United States Stove Company

Project # 24-392
Model: SP24iE (Blazer)
AKA: SP24,
Type: Pellet-Fired Room Heater
March 24, 2025
Revised Date: August 27, 2025

ASTM E2779 Standard Test Method for Determining Particulate Matter Emissions from Pellet Heaters (EPA ALT-146)

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Revision History

March 24, 2025– Original Issue

August 27, 2025 – The following revisions were made at the request of EPA:

-Corrected significant figures in reporting of CO emissions, see page 8.

-Specified locations of room air temperature and velocity measurements, see page 16.

- Added details regarding dilution tunnel flow measurements to Run 1 narrative, page 9.

- Added expanded test booth diagram and description to Appendix A. (Non-CBI p. 116-118)

- Added detail regarding room air ambient measurement to sampling methods section on page 17. Calibration records (Equipment ID #215) are found in Appendix C (Non-CBI p. 221)

-Added note regarding balance audits to page 5.

-Added emissions results with negative catch weights uncorrected to page 8.

-Added citation for EPA ALT-154 to page 17 and copy of the relevant letter to Appendix A. (Non-CBI p. 120)

- Added additional description of test unit malfunction encountered during testing to pages 5 and 9, and added copy of communication between laboratory and manufacturer to Appendix A. (non-CBI p. 119)

-Added manufacturer's updated warranty pages to Appendix B. (non-CBI p.184)

Contents

Affidavit

PFS-TECO was contracted by United States Stove Company (USSC) to provide testing services for the SP24iE (Blazer) Pellet-Fired Room Heater per ASTM E2779, *Determining PM Emissions from Pellet Heaters*. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory from 2/26/2025 to 2/28/2025. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed EPA ALT-146 / ASTM E2779. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.*

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

United States Stove Company of South Pittsburg, TN, contracted with PFS-TECO to perform EPA certification testing on the SP24iE (Blazer) Pellet-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. Testing was performed by Mr. Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed by the manufacturer at a medium heat setting, per ASTM E2779
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- A separate, independent sample train was utilized to determine 1st hour emissions.
- Two test runs were performed in accordance with EPA ALT-146 burn rate settings:
  - 1 Hour at Maximum Burn Setting
  - 2 Hours at Medium Burn Setting (less than the mid-point of the high and low rates)
  - 3 Hours at Minimum Burn Setting
- During the first test run, the technician noted that the burn pot was flooding (becoming overloaded with fuel) and that the unit was unable to maintain flue temperature on high. These symptoms indicate insufficient combustion airflow, so PFS requested replacements for the components that regulate combustion air- the blower motor and control board. This e-mail request is attached in Appendix A.

  Upon disassembly of the unit, the technician observed that the original blower motor's bearings did not spin freely, indicating a failure of that component and isolating it as the cause of the problem. Therefore, prior to run 2, the combustion blower (but not the control board) was replaced.

  During Run 2, no fuel flooding was observed and flue temperatures were stable, indicating that the unit was now operating correctly. Due to this component failure, Run 1 is considered invalid and the results from Run 2 only are used for certification.

- Balance audits were conducted immediately prior to sample weighing for all sample analysis.

Pellet Heater Identification and Testing

- Appliance Tested: ***SP24iE (Blazer)***
- Serial Number: ***N/A – Prototype Unit; PFS Tracking #0219***
- Manufacturer*:* ***United States Stove Company***
- Catalyst: ***No***
- Heat exchange blower: ***Integral***
- Type: ***Pellet Stove***
- Style: ***Insert***
- Date Received: ***Thursday, February 20, 2025***
- Testing Period – Start: ***Wednesday, February 26, 2025*** Finish: ***Friday, February 28, 2025***
- Test Location: ***PFS-TECO Portland Laboratory, 11785 SE HWY 212 - Suite 305, Clackamas, OR 97015***
- Elevation: ***≈131 Feet above sea level***
- Test Technician(s): ***Aaron Kravitz***
- Observers: ***N/A***

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Aaron Kravitz. All procedures used are directly from ASTM E2779 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
189	Mettler Toledo 3'x3' floor scale w/digital weight indicator
053	APEX XC-60 Digital Emissions Sampling Box A
054	APEX XC-60 Digital Emissions Sampling Box B
203	APEX XC-50-DIR Digital Emissions Sampling Box C
055	APEX Ambient sampling box
215	NI Temperature DAQ
057	California Analytical ZRE CO2/CO/O2 IR ANALYZER
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
097	10 lb audit weight
095	Anemometer
221	Microtector
DT0042934	Gas Analyzer Calibration Span Gas
CC341544	Gas Analyzer Calibration Mid Gas

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.

Results

The integrated test run emission rate for test Run 2 was measured to be **0.66 g/hr** with a Higher Heating Value efficiency of **77%** and a CO emission rate of **0.03 g/min**. The calculated first hour particulate emission rate was **1.5 g/hr**. The US Stove Model SP24iE (Blazer) Pellet-Fired Room Heater meets the 2020 PM emission standard of ≤ 2.0 g/hr per CFR 40 part 60, §60.532 (b).

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

Summary Table

Run Number	Date	Segments		Run Time (min)	Heat Output (BTU/hr)	1st Hr Emissions (g/hr)	Integrated Total (g/hr)	CO Emissions (g/min)	Overall CO Emissions (g/min)	Heating Efficiency (%HHV)	Overall Heating Efficiency (%HHV)
		Setting	BR								
1*	2/26/2025	OA	0.62	360	10433	6.0	1.3 (1.3**)	0.23	0.23	88%	88%
		H	1.20	60	19630			1.15		86%	
		M	0.62	120	10493			0.079		89%	
		L	0.43	180	7145			0.042		88%	

*Run invalid due to malfunctioning combustion air blower. Blower replaced prior to Run 2.

**PM emissions reported with negative values left in the calculation and not corrected to zero.

Run Number	Date	Segments		Run Time (min)	Heat Output (BTU/hr)	1st Hr Emissions (g/hr)	Integrated Total (g/hr)	CO Emissions (g/min)	Overall CO Emissions (g/min)	Heating Efficiency (%HHV)	Overall Heating Efficiency (%HHV)
		Setting	BR								
2	2/28/2025	OA	0.68	360	9891	1.5	0.66	0.035	0.03	77%	77%
		H	1.46	60	22587			0.10		81%	
		M	0.65	120	9365			0.041		76%	
		L	0.44	180	5993			0.010		72%	

Test Run Narrative

Run 1

Run 1 was performed on 2/26/2025 as an attempted integrated test run per EPA ALT-146/ ASTM E2779. The overall test duration was 360 minutes. The particulate emissions rate for the integrated test run was 1.3 g/hr. The run had an overall HHV efficiency of 88%. A separate filter train C was run for the first hour of the run only. All test results were appropriate and valid and the burn rate requirement for the integrated test run were achieved. During the run however, the technician noted that the burn pot was flooding (becoming overloaded with fuel) and that the unit was unable to maintain flue temperature on high. These symptoms indicate insufficient combustion airflow, so PFS requested replacements for the components that regulate combustion air- the blower motor and control board. This e-mail request is attached in Appendix A.

Upon disassembly of the unit, the technician observed that the original blower motor's bearings did not spin freely, indicating a failure of that component and isolating it as the cause of the problem. Therefore, prior to run 2, the combustion blower (but not the control board) was replaced.

