that manufacturers obtain regulatory approval if making claims that portions of the firebox are not appropriate for inclusion in the calculation.
- 3.47. Wood heater – an enclosed, wood-burning appliance capable of and intended for space heating or domestic water heating, as defined in the applicable regulation.

4. Interferences

None.

5. Summary of Method

- 5.1. Particulate matter emissions are measured from a wood heater burning cordwood test fuel in a test facility maintained at a set of prescribed ambient conditions. Procedures for operating the appliance, measuring PM and CO emission rates, and methods for reducing data and calculating results are provided.
- 5.2. *Dilution Tunnel.* A dilution tunnel following the specifications detailed in ASTM E2515-11 shall be used for particulate measurements.
- 5.3. *Particulate Matter:* PM emissions are measured in a dilution tunnel specified in ASTM 2515-11 *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* with exceptions as defined in Section 10.1. The flow rate in the dilution tunnel is maintained at a constant rate throughout the test cycle and accurately measured. PM emissions are measured in the dilution tunnel using both the filter method specified in ASTM 2515-11 and with a Thermo model 1405-D using NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.
- 5.4. *Operation.* Appliance operation is conducted on a cold-to-hot test cycle, meaning that the appliance starts the first test run at room temperature and ends with the appliance in a heated state. The second and third test runs may start at a slightly warmer temperature if the appliance is designed to retain the heat from the first run. The appliance is operated at operational phases representing start-up emissions, high heat demand, low heat demand, changing air conditions, and refueling. To complete the certification test, the appliance shall complete three valid test runs for manually air-controlled appliances and four test runs for appliances with automatic air controls. Overall results average all valid test runs to determine the test results.
- 5.5. *Repeatability.*
 - 5.5.1. For manual air control stoves, a series of at least three test runs are conducted for certification or audit purposes.
 - 5.5.2. For appliances with automatic air controls, a series of at least three test runs using automatic controls and a single run completed with the heater and controls disconnected from any external power source shall be conducted for certification and audit purposes.

6. Significance and Use

- 6.1. The measurement of particulate matter emission rates is an important test method widely used in the practice of air pollution control.
 - 6.1.1. These measurements, when approved by state or federal agencies, are often required for the purpose of determining compliance with regulations and statutes.

- 6.1.2. The measurements made before and after design modifications are necessary to demonstrate the effectiveness of design changes in reducing emissions and make this standard an important tool in manufacturers' research and development programs.
- 6.2. Measurement of heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to the useful heat production.

7. Safety

- 7.1. Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to performing this test method.
- 7.2. These tests involve combustion of wood, which releases substantial amounts of heat and combustion products. The heating system also produces large quantities of very hot water and the potential for steam production and system pressurization. Appropriate precautions must be taken to protect personnel from burn hazards and respiration of products of combustion. Exposure of personnel to unsafe levels of carbon monoxide must be avoided, and the use of continuous ambient carbon monoxide monitoring is strongly recommended.

8. Equipment and Supplies. The following items are required for sample collection:

- 8.1. Anemometer. A device capable of detecting air velocities less than 0.10 m/sec (20 ft/min), for measuring air velocities near the test appliance.
- 8.2. *Appliance Flue.*
 - 8.2.1. Steel flue pipe extending to 8.5 ± 0.5 ft. (2.6 ± 0.15 m) above the top of the platform scale, and above this level, insulated solid pack type chimney extending to 15 ± 1 ft. (4.6 ± 0.3 m) above the platform scale, and of the size specified by the appliance manufacturer. This applies to both freestanding and inserts type appliances.
 - 8.2.2. Other chimney types (e.g., solid pack insulated pipe) may be used in place of the steel flue pipe if the appliance manufacturer's written appliance specifications require such chimney for home installation (e.g., zero clearance appliance inserts). Such alternative chimney or flue pipe must remain and be sealed with the appliance following the certification test. This applies only to appliances requiring a specialized chimney.

- 8.2.3. Solid pack insulated chimneys shall have a minimum of 2.5 cm (1 in.) solid-pack insulating material surrounding the entire flue and possess a label demonstrating conformance to U.L. 103 (incorporated by reference—see §60.17).
- 8.3. Appliance Platform Scale and Monitor. For monitoring of fuel load weight change. The scale shall be capable of measuring weight to within 0.01 kg (0.02 lb.) and calibrated to NIST traceable standards at least annually.
- 8.4. Barometer. Aneroid or another barometer capable of measuring atmospheric pressure to within 0.1 in. Hg (2.5 mm Hg) with an uncertainty of +/- 0.05 in. Hg (+/- 1.27 mm Hg).
- 8.5. CO Gas Analyzer. A continuous nondispersive infrared (NDIR) analyzer, or equivalent, that measures the CO concentration in the flue gas stream. A dual-range analyzer is acceptable. These analyzers are often equipped with automated range-switching capability, so that when readings exceed the full-scale of the low measurement range, they are recorded on the high range. As an alternative to using a dual-range analyzer, you may use two segments of a single, large measurement scale to serve as the low and high ranges. In all cases, when two ranges are used, you must quality-assure both ranges using the proper sets of calibration gases.
- 8.6. CO₂ Gas Analyzer. A continuous NDIR analyzer, or equivalent, that measures the CO₂ concentration in the flue gas stream. Dual-range analyzer is acceptable. These analyzers are often equipped with automated range-switching capability, so that when readings exceed the full-scale of the low measurement range, they are recorded on the high range. As an alternative to using a dual-range analyzer, you may use two segments of a single, large measurement scale to serve as the low and high ranges. In all cases, when two ranges are used, you must quality-assure both ranges using the proper sets of calibration gases.
- 8.7. Dilution Tunnel must meet the requirements of ASTM E2515-11, clauses 6.1.6 and 9.2.
- 8.8. Dilution Tunnel temperature and relative humidity measurement. A probe with analog or digital data outputs capable of measuring tunnel temperature to within 0.5 °C (1.0 °F) and tunnel RH to within 2% between 5 and 95% RH at maximum tunnel temperatures, such as the Omega HX85A or equivalent. The probe should also report calculated dewpoint.
- 8.9. Draft Gauge. Electromanometer or other devices for the determination of flue draft or static pressure readable to within 0.005 in. H₂O (1.2 Pa)
- 8.10. Flue Gas Sample Probe. Stainless steel or other approved material of sufficient length to measure the sample point in stack.
- 8.11. Flue Gas Particulate Filters. The filter(s) must be made of material that is non-reactive to the gas being sampled and placed upstream of the gas analyzer.

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- 8.12. Flue Gas Sample Line. The sample line from the probe to the conditioning system/sample pump should be made of Teflon or other material that does not adsorb or otherwise alter the sample gas.
- 8.13. Flue Gas Calibration Line. The sample line from the flue gas probe to the calibration gas shall be made of Teflon or other material that does not adsorb or otherwise alter the sample gas.
- 8.14. Flue Gas Conditioning Equipment. A condenser, dryer or other suitable system which removes moisture, condensable organic material and particulate continuously from the sample flue gas.
- 8.15. Flue Gas Sampling Pump. A leak-free pump is needed to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The pump may be constructed of any material that is non- reactive to the gas being sampled.
- 8.16. Flue Gas Temperature Measurement. A type K thermocouple or equivalent located in the centroid of the stack located 8.0 +/- 0.5 ft (2.44 m +/- 150 mm) above the platform scale, capable of measuring with an accuracy of 4.0°F (2.2°C) or 0.75% of reading, whichever is greater.
- 8.17. Flue Gas Composition Measurement. A sample probe and continuous infrared analyzer or equivalent capable of measuring span of carbon monoxide (CO) and carbon dioxide (CO₂) in the flue gas produced by the appliance tested. Continuous analyzers (or equivalent) shall have maximum zero and span drift, over a 24 h period, of 1% of full scale.
- 8.18. Fuel Scale. Balance capable of weighing the test fuel charge to within 0.02 kg (0.05 lb.) and calibrated to NIST traceable standards at least annually.
- 8.19. Humidity Gauge. Psychrometer or hygrometer for measuring room humidity to within +/- 4% from 25 to 95% RH.
- 8.20. Moisture Meter. Calibrated electrical resistance meter for measuring test fuel moisture to within 2 percent moisture content.
- 8.21. Surface Temperatures. Capable of measuring temperature to within 1.5 percent of expected absolute temperatures with an accuracy of 4.0°F (2.2°C) or 0.75% of reading, whichever is greater.
- 8.22. Test Facility Temperature Monitor. A thermistor, RTD, Type T-Special thermocouple, or other equivalent device, located centrally in a vertically oriented 150 mm (6 in.) long, 50 mm (2 in.) diameter pipe shield that is open at both ends, capable of measuring temperature to within 1°F of expected temperatures.
- 8.23. TEOM – Thermo Fisher Scientific TEOM model 1405-D (Thermo part # 1405D-ANF, excluding models 1405, 1405-DE, or 1405-F) to measure and report continuous particulate matter (PM) measurements in an ASTM 2515-11 dilution tunnel or equivalent dilution method, and operated according to the NYSERDA Dichot TEOM Standard Operating Procedures. For lab air PM

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measurements, Thermo Fisher Scientific TEOM model 1405 (Thermo part # 1405-ANF, excluding model 1405-F), operated according to the NYSERDA Dichot TEOM Standard Operating Procedures.

9. Calibration and Standardizations

- 9.1. ASTM E2515-11. Perform all calibrations required by ASTM E2515-11.
- 9.2. Anemometer. Calibrate the anemometer as specified by the manufacturer's instructions before the first certification test every six months thereafter.
- 9.3. Appliance Platform Scale. Perform a multipoint calibration (at least five points spanning the operational range) of the platform scale before its initial use. The scale manufacturer's calibration results are sufficient for this purpose. Before each certification test, audit the scale with the wood heater in place by weighing at least one calibration weight (Class F) that corresponds to between 20 percent and 80 percent of the expected test fuel charge weight. If the scale cannot reproduce the value of the calibration weight within 0.0045 kg (0.01 lb.) or 1 percent of the expected test fuel charge weight, whichever is greater, recalibrate the scale before use with at least five calibration weights spanning the operational range of the scale.
- 9.4. Barometer. Calibrate using a reference pressure monitor calibrator before the first certification test and semiannually after.
- 9.5. Draft Gauge. Calibrate as per the manufacturer's instructions; a liquid manometer does not require calibration (but must be properly leveled, zeroed, and the system leak checked).
- 9.6. Humidity Gauge. Calibrate as per the manufacturer's instructions before the first certification test and annually thereafter.
- 9.7. Fuel Scale. Calibrate as described in 9.2.
- 9.8. Moisture Meter. Calibrate as per the manufacturer's instructions before the first certification test and semiannually thereafter.
- 9.9. Temperature Sensors. Calibrate using at least five points with an operating range within specification and in compliance with NIST Monograph 175. To be calibrated before the first certification test and semiannually thereafter.

10. Sampling, Test Specimens, and Test Appliances

- 10.1. Particulate matter sampling shall follow ASTM except for the following modifications listed here.
 - 10.1.1. Liquid water should not be present anywhere in the sampling system for a valid sample. The presence of condensed water anywhere in the sampling system invalidates the test run. All data from all invalid test runs shall be included in the report. The reviewing authority shall make a final determination on invalidated runs. Data from any invalidated test run shall

not be used to calculate results. If the testing agency believes a run has been invalidated, the test run shall be repeated.

10.1.2. Dilution tunnel temperature and relative humidity shall be measured electronically and logged at one-minute intervals near the sample probe to calculate dewpoint.

10.1.3. The following section details test conditions that shall be maintained for a valid test run. A valid test shall have no more than two individual deviations from the conditions below to remain a valid run. An example of an individual deviation is a single, ten-minute rolling average where the dilution tunnel exceeded temperature thresholds. Another ten-minute period exceeding the tunnel temperature requirement shall be considered a second deviation.

10.1.3.1. Tunnel flow rate must be sufficient to maintain tunnel temperature below 125 °F (maximum) and 113 °F on a 10-minute rolling average, excluding periods when the appliance door is open. Two exceedances are allowed of the 10-minute rolling average points in each test run. The tunnel relative humidity must be below 90% humidity at 80 °F (ASTM E2515-11 minimum filter temperature as required in this alternative test method) based on 1-minute data excluding periods when the appliance door is open.

10.1.3.1.1. Optionally, real-time tunnel dewpoint temperature measurements recorded at a minimum rate of one reading per minute can be made to override the maximum tunnel temperature requirement (125 °F maximum and 113 °F on a 10-minute rolling average). One-minute dewpoint temperature measurements in the dilution tunnel must be below the one-minute ASTM E2515-11 filter temperature measurement. If there is an exceedance of the tunnel dewpoint temperature above the ASTM E2515-11 filter temperature, then the test run is invalid and must be repeated.

10.1.3.1.2. As an alternative, the tunnel relative humidity may be measured using a psychrometer to measure the wet bulb temperature in the dilution tunnel. These measurements must be taken and recorded, at a minimum of every 2 minutes. ASTM E0377-15 Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry Bulb Temperatures) may be followed for these purposes.

10.1.3.2. A minimum average tunnel flow of 600 DSCFM is required. Higher tunnel flows may be required to meet the parameters of Section 10.1.3. With respect to the last sentence in ASTM 2515-11 Section 9.2.2, tests are excluded from the following requirement, *“The maximum tunnel flow rate shall not exceed five times the minimum flow rate determined as shown in 9.2.4.”*

10.1.3.3. All exceedances must be reported in the test anomalies section, even if deviations are within the test method tolerances.

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10.1.3.4. ASTM 2515-11 filter trains 1 and 2 must meet a precision requirement of 7.5% or lower, regardless of g/kg comparison.

10.1.3.5. Use rounding requirements specified in Section 13.2 of this test method.

10.1.3.6. Use processes specified in Section 10.2.

10.2. Sample Collection. The following are required for sample collection:

10.2.1. Teflon coated glass fiber filters as supplied by the TEOM manufacturer for use with the TEOM model 1405-D. These are Pallflex Emfab (TX40) with an exposed diameter of 13 mm, without organic binder, exhibiting at least 99.95 percent efficiency.

10.2.2. *Test Specimens.* Appliances shall be supplied as complete systems, including all controls and accessories necessary for installation at the test facility. A full set of specifications, designs, and assembly drawings shall be provided when the product is placed under certification of a third-party agency.

10.2.3. Particulate Matter Sampling uses two ASTM 2515-11 sampling trains and a TEOM to obtain real-time data. TEOM data shall be used to report the first-hour emission rate, to provide data for phased emissions, and real-time data reporting requirements. All measurements shall run through the entirety of the test to obtain full run data.

10.2.3.1. Train 1 and 2 shall provide dual sampling trains that shall measure PM emissions from run start to run completion. Trains 1 and 2 must meet a precision requirement of 7.5% or lower per ASTM 2515-11, regardless of g/kg comparison.

10.2.3.1.1. Proportional rate variation shall meet ASTM 2515-11 requirements for all phases.

10.2.3.1.2. Filter conditions must be monitored, and filter changes are required to avoid filter clogging.

10.2.3.2. TEOM data shall be collected at 1-minute intervals for reporting. TEOM operation shall follow the procedures listed on the most recent NYSERDA Standard Operation Procedures for Thermo Scientific 1405-D TEOM for use in a dilution tunnel, found in the EPA docket.

10.3. *Flue Gas Measurement System Setup and Calibration*

10.3.1. Install Flue Gas Sample probe 2 in. (50 mm) above the flue gas temperature measurement in the stack.

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10.3.2. Setup Flue Gas Measurement System with an appropriate sample flow rate to reach 90% of their final reading within 30 seconds when beginning at ambient levels and responding to a high-level calibration gas.

10.3.3. Flue Gas Measurement System shall record CO and CO₂ concentrations at one-minute intervals.

10.4. Preparation of Apparatus

10.4.1. Wood Heater Installation for Certification Testing. Assemble the wood heater appliance and parts in conformance with the manufacturer's provided User Guide. These instructions must match all instructions materials developed by the manufacturer and/or their distributors. Place the wood heater on the platform scale and connect the chimney to the appliance. Clean the flue with an appropriately sized, wire chimney brush before initiating Run 1 of the certification test. Test documentation should include the date and time of flue cleaning.

10.4.2. Wood Heater Temperature Monitors.

10.4.2.1. For catalyst-equipped wood heaters, locate a temperature monitor (optional) about 25 mm (1 in.) upstream of the catalyst at the centroid of the catalyst face area, and locate a temperature monitor (mandatory) that will indicate the catalyst exhaust temperature. This temperature monitor is centrally located within 25 mm (1 in.) downstream at the centroid of the catalyst face area. Record these locations.

10.4.2.2. Locate wood heater surface temperature monitors at five locations on the wood heater firebox exterior surface. Position the temperature monitors centrally on the top surface, centrally on two sidewall surfaces, and centrally on the bottom and back surfaces. Position the monitor sensing tip on the exterior of the firebox surface inside of any heat shield, room air circulation walls, or other wall or shield separated from the firebox exterior surface. Surface temperature locations for unusual design shapes (e.g., spherical, etc.) shall be positioned so that there are four surface temperature monitors positioned to average stove temperature across various points on the appliance.

10.5. Conditioning

10.5.1. Wood Heater Aging Prior to Certification Testing. A wood heater of any type shall be aged at least 50 hours before initiating a certification test. The aging procedure shall be conducted by the manufacturer or a manufacturer's agent prior to sending the appliance to the testing laboratory.

During aging, the appliance shall be operated at a variety of burn rates. Documentation for wood heating aging must be included in the test report to include data on individual hourly burn rates.

10.5.1.1. The manufacturer shall supply wood heater aging information for the final test reports. Aging data that shall be reported include all fuel parameters (species, moisture content, load weights, piece amounts, and size), air settings used, time spent in each air setting phase, amount of fuel burned, and appliance burn rates.

10.5.1.2. If an appliance uses a catalytic combustor, it must be engaged according to the manufacturer's instructions and operate with the catalyst engaged for at least 50 hours during the break-in period. In addition to the reporting requirements listed in 8.1.1, catalytic appliances shall also report hourly catalyst exit temperature data to include the dates and hours of operation.

11. Procedure

11.1. Test Facility Conditions. The test facility shall meet the following requirements during testing.

11.1.1. The test facility temperature shall be maintained between 65 and 87 °F (13 and 31 °C) during each test run.

11.1.2. The flue shall discharge into the same space or into a space freely communicating with the test facility. Any hood or similar device used to vent combustion products shall not induce a draft greater than 0.005 in. H₂O (1.25 Pa) on the wood heater measured when the wood heater is not operating.

11.1.3. For test facilities with artificially induced barometric pressures (e.g., pressurized chambers), the barometric pressure in the test facility shall not exceed 30.5 in. Hg (775 mm Hg) during any test run.

11.1.4. Locate the test facility temperature monitor on the horizontal plane that includes the primary air intake opening for the wood heater. Locate the temperature monitor 3 to 6 ft. (0.9 to 1.8 m) from the front of the wood heater in the 90° sector in front of the wood heater.

11.1.5. Use an anemometer, or equivalent device, to measure the air velocity. Measure and record the room air velocity before the ignition period in L1 Startup and once immediately following the test run completion. Air velocities within 0.6 m (2 ft.) of the test appliance and exhaust system shall be less than 0.25 m/sec (50 ft./min) without fire in the unit.

11.1.6. Measure and record the test facility's ambient relative humidity, barometric pressure, and temperature before and after each test run using equipment as specified in Section 6.

11.2. Wood Heater Firebox Volume.

- 11.2.1. Determine the firebox volume using the definitions for height, width, and length. Volume adjustments due to the presence of firebrick and other permanent fixtures may be necessary. All adjustments shall be detailed in the test report and shall conform to the definition of usable firebox volume contained in this test method. Measurements shall include areas adjacent to and above a baffle.
- 11.2.2. If a manufacturer deems certain areas of the firebox as unusable for fuel load calculations, written documentation stating the basis for that claim and supporting photographic image(s) must be provided and approved by the regulatory authority prior to conducting the certification test. If approval is not granted prior to the test, then the test may be invalidated if the reviewing agency determines the firebox volume is inaccurate.
- 11.3. Test Fuel. The test fuel shall conform to the following requirements and meet specifications as required by the fuel loading calculator:
 - 11.3.1. Fuel Species. Untreated, air-dried, cordwood fuel.
 - 11.3.1.1. Allowable species: maple (big leaf, red, silver), Douglas fir, or birch (black, white, yellow, paper).
 - 11.3.1.2. Kiln-dried fuel is not permitted. Kiln-dried fuel includes drying at elevated air temperature settings above 90 °F.
 - 11.3.1.3. Fuel shall be free of decay, fungus, or other contaminants.
 - 11.3.2. Fuel Moisture.
 - 11.3.2.1. Determine fuel moisture for each fuel piece by averaging five moisture meter readings, one from each of three sides, and each of the ends in the middle, measured parallel to the wood grain.
 - 11.3.2.2. The test fuel load shall have an average moisture content from 19% to 25%, dry basis.
 - 11.3.2.3. Individual fuel pieces shall have an average moisture content of 19% to 25% dry basis.
 - 11.3.2.4. The addition of moisture to previously dried wood is not allowed.
 - 11.3.2.5. It is recommended that the test fuel be stored in a temperature and humidity-controlled room.

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11.3.2.6. Fuel moisture shall be measured within 24 hours of using the fuel for the test and shall be bagged or stored in a humidity-controlled environment until 2 hours prior to testing. A humidity-controlled environment is one where fuel is not subject to conditions that would remove moisture from the fuel, such as fans or a heating source, and maintain relative humidity levels greater than 75%.

11.3.3. Fuel Temperature. The test fuel shall be at the test facility temperature of 55 to 87 °F (13 to 30.6 °C) $\pm$ 2 °F.

11.3.4. Fuel Dimensions. The dimensions of each test fuel piece shall conform to definitions specified by the protocols using the fuel load calculator.

11.3.4.1. Fuel length:

11.3.4.1.1. The length of the fuel pieces will be determined by the fuel load calculator.

11.3.4.1.2. Measurements shall be taken, and the length of the test fuel will be determined by entering the firebox dimensions.

11.3.4.1.3. Piece length specified by the fuel calculator shall be communicated and specified for use in the owner's manual and website. Piece size shall be within 0.5" of the log length determined by the calculator, as measured on the shortest length measurement.

11.3.5. Fuel Loading Direction

11.3.5.1. Fuel loading direction shall be determined by the firebox measurement.

11.3.5.1.1. Stoves with a depth measurement greater than two inches from the width measurement shall be tested with the fuel in a north-south configuration and may not test with fuel in an east-west or crisscross configuration in any load other than Load 1 and Load 2.

11.3.5.1.2. Stoves with a width measurement greater than the depth measurement or a width measurement within two inches of the depth measurement shall be tested with the fuel loaded in an east-west configuration and may not test with fuel in a north/south configuration or crisscross configuration in any load other than Load 1.

11.3.6. Fuel piece weight for each phase of the protocol shall be determined by the fuel load calculator.

11.3.6.1. Kindling – shall be:

11.3.6.1.1. Pieces of wood less than or equal to 1” in diameter.

11.3.6.1.2. No bark requirements for kindling fuel.

11.3.6.1.3. Fuel species may be any species allowed in 7.2.1.1.

11.3.6.1.4. No moisture requirements.

11.3.6.1.5. Length of kindling shall be the fuel length specified by the fuel load calculator.

11.3.6.1.6. Kindling fuel shall conform to the rule that 7 to 10 pieces of kindling equal 1 pound of kindling fuel (+/- 5%).

11.3.6.2. Trapezoidal pieces. The top of any trapezoidal-shaped piece may not be greater in dimension than 70% of the base dimension of the trapezoid and must conform to the piece limits specifications.

11.3.6.3. Starter fuel: pieces of cordwood shall be used during the startup phase. Individual piece weight for starter fuel shall be determined by the fuel load calculator. Each piece shall be triangular, irregular, or circular in cross-section. Square-like or rectangle-like pieces shall not be used (see Figure 1). Pieces that have squared cross sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized to the extent possible, and fuel load pieces shall be composed to include different shapes of wood if using any trapezoidal pieces. .

11.3.6.4. Small fuel pieces: smaller pieces of cordwood by weight and pre-defined length, as defined by the fuel load calculator. Square-like or rectangle-like cross sections pieces shall not be used (see Figure 1). Pieces that have square cross-sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized to the extent possible. No more than two (2) small fuel pieces can be trapezoidal in shape (Figure 2) per fuel load.

11.3.6.5. Large fuel pieces: larger pieces of cordwood, by weight and pre-defined length, as defined by the fuel load calculator. Each piece shall be triangular, irregular, or circular in cross-section. Square-like or rectangle-like cross section pieces shall not be used (see Figure 1). Pieces that have square cross-sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized

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to the extent possible. No more than one (1) large fuel piece can be trapezoidal in shape (Figure 2) per fuel load.

Figure 1. Schematic of unacceptable cross-sectional profiles



Figure 2. Schematic of undesirable and limited use shapes



Figure 3. Schematics of acceptable cross-sectional profiles



11.4. Sampling Equipment.

11.4.1. Prepare the tunnel and lab air PM sampling equipment as defined by the NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

11.4.2. Prepare all other equipment as defined by method EPA Method 1, 2, 3, 4, and ASTM 2515-11, other than deviations from ASTM 2515-11 that are specified in this test method.

11.5. Manufacturer participation in certification testing.

11.5.1. A representative of the manufacturer may observe testing but may not provide instructions to the certification lab, in any form, with testing staff or equipment once the certification tests begin. The names of testing witnesses cannot be withheld as confidential business information (CBI). All correspondence between the manufacturer and lab, written or verbal, must be included in the test report.

11.6. Test Run Procedure.

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- 11.6.1. Before each test series, the firebox shall be vacuumed. Testing shall begin without any ash or other materials in the appliance.
- 11.6.2. Before initiating the compliance test series, clean the flue and dilution tunnel with an appropriately sized wire chimney brush before each certification test. Test documentation should include the date and time of flue cleaning.
- 11.6.3. Record fuel weight data, temperature measurements, and gas concentrations at 1-minute intervals.
- 11.6.4. Wood Heater Operation and Adjustments. Record all adjustments made to the air supply controls, adjustments to and additions or subtractions of fuel, and any other changes to wood heater operations that occur during the test period.
- 11.6.5. Appliance operation –
 - 11.6.5.1. Bypass operation for all appliances shall follow operational instructions contained in the appliance owner's manual.
 - 11.6.5.2. For appliances that can be sold with blowers, test runs must be conducted with automatic blowers turned on at the highest setting for all test runs.
- 11.6.6. The weight of fuel remaining at the end of the test run is determined as the difference between the weight of the wood heater with the remaining coals and fuel and the weight after loading the fuel charge. The starting weight is the tare weight of the cleaned, dry wood heater.
- 11.6.7. Run Documentations. Tests shall conform to one of the options listed below. Failure to comply with one of the options will result in an invalid test run.
 - 11.6.7.1. All runs shall be video recorded in their entirety. The video shall be of sufficient quality to determine fuel characteristics, fuel loading procedures, and firebox conditions during any testing or aging conducted by the test lab. The testing lab shall have the capacity to allow appropriate agencies the opportunity to remotely witness the test.
 - 11.6.7.2. All active periods, as defined by this test method, shall be video recorded and inactive periods, if not video recorded in real time, shall be video recorded at no more than 1-minute intervals.
- 11.6.8. *L1: Start-up Phase*

11.6.8.1. L1 Appliance requirements.

11.6.8.1.1. Stove temperature: internal and external stove temperature must not be greater than the ambient temperature $\pm 2^{\circ}\text{F}$ (1.1°C) for Run 1. There is no stove starting temperature requirement for Runs 2 and 3 except in the case of a failed first run. In this case, if Run 1 is invalid or incomplete, the stove must meet Run 1 condition for at least one valid run. Temperature measurements for the external and internal temperatures shall be taken within 15 minutes before starting the test and shall be reported in the test report.

11.6.8.1.2. Tare the appliance scale before starting the test. Record appliance scale weights at the start and end of L1 phase.

11.6.8.2. L1 Fuel requirements.

11.6.8.2.1. L1 Fuel type – during the startup phase, newspaper (optional up to six full sheets of traditional newspaper size), kindling, and starter fuel pieces are used. No other additions are allowed.

11.6.8.2.2. L1 Loading density

11.6.8.2.2.1. Kindling loading density: 1 lb. per cubic foot for dry kindling, $\pm 5\%$. The fuel load calculator determines the amount of kindling that can be used.

11.6.8.2.2.2. Starter Fuel loading density: 3 lb. per cubic foot, $\pm 5\%$. The fuel load calculator will determine the minimum piece weight that can be used as starter fuel.

11.6.8.3. L1 Fuel loading structure: The loading structure of the fire shall be a bottom-up configuration with newspaper on the bottom, kindling on top of the paper, and starter fuel on top of the kindling. Kindling and starter fuel shall be loaded in a crisscross configuration.

11.6.8.4. L1 Operational parameters.

11.6.8.4.1. All kindling, starter fuel, and newspaper must be in the firebox for light off.

11.6.8.4.2. Settings

11.6.8.4.2.1. Manual appliances: All air settings are fully open.

- 11.6.8.4.2.2. Automatically controlled appliances: settings used to achieve maximum heat output. Air control settings shall not be modified setting, and the appliance shall operate as dictated by the automatic controls.
- 11.6.8.4.3. Light the fire with a torch for a period of no more than 30 seconds.
- 11.6.8.4.4. Immediately after lighting the fire, the appliance door shall be moved to a cracked open position. Cracked open position is defined as opening no more than one inch. The appliance door shall be closed within 5 minutes after ignition.
- 11.6.8.5. L1 Fuel Adjustments: up to three fuel adjustments are allowed in the startup phase. The door may be open for 30 seconds during each fuel adjustment.
- 11.6.8.6. L1 End of Phase – the end of the startup phase is defined by the weight specified by the fuel load calculator.
- 11.6.8.7. L1 Documentation – Video of the test to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coalbed, and fire when the door is closed sufficient to determine fueling positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge.
- 11.6.9. L2: *High-fire Phase* – the high-fire phase commences immediately after the startup phase ends.
 - 11.6.9.1. L2 Appliance Requirements.
 - 11.6.9.1.1. Record the weight of the stove prior to loading the L2 fuel charge, the weight of the fuel charge prior to loading, and the scale weight after loading the L2 fuel charge.
 - 11.6.9.2. L2 Fuel requirements.
 - 11.6.9.2.1. L2 piece size – during the high-fire phase, small cordwood pieces by weight, as defined by the fuel load calculator, are used.
 - 11.6.9.2.2. L2 loading density: 7 lb. per cubic foot, +/- 5%. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.
 - 11.6.9.3. L2 Operational parameters:

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11.6.9.3.1. Door opening: Open the door upon completion of the startup phase and load the L2 fuel load within 60 seconds. Once the fuel has been loaded, the appliance doors shall be closed immediately.

11.6.9.3.2. Air settings

11.6.9.3.2.1. Manually controlled appliances. During the start of the phase air settings shall be fully open to achieve maximum heat output. When 50% of the L2 fuel load mass has been consumed, the air settings shall be moved to the lowest settings.

11.6.9.3.2.2. Automatically controlled appliances: At the start of the phase settings shall be set at those used to achieve maximum heat output. When 50% of the L2 fuel load mass has been consumed, the control systems shall be moved to the control settings to achieve the lowest burn rate. Air control settings shall not be modified after moving to lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.9.4. L2 Fuel Adjustments.

11.6.9.4.1. One fuel adjustment may be made during the high-fire phase prior to moving the primary air control(s) to their lowest setting. The fuel adjustment shall optimize fuel placement for burn conditions. The door shall remain open for 30 seconds for fuel adjustments.

11.6.9.4.2. Additional fuel adjustments shall be made if there is a five-minute period without a weight change of 0.10 pounds at any point during the high-fire phase.

11.6.9.4.3. If there is a five-minute period without a weight change (0.10 lb) at any point during the high-fire phase, the appliance door may be opened for 30 seconds for fuel adjustments.

11.6.9.4.4. All fuel adjustments must be documented in the test report notes and summary.

11.6.9.5. End of L2 Phase –The high-fire phase ends when the scale indicates that 90% of the high-fire fuel mass has been consumed.

11.6.9.6. L2 Documentation – Video of the test during active periods to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings,

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coal-bed, and fire when the door is closed sufficient to determine fuel positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions.
Photo of the fuel charge prior to loading.

11.6.10. *L3: Maintenance-fire Phase* – the L3 maintenance-fire phase commences immediately after the L2 high-fire phase ends.

11.6.10.1. L3 Appliance Requirements.

11.6.10.1.1. Record the weight of the stove prior to loading the maintenance-fire fuel charge, the weight of the fuel charge prior to loading, and the scale weight after loading the maintenance-fire fuel charge.

11.6.10.2. L3 Fuel Requirements.

11.6.10.2.1. Fuel type – during the L3 phase, large cordwood pieces are used. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.10.2.2. L3 Fuel loading structure: fuel shall be loaded in the direction specified by the fueling calculator.

11.6.10.2.3. L3 loading density: 5 lb. per cubic foot, +/- 5%. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.10.3. L3 Operational Parameters:

11.6.10.3.1. Open door upon completion of the L2 phase and load the maintenance-fire fuel charge.

11.6.10.3.2. Air controls

11.6.10.3.2.1. Manually controlled air settings: shall be placed in the fully open position for the first five minutes of the phase, and then returned to the low air setting.

11.6.10.3.2.2. Automatically controlled air settings: shall be placed in the maximum heat output setting for the first five minutes and then shifted to the lowest heat output setting. Air control settings shall not be modified after moving to the lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.10.3.3. L3 Load - L3 fuel loaded within 30 seconds of the door opening. Close the loading door immediately.

11.6.10.4. L3 Fuel Adjustments: Fuel Adjustments: If there is a ten-minute period without weight change (0.10 lb.) at any point during the L3-fire phase, a fuel adjustment shall be made to increase the burn rate. The door may be open for up to 30 seconds for fuel adjustments. Only two fuel adjustments may be made during this phase. If after the second fuel adjustment, another ten-minute period of no weight change (0.10 lb.) occurs, the run ends, and it is a failed test run.

11.6.10.5. L3 End of Phase – The L3-fire phase ends when the scale indicates that 90% of the maintenance-fire fuel mass has been consumed.

11.6.10.6. L3 Documentation – Video of the test to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coal-bed, and fire when the door is closed sufficient to determine fueling positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge prior to loading.

11.6.11. L4: Low burn rate phase – L4 phase commences immediately after the L3-fire ends.

11.6.11.1. L4 Appliance Requirements.

11.6.11.1.1. Record the weight of the stove prior to loading the L4-fire fuel charge, the load of the fuel charge prior to loading, and the scale weight after loading the overnight-fire fuel charge. Alternatively, if the scale was zeroed prior to starting the test, record the scale weight before and after loading the overnight-fire fuel charge.

11.6.11.2. L4 Fuel requirements

11.6.11.2.1. L4 fuel type –a mix of small and large cordwood pieces are used. At least 50% of the fuel charge load, by the number of pieces, must be large pieces.

11.6.11.2.2. L4 Loading structure: fuel will be loaded in one direction.

11.6.11.2.3. L4 loading density: The fuel load calculator specifies a load volume of 12 lb./ft.³ +/-5%. Fuel shall be loaded in a manner to maximize the number of pieces that will fit in the stove without using force. If all pieces cannot be loaded, the stove shall be loaded to the maximum extent possible.

11.6.11.3. L4 Operational Parameters:

11.6.11.3.1. Open the loading door upon completion of the L3 maintenance-fire phase.

11.6.11.3.2. Load the L4 fuel charge within two minutes (120 seconds).

11.6.11.3.3. Keep the door in cracked position (*open up to 1 inch as measured from the opposite of the hinge - largest opening one inch*) for up to five minutes from the beginning of the L4 phase.

11.6.11.3.4. Air controls

11.6.11.3.4.1. Manual air settings: may be placed in the fully open position for the first ten minutes of the phase, and then returned to the low air setting.

11.6.11.3.4.2. Automatically controlled air settings: may be placed in the maximum heat output setting for the first ten minutes and then shifted to the lowest heat output setting. Air control settings shall not be modified after moving to the lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.11.4. L4 Fuel Adjustments.

11.6.11.4.1. Unlimited fuel adjustments are allowed within the first ten minutes of the phase. The door may be open for up to 30 seconds for fuel adjustments.

11.6.11.4.2. If there is a ten-minute period without weight change (0.10 lb.) during the first hour of the L4- phase, a fuel adjustment shall be made. The door may be open for up to 30 seconds for fuel adjustments.

11.6.11.4.3. Only two fuel adjustments may be made during the first hour. If after the second fuel adjustment, another period of no weight change (0.10 lb.) is observed, the run ends, and it is a failed test run.

11.6.11.4.4. No fuel adjustments are allowed after the first hour of the phase.

11.6.11.4.5. If there is no weight change (0.10 lb) for a consecutive period of 20 minutes at any point after the first hour of the phase, the test run ends and is an incomplete test run.

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- 11.6.11.5. L4 End of Phase – The L4 phase shall end when the scale indicates that 100% of the total L4 fuel mass has been consumed. If the fuel load does not burn to 90%, it is a failed test run.
- 11.6.11.6. L4 Documentation - Video of the test during active periods to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coalbed, and fire when the door is closed sufficient to determine fuel positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge prior to loading.
- 11.7. Test Run. A complete test run requires the completion of all four burn phases and loads. For any appliance that will not accommodate the loading arrangement specified in this test method, the test facility personnel shall contact the Agency Administrator to obtain written approval for an alternative loading arrangement.
- 11.8. Test Run Requirements. The following describes the required parameters for each test run. Each emission test run shall include all operational and fueling protocol phases in order as described.
- 11.8.1. Consecutive Test Runs. Consecutive test runs may be conducted, provided that the following requirements are met:
- 11.8.1.1. Run 1 – The appliance shall have an internal and external starting temperature within $\pm 2^{\circ}\text{F}$ (1.1°C) of ambient laboratory temperature at the beginning of Run 1.
- 11.8.1.2. Run 2 – The second test run may commence 24 hours after the start of Run 1. Stove coals and ash can remain in the stove until 1 hour before conducting Run 2. All coals and ash shall be removed at least one hour prior to commencing Run 2.
- 11.8.1.3. Run 3 – The third test run may commence 24 hours after the start of Run 2. Stove coals and ash may remain in the stove until 1 hour before conducting Run 3. All coals and ash shall be removed at least one hour prior to commencing Run 2.
- 11.9. *Failure to Operate at All Test Conditions*
- 11.9.1. If the appliance fails two runs due to incomplete or invalid test runs, it shall be determined that the appliance has failed the certification test and requires a modification to appliance design. All data for incomplete runs shall be reported. Incomplete failed test runs are defined as the following:
- 11.9.1.1. If a wood heater fails to complete all four phases of the test run, the run shall be considered a failed test run.

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- 11.9.1.2. If there is no weight change, defined as 0.10 lb., for a consecutive period of 20 minutes at any point during the test, the unit has failed the test run.
- 11.9.2. If a test run violates any of the test method parameters, the run is invalid.
- 11.9.3. If during certification testing a critical component of the stove is damaged or breaks, the certification test will be stopped and considered invalid.
 - 11.9.3.1. If damage is noted during a test, repairs shall be made by the manufacturer (or by laboratory personnel with written direction from the manufacturer). If the repair involves components that would need aging, the appliance shall then undergo another round of wood heater aging as specified in section 10.6. These components may include but are not limited to catalyst elements, gaskets, and refractory components. The aging process is intended not only to 'cure' the stove but also to cycle parts that may fail with extended use. Alternate aging techniques may be approved by the administrator, depending on the nature of the failure, material, and critical nature.
- 11.10. Test Run Completion. Once three (four for appliances with automatic controls) valid runs have been completed, the testing is complete. No additional runs may be completed.
 - 11.10.1. *Additional Test Runs.*
 - 11.10.1.1. *Invalid/Incomplete Runs.* If there is an invalid run, another additional run may be attempted to complete the test series. If more than three test runs are conducted, the results from all valid test runs shall be used in calculating the average emission rate. The measurement data and results of all test runs shall be reported regardless of which values are used in calculating the emission rate.
 - 11.10.1.2. *No Power Mode for Automatically Controlled Appliances.* For appliances that can only be operated in an automatically controlled mode when power is supplied to the unit, the "no power mode" test run shall not be averaged into the overall test result, but the result from the "no power mode" test run shall be reported separately in the test report. For units where the operator has a choice to operate the appliance in automatic or manual mode, the "no power test" shall be included in the determining the reported results.
 - 11.10.1.3. *Data Elimination.* No test run data can be eliminated from the reporting requirements of this method.
 - 11.10.1.4. A maximum of five runs (six for appliances with automatic controls) attempts can be completed. If a wood heater cannot complete three valid runs after five (six for appliances with automatic controls) attempts, the appliance has failed the certification test.
 - 11.10.2. *Invalid Runs.* When a test run fails to meet one of the QA/QC criteria stipulated in the test method, the data are invalid, and the run must be repeated. Data for the invalidated test run

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must be included in the test report, but the data must not be used in the calculation of average emission values.

- 11.10.3. *Incomplete Runs*: When an appliance cannot successfully complete all operational elements of the protocol specified in Section 11.6.7 through 11.6.10, it is an incomplete run

11.11. Auxiliary Wood Heater Equipment Operation.

- 11.11.1. All test runs should have the fan “ON” at the highest setting except for:

11.11.1.1. The duration of L1;

11.11.1.2. When the door is open in all loads (L1, L2, L3 and L4);

11.11.1.3. From the end of L3 to when the air control is set to the lowest position for L4.

- 11.11.2. An automatic blower can be left energized.

11.12. PM Data Recording.

- 11.12.1. All TEOM data shall be collected and recorded at intervals of 1 minute. TEOM operation shall follow the procedures listed in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

- 11.12.2. Tunnel and lab air PM TEOM Data shall be reported using the Excel data analysis spreadsheet templates that are part of the NYSERDA Standard Operation Procedures for Thermo 1405-D TEOM for use in a dilution tunnel. These data analysis spreadsheets shall be submitted as part of the test report.

- 11.12.3. Lab PM measurement – TEOM. A single channel TEOM is used to measure ambient lab air PM during the test, as configured in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces. The sample flow shall be 3 LPM.

12. **Quality Control Measures**

- 12.1. Dilution tunnel - Conduct sampling equipment leak check and calibration pre-and post-test.

- 12.2. TEOM – Flow and Leak checks are done before and after every test run per NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces. Additional quality control measures are included in the TEOM Operating Procedure.

- 12.3. Conduct all checks and calibrations per ASTM 2515-11.

13. **Data Analysis and Calculations.**

Proportioning of emission factors and rates per phase according to Appendix A, variables shall have

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subscript added to determine the relevancy of phase, i.e. $E_{T(P1)}$ indicates Total particulate emissions for Phase 1 and $E_{g/hr(P2)}$ indicates emissions factor in grams per hour for Phase 2.

13.1. Emission Calculations. Particulate matter, carbon dioxide, and carbon monoxide shall be calculated using the following methodology and reported in grams per hour, grams per kilogram and pounds per million British Thermal Unit (BTU) heat output.

13.2. Rounding

13.2.1. All calculations shall be conducted using all decimal values provided by the instrumentation or recorded by the operator.

13.2.2. No truncation of data is acceptable until the final result has been calculated.

13.2.3. Only the final calculation of the PM emissions rate shall be rounded to three significant figures.

13.2.4. When rounding off a figure, the following procedure should be used. If the first digit to be discarded is less than five, the last digit retained should not be changed. When the first digit discarded is greater than five, or if it is a five followed by at least one digit other than zero, the last figure retained should be increased by one unit. When the first digit discarded is exactly five, followed only by zeros, the last digit retained should be rounded upward if it is an odd number, but no adjustment made if it is an even number.

13.3. TEOM data shall be reported as follows.

13.3.1. Emissions from each of the 4 phases of the test shall be reported as individual results in grams per hour, grams per kilogram, and lb/MMBtu (heat output). Calculations shall use Section 7 of the NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

13.3.2. Emissions from the entire test run in grams per hour, grams per kilogram, and lb/MMBtu (heat output) using the TEOM data.

13.4. PM Filter data: Emissions from the entire test run in grams per hour, grams per kilogram, and lb/MMBtu (heat output) using the ASTM 2515-11 filter data.

Nomenclature

BR – average dry fuel burn rate, lb/hour

$BR_{(x)}$ – Burn rate for specific phase, BR_{L1} , BR_{L2} , BR_{L3} , BR_{L4}

CO – Carbon Monoxide

CO₂ – Carbon Dioxide

BT = time of 90% of overnight load consumed – time of overnight loading

C_{steel} – Specific heat of steel (0.1 Btu/ lb)

E_T – Total particulate emissions for the full test run in grams
 $E_{g/MJ}$ – PM emissions rate in grams per megajoule of heat output
 $E_{g/kg}$ – PM emissions factor in grams per kilogram of dry fuel burned
 $E_{g/hr}$ – PM emissions rate in grams per hour
 HHV – Higher heating value of dry fuel (Btu/lb), measured with ASTM E711
 $kJ/kgmol\ K$ - kilojoules per kilogram-mol Kelvin
 $\%M_d$ - Fuel moisture content, dry basis, percent
 $\%M_w$ - Average moisture in test fuel charge, wet basis, percent
 PCTCO₂ – average CO₂ in the dry flue gas (%)
 PPMco – average CO in the dry flue gas (ppm)
 Q_{out} – Total heat output in BTU's (megajoules)
 SC_i – Scale weight at specific time interval, lb.
 T_1 – Surface Temperature 1 °F (°C)
 T_2 – Surface Temperature 2 °F (°C)
 T_3 – Surface Temperature 3 °F (°C)
 T_4 – Surface Temperature 4 °F (°C)
 T_5 – Surface Temperature 5 °F (°C)
 T_6 - Flue Gas Temperature °F (°C)
 T_7 – Room Temperature °F (°C)
 $TS_{avg(i)}$ – Initial Average Surface Temperature °F (°C)
 $TS_{avg(f)}$ – Final Average Surface Temperature °F (°C)
 W_{fuel} – Fuel charge weight in pounds (kg)
 Θ – Total length of test run, hours
 $\Theta_{(x)}$ – Total length of test run in hours per phase, X
 $\%M_w = 100(\%M_d)/100 + \%M_d$

13.5. Average Wood Heater Surface Temperatures. Calculate the average of the wood heater surface temperatures at the start of the phase (L4) and end at the end of the test (L4) of the test run.

$$L4\ TS_{avg(i)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

$$L4\ TS_{avg(f)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

Average surface temperatures at the start and end of any phase can be determined by averaging all five sensors at the beginning and end of each phase.

$$L_x\ TS_{avg(i)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

$$L_x\ TS_{avg(f)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

13.6. Determine Burn Rates

BR_{L1} = not applicable

$$BR_{L2} = (L2\ Initial\ SC_i - L2\ Final\ SC_i) / \Theta_{(L2)},\ lbs./hr$$

$$BR_{L3} = (L3\ Initial\ SC_i - L3\ Final\ SC_i) / \Theta_{(L3)},\ lbs./hr$$

$$BR_{L4} = (L4\ Initial\ SC_i - L4\ Final\ SC_i) / \Theta_{(L4)},\ lbs./hr$$

13.7. Emissions

13.7.1. Determine emission rates and emission factors, reporting results from both TEOM and filter data, as:

$$E_{g/MJ} = E_T / (Q_{out} \times 0.001055), \text{ g/MJ}$$

$$E_{g/kg} = E_T / (W_{fuel} / (1 + M\%M_d / 100)), \text{ g/dry kg}$$

$$E_{g/hr} = E_T / \Theta, \text{ g/hr}$$

13.8. CO Calculations

$$CO_{PPM} \text{ to } CO_{\%} = CO_{ppm} / 10000 \text{ ppm}/\% = CO_{\%}$$

$$CO_{2(ppm)} \text{ to } CO_{2(\%)} = CO_{2(ppm)} / 10000 \text{ ppm}/\% = CO_{2(\%)}$$

$$CO \text{ factor (g/kg dry wood)} = (CO_{\%} \times 1000 \text{ g/kg} \times 0.508 \times (28 \text{ g/mol} / 12 \text{ g/mol})) / CO_{2(\%)}$$

Where: 0.508 is the assumed carbon fraction of wood

28 is the molecular weight of CO

12 is the molecular weight of Carbon

1000 is a conversion of grams/kg

13.9. Efficiency calculation: As defined in 40 CFR part 60 per subpart AAA, efficiency shall be calculated per CSA B415.10 to be comparable with EPA Method 28R. Efficiency (%HHV), CO emission rate (g/h and g/min) emissions factor (lb/MMBtu, and power output (BTU/h) shall be calculated for all individual loads (L1, L2, L3, and L4) with the following exceptions:

13.9.1. No substitution of data is allowed.

13.9.2. 10-minute average data must be used to calculate efficiency

14. Reporting Requirements. The report shall include the following:

14.1. Introduction

14.1.1. Purpose of test: certification, audit, efficiency,

14.1.2. Name and location of the laboratory conducting the test.

14.1.3. Wood appliance identification – manufacturer, model number/name, design type, description of the appliance tested, stove condition, and date of receipt.

14.1.4. Test information – location of testing, date of tests, sampling methods used, number of test runs, a statement detailing any previous certification testing completed on the wood appliance.

14.1.5. A list of people who conducted research on the appliance, participated in testing preparation, or witnessed the certification testing. This list shall clearly specify their roles in

the testing program for the appliance. The list shall include the participant's name, title, company, contact information and the purpose of their participation.

14.1.6. A statement that the test results apply only to the specific appliance tested.

14.2. Summary and Discussion of Results

14.2.1. Table of results to include test run number, average burn rate for entire run and each phase, carbon monoxide and particulate emission rate for full run, particulate and carbon monoxide emission rate for each load phase (L1, L2, L3, L4), efficiency for the full run and each phase, burn time for total run and each phase.

14.2.2. For each test run and pollutant with real-time data to include: $\Theta_1, \Theta_2, \Theta_3$, CO, CO₂, PM, and efficiency for (1) L1 - the startup phase and (2) L2 - high-, (3) L3-maintenance-, and (4) L4 low burn rate fire phases. Calculated results for PM emissions shall be reported as total emissions in grams, pounds per million Btu output, grams per MJ, grams per kilogram of dry fuel and grams per hour, and pounds per hour. Calculated results for $\Theta_1, \Theta_2, \Theta_3$, CO, and CO₂ emissions shall be reported as grams per kilogram of dry fuel and parts per million for CO and percent for CO and CO₂. Efficiency shall be reported for each load. CO measurements shall be obtained from the dilution tunnel.

14.2.3. A narrative discussion detailing any issues or anomalies that arose during each test run and how those were handled, including comments about the fuel, and loading of the appliance.

14.2.4. TEOM PM Plots

14.2.4.1. A plot of PM emission rate in grams/hour vs. time at 1-minute intervals, for the entire test period, for each run. The report shall include a table reporting the maximum 1-minute, 5-minute, and 60-minute grams per hour on a rolling basis for the test run.

14.2.5. Summary of other data – test facility conditions, surface temperature averages, catalyst temperature averages, pretest fuel weights, test fuel charge weights – total and by phase.

14.3. Discussion. Test run result, specific test run problems, and solutions. Comments on fuel, loading, analysis, and anything that may impact the reported result(s).

14.3.1. Details of deviations from, additions to or exclusions from the test method, and their data quality implications on the test results (if any), as well as information on specific test conditions, such as environmental conditions. An explanation of the deviations, additions, or exclusions shall be provided along with an analysis as to why these elements had no impact.

14.4. Process description:

14.4.1. Data and drawings indicating the firebox size and location of the fuel charge.

14.4.2. Drawings and calculations used to determine firebox volume to include volume, height, width, and lengths, weight, and volume adjustments.

14.4.3. Firebox configuration – At a minimum to include air supply locations and operation, air supply introduction location, refractory location and dimensions, catalyst location, baffle and by-pass location and operation (include line drawings or photographs)

14.4.4. Appliance operation during the test – shall supply details on air supply settings and

adjustments.

14.5. Test fuel properties – the report shall provide information on the species, density, fuel moisture, fuel temperature, and load details from the fuel load calculator to include all measurements including the number of pieces, individual piece weights, piece length, moisture content and weight.

14.6. Sampling

14.6.1. A description of the test procedures and test equipment, including a schematic or other drawing showing the location of all required test equipment. Also, a description of test fuel sourcing, handling and storage practices shall be included.

14.6.2. Describe the sampling location relative to the wood heater, include drawing or photographs.

14.6.3. Provide data on sampling blanks.

14.7. Quality Control and Assurance Procedures

14.7.1. Calibration procedures and results certification procedures, sample and analysis procedures.

14.7.2. Test method quality control procedures to include TEOM leak and flow checks, stratification (velocity) checks, tunnel flow range results, filter temperature range verification and dilution tunnel RH verification.

14.8. Appendices

14.8.1. Results and Example Calculations. Raw data and complete calculations for data included in summary tables.

14.8.2. Raw data. Copies of all files or sheets for sampling measurement, temperature records, and other materials used by lab related to testing.

14.8.3. Calibration Results. Summary of all calibrations, checks, and audits pertinent to the certification.

14.8.4. Sampling and Operation Records. Copies of all uncorrected records of activities not included in raw data sheets (e.g., wood heater door open, times and durations) as well as photographs of fuel loading and airflow settings.

14.8.5. Correspondence. Any correspondence to include written, electronic or verbal communications regarding appliance testing. Items shall include:

14.8.5.1. Request to conduct testing

14.8.5.2. Scheduling of testing

14.8.5.3. Notice to EPA to conduct test and any modifications to that request.

14.8.6. Test Facility Information. Report test facility temperature, air velocity, and humidity information.

14.8.7. Test Equipment Calibration and Audit Information. Report calibration and audit results for the platform scale, test fuel balance, test fuel moisture meter, and sampling equipment, including volume metering systems and gaseous analyzers.

THIS PROTOCOL FOR WOOD STOVES IS THE PROPERTY OF THE NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA) AND CAN BE USED TO TEST TECHNOLOGIES IN A LABORATORY SETTING. ANY DEVIATIONS OR CHANGES TO THIS PROTOCOL FOR WOOD STOVES ARE NOT APPROVED OR SANCTIONED BY NYSERDA. DO NOT CITE, COPY, or DISTRIBUTE THIS PROTOCOL FOR WOOD STOVES WITHOUT THE WRITTEN PERMISSION OF NYSERDA

- 14.8.8. Pretest procedures. Report all pretest procedures conducted at the lab on the appliance to burns, rates, and amounts.
- 14.8.9. All required data for each test run shall be provided in spreadsheet format both in the printed report and in a computer file such that the data can be easily analyzed and calculations easily verified. Formulas used for all calculations shall be accessible for review.
- 14.8.10. For each test run: report TEOM flow and temperature and verification of all TEOM data validation parameters as required in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.
- 14.8.11. Raw data, calibration records, and other relevant documentation shall be retained by the laboratory for a minimum of 7 years.

ASTM E2515 - Glass Fiber Filters

Date:	4/12/24	4/17/24	-	-			
Time:	3:14	0400	-	-			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G00997	249.3	249.5	-	-	A	24-285	#1
G00998	248.5	248.6	-	-	A	↓	↓
G00999	249.2	249.4	-	-	A	↓	↓
G001000	250.3	250.3	-	-	A	↓	↓
G001001	250.8	250.8	-	-	A	24-284	#1
G001002	241.9	242.0	-	-	A	↓	↓
G001003	242.3	242.3	-	-	A	↓	↓
G001004	241.4	241.3	-	-	A	↓	↓
G001005	240.8 ⁸	240.8	-	-	A	23-241	#1
G001006	240.7	240.7	-	-	A	↓	↓
G001007	241.9	242.0	-	-	A	23-241	#2
G001008	239.3	239.4	-	-	A	↓	↓
G001009	241.2	241.3	-	-	A	23-241	#3
G001010	239.4	239.3	-	-	A	↓	↓
G001011	239.5	239.6	-	-	A	24-287	#1
G001012	240.7	240.8	-	-	A	↓	↓

Date:	5/1/24	5/3/24	-	-			
Time:	2:00	2:00	-	-			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G001013	239.1	239.1	-	-	A	24-287	#1
G001014	240.9	240.9	-	-	A	↓	↓
G001015	241.4	241.4	-	-	A		
G001016	241.1	241.1	-	-	A		
G001017	240.7	240.7	-	-	A		
G001018	240.9	240.8	-	-	A		
G001019	239.4	239.5	-	-	A		
G001020	248.5	248.5	-	-	A		
G001021	233.2	233.3	-	-	A		
G001022	241.3	241.2	-	-	A		
G001023	242.6 ⁷	242.6	-	-	A		
G001024	240.6	240.5	-	-	A		
G001025	240.8	240.9	-	-	A		
G001026	240.2	240.2	-	-	A		
G001027	241.4	241.4	-	-	A		
G001028	241.3	241.3	-	-	A		

ASTM E2515 - Glass Fiber Filters

Date:	3/18/24	3/19/24					
Time:	12:30	8:30					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G00965	241.6	241.7	-	-	SB	24-268	#2
G00966	241.8	241.9	-	-	SB	↓	↓
G00967	241.2	241.4	-	-	SB	↓	↓
G00968	241.3	241.2	-	-	SB	↓	↓
G00969	240.4	240.4	-	-	SB	24-268	#3
G00970	242.6	242.4	-	-	SB	↓	↓
G00971	241.2	241.4	-	-	SB	↓	↓
G00972	241.3	241.4	-	-	SB	↓	↓
G00973	240.9	241.0	-	-	SB	24-268	#4
G00974	241.4	241.4	-	-	SB	↓	↓
G00975	241.4	241.2	-	-	SB	↓	↓
G00976	241.1	241.1	-	-	SB	↓	↓
G00977	240.6	240.6	-	-	SB	24-268	#5
G00978	241.2	241.3	-	-	SB	↓	↓
G00979	241.7	241.7	-	-	SB	↓	↓
G00980	241.5	241.7	-	-	SB	↓	↓

Date:	3/21/24	3/22/24					
Time:	16:20	11:20					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G00981	241.6	241.5	-	-	SB	24-281	#1
G00982	240.5	240.6	-	-	SB	↓	↓
G00983	240.7	240.6	-	-	SB	↓	↓
G00984	242.0	241.9	-	-	SB	↓	↓
G00985	241.7	241.6	-	-	SB	↓	#2
G00986	242.9	242.9	-	-	SB	↓	↓
G00987	250.5	250.5	-	-	SB	↓	↓
G00988	240.5	240.6	-	-	SB	↓	↓
G00989	231.4	231.3	-	-	SB		
G00990	239.9	239.9	-	-	SB		
G00991	240.5	240.4	-	-	SB		
G00992	241.2	241.3	-	-	SB		
G00993	241.1	241.2	-	-	SB		
G00994	241.4	241.5	-	-	SB	23-241	#1
G00995	240.5	240.5	-	-	SB	↓	#2
G00996	241.4	241.4	-	-	SB	↓	#3

ASTM E2515 - O-Ring Samples 1-10

Date:	3/18/24	3/19/24					
Time:	12:30	8:30					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	3569.0	3569.0	-	-	SB	24-268	#3
1B	3557.4	3557.4	-	-	SB		
1C	4167.3	4167.4	-	-	SB		
2A	3554.1	3554.1	-	-	SB	24-28	#4
2B	3573.0	3573.1	-	-	SB		
2C	3391.5	3391.5	-	-	SB		
3A	3580.6	3580.5	-	-	SB	24-28	#5
3B	3569.1	3569.2	-	-	SB		
3C	3623.4	3623.5	-	-	SB		
4A	3377.0	3377.0	-	-	SB	24-281	#1
4B	3580.6	3580.6	-	-	SB		
4C	3373.0	3373.0	-	-	SB		
5A	3536.3	3536.4	-	-	SB	24-281	#2
5B	3532.2	3532.2	-	-	SB		
5C	3376.2	3376.7	-	-	SB		

Date:	4/12/24	4/17/24					
Time:	3:02	1030					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	3396.6	3396.6	-	-	A	24-285	#1
6B	3613.8	3613.6	-	-	A		
6C	3401.5	3401.5	-	-	A		
7A	3571.8	3571.6	-	-	A	24-284	#1
7B	3522.8	3522.6	-	-	A		
7C	3407.0	3406.8	-	-	A		
8A	3552.4	3552.5	-	-	A	23-241	#1
8B	3357.8	3557.6	-	-	A		
8C	3586.7	3586.6	-	-	A		
9A	3580.5	3580.4	-	-	A	23-241	#7
9B	3523.4	3523.3	-	-	A		
9C	3430.9	3430.8	-	-	A		
10A	3361.1	3361.0	-	-	A	24-287	#1
10B	3570.7	3570.7	-	-	A		
10C	3366.3	3366.3	-	-	A		

ASTM E2515 - Probe Samples 1-10

Date:	3/18/24	3/19/24					
Time:	13:00	8:30					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	11826.8	115627.0	—	—	SB	24-268	#3
1B	115902.1	115902.2	—	—	SB		
1C	116432.9	116432.8	—	—	SB		
2A	116057.3	116057.4	—	—	SB	24-268	#4
2B	116173.6	116173.8	—	—	SB		
2C	116428.9	116428.8	—	—	SB		
3A	115880.5	115880.5	—	—	SB	24-268	#5
3B	116120.4	116120.5	—	—	SB		
3C	116618.1	116618.1	—	—	SB		
4A	116022.6	116022.6	—	—	SB	24-281	#1
4B	116182.0	116181.8	—	—	SB		
4C	116997.2	116997.3	—	—	SB		
5A	116757.4	116757.3	—	—	SB	24-281	#2
5B	116875.5	116875.4	—	—	SB		
5C	115855.2	115855.0	—	—	SB		

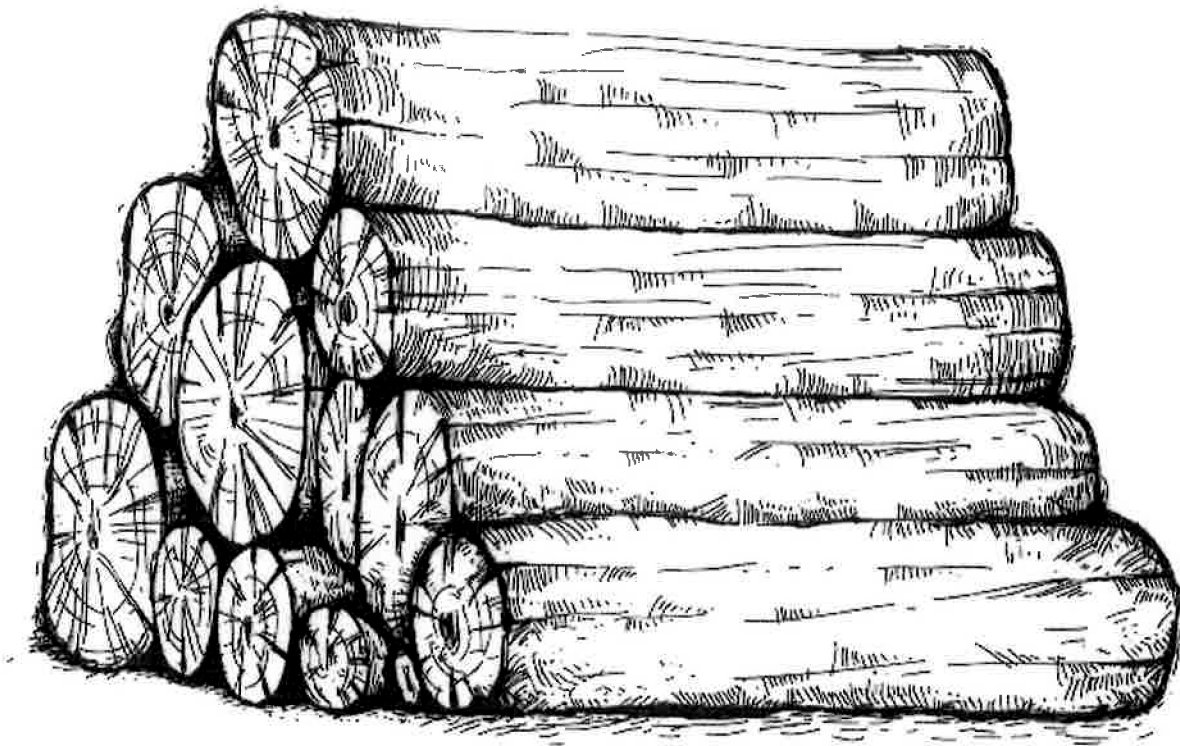
Date:	4/12/24	4/17/24	5/3/24				
Time:	3:30	6:00	1:00				
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A	116383.3	116383.1	—	—	A	24-285	#1
6B	115954.9	115954.6	—	—	A		
6C	115129.4	115128.4	—	—	A		
7A	116557.7	116557.7	—	—	A	24-284	#1
7B	117128.2	117128.0	—	—	A		
7C	116551.0	116550.8	—	—	A		
8A	116637.6	116637.4	—	—	A	23-241	#1
8B	116665.6	116665.7	—	—	A		
8C	116662.5	116662.7	—	—	A		
9A	116530.6	116530.4	—	—	A	23-241	#2
9B	117737.5	117737.4	—	—	A		
9C	116602.8	116602.6	—	—	A		
10A	116645.8	116645.6	—	—	A	24-287	#1
10B	117753.8	117753.4	117753.5	—	A		
10C	116728.3	116728.2	—	—	A		

Wood fireplace Owner's Manual

Part 1 of 2

SAFETY NOTIFICATIONS AND GENERAL INFORMATION

ENGLISH



CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD FIREPLACE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS MANUAL FOR REFERENCE

THANK YOU FOR CHOOSING THIS WOOD FIREPLACE

If this fireplace is not installed properly, combustible materials near it may overheat and catch fire.