Per an EPA request the following details are provided concerning the dilution tunnel velocity calculation: the initial dilution tunnel flow/velocity was measured through a pre-test traverse where the 8 traverse points were averaged (V_strav = 20.555 ft/s) and the center point is measured (V_scent = 20.740 ft/s). In this case, the average value recorded during the test run (19.4 ft/s) was lower than both initial measurements (V_strav and V_scent) taken prior to the test. The average recorded test run velocity measurement may differ from the average traverse and center value and is not indication of an irregularity or problem with the any of the flow/velocity measurements. The variation may be due simply to the stabilization of tunnel flow between ignition and the start of the test run. Pitot tube leak checks were carried out as specified with no irregularities observed.

Run 2

Run 2 was performed on 2/28/2024 as an attempted integrated test run per EPA ALT-146/ ASTM E2779. The overall test duration was 360 minutes. The particulate emissions rate for the integrated test run was 0.66 g/hr. The run had an overall HHV efficiency of 77%. A separate filter train C was run for the first hour of the run only. All test results were appropriate and valid and the burn rate requirement for the integrated test run were achieved. There were no anomalies and all criteria were met.

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E2779 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	64.2	64.1	28.6	24.3	30.12	4.1	8.4	2.1%	360
2	61.3	66.0	31.8	35.6	30.01	3.8	9.1	2.1%	360

Appliance Operation and Test Settings

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

Settings & Run Notes

	Pre-Burn	Test Run		
Run 1	HR 4 (max) Damper fully open	**Maximum Segment** HR 4 (max) Damper fully open	**Medium Segment** HR 2 Damper fully closed	**Minimum Segment** HR 1 Damper fully closed Trim 1 & 4
Run 2	HR 4 (max) Damper fully open	**Maximum Segment** HR 4 (max) Damper fully open	**Medium Segment** HR 2 Damper fully closed	**Minimum Segment** HR 1 Damper fully closed Trim 1 & 4

Appliance Description

Model(s): SP24iE (Blazer), SP24

Description: The SP24iE (Blazer) is designed as an insert while the SP24 is a freestanding design.

Appliance Type: Pellet-Fired Room Heater

Air Introduction System: A variable speed combustion fan forces air into the firebox through holes in the bottom of the firepot.

Combustion Control: A control panel on the left side of the unit is used to select burn rates, which are varied by automatic modulation of the combustion fan and feed system. An automatically controlled distribution bower is also installed.

Fueling System: An inclined auger driven by a gear motor, meters pellets through a drop tube (over feed) to a fire pot in the firebox.

Baffles: N/A

Flue Outlet: Venting is through a 3" diameter steel pipe, which exits through the back right of the unit.

Appliance Dimensions

SP24iE (Blazer) Dimensions

Height	Width	Depth	Weight
21“	29.5”	23.5”	263 lb

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

Appliance Front

Appliance Left

Appliance Right

Appliance Rear

Test Fuel Properties

Test fuel used was Lignetics Pellet Fuel, a PFI Certified Premium Pellet Brand. A sample of pellets was sent to Twin Ports Testing for analysis, see report below.

Pellet Fuel Analysis

Twin Ports Testing, Inc.
1301 North 3rd Street
Superior, WI 54880
p: 715-392-7114
p: 800-373-2562
f: 715-392-7163
www.twinportstesting.com

Analytical Test Report

Report No: USR:W224-0189-01
Issue No: 1

Client: PFS-TECO
11785 SE Hwy 212, Ste 305
Clackamas, OR 97015
Attention: Sebastian Button

PO No:

Signed: Katy Jahr
Katy Jahr
Chemistry Lab Supervisor
Date of Issue: 5/13/2024

Sample Details

Sample Log No:	W224-0189-01	**Sample Date:**	
Sample Designation:	Lignetics Pellets (Mill # 16036)	**Sample Time:**	
Sample Recognized As:	Wood Pellets	**Arrival Date:**	4/26/2024

Test Results

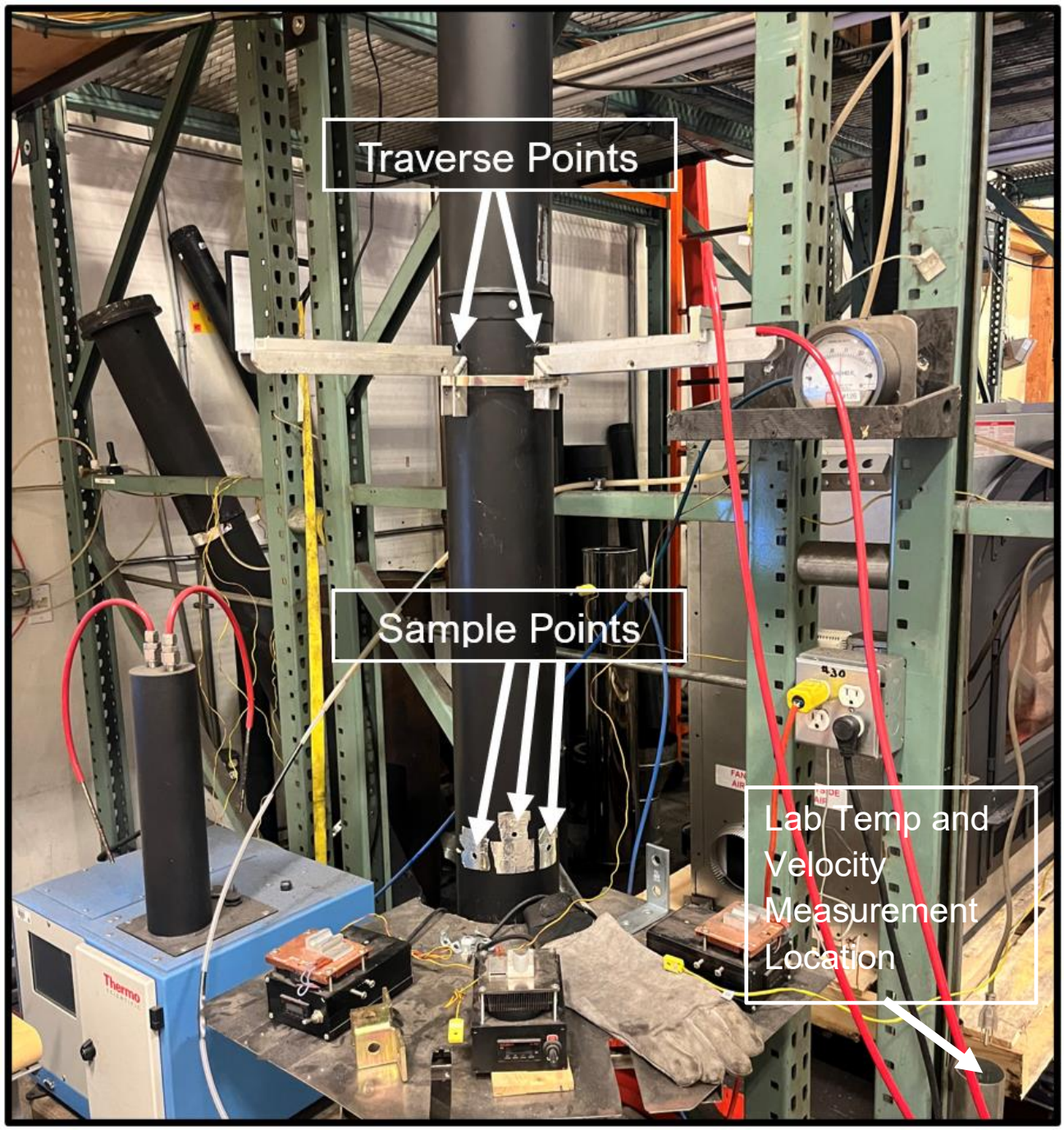
	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		2.10
Ash	ASTM D1102	wt. %	0.17	0.17
Volatile Matter	ASTM D3175	wt. %	80.51	78.82
Fixed Carbon by Difference	ASTM D3172	wt. %	19.31	18.91
Sulfur	ASTM D4239	wt. %	0.070	0.069
SO_2	Calculated	lb/mmbtu		0.163
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.71	18.27
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8627	8445
Carbon	ASTM D5373	wt. %	49.48	48.44
Hydrogen*	ASTM D5373	wt. %	6.22	6.09
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.20
Oxygen*	ASTM D3176	wt. %	> 43.86	> 42.94
*Note: As received values do not include hydrogen and oxygen in the total moisture.				
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

Comments:

PJLA Testing
Accreditation #60243

Sampling Locations and Descriptions

Sample ports are located 14 feet downstream from any disturbances and 2 feet upstream from any disturbances. Flow rate traverse data was collected 12 feet downstream from any disturbances and 4 feet upstream from any disturbances. Lab temperature and velocity measurements were made 3.5 ft from the appliance (See below).



Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 6 inches in diameter. All sampling conditions per ASTM E2515 were followed. Per the standard, laboratory temperature was measured inside a metal tube (2 inches diameter x 6 inches in length) with a Type K thermocouple. No alternate procedures were used.

Analytical Methods Description

Gasket and filter samples were tared and weighted post testing in pairs per EPA Alt-154 (see Appendix A). All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings, dessicated for a minimum of 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 Section 10.

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E2779-10. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 227 Industrial Park Road, South Pittsburg, TN 37380 for archival.

Sealing Label

ATTENTION:

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

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

REPORT #_____ DATE SEALED_____

MANUFACTURER_____ MODEL #_____

Sealed Unit

List of Appendices

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

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

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

PELLET TEST DATA PACKET
ASTM E2779/E2515

Run 1 Data Summary

Client:	USSC
Model:	SP24iE
Job #:	25-392
Tracking #:	219
Test Date:	2/26/2025

Techician Signature

3/21/2025
Date

TEST RESULTS - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

Burn Rate Summary	
High Burn Rate (dry kg/hr)	1.20
Medium Burn Rate (dry kg/hr)	0.62
Low Burn Rate (dry kg/hr)	0.43
Overall Burn Rate (dry kg/hr)	0.62

Medium Burn Rate Target: < 0.81 dry kg/hr

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter - Train C
Total Sample Volume (ft^3)	81.509	54.787	52.341	8.751
Average Gas Velocity in Dilution Tunnel (ft/sec)	19.4			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	13380.8			
Average Gas Meter Temperature (°F)	64.6	87.9	91.0	77.9
Total Sample Volume (dscf)	83.545	54.448	50.985	8.873
Average Tunnel Temperature (°F)	74.8			
Total Time of Test (min)	360			
Total Particulate Catch (mg)	0.1	5.6	5.1	4.0
Particulate Concentration, dry-standard (g/dscf)	0.0000012	0.0001029	0.0001000	0.0004508
Total PM Emissions (g)	0.10	8.16	7.93	6.02
Particulate Emission Rate (g/hr)	0.02	1.36	1.32	6.02
Emissions Factor (g/kg)	-	2.19	2.13	5.00
Difference from Average Total Particulate Emissions (g)	-	0.11	0.11	-
Difference from Average Total Particulate Emissions (%)	-	1.4%	1.4%	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

Final Average Results	
Total Particulate Emissions (g)	8.05
Particulate Emission Rate (g/hr)	1.34
Emissions Factor (g/kg)	2.16
HHV Efficiency (%)	88.3%
LHV Efficiency (%)	94.6%
CO Emissions (g/min)	0.23

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	70.7	OK
Face Velocity	< 30 ft/min	9.6	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	63.7 / 65.2	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
Medium Burn Rate	< midpoint of the high and low burn rates	0.62	OK

Overall Pellet Test Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/26/25
Run: 1
Control #: 25-392
Test Duration: 360
Output Category: Integrated

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	88.3%	94.6%
Combustion Efficiency	99.2%	99.2%
Heat Transfer Efficiency	89.0%	95.4%

Output Rate (kJ/h)	10,998	10,433	**(Btu/h)**
Burn Rate (kg/h)	0.62	1.37	**(lb/h)**
Input (kJ/h)	12,455	11,815	**(Btu/h)**

Test Load Weight (dry kg)	3.73	8.21	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	8.05		
CO (g)	84		
Test Duration (h)	6.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.12	1.27
g/kg Dry Fuel	2.16	22.53
g/h	1.34	14.00
g/min	0.02	0.23
lb/MM Btu Output	0.28	2.96

Air/Fuel Ratio (A/F)	22.21

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

Max Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/26/25
Run: 1
Control #: 25-392
Test Duration: 60
Output Category: Maximum

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	85.7%	91.9%
Combustion Efficiency	96.2%	96.2%
Heat Transfer Efficiency	89.1%	95.5%

Output Rate (kJ/h)	20,694	19,630	**(Btu/h)**
Burn Rate (kg/h)	1.20	2.65	**(lb/h)**
Input (kJ/h)	24,139	22,898	**(Btu/h)**

Test Load Weight (dry kg)	1.20	2.65	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	N/A		
CO (g)	69		
Test Duration (h)	1.00		

Emissions	**Particulate**	**CO**
g/MJ Output	N/A	3.33
g/kg Dry Fuel	N/A	57.27
g/h	N/A	68.94
g/min	N/A	1.15
lb/MM Btu Output	N/A	7.74

Air/Fuel Ratio (A/F)	12.39

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

Medium Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/26/25
Run: 1
Control #: 25-392
Test Duration: 120
Output Category: Medium

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	88.7%	95.1%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	89.2%	95.5%

Output Rate (kJ/h)	11,062	10,493	**(Btu/h)**
Burn Rate (kg/h)	0.62	1.37	**(lb/h)**
Input (kJ/h)	12,470	11,829	**(Btu/h)**

Test Load Weight (dry kg)	1.24	2.74	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	N/A		
CO (g)	9		
Test Duration (h)	2.00		

Emissions	Particulate	CO
g/MJ Output	N/A	0.43
g/kg Dry Fuel	N/A	7.64
g/h	N/A	4.75
g/min	N/A	0.08
lb/MM Btu Output	N/A	1.00

Air/Fuel Ratio (A/F)	21.51

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

Minimum Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/26/25
Run: 1
Control #: 25-392
Test Duration: 180
Output Category: Minimum

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	88.1%	94.4%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	88.5%	94.9%

Output Rate (kJ/h)	7,532	7,145	**(Btu/h)**
Burn Rate (kg/h)	0.43	0.94	**(lb/h)**
Input (kJ/h)	8,551	8,112	**(Btu/h)**

Test Load Weight (dry kg)	1.28	2.82	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	N/A		
CO (g)	8		
Test Duration (h)	3.00		

Emissions	Particulate	CO
g/MJ Output	N/A	0.33
g/kg Dry Fuel	N/A	5.87
g/h	N/A	2.50
g/min	N/A	0.04
lb/MM Btu Output	N/A	0.77