To reduce the risk of fire, follow the installation instructions in this manual.

As one of North America's largest and most respected wood stove and fireplace manufacturers, Stove Builder International takes pride in the quality and performance of all its products.

The following pages provide general advice on wood heating, detailed instructions for safe and effective installation, and guidance on how to get the best performance from this fireplace.

It is highly recommended that this wood burning hearth product be installed and serviced by professionals who are certified by a «Qualified Agency» such as NFI (National Fireplace Institute®) or CSIA (Chimney Safety Institute of America) in the United States and in Canada by WETT (Wood Energy Technology Transfer) or in Quebec by APC (Association des Professionnels du Chauffage).

Contact local building or fire officials about restrictions and installation inspection requirements in your local area.

A building permit might be required for the installation of this fireplace and the chimney that it is connected to. It is also highly recommended to inform your home insurance company.

Please read this entire manual before installing and using this fireplace.

A primary alternative heat source should be available in the home. This heating unit may serve as a supplementary heat source. The manufacturer cannot be responsible for additional heating costs associated with the use of an alternative heat source.

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1. Safety Information and Standards

1.1 Safety

- This stove has been tested for use with an open door in conjunction with a fire screen, sold separately (see in the specification manual of this product if it is possible to have this option). The door may be opened, or fire screen removed only during lighting procedures or reloading. Always close the door or put back on the fire screen after ignition. Do not leave the fireplace unattended when the door is opened with or without a fire screen.
- **WARNING : OPERATE ONLY WITH THE DOOR FULLY CLOSED OR FULLY OPEN WITH THE FIRE SCREEN IN PLACE. IF THE DOOR IS LEFT PARTLY OPEN, GAS AND FLAME MAY BE DRAWN OUT OF THE OPENING, CREATING RISKS FROM BOTH FIRE AND SMOKE.**
- **HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. GLOVES MAY BE NEEDED FOR THE FIREPLACE OPERATION.**
- Using a fireplace with cracked or broken components, such as glass, firebricks or baffle may produce an unsafe condition and may damage the fireplace.
- **NEVER USE GASOLINE, LANTERN FUEL (NAPHTHA), FUEL OIL, MOTOR OIL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS OR AEROSOLS TO START A FIRE IN THIS FIREPLACE. KEEP ALL SUCH LIQUIDS OR AEROSOLS WELL AWAY FROM THE FIREPLACE WHILE IT IS IN USE.**
- Do not store fuel within heater minimum installation clearances.
- Burn only seasoned natural firewood.
- This wood heater needs periodic inspection and repairs for the proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.
- Do not obstruct air inlets. This fireplace needs air for its good operation.
- Do not block the hot air vents of the fireplace as this will cause the fireplace to overheat.
- A smoke detector, a carbon monoxide detector and a fire extinguisher should be installed in the house. Location of detectors should be chosen wisely to avoid false alarm when reloading the appliance. The location of the fire extinguisher should be known by all family members.
- Do not use makeshift materials or make any compromises when installing this fireplace.
- Mixing of appliance components from different sources or modifying components is prohibited and will void the warranty. Any modification of the fireplace that has not been approved in writing by the testing authority is prohibited and violates CSA B365 and NFPA 211 standards.
- The manufacturer grants no warranty, implied or stated, for the poor installation or lack of maintenance of this fireplace and assumes no responsibility for any consequential damages.
- Do not elevate the fire by means of grates, chenets, andirons or any other means.



WARNING This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65warnings.ca.gov/

- The fireplace and chimney must be in an enclosure up to the attic.

CAUTION: DO NOT ATTEMPT TO MODIFY OR ALTER THE CONSTRUCTION OF THE FIREPLACE OR ITS COMPONENTS. ANY MODIFICATION OR ALTERATION OF CONSTRUCTION MAY VOID THE WARRANTY, LISTINGS AND APPROVALS OF THIS SYSTEM. IN THAT CASE, STOVE BUILDER INTERNATIONAL (SBI) WILL NOT BE RESPONSIBLE FOR DAMAGES. INSTALL THE FIREPLACE ONLY AS DESCRIBED IN THESE INSTRUCTIONS.

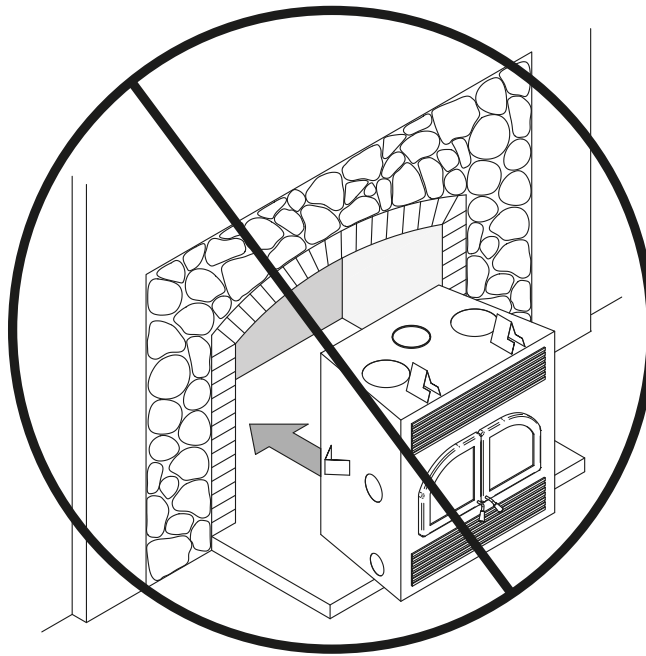
- Mixing of appliance components from different sources or modifying components is prohibited and will void the warranty. Any modification of the fireplace that has not been approved in writing by the testing authority is prohibited and violates CSA B365 (Canada) and NFPA 211 (USA) standards.
- The manufacturer grants no warranty, implied or stated, for the poor installation or lack of maintenance of the fireplace and assumes no responsibility for any consequential damages.
- This fireplace must always be used with the original andirons.
- Do not use a fireplace insert and other products not specified for use with this fireplace.
- Do not install in a mobile home (Canada) or manufactured home (USA).
- Do not use materials other than those listed in the replacement parts section during installation as they may be safety hazards and a fire could result.
- Do not restrict air circulation around the unit. Air circulation around the unit is important. If air circulation is limited, this could increase heat on adjacent walls and ceiling.
- This fireplace has not been tested with an unvented or vented gas log set. To reduce risk of fire or injury, do not install an unvented or vented gas log set into this fireplace.
- The combustion air inlet ducts shall not terminate in attic space.

Over-Firing the fireplace

DO NOT OVERFIRE THIS FIREPLACE: Attempts to achieve firing rates that exceed the fireplace specifications can result in permanent damage to the heater.

This fireplace is designed to operate at a high temperature. However, all installations are different and due to differences in wood heating value, wood moisture content, chimney configuration, and flue draft, this appliance can reach excessive temperature in the worst conditions. If the top or door of the fireplace or other area starts to glow red, you are over-firing the fireplace. Shut down the air control down to slow down the firing rate.

- This fireplace has not been tested for installation inside a masonry fireplace.



1.2 Standards

When installed and operated as described in these instructions, this wood fireplace is suitable for use in residential installations.

In Canada, the CSA B365 «Installation Code for Solid Fuel Burning Appliances and Equipment» and the CSA C22.1 «Canadian National Electrical Code» are to be followed in the absence of local code requirements.

In the USA, the ANSI NFPA 211 «Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances» and the ANSI NFPA 70 «National Electrical Code» are to be followed in the absence of local code requirements.

This fireplace is not approved for use with a so-called “positive flue connection” to the clay tile of a masonry chimney.

2. General Information

2.1 Materials

The **body** of this fireplace, which is most of its weight, is carbon steel. Should it ever become necessary many years in the future, almost the entire fireplace can be recycled into new products, thus eliminating the need to mine new materials.

The **paint** coating on the fireplace is very thin. Its VOC content (Volatile Organic Compounds) is very low. VOCs can be responsible for smog, so all the paint used during the manufacturing process meets the latest air quality requirements regarding VOC reduction or elimination.

The **air tubes** are stainless steel, which can also be recycled.

The **baffle** is made of C-Cast or Vermiculite that is compressed with a binder to form a rigid board. C-Cast can withstand temperatures above 2,000 °F. It is not considered hazardous waste. Disposal at a waste management center is recommended.

Moulded **refractory panels** are mainly composed of silicon dioxide, also known as silica, a product processed from a mined mineral. It is most commonly found in nature in the form of sand and clay. Disposal at a waste management center is recommended. The steel mesh contained in some refractory bricks can also be recycled.

The door and glass **gaskets** are fibreglass which is spun from melted sand. Black gaskets have been dipped into a solvent-free solution. Disposal at a waste management center is recommended.

The door **glass** is a 5/32" (4 mm) thick ceramic material that contains no toxic chemicals. It is made of natural raw materials such as sand and quartz that are combined in such a way to form a high temperature glass. Ceramic glass cannot be recycled in the same way as normal glass, so it should not be disposed of with regular household products. Disposal at a waste management center is recommended.

2.2 Zone Heating

This fireplace is a space heater, which means it is intended to heat the area it is installed in, as well as spaces that connect to that area, although to a lower temperature. This is called zone heating and it is an increasingly popular way to heat homes or spaces within homes. Zone heating can be used to supplement another heating system by heating a particular space within a home, such as a basement, a family room or an addition that lacks another heat source.

Houses of moderate size and relatively new construction can be heated with a properly sized and located wood fireplace. Whole house zone heating works best when the fireplace is in the part of the house where the family spends most of its time. This is normally the main living area where the kitchen, dining and living rooms are located.

Locating the fireplace in this area will give the maximum benefit of the heat it produces and will achieve the highest possible heating efficiency and comfort. The space where the most time is spent will be warmest, while bedrooms and basement (if there is one) will stay cooler. In this way, less wood is burnt than with other forms of heating.

The best location for the fireplace should consider the location of windows, doors, and circulation in the room. There must be enough space in front of the fireplace for the hearth extension and mantel and on the sides or back for the different heat distribution system, for the fresh air intake and for the chimney. Ideally, the chimney must be able to pass through the house without the need to cut floor joists or roof trusses.

Although the fireplace may be able to heat the main living areas of the house to an adequate temperature, you must also have a conventional oil, gas or electric heating system as your primary heating source.

The success of zone heating will depend on several factors, including the correct sizing and location of the fireplace, the size, layout and age of your home and your climate zone. Three-season vacation homes can usually be heated with smaller fireplaces than houses that are heated all winter.

2.3 Emissions and Efficiency

The low smoke emissions produced by the special features inside this fireplace firebox mean that the household will release up to 90% less smoke into the outside environment than if an older conventional fireplace was used. But there is more to the emission control technologies than protecting the environment.

The smoke released from wood when it is heated contains about half of the energy content of the fuel. By burning the wood completely, this fireplace releases all the heat energy from the wood instead of wasting it as smoke up the chimney. Also, the features inside the firebox allow control of the air supply meaning controlling the heat output, while maintaining clean and efficient flaming combustion, which boosts the efficient delivery of heat to the home.

The emission control and advanced combustion features of this fireplace can only work properly if the fuel used is in the correct moisture content range of 15% to 20%. Refer to the following section of suggestions on preparing fuelwood and judging its moisture.

3. Fuel

Good firewood has been cut to the correct length for the fireplace, split to a range of sizes and stacked in the open until its moisture content is down to 15% to 20%.

DO NOT BURN:

- **COAL;**
- **GARBAGE;**
- **LAWN CLIPPINGS OR YARD WASTE;**
- **MATERIALS CONTAINING RUBBER, INCLUDING TIRES;**
- **MATERIALS CONTAINING PLASTIC;**
- **WASTE PETROLEUM PRODUCTS, PAINTS OR PAINT THINNERS, OR ASPHALT PRODUCTS;**
- **MATERIALS CONTAINING ASBESTOS;**
- **CONSTRUCTION OR DEMOLITION DEBRIS;**
- **RAILROAD TIES OR PRESSURE-TREATED WOOD;**
- **MANURE OR ANIMAL REMAINS;**
- **SALT WATER DRIFTWOOD OR OTHER PREVIOUSLY SALT WATER SATURATED MATERIALS;**
- **UNSEASONED WOOD; OR**
- **PAPER PRODUCTS, CARDBOARD, PLYWOOD, OR PARTICLE BOARD. THE PROHIBITION AGAINST BURNING THESE MATERIALS DOES NOT PROHIBIT THE USE OF FIRE STARTERS MADE FROM PAPER, CARDBOARD, SAW DUST, WAX AND SIMILAR SUBSTANCES FOR THE PURPOSE OF STARTING A FIRE IN AN AFFECTED WOOD HEATER.**
- **BURNING THESE MATERIALS MAY RESULT IN THE RELEASE OF TOXIC FUMES OR RENDER THE HEATER INEFFECTIVE AND CAUSE SMOKE.**
- **IF THESE FUELS ARE BURNED IT COULD CREATE A HIGHER CONCENTRATION OF CO THAN BURNING HARD WOOD.**

3.1 Tree Species

The tree species the firewood is produced from is less important than its moisture content. The main difference in firewood from various tree species is the density of the wood. Hardwoods are denser than softwoods.

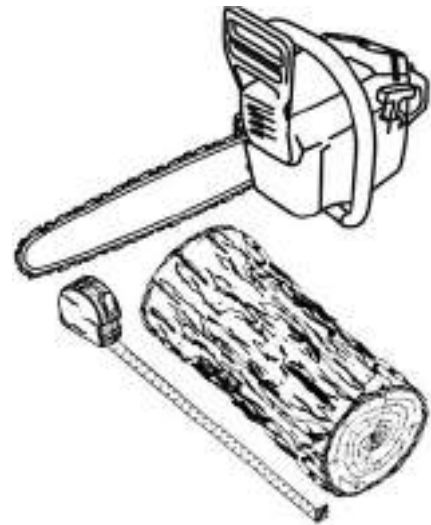
Homeowners with access to both hardwood and softwood use both types for different purposes. Softer woods make good fuel for mild weather in spring and fall because they light quickly and produce less heat.

Softwoods are not as dense as hardwoods so a given volume of wood contains less energy. Using softwoods avoids overheating the house, which can be a common problem with wood heating in moderate weather. Harder woods are best for colder winter weather when more heat and longer burn cycles are desirable.

Hardwood trees like oak, maple, ash and beech are slower growing and longer lived than softer woods like poplar and birch. That makes hardwood trees more valuable. The advice that only hardwoods are good to burn is outdated. Old, leaky cast iron fireplaces wouldn't hold a fire overnight unless they were fed large pieces of hardwood.

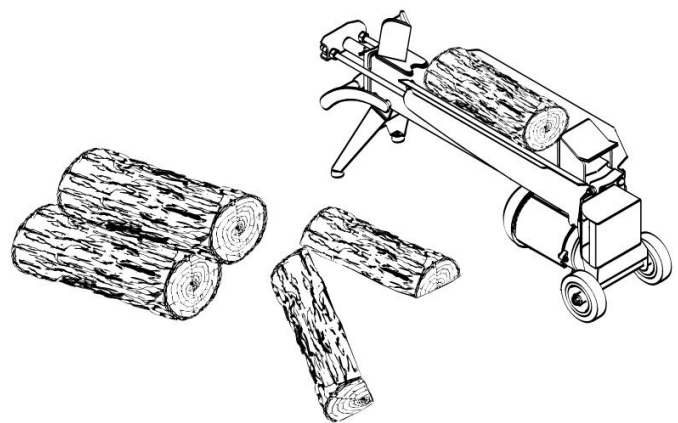
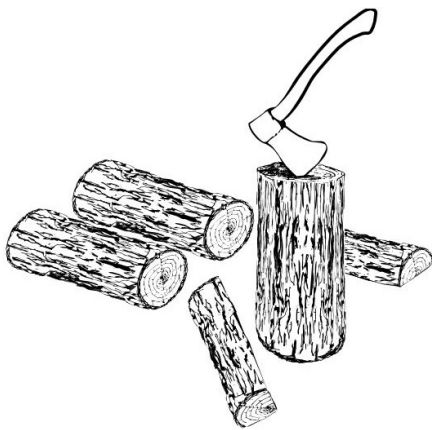
3.2 Log Length

Logs should be cut at least 1" (25 mm) shorter than the firebox so they fit in easily. Pieces that are even slightly too long makes loading the stove very difficult. The most common standard length of firewood is 16" (400 mm).



3.3 Piece Size

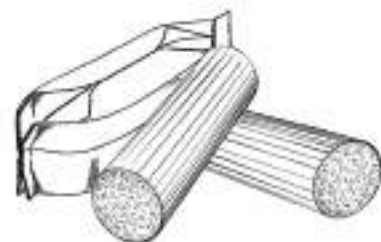
Firewood dries more quickly when it is split. Large unsplit rounds can take years to dry enough to burn. Even when dried, unsplit logs are difficult to ignite because they don't have the sharp edges where the flames first catch.



Wood should be split to a range of sizes, from about 3" to 6" (75 mm to 150 mm) in cross section. Having a range of sizes makes starting and rekindling fires much easier.

3.4 Compressed Wood Logs

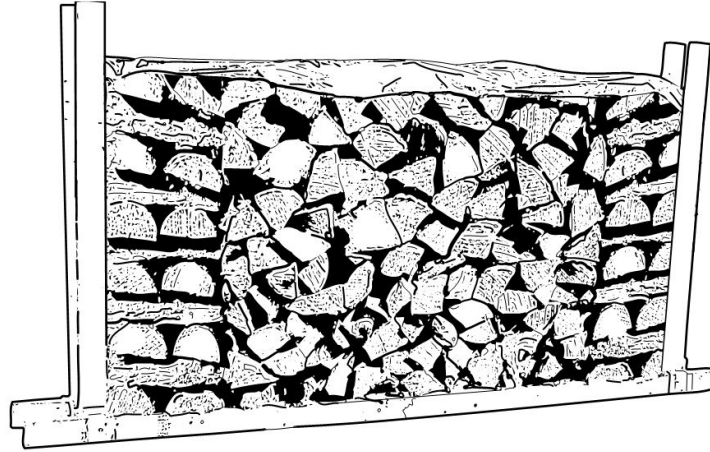
Compressed wood logs made of 100% compressed sawdust can be burned with caution in the number of these logs burned at once. Do not burn compressed logs made of wax impregnated sawdust or logs with any chemical additives. Follow the manufacturer's instructions and warnings. **Do not poke or stir the logs while they are burning.**



Use only logs that meet the requirements of ULC/ORD C127 M1990 for composite logs. Refer to package cautions and warnings before using logs. Refer to cautions and warnings on package before using logs.

3.5 Drying Time

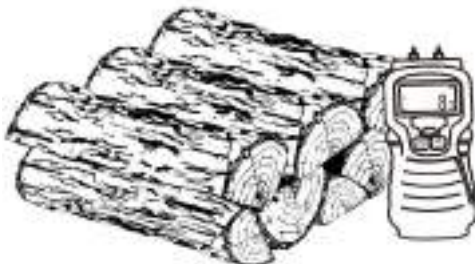
Firewood that is not dry enough to burn is the cause of most complaints about wood burning appliances. Continually burning green or unseasoned wood produces more creosote and involves lack of heat and dirty glass door. Firewood with a moisture content between 15% and 20% will allow the stove to produce its highest possible efficiency.



Here are some facts to consider in estimating drying time:

- Firewood bought from a dealer is rarely dry enough to burn, so it is advisable to buy the wood in spring and dry it yourself;
- Drying happens faster in dry weather than in a damp climate;
- Drying happens faster in warm summer weather than in winter weather;
- Small pieces dry more quickly than large pieces;
- Split pieces dry more quickly than unsplit rounds;
- Softwoods like pine, spruce, poplar, and aspen take less time to dry than hardwoods. they can be dry enough to burn after being stacked to air dry only for the summer months;
- Hardwoods like oak, maple and ash can take one, or even two years to dry fully, especially if the pieces are big;
- Firewood dries more quickly when stacked outside in a location exposed to sun and wind; it takes much longer to dry when stacked in a wood shed;

Use these guidelines to find out if the firewood is dry enough to burn:



- Cracks form at the ends of logs as they dry;
- The wood turns from white or cream colored to grey or yellow;
- Two pieces of wood struck together sounds hollow;
- Dry wood is much lighter in weight than wet wood,
- The face of a fresh cut feels warm and dry;
- The moisture content read by a moisture meter is between 15% to 20%.

4. Operating the Fireplace

4.1 Efficient Wood Combustion

For operating methods of your fireplace, refer to the "Efficient Wood Combustion" section of the "Installation and Operation Manual". This section explains in detail effective operating methods that will get maximum performance from your heating unit. The following topics are covered:

- The space where the wood can be placed for efficient combustion.
- Air control operation to increase or decrease firing rate.
- Lighting a fire when the combustion chamber is cold.
- Loading wood and adjusting the air control to obtain an intense fire allowing the temperature to quickly increase.
- Loading wood and adjusting the air control to obtain a fire that maintains the temperature.
- Loading wood and adjusting air control to obtain a long-lasting fire with the minimum possible intensity.

4.2 First Use

Two things happen when burning the first few fires; the paint cures and the internal components are conditioned. As the paint cures, some of the chemicals vaporize. The vapors are not poisonous, but they smell bad. Fresh paint fumes can also trigger false alarms in smoke detectors. When lighting the heater for the first few times, it may be wise to open doors and windows to ventilate the house.

Burn two or three small fires to begin the curing and conditioning process. Then build bigger and hotter fires until there is no longer paint smell from the fireplace. As hotter and hotter fires are burned, more of the painted surfaces reach the curing temperature of the paint. The smell of curing paint does not disappear until one or two very hot fires have been burned.



Never use gasoline, gasoline-type lantern fuel (naphtha), fuel oil, motor oil, kerosene, charcoal lighter fluid, or similar liquids or aerosols to start or 'freshen up' a fire in this wood stove. Keep all such liquids well away from the stove while it is in use.

4.2.1 Using Fire Starters

Commercial fire starters can be used instead of a newspaper. Some of these starters are made of sawdust and wax and others are made of specialized flammable solid chemicals. Always follow the package directions when using.

Gel starters can also be used, but only to light a fire, in a cold combustion chamber without hot embers inside.

The heater should not be left unattended during ignition and the fire should not burn at full intensity for more than a few minutes.

4.3 Combustion Cycles

Wood heating with a space heater is very different than other forms of heating. There will be temperature variations in different parts of the house and there will be temperature variations throughout day and night. This is normal, and for experienced wood burners these are advantages of zone heating wood burning.

Wood heaters don't have a steady heat output. It is normal for the temperature to rise after a new load of wood is ignited and for its temperature to gradually decrease throughout the burning cycle.

This increasing and decreasing temperature can be matched with the household routines. For example, the temperature in the area can be cooler when the household is active, and it can be warmer when it is inactive.

Wood burns best in cycles. A cycle starts when a new load of wood is ignited by hot coals and ends when that load has been consumed down to a bed of charcoal about the same size as it was when the wood was loaded.

Trying to produce a steady heat output by placing a single log on the fire at regular intervals is not recommended. Always place at least three, and preferably more pieces on the fire at a time so that the heat radiated from one piece helps to ignite the pieces next to it. Each load of wood should provide several hours of heating. The size of each load may vary depending on the amount of heat required.

Burning in cycles means the loading door does not need to be opened while the wood is flaming. This is an advantage since it is preventing smoke leaking from the heater when the door is opened as a full fire is burning. This is especially true if the chimney is on the outside wall of the house.

If the door must be opened while the fire is flaming, fully open air control for a few minutes then open the door slowly.

4.4 Removing Ashes

Ash should be removed from the firebox every two to three days of full-time heating. Ash should not accumulate excessively in the firebox since it will affect the proper operation of the appliance.

The best time to remove ash is in the morning, after an overnight fire when the fireplace is relatively cold, but there is still a little chimney draft to draw the ash dust into the fireplace and prevent going out into the room.

Ashes should be placed in a tightly covered metal container. The container must be placed on a non-combustible floor or on the ground well away from all combustible materials. Ashes almost always contain live embers that can stay hot for days and which release carbon monoxide gas. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be kept in a closed metal container until they are completely cooled. No other waste should be placed in this container.



NEVER STORE ASHES INDOORS OR IN A NON-METALLIC CONTAINER OR ON A WOODEN DECK.

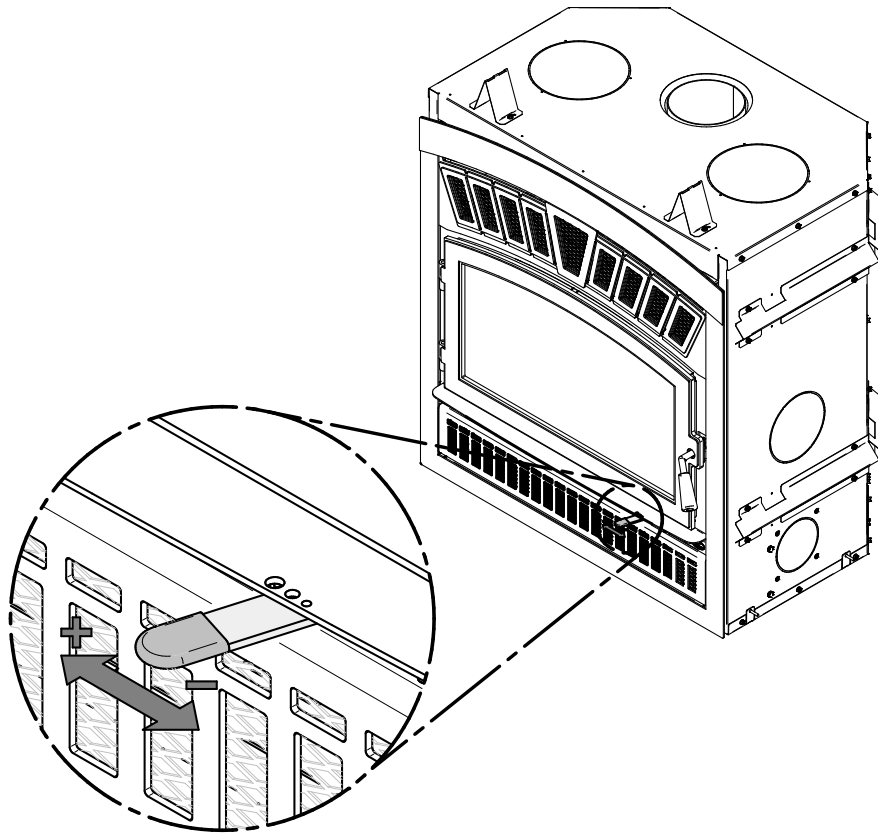
4.5 Air Intake Control

Once the firewood, firebox and chimney are hot, air intake can be reduced to achieve a steady burn.

As the air intake is reduced, the burn rate decreases. This has the effect of distributing the thermal energy of the fuel over a longer period of time. In addition, the flow rate of exhaust through the appliance and flue pipe slows down, which increases the duration of the energy transfer of the exhaust gases. As the air intake is reduced, the flame slows down.

If the flames diminish to the point of disappearing, the air intake has been reduced too early in the combustion cycle or the wood used is too wet. If the wood is dry and the air control is used properly, the flames should decrease, but remain bright and stable.

On the other hand, too much air can make the fire uncontrollable, creating very high temperatures in the unit as well as in the chimney and seriously damaging them. A reddish glow on the unit and on the chimney components indicates overheating. Excessive temperatures can cause a chimney fire.



YOUR PRODUCT MAY DIFFER FROM THE PICTURE, BUT THE OPERATION REMAINS THE SAME.

4.6 Fire Types

Using the air intake control is not the only way to match the fireplace heat output to the desired temperature in the house. A house will need far less heating in October than in January to maintain a comfortable temperature. Filling the firebox full in fall weather will overheat the space. Otherwise, the combustion rate will have to be reduced to a minimum and the fire will be smoky and inefficient. The method used to certify your appliance according to EPA Standards is presented in the Efficient Wood Combustion section of the Installation and Operation Requirements manual (Part 2 of 2) of your appliance. This method was developed specifically for your fireplace and results in the most efficient and cleanest combustion.

4.6.1 Maximum Burn Cycle Times

The burn cycle time is the period between loading wood on a coal bed and the consumption of that wood back to a coal bed of the same size. The flaming phase of the fire lasts for roughly the first half of the burn cycle and the second half is the coal bed phase during which there is little or no flame.

The burning time expected from this fireplace, including both phases, will vary depending on a number of things, such as:

- firebox size,
- the amount of wood loaded,
- the species of wood,
- the wood moisture content,
- the size of the space to be heated,
- the climate zone where the house is, and
- the time of the year.

The table below gives an approximate maximum burn cycle times, based on firebox volume.

Table 1 : Approximate Maximum Burn Cycle Time

FIREBOX VOLUME	MAXIMUM BURN CYCLE TIME
<1.5 cubic feet	3 to 5 hours
1.5 c.f. to 2.0 c.f.	5 to 6 hours
2.0 c.f. to 2.5 c.f.	6 to 8 hours
2.5 c.f. to 3.0 c.f.	8 to 9 hours
>3.0 c.f.	9 to 10 hours

A longer burning time is not necessarily an indication of efficient fireplace operation. It is preferable to build a smaller fire that will provide three or four hours of heating than to fully load the firebox for a much longer burn. Shorter burn cycles make it easier to match the heat output of the fireplace to the heat demand for the space.

4.6.2 Logs Orientation

In a relatively square firebox, the wood can be loaded north-south (ends of the logs visible) or east-west (sides of the logs visible).

North-south loads allow more wood to be loaded at the same time. On the other hand, they break into smaller pieces faster. North-south loading is good for high output, long lasting fires for cold weather.

East-west loads allow a limited amount of wood since too many logs could cause them to fall on the glass. East-west loads, placed in a compact way, take a long time before breaking down. They are excellent for low-intensity, long-lasting fires in relatively mild weather.

4.6.3 Carbon Monoxide

When there is no more flame in the firebox and there are still some unburned logs, check outside if there is smoke coming out of the chimney. If this is the case, it means that the fire is out of air to burn properly. In this situation, the level of CO increase and it is important to react. Open the door slightly and move the logs with a poker. Create a passage for the air below by making a trench with the ember bed. Add small pieces of wood to restart the combustion.

5. Operating the Fireplace



This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

5.1 Using a Fire Screen

In the United States or in provinces with a particulate emissions limit (e.g.: US EPA), the use of open-door wood fireplace with a rigid fire screen is prohibited.

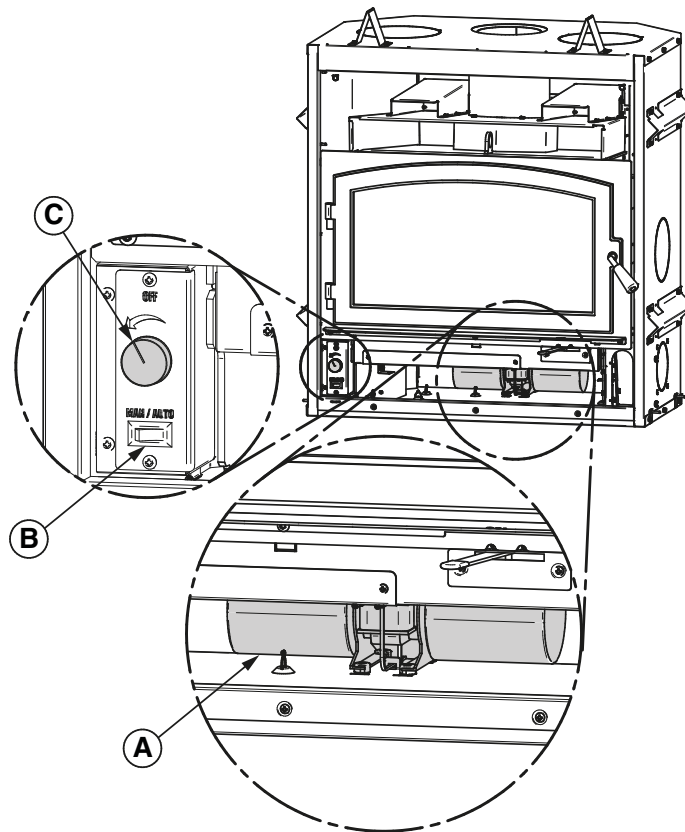
Some fireplaces have been tested for use open-door with a rigid fire screen, this option is sold separately (to confirm that your product has been tested with it, please refer to the specification manual). The fire screen must be properly secured on the fireplace to avoid any risk of sparks damaging the flooring. When the fire screen is in use, do not leave the fireplace unattended to respond promptly in the event of smoke spillage into the room. Potential causes of smoke spillage are described in Section 7 [«The Venting System»](#) of this manual. See “Optional Fire Screen Installation” in the specification manual of your product for installation instructions.

Operating the fireplace with a fire screen increases possibilities of generating carbon monoxide. Carbon monoxide is an odourless gas that is highly toxic which can cause death at high concentration in air. Installation of a carbon monoxide detector is highly recommended.

5.2 Blower Operation

A blower **(A)** may already be installed in the fireplace. If it is the case, it will be located behind the faceplate, at the bottom of the fireplace. Its function is to increase airflow around the fireplace air jacket and improve hot air circulation in the room. When used regularly, the blower can provide a small increase in efficiency, up to 2%. However, the use of a blower should not be used as a way to gain more output from a fireplace that is undersized for the space it is intended to heat.

The blower can operate in automatic or manual mode. To choose the mode, just press the rocker switch **(B)** and choose «AUTO» for automatic mode and «MAN» for manual mode.



YOUR PRODUCT MAY DIFFER FROM THE PICTURE, BUT THE OPERATION REMAINS THE SAME.

Automatic mode: Press the rocker switch **(B)** and choose the «AUTO» mode. Choose the operating speed of the blower with the rheostat button **(C)** above. The blower will start automatically when the fireplace is warm and will shut down automatically when the fireplace is cold.

Manual mode: Press the the rocker switch **(B)** and select the «MAN» mode. Choose the operating speed of the blower with the rheostat button **(C)** above. The blower will start immediately. The blower must be stopped manually, either by turning the rheostat button **(C)** fully to the left or by changing the mode.

OFF: To completely turn off the blower, turn the rheostat button **(C)** counterclockwise until the blower stops.

6. Maintenance

This heater will give many years of reliable service if used and maintained properly. Internal components of the firebox such as firebricks or refractory panels, baffle and air tubes will wear over time. Defective parts should always be replaced with original parts.

To avoid premature deterioration, follow the lighting and reloading procedures in section « Burning Wood Efficiently » and also avoid letting the heater run with the air intake fully open for entire burn cycles.

6.1 Cleaning and Painting

Painted and plated surfaces can be wiped down with a soft, damp cloth. If the paint is scratched or damaged, it is possible to repaint the fireplace with a heat-resistant paint.

Do not clean or paint the fireplace when it is hot.

Before painting, the surface should be sanded lightly with sandpaper and then wiped off to remove dust. Apply two thin layers of paint.

6.2 Refractory Material and Baffle

The intense heat of the fire can cause slight cracks in the refractory panels. It is possible to minimize the appearance of these cracks by hardening the panels as described in the section « First Use ».

Slight cracks will not reduce the effectiveness of the panels. On the other hand, if wider cracks appears, they must be replaced. Inspect the refractory panels and the baffle for damage periodically and replace anything that is cracked or broken.

Operation of the heater with a cracked or missing baffle may cause unsafe temperatures and hazardous conditions and will void the warranty.

6.3 Glass Door Cleaning

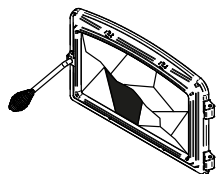
Under normal conditions, the door glass should stay relatively clear. If the firewood is dry enough and the operating instructions in this manual are followed, a whitish, dusty deposit will form on the inner surface of the glass after a week or so of use. This is normal and can be easily removed when the heater is cold by wiping with a damp cloth or paper towel and then drying.

When the fireplace runs at a low combustion rate, light brown stains may form, especially in the lower corners of the glass. This indicates that the fire has been smoky and some of the smoke has condensed on the glass. It also indicates incomplete combustion of the wood, which also means more smoke emissions and faster formation of creosote in the chimney.

The deposits that form on the glass are the best indication of the fuel quality and success in properly using the fireplace. These stains can be cleaned with a special wood stove glass cleaner.

Do not use abrasive products to clean the glass.

The goal should be having a clear glass with no brown stains. If brown stains appear regularly on the glass, something about the fuel or the operating procedure needs to be changed. When brown streaks are coming from the edge of the glass, it is time to replace the gasket around the glass. Always replace the gasket with a genuine one.



Do not clean the glass when the fireplace is hot.

Do not abuse the glass door by striking or slamming shut.

Do not use the fireplace if the glass is broken.

6.4 Exhaust System

Wood smoke can condense inside the chimney, forming a inflammable deposit called creosote. If creosote builds up in the system, it can ignite when a hot fire is burned in the insert. A very hot fire can progress to the top of the chimney. Severe chimney fires can damage even the best chimneys. Smouldering, smoky fires can quickly cause a thick layer of creosote to form. When the insert is operated properly, the exhaust from the chimney is mostly clear and creosote builds up more slowly.

«Creosote - Formation and Need to Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cooler chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire. The chimney connector and chimney should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated ($\frac{1}{8}$ " [3mm] or more it should be removed to reduce the risk of a chimney fire»

6.4.1 Cleaning frequency

It is not possible to predict how much or how quickly creosote will form in the chimney. It is important, therefore, to check the build-up in the chimney monthly until the rate of creosote formation is determined.

Even if creosote forms slowly in the system, the chimney should be cleaned and inspected at least once each year.

Establish a routine for the fuel, wood burner and firing technique. Check daily for creosote build-up until experience shows how often you need to clean to be safe. Be aware that the hotter the fire, the less creosote is deposited and weekly cleaning may be necessary in mild weather even though monthly cleaning may be enough in the coldest months. Contact your local municipal or provincial fire authority for information on how to handle a chimney fire. Have a clearly understood plan to handle a chimney fire.

6.4.2 Sweeping the Chimney

Chimney sweeping can be a difficult and dangerous job. People with no chimney sweeping experience will often prefer to hire a professional chimney sweep to inspect and clean the system for the first time. After seeing the cleaning process, some will choose to do it themselves. The chimney should be checked regularly for creosote buildup. Inspection and cleaning of the chimney can be facilitated by removing the baffle. See « Refractory Panels Replacement » in the product specification manual for more details.



ENGLISH

6.4.3 Chimney Fire

Regular chimney maintenance and inspection can prevent chimney fires. If you have a chimney fire, follow these steps:

1. Close the fireplace door and the air intake control;
2. Alert the occupants of the house of the possible danger;
3. If you require assistance, alert the fire department;
4. If possible, use a dry chemical fire extinguisher, baking soda or sand to control the fire. *Do not use water* as it may cause a dangerous steam explosion;

Do not use the appliance again until the fireplace and its chimney have been inspected by a qualified chimney sweep or a fire department inspector.

7. The Venting System

The venting system acts as the engine that drives the wood heating system. Even the best fireplace will not function safely and efficiently as intended if it is not connected to a suitable chimney. The heat in the flue gases that pass from the fireplace into the chimney is not waste heat. This heat is what the chimney uses to make the draft that draws in combustion air, keeps smoke inside the fireplace and safely vents exhaust to outside. Heat in the flue gas can be seen as the fuel the chimney uses to make draft.

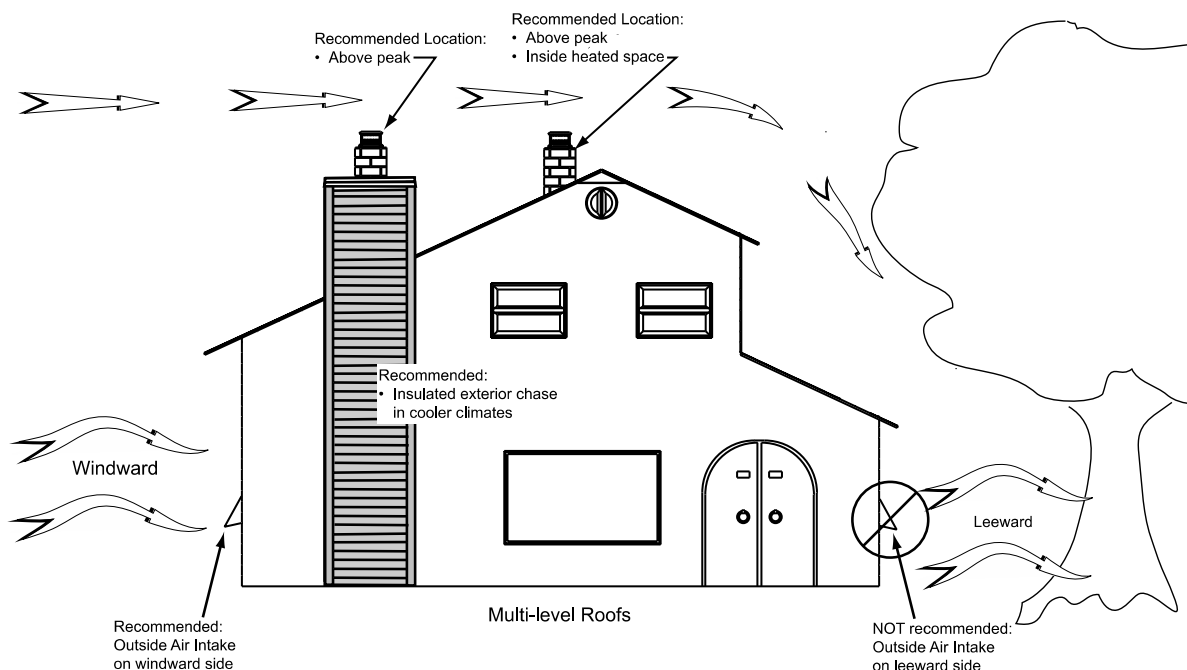
7.1 Location

The location of the chimney is crucial for the proper functioning of the appliance. The chimney should be installed within the house rather than up an outside wall and should rise straight up through the tallest part of the house. This installation benefits from being enclosed within the warm house environment, produce stronger draft, accumulate fewer creosote deposits and will be unaffected by cold temperatures or harsh winds.

The signs of bad system design are cold back drafting when there is no fire in the fireplace, slow kindling of new fires, and smoke roll-out when the door is open for loading. On the other hand, an excessive draft can make the fire uncontrollable, creating very high temperatures in the unit as well as in the chimney and seriously damaging them. A reddish glow on the unit and on the chimney components indicates overheating. Excessive temperatures can cause a chimney fire.

7.2 Supply of Combustion Air

The safest and most reliable supply of combustion air for a fireplace is from the room in which it is installed. Room air is already preheated so it will not chill the fire, and its availability is not affected by wind pressures on the house. The only case in which the fireplace may not have adequate access to combustion air is if the operation of a powerful exhaust device (such as a kitchen range exhaust) causes the pressure in the house to become negative relative to outdoors.



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tech@sbi-international.com



Wood fireplace Owner's Manual

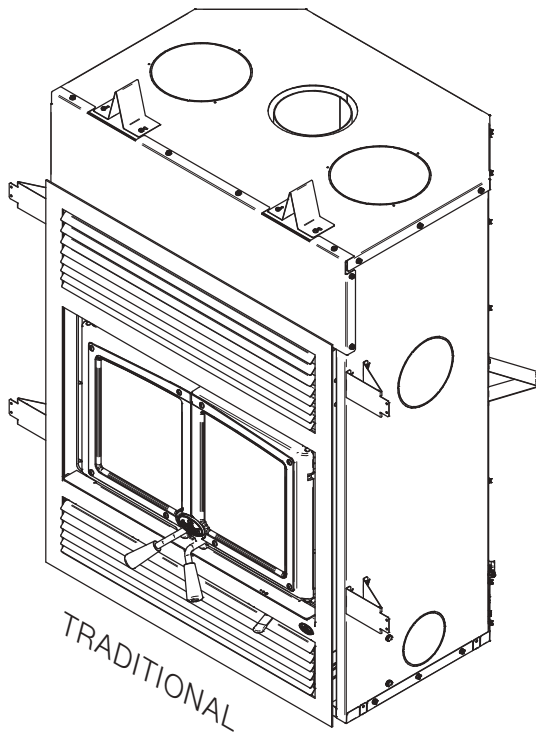
Part 2 of 2

INSTALLATION AND OPERATION REQUIREMENTS

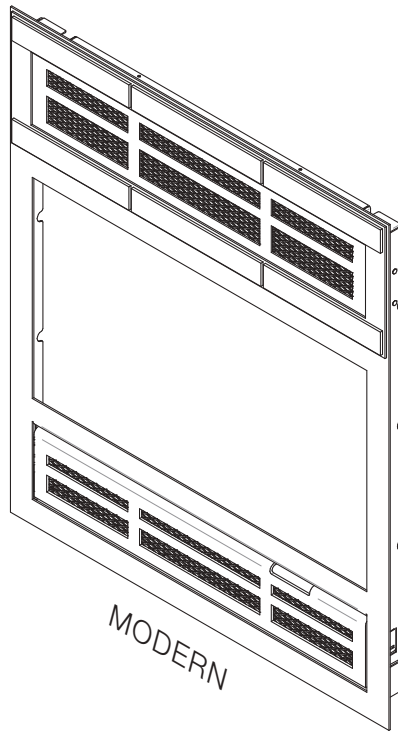
EVEREST III

(OB04017 model)

ENGLISH



US Environmental Protection Agency
phase II certified wood fireplace
compliant with 2020 cord wood standard



Safety tested according to
ULC S610, and UL 127 standards
by an accredited laboratory.

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS MANUAL FOR REFERENCE

Dealer: _____

Installer: _____

Phone Number: _____

Serial Number: _____

ONLINE WARRANTY REGISTRATION

If the unit requires repairs during the warranty period, proof of purchase must be provided. The purchase invoice must be kept. The date indicated on it establishes the warranty period. If it can not be provided, the warranty period will be determined by the date of manufacture of the product. It is also highly recommended to register the warranty online at

<https://www.osburn-mfg.com/en/warranty/warranty-registration/>

Registering the warranty will help to quickly find the information needed on the unit.



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CERTIFICATION PLATE

ENGLISH

1. General Information

1.1 Performances

Values are as measured per test method, except for the recommended heating area, firebox volume, maximum burn time and maximum heat output.

Model	Everest III (OB04017)
Fuel Type	Dry Cordwood
Combustion Technology	Non-catalytic
Recommended heating area (sq. ft.) ¹	750 to 2,500 ft ² (70 to 232 m ²)
Overall firebox volume	3.04 ft ³ (0.086 m ³)
Usable Firebox Volume (EPA)	2.61 ft ³ (0.074 m ³)
Maximum burn time	8 hours
Maximum heat output (dry cordwood) ²	85,000 BTU/h (24.9 kW)
Overall heat output rate (min. to max.) ^{2 3}	25,900 BTU/h to 78,200 BTU/h (7.6 kW to 22.9 kW)
Average overall efficiency ³ (Dry cordwood)	65 % (HHV) ⁴
Optimum efficiency ⁵	71.6 % (LHV) ⁶
Optimum heat transfer efficiency ⁷	68.0 % (LHV) ⁶
Average particulate emissions rate ⁸	1.9 g/h (EPA / CSA B415.1-10) ⁹
Average CO ¹⁰	1.7 g/min

¹ Recommended heating area and maximum burn time may vary subject to location in home, chimney draft, heat loss factors, climate, fuel type and other variables. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

² The maximum heat output (dry cordwood) is based on a loading density varying between 15 lb/ft³ and 20 lb/ft³. Other performances are based on a fuel load prescribed by the standard. The specified loading density varies between 7 lb/ft³ and 12 lb/ft³. The moisture content is between 19% and 25%.

³ As measured per CSA B415.1-10.

⁴ Higher Heating Value of the fuel.

⁵ Optimum overall efficiency at a specific burn rate (LHV).

⁶ Lower Heating Value of the fuel.

⁷ The optimum heat transfer efficiency is for the low burn rate and represents the appliance's ability to convert the energy contained in the wood logs into energy transferred to the room in the form of heat and does not take into account the chemical losses during combustion.

⁸ This appliance is officially tested and certified by an independent agency.

⁹ Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii).

¹⁰ Carbon monoxide.

1.2 Specifications

Recommended log length	16 in (406 mm) east-west
Maximum log length ¹¹	20 in (508 mm) east-west
Log length for testing purpose	15.2 ± 0.5 in (386 ± 12.7 mm)
Flue outlet diameter	6 po (150 mm)
Recommended connector pipe diameter	6 po (150 mm)
Type of chimney	ULC-S629, UL 103 HT (2100 °F)
Baffle material	C-Cast
Approved for alcove installation	No
Approved for mobile home installation ¹²	No
Type of door	Double, glass with cast-iron frame
Type of glass	Ceramic glass
Blower	Included (up to 176 PCM)
Particulate emission standard ¹³	EPA / CSA B415.1-10
USA standard (Safety)	UL 127
Canada standard (Safety)	ULC S610

¹¹ North-south: ends of the logs visible, East-west: sides of the logs visible.

¹² Mobile homes (Canada) or manufactured homes (USA): The US Department of Housing and Urban Development describes “manufactured homes” better known as “mobile homes” as follows; buildings built on fixed wheels and those transported on temporary wheels/axles and set on a permanent foundation. In Canada, a mobile home is a dwelling for which the manufacture and assembly of each component is completed or substantially completed prior to being moved to a site for installation on a foundation and connection to service facilities and which conforms to the CAN/CSA-Z240 MH standard.

¹³ Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii).

1.3 Dimensions

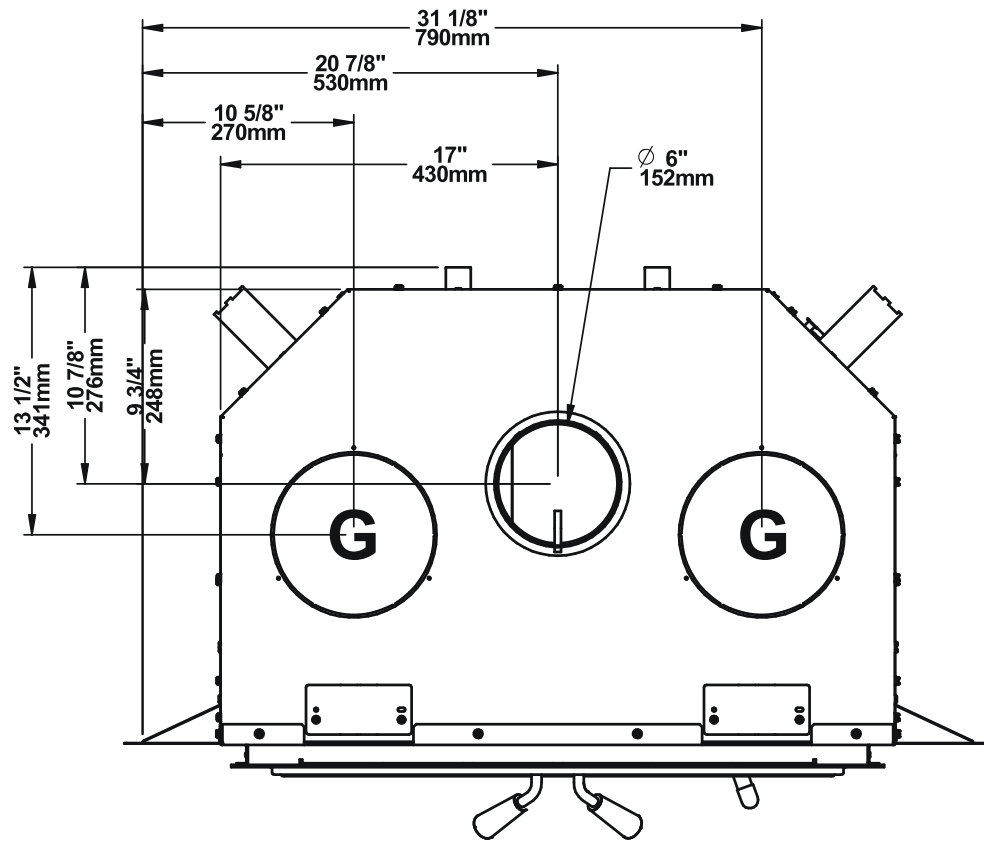


Figure 1: Top View

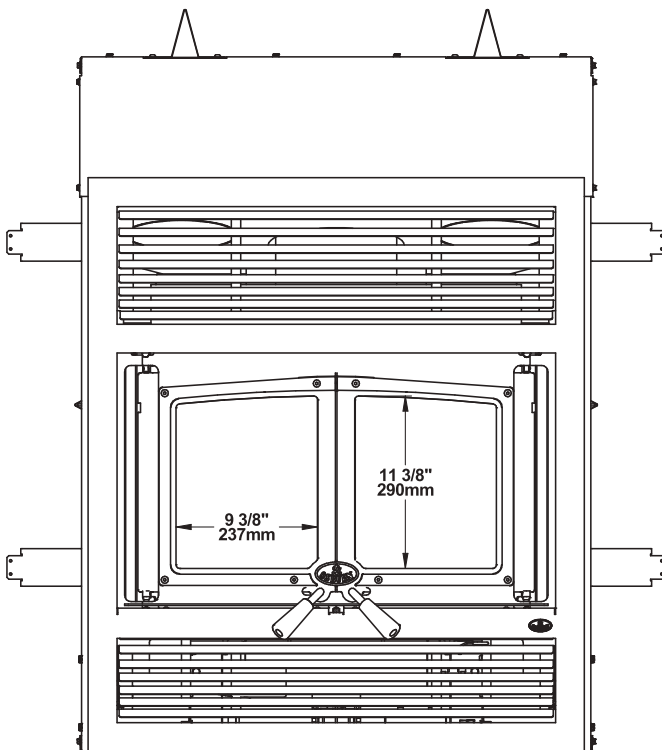


Figure 2: Front View

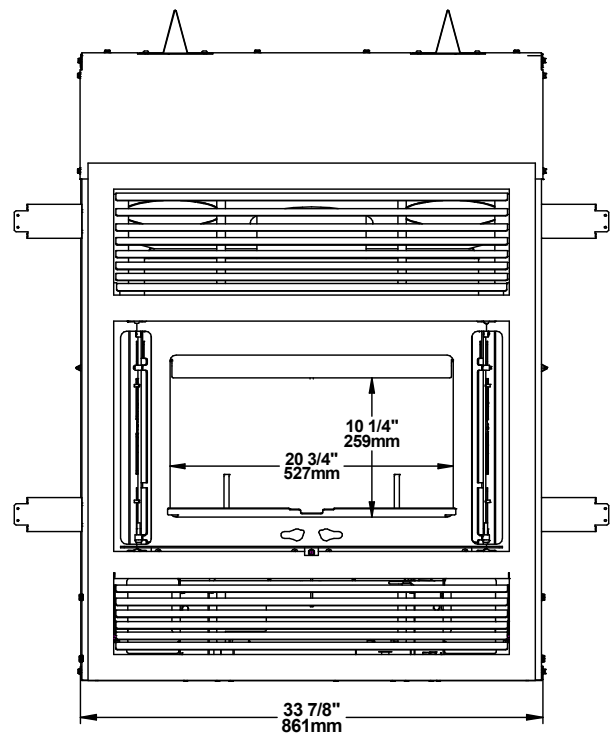


Figure 3: Front View - Door opening

G : Opening for gravity hot air distribution kit (ø 8").

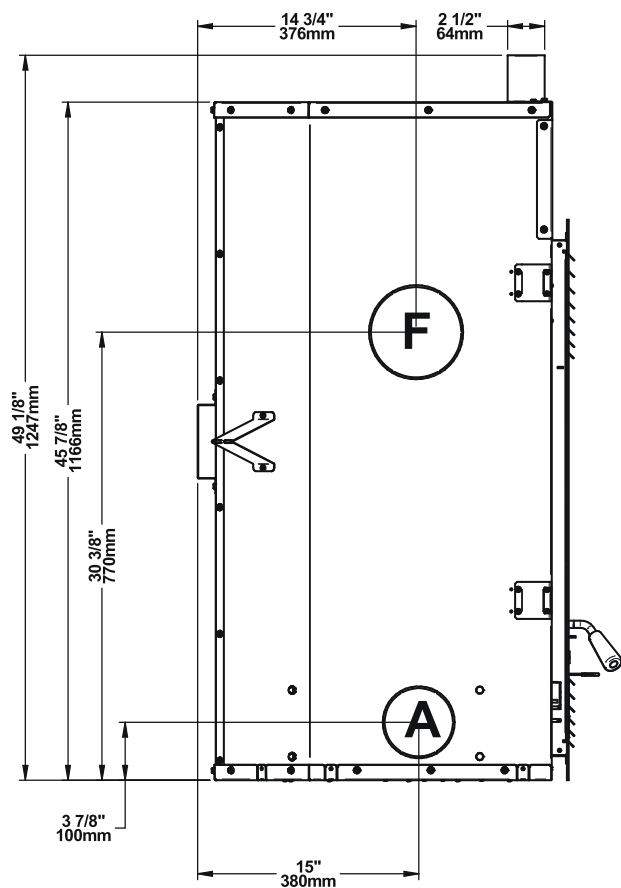


Figure 4: Left side view

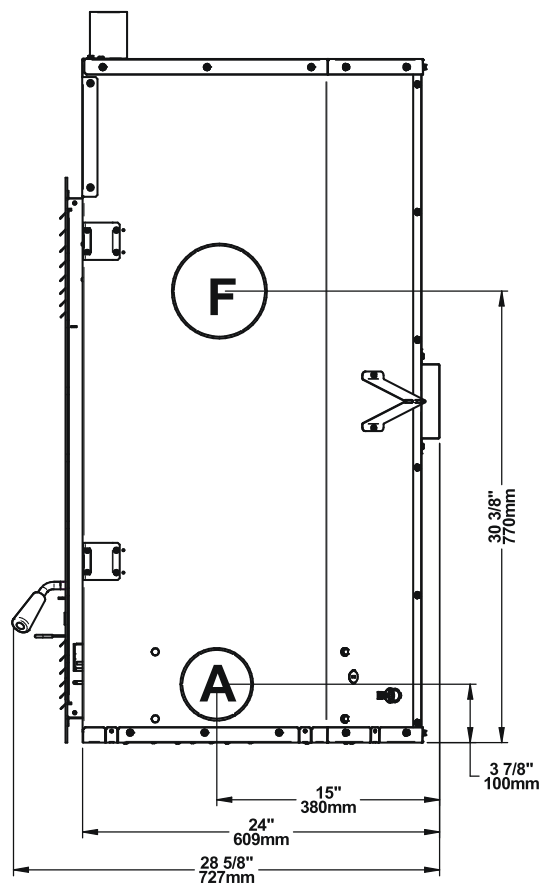


Figure 5: Right side view

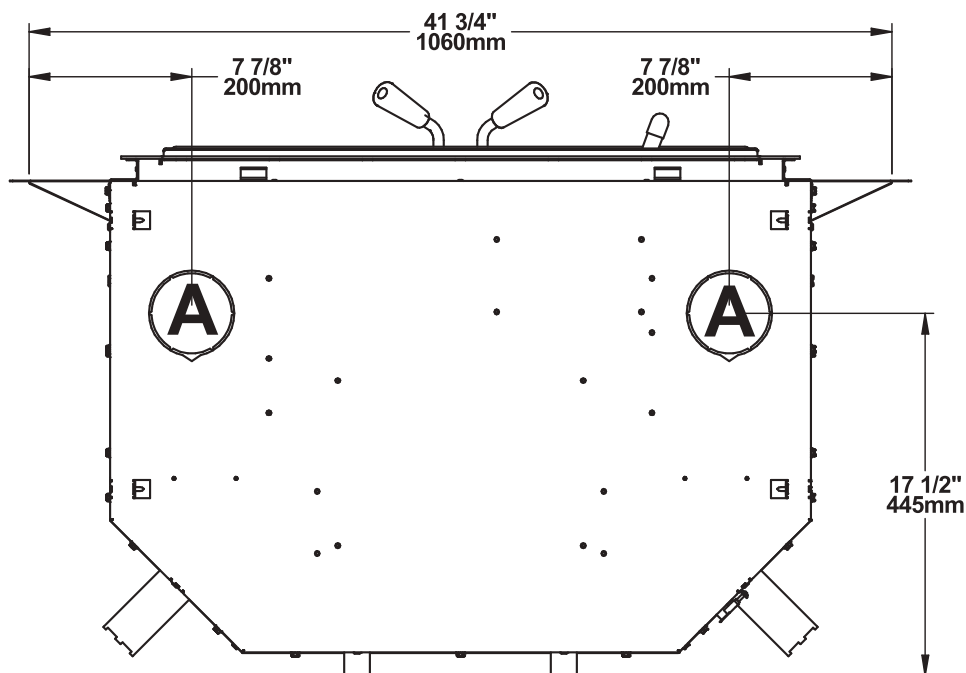


Figure 6: Bottom view

F : Opening for forced air distribution kit (ø 6").