Air/Fuel Ratio (A/F)	30.92

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

DILUTION TUNNEL & MISC. DATA - ASTM E2779 / E2515

Client:	USSC	Job #:	25-392
Model:	SP24iE	Tracking #:	219
Run #:	1	Technician:	AK
Test Start Time:	13:38	Date:	2/26/2025

High Burn End Time (min):	60
Medium Burn End Time (min):	180
Total Sampling Time (min):	360
Recording Interval (min):	1

Meter Box γ Factor:	1.019	(A)
Meter Box γ Factor:	1.005	(B)
Meter Box γ Factor:	1.024	(C)
Meter Box γ Factor:	1.012	(Ambient)
Induced Draft Check (in. H_2O):	0	
Smoke Capture Check (%):	100%	
Date Flue Pipe Last Cleaned:	2/24/2025	
Platform Scale Audit (lbs)	10.0	

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.15	30.09	30.12
Relative Humidity (%)	28.6	24.3	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		81.509	ft^3

Sample Train Leak Checks

	Pre-test	Post-test			
(A)	0.000	0.001	cfm @	-8	in. Hg
(B)	0.000	0.000	cfm @	-7	in. Hg
(C)	0.000	0.000	cfm @	-7	in. Hg
(Ambient)	0.000	0.000	cfm @	-12	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.068	77
2	0.108	77
3	0.110	77
4	0.090	77
5	0.088	77
6	0.102	77
7	0.106	77
8	0.094	77
Center	0.097	77

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	20.555	ft/sec
V_{scent}:	20.740	ft/sec
F_p:	0.991	[ratio]
Initial Tunnel Flow:	234.9	scf/min

Static Pressure: -0.160 in. H_2O

TEST FUEL PROPERTIES

Default Fuel Values

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

Actual Fuel Used Properties

Pellet Brand:	Lignetics
Pellet Fuel Grade:	PFI Premium
HHV (BTU/lb)	8627
%C	49.48
%H	6.22
%O	44.13
%Ash	0.17
MC (%WB)	2.1

PELLET STOVE PREBURN DATA - ASTM E2779

Client: USSC
Job #: 25-392
Model: SP24iE
Tracking #: 219
Run #: 1
Technician: AK
Date: 2/26/2025

Recording Interval (min): 1
Run Time (min): 73

		Average:	-0.034	185	63
Elapsed Time (min)	Scale Reading (lbs)	Weight Change (lbs)	Flue Draft (in H_2O)	Flue (°F)	Ambient (°F)
0	43.4	-	-0.029	146	62
1	43.3	-0.05	-0.031	157	62
2	43.3	-0.05	-0.030	162	62
3	43.2	-0.04	-0.030	164	62
4	43.2	-0.05	-0.030	165	62
5	43.1	-0.03	-0.030	165	62
6	43.1	-0.04	-0.031	165	62
7	43.0	-0.06	-0.030	168	62
8	43.0	-0.05	-0.031	171	62
9	42.9	-0.06	-0.032	173	62
10	42.9	-0.06	-0.032	174	62
11	42.8	-0.05	-0.032	176	62
12	42.8	-0.06	-0.032	176	62
13	42.7	-0.05	-0.033	177	62
14	42.7	-0.06	-0.033	178	62
15	42.6	-0.07	-0.033	179	63
16	42.5	-0.05	-0.034	180	63
17	42.5	-0.07	-0.033	181	63
18	42.4	-0.06	-0.033	181	63
19	42.4	-0.05	-0.035	182	63
20	42.5	0.16	-0.032	183	63
21	42.5	-0.06	-0.035	184	63
22	42.4	-0.05	-0.034	185	63
23	42.4	-0.05	-0.034	185	63
24	42.3	-0.07	-0.035	185	63
25	42.2	-0.04	-0.036	187	63
26	42.2	-0.06	-0.035	186	63
27	42.1	-0.08	-0.034	186	63
28	42.0	-0.06	-0.036	187	63
29	42.0	-0.06	-0.035	187	63
30	41.9	-0.06	-0.035	187	63
31	41.9	-0.05	-0.036	185	63
32	41.8	-0.08	-0.036	187	63
33	41.7	-0.06	-0.036	191	63
34	41.7	-0.07	-0.034	192	64
35	41.6	-0.06	-0.035	192	63
36	41.5	-0.08	-0.035	193	63
37	41.5	-0.06	-0.036	193	63
38	41.4	-0.06	-0.036	194	64
39	41.3	-0.07	-0.036	193	63
40	41.3	-0.07	-0.035	193	63
41	41.2	-0.05	-0.036	194	63
42	41.1	-0.07	-0.035	193	64
43	41.1	-0.07	-0.032	193	63
44	41.0	-0.07	-0.035	193	63
45	40.9	-0.06	-0.035	192	64
46	40.9	-0.07	-0.033	193	64

PELLET STOVE PREBURN DATA - ASTM E2779

Client: USSC
Job #: 25-392
Model: SP24iE
Tracking #: 219
Run #: 1
Technician: AK
Date: 2/26/2025

47	40.8	-0.07	-0.035	192	64
48	40.8	-0.04	-0.036	192	64
49	40.7	-0.07	-0.034	192	64
50	40.6	-0.05	-0.036	191	64
51	40.6	-0.07	-0.035	191	64
52	40.5	-0.06	-0.035	190	64
53	40.5	-0.06	-0.036	190	64
54	40.4	-0.05	-0.036	191	64
55	40.4	-0.04	-0.033	191	64
56	40.3	-0.03	-0.036	190	64
57	40.3	-0.08	-0.034	189	64
58	40.2	-0.07	-0.034	188	64
59	40.1	-0.06	-0.035	188	64
60	40.1	-0.07	-0.034	187	64
61	40.0	-0.06	-0.034	187	64
62	39.9	-0.06	-0.034	186	64
63	39.9	-0.07	-0.040	201	64
64	39.8	-0.05	-0.038	208	64
65	39.8	-0.06	-0.036	204	64
66	39.7	-0.07	-0.036	198	64
67	39.6	-0.05	-0.035	194	64
68	39.6	-0.06	-0.034	190	64
69	39.5	-0.05	-0.034	187	64
70	39.5	-0.06	-0.033	185	64
71	39.4	-0.06	-0.033	183	64
72	39.3	-0.06	-0.033	182	64
73	39.3	-0.06	-0.033	181	64

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.086	0.00	68.8	0.06		8.4		80	180	67	64.2
1	0.097	0.097	0.086	2.24	68.7	0.96	-	8.3	0.0	80	179	68	64.3
2	0.247	0.150	0.086	2.30	68.7	0.98	-	8.3	-0.1	80	178	68	64.4
3	0.392	0.145	0.086	2.32	68.7	1.01	-	8.2	0.0	80	177	68	64.4
4	0.544	0.152	0.086	2.35	68.8	0.97	-	8.2	-0.1	80	176	68	64.3
5	0.690	0.146	0.086	2.36	68.9	1.03	-	8.1	-0.1	80	176	68	64.3
6	0.843	0.153	0.086	2.37	69	1.02	-	8.1	0.0	80	174	69	64.2
7	0.990	0.147	0.086	2.38	69.1	1.05	-	8.0	-0.1	80	173	69	64.4
8	1.144	0.154	0.087	2.39	69.2	1.04	-	8.0	0.0	80	172	69	64.8
9	1.292	0.148	0.087	2.40	69.4	1.07	-	7.9	-0.1	80	171	69	64.6
10	1.445	0.153	0.086	2.40	69.6	1.11	99	7.8	0.0	80	170	69	64.7
11	1.594	0.149	0.086	2.39	69.8	1.13	-	7.8	0.0	80	169	69	64.8
12	1.748	0.154	0.086	2.40	70	1.08	-	7.7	-0.1	80	168	69	64.8
13	1.897	0.149	0.086	2.40	70.2	1.11	-	7.7	-0.1	79	167	69	64.6
14	2.050	0.153	0.086	2.40	70.4	1.14	-	7.6	0.0	79	166	69	64.5
15	2.199	0.149	0.086	2.42	70.7	1.15	-	7.6	-0.1	79	165	69	64.7
16	2.352	0.153	0.086	2.41	70.9	1.19	-	7.5	-0.1	79	164	69	64.8
17	2.503	0.151	0.086	2.41	71.2	1.23	-	7.5	-0.1	79	162	69	64.9
18	2.657	0.154	0.087	2.42	71.4	1.24	-	7.4	0.0	79	161	69	64.9
19	2.809	0.152	0.086	2.41	71.7	1.21	-	7.4	0.0	79	160	69	64.9
20	2.962	0.153	0.086	2.42	72	1.26	104	7.3	0.0	79	159	69	64.7
21	3.119	0.157	0.086	2.41	72.3	1.24	-	7.3	0.0	79	158	69	64.8
22	3.271	0.152	0.086	2.42	72.7	1.24	-	7.2	0.0	79	157	70	64.7
23	3.426	0.155	0.086	2.41	72.9	1.27	-	7.2	0.0	79	155	70	64.7
24	3.576	0.150	0.087	2.42	73.3	1.29	-	7.2	0.0	79	155	70	64.6
25	3.733	0.157	0.086	2.42	73.7	1.32	-	7.1	-0.1	79	155	70	64.6
26	3.882	0.149	0.086	2.42	73.9	1.31	-	7.1	0.0	79	155	70	64.7
27	4.037	0.155	0.085	2.41	74.3	1.31	-	7.0	0.0	79	154	70	64.6
28	4.186	0.149	0.086	2.41	74.6	1.34	-	7.0	0.0	79	153	70	64.8
29	4.343	0.157	0.086	2.40	74.8	1.36	-	6.9	-0.1	79	152	70	64.7
30	4.494	0.151	0.086	2.39	75.2	1.35	104	6.9	0.0	79	151	70	64.6
31	4.651	0.157	0.085	2.40	75.5	1.37	-	6.8	0.0	79	150	70	64.6
32	4.801	0.150	0.086	2.40	75.8	1.37	-	6.8	-0.1	78	148	70	64.5

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.957	0.156	0.086	2.40	76.1	1.38	-	6.8	0.0	78	147	70	64.7
34	5.107	0.150	0.085	2.40	76.5	1.42	-	6.7	0.0	78	146	70	64.8
35	5.262	0.155	0.086	2.39	76.8	1.41	-	6.7	0.0	78	145	70	64.7
36	5.412	0.150	0.085	2.39	77.1	1.43	-	6.6	0.0	78	145	70	64.9
37	5.566	0.154	0.086	2.38	77.4	1.44	-	6.6	-0.1	78	145	70	64.8
38	5.716	0.150	0.086	2.38	77.7	1.47	-	6.5	0.0	78	143	70	64.7
39	5.871	0.155	0.086	2.36	78	1.46	-	6.5	0.0	78	142	70	64.8
40	6.022	0.151	0.086	2.38	78.2	1.46	103	6.4	0.0	78	140	70	64.9
41	6.177	0.155	0.086	2.37	78.6	1.49	-	6.4	0.0	78	139	70	64.8
42	6.330	0.153	0.086	2.36	78.9	1.49	-	6.4	0.0	78	138	70	64.7
43	6.482	0.152	0.085	2.36	79.2	1.51	-	6.3	0.0	78	137	70	64.6
44	6.635	0.153	0.086	2.36	79.4	1.51	-	6.3	0.0	77	136	70	64.7
45	6.786	0.151	0.086	2.37	79.7	1.52	-	6.3	0.0	77	136	70	64.9
46	6.939	0.153	0.086	2.35	80	1.53	-	6.2	0.0	78	136	70	64.8
47	7.090	0.151	0.086	2.36	80.2	1.51	-	6.2	0.0	78	137	70	64.7
48	7.243	0.153	0.086	2.36	80.5	1.53	-	6.1	0.0	78	137	70	64.6
49	7.393	0.150	0.086	2.36	80.7	1.55	-	6.1	0.0	78	136	70	64.8
50	7.546	0.153	0.086	2.36	81.1	1.57	103	6.1	0.0	78	136	70	64.8
51	7.696	0.150	0.086	2.37	81.4	1.56	-	6.0	0.0	78	135	70	64.6
52	7.849	0.153	0.086	2.36	81.6	1.54	-	6.0	0.0	78	134	70	64.6
53	7.998	0.149	0.087	2.36	81.7	1.56	-	5.9	0.0	78	134	70	64.6
54	8.153	0.155	0.086	2.36	82.2	1.54	-	5.9	0.0	78	134	70	64.7
55	8.301	0.148	0.087	2.35	82.3	1.58	-	5.9	0.0	78	133	70	64.7
56	8.456	0.155	0.086	2.36	82.5	1.56	-	5.8	0.0	78	132	70	64.7
57	8.605	0.149	0.086	2.36	82.7	1.57	-	5.8	0.0	77	132	70	64.6
58	8.760	0.155	0.086	2.36	82.9	1.6	-	5.8	0.0	78	132	70	64.5
59	8.908	0.148	0.087	2.34	83.1	1.58	-	5.7	0.0	77	132	70	64.8
60	9.065	0.157	0.086	2.35	83.4	1.59	102	5.7	0.0	78	132	70	64.6
61	9.214	0.149	0.087	2.35	83.5	1.61	-	5.7	0.0	78	131	70	64.6
62	9.369	0.155	0.088	2.35	83.7	1.57	-	5.6	0.0	77	130	70	64.6
63	9.518	0.149	0.087	2.36	83.9	1.6	-	5.6	0.0	77	128	70	64.6
64	9.682	0.164	0.087	2.36	84.1	1.59	-	5.6	0.0	77	126	70	64.5
65	9.831	0.149	0.088	2.36	84.3	1.58	-	5.6	0.0	77	124	70	64.4