A : Opening for fresh air intake (ø 4").

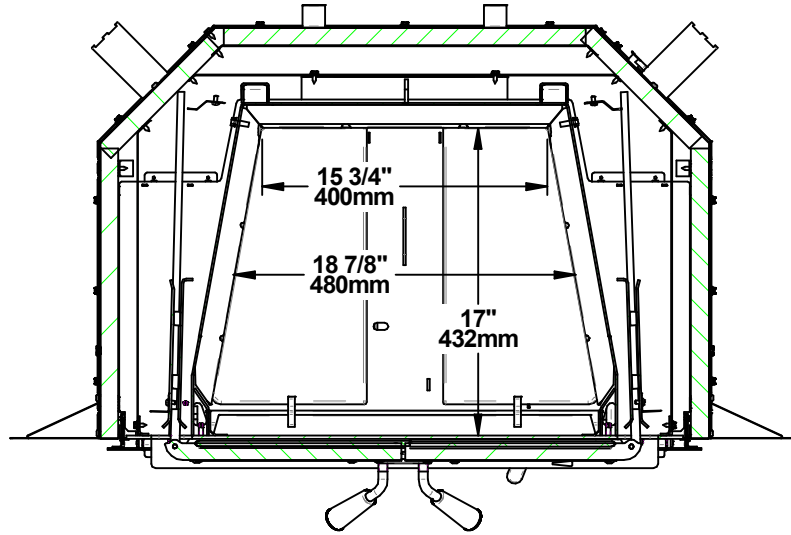


Figure 7: Combustion chamber - Top view

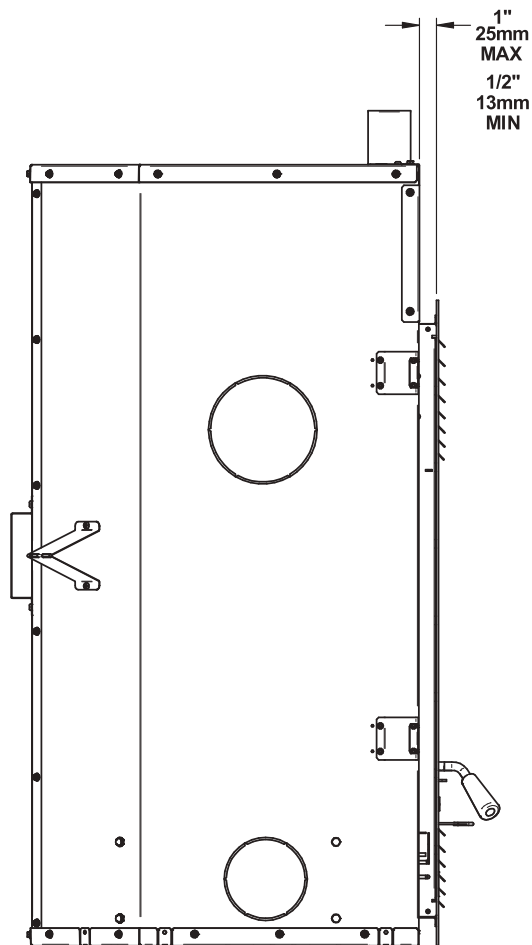


Figure 8: Left view - Faceplate projection

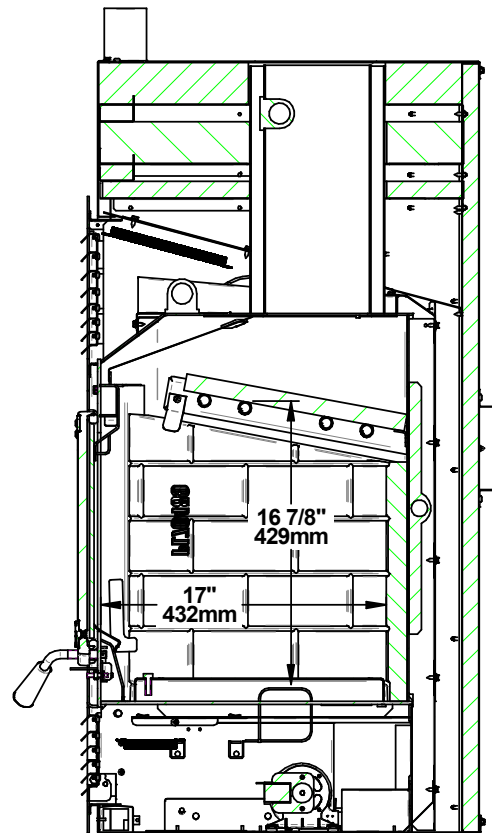


Figure 9: Combustion chamber - Side view

2. Efficient Wood Combustion

2.1 Usable firebox volume

The images below show the space in the firebox where the logs are to be placed. It is important to always respect this space and not to put logs in the grid area marked with an X. This marked area is defined by the space between the glass and the log retainers supplied with the unit. Leave enough space between the logs for good air circulation. Using more than the usable firebox volume for loading wood will result in poor combustion. The Usable firebox volume of 2.61 ft³ shown below is the one used during EPA emissions certification. The recommended log length for this stove is the commercially available length of 16 inches but it was tested, as required by the test procedure, with log length of 15 1/4 inches. The fuel specie used for the EPA certification was Big Leaf Maple.

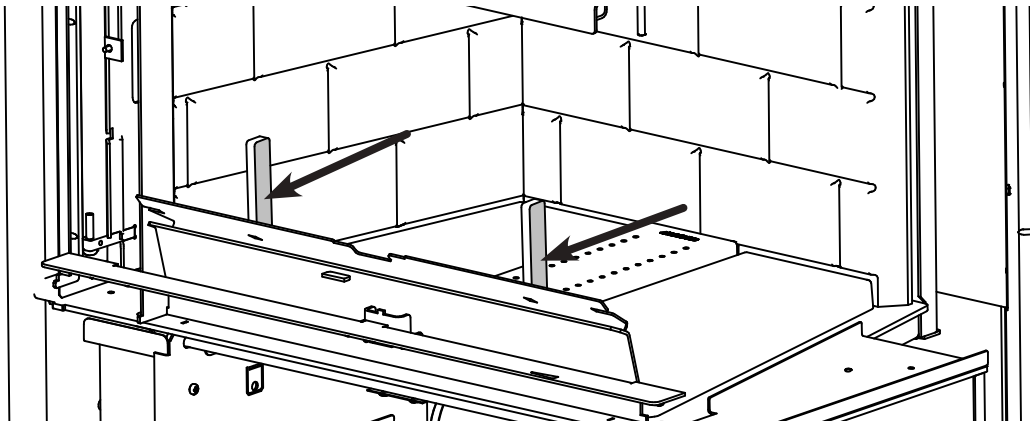


Figure 10: Log retainers

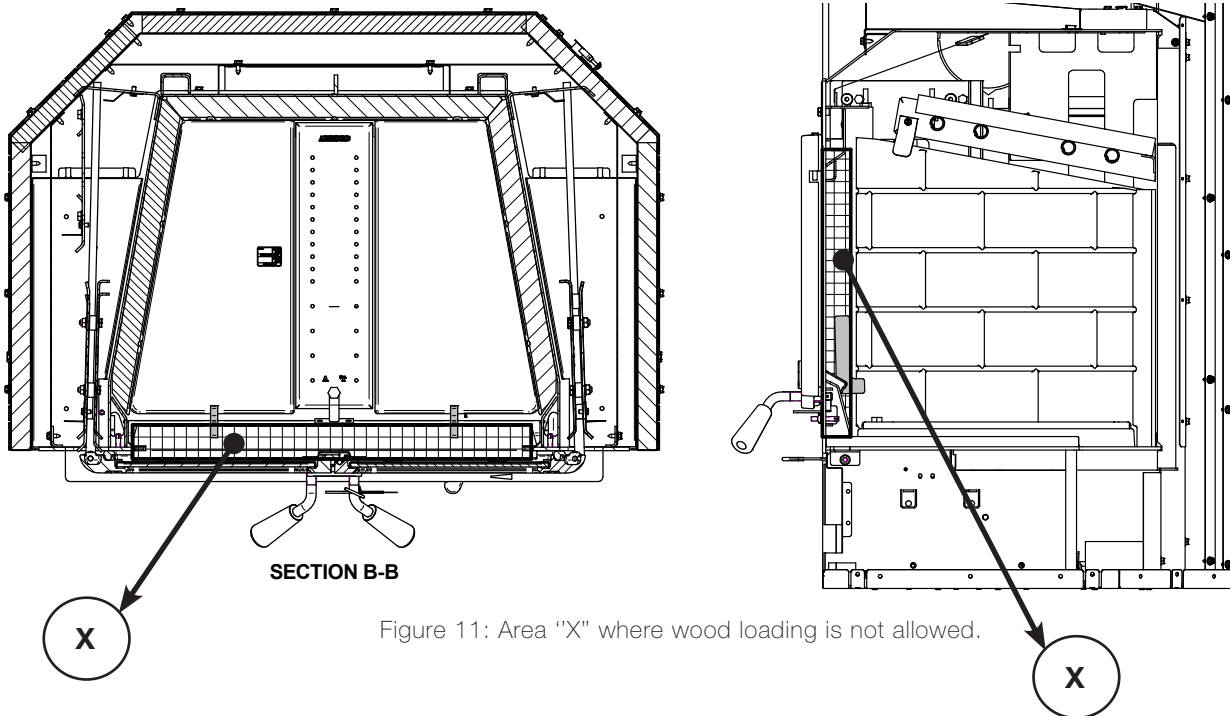


Figure 11: Area "X" where wood loading is not allowed.

The overall firebox calculation is an approximation and is not intended to be used for loading. This volume includes a buffer zone to allow an easier fuel insertion, prevent ash spillage and allow the air wash to work properly.

2.2 Air control

The air control is located underneath the door on the right. To open the air control, push the air control handle completely to the right (High). This will increase the burn rate and the flame intensity. To close the air control, push the air control handle completely to the left (Low). This will permit to achieve the lowest possible burn rate and reduce the flame intensity.

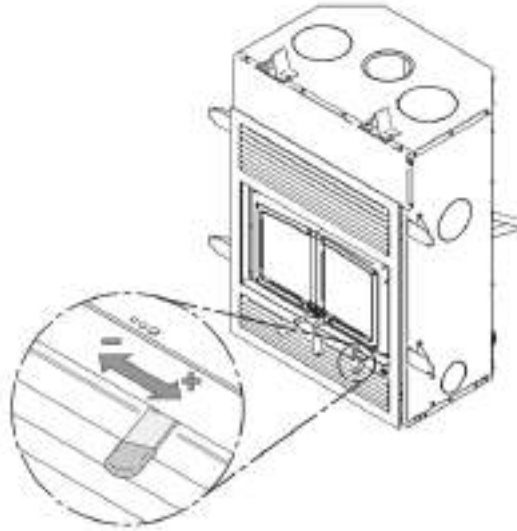


Figure 12: Air control

If the flames decrease to the point of disappearing, it is because the air supply was reduced too early in the combustion cycle, the wood moisture level is too high or the chimney draft is too weak. If the wood is dry, the chimney draft is adequate and the air control is used correctly, the flames should decrease, but remain bright and stable.

However, it is important to note that when the air control is moved to obtain low intensity combustion, it is normal to observe fewer flames in the lower part of the combustion chamber and to see flames appear in the upper part of the combustion chamber near the secondary air tubes.

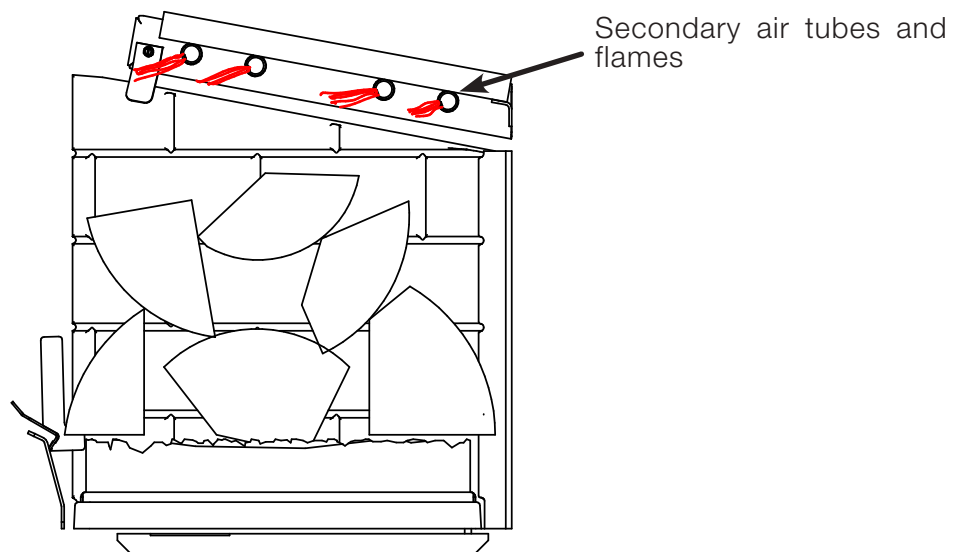


Figure 13: Secondary flame

To reduce particle emissions and minimize clogging of the chimney, it is recommended to reduce

the intensity of combustion while preserving the presence of flames around the logs or in the upper part of the combustion chamber near the secondary air tubes.

2.3 Emission testing certification

This section explains how this factory-built fireplace was operated during the emission testing Certification. See the sections below for the description of this testing procedure. It highlights some good practice or methods that can be used in the “real world” for an efficient and clean combustion. However, it is important to verify the following points regarding the utilization of this method.

- During those tests, the unit is operated with hardwood having a low mass density (Big Leaf Maple) with an average wood moisture between 19% and 25% (dry basis). Using wood with higher mass density or higher moisture content may required greater primary air control opening or greater door opening time for a good ignition and maintain efficient combustion. Moisture measurements are made by averaging several measures using a penetration of more than ½ inch. If measurements are made with instrument with less than ¼ inch penetration, it is suggested to split the fuel piece in 2 and to measure on the freshly split face.
- Very Large wood logs or small log quantities (2 or less) can be more difficult to ignite and may required greater primary air control opening or greater door opening time for a good ignition and maintain efficient combustion.
- It is a good practice to observe the flames few minutes just after closing the door or after closing the air control. After a certain period (typically around 10 minutes), verify that the flames are still visible in the firebox with a stable intensity. Refer to section 2.1 and 2.2 above for more details on efficient operation of your fireplace.

WARNING:

- **DO NOT LEAVE THE FIREPLACE UNATTENDED WHILE A NEW LOAD IS BEING FIRED HOT.**
- **DO NOT BUILD THE FIRE TOO CLOSE TO THE GLASS.**

2.3.1 Start-up phase

The air control needs to be fully open. Place newspaper sheets on the firebox floor and carefully criss-cross 15 to 20 kindling pieces of 1"x1" (2.5 cm x 2.5 cm) approximately over the paper in the middle of the firebox. For the best ignition, put the two first kindling pieces in North-South orientation and sit the front tip of the piece on the Kindling Ignition Enhancer (KIE), behind the log retainers. Use those two kindling pieces to support the rest of the kindling pieces. This allows to leave enough space for the paper under the kindling pieces for a better paper ignition. The smaller kindling must be put in the first layer and larger kindling on the other layers over it. In general, leave some air spaces between each kindling pieces and make sure that fuel pieces are not in contact with fire bricks.

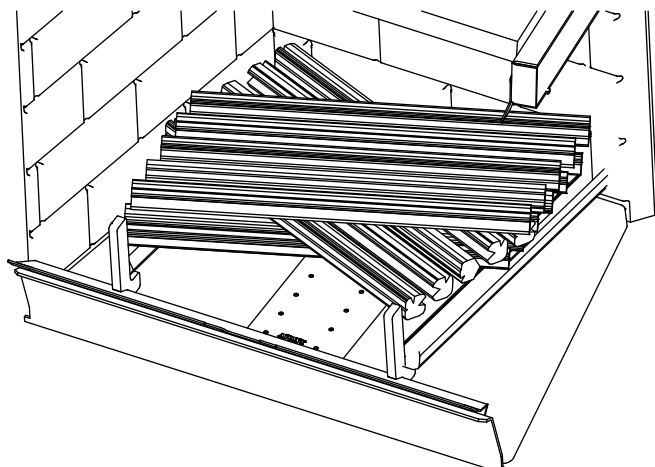


Figure 14: Kindling configuration using Kindling Ignition Enhancer (KIE) - Top view

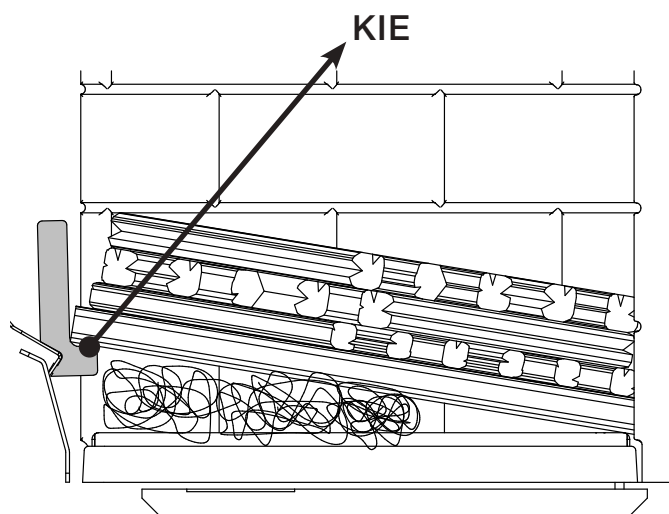


Figure 15: Kindling configuration using Kindling Ignition Enhancer (KIE) - Side view

The kindling pieces need to be dry with moisture content about 10%. To achieve such a dry condition, we recommend splitting kindling pieces at least 2 weeks in advance, and let it dry in a criss-cross stack, and leave it inside at ambient temperature and low relative humidity. The best practice is to have 2 stacks done first, and, have a rotation of those stack to allow one to dry when you use the dried one.

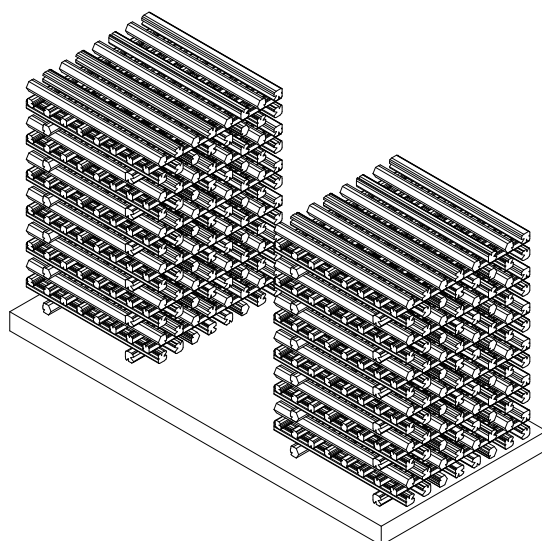


Figure 16: Kindling pieces in a criss-cross stack

Place 5 pieces of start-up fuel of 2 in. x 2 in. (5 cm x 5 cm) approximately over the kindling. For Start-up fuel configuration refer to the picture below. In the same spirit of kindling configuration, use smaller pieces in the first layer and larger on the layer over it. Leave air space between each start-up fuel pieces. Basically, for a good and fast ignition you need to allow the flames to pass all around each wood pieces.

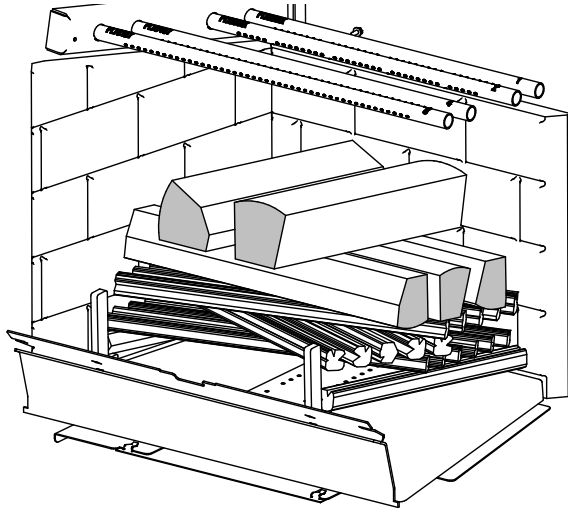


Figure 17: Start-up fuel configuration (over the kindling) -
Top view

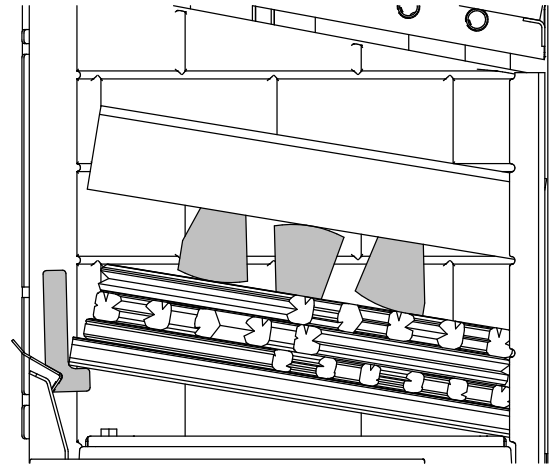


Figure 18: Start-up fuel configuration (over the kindling) -
Side view

Light up the paper at the front and on the side of the fuel load. Using a propane torch will be more efficient (faster) than a small lighter. Let the doors cracked of about one inch. Keep the combustion chamber full of flames between 2 and 3 minutes and close the door when the flames are rolling fast above the fuel load. A fast and very hot ignition will insure an efficient combustion. Keep the air control fully open.



Figure 19: Flames intensity at the beginning of Start-up phase (Door cracked about 1 inch)

2.3.2 High-fire phase

This best time to start this phase is when the unit has a small coal bed, some fuel pieces not completely burn and also when there are still some flames in the combustion chamber. The air control setting is still fully open. This high-fire phase is intended to quickly heat an area, shortly after start-up phase or when restarting the appliance. The High fire load configuration can be made with 5 medium cordwood pieces of 2.5 in. x 4.5 in (6 cm x 11 cm) approximately. Refer to

picture below for a wood load configuration allowing an optimized ignition followed by a stable and clean combustion. In general, medium wood pieces with moisture content between 19% and 25% (dry basis) will be configured in more compact configuration (limited air space between each piece). However, larger wood pieces with a higher moisture content will be configured with more air spaces between each wood pieces.

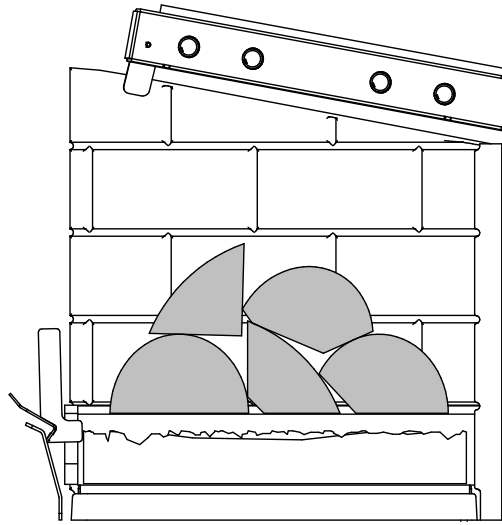


Figure 20: High-fire load configuration with medium size wood pieces

Following the start-up phase, when flames start to reduce in intensity (refer to picture below), open the door and put the first 3 pieces in East-West configuration directly on the unburned wood pieces allowing the primary air to pass under fuel pieces (refer to the picture below). The load needs to be placed in the middle of the firebox without touching the refractory panels. The 2 other pieces should be added on top of the first 3, stacked in the middle, in an East-West orientation.

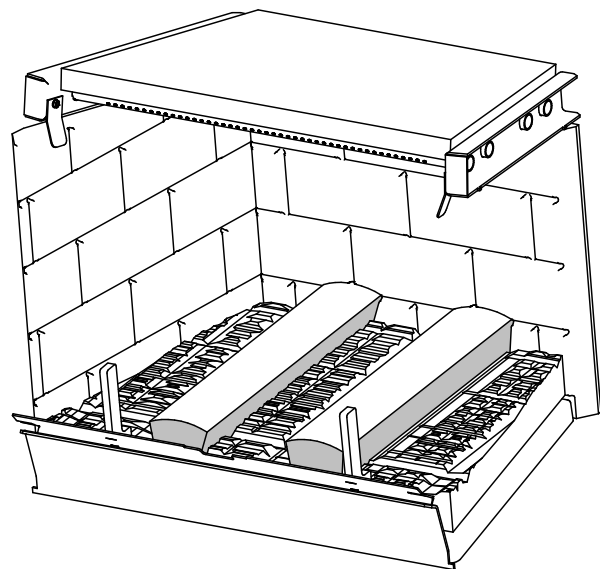


Figure 21: Coal bed and unburned wood pieces before loading the High-fire load

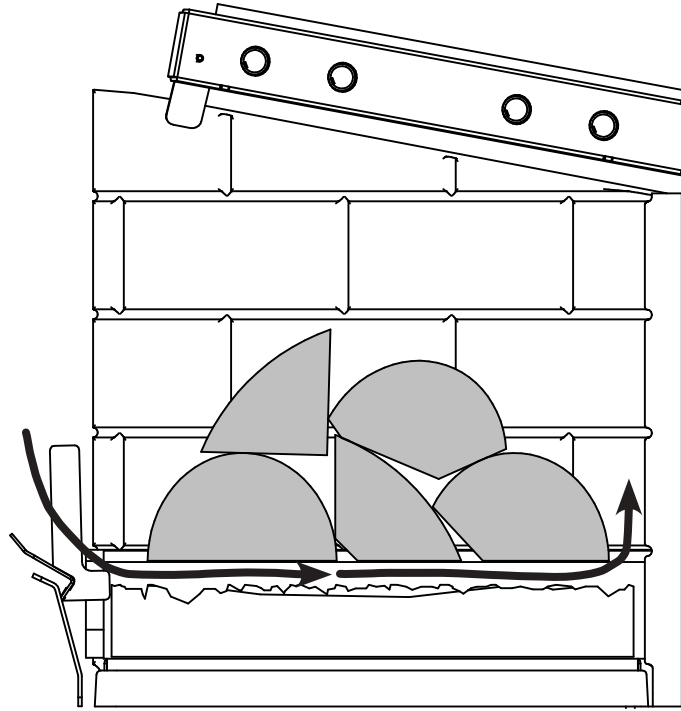


Figure 22: Air path under the High-fire load

Keep the air control fully opened for about half of an hour. That represents approximately when 50% of the load as been consumed. This is when the fire box has reached the maximum temperature, and the flames just begin to reduce in intensity. The air control can be fully or partially closed at that point.

2.3.3 Maintenance-fire phase

This phase is a period when a fire is maintained with a medium-sized coal bed, and a smaller batch of wood normally made of two large cordwood pieces. The goal is to maintain consistent heat output. The Maintenance-fire load configuration is made with 2 larges fuel pieces of 4 in. x 6 in (10 cm x 15 cm) approximately.

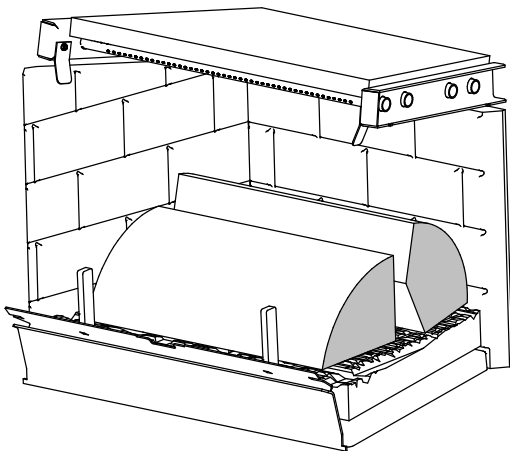


Figure 23: Maintenance-fire load configuration - Top view

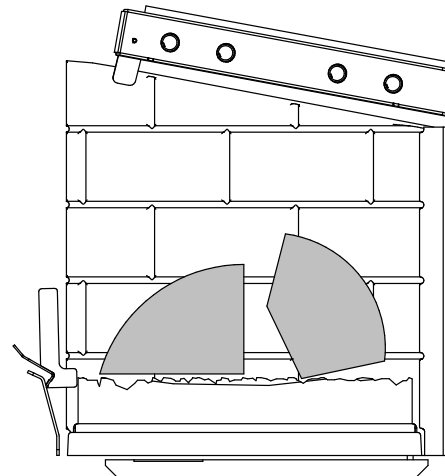


Figure 24: Maintenance-fire load configuration - Side view

Following the high-fire phase, when there are only faint flames remaining and most of the wood is turned into coal, open completely the air control and open the door. The wood pieces can be put gently over the coal bed, and it is not required to stir the coal bed. Put the first piece in East-West orientation at the back of the firebox without touching the refractory panels. Put the second piece just beside the first one also in East-West orientation. Then, close the door and keep the air control fully open for at least 3 minutes. The air control can be fully closed from that point. Make sure flames does not disappear 10-15 minutes after closing the air control.



Figure 25: Charcoal bed at the end of High-fire phase



Figure 26: Maintenance-fire load in firebox

2.3.4 Low-burn rate phase

This phase is a period when the stove has a large coal bed, the stove is fully loaded, and the adjustable air settings are set to produce the lowest possible burn rate. This phase is made to maintain heat over a long time, such as overnight or while away for significant periods of time. The Low-burn rate load configuration is made with 3 large cordwood pieces of 4 in. x 6 in (10 cm x 15 cm) approximately and 3 medium cordwood pieces of 2.5 in. x 4.5 in (6 cm x 11 cm) approximately. The load configuration is East-West.

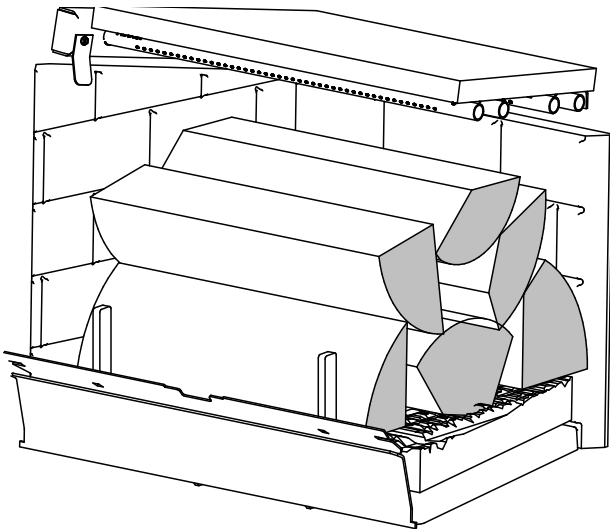


Figure 27: Low-burn rate load configuration - Top view

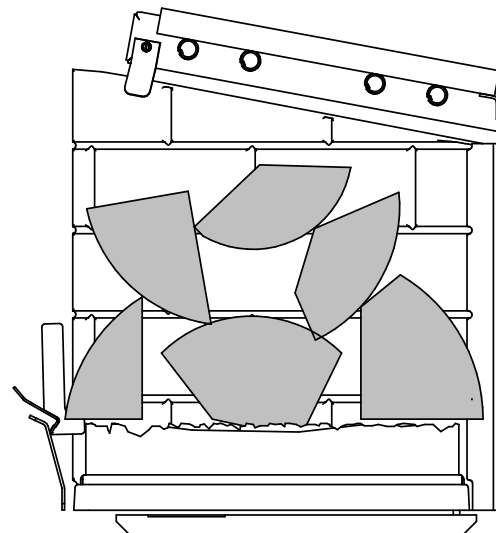


Figure 28: Low-burn rate load configuration - Side view

Following the maintenance-fire phase, when there are only faint flames remaining (or no flames at all) and most of the wood is turned into coal, open completely the air control, open the door and stir the coals slightly to insure ease of wood loading.



Figure 29: Charcoal bed at the end of Maintenance-fire phase



Figure 30: Charcoal bed after stirring

For an optimal loading, put the large wood pieces on the coal bed (first layer) and small pieces over the large pieces of the firebox as shown on the picture above. In general, for large wood load running at low firing rate, maintain air gap between each wood pieces for a faster ignition and an efficient combustion. Make sure that wood pieces are not put over the space between the door glasses and the log retainers (see section 2.1 above). Cordwood pieces at the front of the firebox need to be enough stable to not fall into the door. Proper use of the log retainers can reduce log to roll into the glass door. Let the door cracked of about one inch for at least 3 minutes. Let the flame increase in intensity on each side of the wood load and make sure to ignite completely the top of the wood load (near secondary air tubes) then close the door. Keep the air control fully opened for another 4 minutes minimum and close it partially or completely after that period.



Figure 31: Low-fire load in firebox

3. Approved Chimneys

Table 1 : Approved Chimneys

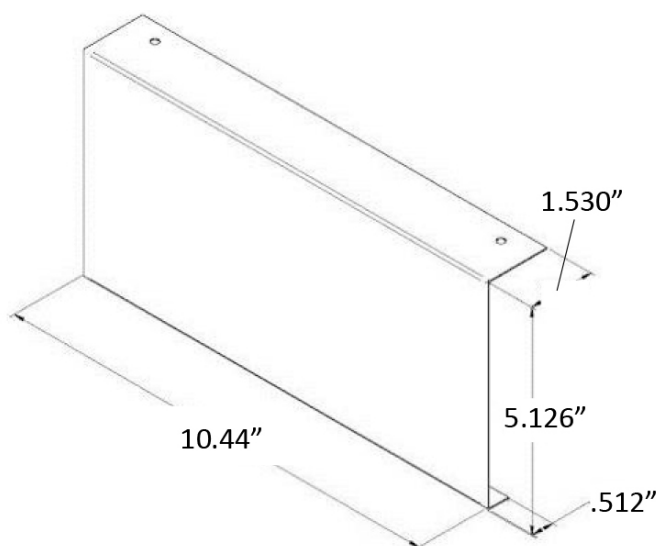
CHIMNEY MANUFACTURER	MODEL	TYPE	DIAMETER
Olympia Chimney SBI Division Venting	Ventis	1" Solid Pack	6" (15 cm)
SBI Division Venting	Nexvent	1" Solid Pack	6" (15 cm)
Olympia Chimney	Champion Chimney System	1" Solid Pack	6" (15 cm)
Olympia Chimney	Rockford Chimney Systems	1" Solid Pack	6" (15 cm)
Selkirk	Ultimate Plus	1" Solid Pack	6" (15 cm)
Selkirk	CF Sentinel (CF)	2" Solid Pack	6" (15 cm)
Selkirk	Super Pro 2100 (ALT)	2" Solid Pack	6" (15 cm)
Selkirk	Super Vent 2100 (JM)	2" Solid Pack	6" (15 cm)
Security Chimney	ASHT	1" Solid Pack	6" (15 cm)
Security Chimney	S-2100 +	2" Solid Pack	6" (15 cm)
DuraVent	Dura Tech	1" Solid Pack	6" (15 cm)
DuraVent	Dura Tech Canada DTC	1" Solid Pack	6" (15 cm)
DuraVent	DuraPlus HTC	2 "Solid Pack	6" (15cm)
DuraVent	Dura Tech Premium	2" Solid Pack	6" (15 cm)
DuraVent	Dura Plus	AC Triple Wall	6" (15 cm)
Metal Fab	Temp Guard	1" Solid Pack	6" (15 cm)
American Metal	HSS	AC Triple Wall	6" (15 cm)
American Metal	HS	AC Triple Wall	6" (15 cm)

Table 2 : List of mandatory components

CHIMNEY MANUFACTURER	MANDATORY COMPONENTS	TYPE/MODEL
Olympia Chimney / SBI Venting Division	Ventilated roof flashing.	1" Solid Pack : Ventis, Nexvent, Champion Chimney System, Rockford Chimney Systems
Security Chimney	Requires insulated attic radiation shield unless chimney is enclosed at the attic level.	2" Solid Pack: S-2100
DuraVent	Ventilated roof flashing.	1" Solid Pack: Dura Tech, Dura Tech Canada DTC 2" Solid Pack: Dura Tech Premium
American Metal	Chimney cannot be enclosed at the attic level.	AC Triple wall : HS AC Triple wall : HSS

3.3.1 Rafter protection

Rafter protectors, at the roof level, must be installed with this unit, if the chimney is enclosed at the attic level. Rafter protectors must be made of 22 ga or more galvanized steel and must have at least the dimension presented on the following diagram:



4. Fireplace Installation

Install the fireplace only as described in these instructions and using only the following fireplace components and chimney components from chimney manufacturers listed in ["Table 1 : Approved Chimneys"](#).

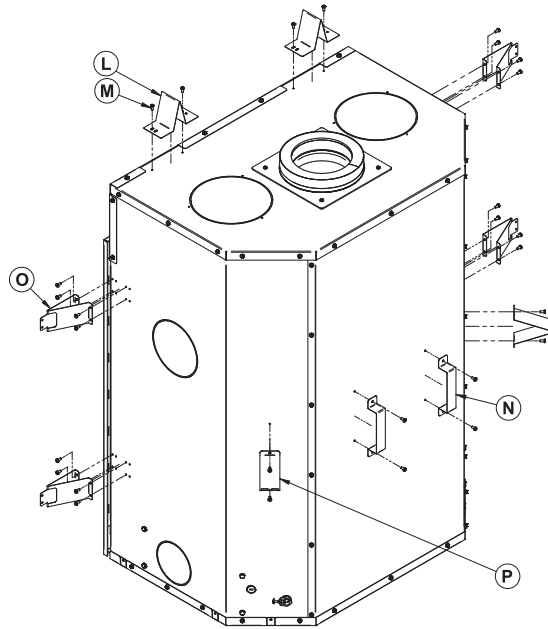
- Fireplace;
- Faceplate and louvers;
- Overlay;
- Refractory panels;
- Insulated chimney made by the manufacturers listed in [Table 1](#), with the corresponding specifications:
 - Chimney lengths;
 - Elbows (where necessary);
 - Associated components as per these installation instructions.

Additional Equipment (optional)

- Forced air distribution kit;
- Traditional or modern gravity hot air distribution kit;
- Fresh air kit;
- Fire Screen;
- Heat shield for combustible shelf.

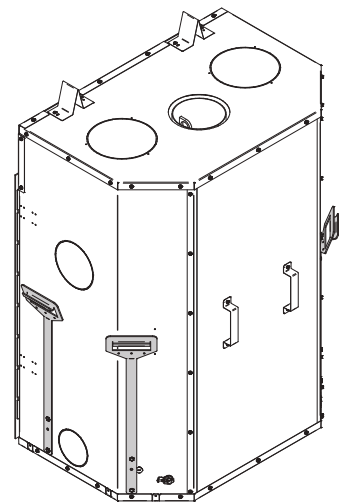
4.1 Standoff installation

Before installing the fireplace, **it is mandatory to install the standoffs** on the top **(L)** , on the sides and **(O)** and **(P)** the back **(N)** of the fireplace. The standoffs can be found in the fireplace firebox and the screws **(M)** to install them can be found in the fireplace manual.



4.2 Carrying Handles

To facilitate the transport of the fireplace, handles sold as an option may be used. They are installed on each side of the fireplace. Wearing gloves is strongly recommended when moving the fireplace.



4.3 Clearances to combustibles

The clearances shown in this section have been determined by test according to procedures set out in safety standards ULC S610 (Canada) and UL127 (U.S.A.). When the fireplace is installed so that its surfaces are at or beyond the minimum clearances specified, combustible surfaces will not overheat under normal and even abnormal operating conditions.

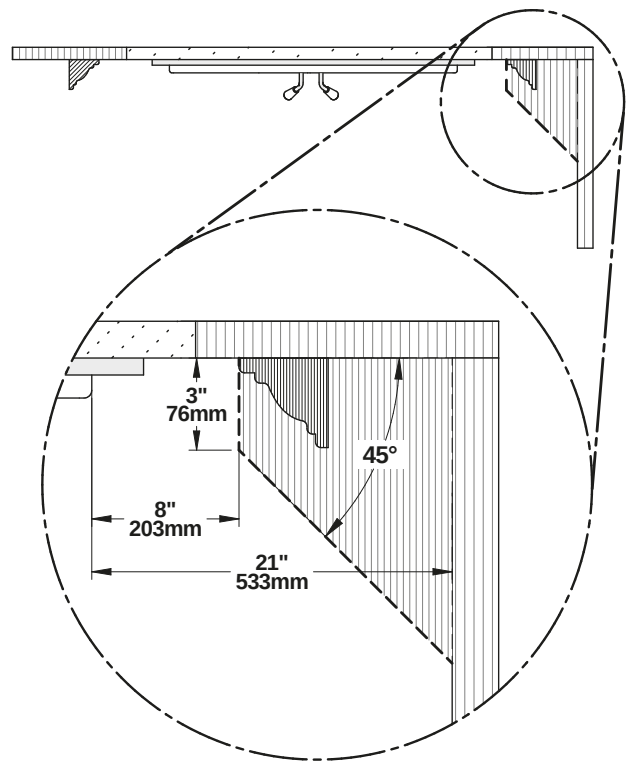
A material is considered non-combustible when made entirely of steel, iron, bricks, tiles, concrete, slate, glass or a combination of these materials. Materials corresponding to ASTM E136 and UL 763 are considered to be non-combustible materials with the exception of gypsum, which will be considered a non-combustible material only if it is certified to withstand an ambient temperature of use of 250°F and more.

No part of the fireplace may be located closer to the combustible than the minimum clearance given.

- Maximum mantle depth 3" (76 mm)
- Mantle minimum distance 8" (203 mm) (measured from the door opening)
- Side wall distance 21" (533 mm) (measured from the door opening)
- Minimum distance to the wall in front of the fireplace 48" (122 cm) in Canada and 36" (914 mm) in USA.
- Minimum ceiling height : 80" (2,03 m) measured from the base of the fireplace.

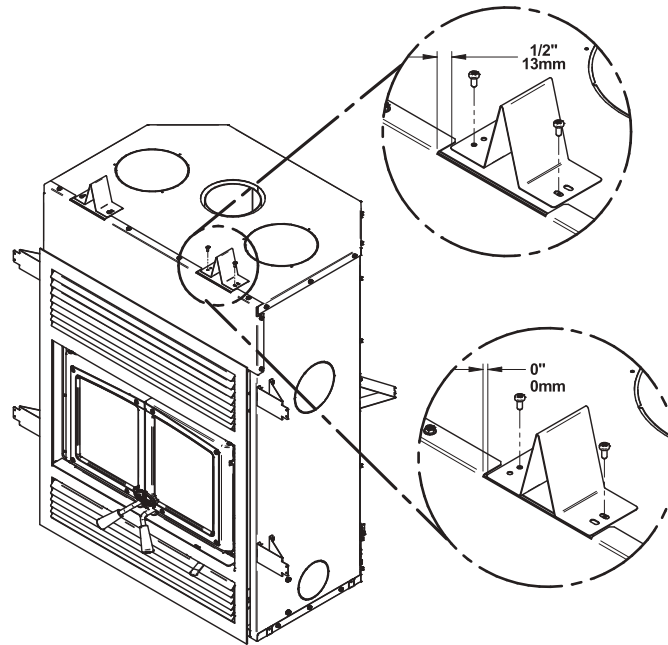
Fireplace enclosure :

- Back wall : 0"
- Sides : 0"
- Floor (underneath the fireplace) : 0"
- Chimney : 2" (50 mm)



4.4 Framing construction

The frame, on the sides and back of the fireplace, must be made of 2" x 3" (5 cm x 8 cm) or larger. The front studs as well as headers on top of the fireplace must be of a depth no more than the depth of the top standoffs. The standoffs can be installed either flush with the fireplace or setback of 1/2" depending on the thickness of the finishing material used.

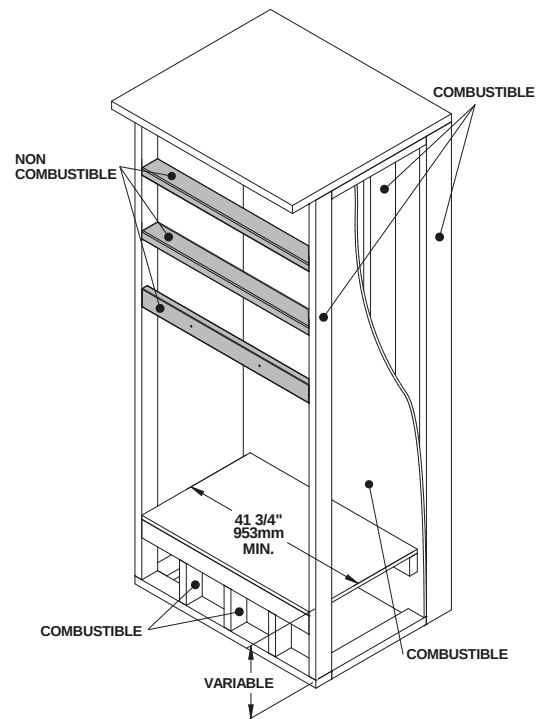


Do not use combustible materials for the frame directly above the fireplace. This area should remain empty to a height of 80" (2.03 m) measured from the base of the fireplace.

Build the fireplace frame using vertical studs placed on the sides of the fireplace, from the floor to the ceiling. The studs must be set back from the front edge of the fireplace by a space equivalent to the thickness of the finishing material, so that it is flush with the finish of the fireplace.

Headers between studs should be installed as follows:

- The headers must be 2" x 3" (5 cm x 8 cm) or 2" x 4" (5 cm x 10 cm). Do not put wood or other material in the area above the fireplace.
- Install only the cripple studs needed to support the finishing material and mantle.



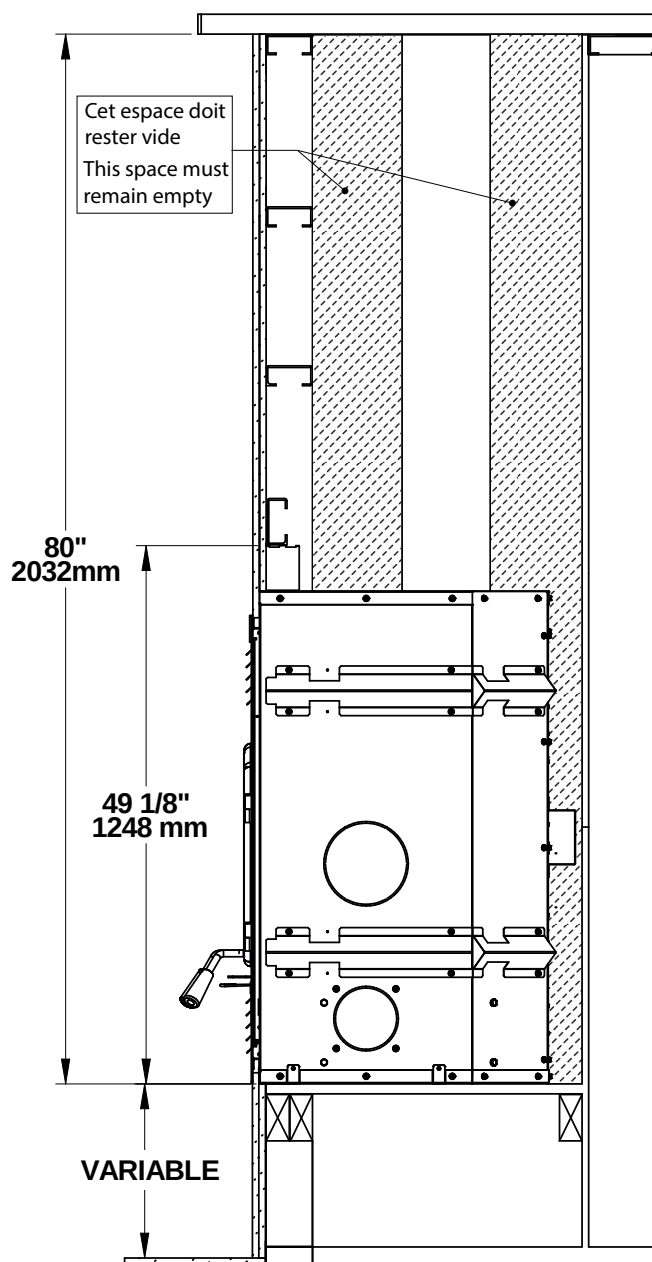
4.4.1 Fireplace Framing

WARNING :

- **DO NOT FILL THE REQUIRED EMPTY SPACE INSIDE THE ENCLOSURE WITH INSULATION OR ANY OTHER MATERIAL.**
- **DO NOT PUT STORAGE SPACE IN THE ENCLOSURE SURROUNDING THE FIREPLACE.**

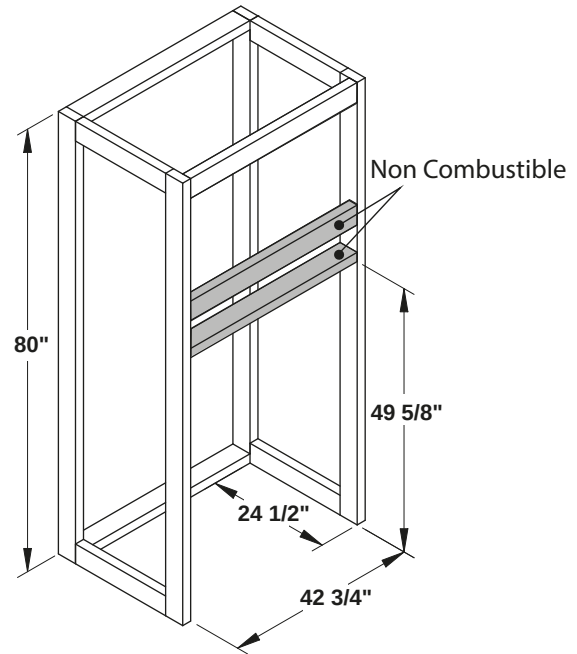
Framing dimensions should be used as a reference only.

The fireplace must not be in contact with any insulation or loose filling material. Inside the chase, around the fireplace, insulation should be covered with drywall panels or any other finishing material except where non-combustible material is required.

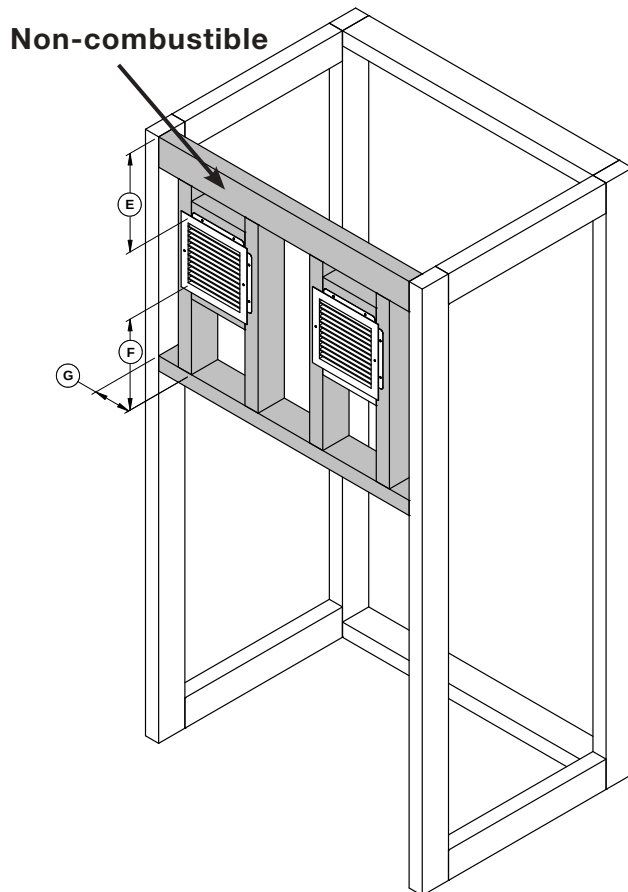


If a finishing material is installed inside the enclosure, its thickness must be added to the following measurements.

- Framing width 42 3/4" (1086 mm)
- Framing height to the first header 49 5/8" (1260 mm)
- Framing depth 24 1/2" (622 mm)
- Framing total height 80" (2032 mm)



4.4.2 Framing with gravity air kit install



The framing dimensions are for reference only.

Framing touching the grills must be made from non-combustible materials (dark area). Finishing material covering the dark framing must be made from non-combustible materials. See facing section.

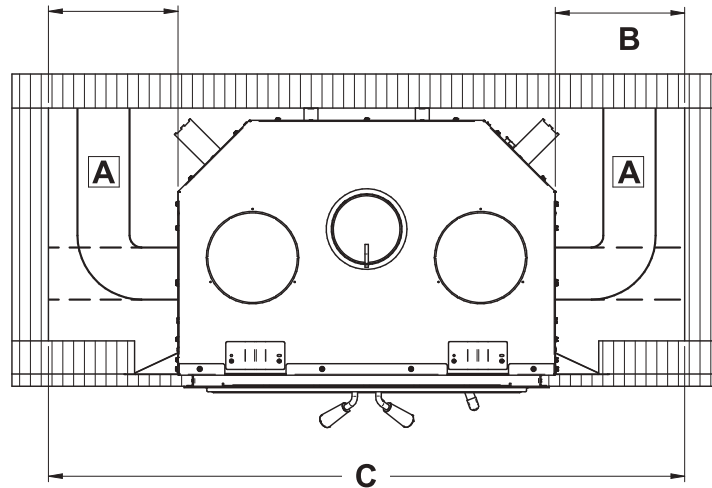
E: Minimum distance between the grill and the combustible ceiling (8")

F: Minimum distance below the grill to non-combustible stud (14")

F: Minimum distance between the grill and a non-combustible shelf (Not shown) (15")

G: Distance between the framing and the first stud (3")

4.4.3 Framing with Fresh Air Intake¹⁴



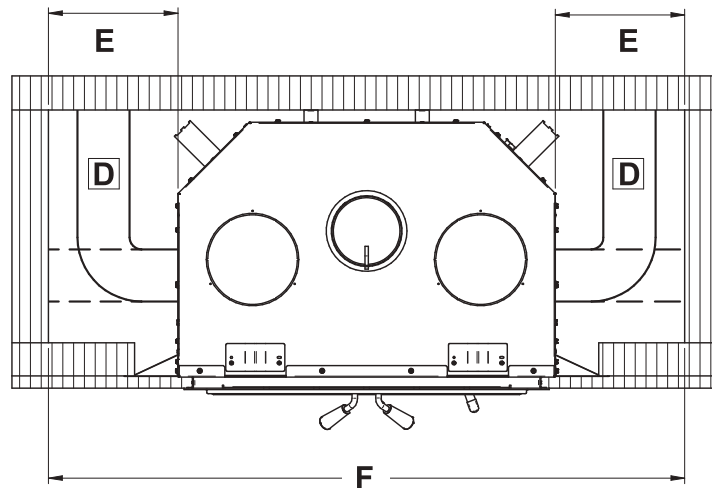
If a finishing material is installed inside the enclosure, its thickness must be added to the following measurements.

A : Fresh air intake duct¹⁵ (Fresh air intake can be installed on the right, left or underneath).

B : Distance between framing and side fireplace standoff 12" (305 mm)

C : Framing width (Installation with centered fireplace) 60 $\frac{3}{4}$ " (1543 mm)

4.4.4 Framing with forced air kit¹⁶



If a finishing material is installed inside the enclosure, its thickness must be added to the following measurements.

D : Forced air duct¹⁷ (Duct can be installed on the left [recommended] **or** on the right).

E : Distance between framing and side fireplace standoff 18" (457 mm)

F : Framing width (Installation with centered fireplace) 72 $\frac{3}{4}$ " (1848 mm)

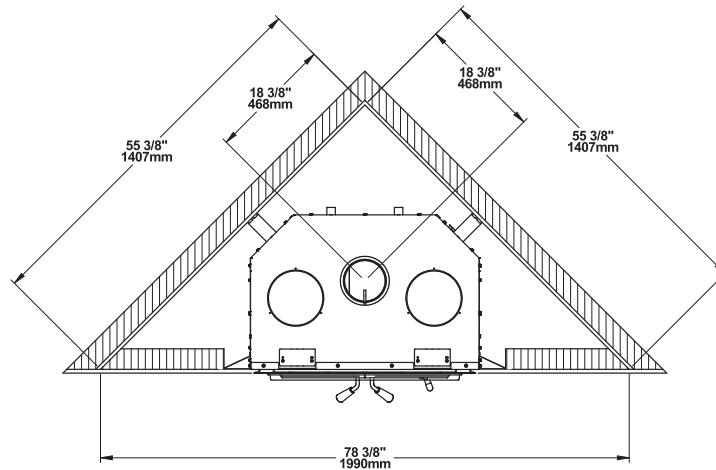
¹⁴ Framing dimensions are for reference only. These measurements are recommended to prevent the ducts from being inside the standoff or have too tight duct curves. Smaller dimensions can be used depending on the size and type of duct as well as the configuration of the installation.

¹⁵ HVAC duct, as per ULC S110 or UL 181, class 0 or class 1, must withstand temperatures up to 250°F.

¹⁶ Framing dimensions are for reference only. These measurements are recommended to prevent the ducts from being inside the standoff or have too tight duct curves. Smaller dimensions can be used depending on the size and type of duct as well as the configuration of the installation.

¹⁷ HVAC duct, as per ULC S110 or UL 181, class 0 or class 1, must withstand temperatures up to 250°F.

4.4.5 Framing with corner installation



Framing configuration should be used as a reference only. If a finishing material is installed inside the enclosure, its thickness must be added to the following measurements. These values are minimum measurements and may need to be increased to allow the installation of the fresh air intake, the forced air kit or the type of finishing material used.

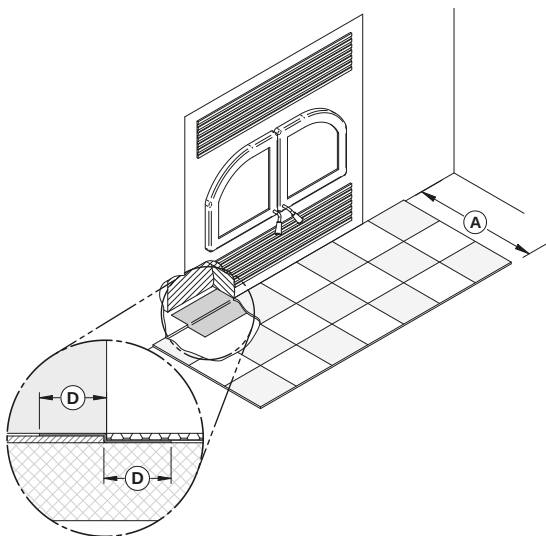
4.5 Hearth Extension Construction

WARNING: THE HEARTH EXTENSION IS TO BE INSTALLED ONLY AS ILLUSTRATED.

This fireplace can be installed directly on the floor or on a raised base, combustible or not. The installation can be done according to one of the following options :

OPTION	INSTALLATION TYPE	R FACTOR REQUIRED	NON-COMBUSTIBLE FLOOR PROTECTION DEPTH
#1	On floor level	Yes (1.00)	16" (406 mm)
#2	Raised base of less than 4"	Yes (1.00)	16" (406 mm)
#3	Raised base of 4" or more	No	16" (406 mm)

4.5.1 Option #1 - Floor Level Installation



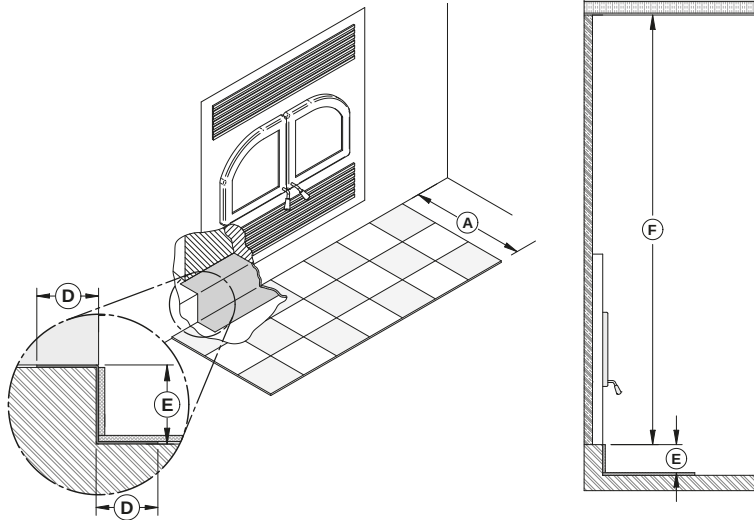
When the fireplace is installed directly on the floor, a non-combustible floor protection of at least 16" **(A)** with an R factor of 1.00 must be installed in front of the fireplace.

The joint between the floor protection and the fireplace must be protected over the entire width of the floor protection by a folded and continuous metal sheet **(D = min 2" [51 mm])** (not supplied).

A clearance of 80" (2.03 m) between the base of the fireplace and the ceiling must be respected.

The minimum floor height under the fireplace should match (or exceed) the height of non-combustible materials used for floor protection.