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.988	0.157	0.087	2.36	84.4	1.61	-	5.5	0.0	77	123	70	64.6
67	10.137	0.149	0.088	2.36	84.5	1.6	-	5.5	0.0	76	121	70	64.6
68	10.300	0.163	0.087	2.36	84.8	1.57	-	5.5	0.0	77	121	70	64.8
69	10.462	0.162	0.088	2.36	84.9	1.58	-	5.5	0.0	76	120	70	64.6
70	10.615	0.153	0.088	2.36	85.1	1.6	103	5.5	0.0	76	119	70	64.5
71	10.766	0.151	0.087	2.37	85.3	1.58	-	5.4	0.0	76	119	70	64.4
72	10.924	0.158	0.088	2.36	85.5	1.61	-	5.4	0.0	76	118	70	64.6
73	11.077	0.153	0.088	2.36	85.6	1.58	-	5.4	0.0	76	118	70	64.5
74	11.230	0.153	0.088	2.36	85.7	1.58	-	5.4	0.0	76	119	70	64.4
75	11.384	0.154	0.088	2.36	85.9	1.61	-	5.3	0.0	76	118	70	64.4
76	11.535	0.151	0.088	2.36	86	1.61	-	5.3	0.0	76	119	70	64.5
77	11.689	0.154	0.088	2.36	86.1	1.6	-	5.3	0.0	76	119	70	64.4
78	11.839	0.150	0.088	2.36	86.2	1.62	-	5.3	0.0	76	118	70	64.3
79	11.994	0.155	0.088	2.36	86.4	1.61	-	5.3	0.0	76	118	70	64.4
80	12.144	0.150	0.088	2.37	86.5	1.62	100	5.2	0.0	76	118	70	64.6
81	12.298	0.154	0.087	2.37	86.7	1.62	-	5.2	0.0	76	118	70	64.3
82	12.447	0.149	0.088	2.37	86.8	1.62	-	5.2	0.0	76	118	69	64.4
83	12.603	0.156	0.088	2.38	86.8	1.63	-	5.2	0.0	76	118	70	64.3
84	12.752	0.149	0.088	2.36	87	1.61	-	5.1	0.0	76	119	69	64.3
85	12.908	0.156	0.087	2.36	87.1	1.63	-	5.1	0.0	76	119	70	64.2
86	13.057	0.149	0.088	2.36	87.2	1.63	-	5.1	0.0	76	119	70	64.3
87	13.213	0.156	0.088	2.37	87.3	1.62	-	5.1	0.0	76	118	70	64.2
88	13.363	0.150	0.087	2.37	87.4	1.61	-	5.0	0.0	76	118	69	64.1
89	13.518	0.155	0.088	2.37	87.5	1.62	-	5.0	0.0	76	118	69	64.2
90	13.669	0.151	0.088	2.37	87.6	1.62	100	5.0	0.0	76	117	69	64.1
91	13.823	0.154	0.087	2.37	87.7	1.63	-	5.0	0.0	76	117	69	64.1
92	13.972	0.149	0.088	2.36	87.8	1.62	-	5.0	0.0	76	117	70	64.1
93	14.127	0.155	0.088	2.38	87.9	1.62	-	4.9	0.0	76	117	69	64.1
94	14.278	0.151	0.088	2.36	88	1.63	-	4.9	0.0	76	118	69	64.1
95	14.431	0.153	0.088	2.36	88.1	1.65	-	4.9	0.0	76	119	69	64.1
96	14.585	0.154	0.088	2.35	88.1	1.63	-	4.9	0.0	76	121	69	64.1
97	14.737	0.152	0.088	2.36	88.3	1.66	-	4.8	0.0	76	121	69	64.1
98	14.891	0.154	0.088	2.36	88.3	1.63	-	4.8	0.0	76	121	69	64.1

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	15.044	0.153	0.087	2.37	88.4	1.63	-	4.8	0.0	76	120	69	64.2
100	15.199	0.155	0.089	2.37	88.4	1.66	100	4.8	0.0	76	120	69	64.4
101	15.348	0.149	0.088	2.37	88.5	1.64	-	4.7	0.0	76	120	69	64.2
102	15.502	0.154	0.087	2.36	88.6	1.63	-	4.7	0.0	76	120	69	64.3
103	15.653	0.151	0.088	2.37	88.7	1.64	-	4.7	0.0	76	119	69	64.2
104	15.808	0.155	0.088	2.36	88.8	1.65	-	4.7	0.0	76	119	69	64.1
105	15.958	0.150	0.088	2.36	88.9	1.64	-	4.6	0.0	76	119	69	64.1
106	16.114	0.156	0.088	2.35	88.9	1.66	-	4.6	0.0	76	119	69	64.1
107	16.264	0.150	0.088	2.37	88.9	1.62	-	4.6	0.0	75	118	69	64.1
108	16.419	0.155	0.087	2.36	89	1.64	-	4.6	0.0	75	118	69	64
109	16.570	0.151	0.088	2.37	89.1	1.64	-	4.6	0.0	75	118	69	64.1
110	16.724	0.154	0.088	2.37	89.1	1.64	99	4.5	0.0	75	118	69	64.1
111	16.874	0.150	0.089	2.37	89.2	1.64	-	4.5	0.0	75	118	69	64.1
112	17.029	0.155	0.088	2.38	89.3	1.65	-	4.5	0.0	76	118	69	64
113	17.180	0.151	0.088	2.37	89.3	1.64	-	4.5	0.0	75	118	69	63.9
114	17.333	0.153	0.089	2.36	89.4	1.65	-	4.5	0.0	75	117	69	64
115	17.487	0.154	0.087	2.35	89.5	1.65	-	4.4	0.0	76	117	69	64
116	17.639	0.152	0.089	2.37	89.5	1.68	-	4.4	0.0	76	117	69	64
117	17.794	0.155	0.087	2.36	89.6	1.64	-	4.4	0.0	75	117	69	63.9
118	17.945	0.151	0.088	2.38	89.5	1.65	-	4.4	0.0	75	117	69	64
119	18.099	0.154	0.088	2.37	89.6	1.66	-	4.3	0.0	75	118	69	63.9
120	18.249	0.150	0.088	2.35	89.7	1.66	99	4.3	0.0	75	118	69	63.9
121	18.405	0.156	0.088	2.37	89.7	1.65	-	4.3	0.0	75	118	69	63.9
122	18.554	0.149	0.088	2.37	89.8	1.67	-	4.3	0.0	75	118	69	63.7
123	18.710	0.156	0.088	2.36	89.8	1.65	-	4.3	0.0	75	118	69	63.7
124	18.861	0.151	0.088	2.36	89.8	1.65	-	4.2	0.0	75	119	69	63.7
125	19.017	0.156	0.088	2.36	89.8	1.68	-	4.2	0.0	75	119	69	63.7
126	19.166	0.149	0.088	2.36	89.9	1.66	-	4.2	0.0	75	121	69	63.8
127	19.322	0.156	0.088	2.37	90	1.68	-	4.1	0.0	75	123	69	63.8
128	19.472	0.150	0.088	2.37	90	1.66	-	4.1	0.0	76	123	69	63.8
129	19.634	0.162	0.088	2.37	90	1.65	-	4.1	0.0	76	123	69	63.9
130	19.786	0.152	0.088	2.38	90	1.68	100	4.1	0.0	75	123	69	63.9
131	19.940	0.154	0.088	2.36	90.1	1.66	-	4.0	0.0	75	123	69	63.9