4.5.2 Option #2 - Raised Base Installation of Less Than 4"

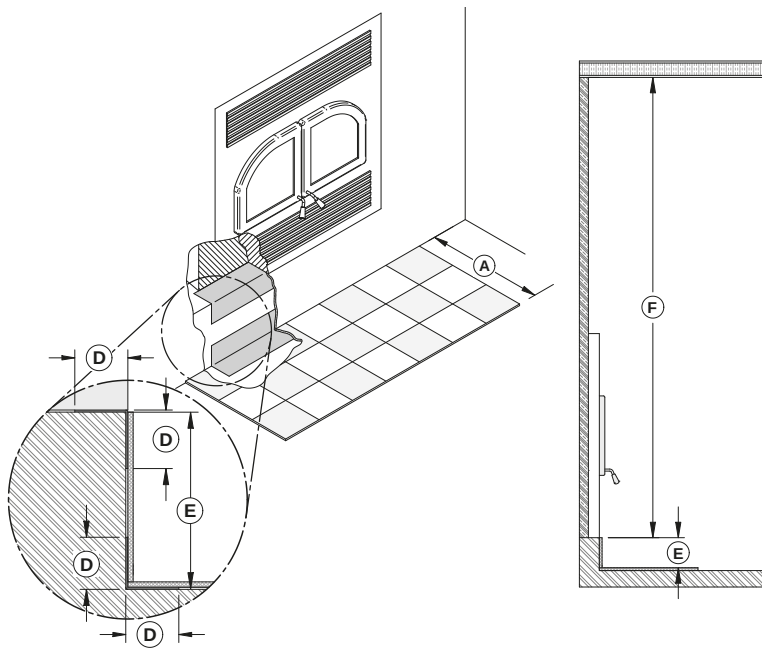


When the fireplace is installed on a raised base of less than 4" **(E)**, a non-combustible floor protection of at least 16" **(A)** with an R factor of 1.00 must be installed in front of the fireplace.

The joint between the floor protection and the fireplace must be protected over the entire width of the floor protection by a folded and continuous metal sheet **(D = min 2" [51 mm])** (not supplied). It is recommended to make the sheet metal in one piece.

*A clearance of 80" (2.03 m) **(F)** between the base of the fireplace and the ceiling must be respected.*

4.5.3 Option #3 - Raised Base Installation of 4" or More



When the fireplace is installed on a raised base of 4" or more **(E)**, a non-combustible floor protection of at least 16" **(A)** with no R factor must be installed in front of the fireplace.

The upper and lower angle, for the full width of the floor protection, must be protected by 2" horizontally and vertically by a folded and continuous metal sheet **(D = 2" [51 mm])** (not supplied). The sheet metal does not have to cover the rest of the wall between the base of the fireplace and the floor. *A clearance of 80" (2.03 m) **(F)** between the base of the fireplace and the ceiling must be respected.*

4.5.4 Floor Protection

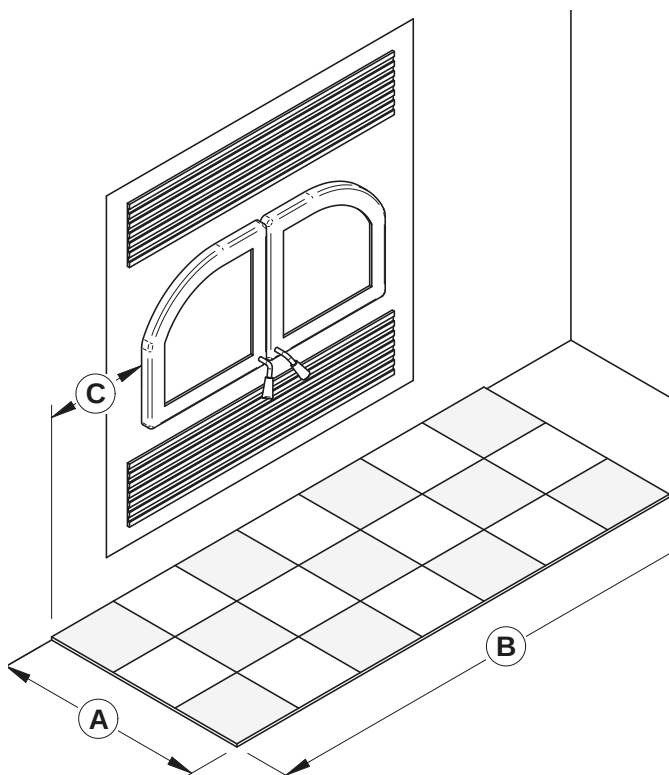
OPTION	INSTALLATION TYPE	R FACTOR REQUIRED	A	B	C
#1	On floor level	Yes (1.00)	16" (406 mm)	36 ¾" (933 mm)	8" (203 mm)
#2	Raised base of less than 4"	Yes (1.00)	16" (406 mm)	36 ¾" (933 mm)	8" (203 mm)
#3	Raised base of 4" or more	No	16" (406 mm)	36 ¾" (933 mm)	8" (203 mm)

ENGLISH

Regardless of the installation type, there must be at least 8" (203 mm) on each side of the fireplace door opening **(C)**.

Floor protection must be a continuous non-combustible surface such as ceramic, concrete board, brick or other equivalent material approved as floor protection. If the ceramic is used, it must be placed on a continuous non-combustible panel to prevent spills from being brought into contact with the floor through cracks or gaps in the ceramic slurry. Alternatives approved by the local building code may also be used.

Do not leave carpets under the floor protection.



4.5.5 R Factor

There are two ways to calculate the R-value of the floor protection. First, by adding the R-values of materials used, or by the conversion if the K factor and thickness of the floor protection are given.

To calculate the total R value from R values of the materials used, simply add the R-values of materials. If the result is equal to or greater than the R-value requirements, the combination is acceptable. R-values of some selected materials are shown below :

Table 3 : Thermal Characteristics of Common Floor Protection Materials¹⁸

MATERIAL	CONDUCTIVITY (K) PER INCH	RESISTANCE (R) PER INCH THICKNESS
Micore® 160	0.39	2.54
Micore® 300	0.49	2.06
Durock®	1.92	0.52
Hardibacker®	1.95	0.51
Hardibacker® 500	2.3	0.44
Wonderboard®	3.23	0.31
Cement mortar	5.00	0.2
Common brick	5.00	0.2
Face brick	9.00	0.11
Marble	14.3 – 20.00	0.07 – 0.05
Ceramic tile	12.5	0.008
Concrete	1.050	0.950
Mineral wool insulation	0.320	3.120
Limestone	6.5	0.153
Ceramic board (Fibremax)	0.450	2.2
Horizontal still air (1/8" [3 mm] thick)	0.135	0.920 ¹⁹

Example:

Required floor protection R of 1.00. Proposed materials: four inches of brick and one inch of Durock® board.

Four inches of brick ($R = 4 \times 0.2 = 0.8$) plus 1 inch of Durock® ($R = 1 \times 0.52 = 0.52$).
 $0.8 + 0.52 = 1.32$.

This R value is larger than the required 1.00 and is therefore acceptable.

In the case of a known K and thickness of alternative materials to be used in combination, convert all K values to R by dividing the thickness of each material by its K value. Add R values of the proposed materials as shown in the previous example.

Common brick K value = 5

Thickness = 4"

R value = Thickness/K = $4/5 = 0.8$

Durock K value = 1.92

Thickness = 1"

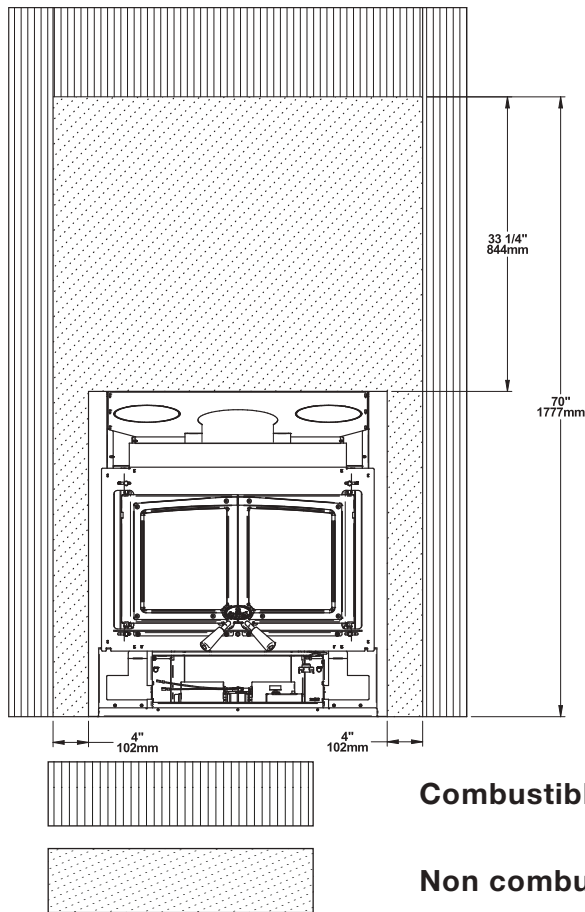
R value = Thickness/K = $1/1.92 = 0.52$

Total R value = $.8 + 0.52 = 1.32$

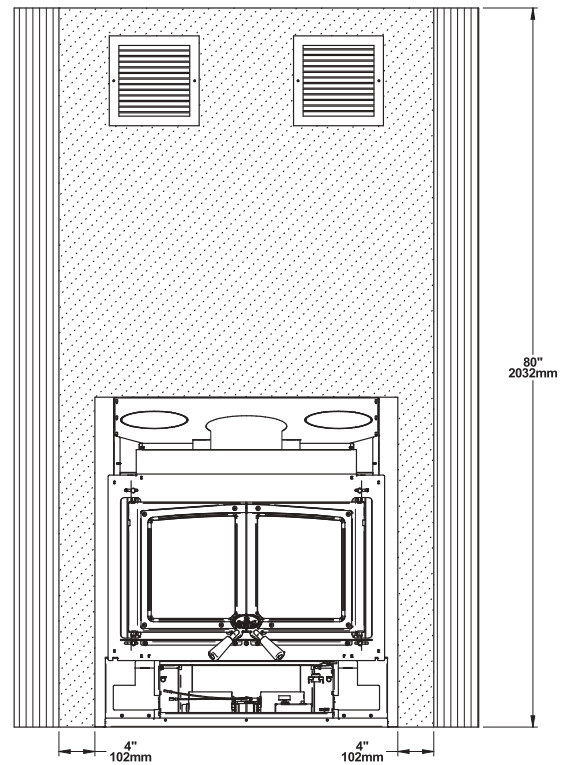
4.6 Facing

Non-combustible finishing materials such as brick or ceramic can be glued to the facade of the fireplace. Do not put a seal between the faceplate and the finishing material to facilitate the removal of the faceplate if necessary.

Unit without option



Unit with Hot air gravity kit



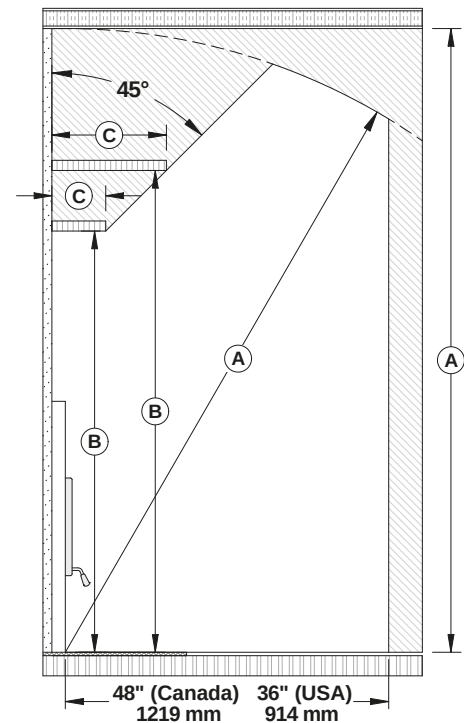
4.7 Shelf Installation

4.7.1 With the traditional faceplate (OA10619)

A **combustible** shelf with a depth of 6" (152 mm) **(C)** can be installed at least 48" (1219 mm) **(B)** from the base of the fireplace. Different shelf sizes are listed in the following table.

POSITIONING AND DEPTH OF THE SHELF	
B	C
48" (1,21 m)	6" (152 mm)
50" (1,27 m)	8" (203 mm)
52" (1,32 m)	10" (254 mm)
54" (1,37 m)	12" (305 mm)

For a shelf dimension that does not appear in the table, add 42" (1,07 m) to the depth of the shelf to find the safe position of the shelf. The height **(A)** should always be 80" (2.03 m) from the base of the fireplace.



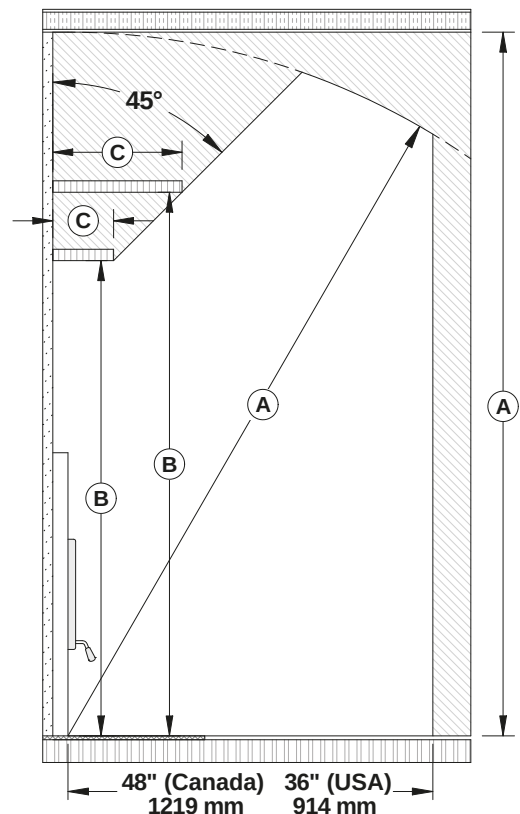
4.7.2 With the modern faceplate (OA10621)

A **non-combustible** shelf with a depth of 6" (152 mm) to 12" (305 mm) can be installed at least 48" (1219 mm) from the base of the fireplace.

In order to install a **combustible** shelf with a depth of 6" (152 mm) **(A)** at least 48" (1219 mm) from the base of the fireplace **(B)**, a metal **heat shield** must be installed 5" below the combustible shelf **(C)**. The depth **(D)** of the heat shield is equal to the depth of the combustible shelf minus one inch. Different shelf sizes are listed in the following table.

POSITIONING AND DEPTH OF THE SHELF	
B	A
48" (1,21 m)	6" (152 mm)
50" (1,27 m)	8" (203 mm)
52" (1,32 m)	10" (254 mm)
54" (1,37 m)	12" (305 mm)

For a shelf dimension that does not appear in the table, add 42" (1,07 m) to the depth of the shelf to find the safe position of the shelf. The height **(E)** should always be 80" (2.03 m) from the base of the fireplace.

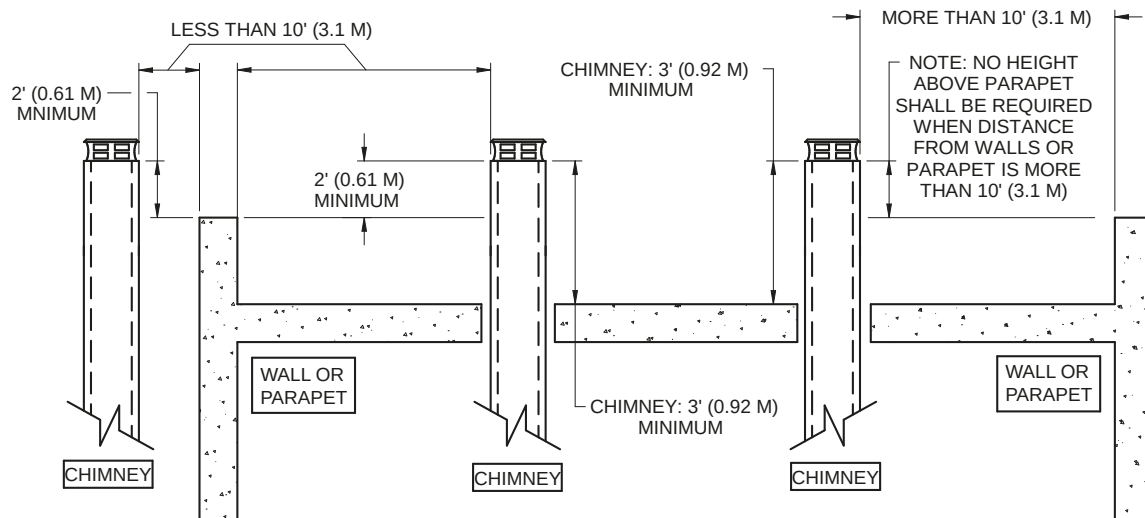
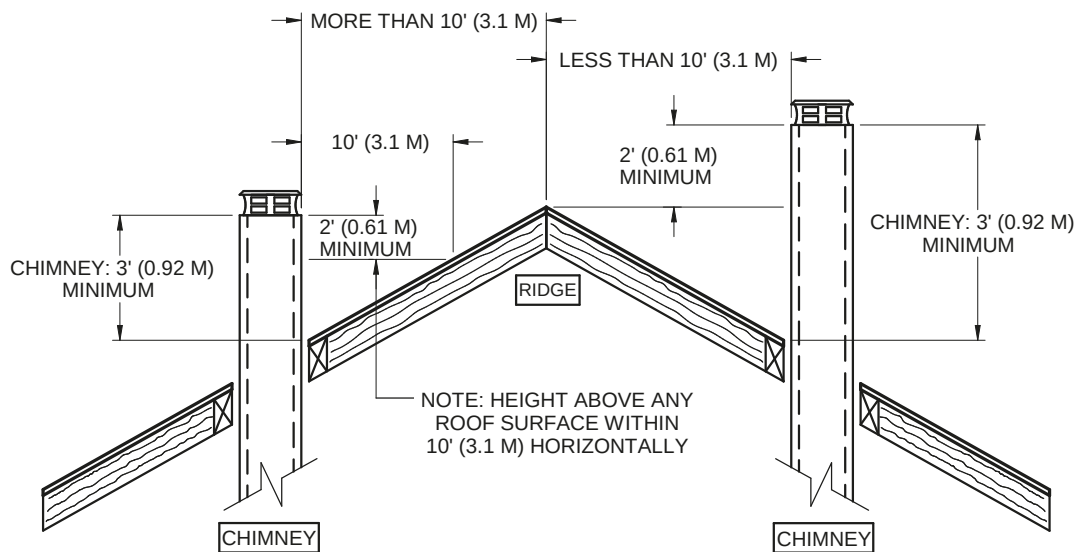


5. Chimney Installation

The chimney manufacturer's installation manual takes precedence over the following installation instructions. To ensure a safe installation, please refer to it. Some non-illustrated parts may be required.

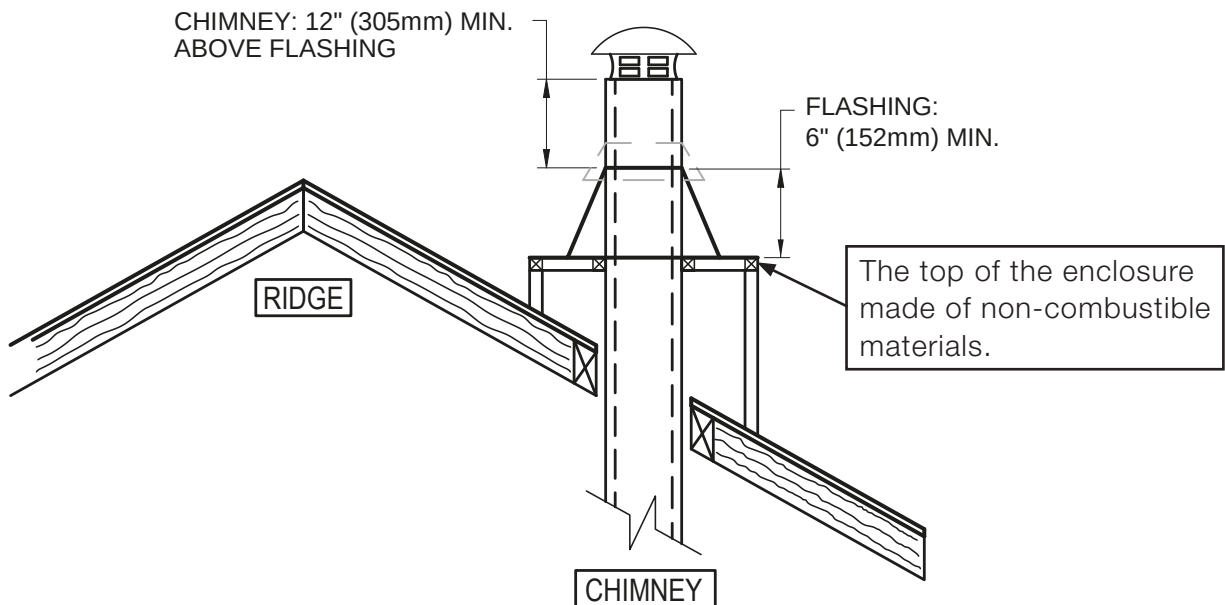
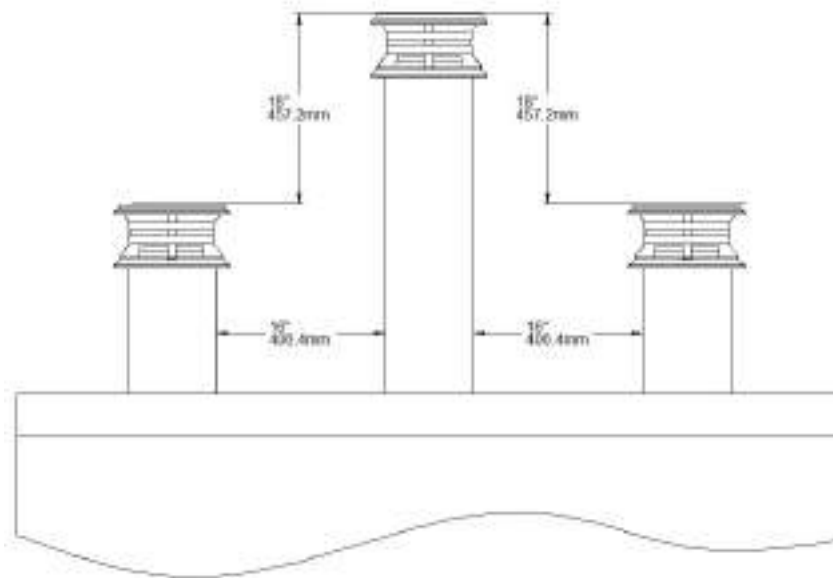
5.1 General Advices

- This wood burning fireplace has optimum performance and efficiency when connected to a **chimney** with a **6" (150 mm) diameter flue**, only the chimneys listed in the ["Table 1 : Approved Chimneys"](#), [page 19](#) can be used.
- To insure a good draft, it is recommended to have a length of 18" (457 mm) from the top of the unit to the first offset. However, starting using a 30° or 45° (Canada Only) elbow is also approved.
- **A CHIMNEY VENTING A FIREPLACE SHALL NOT VENT ANY OTHER APPLIANCE.**
- The **minimum height of the chimney** system is **15 feet (4.6 m)** from the base of the appliance to the chimney cap. If only the minimum height of the chimney system is installed, the operating conditions must be optimal (interior chimney, minimum height of 18" (457 mm) before any deviation, etc.).
- The **chimney** must have **at least one support**. The maximum chimney length that should be supported by the fireplace is 9 feet (2.75 m) for 2" Solid Pack chimney (5 cm) and 12 feet (3.7 m) for 1" Solid Pack chimney.
- The chimney must extend at least 3 ft. (92 cm) above its point of contact with the roof and at least 2 ft. (61 cm) higher than any wall, roof or building within 10 ft. (3.1 m) of it.
- **WARNING : IF THE CHIMNEY IS INSTALLED IN A CHASE, IT MUST EXCEED THE TOP OF IT BY AT LEAST 3 FEET (92 CM) IF IT'S MADE OF COMBUSTIBLE MATERIALS OR AT LEAST 1.5 FEET (46 CM) WHEN IT IS MADE OF NON-COMBUSTIBLE MATERIALS.**



- Avoid deviations as much as possible, especially the sharp ones. Each deviation adds restriction to the system and can lead to draft problems.
- If the chimney extends higher than 5 ft. (1.5 m) above its point of contact with the roof, it must be secured using a roof brace.
- A rain cap must be installed on top of the chimney.

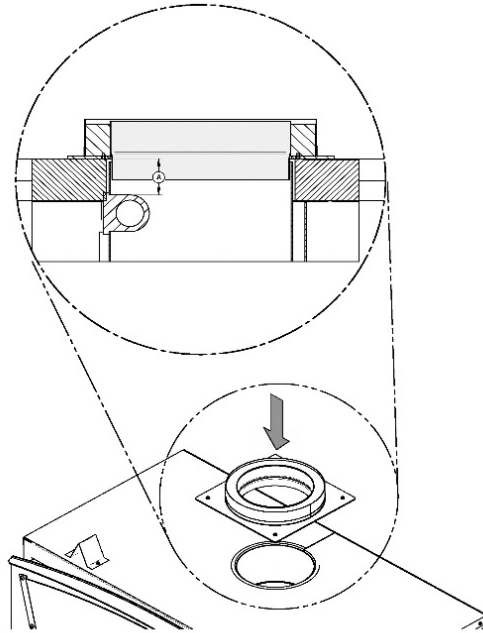
- For installations where more than one chimney is located in the same non-chase or within the same area, their terminations must be separated by at least 16" (410 mm) horizontally, and 18" (460 mm) vertically. This separation is to prevent smoke migrating from one chimney to another.



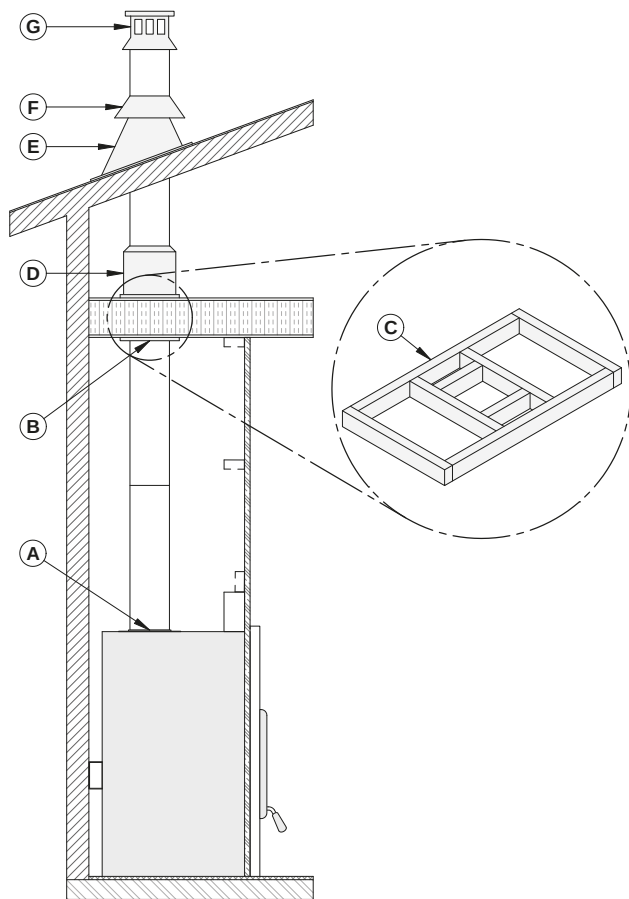
Note: The chimney chase on the roof must be the same size as the flashing.

- WARNING:** IF THE CHIMNEY IS INSTALLED IN AN ENCLOSURE ABOVE THE ROOF, IT MUST EXCEED THE TOP OF THE FLASHING CONE BY AT LEAST 12 INCHES (30 CM). THE FLASHING MUST HAVE A MINIMUM HEIGHT OF 6 INCHES (15.25CM). THE TOP OF THE ENCLOSURE MUST BE MADE OF NON-COMBUSTIBLE MATERIALS.

- A clearance of 2" (50 mm) between the chimney and any combustible material is required. This space must remain free, without insulation or other combustible material. The parts of the chimney that pass into inhabited spaces must be enclosed in an enclosure.
- In all cases, the chimney must start with a 6" diameter anchor plate attached to the fireplace.
- If the male anchor plate nozzle exceeds 2" (50 mm) in length **(A)**, it must be cut above the lifting hooks welded inside the flue outlet so that it is sitting perfectly on the top of the fireplace.



5.2 Ceiling Supported Installation



A : Anchor plate

B: Ceiling support

C: Framing opening

D: Attic insulation shield

E: Roof flashing

F: Storm collar

G: Chimney cap

1. Cut and frame square openings **(C)** in the ceiling, floor and roof where the chimney will pass. A 2" clearance must be maintained between the chimney and any combustible materials. The 2" space must remain empty, without insulation or any other combustible material. The size of the floor and ceiling holes must be in accordance with the chimney manufacturer's instructions.
2. From underneath the ceiling, install a ceiling support **(B)** in each floor where the chimney will pass. In the attic, install an attic radiation shield from above **(D)**.
3. Install an anchor plate **(A)** and a first chimney section on the fireplace. Install the number of chimney sections needed, making sure to lock each section in place.
4. When the desired height of the chimney is reached, install a roof support (not shown).
5. Put the roof flashing **(E)** in place and seal the joint between the roof and the flashing with roof sealant. For sloping roofs, place the flashing under the upper shingles and on top of the lower shingles. Nail the flashing to the roof, using roofing nails.

When a ventilated roof flashing is installed, precautions are to be taken not to caulk or seal the ventilating openings.

6. Place the storm collar **(F)** on the roof flashing and tighten it with the bolt. Seal the joint between the storm collar and the chimney, using silicone sealant.
7. Install the chimney cap **(G)**.

5.3 Offset Installation

1. Follow the instructions for a ceiling supported installation until the first elbow.
2. Install and turn the elbow in the right direction. Attach to the chimney using three ½" (12 mm) metal screws.
3. Install the appropriate number of chimney sections to obtain the necessary deviation. Secure the chimney sections together with three ½" (12 mm) screws. If the offset section has two or more chimney sections, a bracket must be installed. If the chimney go through a wall, install a wall thimble.
4. Install another elbow to bring the chimney back in a vertical position.
5. Continue the installation following the instructions of the ceiling supported installation.

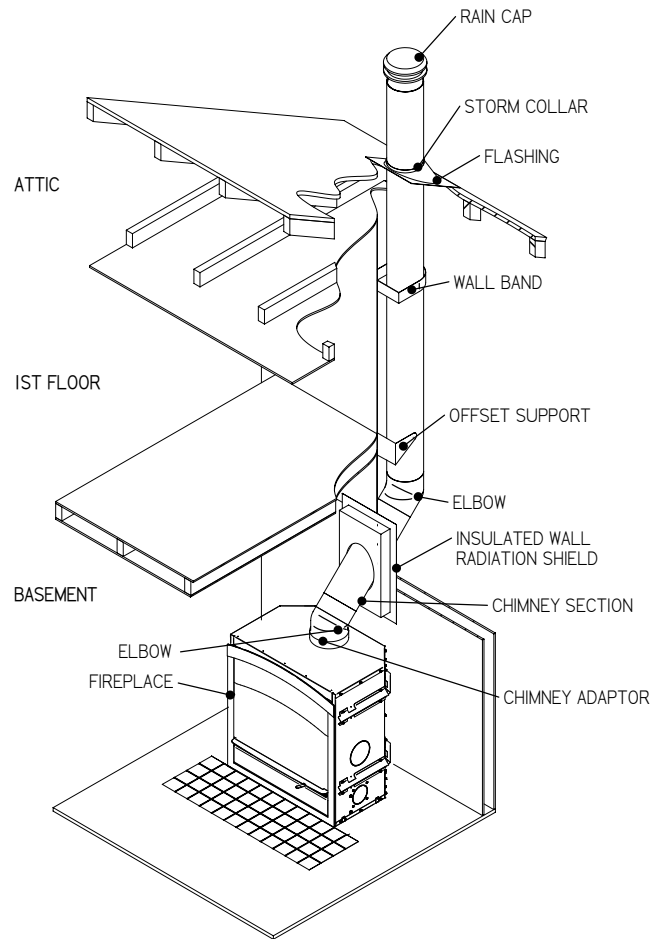


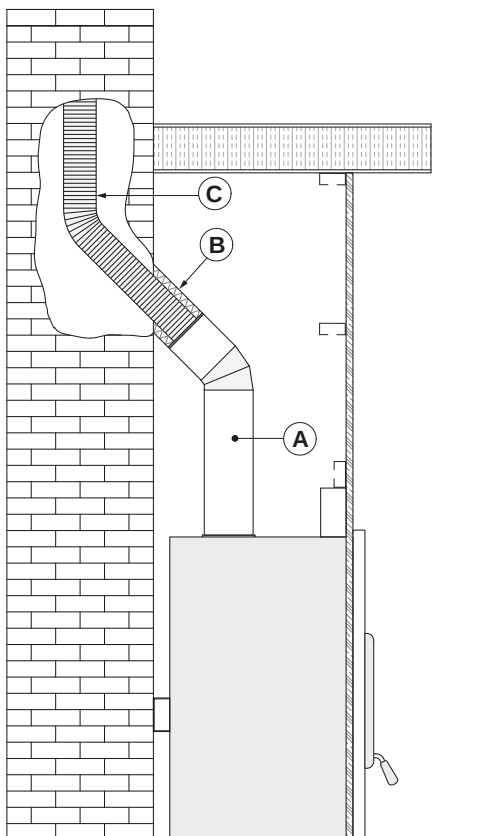
Table 4 : Minimum system height when using elbows

Chimney model	Please consult the specification manual for your fireplace
Vertical Installation	15 ft (4,6 m)
Two (2) elbows	15 ft (4,6 m)
Four (4) elbows	17 ft (5,2 m)

5.4 Masonry Chimney Installation

The masonry chimney must meet the minimum requirements of the local building code or equivalent for a safe installation. Contact a building inspector to learn about the requirements in the area.

Before starting the installation, the masonry chimney should be inspected for cracks, crumbling mortar, creosote layers, obstructions or other signs of deterioration. If signs of deterioration are noted, the chimney should be repaired and cleaned before installation.



1. Position the fireplace in its location. Temporarily install the elbow or chimney section **(A)** on the top of the fireplace and, using a level, mark with an oval the location where the flue liner will enter the masonry chimney.
2. Mark where the flue will pass through the masonry chimney. Drill a hole in the masonry chimney to insert an insulated liner adapter **(B)**.
3. Lower the liner **(C)** into the chimney to the level of the hole.
4. Slide an insulated 45° or 30° liner adapter and connect it to the liner.
5. Seal the opening around the liner with high temperature refractory cement.
6. Then, follow the chimney manufacturer's instructions to connect the extended liner section to the special chimney connector.

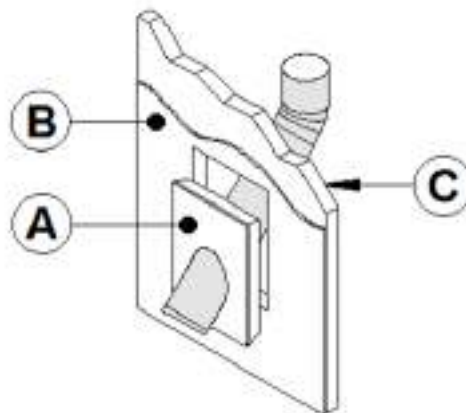
The liner must extend at least 12" (30 cm) above the masonry chimney.

5.5 Angled Wall Pass-Thru Installation

When passing through a combustible wall with the chimney at a 30° or 45° angle (Canada only), an angled wall pass-thru must be installed. Follow the chimney manufacturer's installation instructions.

In cold climate locations, it is recommended to use the insulated wall pass-thru to maintain the home's thermal barrier.

A	Wall pass-thru
B	Interior wall
C	Exterior wall



5.6 Chimney Support Installation

5.6.1 Roof Support

The universal roof support can be used on:

- a roof to support the chimney;
- a floor, ceiling, or roof over an offset to support the chimney or;
- as additional support.



Always follow the manufacturer's instructions for the maximum chimney height that can be supported by the support.

5.6.2 Offset Support

This support is used above a chimney offset. When the offset of the chimney pass through a wall, this support can be installed on the wall to support the chimney.



6. INSTALLATION OF OPTIONS ON YOUR PRODUCT

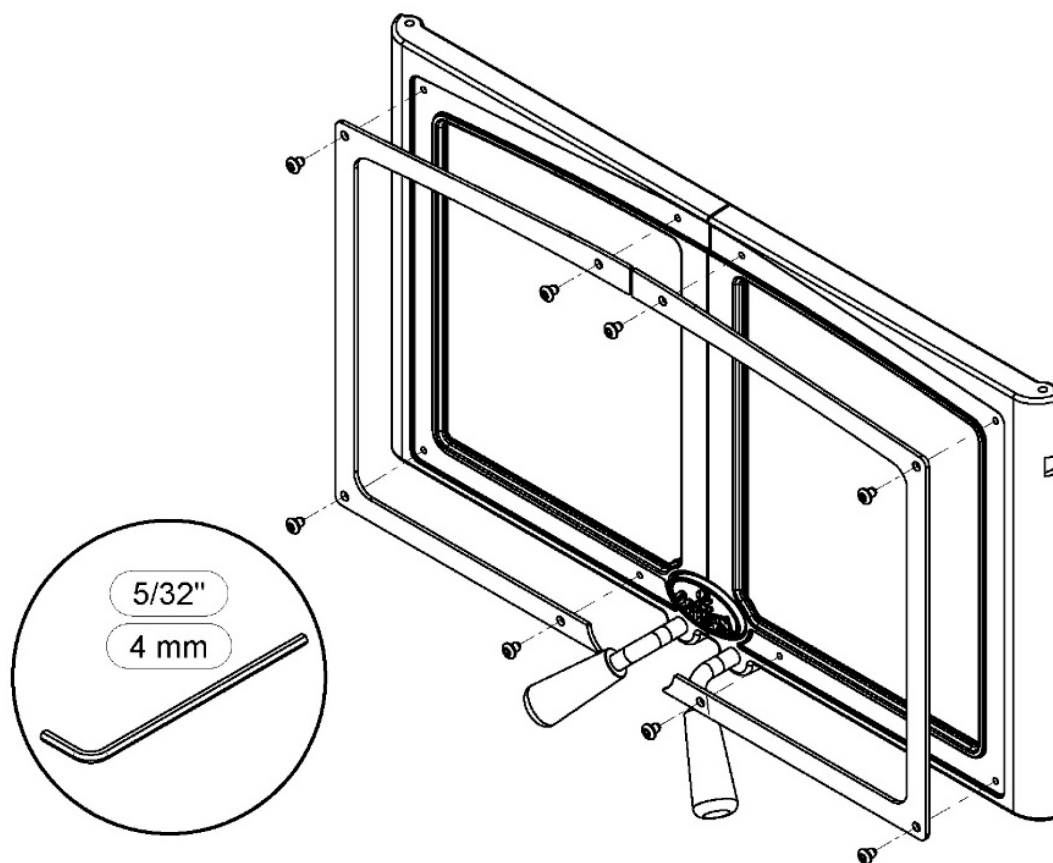
6.1 Door Overlay Installation

In order to complete the assembly of your Everest II wood fireplace, you need to install the door overlay. See figure below for installation instructions:

Position the overlays on the door frames and secure them from the inside of the doors using the 8 included screws.

To facilitate the installation, do not tighten the screws until they are all installed.

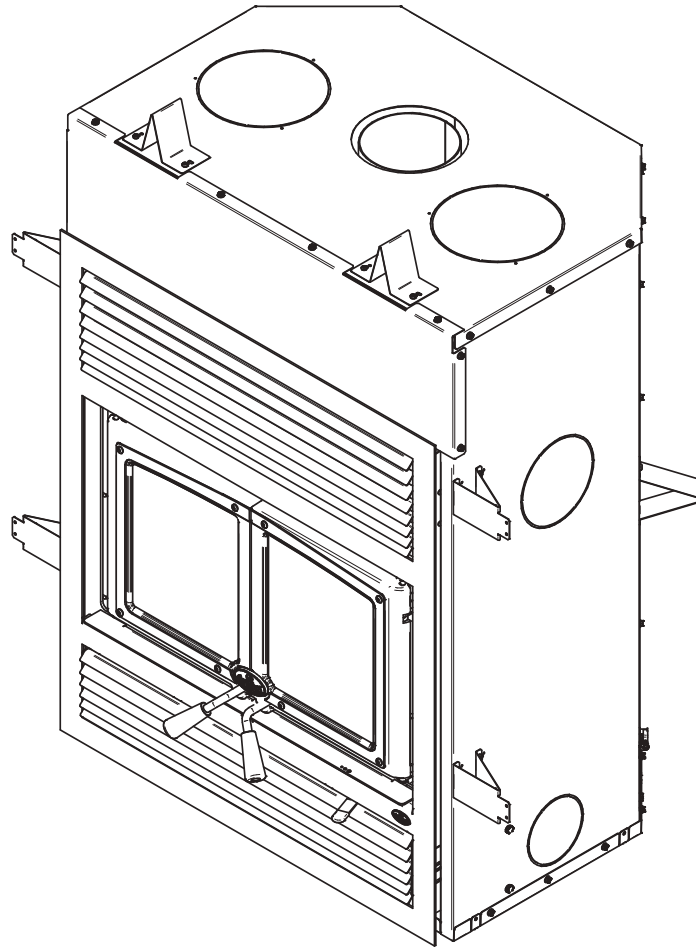
Note: It is not necessary to remove the glass or any other component to install the overlay.



6.2 Faceplate and Louvers installation

A faceplate must be installed on this fireplace.

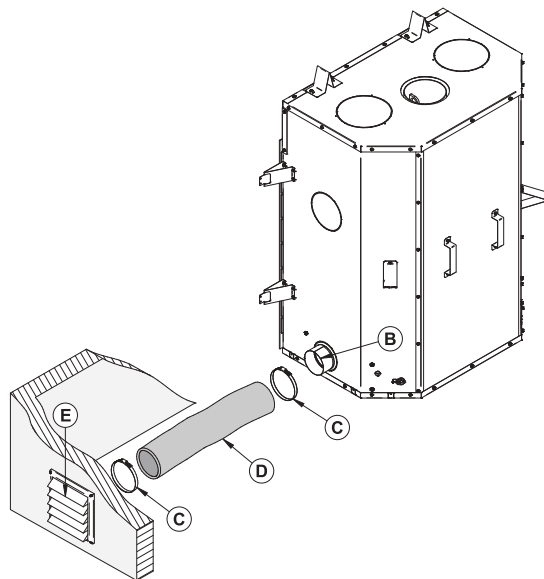
See the faceplate installation manual for more details.



6.3 Optional Fresh Air Kit Intake Installation

Follow the instructions below for connecting the fireplace to a fresh air intake:

- The insulated flexible pipe **(D)** should be of sufficient length (at least 10') and of a configuration to prevent condensation.
- The outside wall register **(E)** must not be installed:
 - More than 50% of the total height of the chimney;
 - At more than 10' (3 m) above the base of the fireplace;
 - More than 3' (0.9 m) below the base of the fireplace.
- The fresh air must come from outside the house. The air intake should not take air in the attic, basement or garage.
- The duct and the air intake can be installed above or below the floor level.
- The air intake should be installed high enough not to be obstructed by snow. It should be protected from the wind, away from automobile exhaust, a gas meter or other air inlets or outlets.



The following items are included with the fireplace:

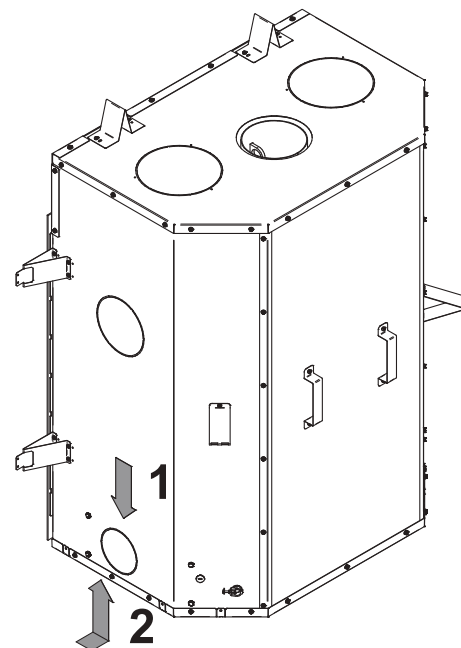
- One (1) 4" (76 mm) adapter **(B)**;
- One (1) air intake plate;
- Four (4) screws.

The following items are not included:

- The outside wall register **(E)**;
- The two (2) adjustable collars **(C)**;
- Insulated duct length 4" **(D)**. (Duct must be HVAC type and must comply with ULC S110 or UL 181, Class 0 or Class 1 and must withstand temperatures up to 250° F).

Note: Only remove the knockout that will be used to connect the fresh air intake assembly.

The fresh air intake can be installed in two different locations on the fireplace. On the right side **(1)** of the fireplace (the most common) or on the right side under the fireplace **(2)**.

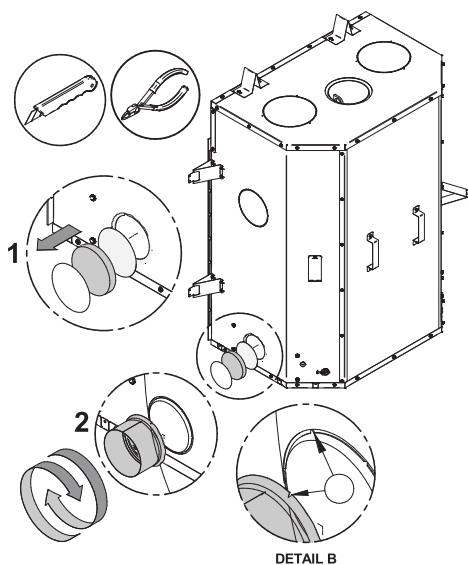


Installation

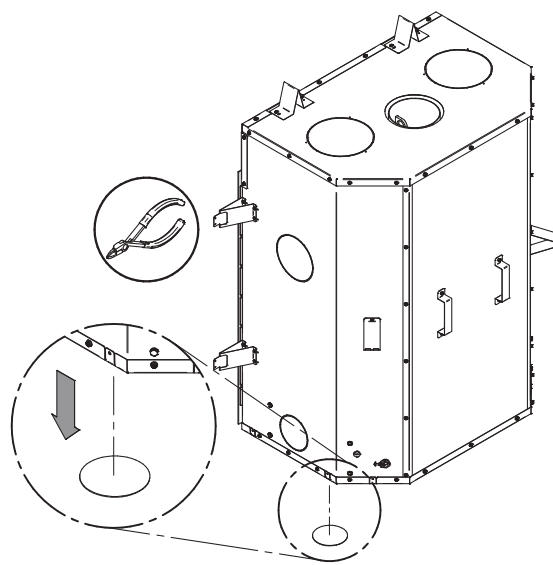


It is strongly recommended to wear gloves to complete the installation.

1. To use the air intake on the right side, remove the knockout by cutting the micro-joints. Cut and remove the insulation and the other knockout inside the fireplace **(1)**. To use the opening under the fireplace, only cut the knockout.
2. Install the adapter included in the fireplace **(2)** and align the notch of the adapter **(T)** with the one on the fireplace. Turn the adapter clockwise.



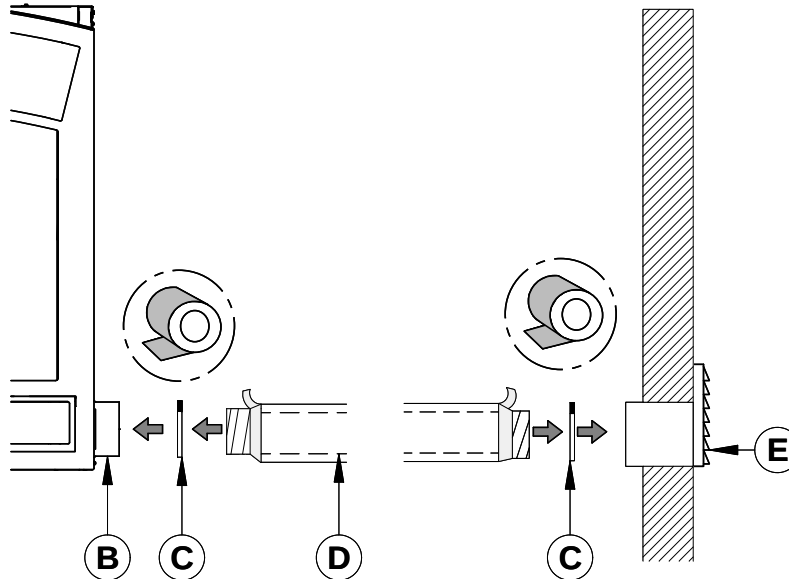
Fresh air intake on the right side



Fresh air intake underneath

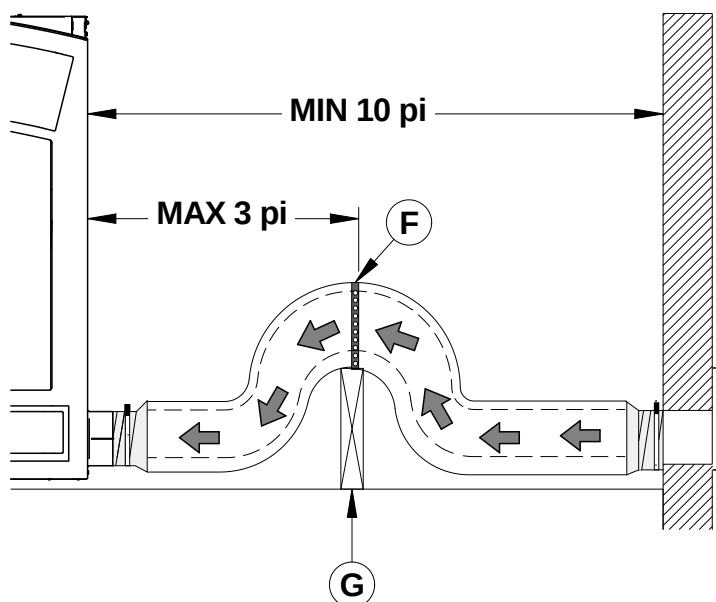
3. Install the flexible duct **(D)** on the fresh-air inlet adapter **(B)** using one hose clamp **(C)**. Fix the other end to the outer wall register **(E)** using the second hose clamp **(C)**. The outer wall register **(E)** must be installed outside the house.

To properly install the flexible duct, gently remove the insulation and plastic wrap to expose the duct. Fix the duct using clamps. Stick aluminum tape around the joint between the duct and adapter to make the connection airtight. Carefully replace the insulation and plastic wrap on the duct. Secure the plastic with aluminum tape.



4. To complete the installation, make a hole of $\frac{1}{4}$ " to $\frac{1}{2}$ " (6 mm to 13 mm) bigger than the duct diameter on the outside wall of the house at the chosen location. From outside, place the outside wall register in the hole (open side down) and fasten the register to the wall, with screws.

Use the required length for the installation while respecting the maximum length of 30' (9 m). To avoid condensation, it is recommended to use an insulated duct long enough and containing a «P-Trap» loop. This configuration can be done inside the chase, but must at all times maintain clearances to combustibles.



It is strongly recommended to install a mechanical shutter that closes the outside air inlet when the fireplace is not in use.

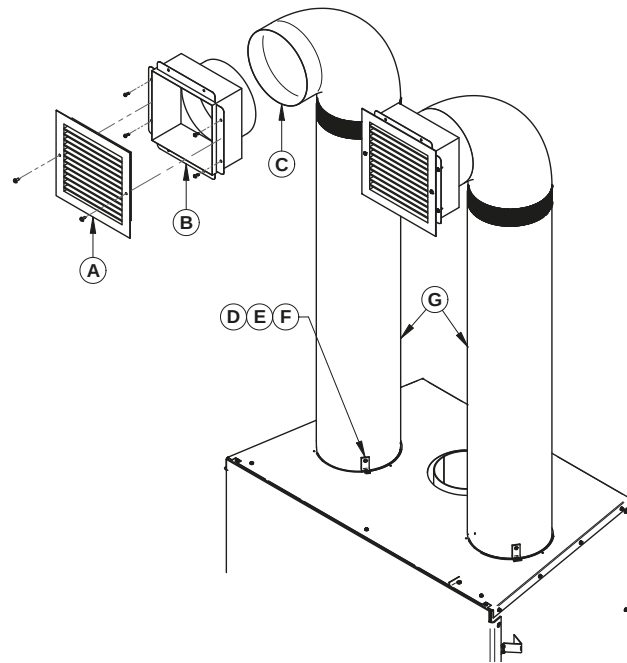
6.4 Optional Traditional Gravity Hot Air Distribution Kit Installation

The kit includes:

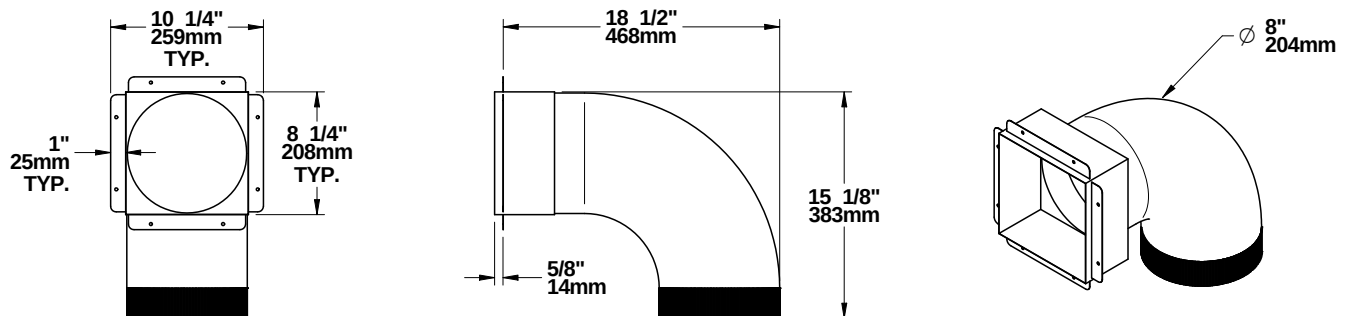
- 2 hot air outlets (grilles **(A)** and frames **(B)**);
- 2 90° elbows **(C)**;
- 6 steel brackets **(D)** with fastening screws **(E)** and self-tapping screws **(F)**

Parts not included in the kit:

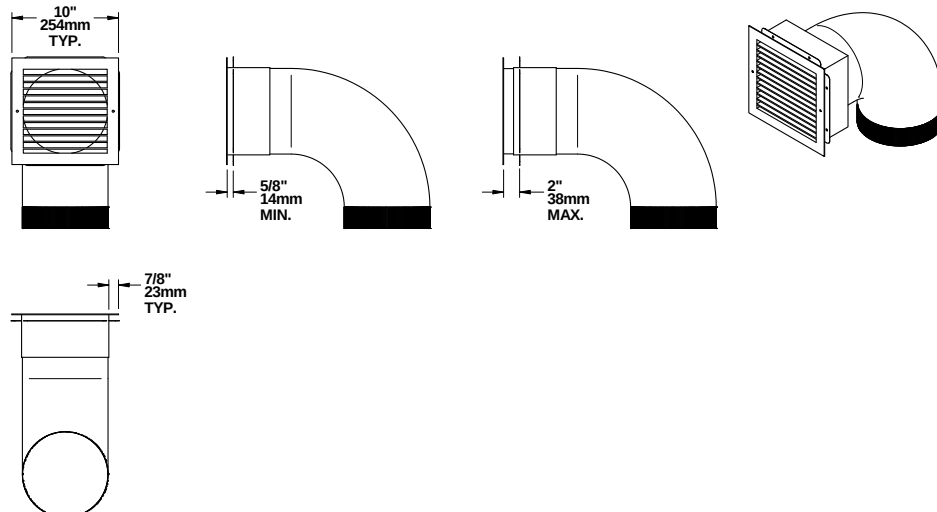
- 8" rigid ducting **(G)**, 26 ga, galvanized steel.



Dimensions of hot air outlet frame with elbow



Dimensions of hot air outlet decorative grille with elbow

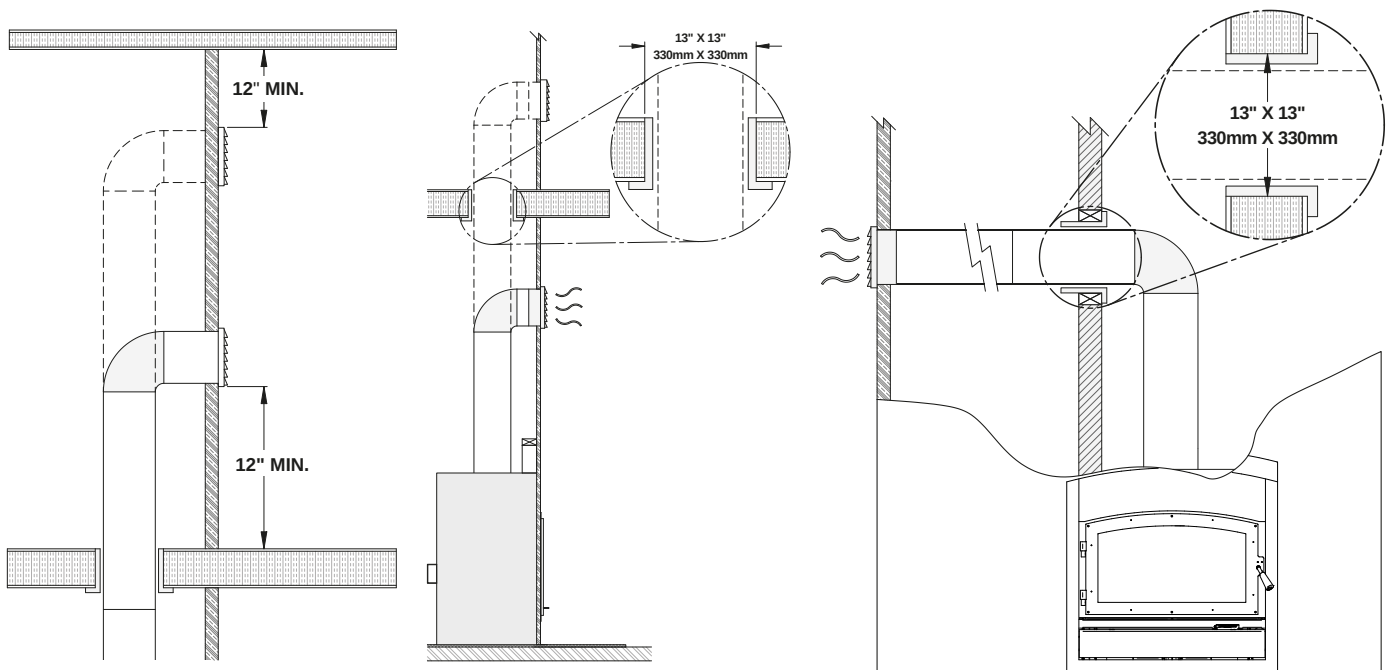


Installation rules and advice

- The minimum height of the hot air duct is 68" (1.7 m). It must be measured from the base of the fireplace to the top of the hot air outlets.
- Do not connect the hot air ducts to a central heating system. The malfunction of the heating system would overheat the fireplace.
- Do not use insulated flexible ducts as they may overheat.
- Do not use «T» fittings or anything other than those listed below.
- All ducts must be placed vertically or horizontally. **Never route the ducting downwards.**
- The flaps of the hot air outlet grilles must point down to prevent overheating of the adjacent ceilings.
- Always install both hot air outlet grilles when the hot air gravity kit is installed.
- The hot air outlets can be installed in the same room as the fireplace, or both can be installed in adjacent rooms or upstairs. If the outlets are installed at different heights, the higher outlet will draw more heat.
- When forced air kit is installed in conjunction with a gravity kit, the forced air device will draw some of the air from the gravity kit ducting, therefore reducing its efficiency.

Clearances

- Maximum length of pipes, including elbows: 10' (3 m)
- The maximum number of elbows allowed per duct is two.
- There shall be a clearance of at least 12" (305 mm) between the hot air outlet frame and a ceiling, side wall or mantle made of flammable material.
- When the duct passes through a wall or floor made of flammable material, a firestop radiation shield (same as the one used for a class A chimney) must be installed in the opening of the wall or floor. There must be a clearance of at least 2" (50 mm) between the ducts and the firestop.

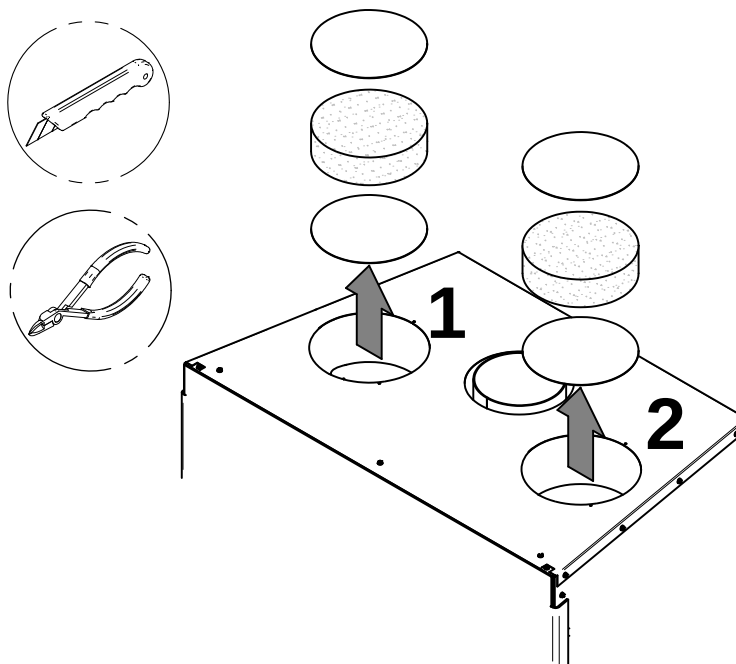


Installation

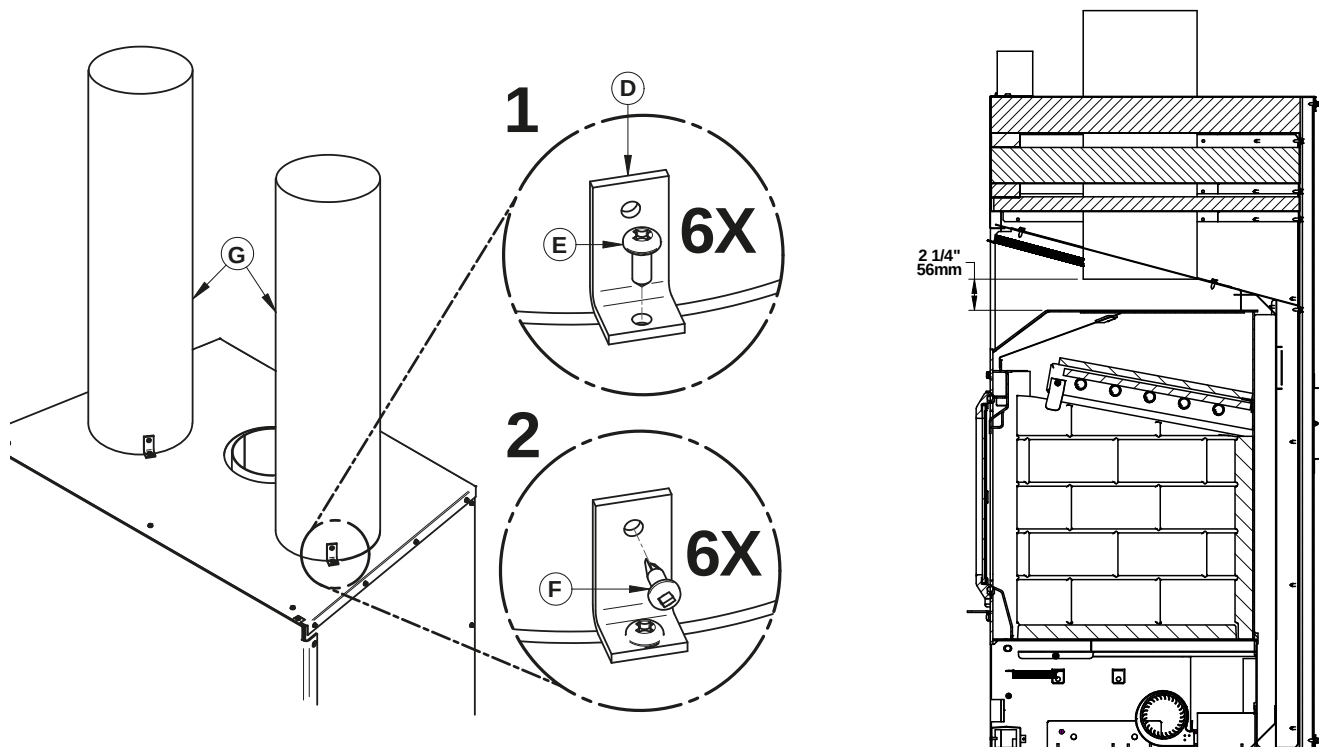


It is strongly recommended to wear gloves to complete the installation.

- A) Remove the knockout that close the 8" (20 cm) diameter holes on top of the fireplace. Then cut and remove the insulation and the other set of knockout inside the fireplace.



- B) Screw 6 steel brackets **(D)** with 6 screws **(E)** onto the top of the fireplace (3 per duct). Insert the ducts **(G)** (not supplied) into each opening. Position the ducts as shown in the section view below, for optimal heat capture. Screw each duct in place in the brackets **(D)** with 6 self-drilling screws **(F)**.

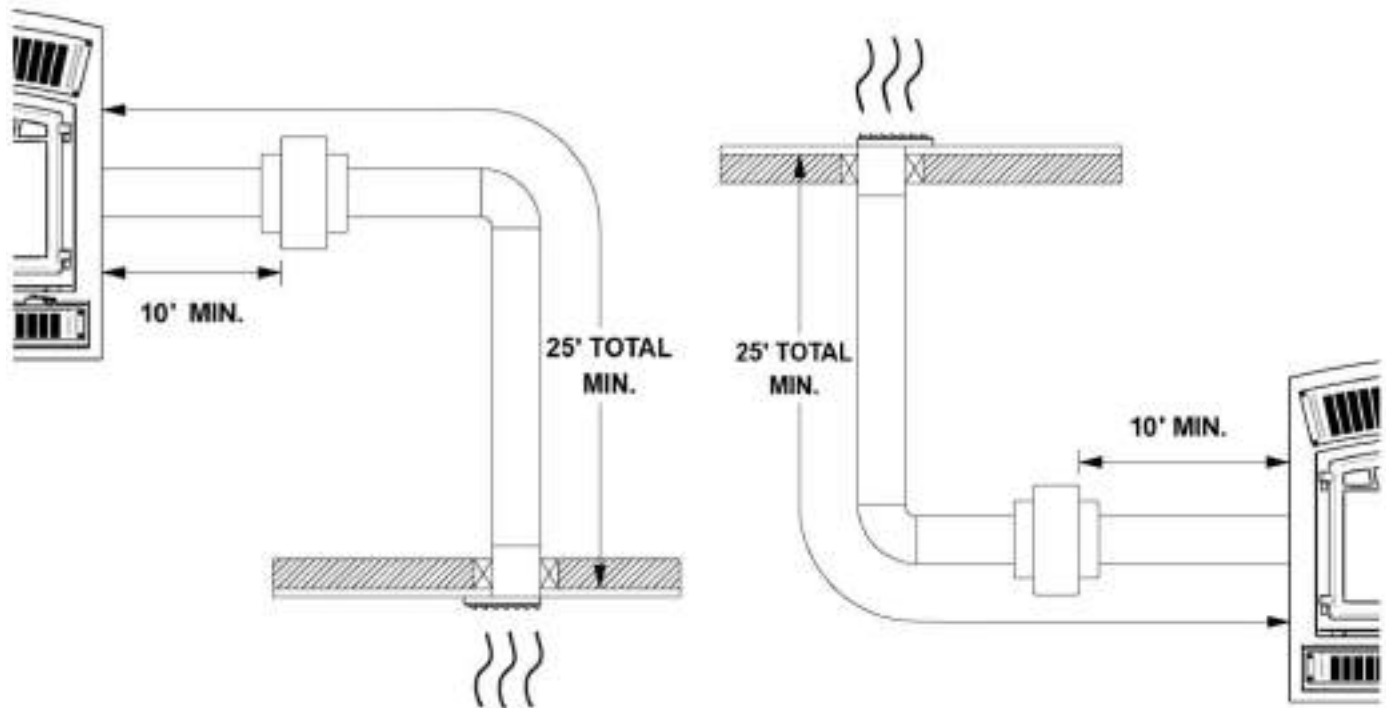


6.5 Optional Forced Air Distribution Kit Installation

It is possible to connect a forced air kit on the back or on either side of the Everest II. This kit allows distributing heat to another room up to 50 feet (15 m) of the fireplace. The insulated flexible pipe (not included in the kit) must be HVAC type pipe and must comply with ULC S110 and/or UL 181, Class 0 or Class 1 Standards and must withstand temperatures up to 250 °F.

For the complete installation procedure, see the installation manual provided with the kit. You can also download this manual at www.osburn-mfg.com.

ENGLISH



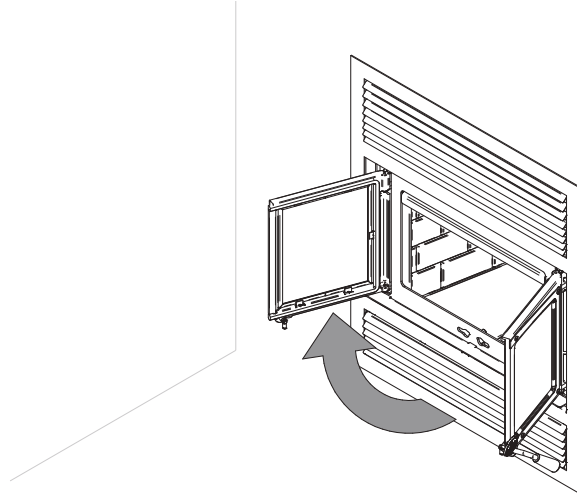
*The EPA standard states that it is necessary to perform certification testing with any ventilation that is likely to alter the units' performance. For this reason, SBI has tested the effects of the forced air kit on the emissions of fine particles. Due to the design of our appliance and more specifically to the temperature sensor that is installed to control stops and starts, the forced air kit does not affect the emission results. In fact, this option promotes the recovery of excess heat to later redistribute it to other rooms. During our testing, it was noted that the convection blowers underneath the firebox had more of an effect on the fine particles emission due to the air being directed onto the firebox thus cooling the unit. However, this appliance has already been tested for emission

6.6 Optional Fire Screen Installation

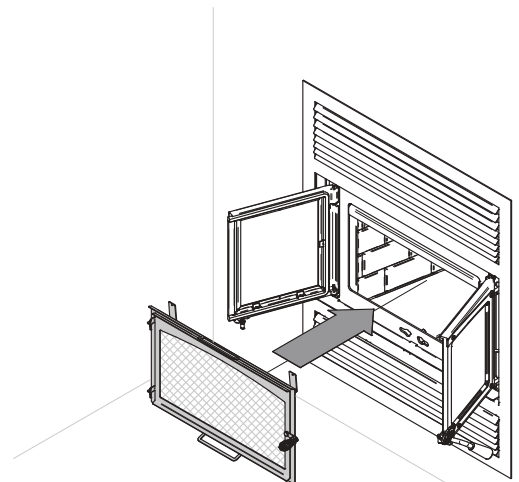
A firescreen door can be installed on the fireplace. For more details, refer to the installation manual supplied with the firescreen.

Warning: Never leave the fireplace unattended while in use with the firescreen.

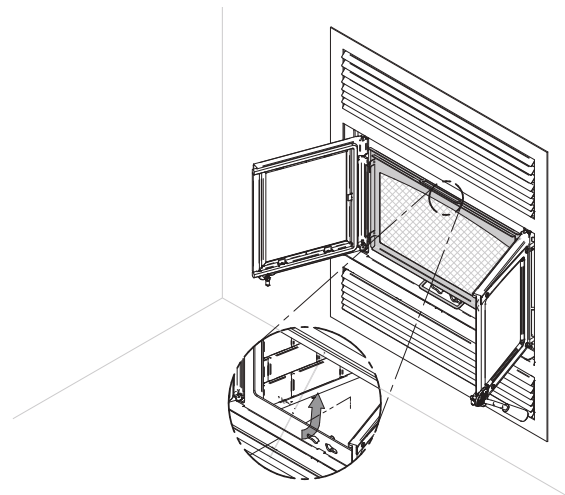
1. Open the doors.



2. Hold the firescreen and bring it close to the door opening.



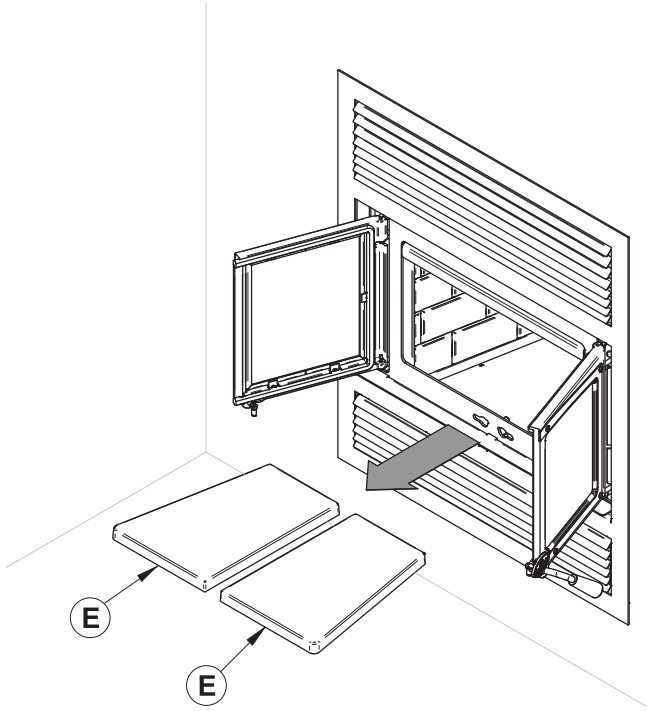
3. Lean the upper part of the firescreen against the top door opening making sure to insert the top firescreen bracket behind the primary air deflector.
4. Lift the firescreen upwards and push the bottom part towards the fireplace then let the firescreen rest on the bottom of the door opening.



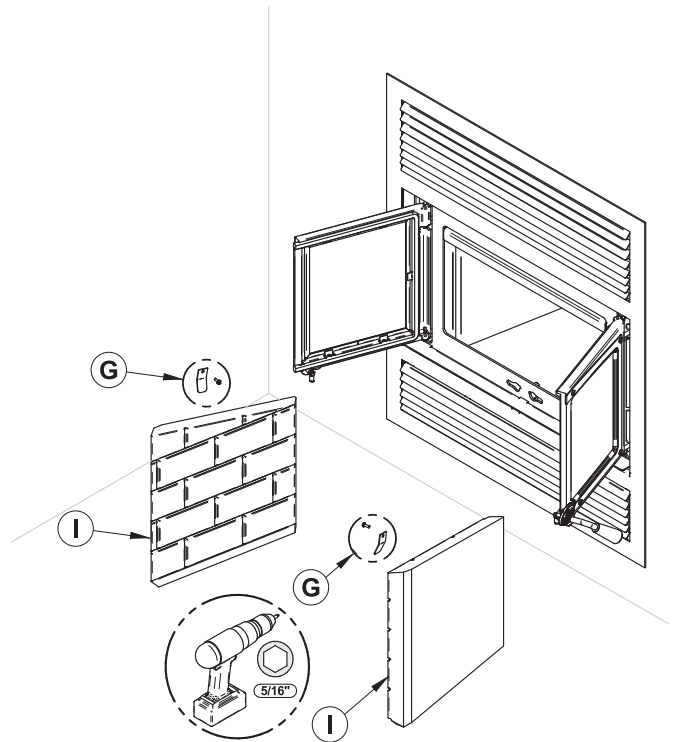
7. REPLACEMENT OF PARTS ON YOUR PRODUCT

7.1 Refractory Panels Replacement

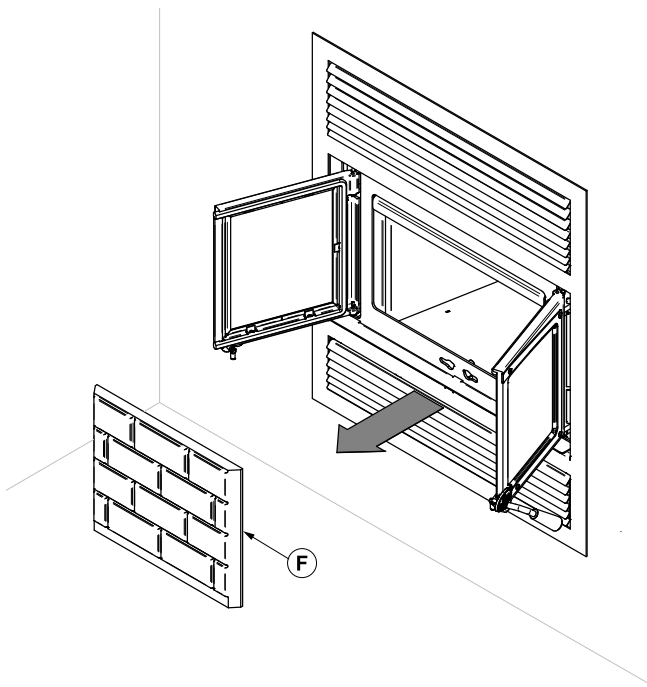
1. Remove the floor refractory panels **(E)**.



2. Using a power driver, remove the refractory panel brackets **(G)** and the side refractory panels **(I)**.

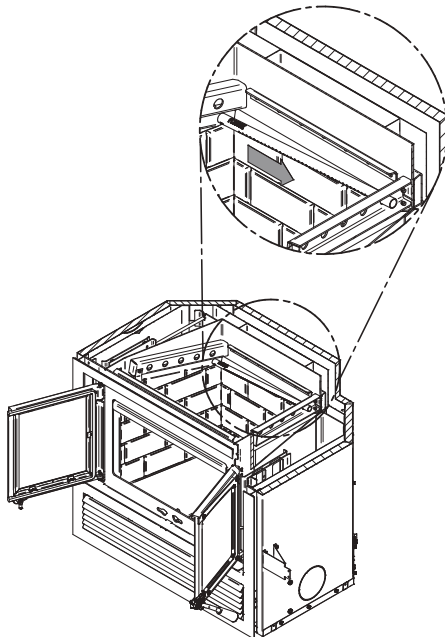
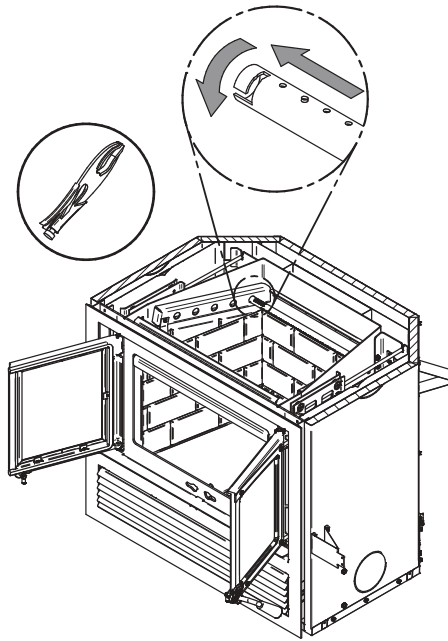


3. Remove the back refractory panel **(F)**.



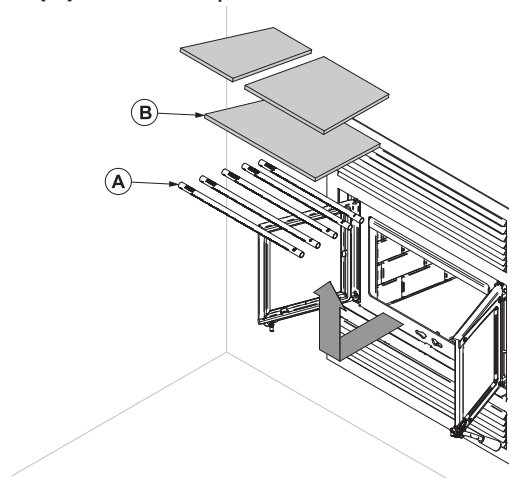
7.2 Secondary Air Tubes and Baffle Installation

1. Starting with the rear tube, lean and insert the right end of the secondary air tube into the rear right channel hole. Then lift and insert the left end of the tube into the rear left channel.



2. Align the notch in the left end of the tube with the key of the left air channel hole. Using a «Wise grip» hold the tube and lock it in place by turning the tube as shown. Make sure the notch reaches the end of the key way.
3. Repeat for center back tube.
4. Put the baffle in place.
5. Repeat steps 1 and 2 for the two front tubes.
6. To remove the tubes use the above steps in reverse order.

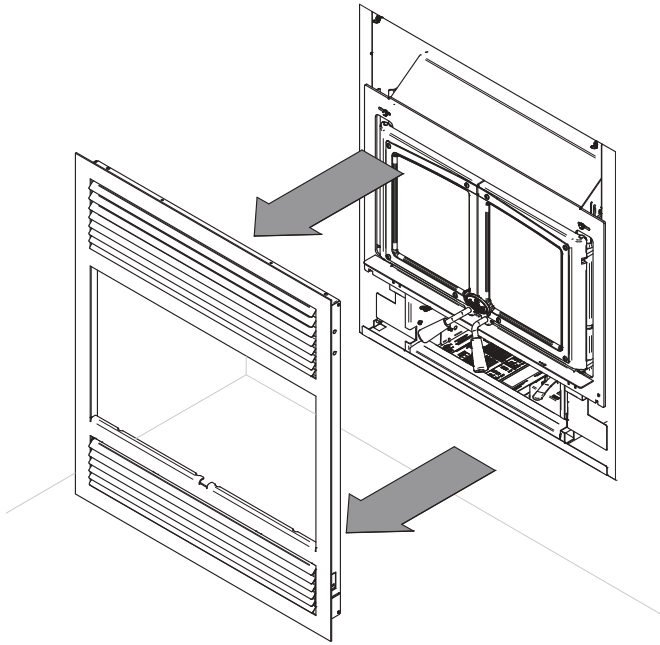
Note that secondary air tubes (A) can be replaced without removing the baffle board (B).



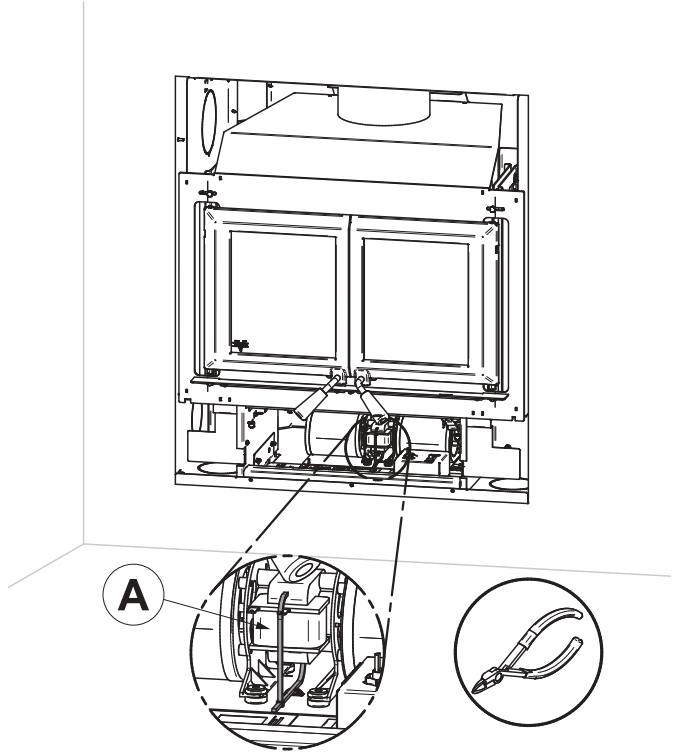
7.3 Blower replacement

To facilitate the blower replacement, it is recommended to remove the faceplate first. Refer to the faceplate installation manual for more details.

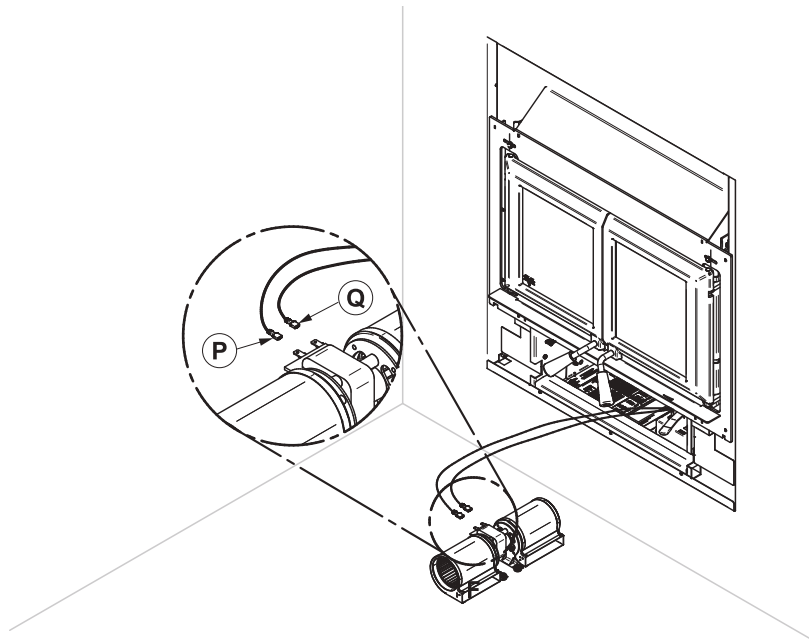
1. Take off the faceplate



2. Cut the ty-rop. Lift the blower **(A)** located under the firebox towards the back. Turn 90° to pull out.



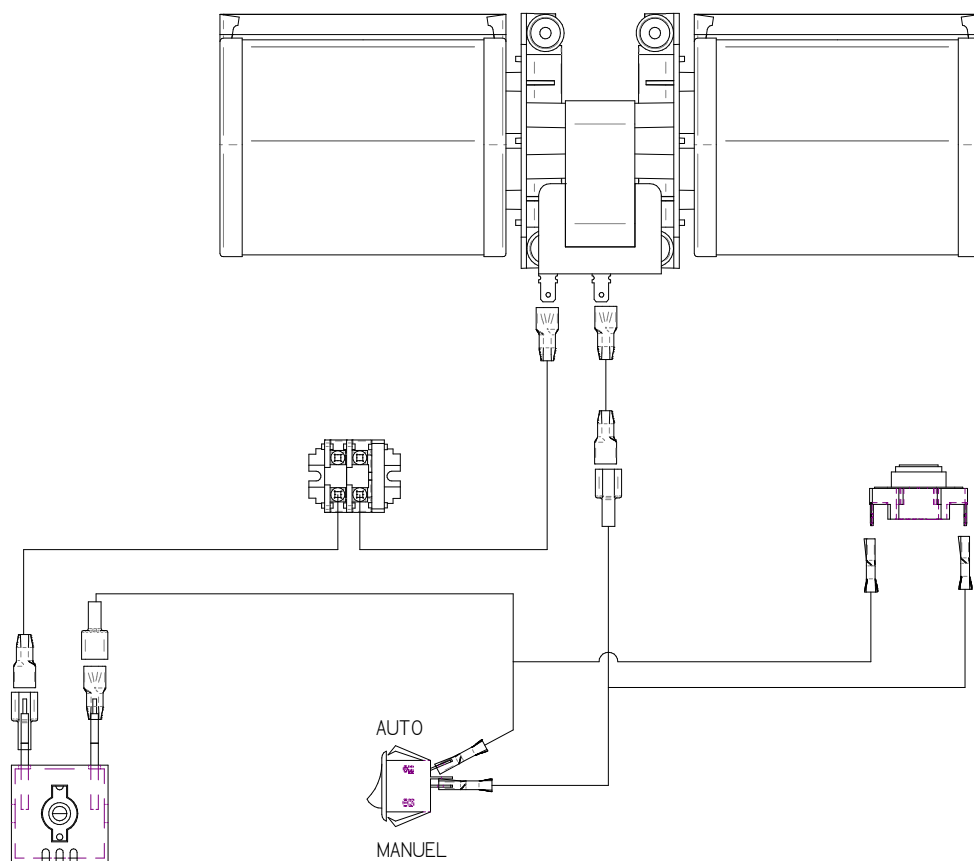
3. Unplug the wires and unplug the blower's electric wires **(P)** and **(Q)**.



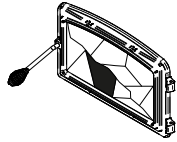
4. Repeat the steps in reverse order to reinstall the blower.

Blower Connection

The wiring should be done by a qualified electrician. Connect the wires from the power outlet to the terminal block, making sure that the white wire matches the white wire on the terminal. Connect the black wire with the black wire of the terminal block. The ground (green or skinned wire) must be attached to the fireplace metal frame.



7.4 Glass Door



Do not clean the glass when the fireplace is hot.
Do not abuse the glass door by striking or slamming shut.
Do not use the fireplace if the glass is broken.

7.4.1 Replacement

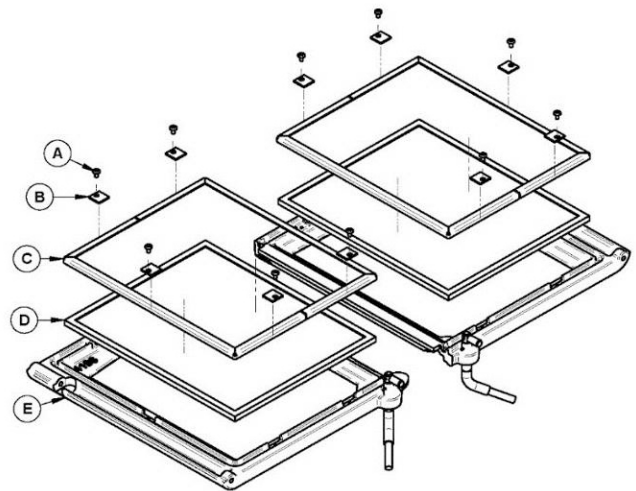
The glass used is a ceramic glass, 5/32" (4 mm) thick, 12 1/2" x 11 1/8" (319 mm x 283 mm) tested to reach temperatures up to 1400° F. If the glass breaks, it must be replaced by a ceramic glass from SCHOTT with the same specification. **Tempered glass or ordinary glass will not withstand the high temperatures of this unit.**

WARNING: DO NOT USE SUBSTITUTE MATERIALS WHEN REPLACING THE GLASS.

To replace the glass, use the following procedure;

Remove the glass retaining screws **(A)** and clips **(B)** then the metal frames **(C)** that hold the glass **(D)** to the door frame **(E)**. Lift out the glass **(D)** and pull off the old gasket. Do the same for the other door.

This is a good time to clean the glass thoroughly.

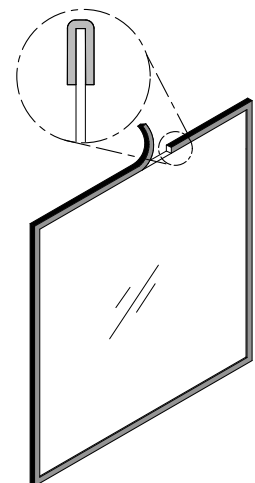


7.4.2 Gasket

To remove or replace the glass **(G)**:

5. Remove the door **(H)** and place it face-down on something soft.
6. Remove the glass retainers **(E)** held in place by the screws **(D)**.
7. Remove the frames **(F)**.
8. Remove the glass. If it is damaged install a new one in place. The replacement glass must have a gasket all around.
9. Reinstall the glass, being careful to centre the glass in the door and not to over-tightening the retaining screw.

The two main causes of broken door glass are uneven placement in the door and over-tightening the retaining screws.

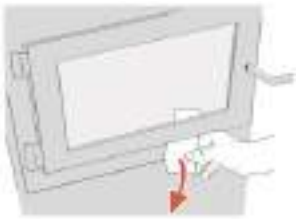


7.4.3 Gasket

The glass gasket is flat, adhesive-backed, woven fibreglass. The gasket must be centred on the edge of the glass.

1. Follow the steps of the previous section to remove the glass.
2. Remove the old gasket and clean the glass thoroughly.
3. Peel back a section of the paper covering the adhesive and place the gasket on a table with the adhesive side up.
4. Stick the end of the gasket to the middle of one edge, then press the edge of the glass down onto the gasket, taking care that it is perfectly centred on the gasket.
5. Peel off more of the backing and rotate the glass. The gasket must not be stretched during installation.
6. Cut the gasket to the required length. Pinch the gasket onto the glass in a U-shape, all around the glass.

7.5 Door



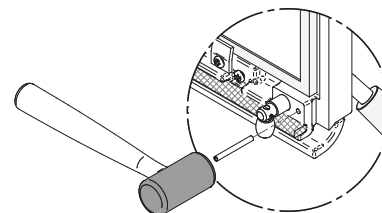
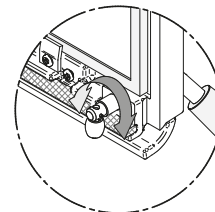
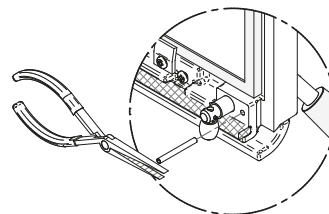
In order for the fireplace to burn at its best efficiency, the door must provide a perfect seal with the firebox. Therefore, the gasket should be inspected periodically to check for a good seal. The tightness of the door seal can be verified by closing and latching the door on a strip of paper. The test must be performed all around the door. If the paper slips out easily anywhere, either adjust the door or replace the gasket.

At the end of each heating season it is recommended to add a high temperature graphite paste on the threads of the door handles. This paste will protect the threads from rust and prevent dust accumulation that can prevent the handles from rotating freely.

7.5.1 Adjustment

The door seal may be improved with a simple latch mechanism adjustment on the right door:

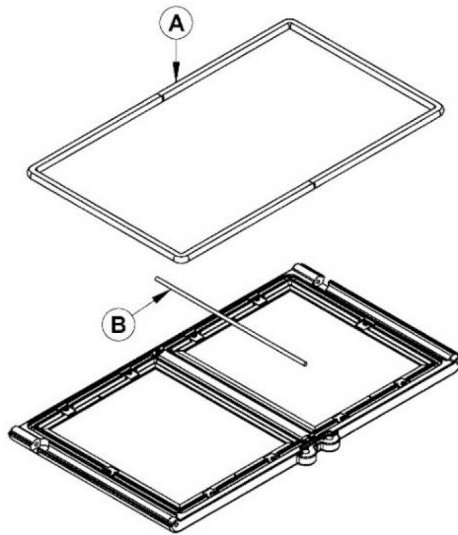
1. Remove the split pin by pulling and turning it using pliers.
2. Turn the handle one counterclockwise turn to increase pressure.
3. Reinstall the split pin with a small hammer.



7.5.2 Gasket

Use the correct replacement gasket: **(A)** for the doors and **(B)** for the doors junction. Both can be purchased from your retailer. The diameter and density of the gasket is important to getting a good seal.

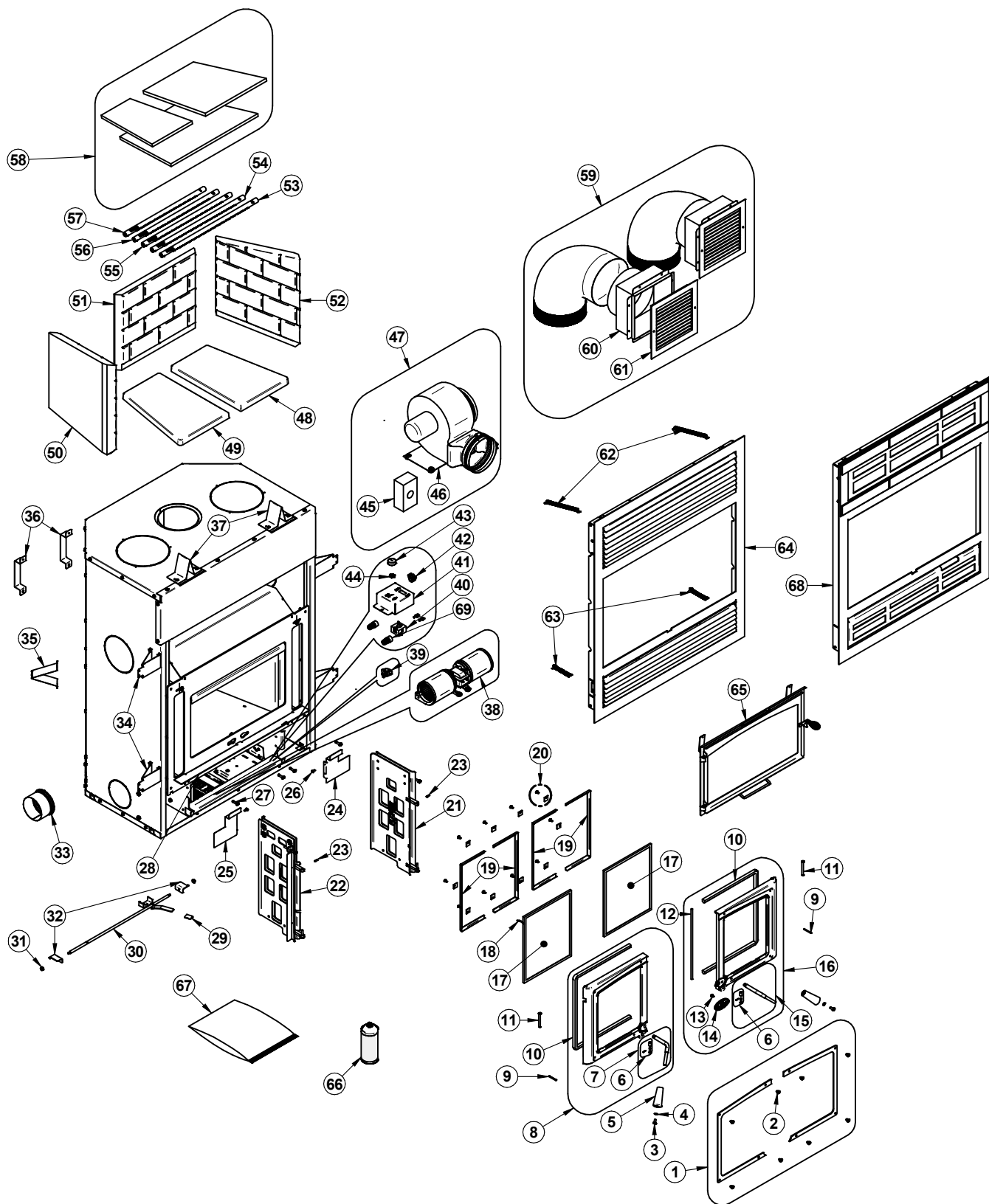
Place the doors face-down on something soft like a cushion of rags or piece of carpet. Remove the old gaskets from the door by pulling and prying it out with an old screw driver. Then use the screwdriver to scrape the old gasket adhesive from the door. Now run a 1/4" (6 mm) bead of high temperature silicone in the door frame gasket groove of the door gasket. Starting from the middle of the hinge side, press the gasket into the groove. Do not stretch the gasket as you place it. Leave the gasket about 1/2" long when you cut it and press the end into the groove. Tuck any loose fibres under the gasket and into the silicone. Do the same for center door gaskets. Repeat for the other door. Close the door and do not use the fireplace for 24 hours.



Location	Length	Dimension
On each door frame	38" (96 cm)	Round 5/8" (16 mm)
Center door gasket	14" (36 cm)	Round 1/4" (6 mm) self-adhesive

8. Exploded Diagram and Part List

ENGLISH



IMPORTANT: THIS IS DATED INFORMATION. When requesting service or replacement parts for your unit, please provide the model number and the serial number. We reserve the right to change parts due to technology upgrades or availability. Contact an authorized dealer to obtain any of these parts. Never use substitute materials. Use of non-approved parts can result in poor performance and safety hazards.

#	Item	Description	Qté
1	OA10622	BRUSHED NICKEL DOOR OVERLAY	1
1	OA10620	BLACK DOOR OVERLAY	1
2	30252	MECHANICAL SCREW 1/4-20 X 5/16" BUTTONHEAD HEX DEEP #5/32 18-8 BLACK	8
3	30025	1/4-20 X 1/2" PAN-HEAD QUADREX BLACK SCREW	2
4	30187	STAINLESS WASHER ID 17/64" X OD 1/2"	2
5	30898	ROUND WOODEN BLACK HANDLE DULL BLACK FINISH	2
6	SE36580	LATCH KIT	2
7	SE70409	LEFT HANDLE AND LATCH KIT	1
8	SE24195	LEFT DOOR ASSEMBLY WITH GASKET AND HANDLE	1
9	30101	SPRING TENSION PIN 5/32"Ø X 1 1/2"L	2
10	AC06500	SILICONE AND 5/8" X 8' BLACK DOOR GASKET KIT	2
11	30877	HINGE PIN 1/4"Ø X 2-1/2"L	2
12	40030	6 mm GASKET	3
13	30124	SCREW #8 - 32 X 5/16" TRUSS QUADREX ZINC	1
14	30450	OSBURN DOOR LOGO	1
15	SE70410	RIGHT HANDLE AND LATCH KIT	1
16	SE24196	RIGHT DOOR ASSEMBLY WITH GASKET AND HANDLE	1
17	SE70001	REPLACEMENT GLASS WITH GASKET 10 5/16" X 12 7/16"	2
18	AC06400	3/4" (FLAT) X 6' BLACK SELF-ADHESIVE GLASS GASKET	1
19	PL70000	GLASS RETAINER TRIM	4
20	SE63024	GLASS RETAINER WITH SCREWS KIT (10 UNITS)	1
21	SE70479	RIGHT CHARIOT ASSEMBLY	1
22	SE70477	LEFT CHARIOT ASSEMBLY	1
23	30143	SOCKET SET SCREW #10-32 X 1/2"	2
24	PL70439	RIGHT PLUG FACEPLATE	1
25	PL70425	LEFT PLUG FACEPLATE	1
26	30154	BLACK SCREW #10 X 5/8" QUADREX #2 TYPE A	2
27	30506	SCREW PAN TORX TYPE F 1/4-20 X 1" BLACK	4
28	PL70426	ASH TRAY	1
29	30556	AIR CONTROL FINISHING TIP	1
30	SE70440	AIR CONTROL ASSEMBLY	1
31	30220	FLANGED LOCKNUT 1/4-20	2
32	PL70104	AIR INLET	2
33	PL63954	4" ADAPTOR	1
34	PL70463	SIDE STAND-OFF	4

#	Item	Description	Qté
35	PL70424	SIDE REAR STAND-OFF	2
36	PL70452	REAR STAND-OFF	2
37	PL70453	TOP STAND-OFF	2
38	44207	DOUBLE CAGE BLOWER 176 CFM (CLASS H)	1
39	44028	CERAMIC THERMODISC F110-20F	1
40	44080	RHEOSTAT WITHOUT NUT (MODEL KBMS-13BV)	1
41	PL70113	TERMINAL COVER	1
42	44091	ROCKER SWITCH 2 POSITION MSR-8	1
43	44085	RHEOSTAT KNOB	1
44	44087	RHEOSTAT NUT	1
45	44131	SPEED CONTROL (2.5 A)	1
46	44121	FORCED AIR KIT BLOWER 6" - 2.4A	1
47	VA4460	FORCED AIR KIT	1
48	22354	RIGHT FLOOR REFRACTORY	1
49	22353	LEFT FLOOR REFRACTORY	1
50	22355	LEFT REFRACTORY	1
51	22357	REAR REFRACTORY	1
52	22356	RIGHT REFRACTORY	1
53	PL70107	FRONT SECONDARY AIR TUBE	1
54	PL70407	CENTER FRONT SECONDARY AIR TUBE	1
55	PL70408	CENTER SECONDARY AIR TUBE	1
56	PL70108	REAR CENTER SECONDARY AIR TUBE	1
57	PL70109	REAR SECONDARY AIR TUBE	1
58	SE36511	RIGID CERAMIC BAFFLE KIT 2000 SERIE (3 PCES)	1
59	AC01375	HOT AIR GRAVITY KIT - TRADITIONAL	1
60	30640	GALVANISED BOX FOR HOT AIR GRAVITY KIT 8"	2
61	30540	HOT AIR GRAVITY KIT GRILL	2
62	30767	SPRING 1/2"Ø OUTSIDE X 8"L	2
63	30472	SPRING 1/2" OUTSIDE Ø X 3"L	2
64	OA10619	TRADITIONAL STYLE FACEPLATE	1
65	AC01379	FIRESSCREEN DOOR	1
66	AC05959	METALLIC BLACK STOVE PAINT - 342 g (12oz) AEROSOL	1
67	SE46186	EVEREST II INSTRUCTION MANUAL KIT	1
68	OA10621	MODERN FACEPLATE	1

OSBURN LIMITED LIFETIME WARRANTY

The warranty of the manufacturer extends only to the original retail purchaser and is not transferable. This warranty covers brand new products only, which have not been altered, modified nor repaired since shipment from factory. Proof of purchase (dated bill of sale), model name and serial number must be supplied when making any warranty claim to your OSBURN dealer.

This warranty applies to normal residential use only. This warranty is void if the unit is used to burn material other than cordwood (for which the unit is not certified by EPA) and void if not operated according to the owner's manual. Damages caused by misuse, abuse, improper installation, lack of maintenance, over firing, negligence or accident during transportation, power failures, downdrafts, venting problems or under-estimated heating area are not covered by this warranty. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

This warranty does not cover any scratch, corrosion, distortion, or discoloration. Any defect or damage caused by the use of unauthorized or other than original parts voids this warranty. An authorized qualified technician must perform the installation in accordance with the instructions supplied with this product and all local and national building codes. Any service call related to an improper installation is not covered by this warranty.

The manufacturer may require that defective products be returned or that digital pictures be provided to support the claim. Returned products are to be shipped prepaid to the manufacturer for investigation. Transportation fees to ship the product back to the purchaser will be paid by the manufacturer. Repair work covered by the warranty, executed at the purchaser's domicile by an authorized qualified technician requires the prior approval of the manufacturer. All parts and labour costs covered by this warranty are limited according to the table below.

The manufacturer, at its discretion, may decide to repair or replace any part or unit after inspection and investigation of the defect. The manufacturer may, at its discretion, fully discharge all obligations with respect to this warranty by refunding the wholesale price of any warranted but defective parts. The manufacturer shall, in no event, be responsible for any uncommon, indirect, consequential damages of any nature, which are in excess of the original purchase price of the product. **A one-time replacement limit applies to all parts benefiting from lifetime coverage.** This warranty applies to products purchased after June 1st, 2015.

DESCRIPTION	WARRANTY APPLICATION*	
	PARTS	LABOUR
Combustion chamber (welds only) and cast iron door frame	Lifetime***	5 years
Ceramic glass**, plating (manufacturing defect**), and convector air-mate	Lifetime***	N/A
Surrounds, heat shields, ash drawer, steel legs, pedestal, trims (aluminum extrusions), vermiculite, C-Cast or equivalent baffle**, secondary air tubes**, removable stainless steel combustion chamber, deflectors, and supports	7 years***	N/A
Handle assembly, glass retainers and air control mechanism	5 years	3 years
Removable carbon steel combustion chamber components	5 years	N/A
Standard and optional blower, heat sensors, switches, rheostat, wiring, and electronics	2 years	1 year
Paint (peeling**), gaskets, insulation, ceramic fiber blankets, refractory bricks (fireplace only***), and other options	1 year	N/A
All parts replaced under the warranty	90 days	N/A

***Subject to limitations above **Picture required ***limited to one replacement**

Labour cost and repair work to the account of the manufacturer are based on a predetermined rate schedule and must not exceed the wholesale price of the replacement part.

Shall your unit or a components be defective, contact immediately your **OSBURN** dealer. To accelerate processing of your warranty claim, make sure to have on hand the following information when calling:

- Your name, address and telephone number
- Bill of sale and dealer's name
- Installation configuration
- Serial number and model name as indicated on the nameplate fixed to the back of your unit
- Nature of the defect and any relevant information

Before shipping your unit or defective component to our plant, you must obtain an Authorization Number from your OSBURN dealer. Any merchandise shipped to our plant without authorization will be refused automatically and returned to sender.

Wood_Revision: June 2021

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250, De Copenhague street,
St-Augustin-de-Desmaures (Québec), Canada
G3A 2H3
1-877-356-6663
www.osburn-mfg.com/en
tech@sbi-international.com



Wood fireplace Owner's Manual

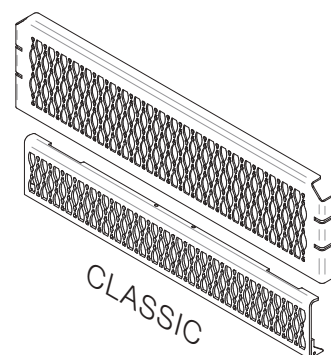
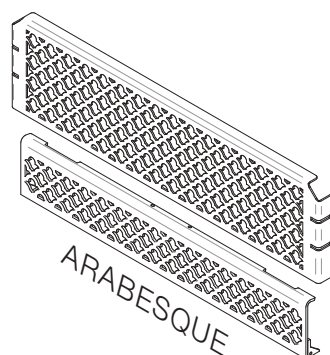
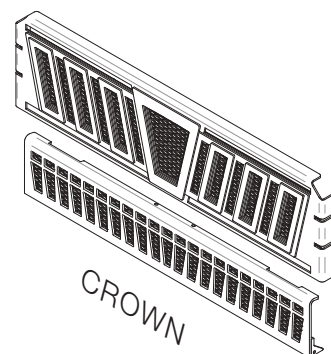
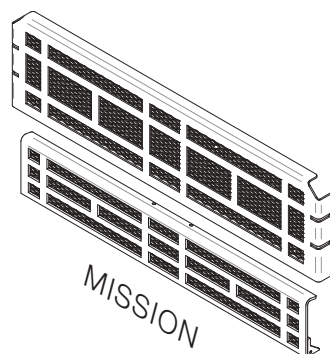
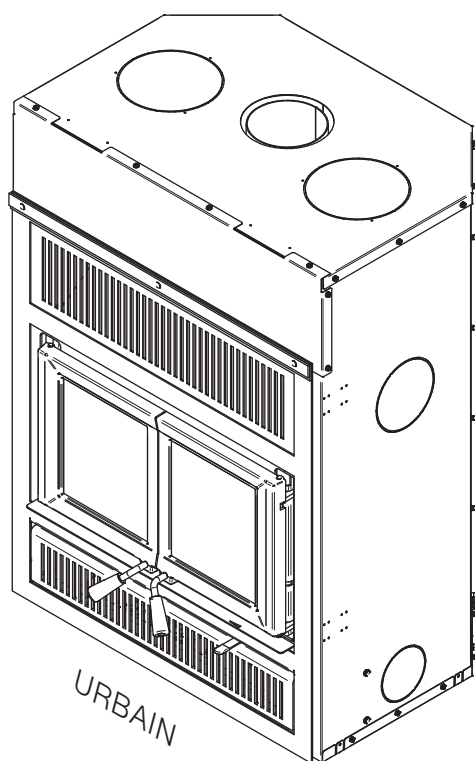
Part 2 of 2

INSTALLATION AND OPERATION REQUIREMENTS

DALLAIRE

(FP18R model)

ENGLISH



US Environmental Protection
Agency phase II certified wood
fireplace compliant with 2020
cord wood standard



Safety tested according to ULC
S610, UL 127 standards by an
accredited laboratory.

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD FIREPLACE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS MANUAL FOR REFERENCE



Wood fireplace Owner's Manual

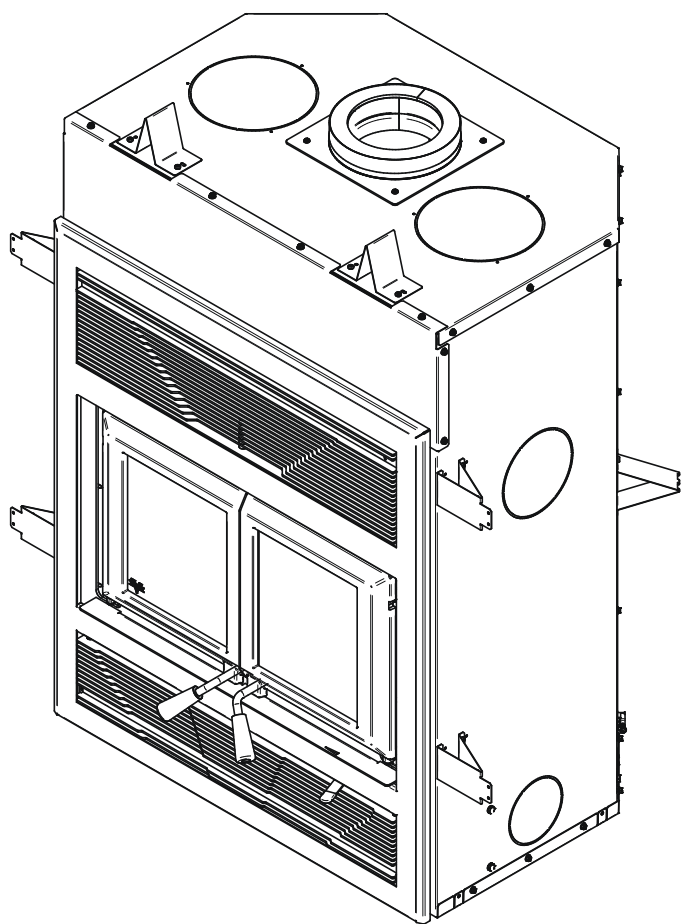
Part 2 of 2

INSTALLATION AND OPERATION REQUIREMENTS

HE325R

(VB00026 model)

ENGLISH



Safety tested according to ULC S610,
UL 127 standards by an accredited
laboratory.

EPA
≤2.5 g/h

US Environmental Protection Agency
phase II certified wood fireplace
compliant with 2020 cord wood standard.

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD FIREPLACE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS MANUAL FOR REFERENCE

enerzone

Wood fireplace Owner's Manual

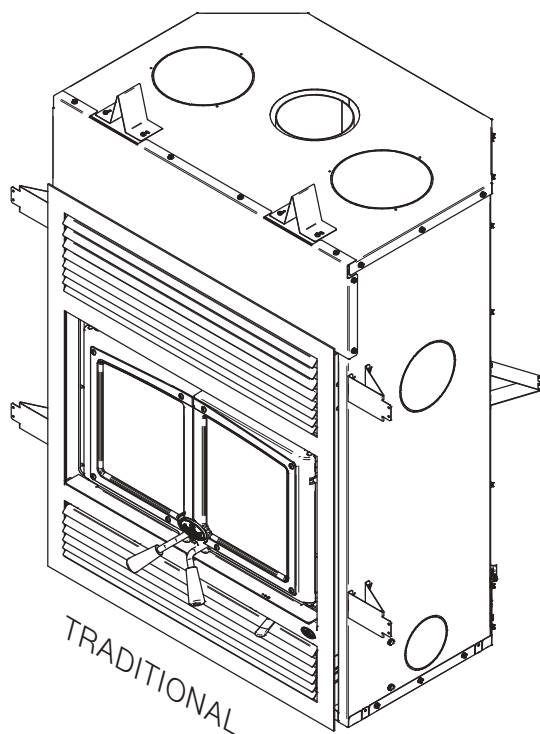
Part 2 of 2

INSTALLATION AND OPERATION REQUIREMENTS

SOLUTION 3.0 ZC

(EB00069 model)

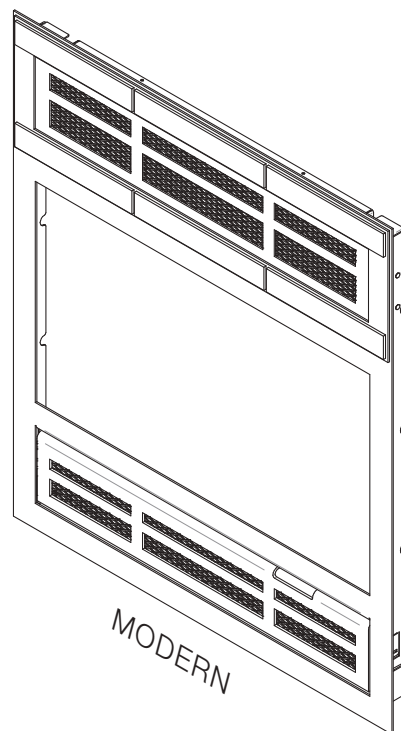
ENGLISH



US Environmental Protection Agency
phase II certified wood fireplace
compliant with 2020 cord wood standard



Safety tested according to
ULC S610, and UL 127 standards
by an accredited laboratory.



CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS MANUAL FOR REFERENCE



Wood fireplace Owner's Manual

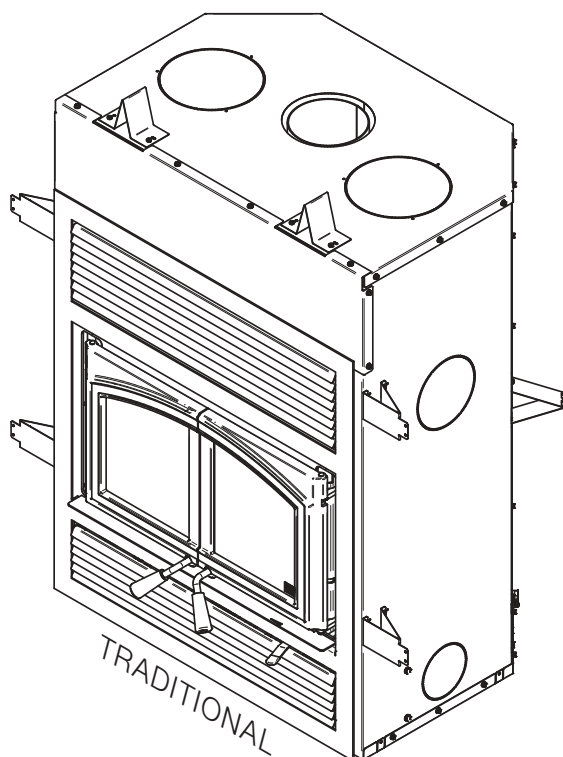
Part 2 of 2

INSTALLATION AND OPERATION REQUIREMENTS

St.Clair 3000R

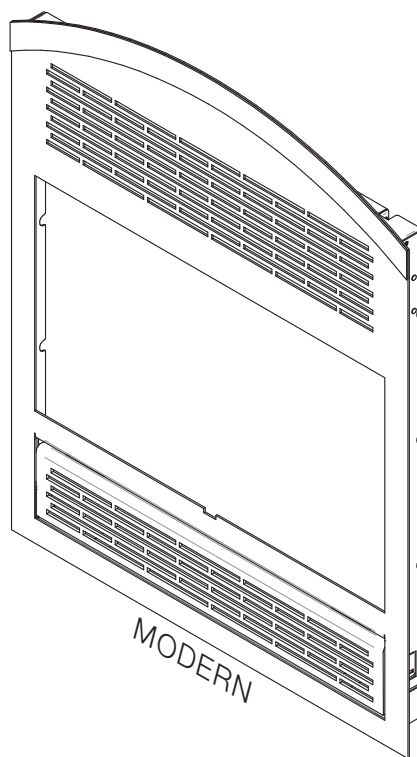
(SF00623 model)

ENGLISH



TRADITIONAL

US Environmental Protection
Agency phase II certified wood
fireplace compliant with 2020
cord wood standard



MODERN

Safety tested according
to ULC S610, UL 127
standards by an accredited
laboratory.

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD FIREPLACE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS MANUAL FOR REFERENCE



Intertek

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS
D'INFORMATION

STANDARDS / NORMES D'ESSAI

Certified to / Certifié selon ULCS210

Certified to / Certifié selon UL 127

Certified to / Certifié selon CSA B415.1-10

Certified to / Certifié selon ASTM E2515-11 (R2017)

MODEL / MODÈLE:

EVEREST III

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUÉ HOMOLOGUÉ

FOR USE WITH / POUR UTILISATION AVEC
WOOD ONLY / BOIS SEULEMENT
CONTACT LOCAL BUILDING OFFICIALS ABOUT
THE RESTRICTIONS AND INSTALLATION
INSPECTION IN YOUR AREA.
COMMUNIQUER AVEC LES AUTORITÉS
LOCALES DU BÂTIMENT ET DE LA PRÉVENTION
DES INCENDIES AU SUJET DES RESTRICTIONS
D'INSTALLATION DANS VOTRE SECTEUR.

Control Number (LG): 5007735
(New / Nouveau)Serial Number
No. de Série

999

INSTALL AND USE ONLY IN ACCORDANCE WITH SBI STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.
L'INSTALLATION ET L'OPERATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SBI FABRICANT DE POELES INTERNATIONAL.

PREVENT HOUSE FIRES

- Use solid fuel only.
 - For safety, keep screen doors or glass doors tightly closed.
 - Do not overfire ash.
 - Replace with only ceramic glass 4mm thick.
 - Use only with listed factory-built chimney as per manufacturer's instructions.
 - A non-combustible hearth extension must be installed in front of unit extending 16 in (406 mm) in front and 8 in (203 mm) on each side of door opening.
 - Hearth extension must have a minimum R factor of 1.00. No minimum R factor is required if fireplace is elevated by at least 4 in. (102 mm).
 - Do not use a fireplace insert or other products not specified for use with this product.
- Areas of the fireplace incorporating wires or cold air ducts shall be enclosed in accordance with manufacturer's instructions.
- WARNING:** This fireplace has not been tested with an unvented gas log set. To reduce risk of fire or injury, do not install an unvented gas log set into fireplace. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

- Suitable for transportable building installation in CANADA only.

PRÉVENIR LES INCENDIES

- Utiliser uniquement du bois de chauffage.
 - Pour votre sécurité, maintenir les portes de grillages ou de vitres fermées de façon étanche.
 - Ne pas surchauffer le foyer.
 - Remplacer la vitre seulement avec un verre céramique de 4mm d'épaisseur.
 - Pour utilisation seulement avec une cheminée préfabriquée homologuée tel que spécifiée selon les instructions du fabricant.
 - Une protection de plancher non combustible doit être installée à l'avant du foyer exécutant de 16 po (406 mm) à l'avant et 8 po (203 mm) de chaque côté de l'ouverture de porte.
 - La protection à l'avant du foyer doit avoir un facteur R minimum de 1.00. Aucun facteur R n'est requis si le foyer est surélevé d'au moins 4 po (102 mm).
 - Ne pas utiliser de foyer à gaz non ventilé ou autres produits qui ne sont pas conçus spécialement pour être utilisés avec le présent foyer.
- Les zones du foyer intégrant des conduits d'air chaud ou froid doivent être installées en accord avec les instructions du fabricant.
- ATTENTION:** Ce foyer n'a pas été mis à l'essai avec un ensemble de bûches démontées à gaz non ventilé. Pour réduire les risques de feu ou de blessures, ne pas installer d'ensemble de bûches démontées à gaz non ventilé dans ce foyer.
- Cet appareil requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistante par rapport au manuel de l'utilisateur constitue une violation de la loi fédérale (USA).

Convient aux bâtiments transportables au CANADA seulement.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS /
DÉGAGEMENTS MINIMUM AUX MATÉRIEAUX COMBUSTIBLES

Side wall / Mur latéral (1):

25 in (533 mm)

Side facing / Parement latéral (2): 8 in (203 mm)

Shelf (from floor) /

Tablette (du sol) (2)(3)(4):

48 in (1219 mm)

Ceiling (from floor) /

Plafond (à partir du plancher) (3): 80 in. (2032 mm)

(1) From door opening. / À partir de l'ouverture de la porte.

(2) Subject to a maximum protrusion (consult owner's manual). / Sujet à une saillie maximale (consulter le manuel d'instructions).

(3) If the fireplace is elevated, the clearance to the combustible shelf and ceiling must be increased by an equivalent value. / Si le foyer est surélevé, les dégagements à la tablette combustible et au plafond doivent être augmentés d'une valeur équivalente.

(4) Consult owner's manual for material to be used. / Consulter le manuel d'installation pour le matériel à utiliser.

Blower / Ventilateur: (115V, 0.8A, 60Hz)

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE

- 1) Keep doors closed
- 2) Close all combustion air controls

EN CAS D'INCENDIE DE CHEMINÉE

- 1) Maintenir les portes fermées
- 2) Fermer tous les dispositifs d'admission d'air

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.U. (EPA). Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate / Moyenne pondérée des émissions: 1.9 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii).

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p66warnings.ca.gov)

CAUTION

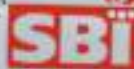
- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.
- THIS FIREPLACE NEEDS AIR FOR GOOD OPERATION.
- WHEN A FIRE IS BURNING IN THE FIREPLACE, FRESH AIR MUST BE SUPPLIED TO THE ROOM WHERE THE FIREPLACE IS LOCATED, FAILURE TO PROVIDE THIS MAY STARVE OTHER FUEL BURNING APPLIANCE FROM AN ADEQUATE AIR SUPPLY.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.
- CE FOYER A BESOIN D'AIR POUR SON BON FONCTIONNEMENT.
- LORSQUE LE FOYER BRÛLE, UN APPORT D'AIR SUPPLÉMENTAIRE DOIT ÊTRE PRÉVU DANS LA PIÈCE, UN MANQUE D'AIR D'APPOINT POURRAIT PRIVER LES AUTRES APPAREILS DE COMBUSTION D'UNE ALIMENTATION D'AIR ADÉQUATE.