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	20.092	0.152	0.088	2.35	90.1	1.68	-	4.0	0.0	75	123	69	63.9
133	20.245	0.153	0.088	2.36	90.2	1.66	-	4.0	0.0	76	123	69	63.9
134	20.399	0.154	0.088	2.36	90.2	1.66	-	4.0	0.0	75	123	69	63.8
135	20.550	0.151	0.088	2.36	90.2	1.68	-	3.9	0.0	75	123	69	63.8
136	20.704	0.154	0.088	2.36	90.1	1.69	-	3.9	0.0	75	123	69	63.9
137	20.855	0.151	0.088	2.36	90.2	1.68	-	3.9	0.0	75	123	69	63.8
138	21.009	0.154	0.088	2.36	90.3	1.68	-	3.9	0.0	75	123	69	63.9
139	21.158	0.149	0.089	2.38	90.2	1.68	-	3.9	0.0	75	123	69	63.8
140	21.314	0.156	0.089	2.37	90.2	1.69	99	3.8	0.0	75	123	69	63.8
141	21.464	0.150	0.089	2.36	90.3	1.67	-	3.8	0.0	75	123	69	63.7
142	21.620	0.156	0.088	2.35	90.4	1.68	-	3.8	0.0	76	123	69	63.7
143	21.770	0.150	0.088	2.35	90.4	1.68	-	3.8	0.0	76	123	69	63.7
144	21.927	0.157	0.089	2.35	90.4	1.66	-	3.7	0.0	75	122	69	63.7
145	22.076	0.149	0.089	2.36	90.5	1.68	-	3.7	0.0	75	122	69	63.8
146	22.232	0.156	0.088	2.36	90.5	1.67	-	3.7	0.0	75	122	69	63.8
147	22.381	0.149	0.089	2.36	90.5	1.68	-	3.7	0.0	75	122	69	63.7
148	22.535	0.154	0.088	2.36	90.5	1.67	-	3.6	0.0	75	122	69	63.8
149	22.687	0.152	0.088	2.36	90.5	1.66	-	3.6	0.0	75	121	69	63.9
150	22.839	0.152	0.088	2.36	90.6	1.69	99	3.6	0.0	75	121	69	63.8
151	22.992	0.153	0.088	2.35	90.5	1.67	-	3.6	0.0	75	121	69	63.8
152	23.145	0.153	0.088	2.35	90.6	1.69	-	3.6	0.0	75	121	69	63.9
153	23.299	0.154	0.088	2.35	90.6	1.67	-	3.5	0.0	75	121	69	63.8
154	23.450	0.151	0.088	2.35	90.7	1.69	-	3.5	0.0	75	120	69	63.8
155	23.604	0.154	0.089	2.35	90.6	1.67	-	3.5	0.0	75	121	69	63.9
156	23.754	0.150	0.088	2.35	90.6	1.68	-	3.5	0.0	75	121	69	63.9
157	23.908	0.154	0.088	2.35	90.6	1.67	-	3.4	0.0	75	122	69	63.8
158	24.057	0.149	0.088	2.35	90.7	1.68	-	3.4	0.0	75	122	69	63.8
159	24.213	0.156	0.088	2.36	90.7	1.69	-	3.4	0.0	75	122	69	63.9
160	24.362	0.149	0.088	2.34	90.7	1.67	99	3.4	0.0	75	122	69	63.9
161	24.518	0.156	0.088	2.35	90.7	1.69	-	3.3	0.0	75	121	69	63.8
162	24.667	0.149	0.088	2.34	90.7	1.68	-	3.3	0.0	75	121	69	63.9
163	24.823	0.156	0.088	2.34	90.7	1.7	-	3.3	0.0	75	122	69	63.8
164	24.973	0.150	0.088	2.34	90.8	1.68	-	3.3	0.0	75	123	69	63.8

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	25.128	0.155	0.088	2.34	90.7	1.69	-	3.2	0.0	75	123	69	63.8
166	25.278	0.150	0.088	2.35	90.9	1.69	-	3.2	0.0	75	122	69	63.9
167	25.431	0.153	0.088	2.34	90.8	1.69	-	3.2	0.0	75	122	69	63.8
168	25.581	0.150	0.088	2.34	90.8	1.68	-	3.2	0.0	75	122	69	63.9
169	25.735	0.154	0.088	2.36	90.8	1.7	-	3.1	0.0	75	122	69	63.9
170	25.886	0.151	0.088	2.35	90.9	1.7	99	3.1	0.0	75	122	69	63.9
171	26.039	0.153	0.088	2.34	90.9	1.7	-	3.1	0.0	75	122	69	63.9
172	26.191	0.152	0.088	2.34	90.9	1.7	-	3.1	0.0	75	122	69	63.9
173	26.343	0.152	0.087	2.33	90.9	1.71	-	3.0	0.0	75	122	69	63.7
174	26.497	0.154	0.088	2.34	90.9	1.7	-	3.0	0.0	75	122	69	63.8
175	26.648	0.151	0.087	2.33	90.9	1.7	-	3.0	0.0	75	122	69	63.9
176	26.802	0.154	0.086	2.34	90.8	1.7	-	3.0	0.0	75	121	69	63.9
177	26.952	0.150	0.087	2.34	90.8	1.7	-	3.0	0.0	75	121	69	64
178	27.106	0.154	0.087	2.34	90.8	1.69	-	2.9	0.0	75	121	69	64.1
179	27.282	0.176	0.087	2.34	90.9	1.7	-	2.9	0.0	75	121	69	64.3
180	27.437	0.155	0.086	2.35	90.9	1.7	101	2.9	0.0	75	122	69	64.4
181	27.586	0.149	0.088	2.34	90.8	1.7	-	2.9	0.0	75	121	69	64.6
182	27.741	0.155	0.087	2.33	90.8	1.7	-	2.8	0.0	75	121	69	64.7
183	27.891	0.150	0.086	2.32	90.9	1.69	-	2.8	0.0	75	121	69	64.6
184	28.046	0.155	0.086	2.33	90.9	1.7	-	2.8	0.0	75	121	69	64.7
185	28.195	0.149	0.087	2.33	91	1.71	-	2.8	0.0	75	121	69	64.6
186	28.352	0.157	0.087	2.33	91	1.69	-	2.8	0.0	75	121	69	64.7
187	28.503	0.151	0.087	2.33	91	1.69	-	2.8	0.0	75	120	69	64.7
188	28.658	0.155	0.087	2.34	91	1.69	-	2.7	0.0	75	119	69	64.7
189	28.808	0.150	0.087	2.33	91	1.7	-	2.7	0.0	75	119	69	64.8
190	28.961	0.153	0.087	2.33	91.1	1.7	100	2.7	0.0	75	119	69	64.8
191	29.110	0.149	0.087	2.32	91.1	1.71	-	2.7	0.0	75	120	69	64.8
192	29.265	0.155	0.087	2.35	91.2	1.69	-	2.7	0.0	75	120	69	64.9
193	29.415	0.150	0.087	2.34	91.1	1.7	-	2.6	0.0	75	119	69	65
194	29.568	0.153	0.087	2.33	91.2	1.72	-	2.6	0.0	75	119	69	65
195	29.720	0.152	0.087	2.34	91.2	1.7	-	2.6	0.0	75	119	69	65
196	29.872	0.152	0.087	2.32	91.3	1.71	-	2.6	0.0	75	119	69	64.9
197	30.026	0.154	0.087	2.33	91.3	1.71	-	2.6	0.0	75	119	69	65.1