Made in La Guadeloupe, (Gc), Canada
25/06/2024 (# Test)



Fabriqueur de poêles international
Stove Builder International

Fabrique à La Guadeloupe, (Gc), Canada

25/06/2024 (# Test)
27978



REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS
D'INFORMATION

Intertek

STANDARDS / NORMES D'ESSAI:

Certified to / Certifié selon UL 5818
Certified to / Certifié selon UL 137
Certified to / Certifié selon CSA 4415.1-15
Certified to / Certifié selon ASTM E2513-11 (R0017)

Control Number (LG) : 5007735

(Date / À la 2024)

Serial Number

No. de Série

998

MODEL / MODÈLE:

FP18
DALLAIRE

LISTED FACTORY BUILT FIREPLACE FOYER PRÉFABRIQUÉ HOMOLOGUÉ

FOR USE WITH / POUR UTILISATION AVEC
WOOD ONLY / BOIS SEULEMENT
CONTACT LOCAL BUILDING OFFICIALS ABOUT
THE RESTRICTIONS AND INSTALLATION
INSPECTION IN YOUR AREA.
COMMUNIQUER AVEC LES AUTORITÉS
LOCALES DU BÂTIMENT ET DE LA PRÉVENTION
DES INCENDIES AU SUJET DES RESTRICTIONS
D'INSTALLATION DANS VOTRE SECTEUR.

INSTALL AND USE ONLY IN ACCORDANCE WITH SBI STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.
L'INSTALLATION ET L'UTILISATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SBI FABRICANT DE POÈLES INTERNATIONAL.

PREVENT HOUSE FIRES

PRÉVENEZ LES INCENDIES

- Use solid fuel only.
For safety, keep screen doors or glass doors tightly closed.
 - Do not overfire unit.
 - Replace with only ceramic glass door track.
 - Use only with listed factory-built chimney as per manufacturer's instructions.
 - A non-combustible hearth extension must be installed in front of unit extending 16 in (406 mm) in front and 8 in (203 mm) on each side of door opening.
 - Hearth extension must have a minimum R factor of 1.00. No minimum R factor is required if fireplace is elevated by at least 4 in (102 mm).
 - Do not use a fireplace insert or other products not specified for use with this product.
- Areas of the fireplace incorporating warm or cold air ducts shall be enclosed in accordance with manufacturer's instructions.
- WARNING:** This fireplace has not been tested with an unvented gas log set. To reduce risk of fire or injury, do not install an unvented gas log set into fireplace. This unit heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

- Utiliser uniquement du bois de chauffage.
Pour votre sécurité, maintenir les portes de grilles ou de vitres fermées de façon stricte.
 - Ne pas surchauffer le foyer.
 - Remplacer la vitre seulement avec un verre céramique de 4mm d'épaisseur.
 - Pour utilisation seulement avec une cheminée préfabriquée homologuée tel que spécifié selon les instructions du manufacturier.
 - Une protection de plancher incombustible doit être installée à l'avant du foyer existant de 16 po (406 mm) à l'avant et 8 po (203 mm) de chaque côté de l'ouverture du foyer.
 - La protection à l'avant du foyer doit avoir un facteur R minimum de 1.00. Aucun facteur R n'est requis si le foyer est surélevé d'au moins 4 po (102 mm).
 - Ne pas utiliser de foyer encastrable ou autres produits qui ne sont pas conçus spécialement pour être utilisés avec le présent foyer.
- Les zones du foyer intégrant des conduits d'air chaud ou froid doivent être installées en accord avec les instructions du manufacturier.
- ATTENTION:** Ce foyer n'a pas été mis à l'essai avec un ensemble de bûches décoratives à gaz non ventilé. Pour réduire les risques de feu ou de blessures, ne pas installer d'ensemble de bûches décoratives à gaz non ventilé dans ce foyer.
- Cet appareil requiert des inspections et réparations périodiques. Consulter le Manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon incohérente par rapport au manuel de l'utilisateur constitue une violation de la loi fédérale (USA).

- Suitable for transportable building installation in CANADA only.

Convient aux bâtiments transportables au CANADA seulement.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS / DÉGAGEMENTS MINIMUM AUX MATÉRIEAUX COMBUSTIBLES

Sidewall / Mur latéral (1) :	21 in (533 mm)	Side facing / Parement latéral (2) :	8 in (203 mm)
Shelf (from floor) / Tablette (du sol) (2)(3)(4) :	48 in (1219 mm)	Ceiling (from floor) / Plafond (à partir du plancher) (3) :	80 in (2032 mm)

- (1) From door opening. / À partir de l'ouverture de la porte.
(2) Subject to a maximum protrusion (consult owner's manual). / Sujet à une saillie maximale (consultez le manuel d'instructions).
(3) If the fireplace is elevated, the clearance to the combustible shelf and ceiling must be increased by an equivalent value. / Si le foyer est surélevé, les dégagements à la tablette combustible et au plafond doivent être augmentés d'une valeur équivalente.
(4) Consult owner's manual for material to be used. / Consulter le manuel d'installation pour le matériel à utiliser.

Blower / Ventilateur: (115V, 0.8A, 60Hz)

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE

- 1) Keep doors closed
- 2) Close all combustion air controls

EN CAS D'INCENDIE DE CHEMINÉE

- 1) Maintenir les portes fermées
- 2) Fermer tous les dispositifs d'admission d'air

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.U. (EPA). Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate / Moyenne pondérée des émissions: 1.8 g/h

WARNING: Tested and certified in compliance with CPS 40 part 60, subpart AAA, section 80.534(a)(1)(i).
This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harms.
(For more information go to www.p66warnrga.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.
- THIS FIREPLACE NEEDS AIR FOR GOOD OPERATION.
- WHEN A FIRE IS BURNING IN THE FIREPLACE, FRESH AIR MUST BE SUPPLIED TO THE ROOM WHERE THE FIREPLACE IS LOCATED, FAILURE TO PROVIDE THIS MAY STARVE OTHER FUEL BURNING APPLIANCE FROM AN ADEQUATE AIR SUPPLY.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.
- CE FOYER A BESOIN D'AIR POUR SON BON FONCTIONNEMENT.
- LORSQUE LE FOYER BRÛLE, UN APPORT D'AIR SUPPLÉMENTAIRE DOIT ÊTRE PRÉVU DANS LA PIÈCE, UN MANQUE D'AIR D'APPOINT POURRAIT PRIVER LES AUTRES APPAREILS DE COMBUSTION D'UNE ALIMENTATION D'AIR ADÉQUATE.



Fabricant de poêles international
Stove Builder International

Made in La Guadeloupe, (QC), Canada

25/06/2024 (# Test)

Fabrique à La Guadeloupe, (QC), Canada

25/06/2024 (# Test)
27960



Intertek

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI

Certified to / Certifié selon ULC S610

Certified to / Certifié selon UL 127

Certified to / Certifié selon CSA B415.1-10

Certified to / Certifié selon ASTM E2515-11 (R3007)

Control Number (L.G.): 5007735

(Date / Date 2024)

Serial Number

No. de Série

99

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUÉ HOMOLOGUÉ

FOR USE WITH / POUR UTILISATION AVEC
WOOD ONLY / BOIS SEULEMENT
CONTACT LOCAL BUILDING OFFICIALS
ABOUT THE RESTRICTIONS AND
INSTALLATION INSPECTION IN YOUR AREA.
COMMUNIQUER AVEC LES AUTORITÉS
LOCALES DU BÂTIMENT ET DE LA
PRÉVENTION DES INCENDIES AU SUJET DES
RESTRICTIONS D'INSTALLATION DANS
VOTRE SECTEUR.

MODEL / MODÈLE:
HE325R

INSTALL AND USE ONLY IN ACCORDANCE WITH THE STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.
L'INSTALLATION ET L'OPERATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SON FABRICANT DE POÊLES INTERNATIONAL.

PREVENT HOUSE FIRES

- Use solid fuel only.
- For safety, keep screen doors or glass doors tightly closed.
- Do not overfire unit.
- Replace with only ceramic glass 4mm thick.
- Use only with listed factory-built chimney as per manufacturer's instructions.
- A non-combustible hearth extension must be installed in front of unit extending 16 in (406 mm) in front and 8 in (203 mm) on each side of door opening. See owner's manual for more details.
- Do not use a fireplace insert or other products not specified for use with this product.

• Areas of the fireplace incorporating warm or cold air ducts shall be enclosed in accordance with manufacturer's instructions.

• **WARNING:** This fireplace has not been tested with an unvented gas log set. To reduce risk of fire or injury, do not install an unvented gas log set into fireplace.

• This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

• Suitable for transportable building installation in CANADA only.

PRÉVEZ LES INCENDIES

- Utiliser uniquement du bois de chauffage.
- Pour votre sécurité, maintenir les portes de grillage ou de vitres fermées de façon étanche.
- Ne pas surchauffer le foyer.
- Remplacer la vitre seulement avec un verre céramique de 4mm d'épaisseur.
- Pour utilisation seulement avec une cheminée préfabriquée homologuée tel que spécifié selon les instructions du fabricant.
- Une protection de plancher incombustible doit être installée à l'avant du foyer s'étendant de 16 po (406 mm) à l'avant et 8 po (203 mm) de chaque côté de l'ouverture de porte. Se référer au manuel d'installation pour plus de détails.
- Ne pas utiliser de foyer insertable ou autres produits qui ne sont pas conçus spécialement pour être utilisés avec le présent foyer.
- Les zones du foyer intégrant des conduits d'air chaud ou froid doivent être installées en accord avec les instructions du fabricant.

• **ATTENTION:** Ce foyer n'a pas été testé à l'essai avec un ensemble de bûches décoratives à gaz non ventillé. Pour réduire les risques de feu ou de blessures, ne pas installer d'ensemble de bûches décoratives à gaz non ventillé avec ce foyer.

• Cet appareil requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon incohérente par rapport au manuel de l'utilisateur constitue une violation de la loi fédérale (USA).

• Convient aux bâtiments transportables au CANADA seulement.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS / DÉGAGEMENTS MINIMUM AUX MATÉRIEAUX COMBUSTIBLES

Sidewall / Mur latéral (1):

21 in (533 mm)

Side facing / Parement latéral (2): 8 in (203 mm)

Shelf (from floor) /

Tablette (du sol) (3)(3a):

48 in (1219 mm)

Ceiling (from floor) /

Plafond (à partir du plancher) (3): 80 in (2032 mm)

(1) From door opening. / À partir de l'ouverture de la porte.

(2) Subject to a maximum protrusion (consult owner's manual). / Sujet à une saillie maximale (consultez le manuel d'instructions).

(3) If the fireplace is elevated, the clearance to the combustible shelf and ceiling must be increased by an equivalent value. / Si le foyer est surélevé, les dégagements à la tablette combustible et au plafond doivent être augmentés d'une valeur équivalente.

(3a) Consult owner's manual for max value to be used. / Consulter le manuel d'installation pour la valeur à utiliser.

Blower / Ventilateur: (115V, 0.8A, 60Hz)

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE

- 1) Keep doors closed
- 2) Close all combustion air controls

EN CAS D'INCENDIE DE CHEMINÉE

- 1) Maintenir les portes fermées
- 2) Fermer tous les dispositifs d'alimentation d'air

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.U. (EPA). Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate / Moyenne pondérée des émissions: 1.8 g/h

Tested and certified in compliance with CFR 42 part 99, subpart AAA, section 60.554(e)(1)(ii).

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p66warnings.ca.gov)



CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.
- THIS FIREPLACE NEEDS AIR FOR GOOD OPERATION.
- WHEN A FIRE IS BURNING IN THE FIREPLACE, FRESH AIR MUST BE SUPPLIED TO THE ROOM WHERE THE FIREPLACE IS LOCATED, FAILURE TO PROVIDE THIS MAY STARVE OTHER FUEL BURNING APPLIANCE FROM AN ADEQUATE AIR SUPPLY.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.
- CE FOYER A BESOIN D'AIR POUR SON BON FONCTIONNEMENT.
- LORSQUE LE FOYER BRÛLE, UN APPORT D'AIR SUPPLÉMENTAIRE DOIT ÊTRE PRÉVU DANS LA PIÈCE, UN MANQUE D'AIR D'APPOINT POURRAIT PRIVER LES AUTRES APPAREILS DE COMBUSTION D'UNE ALIMENTATION D'AIR ADEQUATE.

Made in La Gueadeloupe, (Qc), Canada

25/06/2024 (# Test)



Fabriqué à La Gueadeloupe, (Qc), Canada

25/06/2024 (# Test)

27979



Intertek

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS
D'INFORMATION

STANDARDS / NORMES D'ESSAI:

Certified to / Certifié selon ULC S610

Certified to / Certifié selon UL 137

Certified to / Certifié selon CSA 24.15.1-10

Certified to / Certifié selon ASTM E2515-11 (R2017)

MODEL / MODÈLE:
SOLUTION 3.0 ZC

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUÉ HOMOLOGUÉ

FOR USE WITH / POUR UTILISATION AVEC
WOOD ONLY / BOIS SEULEMENT

CONTACT LOCAL BUILDING OFFICIALS ABOUT
THE RESTRICTIONS AND INSTALLATION
INSPECTION IN YOUR AREA.

COMMUNIQUER AVEC LES AUTORITÉS
LOCALES DU BÂTIMENT ET DE LA PRÉVENTION
DES INCENDIES AU SUJET DES RESTRICTIONS
D'INSTALLATION DANS VOTRE SECTEUR.

Control Number (L.G.): 5007735

Issue / Juin 2024

Serial Number
No. de Série

999

INSTALL AND USE ONLY IN ACCORDANCE WITH SBI STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.
L'INSTALLATION ET L'OPERATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SBI FABRICANT DE POÊLES INTERNATIONAL.

PREVENT HOUSE FIRES

- Use solid fuel only.
- For safety, keep screen doors or glass doors tightly closed.
- Do not overfire unit.
- Replace with only certified glass 4mm thick.
- Use only with listed factory-built chimney as per manufacturer's instructions.
- A non-combustible hearth extension must be installed in front of unit extending 18 in (457 mm) in front and 6 in (152 mm) on each side of door opening.
- Hearth extension must have a minimum R factor of 1.00. No minimum R factor is required if fireplace is elevated by at least 4 in. (102 mm).
- Do not use a fireplace insert or other products not specified for use with this product.
- Area of the fireplace incorporating warm or cold air ducts shall be enclosed in accordance with manufacturer's instructions.
- WARNING:** This fireplace has not been tested with an unvented gas log set. To reduce risk of fire or injury, do not install an unvented gas log set into fireplace. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

- Not suitable for transportable building installation in CANADA only.

PRÉVENEZ LES INCENDIES

- Utiliser uniquement du bois de chauffage.
- Pour votre sécurité, maintenir les portes de grillages ou de vitres fermées de façon étanche.
- Ne pas surchauffer le foyer.
- Remplacer la vitre seulement avec un verre cintrique de 4mm d'épaisseur.
- Pour utilisation seulement avec une cheminée préfabriquée homologuée tel que spécifié selon les instructions du fabricant.
- Une protection de plancher incombustible doit être installée à l'avant du foyer s'étendant de 18 po (457 mm) à l'avant et 6 po (152 mm) de chaque côté de l'ouverture de porte.
- La protection à l'avant du foyer doit avoir un facteur R minimum de 1.00. Aucun facteur R n'est requis si le foyer est surélevé d'au moins 4 po. (102 mm).
- Ne pas utiliser de foyer encastrable ou autres produits qui ne sont pas conçus spécialement pour être utilisés avec le présent foyer.
- Les zones du foyer intégrant des conduits d'air chaud ou froid doivent être installées en accord avec les instructions du fabricant.
- ATTENTION:** Ce foyer n'a pas été mis à l'essai avec un ensemble de bûches décoratives à gaz non ventilé. Pour réduire les risques de feu ou de blessures, ne pas installer d'ensemble de bûches décoratives à gaz non ventilé dans ce foyer.
- Cet appareil requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon incohérente par rapport au manuel de l'utilisateur constitue une violation de la loi fédérale (USA).

- Conviert aux bâtiments transportables au CANADA seulement.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS / DÉGAGEMENTS MINIMUM AUX MATÉRIEAUX COMBUSTIBLES

Sidewall / Mur latéral [1] :	21 in (533 mm)	Side facing / Parement latéral (2) :	8 in (203 mm)
Shelf (from floor) / Tablette (du sol) [2][3][4] :	48 in (1219 mm)	Ceiling (from floor) / Plafond (à partir du plancher) (3) :	80 in. (2032 mm)

[1] From door opening. / À partir de l'ouverture de la porte.

[2] Subject to a maximum protection (consult owner's manual). / Sujet à une sùille maximale (consulter le manuel d'instructions).

[3] If the fireplace is elevated, the clearance to the combustible shelf and ceiling must be increased by an equivalent value. / Si le foyer est surélevé, les dégagements à la tablette combustible et au plafond doivent être augmentés d'une valeur équivalente.

[4] Consult owner's manual for material to be used. / Consulter le manuel d'installation pour le matériel à utiliser.

Blower / Ventilateur: (115V, 0.8A, 60Hz)

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE

- Keep doors closed
- Close all combustion air controls

EN CAS D'INCENDIE DE CHEMINÉE

- Maintenir les portes fermées
- Fermer tous les dispositifs d'admission d'air

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.U. (EPA). Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate / Moyenne pondérée des émissions: 1.8 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(i).



WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p66warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.
- THIS FIREPLACE NEEDS AIR FOR GOOD OPERATION.
- WHEN A FIRE IS BURNING IN THE FIREPLACE, FRESH AIR MUST BE SUPPLIED TO THE ROOM WHERE THE FIREPLACE IS LOCATED, FAILURE TO PROVIDE THIS MAY STARVE OTHER FUEL BURNING APPLIANCE FROM AN ADEQUATE AIR SUPPLY.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.
- CE FOYER A BESOIN D'AIR POUR SON BON FONCTIONNEMENT.
- LORSQUE LE FOYER BRÛLE, UN APPORT D'AIR SUPPLÉMENTAIRE DOIT ÊTRE PRÉVU DANS LA PIÈCE, UN MANQUE D'AIR D'APPOINT POURRAIT PRIVER LES AUTRES APPAREILS DE COMBUSTION D'UNE ALIMENTATION D'AIR ADÉQUATE.



Made in La Gueadeloupe, (Qc), Canada

25/06/2024 (# Test)



Fabricant de poêles international
Stove Builder International

Fabrique à La Gueadeloupe, (Qc), Canada

25/06/2024 (# Test)

27482



REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS
D'INFORMATION

Intertek

STANDARDS / NORMES D'ESSAI

Certified to / Certifié selon UL 9820

Certified to / Certifié selon UL 127

Certified to / Certifié selon CSA B415.1-10

Certified to / Certifié selon ASTM E2915-11 (F2017)

MODEL / MODÈLE: ST. CLAIR 3000R

LISTED FACTORY BUILT FIREPLACE FOYER PRÉFABRIQUÉ HOMOLOGUÉ

FOR USE WITH / POUR UTILISATION AVEC
WOOD ONLY / BOIS SEULEMENT
CONTACT LOCAL BUILDING OFFICIALS
ABOUT THE RESTRICTIONS AND
INSTALLATION INSPECTION IN YOUR AREA.
COMMUNIQUER AVEC LES AUTORITÉS
LOCALES DU BÂTIMENT ET DE LA
PRÉVENTION DES INCENDIES AU SUJET DES
RESTRICTIONS D'INSTALLATION DANS
VOTRE SECTEUR.

Control Number (LG) : 5007735
(June / juin 2024)

Serial Number
No. de Série

99

INSTALL AND USE ONLY IN ACCORDANCE WITH SBI STOVE BUILDER INTERNATIONAL INSTALLATION AND OPERATION INSTRUCTIONS.
L'INSTALLATION ET L'OPERATION DOIT SE FAIRE SELON LES INSTRUCTIONS D'INSTALLATION ET D'UTILISATION DE SBI FABRICANT DE POÊLES INTERNATIONAL.

PREVENT HOUSE FIRES

- Use solid fuel only.
For safety, keep screen doors or glass doors tightly closed.
- Do not overfire unit.
- Replace with only ceramic glass 4mm thick.
- Use only with listed factory-built chimney as per manufacturer's instructions.
- A non-combustible hearth extension must be installed in front of unit extending 16 in (406 mm) in front and 8 in (203 mm) on each side of door opening. See owner's manual for more details.
- Do not use a fireplace insert or other products not specified for use with this product.
- Areas of the fireplace incorporating warm or cold air ducts shall be enclosed in accordance with manufacturer's instructions.
- WARNING: This fireplace has not been tested with an unvented gas log set. To reduce risk of fire or injury, do not install an unvented gas log set into fireplace. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

• Suitable for transportable building installation in CANADA only.

PRÉVENEZ LES INCENDIES

- Utiliser uniquement du bois de chauffage.
- Pour votre sécurité, maintenir les portes de grilles ou de vitres fermées de façon étanche.
- Ne pas surchauffer le foyer.
- Remplacer la vitre seulement avec un verre céramique de 4mm d'épaisseur.
- Pour utilisation seulement avec une cheminée préfabriquée homologuée tel que spécifié selon les instructions du manufacturier.
- Une protection de plancher incombustible doit être installée à l'avant du foyer s'étendant de 16 po (406 mm) à l'avant et 8 po (203 mm) de chaque côté de l'ouverture de porte. Se référer au manuel d'installation pour plus de détails.
- Ne pas utiliser de foyer encastrable ou autres produits qui ne sont pas conçus spécialement pour être utilisés avec le présent foyer.
- Les zones du foyer intégrant des conduits d'air chaud ou froid doivent être isolées en accord avec les instructions du manufacturier.
- ATTENTION: Ce foyer n'a pas été testé à l'essai avec un ensemble de bûches décoratives à garniss ventillé. Pour réduire les risques de feu ou de blessures, ne pas installer d'ensemble de bûches décoratives à gaz non ventillé dans ce foyer.
- Cet appareil requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon incohérente par rapport au manuel de l'utilisateur constitue une violation de la loi fédérale (USA).
- Convient aux bâtiments transportables au CANADA seulement.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS / DÉGAGEMENTS MINIMUM AUX MATÉRIAUX COMBUSTIBLES

Sidewall / Mur latéral (1) :	21 in (533 mm)	Side facing / Parement latéral (2) :	8 in (203 mm)
Shell (from floor) / Tablette (de sol) (2)(3)(4) :	48 in (1219 mm)	Ceiling (from floor) / Plafond (à partir du plancher) (3) :	80 in (2032 mm)

(1) From door opening. / À partir de l'ouverture de la porte.

(2) Subject to a maximum protrusion (consult owner's manual). / Sujet à une saillie maximale (consultez le manuel d'instructions).

(3) If the fireplace is elevated, the clearances to the combustible shell and ceiling must be increased by an equivalent value. / Si le foyer est surélevé, les dégagements à la tablette combustible et au plafond doivent être augmentés d'une valeur équivalente.

(4) Consult owner's manual for material to be used. / Consulter le manuel d'installation pour le matériel à utiliser.

Blower / Ventilateur: (115V, 0.8A, 60Hz)

PROCEDURE TO FOLLOW IN CASE OF RUN-AWAY FIRE

- 1) Keep doors closed.
- 2) Close all combustion air controls.

EN CAS D'INCENDIE DE CHEMINÉE

- 1) Maintenir les portes fermées.
- 2) Fermer tous les dispositifs d'admission d'air.

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES E.U. (EPA), Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate / Moyenne pondérée des émissions: 1.9 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(3).



WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p66warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.
- THIS FIREPLACE NEEDS AIR FOR GOOD OPERATION.
- WHEN A FIRE IS BURNING IN THE FIREPLACE, FRESH AIR MUST BE SUPPLIED TO THE ROOM WHERE THE FIREPLACE IS LOCATED, FAILURE TO PROVIDE THIS MAY STARVE OTHER FUEL BURNING APPLIANCE FROM AN ADEQUATE AIR SUPPLY.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS. UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.
- CE FOYER A BESOIN D'AIR POUR SON BON FONCTIONNEMENT. LORSQUE LE FOYER BRÛLE, UN APPORT D'AIR SUPPLÉMENTAIRE DOIT ÊTRE PRÉVU DANS LA PIÈCE, UN MANQUE D'AIR D'APPOINT POURRAIT PRIVER LES AUTRES APPAREILS DE COMBUSTION D'UNE ALIMENTATION D'AIR ADÉQUATE.



Made in La Guadeloupe, (Qc), Canada
25/06/2024 (# Test)

EMPIRE

11NCC-1512

Fabriquée à La Guadeloupe, (Qc), Canada

25/06/2024 (# Test)
27981



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



PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0182484A0912013i231228

A2LA ACCREDITED **CERTIFICATE OF CALIBRATION WITH DATA**

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 300kg x 0.	82484A0912013i	#050	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.01	QC033	12/28/23	12/14/22	12/2024

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:	
100	0.05	HB44	HB44	100	0.01	
As-Found:		As-Found:		As-Found:		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	
As-Left:		As-Left:		As-Left:		Good ☐ Fair ☒ Poor ☐ Temperature: 19.3°C
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.87	400.01	0.006
200	200.00	200.00	0.005
100	100.02	100.02	0.005
75	75.02	75.02	0.005
50	50.02	50.02	0.005
25	25.00	25.00	0.005

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:

Comments/Information Concerning this Calibration

12/28/23: RH-42.5%

Report prepared/reviewed by: R.B. Date: 12-28-23

Technician: C. Call

Signature: [Signature]

THIS CERTIFICATE SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation 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

Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: XC-50-DIR
 Lab ID #: 129
 Serial #: 1906005
 Calibration Date: 12/12/2023
 Calibration Expiration: 6/12/2024
 Barometric Pressure: 30.04 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer: Apex		NI	Aquatech	Red Lion
Model: SK25DA		NI 9213	DBX2	Cub 5
Lab ID#: 47		216	202	129B
Calibration Expiration Date: 4/17/2024		2/28/2024	5/24/2024	3/1/2024
Calibration γ Factor: 0.99879				

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	219.928	183.944	203.704
Standard DGM Temperature (°F)	69.0	70.0	70.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	8.030	6.752	7.500
DGM Temperature (°F)	92.0	92.0	93.0
DGM Pressure (in H ₂ O)	1.60	0.98	0.7
Net Volume for Standard DGM (ft ³)	7.767	6.496	7.194
Net Volume for DGM (ft ³)	8.030	6.752	7.500

Dry Gas Meter γ Factor	1.004	0.998	0.998
γ Factor Deviation From Average	1.004	0.998	0.998

Average Gas Meter γ Factor

1.000

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Technician:

Report and Certificate of Calibration



www.Cal-Cert.com

Toll Free
800-356-4662

Address
3777 SE International Way
Milwaukie, OR 97122

Local
503-634-8620



Report #: 33086-203315-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	40% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	129B
Capacity:	1 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		Range Resolution:		Mode Verified:		Pressure		
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005	
0.100	0.100	0.100	0.00	0.097	0.00	0.01	0.0067	
0.250	0.247	0.247	0.00	0.247	0.00	0.01	0.0006	
0.500	0.496	0.496	0.00	0.495	0.00	0.01	0.0011	
0.750	0.743	0.743	-0.01	0.743	-0.01	0.01	0.001	
1.000	0.992	0.992	-0.01	0.992	-0.01	0.01	0.0022	
0.750	0.745	0.745	-0.01	0.743	-0.01	0.01	0.006	
0.500	0.496	0.496	0.00	0.496	0.00	0.01	0.0009	
0.250	0.248	0.248	0.00	0.249	0.00	0.01	0.0031	
0.100	0.101	0.101	0.00	0.099	0.00	0.01	0.0049	
0.000	0.009	0.009	0.01	-0.004	0.00	0.01	0.0005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).**

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:



Report and Certificate of Calibration



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Address
3777 SE International Way
Milwaukie, OR 97122

Local
503-634-8620



Report #: 33086-203316-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	40% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	129C
Capacity:	5 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		Range Resolution:		Mode Verified:		Pressure		
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	
0.50	0.50	0.50	0.00	0.49	-0.01	0.05	0.024	
1.25	1.23	1.23	-0.02	1.24	-0.01	0.05	0.014	
2.50	2.47	2.47	-0.03	2.47	-0.03	0.05	0.017	
3.75	3.71	3.71	-0.04	3.71	-0.04	0.05	0.007	
5.00	4.96	4.96	-0.04	4.95	-0.05	0.05	0.023	
3.75	3.71	3.71	-0.04	3.72	-0.03	0.05	0.041	
2.50	2.47	2.47	-0.03	2.47	-0.03	0.05	0.006	
1.25	1.24	1.24	-0.01	1.24	-0.01	0.05	0.01	
0.50	0.51	0.51	0.01	0.50	0.00	0.05	0.027	
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

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All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:



Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: XC-50-DIR
 Lab ID #: 130
 Serial #: 1906006
 Calibration Date: 12/12/2023
 Calibration Expiration: 6/12/2024
 Barometric Pressure: 30.04 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer:	Apex	NI	Aquatech	Red Lion
Model:	SK25DA	NI 9213	DBX2	CUB5
Lab ID#:	47	216	202	130B
Calibration Expiration Date:	4/17/2024	2/28/2024	5/24/2024	3/1/2024
Calibration γ Factor:	0.99879			

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	158.813	156.693	151.189
Standard DGM Temperature (°F)	66.0	68.0	69.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	5.762	5.724	5.533
DGM Temperature (°F)	86.0	89.0	91.0
DGM Pressure (in H ₂ O)	1.73	1.01	0.8
Net Volume for Standard DGM (ft ³)	5.608	5.534	5.339
Net Volume for DGM (ft ³)	5.762	5.724	5.533
Dry Gas Meter γ Factor	1.005	1.001	1.002
γ Factor Deviation From Average	1.005	1.001	1.002

Average Gas Meter γ Factor

1.003

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Technician:

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Local
503-634-8620



Report #: 33086-203317-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	39% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	130B
Capacity:	1 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		Range Resolution:		Mode Verified:		Pressure		
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005	
0.100	0.099	0.099	0.00	0.098	0.00	0.01	0.0021	
0.250	0.246	0.246	0.00	0.246	0.00	0.01	0.001	
0.500	0.493	0.493	-0.01	0.493	-0.01	0.01	0.0009	
0.750	0.748	0.748	0.00	0.741	-0.01	0.01	0.0185	
1.000	0.991	0.991	-0.01	0.991	-0.01	0.01	0.0026	
0.750	0.743	0.743	-0.01	0.742	-0.01	0.01	0.0025	
0.500	0.494	0.494	-0.01	0.494	-0.01	0.01	0.0009	
0.250	0.247	0.247	0.00	0.248	0.00	0.01	0.0026	
0.100	0.098	0.098	0.00	0.100	0.00	0.01	0.0052	
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
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All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:



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Local
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Report #: 33086-203318-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	39% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	130C
Capacity:	5 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		Range Resolution:		Mode Verified:		Pressure		
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	
0.50	0.51	0.51	0.01	0.49	-0.01	0.05	0.034	
1.25	1.20	1.20	-0.05	1.24	-0.01	0.05	0.083	
2.50	2.53	2.53	0.03	2.48	-0.02	0.05	0.127	
3.75	3.70	3.70	-0.05	3.73	-0.02	0.05	0.056	
5.00	4.97	4.97	-0.03	4.98	-0.02	0.05	0.049	
3.75	3.71	3.71	-0.04	3.73	-0.02	0.05	0.061	
2.50	2.46	2.46	-0.04	2.49	-0.01	0.05	0.06	
1.25	1.21	1.21	-0.04	1.24	-0.01	0.05	0.062	
0.50	0.50	0.50	0.00	0.50	0.00	0.05	0.005	
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

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All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

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Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:



Report and Certificate of Calibration



Portland Laboratory
5777 SE International Way
Milwaukie, OR 97222
503-654-1692
503-654-9620

Anaheim Laboratory
190 S. Chaparral Ct Suite 110
Anaheim Hills, CA 92808
888-700-4100
714-686-5300

www.Cal-Cert.com

Report #: 30452-28785-3646 **Customer PO#:** 1100
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: John Steinert
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

LP-00051 Electrical Meter Fluke SN: 9663004 Cal: 01/10/2023 Due: 01/10/2024 Vendor: Fluke Report #: EVL861119
LP-01333 Electrical Meter IET Labs, Inc. SN: E3-1842499 Cal: 01/19/2023 Due: 01/31/2024 Vendor: Transcat Calibration Lab Report #: 5-G584Z-20-1
LP-01347 Thermo-Hygrometer Comark SN: 06210350163 Cal: 04/18/2023 Due: 04/30/2024 Vendor: Cal-Cert Range: 122 °F 95 %RH Report #: 28945-67214-3646

Instrument Data

Calibration Date:	August 9, 2023	Reference:	Manufactures Tolerances
Recommended Due Date:	August 9, 2024	Cal-Cert Procedure:	CP-080
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Delmhorst	Temperature:	74 °F
Type:	Resistivity Meter	Humidity:	36% RH
Model Number:	MCS-1	Asset #:	#094
Serial #:	#094	Service Location:	Cal-Cert Lab
Capacity:	120 Megaohms	As Found:	Pass
Tolerance:	3.00 % of indication	As Left:	Pass

Instrument Range:		120 Megaohms		Resolution:	0.001	Mode Verified:	Resistance
Standard Reading	UUT	UUT	Error	UUT	Error		
	As Found	Reading #1		Reading #2			
0.000	0.000	0.000	0.000	0.000	0.000		
1.100	1.095	1.095	-0.005	1.095	-0.005		
54.545	54.719	54.719	0.173	54.719	0.173		
0.000	0.000	0.000	0.000	0.000	0.000		

Expanded Uncertainty± 2.50 Megaohms

Remarks:

100Mohm std Parallel with 120Mohm UUT= 54.545Mohms

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

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Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

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Service Engineer: Brent Enbysk

Date: August 9, 2023

Technical Manager: Marshall Doyle

Signature:



CERTIFICATE OF CALIBRATION

CUSTOMER: PFS-TECO : CLACKAMAS, OR
PO NUMBER: 1097
INST. MANUFACTURER: DWYER
INST. DESCRIPTION: VELOMETER
MODEL NUMBER: 471
SERIAL NUMBER: CP288569 ID# 095
RATED ACCURACY: SEE NOTES BELOW.
UNCERTAINTY GIVEN: $\pm 0.43\%$ RD ; k=2

CALIBRATION DATE: 05/23/2023
CALIBRATION DUE: 05/23/2024
PROCEDURE: T.O.33K8-4-1769-1
CALIBRATION FLUID: AIR @ 14.7 PSIA 70°F
RECEIVED CONDITION: WITHIN MFG. SPECS.
LEFT CONDITION: WITHIN MFG. SPECS.
AMBIENT CONDITIONS: 763mm HGA 53% RH 71°F
CERTIFICATE FILE #: 490265.2023

NOTES: $\pm 3.0\%$ FS (0-500 / 0-1500) ** $\pm 4.0\%$ F.S. (0-5000) ** $\pm 5.0\%$ F.S. (0-15000) ** $\pm 2\%$ °F

Q.MANUAL IM 2.0 REV 2020.2 DATED 7-27-2020

DECISION RULE: SIMPLE ACCEPTANCE. MEASUREMENT UNCERTAINTIES NOT TAKEN INTO CONSIDERATION WHEN DETERMINING PASS/FAIL

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM.STD. ACTUAL DEG. F
74	77	0 TO 200°F	0 TO 200°F
118	121	45.0	44.5
253	259	73.9	73.2
491	502	100.3	99.8
515	525		
1028	1049		
1492	1526		
502	514		
3145	3224		
4993	5135		
6892	7061		
14821	15229		

STANDARDS USED:

A310: TEMP. STANDARD ± 0.024 F TRACE# 1649766843	DUE	02/09/2024
A800: FLOW-DYNE SONIC NOZZLE SYSTEM 0 - 1086 CFM $\pm 0.46\%$ RD. TRACE# 144613547, 1424663640, 1583314714	DUE	12/10/2023

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

Dick Munns Company • 11133 Winners Circle, Los Alamitos, CA 90720
Phone: 714-827-1215 • www.dickmunns.com

This Calibration Certificate shall not be reproduced except, in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date:

Approved By:

Cal. Technician:

Calibrated at:

Lab

On-Site (Customer's)

5-23-2023

DC

Page 1 of 1



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PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIR10134307497231228

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
g	0.0001	QC012	12/28/23	12/14/22	6/2024

FUNCTIONAL CHECKS

ECCENTRICITY		LINEARITY		STANDARD DEVIATION			ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:		
100	0.0003	50 x 4	0.0002	100	0.0001		
As-Found:		As-Found:		1. 100.0000	5. 100.0000	9. 99.9999	
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	2. 100.0001	6. 99.9999	10. 99.9998	☐ Good ☒ Fair ☐ Poor
As-Left:		As-Left:		3. 99.9999	7. 99.9998	<u>Result</u>	Temperature: 21.4°C
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	4. 99.9999	8. 99.9999	0.00009	

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	200.0010	200.0000	0.00022
100	100.0008	100.0000	0.00022
50	50.0003	49.9999	0.00021
20	20.0001	20.0000	0.00021
0.1	0.0999	0.0999	0.00021
0.05	0.0499	0.0499	0.00021

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20kg to 1mg	7133	4/30/23	4/2024	20231034

Permanent Information Concerning this Equipment:

6 month calibration cycle

Comments/Info Concerning this Calibration:

12/28 RH = 40.5% Adjusted span.

Report prepared/reviewed by: R.B. Date: 12-28-23

Technician: R. Butcher

Signature: R. Butcher

THIS CERTIFICATE SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards. Results relate only to the item(s) tested. Unless otherwise noted, statements of conformity do not include measurement

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PT ID: DIR101



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Report of Calibration

Firm: PFS-TECO
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22
Purchase Order: 1067
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner
Customer ID: Listed in Table

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Stainless Steel	7.95 g/cm ³	200 mg & 100 mg	ASTM Class 1

Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:

100 g to 1 mg Working Standards Were Calibrated: 07/02/21 Due: 07/31/22 Standards ID: 723318

Mass Comparators Used: MET-05

Tested by: D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" (Previously known as "Apparent Mass vs. 8.0 g/cm³").

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor $k=2$ for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

page 1 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 05/09/22

Signature  David S. Thompson

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Report of Calibration

Firm: PFS-TECO
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22
Purchase Order: 1067
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner
Customer ID: Listed in Table

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.93 to 21.94	760.7 to 760.8	47.8 to 47.9

Conventional Mass Value

Nominal Value	As Found Value (g)	As Found Correction* (mg)	As Left Value (g)	As Left Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200 mg, 1000101395, #109-B	0.2000082	0.0082	0.2000082	0.0082	0.0014	0.010
100 mg, 1000126267, #109-A	0.1000065	0.0065	0.1000065	0.0065	0.0014	0.010

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within ASTM Class 1 tolerances As Found.

Recalibration Due: The customer has requested a 5-year calibration cycle. The calibration due date for these weights is 05/09/27. The values listed above were found at the time of calibration. Any number of factors may cause these items to drift out of calibration before the calibration interval has expired.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2017 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 to 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 05/09/22


Signature David S. Thompson

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Report and Certificate of Calibration



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Address
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Milwaukie, OR 97222

Local
503-654-9620



Report #: 32664-227238-5 **Customer PO#:** 1107
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: John Steinert
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

LP-00397 Gage Block Set Mitutoyo SN: 509020 Cal: 12/28/2022 Due: 12/28/2024 Vendor: BHD Test and Measurement Report #: 99826
LP-01346 Thermo-Hygrometer Comark SN: 06210350198 Cal: 02/17/2023 Due: 02/28/2024 Vendor: Cal-Cert Range: 122 °F 95 %RH Report #: 28026-67215-4239

Instrument Data

Calibration Date:	January 31, 2024	Reference:	ASME B89.1.13-2013
Calibration Due Date:	January 31, 2025	Cal-Cert Procedure:	CP-010
Calibration Frequency:	12 Months	Indicating System:	Vernier
Manufacturer:	Dwyer	Temperature:	67 °F
Type:	Micrometer	Humidity:	39% RH
Model Number:	Unknown	Asset #:	#217
Serial #:	Unknown	Service Location:	Cal-Cert Lab
Capacity:	1 Inches	As Found:	PASS
Resolution:	0.001 Inches	As Left:	PASS

Instrument Range:		Range Resolution:				
1.000 Inches		0.001 Inches				
Calibration Standard	As Found	As Left Reading 1	As Left Reading 2	Tolerance ±	Expanded Uncertainty	
Inches	Inches	Inches	Inches	Inches	Inches	Inches
0.000	0.000	0.000	0.000	0.001	0.0006	
0.200	0.200	0.200	0.200	0.001	0.0006	
0.400	0.400	0.400	0.400	0.001	0.0006	
0.600	0.600	0.600	0.600	0.001	0.0006	
0.800	0.800	0.800	0.800	0.001	0.0006	
1.000	1.000	1.000	1.000	0.001	0.0006	

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

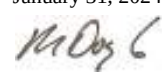
This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above.

Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

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Service Engineer: Cameron Walling **Date:** January 31, 2024

Technical Manager: Marshall Doyle **Signature:** 



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PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIR101C101887029231228

A2LA ACCREDITED **CERTIFICATE OF CALIBRATION WITH DATA**

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Mettler	IND570 - 1000lbx0	C101887029	#190	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.02	QC033	12/28/23	12/14/22	12/2024

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:	
400	0.10	HB44	HB44	200	0.04	
As-Found:		As-Found:		As-Found:		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	
As-Left:		As-Left:		As-Left:		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	

☐ Good

☒ Fair

☐ Poor

Temperature: 15.8°C

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	N/A	1000.02	0.012
600	600.66	599.98	0.011
400	400.46	399.90	0.011
200	200.16	200.00	0.011
100	100.10	99.96	0.011
50	50.04	49.98	0.011

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:

Comments/Information Concerning this Calibration

12/28/23 - Overload at 1000lb AF. 1000lb, 600lb AL readings show overload on node 3. Hysteresis 0.10lb. RH: 45.4%

Report prepared/reviewed by: R.B. Date: 12-28-23

Technician: C. Call

Signature: [Signature]

THIS CERTIFICATE SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation 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.

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Edgetech Instruments

CERTIFICATE OF CALIBRATION

Customer: PFS-TECO

Date of Certificate Issue: 02/09/24

Certificate No.: 54129_02.24_DTH

11785 SE Highway 212, Clackamas, OR 97015

Procedure: PRM07-07-DewTrak II

Manufacturer: Edgetech Instruments

Cal Date: 02/09/24

Model: DewTrak II / D2

Due Date: 02/09/25

Description: Chilled Mirror Hygrometer

Cal Interval Months: 12

Serial No.: 54129 / 2A5648

SO/RMA No.: 16407

Asset/ID No.: Unknown

As-Found Condition: In-Tolerance

Calibration Method: Comparison

As-Left Condition: Left, As-Found

Environmental Conditions: Temperature: 73.6 °F | Humidity: 13.9 % rh

This certifies the above instrument meets or exceeds published measurements specifications and has been calibrated using standards traceable to the international system of units (SI) through the National Institute of Standard and Technology (NIST). The policies and procedures used at this facility are in full compliance with ISO/IEC 17025-2017(E) international standard. This certificate shall not be reproduced, except in full, without the written approval of the calibration laboratory of Edgetech Instruments Inc. The environment in which this instrument was calibrated is maintained within the operating specifications of the instrument and the standards. All calibration results relate to items calibrated only.

Note: The calibration results were analyzed and pass or fail criteria is based on the accuracy specifications provided on this item report. The uncertainty of measurement is not factored in for pass or fail criteria and are only reported for the customer analysis.

Standard Used:

Asset #	Make / Model	Due Date
285	ETI DewTrak II	10/24/24
173	ETI DewMaster	08/10/24
291	ETI RH-Calibrator	05/20/24
172	ETI DewMaster	12/08/24



Accreditation # 92175

Performed by:

Greg Meunier

Greg Meunier, Calibration Technician

Verified by:

Dexter Ekeh

Dexter Ekeh, Calibration Technician

Calibration Location: Edgetech Instruments at 399 River Rd., Hudson, MA 01749

CERTIFICATE OF CALIBRATION

Customer: PFS-TECO

Date of Certificate Issue: 02/09/24

Certificate No.: 54129_02.24_DTII

Decision rule 1 Measurement of uncertainty is not taken into account when stating conformity .When determining an "in-tolerance" or "out-of-tolerance" conditions on calibrations the measurement uncertainty will not be taken into account .When a measurement result is declared "in-tolerance", the measured value(s) shall fall within the appropriate specification limit and the uncertainty of the measured value shall be stated and provided

UUT Accuracy Specifications | FP/DP: +/- 0.2 °C

As Found Data: In-Tolerance

As Left Data: Left, As-Found

Test:	Ref. °C	UUT °C	Dev. °C	U k=2 C
Dew Point	40.04	39.98	0.06	N/A
Dew Point	13.88	13.99	0.11	0.08
Frost Point	-10.00	-9.83	0.17	0.08

U k=2 uncertainty data for Dew points above 20° C are not 17025 Accredited: N/A

Note: Compliance – The measurement results are within (or below) the specification limit when the measurement uncertainty is taken into account. For the above calibration point that it is not possible to state compliance using a 95 % coverage probability for the expanded uncertainty the measurement result is below the limit or within specification

End of Certificate

DT II_05_22_13_FP

Report and Certificate of Calibration



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Milwaukie, OR 97222

Local
503-654-9620



Report #: 32102-201251-4686 **Customer PO#:** 1102
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

10-00954 Gage Block Set Shars SN: 120018 Cal: 05/26/2023 Due: 05/26/2025 Vendor: American Gage Report #: 109141
LP-00397 Gage Block Set Mitutoyo SN: 509020 Cal: 12/28/2022 Due: 12/28/2024 Vendor: BHD Test and Measurement Report #: 99826
LP-01757 Thermo-Hygrometer Comark SN: 06257740560 Cal: 04/28/2023 Due: 04/28/2024 Report #: 29096-209333-4201

Instrument Data

Calibration Date:	December 6, 2023	Reference:	Manufacturer's Spec
Calibration Due Date:	December 6, 2024	Cal-Cert Procedure:	CP-115
Calibration Frequency:	12 Months	Indicating System:	Stamped
Manufacturer:	Starrett	Temperature:	69 °F
Type:	Tape Measure	Humidity:	51% RH
Model Number:	Exact	Asset #:	207
Serial #:	138054-2203-00002249	Service Location:	Cal-Cert Lab
Capacity:	192.00 Inches	As Found:	Pass
		As Left:	Pass

Instrument Range:		192.000 Inches	Range Resolution:		0.06250 Inches
	Calibration Standard	As Found Reading	Verification Reading #1	Verification Reading #2	
	0.2500	0.2500	0.2500	0.2500	
	1.0000	1.0000	1.0000	1.0000	
	6.0000	6.0000	6.0000	6.0000	
	12.0000	12.0000	12.0000	12.0000	
	64.0000	64.0000	64.0000	64.0000	
	128.0000	128.0000	128.0000	128.0000	
	192.0000	192.0000	192.0000	192.0000	

Expanded Uncertainty ± 0.07217 Inches

Remarks:

Metric scale not calibrated.

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSS Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated. All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

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Service Engineer: Scott McGuire **Date:** December 6, 2023
Technical Manager: Marshall Doyle **Signature:**

Report and Certificate of Calibration



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800-556-9922

Address:
4777 SE International Way
Milwaukie, OR 97222

Local:
503-634-6922



Report #: 31621-201253-5 **Customer PO#:** 1102
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

LP-00397 Gage Block Set Mitutoyo SN: 509020 Cal: 12/28/2022 Due: 12/28/2024 Vendor: BHD Test and Measurement Report #: 99826
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/30/2023 Due: 01/31/2024 Range: 122 °F 95 %RH Report #: 27747-205513-4239

Instrument Data

Calibration Date:	October 23, 2023	Reference:	ASME B89.1.14 2018
Calibration Due Date:	October 23, 2024	Cal-Cert Procedure:	CP-008
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Mitutoyo	Temperature:	66 °F
Type:	Digital Caliper	Humidity:	51% RH
Model Number:	CD-P6"S	Asset #:	208
Serial #:	B22159310	Service Location:	Cal-Cert Lab
Capacity:	6 Inches	As Found:	PASS
Resolution:	0.0005 Inches	As Left:	PASS

Instrument Range:	6.0000 Inches	Range Resolution:	0.0005 Inches
--------------------------	---------------	--------------------------	---------------

Outside Jaws / Linearity				
Calibration Standard Inches	As Found Inches	As Left Reading 1 Inches	As Left Reading 2 Inches	Tolerance ± Inches
0.0000	0.0000	0.0000	0.0000	0.0000
0.0500	0.0495	0.0495	0.0495	0.0010
0.3000	0.3000	0.3000	0.3000	0.0010
0.6000	0.6000	0.6000	0.6000	0.0010
1.2000	1.1995	1.1995	1.1995	0.0010
2.4000	2.4000	2.4000	2.4000	0.0010
3.5000	3.5000	3.5000	3.5000	0.0010
5.0000	5.0000	5.0000	5.0000	0.0010
6.0000	5.9995	5.9995	5.9995	0.0010

Expanded Uncertainty ± 0.00036 Inches

Scale Shift Verification			
	Target	Measured	Tolerance ±
Resolution Check	0.1005	0.10050	N/A
Depth	1.000	1.00000	0.001
Step	1.000	1.00000	0.001
Inside Jaws	1.000	0.99950	0.001
Inspections			
Jaws Parallel		Acceptable	

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above.
Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Cameron Walling **Date:** October 23, 2023
Technical Manager: Marshall Doyle **Signature:**

Caliper CF-008-01

Revision 17 6/30/2023

Report and Certificate of Calibration



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800-328-4800

Address
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Milwaukie, OR 97122

Local
503-634-0900



Report #: 33086-206392-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

13-01811 Thermocouple Meter/Calibrator Tegan SN: 2454186 Cal: 10/04/2023 Due: 02/28/2024 Range: 2400 °F Report #: 31363-217443-3646
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 26, 2024	Reference:	Navair 17-20ST-95
Recommended Due Date:	February 26, 2025	Cal-Cert Procedure:	CP-013
Calibration Frequency:	12 Months	Indicating System:	Computer
Manufacturer:	National Instruments	Temperature:	70 °F
Type:	Data Logger	Humidity:	42% RH
Model Number:	NI 9213	Asset #:	216 Booth 2
Serial #:	1E286FA	Service Location:	Service Address
Resolution:	0.1 °F	As Found:	Pass
Capacity:	2,500 °F	As Left:	Pass
Tolerance:	± 2.0 °F		
Thermocouple Type:	K		

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Tunnel	0.00	-0.10	-0.10	-0.10	0.10	0.346
	500.00	499.80	499.80	499.80	-0.20	
	1000.00	1000.00	1000.00	1000.00	0.00	
	1500.00	1499.90	1499.90	1499.90	-0.10	
	2000.00	1999.90	1999.90	1999.90	-0.10	
	2400.00	2399.90	2399.90	2399.90	-0.10	
	0.00	-0.20	-0.20	-0.20	0.20	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Flue	0.00	-0.30	-0.30	-0.30	0.30	0.346
	500.00	499.70	499.70	499.70	-0.30	
	1000.00	999.80	999.80	999.80	-0.20	
	1500.00	1499.80	1499.80	1499.80	-0.20	
	2000.00	1999.80	1999.80	1999.80	-0.20	
	2400.00	2399.70	2399.70	2399.70	-0.30	
	0.00	-0.30	-0.30	-0.30	0.30	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Filter A	0.00	-0.50	-0.50	-0.50	0.50	0.346
	500.00	499.50	499.50	499.50	-0.50	
	1000.00	999.70	999.70	999.70	-0.30	
	1500.00	1499.60	1499.60	1499.60	-0.40	
	2000.00	1999.50	1999.50	1999.50	-0.50	
	2400.00	2399.50	2399.50	2399.50	-0.50	
	0.00	-0.50	-0.50	-0.50	0.50	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Back	0.00	-0.60	-0.60	-0.60	0.60	0.346
	500.00	499.40	499.40	499.40	-0.60	
	1000.00	999.50	999.50	999.50	-0.50	
	1500.00	1499.50	1499.50	1499.50	-0.50	
	2000.00	1999.40	1999.40	1999.40	-0.60	
	2400.00	2399.40	2399.40	2399.40	-0.60	
	0.00	-0.60	-0.60	-0.60	0.60	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Catalyst	0.00	-0.8	-0.8	-0.8	0.80	0.346
	500.00	499.30	499.30	499.30	-0.70	
	1000.00	999.40	999.40	999.40	-0.60	
	1500.00	1499.30	1499.30	1499.30	-0.70	
	2000.00	1999.30	1999.30	1999.30	-0.70	
	2400.00	2399.20	2399.20	2399.20	-0.80	
	0.00	-0.7	-0.7	-0.7	0.70	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Meter A	0.00	-0.90	-0.90	-0.90	0.90	0.346
	500.00	499.20	499.20	499.20	-0.80	
	1000.00	999.30	999.30	999.30	-0.70	
	1500.00	1499.20	1499.20	1499.20	-0.80	
	2000.00	1999.20	1999.20	1999.20	-0.80	
	2400.00	2399.10	2399.10	2399.10	-0.90	
	0.00	-0.90	-0.90	-0.90	0.90	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Left	0.00	-0.80	-0.80	-0.80	0.80	0.346
	500.00	499.20	499.20	499.20	-0.80	
	1000.00	999.40	999.40	999.40	-0.60	
	1500.00	1499.30	1499.30	1499.30	-0.70	
	2000.00	1999.20	1999.20	1999.20	-0.80	
	2400.00	2399.20	2399.20	2399.20	-0.80	
	0.00	-0.80	-0.80	-0.80	0.80	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Right	0.00	-0.90	-0.90	-0.90	0.90	0.346
	500.00	499.10	499.10	499.10	-0.90	
	1000.00	999.20	999.20	999.20	-0.80	
	1500.00	1499.20	1499.20	1499.20	-0.80	
	2000.00	1999.10	1999.10	1999.10	-0.90	
	2400.00	2399.00	2399.00	2399.00	-1.00	
	0.00	-1.00	-1.00	-1.00	1.00	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Filter B	0.00	0.00	0.00	0.00	0.00	0.346
	500.00	500.50	500.50	500.50	0.50	
	1000.00	1000.20	1000.20	1000.20	0.20	
	1500.00	1499.80	1499.80	1499.80	-0.20	
	2000.00	1999.40	1999.40	1999.40	-0.60	
	2400.00	2399.00	2399.00	2399.00	-1.00	
	0.00	0.00	0.00	0.00	0.00	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Top	0.00	-1.20	-1.20	-1.20	1.20	0.346
	500.00	498.90	498.90	498.90	-1.10	
	1000.00	999.00	999.00	999.00	-1.00	
	1500.00	1498.90	1498.90	1498.90	-1.10	
	2000.00	1998.90	1998.90	1998.90	-1.10	
	2400.00	2398.70	2398.70	2398.70	-1.30	
	0.00	-1.20	-1.20	-1.20	1.20	

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSS Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above.

Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

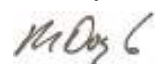
All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 26, 2024

Technical Manager: Marshall Doyle

Signature: 

Report and Certificate of Calibration



www.Cal-Cert.com

Toll Free
800-334-6666

Address
4777 SE International Way
Milwaukie, OH 97002

Local
503-664-0900



Report #: 33086-206392-4525-B **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

13-01811 Thermocouple Meter/Calibrator Tegan SN: 2454186 Cal: 10/04/2023 Due: 02/28/2024 Range: 2400 °F Report #: 31363-217443-3646
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 26, 2024	Reference:	Navair 17-20ST-95
Recommended Due Date:	February 26, 2025	Cal-Cert Procedure:	CP-013
Calibration Frequency:	12 Months	Indicating System:	Computer
Manufacturer:	National Instruments	Temperature:	70 °F
Type:	Data Logger	Humidity:	42% RH
Model Number:	NI 9213	Asset #:	216 Booth 2
Serial #:	1E286FA	Service Location:	Service Address
Resolution:	0.1 °F	As Found:	Pass
Capacity:	2,500 °F	As Left:	Pass
Tolerance:	± 2.0 °F		
Thermocouple Type:	K		

Thermocouple LOGGING FUNCTION

Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Bottom	0.00	-1.30	-1.30	-1.30	1.30	0.346
	500.00	498.80	498.80	498.80	-1.20	
	1000.00	998.90	998.90	998.90	-1.10	
	1500.00	1498.90	1498.90	1498.90	-1.10	
	2000.00	1998.70	1998.70	1998.70	-1.30	
	2400.00	2398.60	2398.60	2398.60	-1.40	
	0.00	-1.30	-1.30	-1.30	1.30	

Thermocouple LOGGING FUNCTION

Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Meter B	0.00	-1.30	-1.30	-1.30	1.30	0.346
	500.00	498.80	498.80	498.80	-1.20	
	1000.00	998.90	998.90	998.90	-1.10	
	1500.00	1498.90	1498.90	1498.90	-1.10	
	2000.00	1998.70	1998.70	1998.70	-1.30	
	2400.00	2398.60	2398.60	2398.60	-1.40	
	0.00	-1.30	-1.30	-1.30	1.30	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Meter C	0.00	-1.50	-1.50	-1.50	1.50	0.346
	500.00	498.60	498.60	498.60	-1.40	
	1000.00	998.70	998.70	998.70	-1.30	
	1500.00	1498.70	1498.70	1498.70	-1.30	
	2000.00	1998.60	1998.60	1998.60	-1.40	
	2400.00	2398.40	2398.40	2398.40	-1.60	
	0.00	-1.50	-1.50	-1.50	1.50	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Filter C	0.00	-1.50	-1.50	-1.50	1.50	0.346
	500.00	498.70	498.70	498.70	-1.30	
	1000.00	998.80	998.80	998.80	-1.20	
	1500.00	1498.70	1498.70	1498.70	-1.30	
	2000.00	1998.60	1998.60	1998.60	-1.40	
	2400.00	2398.50	2398.50	2398.50	-1.50	
	0.00	-1.40	-1.40	-1.40	1.40	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Ambient	0.00	-1.2	-1.2	-1.2	1.20	0.346
	20.00	18.90	18.90	18.90	-1.10	
	40.00	39.00	39.00	39.00	-1.00	
	60.00	58.90	58.90	58.90	-1.10	
	80.00	79.00	79.00	79.00	-1.00	
	100.00	98.90	98.90	98.90	-1.10	
	0.00	-1.1	-1.1	-1.1	1.10	

Remarks:

15 Channels, Ambient is Type-T calibrated from 0 to 100°F per customer request.

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above.

Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 26, 2024

Technical Manager: Marshall Doyle

Signature:





Making our world
more productive

DocNumber: 539508



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

LGEK6G TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97082-9547

Certificate Issuance Date: 05/08/2023

Linde Order Number: 72422800

Buyer Number: NI CD17C08E-AS

Customer PO Number: 80430565

Fil Date: 05/02/2023

Lot Number: 70066312207

Cylinder Style & Outer: AS CGA 550

Cylinder Pressure and Volume: 1290 psig 99 ft³

Certified Concentration

Expiration Date:	05/08/2031	NIST Traceable
Cylinder Number:	CC505834	Expanded Uncertainty
16.98 %	Carbon dioxide	± 0.13 %
4.30 %	Carbon monoxide	± 0.03 %
17.16 %	Oxygen	± 0.05 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 05/08/2023

Term: 96 Months

Expiration Date: 05/08/2031

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document EPA-600/R-12/031, 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.

CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: Carbon dioxide

Requested Concentration: 17 %
Certified Concentration: 16.98 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 04/05/2023

Reference Standard: Type / Cylinder #: NTRM / CC728961

Concentration / Uncertainty: 16.94 % ± 0.03 %
Expiration Date: 01/12/2027

Traceable to: SRM # / Sample # / Cylinder #: NTRM / 150701 / CC725873
SRM Concentration / Uncertainty: 16.94 % ± 0.031 %
SRM Expiration Date: 01/12/2027

First Analysis Data:				Date	05/08/2023
Z:	0	R:	16.34	C:	16.98
R:	16.26	Z:	0	C:	16.99
Z:	0	C:	17	R:	16.35
UOM:	%	Mean Test Result:	16.98 %		

Second Analysis Data:				Date	
Z:	0	R:	0	C:	0
R:	0	Z:	0	C:	0
Z:	0	C:	0	R:	0
UOM:	%	Mean Test Result:			

2. Component: Carbon monoxide



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PPKKG TUALATIN OR H
10400 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062-9547

Certificate Issue Date: 10/16/2019

Praxair Order Number: 71120745

Part Number: NI CD100033E AS

Customer PO Number: 79106732

Fill Date: 10/06/2019

Lot Number: 70089328102

Cylinder Style & Outlet: AS

CGA 550

Cylinder Pressure and Volume: 2000 psig 140 ft³

Certified Concentration

Expiration Date:	10/16/2027	NIST Traceable
Cylinder Number:	CC139173	Expanded Uncertainty
10.09 %	Carbon dioxide	± 0.4 %
2.53 %	Carbon monoxide	± 0.6 %
10.48 %	Oxygen	± 0.4 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 10/16/2019

Term: 96 Months

Expiration Date: 10/16/2027

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/631, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.

CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(P=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: Carbon dioxide

Requested Concentration: 10 %
Certified Concentration: 10.09 %
Instrument Used: Horiba VIA-510 S/N 20C194W6
Analytical Method: NDIR
Last Multipoint Calibration: 06/19/2019

First Analysis Data:	Date	10/16/2019
Z: 0 R: 14 C: 10.09 Conc: 10.09		
R: 14 Z: 0 C: 10.1 Conc: 10.1		
Z: 0 C: 10.1 R: 14.01 Conc: 10.1		
UOM: %	Mean Test Assay:	10.09 %

Reference Standard: Type / Cylinder #: GMS / CC164230

Concentration / Uncertainty: 14.00 % ± 0.26%

Expiration Date: 04/16/2027

Traceable to: SRM # / Sample # / Cylinder #: SRM 1675a / 6-P-51 / CAL014539

SRM Concentration / Uncertainty: 13.903% / ± 0.034%

SRM Expiration Date: 05/16/2022

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: 2.5 %
Certified Concentration: 2.53 %
Instrument Used: Horiba VIA-510 S/N US9UC9X
Analytical Method: NDIR
Last Multipoint Calibration: 06/19/2019

First Analysis Data:	Date	10/16/2019
Z: 0 R: 5 C: 2.53 Conc: 2.53		
R: 5 Z: 0 C: 2.53 Conc: 2.53		
Z: 0 C: 2.54 R: 5.01 Conc: 2.54		
UOM: %	Mean Test Assay:	2.53 %

Reference Standard: Type / Cylinder #: GMS / CC242033

Concentration / Uncertainty: 5.00 % ± 0.43%

Expiration Date: 04/09/2025

Traceable to: SRM # / Sample # / Cylinder #: SRM 2642a / 51-0-23 / FF23105

SRM Concentration / Uncertainty: 7.859% / ± 0.33%

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: 10.5 %
Certified Concentration: 10.48 %
Instrument Used: OXYMAT 5II
Analytical Method: Paramagnetic
Last Multipoint Calibration: 06/19/2019

First Analysis Data:	Date	10/16/2019
Z: 0 R: 9.88 C: 10.48 Conc: 10.48		
R: 9.88 Z: 0 C: 10.48 Conc: 10.48		
Z: 0 C: 10.5 R: 9.89 Conc: 10.49		
UOM: %	Mean Test Assay:	10.48 %

Reference Standard: Type / Cylinder #: NTRM / DT0010384

Concentration / Uncertainty: 9.875 % ± 0.4%

Expiration Date: 11/16/2022

Traceable to: SRM # / Sample # / Cylinder #: NTRM / 170701 / NTRM DT0010384

SRM Concentration / Uncertainty: 9.875% / ± 0.040%

SRM Expiration Date: 11/16/2022

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

Jose Vazquez

Certified By

Jenna Lockman



Compressed gas, n.o.s.
(Carbon Monoxide, Carbon Dioxide, Oxygen,
Nitrogen)

UN1956

SPG 5P10162.5VM2
Part Number

Primary Standard, +/- 0.02% Absolute

2.500 % Carbon Monoxide
10.00 % Carbon Dioxide
10.00 % Oxygen
Balance Nitrogen

CAS:	630-08-0
CAS:	124-38-9
CAS:	7782-44-7
CAS:	7727-37-9

DANGER: CAUSES DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE WHEN HEATED. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. MAY INCREASE RESPIRATION AND HEARTRATE. Use only with equipment of compatible materials of construction and rated for cylinder pressure. Protect from sunlight when ambient temperature exceeds 52C (125F). Use a back flow preventive device in the piping. Close valve after each use and when empty. Do not open valve until connected to equipment prepared for use. Obtain special instructions before use. Protect from sunlight. Store in a well-ventilated place. IF exposed or concerned: Get medical advice. Store locked up. Dispose of contents/container in accordance with container/supplier owner instructions. Do not handle until all safety precautions have been read and understood. Do not breathe gas. Wash hands thoroughly after handling. Do not eat, drink, or smoke when using this product. Wear protective gloves, protective clothing, eye protection, and/or face protection. Read and follow the Safety Data Sheet (SDS) before use.

FIRST AID: IF ON SKIN: wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing. IF exposed or concerned: Get medical advice.



WARNING: This product can expose you to Carbon Monoxide which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Lot No: 1-053-122
Serial Number: CC341544
SPG 5P10162.5VM2
Part Number
PO #: 206483
Expires: 2-2024

NorLAB

To Order Call: 800-657-6672

In Emergency Call: 1-800-424-6300
Norco, Inc.
808 W. Gower Road
Boise, Idaho 83705



CERTIFICATE OF CALIBRATION

CUSTOMER: PFS-TECO CLACKAMAS OR
PO NUMBER: 1088
INST. MANUFACTURER: OMEGA
INST. DESCRIPTION: MASS FLOWMETER
MODEL NUMBER: FMA-1608A
SERIAL NUMBER: 285467 197
RATED ACCURACY: +/- .8 % RD, + .2 % F.S.
UNCERTAINTY GIVEN: TOTAL measurement uncertainty: +/- .186 % RD, K = 2
NOTES: REFERENCE CONDITIONS: 760mm HGA & 70 DEG. F QM.IM 2.0 REV. DATED 7-27-2020
DECISION RULE: SIMPLE ACCEPTANCE. MEASUREMENT UNCERTAINTIES NOT TAKEN INTO CONSIDERATION WHEN DETERMINING PASS/FAIL

CALIBRATION DATE: 04/09/24
CALIBRATION DUE: 04/09/25
PROCEDURE: NAVAIR-17-20MG-20
CALIBRATION FLUID: AIR
AS RECEIVED: WITHIN SPECS.
AS RETURNED: WITHIN SPECS.
AMBIENT CONDITIONS: 765 mm HGA 53 % RH 73 F
CERTIFICATE FILE #: 531513.2024

TEST POINT NUMBER	UUT INDICATED SLPM	DM.STD. ACTUAL SLPM	LOWER LIMITS SLPM	UPPER LIMITS SLPM
1	1.998	1.967	1.942	2.054
2	4.014	3.960	3.942	4.086
3	5.979	5.937	5.891	6.067
4	8.024	7.981	7.920	8.128
5	9.996	9.947	9.876	10.116
6	11.993	11.942	11.857	12.129
7	14.014	13.963	13.862	14.166
8	15.978	15.928	15.810	16.146
9	17.964	17.918	17.780	18.148
10	19.992	19.934	19.792	20.192

STANDARDS USED:

A24 TEMP.STD.:HART SCIENTIFIC +/- .025 F (+/- .04 C) TRACE# 1683031933	DUE	05/02/24
A5 VOLUME PROVER +/- .04% BY VOLUME 2-1200 ACPM .21%RD RD TRACE# 1649766843,06290041521	DUE	01/18/25
A290 VOLUME PROVER +/- .12% RD TRACE# 1553246286	DUE	04/18/24
A800 FLOWCART critical flow nozzles +/- .2% RD 2-1050 SCFH TRACE# 344933547,1424803040,1383334714	DUE	05/12/24

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

Dick Munns Company - 11133 Winners Circle, Los Alamitos, CA 90720
Phone: 714-827-1215 - www.dickmunns.com

This Calibration Certificate shall not be reproduced except, in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date:

Approved By:

Cal. Technician:

Calibrated at: ☒ Lab

☐ On-Site (Customer's)

Page 1 of 1

04/09/2024

[Signature]

[Signature]

Thermo Fisher Scientific Inc.

Serial # CVK 7037

Weight One	Weight Two	Weight Three	Average Weight
<u>0.094101</u> grams	<u>0.094103</u> grams	<u>0.094102</u> grams	<u>0.09410</u> grams

Technician: Ying Dunn 2-18-21
Name Date

Q.A.: [Signature] 2/18/21
Name Date

This filter has been weighed on a laboratory balance that is calibrated and certified traceable to NIST test standards.



CERTIFICATE OF CALIBRATION

CUSTOMER:	PFS-TECO; CLACKAMAS, OR	CALIBRATION DATE:	06/17/2024
PO NUMBER:	1120	CALIBRATION DUE:	06/17/2025
INST. MANUFACTURER:	AQUATECH SCIENTIFIC INSTRUMENTS	PROCEDURE:	NAVAIR-17-20MG-02,5T-104
INST. DESCRIPTION:	DIGITAL BAROMETER	CALIBRATION FLUID:	AIR
MODEL NUMBER:	DBX2	AS RECEIVED:	WITHIN SPECS.
SERIAL NUMBER:	118222	AS RETURNED:	WITHIN SPECS.
RATED ACCURACY:	+/- .18 mmHGA	AMBIENT CONDITIONS:	763 mmHGA, 45% RH, 75F
UNCERTAINTY GIVEN:	+/- .03mmHGA.;k=2	CERTIFICATE FILE #:	533813.2024
NOTES: AS RECEIVED / AS LEFT WITHIN SPECS.			

DECISION RULE: SIMPLE ACCEPTANCE. MEASUREMENT UNCERTAINTIES NOT TAKEN INTO CONSIDERATION WHEN DETERMINING PASS/FAIL

TEST POINT NUMBER	UUT INDICATED mmHGA	DM.STD. ACTUAL mmHGA	% RD. ERROR	TEST RESULTS
1	605.27	605.335	0.010	PASS
2	634.40	634.454	0.009	PASS
3	675.73	675.805	0.011	PASS
4	701.16	701.223	0.009	PASS
5	725.02	725.102	0.011	PASS
6	763.27	763.352	0.011	PASS
7	775.01	775.101	0.012	PASS

STANDARDS USED:

A22 0-1000mmHGA .05mmHGA TRACE#1616426098

DUE

04/27/25

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

Dick Munns Company • 11133 Winners Circle, Los Alamitos, CA 90720
Phone: 714-827-1215 • www.dickmunns.com

This Calibration Certificate shall not be reproduced except, in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date:

Approved By:

Cal. Technician:

Calibrated at: ☒ Lab

☐ On-Site (Customer's)

6-17-2024

Page 1 of 1



CERTIFICATE OF CALIBRATION

CUSTOMER: PFS-TECO; CLACKAMAS, OR
PO NUMBER: 1096
INST. MANUFACTURER: AQUATECH SCIENTIFIC INSTRUMENTS
INST. DESCRIPTION: DIGITAL BAROMETER
MODEL NUMBER: DBX2
SERIAL NUMBER: 118222
RATED ACCURACY: +/- .18 mmHGA
UNCERTAINTY GIVEN: +/- .03mmHGA, k=2
NOTES: AS REC./AS LEFT WITHIN SPECS. ** DECISION RULE: PFA NOT USED TO DETERMINE CONFORMITY **

CALIBRATION DATE: 05/23/2023
CALIBRATION DUE: 05/23/2024
PROCEDURE: NAVAIR-17-20MP-03
CALIBRATION FLUID: AIR @ 70F
STANDARD(S) USED: A321, A22 DUE 3-2024
NIST TRACE #'S: 1236086968, 1583142077
AMBIENT CONDITIONS: 757 mmHGA, 60% RH, 68F
CERTIFICATE FILE #: 533813

TEST POINT	UUT	DM.STD.	
NUMBER	INDICATED	ACTUAL	% RD. ERROR
	mmHGA	mmHGA	
1	605.24	605.330	0.015
2	635.45	635.525	0.012
3	678.24	678.303	0.009
4	702.18	702.258	0.011
5	724.19	724.295	0.014
6	757.11	757.231	0.016
7	775.39	775.525	0.017



All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

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Issuing Date:

Approved By:

Cal. Technician:

Calibrated at: ☒ Lab

☐ On-Site (Customer's)

5-23-2023

Page 1 of 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Bernard Blouin
Mechanical Engineer
Stove Builder International, Inc.
250, De Copenhague
St-Augustin-de-Desmaures (Qc)
G3A 2H3, Canada

02/06/2024

Dear Mr. Blouin,

This letter is in response to your correspondence, which started November 17th, 2023, went through several iterations, email discussions and resulted in a final letter dated January 11th, 2024. In your letters, you request the use of alternative testing procedures to demonstrate compliance with the cord wood emissions standard published in 40 CFR part 60, Subpart AAA – Standards of Performance for New Residential Wood Heaters (Subpart AAA). 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 testing procedures and our approval decisions are discussed below.

According to the information provided in your correspondence, you seek an alternative test method and testing procedures for use when conducting testing on the Stove Builder International Inc. (SBI) Everest III Series residential wood heater. Currently, as required by section 60.534(a)(2) of Subpart AAA, a manufacturer, when using the 2020 cord wood alternative compliance option, must have their appliance tested by an EPA-approved test laboratory and the testing conducted with cord wood using an alternative cord wood test method approved by the EPA Administrator or their delegated authority to establish the certification test conditions and the particulate matter (PM) emission values.

Your request seeks to use the specified modifications, detailed below, coupled with **NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard (attached)** as the alternative cord wood test method to certify the SBI Everest III Series model line. In your request, you state that the SBI Everest III Series is a room heater and that you are seeking a cord wood alternative test method to use for compliance testing. You also state, in your request letter, that your appliance has a usable firebox volume of 2.61 ft³ and an overall firebox volume of 3.04 ft³.

Because the longest length (nominal width) of your usable firebox is 18.28 inches, you state that you will use cord wood fuel with a nominal length of 16.0in length, loaded in East-West fashion, for testing which represents 80% to 95% of the usable firebox width (the longest dimension). In your request, you state that you would like to use Big Leaf Maple cord wood for compliance testing. This fuel is among the allowable

fuel species specified in the fuel load calculator that accompanies the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard.

We understand from your request, that you also seek use of several alternative testing procedures, detailed in the second list below, when conducting sampling as required by 40 CFR 60.534(c), which requires that PM emission concentrations be measured using ASTM E2515-11 *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel* (ASTM E2515-11). Additionally, in your request, you seek to use a separate ASTM E2515-11 sampling train for collecting the first hour of PM emissions, as is required by 40 CFR 60.534(d) that states the “approved test laboratory must also measure the first hour of PM emissions for each test run using a separate filter in one of the two parallel trains.” This third, identical and independent sampling train when used to sample concurrently for the first hour of the PM compliance testing will independently measure the first hour of PM emissions for each test run, thus avoiding the need to change filters in one of the paired trains.

Based on the information provided and with the caveats set forth below, we are approving your request to use NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard (attached) as the alternative cord wood test method when conducting certification testing as required by Subpart AAA, section 60.534(a)(2) on the SBI Everest III Series room heater with the modifications detailed below.

When using NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard as the alternative cord wood test method to certify the SBI Everest III Series, these changes and modifications must be made:

1. Owner’s Manual Requirements:

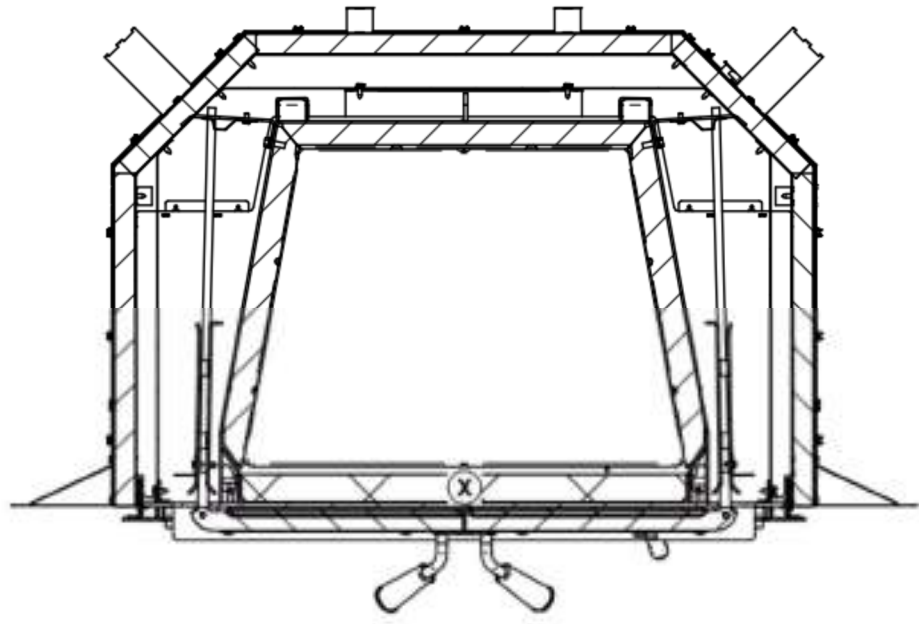
- A. A complete and final copy of the Owner’s manual must be provided to the test laboratory one day prior to the day of testing. This Owner’s manual must be the same manual provided to all owners upon purchase and all fuel loading details must meet the requirements of Section 11 in the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard.
- B. All certification test procedures must be consistent with the Owner’s manual and the manufacturer may not provide other operating instructions to the test lab.
- C. All fuel loading procedures and air control / door closing procedures must be included in the Owner’s manual. This includes necessary bypass operating instructions/ information required in Section 11.6.5.1 of The NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard, as well as required fuel piece length information required in section 11.3.4.1.3 of that test method.
- D. Kindling and start-up instructions in the owner’s manual are limited to top-down start, or bottom-up start direction. For the purposes of this testing, a bottom-up start will be required. There must be no discussion regarding fuel spacing and piece size in the instructions to the lab. However, general guidance on kindling and start-up fuel arrangement can be supplied (e.g., Split the start-up fuel piece into 6 pieces, use between 10-15 pieces of kindling, put the biggest pieces on the bottom and the smallest on top, stack into 5 to 7 layers).

- E. The Owner's manual information may inform the test laboratory on appliance operation however NO INSTRUCTIONS IN THE OWNER'S MANUAL MAY OVERRIDE ANY REQUIREMENT OF THIS TEST METHOD, ASTM E-2515, The NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard OR ANY provision stipulated in 40 CFR 60, Subpart AAA.

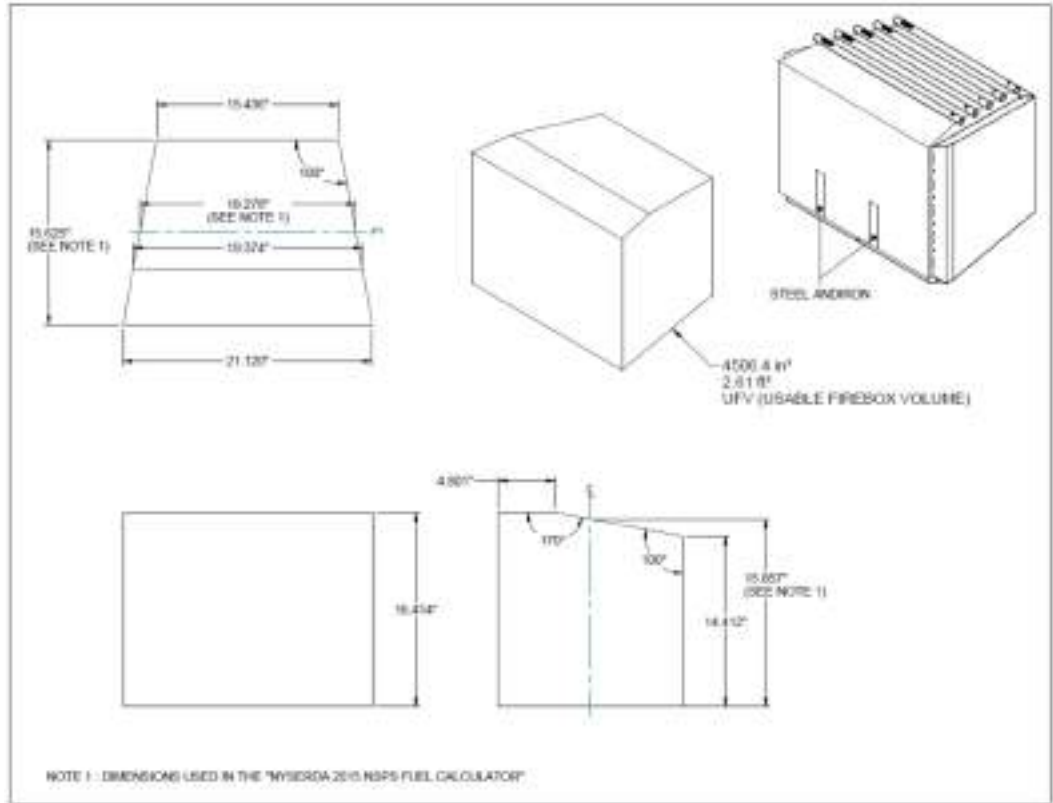
2. Section 8.3 – Additional firebox documentation requirements:

- A. Overall firebox dimensions and usable firebox dimensions must have been provided to EPA prior to alternative method approval. In addition, the usable firebox dimensions must be illustrated in the Owner's Manual with instructions to the end user for appropriate fueling/loading.
- B. Overall firebox volume and usable firebox volume must also be reported in the test report and must agree with dimensions stated in this letter.
- C. Fuel load density must be based on the usable firebox dimensions as determined below in this alternative test method approval.
- i. On the SBI Everest III Series, the Usable Firebox Volume (UFV) is smaller than the Overall Firebox Volume. The reason for this is because wood should not be placed on the lower primary air intake channel. As provided, the User's Owner's Manual section 2.4 for the SBI Everest III Series specifies:

"The images below show the space in the firebox where the logs are to be placed. It is important to always respect this space and not to put logs in the grid area marked with an X. The marked area is defined by the space between the glass and the steel andiron (not removable) supplied with the unit. Leave enough space between the logs for good air circulation. Using more than the usable firebox volume for loading wood will result in poor combustion. The Usable firebox volume of 2.61 ft³ shown below is the one used during EPA emissions certification. The recommended log length for this stove is 16 inches and the fuel species used for the EPA certification will be Big Leaf maple. "



ii. SBI Everest III Series UFV schematic:



iii. SBI Everest III Series UFV calculation:

$$UFV = UFV_{front} + UFV_{rear} + UFV_{rear,tri}$$

$$UFV_{front} = \frac{(21.120 + 19.374)}{2} \times 4.801 \times 16.414 = 1595.5 \text{ in}^3$$

$$UFV_{rear} = \frac{(19.374 + 15.436)}{2} \times 14.412 \times (15.625 - 4.801) = 2715.3 \text{ in}^3$$

$$UFV_{rear,top,center} = \frac{1}{2} \times 15.436 \times (16.414 - 14.412) \times (15.625 - 4.801) = 167.2 \text{ in}^3$$

$$UFV_{rear,top,side} = \frac{1}{3} \times \frac{19.374 - 15.436}{2} \times (16.414 - 14.412) \times (15.625 - 4.801) = 14.2 \text{ in}^3$$

$$UFV = 1595.5 + 2715.3 + 167.2 + (2 \times 14.2) = 4506.4 \text{ in}^3$$

$$UFV = \frac{4506.4}{12^3} = 2.61 \text{ ft}^3$$

- D. UFV calculation from “The NYSERDA 2015 NSPS Fuel Calculator (8/07/2023) would require an adjustment of 0.012 ft³ to match the above UFV calculation of 2.61 ft³. If there is any difference in fuel loading determined by this volume difference, you will use the loading requirements for the larger of these two values for this testing (2.61 ft³).

1.3 Firebox Information		
Firebox Shape:	☒ Cubic	☐ Cylindrical
Firebox width:	18.28	in.
Firebox depth:	15.63	in.
Firebox height:	15.86	in.
Volume adjustment:	0.012	ft ³
Firebox Net Volume:	2.609	ft ³

- i. The firebox width of 18.28 inches is measured at the center of the UFV. This represents the average width of the firebox (the UFV drawing above has more details). Taking the average width creates a small error to the calculation (underestimate of 21.1 in³). This error is highlighted in the calculations below:

$$h_{adj,top,tri} = 16.414 + (4.801 \tan(10^\circ)) - 14.412 = 2.849 \text{ in}$$

$$V_{adj,estimated} = \frac{2.849 \times 15.625}{2} \times 18.278 = 406.8 \text{ in}^3$$

$$V_{adj,real} = V_{adj,center} + 2 \times V_{adj,side}$$

$$V_{adj,center} = \frac{2.849 \times 15.625}{2} \times 15.436 = 343.6 \text{ in}^3$$

$$V_{adj,side} = \frac{2.849}{3} \times \frac{(21.120 - 15.436)}{2} \times 15.625 = 42.2 \text{ in}^3$$

$$V_{adj,real} = 343.6 + 2 \times 42.2 = 427.9 \text{ in}^3$$

$$V_{fireboxshape,error} = 406.8 - 427.9 = 21.1 \text{ in}^3$$

- ii. The firebox depth of 15.63 inches is measured from the back of the firebox up to the steel andiron (non-removable) at the front of the firebox. Again, the UFV schematic above has additional details.

- iii. The firebox height of 15.86 inches is the dimension measured at the center of the firebox, from the bottom of the firebox up to the secondary air tubes. This represents the average height of the firebox. Once more, the UFV schematic above has additional details.
- iv. The volume to be removed represents the small triangle above the front secondary air tube, and is calculated as:

$$Height_{triangle} = 4.801 \times \tan(10^\circ) = 0.847 \text{ in}$$

$$V_{tri,center} = \frac{0.847 \times 4.801}{2} \times 19.374 = 39.4 \text{ in}^3$$

$$V_{tri,side} = \frac{1}{3} \times \frac{(21.120 - 19.374)}{2} \times 0.847 \times 4.801 = 1.2 \text{ in}^3$$

$$V_{tri,adj} = V_{tri,center} + 2 \times V_{tri,side}$$

$$V_{tri,adj} = 39.4 + 2 \times 1.2 = 41.8 \text{ in}^3$$

- v. Finally, the volume adjustment necessary for the fuel load calculator is shown by the following calculation:

$$V_{adj} = V_{tri,adj} - V_{firebox_shape_error}$$

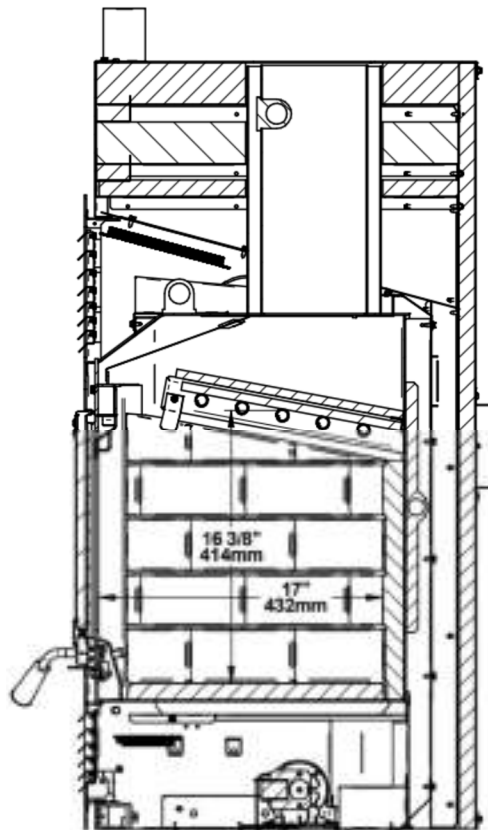
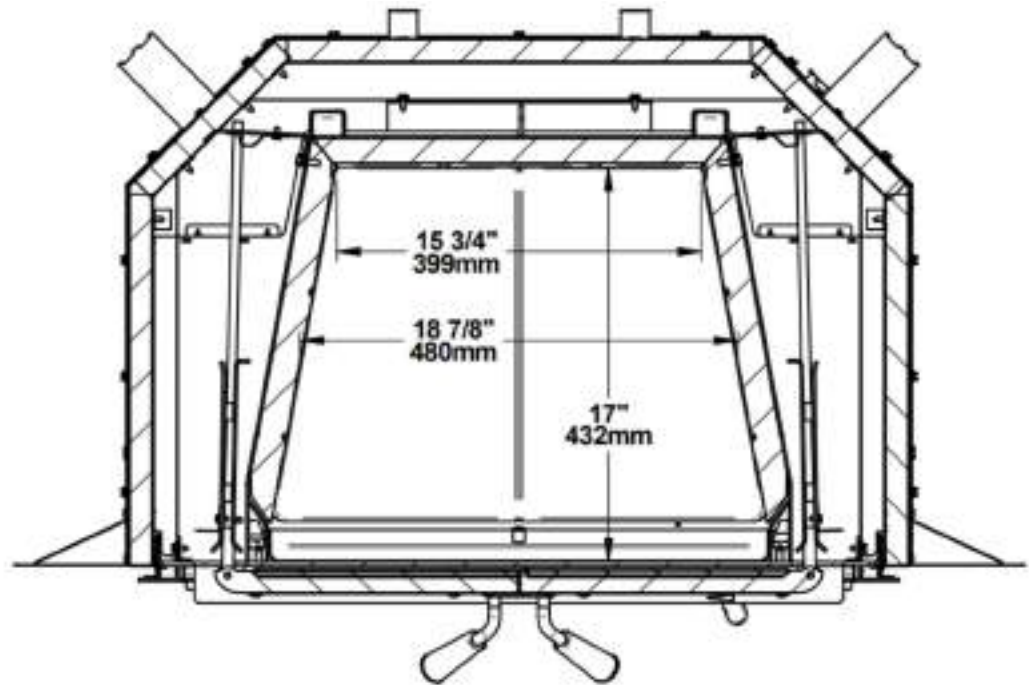
$$V_{adj} = 41.8 - 21.1 = 20.7 \text{ in}^3$$

$$V_{adj} = \frac{20.7}{12^3} = 0.012 \text{ ft}^3$$

- E. The overall firebox volume (OFV) is for marketing purposes only. The overall firebox calculation is not intended to be used for testing, as it includes areas of the firebox into which the test fuel load is not permitted to be placed. This area is a buffer zone to allow an easier fuel insertion, to prevent ash spillage and to allow the air wash to work properly. The calculation presented below approximates the volume a consumer could easily confirm using a measuring tape. As provided, the User's Owner's Manual section 2.1 for the Everest III series specifies:

“The overall firebox calculation is an approximation and is not intended to be used for loading. This volume includes a buffer zone to allow an easier fuel insertion, prevent ash spillage and allow the air wash to work properly.”

i. SBI Everest III Series overall firebox volume (OFV) calculation:



$$OFV = 18.875 \times 17.000 \times 16.375 = 5254.330 \text{ in}^3 OFV = \frac{5257.33}{12^3} = 3.04 \text{ ft}^3$$

3. Additional requirements:

- A. Emissions must be measured and reported from all test runs.
- B. The NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards is meant to be run in triplicate, with no test runs excluded (no option to replace one test run with two others) and the reported test result is the average value of these three replicate tests.
- C. The trains must not be disassembled until after a post-test leak check is performed.
- D. The blower of the SBI Everest III Series is operated manually. Per section 11.6.5.2 of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards. Section 11.11.1.1 states: “All test runs should have the fan “ON” at the highest setting except for 1) the duration of L1, and 2) When the door is open in all loads (L1, L2, L3, and L4) and, 3) From the end of L3 to when the air control is set to the lowest position for L4.
- E. Be advised that per section 11.6.7.1 of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 11.6.7.2 all test runs must be video recorded in their entirety or at least at 1-minute intervals, and remote witness capability must be made available by the test lab upon request.
- F. Follow Technical Information Document 024 - Memo on Rounding and Significant Figures for rounding conventions: <https://www.epa.gov/emc/technical-information-document-024-memo-rounding-and-significant-figures>

Additionally, based on the information provided, and with the modifications listed below and the caveats set forth at the end, we are approving your request to use a modified version of ASTM E2515-11 when conducting PM emission sampling as required by 40 CFR 60.534(c) including an alternative sampling procedure when conducting first hour PM emission sampling as required by 40 CFR 60.534(d).

When using ASTM E2515-11 to conduct PM sampling as required by 60.534(c), the following changes and modifications must be made:

1. Section 9.2.2 - Modification of requirement:

- a. Tunnel flow rate must be sufficient to maintain tunnel temperature below 125 °F (maximum) and 104 °F on a 10-minute rolling average, excluding periods when the appliance door is open. Two exceedances are allowed of the 10-minute rolling average points in each test run. The tunnel relative humidity must be below 90% humidity at 80°F (ASTM E2515-11 minimum filter temperature as required in this alternative test method) based on 1-minute data excluding periods when the appliance door is open.
 - i. Optionally, real-time tunnel dewpoint temperature measurements recorded at a minimum rate of one reading per minute can be made to override the maximum

tunnel temperature requirement (125°F maximum and 104°F on a 10-minute rolling average). One-minute dewpoint temperature measurements in the dilution tunnel must be below the one-minute ASTM E2515-11 filter temperature measurement. If there is an exceedance of the tunnel dewpoint temperature above the ASTM E2515-11 filter temperature, then the test run is invalid and must be repeated.

- ii. As an alternative to 1.a.i, the tunnel relative humidity may be measured using a psychrometer to measure the wet bulb temperature in the dilution tunnel. These measurements must be taken and recorded, at a minimum of every 2 minutes. ASTM E0377-15 Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry- Bulb Temperatures) may be followed for these purposes.
 - b. With respect to the last sentence in ASTM E2515-11 section 9.2.2, you are excluded from the following requirement: “The maximum tunnel flow rate shall not exceed five times the minimum flow rate determined as shown in 9.2.4.”
2. Sections 9.8.1, 10.2.1 and 11.7 - Additional requirements:
- a. **The filter temperature must be maintained between 80 and 90 °F during testing.**
 - b. Filters must be weighed in pairs using EPA [ALT-154](#).
 - c. Only one point per sampling train is allowed outside the ± 10 percent proportionality range per test run.
 - d. **Non-desiccated post-test filter weights must be taken within an hour after the post-test leak check. These initial weights must be included in the test report.**
 - e. Oven drying desiccation, at any temperature, is not allowed.
 - f. Dual train comparison (precision) must be calculated in terms of percent difference between the two sample trains and in terms of calculated emissions difference on a g/kg basis. These values must both be clearly reported for each test run.
 - g. Negative filter weights must be discussed in the test report. Where negative mass (i.e., filter material left on O-rings and gaskets) is subtracted from the overall PM mass, the resultant PM mass must be reported with the mass subtracted and with the mass not subtracted for comparison purposes. Given the gravimetric procedures in ALT-154 we do not expect to encounter any negative mass issues with the filters but if any should be present there must be a full discussion in the test report on how this may have come to be the case and what impact it may have on the measured emissions.
3. Sections 9.5.2 through 11.4.2 - Additional requirement:
- a. Ambient background sampling and filter collection must be conducted per the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, Section 11.12ASTM E2515-11, section 4.3 and all other method specific room air sampling requirements.
4. Sections 9.6.4 through 9.6.5.1 - Additional requirement:
- a. Particulate matter emission concentrations must be measured with ASTM E2515-11 with the following exceptions, eliminate section 9.6.5.1 of ASTM E2515-11 and perform the post-test leak checks as specified below:

- i. **Post-Test Leak Check:** A leak check of each sampling train is mandatory at the conclusion of each sampling run before sample recovery. The leak check must be performed in accordance with the procedures of ASTM E2515-11, section 9.6.4.1, except that it must be conducted at a vacuum equal to or greater than the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.0003 m³/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
- b. Additionally, if a component change of either sampling train is needed during sampling, then perform the leak check specified below:
 - i. **Leak Checks During Sample Run:** If, during a sampling run, a component (e.g., filter assembly) change becomes necessary, a leak check must be conducted immediately before the change is made. Record the sample volume before and after the leak test. The sample volume collected during any leak checks must not be included in the total sample volume for the test run. The leak check must be done according to the procedure outlined in ASTM E2515-11, section 9.6.4.1, except that it must be done at a vacuum equal to or greater than the maximum value recorded up to that point in the sampling run. If the leakage rate is found to be no greater than 0.0003 m³/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
- c. **NOTE:** Immediately after component changes, leak checks are optional but highly recommended. If such leak checks are done, the post-test leak check procedure referenced above shall be used.

When using ASTM E2515-11 to conduct first hour PM sampling as required by 60.534(d), these changes and modifications must be made:

1. To determine the first hour PM emissions as required by 60.534(d), the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 10.2.3, requires the use of a TEOM to report the first-hour emission rate, to provide data for phased emissions, and real-time data reporting requirements. All TEOM measurements shall run through the entirety of the test to obtain full run data.

All other requirements of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards and ASTM E2515-11 must be followed during the testing, and all requirements of 40 CFR part 60, Subpart AAA must be satisfied and described in your test report. This approval is based on the understanding that the lowest heat output (Btu/hr) setting on the Everest III Series room heater available to the user will correspond to the lowest burn rate to be evaluated during certification testing and the test report will fully document that the certification testing was conducted as such. This is consistent with section 60.534(a)(1) of Subpart AAA, which states, "the burn rate for the low burn category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer."

A copy of this letter must be included in any certification test report where this alternative test method determination is utilized.

If you have additional questions regarding this approval, please contact me at 919-541-4790 or johnson.steffan@epa.gov.

Sincerely,

Steffan M. Johnson
Group Leader
Measurement Technology Group

cc:

Shannon Banner – EPA/OAQPS/SPPD
James Hemby – EPA/OAQPS/AQAD
Rafael Sanchez – EPA/OECA
Bill Schrock - EPA/OAQPS/SPPD
Robert Scinta – EPA/OECA
Nick Swanson – EPA/OAQPS/SPPD
Michael Toney – EPA/OAQPS/AQAD
Mark Turner – EPA/OAQPS/SPPD
Chet Wayland – EPA/OAQPS/AQAD

APPENDIX

NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard

Note: This method does not include all the specifications (e.g. equipment and supplies) and procedures (e.g., sample and analytical) essential to its performance. Some material is incorporated by reference from other methods. Therefore, to obtain reliable results, persons using this method shall have a thorough knowledge of at least the following EPA Tests:

- Method 1- Sample and Velocity Traverses for Stationary Sources
- Method 2- Determination of Stack Gas Velocity and Volumetric Flow Rate (Standard Type Pitot Tube)
- Method 3 – Gas Analysis for the Determination of Dry Molecular Weight
- Method 4 – Determination of Moisture Content in Stack Gases
- Method 5G – Determination of Particulate Matter from Wood Heaters (Dilution Tunnel Sampling Location)
- Method 10 - Carbon Monoxide - Instrumental Analyzer
- Method 28 – Certification and Auditing of Wood Heaters

1. Scope and Application

- 1.1. This test method specifies operation and fueling for certification and auditing of manually fed wood-fired stoves and heaters with manual or automatic controls.
- 1.2. This test method measures particulate matter (PM) emissions, heat output, and efficiency.
- 1.3. Carbon monoxide emissions are measured per CSA B415.1 *Performance Testing of Solid-Fuel-Burning Heating Appliances*.
- 1.4. Particulate emissions are measured using the dilution tunnel method.
 - 1.4.1. As specified in ASTM E2515-11, *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel*, with modifications described in Section 10.1 of this test method.
 - 1.4.2. Using the Tapered Element Oscillating Microbalance (TEOM) continuous PM method as detailed in this test method.
- 1.5. Efficiency using CSA B415.1 with the following exceptions:
 - 1.5.1. No substitution of data is allowed.

- 1.5.2. 10-minute average data must be used to calculate efficiency
- 1.6. Analyte. Particulate matter (PM). No CAS number assigned.
- 1.7. Applicability. This method is applicable for the certification and auditing of wood space heaters that burn cordwood fuel. The test quantifies PM and CO emissions and provides overall efficiency ratings, maximum burn time, and heat output.
- 1.8. Data Quality Objectives. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.
- 1.9. Distinguishing features of appliances covered by this standard include:
 - 1.9.1. Cordwood fuel is hand-fed into the firebox.
 - 1.9.2. A chimney or vent that exhausts combustion products from the appliance.
- 1.10. The values stated are to be regarded as the standard, whether in I-P (British) or SI units. The values given in parentheses are for information only.
- 1.11. Data Quality Objectives.
 - 1.11.1. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.
 - 1.11.2. Measurement of emissions and heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to useful heat production.
 - 1.11.3. This is a laboratory method intended to capture operating periods that are representative of actual field use without excessive test burden.

2. Referenced Methods

- 2.1. NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces
- 2.2. ASTM 2515-11: Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.
- 2.3. CSA B415.1 Performance Testing of Solid-Fuel-Burning Heating Appliances.

3. Definitions

- 3.1. Aborted Test Run – The run shall be considered aborted if a force majeure event occurs, such as a power outage or equipment operation failure. Aborted test runs are treated differently than incomplete or invalid test runs.

- 3.2. Active Period – the active period of a test is defined as the following events: (1) Door opening and closing, damper adjustments, adjustments of air controls, (2) Kindling and start-up wood within the stove and prior to ignition; (3) Coal bed raking, ((4) Fuel pieces before loading; (5) Fuel in firebox immediately after loading, (6) Fuel adjustments; (7) End of the test run coal bed conditions (this requires opening the door at the end of test), or (8) any other event where the user engages with the appliance.
- 3.3. Appliance – a wood heater capable of and intended for space heating defined in the applicable regulation. The appliance includes a combustion chamber, combustion air settings, operating controls, and a thermostat if specified, and any other accessory required for standard operation, such as a barometric damper.
- 3.4. Automatically controlled appliance – an appliance whose air controls are controlled automatically controlled throughout the appliance operation and can only be disabled by a technician or when in a power-out mode. Appliances controlling air for portions of a burn cycle are not automatically controlled appliances for this test method.
- 3.5. Centroidal Area – means the central area of the stack or duct that is no greater than 1 percent of the stack or duct cross-section. This area has the same geometric shape as the stack or duct.
- 3.6. Certification or audit test – a series of at least three test runs (four runs, if use of a fan is an option) conducted for certification or audit purposes that meets the specifications detailed in this protocol.
- 3.7. Chop – using a poker or another piece of wood to strike a piece of the fuel charge to break it into smaller pieces.
- 3.8. Coal-bed Stirring – prior to adding a new fuel charge, using a poker or piece of wood to stir or level the coal bed of the appliance for the sole purpose of ensuring ease of loading of the fuel charge. No special formations can be made, such as creating coal bed formations or pushing coals to one side or creating slopes with the coals.
- 3.9. Data recorder – The equipment that permanently records the concentrations reported by the analyzers.
- 3.10. Drift – Difference between pre and post run calibration system bias (or system calibration error) checks at a specific calibration concentration level.
- 3.11. East-west stove – a stove where the firebox dimension parallel to the loading door is greater or equal to the stove depth measurement. Logs are loaded so that they are viewed on the long length of the stove.
- 3.12. Emission factor – the emission of a pollutant expressed in mass per unit of energy (typically) output from the appliance.
- 3.13. Firebox – the portion of the chamber in the wood heater in which the test fuel charge is placed and combusted.

- 3.14. Firebox depth – the horizontal length of the fire chamber dimension measured perpendicular to the loading door. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. If the manufacturer believes that a portion of the firebox depth is not usable for firebox volume calculation, photo documentation and a written basis must be included in the test report.
- 3.15. Firebox Height – the vertical distance extending above the top of the firebox to the floor of the firebox. Firebox height is not necessarily uniform. The measurement must account for variations caused by internal baffles, air channels, or other permanent obstructions. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume.
- 3.16. Firebox width – the horizontal fire chamber dimension that is parallel to the loading door. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. If the manufacturer believes that a portion of the firebox width is not usable for firebox volume calculation, photo documentation and a written basis must be included in the test report.
- 3.17. Flue Gas Measurement System – All the equipment used to measure stack gas components of interest. This system comprises five major subsystems: sample acquisition, sample transport, sample conditioning, gas analyzer, and data recorder.
- 3.18. Fuel Adjustment – manipulations to the fuel charge to reflect typical owner practices that allow the cordwood fuel to burn appropriately during the test period. A fuel adjustment includes minor changes in fuel placement. It does not include chopping the wood, stirring the coal bed, or reorganizing fuel placement.
- 3.19. Fuel load calculator – The locked excel spreadsheet tool that determines the allowable test fuel load weights and required piece sizes for each individual load.
- 3.20. Fuel loading direction – For loads 2, 3, and 4 fuel shall be loaded based parallel to the dimension with the largest value. If the firebox length and width are within 2”, fuel shall be loaded in an east/west fashion, parallel to the loading door. A crisscross configuration is allowed for L1 but cannot be used as a load configuration for loads 2, 3, or 4.
- 3.21. Gas analyzer – Instrument that measures and transmits an output proportional to a gas concentration.
- 3.22. Incomplete Test Run – Any test run that does not successfully complete all six test phases continuously due to stopped fuel combustion or other appliance issues, as detailed in Section 12.24.11.
- 3.23. Invalid Test Run – Any complete or partial test that does not meet the specifications detailed in this test method as the fault of the system operation.

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- 3.24. Kindling pieces – small pieces of wood less than 1” in diameter. No bark or moisture requirements for these pieces, however kindling pieces shall not be dried or stored anywhere but in laboratory ambient conditions. Kindling length shall be of the same wood species as the fuel charge length. Individual kindling pieces may weigh no less than 1.5 ounces.
- 3.25. Large fuel pieces – pieces that are larger for the appliance as defined by the fuel load calculator.
- 3.26. L1 Start-up – period of the test when the unit has kindling and startup fuel under the conditions described in Section 11.6.7.
- 3.27. L2 High-fire Phase – period of the test when the unit has a small coal bed and the stoves air settings are fully open. It is intended to replicate periods when homeowners are trying to quickly heat an area, shortly after starting or restarting the appliance.
- 3.28. L3 Maintenance-fire phase– period of the test when a fire is maintained with a medium-sized coal bed, and a smaller batch of wood made up of two large pieces. This is intended to simulate a period when the operator is trying to maintain consistent heat output.
- 3.29. L4 Low-burn Rate Phase – period of the test when the stove has a large coal bed, the stove is fully loaded, and the adjustable air settings are set to produce the lowest possible burn rate and have the lowest air settings. It is intended to simulate when the operator is trying to maintain heat over a long time, such as overnight or while away for significant periods of time.
- 3.30. North-south stove – a firebox that has its longest dimension measurement perpendicular to the loading door. In this stove type, logs are loaded so that the ends of the fuel are viewed when loaded.
- 3.31. Phase – A distinct period in the test run with its own operational procedures and conditions.
- 3.32. Primary air supply – air supply that introduces air to the wood heater in the combustion chamber and is adjusted to target a desired burn rate. The wood heater manufacturer or test facility can document this through design drawings.
- 3.33. Secondary air supply – air supply that introduces air to the wood heater such that the burn rate is not altered by more than 10 percent when the secondary air supply is adjusted during the test run. The wood heater manufacturer or test facility can document this through design drawings that show the secondary air is introduced only into a mixing chamber or secondary chamber outside the firebox.
- 3.34. Significant figure – is any digit that is necessary to define the specific value or quantity. Zeros may be used either to indicate a specific value, like any other digit or to indicate the magnitude of a number.
- 3.35. Small fuel pieces – pieces that are small for the appliance as defined by the fuel load calculator.
- 3.36. Starter fuel – pieces of cordwood that can be smaller than small and large pieces but larger than kindling, as defined by the fuel load calculator.

- 3.37. System calibration mode – The introduction of calibration gases into the measurement system at the flue gas inlet probe upstream of conditioning components, filtration, and flue gas sample transport equipment.
- 3.38. Test data – means the data for all test runs conducted on the wood heater, including any data collected during failed and invalid runs and includes records of preparation of standards, identification of equipment used and personnel present, records of calibrations, raw data sheets for field sampling, raw data sheets for field and laboratory analyses, chain-of-custody documentation, and example calculations for reported results.
- 3.39. Test facility – the area in which the wood heater is installed, operated, and sampled for emissions.
- 3.40. Test fuel charge– the collection of test fuel pieces used in each of the four phases of the test run. L2, L3, and L4 recommend that at least 75% of the individual pieces with at least 80% bark on one side of the fuel piece. Bark shall not be removed for certification testing. Any fuel charge that suggests bark was purposely removed or shaped shall be deemed invalid. Examples of fuel piece manipulation are provided in Section 11. If 75% of the fuel load pieces for L2, L3, and L4 do not have bark, document in the test report, and provide a basis for the lack of bark.
- 3.41. Test fuel load – the group of test fuel pieces that are loaded, as specified by phase, throughout the test run.
- 3.42. Test fuel loading – the arrangement of the test fuel charge.
- 3.43. Total run fuel load – the amount of wood burned during the entire test run.
- 3.44. Test fuel loading density – the calculation determining the weight of the as-fired test fuel load. The calculation is based on the usable volume of the firebox.
- 3.45. Test run – an individual emission test that includes the four operational phases required by the fueling protocol.
- 3.46. Usable firebox volume – the calculated volume of the firebox determined using its height, width, and depth as defined in this section. This calculation represents the area where wood is likely to be loaded. If the manufacturer claims that portions of the firebox may not be used in the calculation, a justification must be submitted with the test report. If the justification is not approved, the test results will be deemed unrepresentative for certification purposes. It is highly recommended that manufacturers obtain regulatory approval if making claims that portions of the firebox are not appropriate for inclusion in the calculation.
- 3.47. Wood heater – an enclosed, wood-burning appliance capable of and intended for space heating or domestic water heating, as defined in the applicable regulation.

4. Interferences

None.

5. Summary of Method

- 5.1. Particulate matter emissions are measured from a wood heater burning cordwood test fuel in a test facility maintained at a set of prescribed ambient conditions. Procedures for operating the appliance, measuring PM and CO emission rates, and methods for reducing data and calculating results are provided.
- 5.2. *Dilution Tunnel.* A dilution tunnel following the specifications detailed in ASTM E2515-11 shall be used for particulate measurements.
- 5.3. *Particulate Matter:* PM emissions are measured in a dilution tunnel specified in ASTM 2515-11 *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* with exceptions as defined in Section 10.1. The flow rate in the dilution tunnel is maintained at a constant rate throughout the test cycle and accurately measured. PM emissions are measured in the dilution tunnel using both the filter method specified in ASTM 2515-11 and with a Thermo model 1405-D using NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.
- 5.4. *Operation.* Appliance operation is conducted on a cold-to-hot test cycle, meaning that the appliance starts the first test run at room temperature and ends with the appliance in a heated state. The second and third test runs may start at a slightly warmer temperature if the appliance is designed to retain the heat from the first run. The appliance is operated at operational phases representing start-up emissions, high heat demand, low heat demand, changing air conditions, and refueling. To complete the certification test, the appliance shall complete three valid test runs for manually air-controlled appliances and four test runs for appliances with automatic air controls. Overall results average all valid test runs to determine the test results.
- 5.5. *Repeatability.*
 - 5.5.1. For manual air control stoves, a series of at least three test runs are conducted for certification or audit purposes.
 - 5.5.2. For appliances with automatic air controls, a series of at least three test runs using automatic controls and a single run completed with the heater and controls disconnected from any external power source shall be conducted for certification and audit purposes.

6. Significance and Use

- 6.1. The measurement of particulate matter emission rates is an important test method widely used in the practice of air pollution control.
 - 6.1.1. These measurements, when approved by state or federal agencies, are often required for the purpose of determining compliance with regulations and statutes.

- 6.1.2. The measurements made before and after design modifications are necessary to demonstrate the effectiveness of design changes in reducing emissions and make this standard an important tool in manufacturers' research and development programs.
- 6.2. Measurement of heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to the useful heat production.

7. Safety

- 7.1. Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to performing this test method.
- 7.2. These tests involve combustion of wood, which releases substantial amounts of heat and combustion products. The heating system also produces large quantities of very hot water and the potential for steam production and system pressurization. Appropriate precautions must be taken to protect personnel from burn hazards and respiration of products of combustion. Exposure of personnel to unsafe levels of carbon monoxide must be avoided, and the use of continuous ambient carbon monoxide monitoring is strongly recommended.

8. Equipment and Supplies. The following items are required for sample collection:

- 8.1. Anemometer. A device capable of detecting air velocities less than 0.10 m/sec (20 ft/min), for measuring air velocities near the test appliance.
- 8.2. *Appliance Flue.*
 - 8.2.1. Steel flue pipe extending to 8.5 ± 0.5 ft. (2.6 ± 0.15 m) above the top of the platform scale, and above this level, insulated solid pack type chimney extending to 15 ± 1 ft. (4.6 ± 0.3 m) above the platform scale, and of the size specified by the appliance manufacturer. This applies to both freestanding and inserts type appliances.
 - 8.2.2. Other chimney types (e.g., solid pack insulated pipe) may be used in place of the steel flue pipe if the appliance manufacturer's written appliance specifications require such chimney for home installation (e.g., zero clearance appliance inserts). Such alternative chimney or flue pipe must remain and be sealed with the appliance following the certification test. This applies only to appliances requiring a specialized chimney.

- 8.2.3. Solid pack insulated chimneys shall have a minimum of 2.5 cm (1 in.) solid-pack insulating material surrounding the entire flue and possess a label demonstrating conformance to U.L. 103 (incorporated by reference—see §60.17).
- 8.3. Appliance Platform Scale and Monitor. For monitoring of fuel load weight change. The scale shall be capable of measuring weight to within 0.01 kg (0.02 lb.) and calibrated to NIST traceable standards at least annually.
- 8.4. Barometer. Aneroid or another barometer capable of measuring atmospheric pressure to within 0.1 in. Hg (2.5 mm Hg) with an uncertainty of +/- 0.05 in. Hg (+/- 1.27 mm Hg).
- 8.5. CO Gas Analyzer. A continuous nondispersive infrared (NDIR) analyzer, or equivalent, that measures the CO concentration in the flue gas stream. A dual-range analyzer is acceptable. These analyzers are often equipped with automated range-switching capability, so that when readings exceed the full-scale of the low measurement range, they are recorded on the high range. As an alternative to using a dual-range analyzer, you may use two segments of a single, large measurement scale to serve as the low and high ranges. In all cases, when two ranges are used, you must quality-assure both ranges using the proper sets of calibration gases.
- 8.6. CO₂ Gas Analyzer. A continuous NDIR analyzer, or equivalent, that measures the CO₂ concentration in the flue gas stream. Dual-range analyzer is acceptable. These analyzers are often equipped with automated range-switching capability, so that when readings exceed the full-scale of the low measurement range, they are recorded on the high range. As an alternative to using a dual-range analyzer, you may use two segments of a single, large measurement scale to serve as the low and high ranges. In all cases, when two ranges are used, you must quality-assure both ranges using the proper sets of calibration gases.
- 8.7. Dilution Tunnel must meet the requirements of ASTM E2515-11, clauses 6.1.6 and 9.2.
- 8.8. Dilution Tunnel temperature and relative humidity measurement. A probe with analog or digital data outputs capable of measuring tunnel temperature to within 0.5 °C (1.0 °F) and tunnel RH to within 2% between 5 and 95% RH at maximum tunnel temperatures, such as the Omega HX85A or equivalent. The probe should also report calculated dewpoint.
- 8.9. Draft Gauge. Electromanometer or other devices for the determination of flue draft or static pressure readable to within 0.005 in. H₂O (1.2 Pa)
- 8.10. Flue Gas Sample Probe. Stainless steel or other approved material of sufficient length to measure the sample point in stack.
- 8.11. Flue Gas Particulate Filters. The filter(s) must be made of material that is non-reactive to the gas being sampled and placed upstream of the gas analyzer.

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- 8.12. Flue Gas Sample Line. The sample line from the probe to the conditioning system/sample pump should be made of Teflon or other material that does not adsorb or otherwise alter the sample gas.
- 8.13. Flue Gas Calibration Line. The sample line from the flue gas probe to the calibration gas shall be made of Teflon or other material that does not adsorb or otherwise alter the sample gas.
- 8.14. Flue Gas Conditioning Equipment. A condenser, dryer or other suitable system which removes moisture, condensable organic material and particulate continuously from the sample flue gas.
- 8.15. Flue Gas Sampling Pump. A leak-free pump is needed to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The pump may be constructed of any material that is non- reactive to the gas being sampled.
- 8.16. Flue Gas Temperature Measurement. A type K thermocouple or equivalent located in the centroid of the stack located 8.0 +/- 0.5 ft (2.44 m +/- 150 mm) above the platform scale, capable of measuring with an accuracy of 4.0°F (2.2°C) or 0.75% of reading, whichever is greater.
- 8.17. Flue Gas Composition Measurement. A sample probe and continuous infrared analyzer or equivalent capable of measuring span of carbon monoxide (CO) and carbon dioxide (CO₂) in the flue gas produced by the appliance tested. Continuous analyzers (or equivalent) shall have maximum zero and span drift, over a 24 h period, of 1% of full scale.
- 8.18. Fuel Scale. Balance capable of weighing the test fuel charge to within 0.02 kg (0.05 lb.) and calibrated to NIST traceable standards at least annually.
- 8.19. Humidity Gauge. Psychrometer or hygrometer for measuring room humidity to within +/- 4% from 25 to 95% RH.
- 8.20. Moisture Meter. Calibrated electrical resistance meter for measuring test fuel moisture to within 2 percent moisture content.
- 8.21. Surface Temperatures. Capable of measuring temperature to within 1.5 percent of expected absolute temperatures with an accuracy of 4.0°F (2.2°C) or 0.75% of reading, whichever is greater.
- 8.22. Test Facility Temperature Monitor. A thermistor, RTD, Type T-Special thermocouple, or other equivalent device, located centrally in a vertically oriented 150 mm (6 in.) long, 50 mm (2 in.) diameter pipe shield that is open at both ends, capable of measuring temperature to within 1°F of expected temperatures.
- 8.23. TEOM – Thermo Fisher Scientific TEOM model 1405-D (Thermo part # 1405D-ANF, excluding models 1405, 1405-DE, or 1405-F) to measure and report continuous particulate matter (PM) measurements in an ASTM 2515-11 dilution tunnel or equivalent dilution method, and operated according to the NYSERDA Dichot TEOM Standard Operating Procedures. For lab air PM

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measurements, Thermo Fisher Scientific TEOM model 1405 (Thermo part # 1405-ANF, excluding model 1405-F), operated according to the NYSERDA Dichot TEOM Standard Operating Procedures.

9. Calibration and Standardizations

- 9.1. ASTM E2515-11. Perform all calibrations required by ASTM E2515-11.
- 9.2. Anemometer. Calibrate the anemometer as specified by the manufacturer's instructions before the first certification test every six months thereafter.
- 9.3. Appliance Platform Scale. Perform a multipoint calibration (at least five points spanning the operational range) of the platform scale before its initial use. The scale manufacturer's calibration results are sufficient for this purpose. Before each certification test, audit the scale with the wood heater in place by weighing at least one calibration weight (Class F) that corresponds to between 20 percent and 80 percent of the expected test fuel charge weight. If the scale cannot reproduce the value of the calibration weight within 0.0045 kg (0.01 lb.) or 1 percent of the expected test fuel charge weight, whichever is greater, recalibrate the scale before use with at least five calibration weights spanning the operational range of the scale.
- 9.4. Barometer. Calibrate using a reference pressure monitor calibrator before the first certification test and semiannually after.
- 9.5. Draft Gauge. Calibrate as per the manufacturer's instructions; a liquid manometer does not require calibration (but must be properly leveled, zeroed, and the system leak checked).
- 9.6. Humidity Gauge. Calibrate as per the manufacturer's instructions before the first certification test and annually thereafter.
- 9.7. Fuel Scale. Calibrate as described in 9.2.
- 9.8. Moisture Meter. Calibrate as per the manufacturer's instructions before the first certification test and semiannually thereafter.
- 9.9. Temperature Sensors. Calibrate using at least five points with an operating range within specification and in compliance with NIST Monograph 175. To be calibrated before the first certification test and semiannually thereafter.

10. Sampling, Test Specimens, and Test Appliances

- 10.1. Particulate matter sampling shall follow ASTM except for the following modifications listed here.
 - 10.1.1. Liquid water should not be present anywhere in the sampling system for a valid sample. The presence of condensed water anywhere in the sampling system invalidates the test run. All data from all invalid test runs shall be included in the report. The reviewing authority shall make a final determination on invalidated runs. Data from any invalidated test run shall

not be used to calculate results. If the testing agency believes a run has been invalidated, the test run shall be repeated.

10.1.2. Dilution tunnel temperature and relative humidity shall be measured electronically and logged at one-minute intervals near the sample probe to calculate dewpoint.

10.1.3. The following section details test conditions that shall be maintained for a valid test run. A valid test shall have no more than two individual deviations from the conditions below to remain a valid run. An example of an individual deviation is a single, ten-minute rolling average where the dilution tunnel exceeded temperature thresholds. Another ten-minute period exceeding the tunnel temperature requirement shall be considered a second deviation.

10.1.3.1. Tunnel flow rate must be sufficient to maintain tunnel temperature below 125 °F (maximum) and 113 °F on a 10-minute rolling average, excluding periods when the appliance door is open. Two exceedances are allowed of the 10-minute rolling average points in each test run. The tunnel relative humidity must be below 90% humidity at 80 °F (ASTM E2515-11 minimum filter temperature as required in this alternative test method) based on 1-minute data excluding periods when the appliance door is open.

10.1.3.1.1. Optionally, real-time tunnel dewpoint temperature measurements recorded at a minimum rate of one reading per minute can be made to override the maximum tunnel temperature requirement (125 °F maximum and 113 °F on a 10-minute rolling average). One-minute dewpoint temperature measurements in the dilution tunnel must be below the one-minute ASTM E2515-11 filter temperature measurement. If there is an exceedance of the tunnel dewpoint temperature above the ASTM E2515-11 filter temperature, then the test run is invalid and must be repeated.

10.1.3.1.2. As an alternative, the tunnel relative humidity may be measured using a psychrometer to measure the wet bulb temperature in the dilution tunnel. These measurements must be taken and recorded, at a minimum of every 2 minutes. ASTM E0377-15 Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry Bulb Temperatures) may be followed for these purposes.

10.1.3.2. A minimum average tunnel flow of 600 DSCFM is required. Higher tunnel flows may be required to meet the parameters of Section 10.1.3. With respect to the last sentence in ASTM 2515-11 Section 9.2.2, tests are excluded from the following requirement, *“The maximum tunnel flow rate shall not exceed five times the minimum flow rate determined as shown in 9.2.4.”*

10.1.3.3. All exceedances must be reported in the test anomalies section, even if deviations are within the test method tolerances.

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10.1.3.4. ASTM 2515-11 filter trains 1 and 2 must meet a precision requirement of 7.5% or lower, regardless of g/kg comparison.

10.1.3.5. Use rounding requirements specified in Section 13.2 of this test method.

10.1.3.6. Use processes specified in Section 10.2.

10.2. Sample Collection. The following are required for sample collection:

10.2.1. Teflon coated glass fiber filters as supplied by the TEOM manufacturer for use with the TEOM model 1405-D. These are Pallflex Emfab (TX40) with an exposed diameter of 13 mm, without organic binder, exhibiting at least 99.95 percent efficiency.

10.2.2. *Test Specimens.* Appliances shall be supplied as complete systems, including all controls and accessories necessary for installation at the test facility. A full set of specifications, designs, and assembly drawings shall be provided when the product is placed under certification of a third-party agency.

10.2.3. Particulate Matter Sampling uses two ASTM 2515-11 sampling trains and a TEOM to obtain real-time data. TEOM data shall be used to report the first-hour emission rate, to provide data for phased emissions, and real-time data reporting requirements. All measurements shall run through the entirety of the test to obtain full run data.

10.2.3.1. Train 1 and 2 shall provide dual sampling trains that shall measure PM emissions from run start to run completion. Trains 1 and 2 must meet a precision requirement of 7.5% or lower per ASTM 2515-11, regardless of g/kg comparison.

10.2.3.1.1. Proportional rate variation shall meet ASTM 2515-11 requirements for all phases.

10.2.3.1.2. Filter conditions must be monitored, and filter changes are required to avoid filter clogging.

10.2.3.2. TEOM data shall be collected at 1-minute intervals for reporting. TEOM operation shall follow the procedures listed on the most recent NYSERDA Standard Operation Procedures for Thermo Scientific 1405-D TEOM for use in a dilution tunnel, found in the EPA docket.

10.3. *Flue Gas Measurement System Setup and Calibration*

10.3.1. Install Flue Gas Sample probe 2 in. (50 mm) above the flue gas temperature measurement in the stack.

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10.3.2. Setup Flue Gas Measurement System with an appropriate sample flow rate to reach 90% of their final reading within 30 seconds when beginning at ambient levels and responding to a high-level calibration gas.

10.3.3. Flue Gas Measurement System shall record CO and CO₂ concentrations at one-minute intervals.

10.4. Preparation of Apparatus

10.4.1. Wood Heater Installation for Certification Testing. Assemble the wood heater appliance and parts in conformance with the manufacturer's provided User Guide. These instructions must match all instructions materials developed by the manufacturer and/or their distributors. Place the wood heater on the platform scale and connect the chimney to the appliance. Clean the flue with an appropriately sized, wire chimney brush before initiating Run 1 of the certification test. Test documentation should include the date and time of flue cleaning.

10.4.2. Wood Heater Temperature Monitors.

10.4.2.1. For catalyst-equipped wood heaters, locate a temperature monitor (optional) about 25 mm (1 in.) upstream of the catalyst at the centroid of the catalyst face area, and locate a temperature monitor (mandatory) that will indicate the catalyst exhaust temperature. This temperature monitor is centrally located within 25 mm (1 in.) downstream at the centroid of the catalyst face area. Record these locations.

10.4.2.2. Locate wood heater surface temperature monitors at five locations on the wood heater firebox exterior surface. Position the temperature monitors centrally on the top surface, centrally on two sidewall surfaces, and centrally on the bottom and back surfaces. Position the monitor sensing tip on the exterior of the firebox surface inside of any heat shield, room air circulation walls, or other wall or shield separated from the firebox exterior surface. Surface temperature locations for unusual design shapes (e.g., spherical, etc.) shall be positioned so that there are four surface temperature monitors positioned to average stove temperature across various points on the appliance.

10.5. Conditioning

10.5.1. Wood Heater Aging Prior to Certification Testing. A wood heater of any type shall be aged at least 50 hours before initiating a certification test. The aging procedure shall be conducted by the manufacturer or a manufacturer's agent prior to sending the appliance to the testing laboratory.

During aging, the appliance shall be operated at a variety of burn rates. Documentation for wood heating aging must be included in the test report to include data on individual hourly burn rates.

10.5.1.1. The manufacturer shall supply wood heater aging information for the final test reports. Aging data that shall be reported include all fuel parameters (species, moisture content, load weights, piece amounts, and size), air settings used, time spent in each air setting phase, amount of fuel burned, and appliance burn rates.

10.5.1.2. If an appliance uses a catalytic combustor, it must be engaged according to the manufacturer's instructions and operate with the catalyst engaged for at least 50 hours during the break-in period. In addition to the reporting requirements listed in 8.1.1, catalytic appliances shall also report hourly catalyst exit temperature data to include the dates and hours of operation.

11. Procedure

11.1. Test Facility Conditions. The test facility shall meet the following requirements during testing.

11.1.1. The test facility temperature shall be maintained between 65 and 87 °F (13 and 31 °C) during each test run.

11.1.2. The flue shall discharge into the same space or into a space freely communicating with the test facility. Any hood or similar device used to vent combustion products shall not induce a draft greater than 0.005 in. H₂O (1.25 Pa) on the wood heater measured when the wood heater is not operating.

11.1.3. For test facilities with artificially induced barometric pressures (e.g., pressurized chambers), the barometric pressure in the test facility shall not exceed 30.5 in. Hg (775 mm Hg) during any test run.

11.1.4. Locate the test facility temperature monitor on the horizontal plane that includes the primary air intake opening for the wood heater. Locate the temperature monitor 3 to 6 ft. (0.9 to 1.8 m) from the front of the wood heater in the 90° sector in front of the wood heater.

11.1.5. Use an anemometer, or equivalent device, to measure the air velocity. Measure and record the room air velocity before the ignition period in L1 Startup and once immediately following the test run completion. Air velocities within 0.6 m (2 ft.) of the test appliance and exhaust system shall be less than 0.25 m/sec (50 ft./min) without fire in the unit.

11.1.6. Measure and record the test facility's ambient relative humidity, barometric pressure, and temperature before and after each test run using equipment as specified in Section 6.

11.2. Wood Heater Firebox Volume.

- 11.2.1. Determine the firebox volume using the definitions for height, width, and length. Volume adjustments due to the presence of firebrick and other permanent fixtures may be necessary. All adjustments shall be detailed in the test report and shall conform to the definition of usable firebox volume contained in this test method. Measurements shall include areas adjacent to and above a baffle.
- 11.2.2. If a manufacturer deems certain areas of the firebox as unusable for fuel load calculations, written documentation stating the basis for that claim and supporting photographic image(s) must be provided and approved by the regulatory authority prior to conducting the certification test. If approval is not granted prior to the test, then the test may be invalidated if the reviewing agency determines the firebox volume is inaccurate.
- 11.3. Test Fuel. The test fuel shall conform to the following requirements and meet specifications as required by the fuel loading calculator:
 - 11.3.1. Fuel Species. Untreated, air-dried, cordwood fuel.
 - 11.3.1.1. Allowable species: maple (big leaf, red, silver), Douglas fir, or birch (black, white, yellow, paper).
 - 11.3.1.2. Kiln-dried fuel is not permitted. Kiln-dried fuel includes drying at elevated air temperature settings above 90 °F.
 - 11.3.1.3. Fuel shall be free of decay, fungus, or other contaminants.
 - 11.3.2. Fuel Moisture.
 - 11.3.2.1. Determine fuel moisture for each fuel piece by averaging five moisture meter readings, one from each of three sides, and each of the ends in the middle, measured parallel to the wood grain.
 - 11.3.2.2. The test fuel load shall have an average moisture content from 19% to 25%, dry basis.
 - 11.3.2.3. Individual fuel pieces shall have an average moisture content of 19% to 25% dry basis.
 - 11.3.2.4. The addition of moisture to previously dried wood is not allowed.
 - 11.3.2.5. It is recommended that the test fuel be stored in a temperature and humidity-controlled room.

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11.3.2.6. Fuel moisture shall be measured within 24 hours of using the fuel for the test and shall be bagged or stored in a humidity-controlled environment until 2 hours prior to testing. A humidity-controlled environment is one where fuel is not subject to conditions that would remove moisture from the fuel, such as fans or a heating source, and maintain relative humidity levels greater than 75%.

11.3.3. Fuel Temperature. The test fuel shall be at the test facility temperature of 55 to 87 °F (13 to 30.6 °C) $\pm$ 2 °F.

11.3.4. Fuel Dimensions. The dimensions of each test fuel piece shall conform to definitions specified by the protocols using the fuel load calculator.

11.3.4.1. Fuel length:

11.3.4.1.1. The length of the fuel pieces will be determined by the fuel load calculator.

11.3.4.1.2. Measurements shall be taken, and the length of the test fuel will be determined by entering the firebox dimensions.

11.3.4.1.3. Piece length specified by the fuel calculator shall be communicated and specified for use in the owner's manual and website. Piece size shall be within 0.5" of the log length determined by the calculator, as measured on the shortest length measurement.

11.3.5. Fuel Loading Direction

11.3.5.1. Fuel loading direction shall be determined by the firebox measurement.

11.3.5.1.1. Stoves with a depth measurement greater than two inches from the width measurement shall be tested with the fuel in a north-south configuration and may not test with fuel in an east-west or crisscross configuration in any load other than Load 1 and Load 2.

11.3.5.1.2. Stoves with a width measurement greater than the depth measurement or a width measurement within two inches of the depth measurement shall be tested with the fuel loaded in an east-west configuration and may not test with fuel in a north/south configuration or crisscross configuration in any load other than Load 1.

11.3.6. Fuel piece weight for each phase of the protocol shall be determined by the fuel load calculator.

11.3.6.1. Kindling – shall be:

11.3.6.1.1. Pieces of wood less than or equal to 1” in diameter.

11.3.6.1.2. No bark requirements for kindling fuel.

11.3.6.1.3. Fuel species may be any species allowed in 7.2.1.1.

11.3.6.1.4. No moisture requirements.

11.3.6.1.5. Length of kindling shall be the fuel length specified by the fuel load calculator.

11.3.6.1.6. Kindling fuel shall conform to the rule that 7 to 10 pieces of kindling equal 1 pound of kindling fuel (+/- 5%).

11.3.6.2. Trapezoidal pieces. The top of any trapezoidal-shaped piece may not be greater in dimension than 70% of the base dimension of the trapezoid and must conform to the piece limits specifications.

11.3.6.3. Starter fuel: pieces of cordwood shall be used during the startup phase. Individual piece weight for starter fuel shall be determined by the fuel load calculator. Each piece shall be triangular, irregular, or circular in cross-section. Square-like or rectangle-like pieces shall not be used (see Figure 1). Pieces that have squared cross sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized to the extent possible, and fuel load pieces shall be composed to include different shapes of wood if using any trapezoidal pieces. .

11.3.6.4. Small fuel pieces: smaller pieces of cordwood by weight and pre-defined length, as defined by the fuel load calculator. Square-like or rectangle-like cross sections pieces shall not be used (see Figure 1). Pieces that have square cross-sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized to the extent possible. No more than two (2) small fuel pieces can be trapezoidal in shape (Figure 2) per fuel load.

11.3.6.5. Large fuel pieces: larger pieces of cordwood, by weight and pre-defined length, as defined by the fuel load calculator. Each piece shall be triangular, irregular, or circular in cross-section. Square-like or rectangle-like cross section pieces shall not be used (see Figure 1). Pieces that have square cross-sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized

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to the extent possible. No more than one (1) large fuel piece can be trapezoidal in shape (Figure 2) per fuel load.

Figure 1. Schematic of unacceptable cross-sectional profiles



Figure 2. Schematic of undesirable and limited use shapes



Figure 3. Schematics of acceptable cross-sectional profiles



11.4. Sampling Equipment.

11.4.1. Prepare the tunnel and lab air PM sampling equipment as defined by the NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

11.4.2. Prepare all other equipment as defined by method EPA Method 1, 2, 3, 4, and ASTM 2515-11, other than deviations from ASTM 2515-11 that are specified in this test method.

11.5. Manufacturer participation in certification testing.

11.5.1. A representative of the manufacturer may observe testing but may not provide instructions to the certification lab, in any form, with testing staff or equipment once the certification tests begin. The names of testing witnesses cannot be withheld as confidential business information (CBI). All correspondence between the manufacturer and lab, written or verbal, must be included in the test report.

11.6. Test Run Procedure.

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- 11.6.1. Before each test series, the firebox shall be vacuumed. Testing shall begin without any ash or other materials in the appliance.
- 11.6.2. Before initiating the compliance test series, clean the flue and dilution tunnel with an appropriately sized wire chimney brush before each certification test. Test documentation should include the date and time of flue cleaning.
- 11.6.3. Record fuel weight data, temperature measurements, and gas concentrations at 1-minute intervals.
- 11.6.4. Wood Heater Operation and Adjustments. Record all adjustments made to the air supply controls, adjustments to and additions or subtractions of fuel, and any other changes to wood heater operations that occur during the test period.
- 11.6.5. Appliance operation –
 - 11.6.5.1. Bypass operation for all appliances shall follow operational instructions contained in the appliance owner's manual.
 - 11.6.5.2. For appliances that can be sold with blowers, test runs must be conducted with automatic blowers turned on at the highest setting for all test runs.
- 11.6.6. The weight of fuel remaining at the end of the test run is determined as the difference between the weight of the wood heater with the remaining coals and fuel and the weight after loading the fuel charge. The starting weight is the tare weight of the cleaned, dry wood heater.
- 11.6.7. Run Documentations. Tests shall conform to one of the options listed below. Failure to comply with one of the options will result in an invalid test run.
 - 11.6.7.1. All runs shall be video recorded in their entirety. The video shall be of sufficient quality to determine fuel characteristics, fuel loading procedures, and firebox conditions during any testing or aging conducted by the test lab. The testing lab shall have the capacity to allow appropriate agencies the opportunity to remotely witness the test.
 - 11.6.7.2. All active periods, as defined by this test method, shall be video recorded and inactive periods, if not video recorded in real time, shall be video recorded at no more than 1-minute intervals.
- 11.6.8. *L1: Start-up Phase*

11.6.8.1. L1 Appliance requirements.

11.6.8.1.1. Stove temperature: internal and external stove temperature must not be greater than the ambient temperature $\pm 2^{\circ}\text{F}$ (1.1°C) for Run 1. There is no stove starting temperature requirement for Runs 2 and 3 except in the case of a failed first run. In this case, if Run 1 is invalid or incomplete, the stove must meet Run 1 condition for at least one valid run. Temperature measurements for the external and internal temperatures shall be taken within 15 minutes before starting the test and shall be reported in the test report.

11.6.8.1.2. Tare the appliance scale before starting the test. Record appliance scale weights at the start and end of L1 phase.

11.6.8.2. L1 Fuel requirements.

11.6.8.2.1. L1 Fuel type – during the startup phase, newspaper (optional up to six full sheets of traditional newspaper size), kindling, and starter fuel pieces are used. No other additions are allowed.

11.6.8.2.2. L1 Loading density

11.6.8.2.2.1. Kindling loading density: 1 lb. per cubic foot for dry kindling, $\pm 5\%$. The fuel load calculator determines the amount of kindling that can be used.

11.6.8.2.2.2. Starter Fuel loading density: 3 lb. per cubic foot, $\pm 5\%$. The fuel load calculator will determine the minimum piece weight that can be used as starter fuel.

11.6.8.3. L1 Fuel loading structure: The loading structure of the fire shall be a bottom-up configuration with newspaper on the bottom, kindling on top of the paper, and starter fuel on top of the kindling. Kindling and starter fuel shall be loaded in a crisscross configuration.

11.6.8.4. L1 Operational parameters.

11.6.8.4.1. All kindling, starter fuel, and newspaper must be in the firebox for light off.

11.6.8.4.2. Settings

11.6.8.4.2.1. Manual appliances: All air settings are fully open.

11.6.8.4.2.2. Automatically controlled appliances: settings used to achieve maximum heat output. Air control settings shall not be modified setting, and the appliance shall operate as dictated by the automatic controls.

11.6.8.4.3. Light the fire with a torch for a period of no more than 30 seconds.

11.6.8.4.4. Immediately after lighting the fire, the appliance door shall be moved to a cracked open position. Cracked open position is defined as opening no more than one inch. The appliance door shall be closed within 5 minutes after ignition.

11.6.8.5. L1 Fuel Adjustments: up to three fuel adjustments are allowed in the startup phase. The door may be open for 30 seconds during each fuel adjustment.

11.6.8.6. L1 End of Phase – the end of the startup phase is defined by the weight specified by the fuel load calculator.

11.6.8.7. L1 Documentation – Video of the test to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coalbed, and fire when the door is closed sufficient to determine fueling positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge.

11.6.9. L2: *High-fire Phase* – the high-fire phase commences immediately after the startup phase ends.

11.6.9.1. L2 Appliance Requirements.

11.6.9.1.1. Record the weight of the stove prior to loading the L2 fuel charge, the weight of the fuel charge prior to loading, and the scale weight after loading the L2 fuel charge.

11.6.9.2. L2 Fuel requirements.

11.6.9.2.1. L2 piece size – during the high-fire phase, small cordwood pieces by weight, as defined by the fuel load calculator, are used.

11.6.9.2.2. L2 loading density: 7 lb. per cubic foot, +/- 5%. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.9.3. L2 Operational parameters:

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11.6.9.3.1. Door opening: Open the door upon completion of the startup phase and load the L2 fuel load within 60 seconds. Once the fuel has been loaded, the appliance doors shall be closed immediately.

11.6.9.3.2. Air settings

11.6.9.3.2.1. Manually controlled appliances. During the start of the phase air settings shall be fully open to achieve maximum heat output. When 50% of the L2 fuel load mass has been consumed, the air settings shall be moved to the lowest settings.

11.6.9.3.2.2. Automatically controlled appliances: At the start of the phase settings shall be set at those used to achieve maximum heat output. When 50% of the L2 fuel load mass has been consumed, the control systems shall be moved to the control settings to achieve the lowest burn rate. Air control settings shall not be modified after moving to lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.9.4. L2 Fuel Adjustments.

11.6.9.4.1. One fuel adjustment may be made during the high-fire phase prior to moving the primary air control(s) to their lowest setting. The fuel adjustment shall optimize fuel placement for burn conditions. The door shall remain open for 30 seconds for fuel adjustments.

11.6.9.4.2. Additional fuel adjustments shall be made if there is a five-minute period without a weight change of 0.10 pounds at any point during the high-fire phase.

11.6.9.4.3. If there is a five-minute period without a weight change (0.10 lb) at any point during the high-fire phase, the appliance door may be opened for 30 seconds for fuel adjustments.

11.6.9.4.4. All fuel adjustments must be documented in the test report notes and summary.

11.6.9.5. End of L2 Phase –The high-fire phase ends when the scale indicates that 90% of the high-fire fuel mass has been consumed.

11.6.9.6. L2 Documentation – Video of the test during active periods to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings,

coal-bed, and fire when the door is closed sufficient to determine fuel positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions.
Photo of the fuel charge prior to loading.

11.6.10. *L3: Maintenance-fire Phase* – the L3 maintenance-fire phase commences immediately after the L2 high-fire phase ends.

11.6.10.1. L3 Appliance Requirements.

11.6.10.1.1. Record the weight of the stove prior to loading the maintenance-fire fuel charge, the weight of the fuel charge prior to loading, and the scale weight after loading the maintenance-fire fuel charge.

11.6.10.2. L3 Fuel Requirements.

11.6.10.2.1. Fuel type – during the L3 phase, large cordwood pieces are used. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.10.2.2. L3 Fuel loading structure: fuel shall be loaded in the direction specified by the fueling calculator.

11.6.10.2.3. L3 loading density: 5 lb. per cubic foot, +/- 5%. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.10.3. L3 Operational Parameters:

11.6.10.3.1. Open door upon completion of the L2 phase and load the maintenance-fire fuel charge.

11.6.10.3.2. Air controls

11.6.10.3.2.1. Manually controlled air settings: shall be placed in the fully open position for the first five minutes of the phase, and then returned to the low air setting.

11.6.10.3.2.2. Automatically controlled air settings: shall be placed in the maximum heat output setting for the first five minutes and then shifted to the lowest heat output setting. Air control settings shall not be modified after moving to the lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.10.3.3. L3 Load - L3 fuel loaded within 30 seconds of the door opening. Close the loading door immediately.

11.6.10.4. L3 Fuel Adjustments: Fuel Adjustments: If there is a ten-minute period without weight change (0.10 lb.) at any point during the L3-fire phase, a fuel adjustment shall be made to increase the burn rate. The door may be open for up to 30 seconds for fuel adjustments. Only two fuel adjustments may be made during this phase. If after the second fuel adjustment, another ten-minute period of no weight change (0.10 lb.) occurs, the run ends, and it is a failed test run.

11.6.10.5. L3 End of Phase – The L3-fire phase ends when the scale indicates that 90% of the maintenance-fire fuel mass has been consumed.

11.6.10.6. L3 Documentation – Video of the test to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coal-bed, and fire when the door is closed sufficient to determine fueling positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge prior to loading.

11.6.11. L4: Low burn rate phase – L4 phase commences immediately after the L3-fire ends.

11.6.11.1. L4 Appliance Requirements.

11.6.11.1.1. Record the weight of the stove prior to loading the L4-fire fuel charge, the load of the fuel charge prior to loading, and the scale weight after loading the overnight-fire fuel charge. Alternatively, if the scale was zeroed prior to starting the test, record the scale weight before and after loading the overnight-fire fuel charge.

11.6.11.2. L4 Fuel requirements

11.6.11.2.1. L4 fuel type –a mix of small and large cordwood pieces are used. At least 50% of the fuel charge load, by the number of pieces, must be large pieces.

11.6.11.2.2. L4 Loading structure: fuel will be loaded in one direction.

11.6.11.2.3. L4 loading density: The fuel load calculator specifies a load volume of 12 lb./ft.³ +/-5%. Fuel shall be loaded in a manner to maximize the number of pieces that will fit in the stove without using force. If all pieces cannot be loaded, the stove shall be loaded to the maximum extent possible.

11.6.11.3. L4 Operational Parameters:

11.6.11.3.1. Open the loading door upon completion of the L3 maintenance-fire phase.

11.6.11.3.2. Load the L4 fuel charge within two minutes (120 seconds).

11.6.11.3.3. Keep the door in cracked position (*open up to 1 inch as measured from the opposite of the hinge - largest opening one inch*) for up to five minutes from the beginning of the L4 phase.

11.6.11.3.4. Air controls

11.6.11.3.4.1. Manual air settings: may be placed in the fully open position for the first ten minutes of the phase, and then returned to the low air setting.

11.6.11.3.4.2. Automatically controlled air settings: may be placed in the maximum heat output setting for the first ten minutes and then shifted to the lowest heat output setting. Air control settings shall not be modified after moving to the lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.11.4. L4 Fuel Adjustments.

11.6.11.4.1. Unlimited fuel adjustments are allowed within the first ten minutes of the phase. The door may be open for up to 30 seconds for fuel adjustments.

11.6.11.4.2. If there is a ten-minute period without weight change (0.10 lb.) during the first hour of the L4- phase, a fuel adjustment shall be made. The door may be open for up to 30 seconds for fuel adjustments.

11.6.11.4.3. Only two fuel adjustments may be made during the first hour. If after the second fuel adjustment, another period of no weight change (0.10 lb.) is observed, the run ends, and it is a failed test run.

11.6.11.4.4. No fuel adjustments are allowed after the first hour of the phase.

11.6.11.4.5. If there is no weight change (0.10 lb) for a consecutive period of 20 minutes at any point after the first hour of the phase, the test run ends and is an incomplete test run.

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- 11.6.11.5. L4 End of Phase – The L4 phase shall end when the scale indicates that 100% of the total L4 fuel mass has been consumed. If the fuel load does not burn to 90%, it is a failed test run.
- 11.6.11.6. L4 Documentation - Video of the test during active periods to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coalbed, and fire when the door is closed sufficient to determine fuel positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge prior to loading.
- 11.7. Test Run. A complete test run requires the completion of all four burn phases and loads. For any appliance that will not accommodate the loading arrangement specified in this test method, the test facility personnel shall contact the Agency Administrator to obtain written approval for an alternative loading arrangement.
- 11.8. Test Run Requirements. The following describes the required parameters for each test run. Each emission test run shall include all operational and fueling protocol phases in order as described.
- 11.8.1. Consecutive Test Runs. Consecutive test runs may be conducted, provided that the following requirements are met:
- 11.8.1.1. Run 1 – The appliance shall have an internal and external starting temperature within +/- 2 °F (1.1°C) of ambient laboratory temperature at the beginning of Run 1.
- 11.8.1.2. Run 2 – The second test run may commence 24 hours after the start of Run 1. Stove coals and ash can remain in the stove until 1 hour before conducting Run 2. All coals and ash shall be removed at least one hour prior to commencing Run 2.
- 11.8.1.3. Run 3 – The third test run may commence 24 hours after the start of Run 2. Stove coals and ash may remain in the stove until 1 hour before conducting Run 3. All coals and ash shall be removed at least one hour prior to commencing Run 2.
- 11.9. *Failure to Operate at All Test Conditions*
- 11.9.1. If the appliance fails two runs due to incomplete or invalid test runs, it shall be determined that the appliance has failed the certification test and requires a modification to appliance design. All data for incomplete runs shall be reported. Incomplete failed test runs are defined as the following:
- 11.9.1.1. If a wood heater fails to complete all four phases of the test run, the run shall be considered a failed test run.

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- 11.9.1.2. If there is no weight change, defined as 0.10 lb., for a consecutive period of 20 minutes at any point during the test, the unit has failed the test run.
- 11.9.2. If a test run violates any of the test method parameters, the run is invalid.
- 11.9.3. If during certification testing a critical component of the stove is damaged or breaks, the certification test will be stopped and considered invalid.
 - 11.9.3.1. If damage is noted during a test, repairs shall be made by the manufacturer (or by laboratory personnel with written direction from the manufacturer). If the repair involves components that would need aging, the appliance shall then undergo another round of wood heater aging as specified in section 10.6. These components may include but are not limited to catalyst elements, gaskets, and refractory components. The aging process is intended not only to 'cure' the stove but also to cycle parts that may fail with extended use. Alternate aging techniques may be approved by the administrator, depending on the nature of the failure, material, and critical nature.
- 11.10. Test Run Completion. Once three (four for appliances with automatic controls) valid runs have been completed, the testing is complete. No additional runs may be completed.
 - 11.10.1. *Additional Test Runs.*
 - 11.10.1.1. *Invalid/Incomplete Runs.* If there is an invalid run, another additional run may be attempted to complete the test series. If more than three test runs are conducted, the results from all valid test runs shall be used in calculating the average emission rate. The measurement data and results of all test runs shall be reported regardless of which values are used in calculating the emission rate.
 - 11.10.1.2. *No Power Mode for Automatically Controlled Appliances.* For appliances that can only be operated in an automatically controlled mode when power is supplied to the unit, the "no power mode" test run shall not be averaged into the overall test result, but the result from the "no power mode" test run shall be reported separately in the test report. For units where the operator has a choice to operate the appliance in automatic or manual mode, the "no power test" shall be included in the determining the reported results.
 - 11.10.1.3. *Data Elimination.* No test run data can be eliminated from the reporting requirements of this method.
 - 11.10.1.4. A maximum of five runs (six for appliances with automatic controls) attempts can be completed. If a wood heater cannot complete three valid runs after five (six for appliances with automatic controls) attempts, the appliance has failed the certification test.
 - 11.10.2. *Invalid Runs.* When a test run fails to meet one of the QA/QC criteria stipulated in the test method, the data are invalid, and the run must be repeated. Data for the invalidated test run

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must be included in the test report, but the data must not be used in the calculation of average emission values.

- 11.10.3. *Incomplete Runs*: When an appliance cannot successfully complete all operational elements of the protocol specified in Section 11.6.7 through 11.6.10, it is an incomplete run

11.11. Auxiliary Wood Heater Equipment Operation.

- 11.11.1. All test runs should have the fan “ON” at the highest setting except for:

11.11.1.1. The duration of L1;

11.11.1.2. When the door is open in all loads (L1, L2, L3 and L4);

11.11.1.3. From the end of L3 to when the air control is set to the lowest position for L4.

- 11.11.2. An automatic blower can be left energized.

11.12. PM Data Recording.

- 11.12.1. All TEOM data shall be collected and recorded at intervals of 1 minute. TEOM operation shall follow the procedures listed in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

- 11.12.2. Tunnel and lab air PM TEOM Data shall be reported using the Excel data analysis spreadsheet templates that are part of the NYSERDA Standard Operation Procedures for Thermo 1405-D TEOM for use in a dilution tunnel. These data analysis spreadsheets shall be submitted as part of the test report.

- 11.12.3. Lab PM measurement – TEOM. A single channel TEOM is used to measure ambient lab air PM during the test, as configured in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces. The sample flow shall be 3 LPM.

12. **Quality Control Measures**

- 12.1. Dilution tunnel - Conduct sampling equipment leak check and calibration pre-and post-test.

- 12.2. TEOM – Flow and Leak checks are done before and after every test run per NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces. Additional quality control measures are included in the TEOM Operating Procedure.

- 12.3. Conduct all checks and calibrations per ASTM 2515-11.

13. **Data Analysis and Calculations.**

Proportioning of emission factors and rates per phase according to Appendix A, variables shall have

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subscript added to determine the relevancy of phase, i.e. $E_{T(P1)}$ indicates Total particulate emissions for Phase 1 and $E_{g/hr(P2)}$ indicates emissions factor in grams per hour for Phase 2.

13.1. Emission Calculations. Particulate matter, carbon dioxide, and carbon monoxide shall be calculated using the following methodology and reported in grams per hour, grams per kilogram and pounds per million British Thermal Unit (BTU) heat output.

13.2. Rounding

13.2.1. All calculations shall be conducted using all decimal values provided by the instrumentation or recorded by the operator.

13.2.2. No truncation of data is acceptable until the final result has been calculated.

13.2.3. Only the final calculation of the PM emissions rate shall be rounded to three significant figures.

13.2.4. When rounding off a figure, the following procedure should be used. If the first digit to be discarded is less than five, the last digit retained should not be changed. When the first digit discarded is greater than five, or if it is a five followed by at least one digit other than zero, the last figure retained should be increased by one unit. When the first digit discarded is exactly five, followed only by zeros, the last digit retained should be rounded upward if it is an odd number, but no adjustment made if it is an even number.

13.3. TEOM data shall be reported as follows.

13.3.1. Emissions from each of the 4 phases of the test shall be reported as individual results in grams per hour, grams per kilogram, and lb/MMBtu (heat output). Calculations shall use Section 7 of the NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

13.3.2. Emissions from the entire test run in grams per hour, grams per kilogram, and lb/MMBtu (heat output) using the TEOM data.

13.4. PM Filter data: Emissions from the entire test run in grams per hour, grams per kilogram, and lb/MMBtu (heat output) using the ASTM 2515-11 filter data.

Nomenclature

BR – average dry fuel burn rate, lb/hour

$BR_{(x)}$ – Burn rate for specific phase, BR_{L1} , BR_{L2} , BR_{L3} , BR_{L4}

CO – Carbon Monoxide

CO₂ – Carbon Dioxide

BT = time of 90% of overnight load consumed – time of overnight loading

C_{steel} – Specific heat of steel (0.1 Btu/ lb)

E_T – Total particulate emissions for the full test run in grams
 $E_{g/MJ}$ – PM emissions rate in grams per megajoule of heat output
 $E_{g/kg}$ – PM emissions factor in grams per kilogram of dry fuel burned
 $E_{g/hr}$ – PM emissions rate in grams per hour
 HHV – Higher heating value of dry fuel (Btu/lb), measured with ASTM E711
 $kJ/kgmol\ K$ - kilojoules per kilogram-mol Kelvin
 $\%M_d$ - Fuel moisture content, dry basis, percent
 $\%M_w$ - Average moisture in test fuel charge, wet basis, percent
 PCTCO₂ – average CO₂ in the dry flue gas (%)
 PPMco – average CO in the dry flue gas (ppm)
 Q_{out} – Total heat output in BTU's (megajoules)
 SC_i – Scale weight at specific time interval, lb.
 T_1 – Surface Temperature 1 °F (°C)
 T_2 – Surface Temperature 2 °F (°C)
 T_3 – Surface Temperature 3 °F (°C)
 T_4 – Surface Temperature 4 °F (°C)
 T_5 – Surface Temperature 5 °F (°C)
 T_6 - Flue Gas Temperature °F (°C)
 T_7 – Room Temperature °F (°C)
 $TS_{avg(i)}$ – Initial Average Surface Temperature °F (°C)
 $TS_{avg(f)}$ – Final Average Surface Temperature °F (°C)
 W_{fuel} – Fuel charge weight in pounds (kg)
 Θ – Total length of test run, hours
 $\Theta_{(x)}$ – Total length of test run in hours per phase, X
 $\%M_w = 100(\%M_d)/100 + \%M_d$

13.5. Average Wood Heater Surface Temperatures. Calculate the average of the wood heater surface temperatures at the start of the phase (L4) and end at the end of the test (L4) of the test run.

$$L4\ TS_{avg(i)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

$$L4\ TS_{avg(f)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

Average surface temperatures at the start and end of any phase can be determined by averaging all five sensors at the beginning and end of each phase.

$$L_x\ TS_{avg(i)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

$$L_x\ TS_{avg(f)} - (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

13.6. Determine Burn Rates

BR_{L1} = not applicable

$$BR_{L2} = (L2\ Initial\ SC_i - L2\ Final\ SC_i) / \Theta_{(L2)},\ lbs./hr$$

$$BR_{L3} = (L3\ Initial\ SC_i - L3\ Final\ SC_i) / \Theta_{(L3)},\ lbs./hr$$

$$BR_{L4} = (L4\ Initial\ SC_i - L4\ Final\ SC_i) / \Theta_{(L4)},\ lbs./hr$$

13.7. Emissions

13.7.1. Determine emission rates and emission factors, reporting results from both TEOM and filter data, as:

$$E_{g/MJ} = E_T / (Q_{out} \times 0.001055), \text{ g/MJ}$$

$$E_{g/kg} = E_T / (W_{fuel} / (1 + M\%M_d / 100)), \text{ g/dry kg}$$

$$E_{g/hr} = E_T / \Theta, \text{ g/hr}$$

13.8. CO Calculations

$$CO_{PPM} \text{ to } CO_{\%} = CO_{ppm} / 10000 \text{ ppm}/\% = CO_{\%}$$

$$CO_{2(ppm)} \text{ to } CO_{2(\%)} = CO_{2(ppm)} / 10000 \text{ ppm}/\% = CO_{2(\%)}$$

$$CO \text{ factor (g/kg dry wood)} = (CO_{\%} \times 1000 \text{ g/kg} \times 0.508 \times (28 \text{ g/mol} / 12 \text{ g/mol})) / CO_{2(\%)}$$

Where: 0.508 is the assumed carbon fraction of wood

28 is the molecular weight of CO

12 is the molecular weight of Carbon

1000 is a conversion of grams/kg

13.9. Efficiency calculation: As defined in 40 CFR part 60 per subpart AAA, efficiency shall be calculated per CSA B415.10 to be comparable with EPA Method 28R. Efficiency (%HHV), CO emission rate (g/h and g/min) emissions factor (lb/MMBtu, and power output (BTU/h) shall be calculated for all individual loads (L1, L2, L3, and L4) with the following exceptions:

13.9.1. No substitution of data is allowed.

13.9.2. 10-minute average data must be used to calculate efficiency

14. Reporting Requirements. The report shall include the following:

14.1. Introduction

14.1.1. Purpose of test: certification, audit, efficiency,

14.1.2. Name and location of the laboratory conducting the test.

14.1.3. Wood appliance identification – manufacturer, model number/name, design type, description of the appliance tested, stove condition, and date of receipt.

14.1.4. Test information – location of testing, date of tests, sampling methods used, number of test runs, a statement detailing any previous certification testing completed on the wood appliance.

14.1.5. A list of people who conducted research on the appliance, participated in testing preparation, or witnessed the certification testing. This list shall clearly specify their roles in

the testing program for the appliance. The list shall include the participant's name, title, company, contact information and the purpose of their participation.

14.1.6. A statement that the test results apply only to the specific appliance tested.

14.2. Summary and Discussion of Results

14.2.1. Table of results to include test run number, average burn rate for entire run and each phase, carbon monoxide and particulate emission rate for full run, particulate and carbon monoxide emission rate for each load phase (L1, L2, L3, L4), efficiency for the full run and each phase, burn time for total run and each phase.

14.2.2. For each test run and pollutant with real-time data to include: $\Theta_1, \Theta_2, \Theta_3$, CO, CO₂, PM, and efficiency for (1) L1 - the startup phase and (2) L2 - high-, (3) L3-maintenance-, and (4) L4 low burn rate fire phases. Calculated results for PM emissions shall be reported as total emissions in grams, pounds per million Btu output, grams per MJ, grams per kilogram of dry fuel and grams per hour, and pounds per hour. Calculated results for $\Theta_1, \Theta_2, \Theta_3$, CO, and CO₂ emissions shall be reported as grams per kilogram of dry fuel and parts per million for CO and percent for CO and CO₂. Efficiency shall be reported for each load. CO measurements shall be obtained from the dilution tunnel.

14.2.3. A narrative discussion detailing any issues or anomalies that arose during each test run and how those were handled, including comments about the fuel, and loading of the appliance.

14.2.4. TEOM PM Plots

14.2.4.1. A plot of PM emission rate in grams/hour vs. time at 1-minute intervals, for the entire test period, for each run. The report shall include a table reporting the maximum 1-minute, 5-minute, and 60-minute grams per hour on a rolling basis for the test run.

14.2.5. Summary of other data – test facility conditions, surface temperature averages, catalyst temperature averages, pretest fuel weights, test fuel charge weights – total and by phase.

14.3. Discussion. Test run result, specific test run problems, and solutions. Comments on fuel, loading, analysis, and anything that may impact the reported result(s).

14.3.1. Details of deviations from, additions to or exclusions from the test method, and their data quality implications on the test results (if any), as well as information on specific test conditions, such as environmental conditions. An explanation of the deviations, additions, or exclusions shall be provided along with an analysis as to why these elements had no impact.

14.4. Process description:

14.4.1. Data and drawings indicating the firebox size and location of the fuel charge.

14.4.2. Drawings and calculations used to determine firebox volume to include volume, height, width, and lengths, weight, and volume adjustments.

14.4.3. Firebox configuration – At a minimum to include air supply locations and operation, air supply introduction location, refractory location and dimensions, catalyst location, baffle and by-pass location and operation (include line drawings or photographs)

14.4.4. Appliance operation during the test – shall supply details on air supply settings and

adjustments.

14.5. Test fuel properties – the report shall provide information on the species, density, fuel moisture, fuel temperature, and load details from the fuel load calculator to include all measurements including the number of pieces, individual piece weights, piece length, moisture content and weight.

14.6. Sampling

14.6.1. A description of the test procedures and test equipment, including a schematic or other drawing showing the location of all required test equipment. Also, a description of test fuel sourcing, handling and storage practices shall be included.

14.6.2. Describe the sampling location relative to the wood heater, include drawing or photographs.

14.6.3. Provide data on sampling blanks.

14.7. Quality Control and Assurance Procedures

14.7.1. Calibration procedures and results certification procedures, sample and analysis procedures.

14.7.2. Test method quality control procedures to include TEOM leak and flow checks, stratification (velocity) checks, tunnel flow range results, filter temperature range verification and dilution tunnel RH verification.

14.8. Appendices

14.8.1. Results and Example Calculations. Raw data and complete calculations for data included in summary tables.

14.8.2. Raw data. Copies of all files or sheets for sampling measurement, temperature records, and other materials used by lab related to testing.

14.8.3. Calibration Results. Summary of all calibrations, checks, and audits pertinent to the certification.

14.8.4. Sampling and Operation Records. Copies of all uncorrected records of activities not included in raw data sheets (e.g., wood heater door open, times and durations) as well as photographs of fuel loading and airflow settings.

14.8.5. Correspondence. Any correspondence to include written, electronic or verbal communications regarding appliance testing. Items shall include:

14.8.5.1. Request to conduct testing

14.8.5.2. Scheduling of testing

14.8.5.3. Notice to EPA to conduct test and any modifications to that request.

14.8.6. Test Facility Information. Report test facility temperature, air velocity, and humidity information.

14.8.7. Test Equipment Calibration and Audit Information. Report calibration and audit results for the platform scale, test fuel balance, test fuel moisture meter, and sampling equipment, including volume metering systems and gaseous analyzers.

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- 14.8.8. Pretest procedures. Report all pretest procedures conducted at the lab on the appliance to burns, rates, and amounts.
- 14.8.9. All required data for each test run shall be provided in spreadsheet format both in the printed report and in a computer file such that the data can be easily analyzed and calculations easily verified. Formulas used for all calculations shall be accessible for review.
- 14.8.10. For each test run: report TEOM flow and temperature and verification of all TEOM data validation parameters as required in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.
- 14.8.11. Raw data, calibration records, and other relevant documentation shall be retained by the laboratory for a minimum of 7 years.



OMB Control No. 2060-0161
Approval expires 03/31/2019

OMB Control No. 2060-0693
Approval expires 03/31/2019

EPA Form 6400-05

Office of Enforcement and Compliance Assurance

30-DAY NOTIFICATION

2015 CLEAN AIR ACT (CAA) STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS, NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES 40 CFR PART 60 SUBPARTS AAA AND QQQQ

The public reporting and recordkeeping burden for this collection of information is estimated to average 2 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Regulatory Support Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Disclaimer: The statutory provisions and the EPA regulations described in this document contain legally binding requirements. This document is not a substitute for those provisions or regulations, nor is it a regulation itself. In the event of a discrepancy, please refer to 40 CFR PART 60 Subparts AAA AND QQQQ, sections 60.537 and 60.5479. If you have additional questions, please contact Rafael Sanchez at 202-564-7028 or via email at sanchez.rafael@epa.gov.

Instructions: The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov. This notice must be received by the EPA at least 30 days before the start of testing.

GENERAL INFORMATION						
Manufacturer's Name: Stove Builder International						
Heater Type (Check one):	☒ Adjustable Burn Rate Wood Heater	☐ Pellet Stove	☐ Single Burn Rate Heater	☐ Hydronic Heater	☐ Forced Air Furnace	☐ Other:
Hydronic Heater Type (Check one):	☐ Full Storage	☐ Partial Storage	☐ Indoor	☐ Outdoor	☐ Other:	
Forced-Air Furnace Type (Check one):	☐ Small (less than 65,000 BTU/hr heat output)		☐ Large (greater than 65,000 BTU/hr heat output)			
Fuel Tested (Check one):	☐ Crib	☐ Pellet	☒ Cordwood	☐ Wood Chips	☐ Other:	
Model Name(s) (as will appear on test report): Everest III Series						
Model Number(s) (as will appear on test report): Everest III, other model names TBD.						
Equipped with a catalytic combustor? ☐ Yes ☒ No						



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Mailing Address: Same as street address		
Street Address: 250 rue de Copenhagen		
City: Saint-Augustin-de-Desmaures	State: Québec	ZIP Code: G3A 2H3
Phone: 1-418-878-3040 x5224	Fax: 1-418-878-3001	Web Site: www.sbi-international.com
Address of Manufacturer: Same as above.		
City:	State	ZIP Code:
EPA APPROVED TEST LABORATORY		
Name and Title of Authorized Representative: Lyrik Pitzman and Aaron Kravitz		
Company: PFS TECO		
Phone: (503) 650-0088 Ext 3001	E-mail: lyrik.pitzman@pfsteco.com	Fax:



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City: Clackamas	State: OR	ZIP Code: 97015
EPA APPROVED THIRD-PARTY CERTIFIER		
Name and Title of Authorized Representative: John Steinert, General Manager		
Company: PFS-TECO		
Phone: 503-650-0088	E-mail: john.steinert@pfsteco.com	Fax:
City: Clackamas	State: OR	ZIP Code: 97015
COMPLIANCE TEST INFORMATION		
Test Method(s): ATM, See EPA letter of 02/06/2024		
Date(s) of Proposed Test: Week of May 6, 2024		
Testing Location (Name and Address): PFS-TECO, see address above.		
Contact Name: Guillaume Thibodeau-Fortin	Title: Laboratory Manager	



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Phone Number: 1-418-878-3040 x5224	Email Address: gthibodeaufortin@sbi-international.com
Guillaume Thibodeau-Fortin, P. Eng., Laboratory Manager	
Print Name and Title of Authorized Official	
	
Signature	
04-02-2024	
Date	
1-418-878-3040 x 5224	
Telephone Number:	
gthibodeaufortin@sbi-international.com	
Email Address:	
Remarks:	

Email to request a test lab to review the test method that will be presented in the ATM. **GF**

Guillaume Thibodeau-Fortin

De: Guillaume Thibodeau-Fortin
Envoyé: 17 octobre 2023 09:45
À: Sebastian Bulton
Cc: John Steinert, Louis-Pierre Côté, Bernard Blouin
Objet: CONFIDENTIAL - IDC-like test method - CONFIDENTIAL

CONFIDENTIAL INFORMATION

Good morning Sebastian,

We finally received a "Go" from Nysenda to use a new test method call the "IDC-like". [REDACTED]

We currently have a factory-built, manually controlled, non-cat fireplace that we want to test using this method. Testing will need to be performed in your lab because of the TEOM need.

1. Can you review both documents (method and calculator) to make sure nothing prevents you from testing?
 - a. We put some comments in the margin to help you see what is different from ALT-140. We asked for clarification for some points, but I will not wait for that to ask for an official ATM.
 - b. We did not review the fuel load calculator yet, will be done this week.
2. Can you tell us what is your next window for a testing like that?

Please find the documents under this link: [REDACTED]

Please contact Bernard if you find anything that would prevents you from testing. We need to send the official ATM request ASAP, hopefully next week.

This is confidential information; [REDACTED]

Thank you [REDACTED]



Guillaume Thibodeau-Fortin, Ing./P.Eng.

Ingénieur mécanique
Mechanical Engineer



In this email, date of May 6 was booked for another testing. After delay, it was decided to use May 6 for Everest III Series certification testing. *GF*

Guillaume Thibodeau-Fortin

De: John Steinert [REDACTED]
Envoyé: 8 novembre 2023 19:30
À: Guillaume Thibodeau-Fortin
Cc: Louis-Pierre Côté; Sylvain Marcoux
Objet: [EXT] RE: Certification testing - [REDACTED]
Pièces jointes: SBI IITA IDC Testing Everest III.pdf

ATTENTION/CAUTION: Ce message vient de l'extérieur de l'organisation. Ne pas cliquer sur les liens ou ouvrir les attachements sans être certain que le contenu est sécuritaire. / This email originated from outside of the organization. Do not click links or open attachments unless you know the content is safe.

Hi Guillaume,

Attached is the proposal for the Everest III for your review. Please give me a call if you would like to discuss. I have also penciled you in the schedule for the Week of May 6 for the [REDACTED]

Kind Regards,

John Steinert
Vice-President Hearth Products Division
PFS TECO
11785 SE Highway 212 - Suite 305
Clackamas, OR 97015

[REDACTED]
[REDACTED]
[REDACTED]
www.pfsteco.com

From: Guillaume Thibodeau-Fortin [REDACTED]
Sent: Wednesday, November 8, 2023 12:55 PM
To: John Steinert [REDACTED]
Cc: [REDACTED]
Subject: Certification testing - [REDACTED]

Hello John,

After will be done with the Everest III, we would like to certify a factory-built fireplace called [REDACTED]. Our wish was May 2024. It would be using our IDC-like method. Can you save a space for us in May?

Also, I did not receive a contract for the Everest III, were you planning to send it out closer to test date?

Thanks,

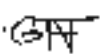


Guillaume Thibodeau-Fortin, Ing./P.Eng.

Ingénieur mécanique

Mechanical Engineer



Email to present the ATM to EPA, ask for a clarification and send the 30-day notification. 

Guillaume Thibodeau-Fortin

De: Guillaume Thibodeau-Fortin
Envoyé: 3 avril 2024 08:27
À: Sanchez, Rafael; WoodHeaterReports
Cc: Johnson, Steffany; Louis-Pierre Côté; Bernard Blouin
Objet: RE: IDC testing - Clarification needed and 30-day notice
Pièces jointes: EverestIII_series_30-days-2024-04-02-signed.pdf; SBI Everest III Response_combined.pdf

Hello Rafael,

We received an ATM from Steffan Johnson team to test a wood heater using a new cordwood test method called IDC. The ATM is in attachment. One of the differences with other known test method is the fact that all burn rates are tested in one day, and there are 3 replicates of that "test day". In this method, it is not possible to replace one test run by two test runs, like in Method 28R.

We would like to have a clarification on how to proceed if, after 1, up to 3 days of test, a modification needs to be done to the unit. 

- To proceed to a modification to a wood heater, you need to advice EPA by email that you want to stop the certification program to do a modification to the unit, you do the modification, and then you send another email saying you are ready to restart testing. You can stop the testing, do the modification, and start the testing on the following day.

Please confirm that this procedure will be accepted for the certification using the ATM attached.

Also, please find attached the 30-day notice for the certification using the ATM attached. Testing is scheduled on the May 6 2024. Thank you,



Guillaume Thibodeau-Fortin, Ing./P.Eng.

Ingénieur mécanique
Mechanical Engineer





Fabricant de poêles international inc.
Stove Builder International Inc.

Notre *passion* devient source d'énergie
We Turn *passion* Into Energy

July 5, 2024

Air Branch/Wood Heater Program Lead
Monitoring, Assistance, and Media Programs Division
Office of Compliance
U.S. EPA
1200 Pennsylvania Ave., NW
MS:2227A
Washington, DC 20004
Attn: EPA Administrator

Subject: Compliance Statements and Acknowledgements for Everest III Series

Dear Administrator,

As stated in the application for certificate of compliance, Stove Builder International Inc (SBI) states and acknowledges the 13 items below.

1. SBI provided all engineering drawing (including specifications for each component listed in paragraphs (k)(2), (3) and (4) of 60.533(b) and 60.5475(b) available in PFS Test Report 23-241. Tolerances are identified on all part draft and cannot reasonably be anticipated to cause wood heater in the model line to exceed the applicable emission limits. The user's manual shows how to replace and inspect emission-critical part such as the secondary tubes.
2. SBI confirm that the firebox or any firebox component (including the materials listed in paragraph (k)(3) of 60.533(b) and 60.5475(b) will be composed of material similar from the material used for the firebox or firebox component in the wood heater on which certification testing was performed. Individual brick size and color may vary but the specification of the material remains the same. The inner firebox brick coverage remains also always the same. If other differences occur over time, a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency will be communicate with Residential Wood Heater Compliance Program Lead.
3. SBI will provide to Residential Wood Heater Compliance Program Lead the Confidential Business Information (CBI) report including all test data and drawings by e-mail to Sanchez.Rafael@epa.gov.
4. SBI provided all documentation that proves that the certification tests were valid. Raw data sheets, laboratory technician notes, calculations and test results were provided to Residential Wood Heater Compliance Program Lead in PFS Test Report 23-241. SBI confirms that the burn rate for the low burn rate category is no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.
5. SBI provided, in PFS Test Report 23-241, a copy of the warranty that stated: "This warranty is void if the unit is used to burn materials other than cordwood (for which the unit is not certified by the EPA) and void if not operated according to the owner's manual. This warranty applies to normal residential use only. Damages caused by misuse, abuse, improper installation, lack of maintenance, over firing, negligence or accident during transportation, power failures, downdrafts, venting problems or under-estimated heating area are not covered by this warranty. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature



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in the designated area in case of a power failure.”

6. SBI, with the help of the third-party certifier, Intertek, built a Quality Assurance Program. A quality control is performed for each unit produced and 4 times a year, Intertek audits our production line to make sure that the models in production comply with the certification unit.
7. SBI confirms that the certification model was sealed by PFS. Permanent straps holds the unit on a wooden palette and prevent the door from opening. A sticker was installed on the unit directly, then the unit was shrink-wrapped, and a second sticker was installed over the wrapping. The sealed unit will be store at SBI laboratory as long as the unit is in production, but a least for 5 years after certification test.
8. SBI states that the units produce under this certificate will be:
 - a. Similar in all material respects that would affect emissions as defined in § 60.531 to the wood heater submitted for certification testing, and labeled as prescribed in § 60.536 and 60.5478.
 - b. Accompanied by an owner’s manual that meets the requirements in § 60.536 and 60.5478. A copy of the owner’s manual was submitted to the Administrator and will be available to the public on the manufacturer’s web site at production launch.
9. SBI has entered into contracts with an approved laboratory, PFS, and third-party certifier, Intertek.
10. SBI allows the approved laboratory and approved third-party certifier to submit information to Residential Wood Heater Compliance Program Lead on behalf of SBI, including any claimed to be CBI.
11. SBI will place a copy of the certification test report, summary and all non-CBI on the manufacturer’s web site available to the public within 30 days after the Administrator issues a certificate of compliance.
12. SBI acknowledges that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the Administrator.
13. SBI acknowledges that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

Print name and title : Guillaume Thibodeau-Fortin, P. Eng., Laboratory Manager

Date : 2024-07-05

Signature of responsible representative of the manufacturer certifying the accuracy of the above statements:

The authorized or responsible party whose signature is above is certifying that the manufacturer has complied with and will continue to comply with all requirements of the 2015 CAA Standards for compliance certification and that the manufacturer remains responsible for compliance regardless of any error by the test laboratory or third-party certifier.



**OMB Control No. 2060-0161
Approval expires 3/31/2019**

**OMB Control No. 2060-0693
Approval expires 3/31/2019**

EPA Form 6400-03

RESIDENTIAL WOOD HEATER CERTIFICATE OF COMPLIANCE APPLICATION

INSTRUCTIONS

Pursuant to the 2015 Clean Air Act Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces, 40 CFR Part 60 Subparts AAA and QQQQ (2015 Wood Heater Rule), any manufacturer of an affected residential wood heater must apply to the EPA for a certificate of compliance for each model line. Without applying for and obtaining a certificate of compliance, a manufacturer may not manufacture, advertise for sale, offer for sale, or sell affected residential wood heaters in the United States.

Under Subpart AAA, affected residential wood-burning room heaters currently include, but are not limited to, adjustable burn rate stoves, catalytic adjustable burn rate stoves; hybrid adjustable burn rate stoves; single burn rate stoves; and pellet stoves.

Under Subpart QQQQ, affected residential wood-burning central heaters currently include, but are not limited to, indoor hydronic heaters ("wood boilers"); outdoor hydronic heaters ("outdoor wood boilers"); and forced-air furnaces ("warm air furnaces").

By completing and submitting this application to EPA, you will satisfy the requirement to apply for a certificate of compliance. To submit a complete application, this application must include the following:

- (1) Certification test report prepared by an EPA-approved test laboratory
- (2) Certification of conformity by an EPA-approved third party certifier
- (3) Quality assurance plan
- (4) All required supporting documentation and manufacturer statements pursuant to the 2015 Wood Heater Rule (Sections 60.533 or 60.5475)

This application must be signed by a responsible representative of the manufacturer or an authorized representative. Once completed with all required information/documentation included, this application must be submitted to WoodHeaterReports@epa.gov.

The public reporting and recordkeeping burden for this collection of information is estimated to average 8 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Regulatory Support Division, U.S. Environmental Protection Agency (EPA) (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed application to this address.

Disclaimer: The statutory provisions and the EPA regulations described in this document contain legally binding requirements. This document is not a substitute for those provisions or regulations, nor is it a regulation itself. In the event of a discrepancy, please refer to Part 60 Subparts AAA AND QQQQ, Sections 60.537 and 60.5479. If you have additional questions, please contact Rafael Sanchez at 202-

564-7028, Residential Wood Heater Compliance Program Lead, or via email at sanchez.rafael@epa.gov.

MANUFACTURER INFORMATION

Manufacturer's Name: Stove Builder International

Manufacturer's Physical Address:
250 rue de Copenhagen
Saint-Augustin-de-Desmaures,
Canada, G3A 2H3

Manufacturer's Mailing Address (if different from physical address):

Name and Title of Manufacturer's Responsible/Authorized Representative Submitting this Application:
Guillaume Thibodeau-Fortin

Manufacturer's Contact E-mail: gthibodeaufortin@sbi-international.com

Manufacturer's Phone Number: 1-418-878-3040 x5224

Manufacturer's Website Address:
www.sbi-international.com

Manufacturer's Website Address where the test report and owner's manual will be posted, if known:
www.enerzone-intl.com www.osburn-mfg.com
www.occanada.com www.empirestove.com
www.valcourtinc.com

AFFECTED WOOD HEATER MODEL INFORMATION

Model Name(s) (as appearing on the certification test report). Please note: the model name and design number must clearly distinguish one model from another. The name and design number cannot include the EPA symbol or logo or name or derivatives such as "EPA": Everest III Serie

Model Number(s) (as appearing on the certification test report): Everest III, HE325R, Dallaire, St. Clair 3000R and the Solution 3.0 ZC

Heater Type Check one):	☒ Adjustable Burn Rate Wood Stover	☐ Pellet Stove	☐ Single Burn Rate Wood Stove	☐ Hydronic Heater	☐ Forced-Air Furnace (FAF)
Hydronic Heater Type (Check one):	☐ Full Storage	☐ Partial Storage	☐ Indoor	☐ Outdoor	
Forced-Air Furnace Type (Check one):	☐ Small (less than 65,000 BTU/hr heat output)		☐ Large (greater than 65,000 BTU/hr heat output)		
Fuel Tested (Check one):	☐ Crib	☐ Pellet	☒ Cordwood	☐ Wood Chips	☐ Other:
Certification Step:	☐ 2015	☐ 2016 (FAFs only)	☐ 2017 (FAFs only)	☒ 2020 (ALL HEATERS)	
Was this heater tested using an EPA-approved Alternative Test Method (ATM)? ☒ Yes ☐ No If yes, provide date of EPA approval and attach copy of EPA approved ATM letter): 2/6/2024 If not, what Test Method(s) did the test laboratory use for the certification test? (List all applicable test methods):				Heater equipped with a catalytic combustor? ☐ Yes ☒ No	

Date of submission of 30-Day Notice to the EPA: 4/3/2024 What was the proposed date(s) of testing? 5/06/2024 What was the actual date(s) of testing? 5/06/2024 Was the compliance test postponed or suspended? ☐ Y ☒ N If yes, date of EPA notification of postponement or suspension: Explain reason for postponing or suspending the certification test:		
EPA-APPROVED TEST LABORATORY		
Name of EPA-Approved Test Laboratory: PFS-TECO		
Name(s) of Person(s) Authorized and/or Responsible for Conducting Certification Test: Aaron Kravitz		
Position/Title: Lab Supervisor		
Address: 11785 SE Highway 212 – Suite 305		
City: Clackamas	State: Oregon	ZIP Code: 97015-9050
Phone: (503) 650-0088	Email: aaron.kravitz@pfsteco.com	
EPA-APPROVED THIRD PARTY CERTIFIER		
Name of EPA-Approved Third-Party Certifier: Intertek		
Name(s) of Person(s) Authorized and/or Responsible for Reviewing Test Report and/or Issuing Certification of Conformity: Jean-Philippe Kayl		
Position/Title: Director, Product Certification		
Address: 545 E Algonquin Rd		
City: Arlington Heights	State: IL	ZIP Code: 60005
Phone: 630-481-3114	Email: jpkayl@intertek.com	

REQUIRED SUPPORTING DOCUMENTATION/MANUFACTURER STATEMENTS

NOTE: TO COMPLETE THIS APPLICATION, ALL REQUIRED DOCUMENTATION AND MANUFACTURER STATEMENTS MUST ACCOMPANY THIS APPLICATION.

1. Engineering Drawings

Engineering drawings and specifications of components that may affect emissions (including specifications for each component listed in paragraphs (k)(2), (3) and (4) of 60.533(b) and 60.5475(b)). Manufacturers may use assembly or design drawings that have been prepared for other purposes, but must designate on the drawings the dimensions of each component listed in paragraph (k) of this section. Manufacturers must identify tolerances of components listed in paragraph (k)(2) of 60.533(b) and 60.5475(b) that are different from those specified in that paragraph, and show that such tolerances cannot reasonably be anticipated to cause wood heaters in the model line to exceed the applicable emission limits. The drawings must identify how the emission-critical parts, such as air tubes and catalyst, can be readily inspected and replaced.

2. Firebox Statement Requirement

A statement whether the firebox or any firebox component (including the materials listed in paragraph (k)(3) of 60.533(b) and 60.5475(b)) will be composed of material different from the material used for the firebox or firebox component in the wood heater on which certification testing was performed, a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency.

3. Confidential Business Information

Clear identification of any claimed confidential business information (CBI). Submit such information under separate cover to the EPA CBI Office; Attn: Residential Wood Heater Compliance Program Lead, 1200 Pennsylvania Ave., NW, Room 7149-D, MS:2227A, Washington, DC 20460. **Note that all emissions data, including all information necessary to determine emission rates in the format of the standard, cannot be claimed as CBI.**

4. All Documentation Pertaining to a Valid Certification Test

All documentation pertaining to a valid certification test including the complete test report and, for all test runs: Raw data sheets, laboratory technician notes, calculations and test results. Documentation must include the items specified in the applicable test methods. Documentation must include discussion of each test run and its appropriateness and validity, and must include detailed discussion of all anomalies, whether all burn rate categories were achieved, any data not used in the calculations and, for any test runs not completed, the data collected during the test run and the reason(s) that the test run was not completed and why. The burn rate for the low burn rate category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer. The test report must include a summary table that clearly presents the individual and overall emission rates, efficiencies and heat outputs. Submit the test report and all associated required information, according to the procedures for electronic reporting specified in § 60.537(f) and 60.5475(f).

5. Warranties

A copy of the warranties for the model line, which must include a statement that the warranties are void if the unit is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the owner's manual.

6. Quality Assurance Program Statement

A statement that the manufacturer will conduct a quality assurance program for the model line that satisfies the requirements of § 60.533(m).

7. Laboratory Sealing of Unit

A statement describing how the tested unit was sealed by the laboratory after the completion of certification testing and asserting that such unit will be stored by the manufacturer in the sealed state until 5 years after the certification test.

8. Statements that the Wood Heaters Manufactured under this Certificate will be:

- (i) Similar in all material respects that would affect emissions as defined in § 60.531 to the wood heater submitted for certification testing, and
- (ii) Labeled as prescribed in § 60.536 and 60.5478, and
- (iii) Accompanied by an owner's manual that meets the requirements in § 60.536 and 60.5478. In addition, a copy of the owner's manual must be submitted to the EPA and be available to the public on the manufacturer's web site.

9. Third Party Certification Statement

A statement that the manufacturer has entered into contracts with an approved laboratory and an approved third-party certifier that satisfy the requirements of § 60.533(f).

10. Approved Laboratory/Third Party Statement

A statement that the approved laboratory and approved third-party certifier are allowed to submit information on behalf of the manufacturer, including any claimed to be CBI.

11. Manufacturer's Website Certification Test Reports Availability Statement

A statement that the manufacturer will place a copy of the certification test report and summary on the manufacturer's web site available to the public within 30 days after the EPA issues a certificate of compliance.

12. Transferability Acknowledgement Statement

A statement of acknowledgment that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the EPA.

13. Statement about Selling Wood Heaters without an EPA Certificate

A statement acknowledging that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

PLEASE ACKNOWLEDGE THAT ALL REQUIRED SUPPORTING DOCUMENTATION AND MANUFACTURER STATEMENTS ACCOMPANY THIS APPLICATION.

Initials GTF

SIGNATURE OF RESPONSIBLE OFFICER OR AUTHORIZED REPRESENTATIVE OF THE MANUFACTURER CERTIFYING THE ACCURACY AND COMPLETENESS OF THIS APPLICATION:

Signature: 

Print Name: Guillaume Thibodeau-Fortin, P. Eng.

Title: Laboratory Engineer

Date: 2024-07-05

The responsible officer or authorized representative of the manufacturer whose signature is above is certifying that the manufacturer has complied with all requirements of the 2015 Wood Heater Rule for compliance certification and will continue to do so. The manufacturer remains responsible for compliance regardless of any error by the EPA-approved test laboratory or third-party certifier.