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	30.176	0.150	0.086	2.33	91.3	1.71	-	2.6	0.0	75	118	69	65
199	30.330	0.154	0.087	2.32	91.3	1.7	-	2.5	0.0	75	118	69	65.1
200	30.481	0.151	0.087	2.34	91.3	1.71	99	2.5	0.0	75	118	69	65.2
201	30.634	0.153	0.087	2.34	91.3	1.71	-	2.5	0.0	75	118	69	65
202	30.783	0.149	0.087	2.34	91.4	1.71	-	2.5	0.0	75	118	69	65
203	30.937	0.154	0.088	2.34	91.3	1.71	-	2.5	0.0	75	117	69	65
204	31.087	0.150	0.087	2.34	91.3	1.71	-	2.5	0.0	75	117	69	64.7
205	31.242	0.155	0.087	2.33	91.4	1.71	-	2.4	0.0	75	117	69	64.8
206	31.390	0.148	0.087	2.32	91.4	1.7	-	2.4	0.0	74	117	69	64.8
207	31.546	0.156	0.087	2.33	91.3	1.71	-	2.4	0.0	74	116	69	64.8
208	31.695	0.149	0.087	2.33	91.4	1.72	-	2.4	0.0	75	116	69	64.9
209	31.851	0.156	0.087	2.33	91.4	1.7	-	2.4	0.0	74	116	69	64.9
210	32.017	0.166	0.088	2.32	91.4	1.71	100	2.4	0.0	75	117	69	64.9
211	32.174	0.157	0.088	2.32	91.4	1.71	-	2.3	0.0	75	117	69	64.8
212	32.325	0.151	0.087	2.33	91.3	1.71	-	2.3	0.0	74	116	69	64.9
213	32.479	0.154	0.088	2.33	91.4	1.7	-	2.3	0.0	74	116	69	64.9
214	32.628	0.149	0.087	2.33	91.4	1.71	-	2.3	0.0	74	116	69	65
215	32.781	0.153	0.087	2.33	91.4	1.71	-	2.3	0.0	74	115	69	64.9
216	32.933	0.152	0.087	2.34	91.4	1.7	-	2.3	0.0	74	115	69	65
217	33.087	0.154	0.087	2.33	91.4	1.7	-	2.2	0.0	74	115	69	64.9
218	33.238	0.151	0.087	2.31	91.3	1.73	-	2.2	0.0	74	115	69	64.9
219	33.390	0.152	0.087	2.32	91.4	1.73	-	2.2	0.0	74	115	69	64.9
220	33.543	0.153	0.087	2.33	91.3	1.73	99	2.2	0.0	74	116	69	64.8
221	33.695	0.152	0.088	2.32	91.3	1.72	-	2.2	0.0	74	116	69	64.8
222	33.848	0.153	0.088	2.32	91.3	1.72	-	2.2	0.0	74	115	69	64.8
223	33.999	0.151	0.087	2.32	91.3	1.72	-	2.1	0.0	74	115	69	65
224	34.152	0.153	0.087	2.32	91.3	1.72	-	2.1	0.0	74	115	69	65
225	34.302	0.150	0.088	2.33	91.3	1.72	-	2.1	0.0	74	114	69	64.9
226	34.456	0.154	0.087	2.33	91.2	1.71	-	2.1	0.0	74	114	69	65
227	34.604	0.148	0.087	2.33	91.2	1.73	-	2.1	0.0	74	114	69	64.9
228	34.758	0.154	0.087	2.32	91.2	1.71	-	2.0	0.0	74	114	69	64.8
229	34.906	0.148	0.087	2.33	91.2	1.72	-	2.0	0.0	74	115	69	64.8
230	35.062	0.156	0.087	2.33	91.2	1.73	99	2.0	0.0	74	115	69	64.8

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	35.210	0.148	0.087	2.32	91.1	1.74	-	2.0	0.0	74	115	69	64.8
232	35.364	0.154	0.087	2.32	91.1	1.71	-	2.0	0.0	74	115	69	64.8
233	35.513	0.149	0.087	2.31	91.1	1.72	-	2.0	0.0	74	114	69	64.8
234	35.668	0.155	0.087	2.31	91.2	1.72	-	1.9	0.0	74	114	69	64.8
235	35.817	0.149	0.086	2.31	91.2	1.72	-	1.9	0.0	74	113	69	64.8
236	35.972	0.155	0.087	2.31	91.1	1.72	-	1.9	0.0	74	113	69	64.8
237	36.120	0.148	0.087	2.32	91.1	1.72	-	1.9	0.0	74	112	69	64.9
238	36.274	0.154	0.087	2.31	91.1	1.72	-	1.9	0.0	74	112	69	64.9
239	36.424	0.150	0.087	2.31	91.1	1.74	-	1.9	0.0	74	112	69	64.8
240	36.578	0.154	0.087	2.32	91.1	1.72	99	1.8	0.0	74	113	69	64.8
241	36.727	0.149	0.087	2.31	91	1.72	-	1.8	0.0	74	113	69	64.7
242	36.880	0.153	0.088	2.33	91.1	1.71	-	1.8	0.0	74	113	69	64.7
243	37.029	0.149	0.087	2.32	91	1.72	-	1.8	0.0	74	112	69	64.7
244	37.182	0.153	0.087	2.32	91	1.72	-	1.8	0.0	74	112	69	64.7
245	37.331	0.149	0.087	2.33	91	1.73	-	1.8	0.0	74	112	69	64.8
246	37.485	0.154	0.087	2.33	91.1	1.71	-	1.8	0.0	74	112	69	64.9
247	37.635	0.150	0.087	2.31	91.1	1.74	-	1.7	0.0	74	112	69	64.8
248	37.787	0.152	0.086	2.31	91	1.72	-	1.7	0.0	74	112	69	64.9
249	37.938	0.151	0.087	2.31	91.1	1.73	-	1.7	0.0	74	111	69	64.9
250	38.090	0.152	0.087	2.31	91.1	1.72	99	1.7	0.0	74	111	69	65
251	38.243	0.153	0.087	2.31	91.1	1.73	-	1.7	0.0	74	111	69	65
252	38.394	0.151	0.087	2.31	91.1	1.73	-	1.7	0.0	74	111	69	65
253	38.546	0.152	0.087	2.31	91.1	1.73	-	1.6	0.0	74	112	69	65
254	38.697	0.151	0.087	2.31	91.1	1.73	-	1.6	0.0	74	112	69	65
255	38.850	0.153	0.086	2.31	91.1	1.74	-	1.6	0.0	74	112	69	65
256	39.030	0.180	0.087	2.31	91.1	1.75	-	1.6	0.0	73	111	69	65
257	39.186	0.156	0.086	2.32	91.2	1.73	-	1.6	0.0	73	110	70	65
258	39.337	0.151	0.086	2.32	91.2	1.74	-	1.6	0.0	73	110	70	65
259	39.491	0.154	0.086	2.32	91.2	1.73	-	1.6	0.0	73	110	70	65
260	39.640	0.149	0.086	2.31	91.3	1.75	101	1.5	0.0	73	110	70	65.1
261	39.795	0.155	0.087	2.32	91.2	1.73	-	1.5	0.0	73	111	70	65.1
262	39.944	0.149	0.087	2.33	91.2	1.73	-	1.5	0.0	73	111	70	65
263	40.098	0.154	0.086	2.32	91.2	1.72	-	1.5	0.0	73	111	70	65

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	40.247	0.149	0.086	2.31	91.3	1.76	-	1.5	0.0	73	111	70	65
265	40.401	0.154	0.087	2.32	91.3	1.73	-	1.5	0.0	73	111	70	65
266	40.550	0.149	0.087	2.31	91.3	1.74	-	1.4	0.0	73	111	70	65
267	40.706	0.156	0.086	2.32	91.4	1.74	-	1.4	0.0	73	110	70	65.1
268	40.854	0.148	0.086	2.32	91.5	1.73	-	1.4	0.0	73	110	70	65.1
269	41.009	0.155	0.086	2.32	91.4	1.73	-	1.4	0.0	73	109	70	65
270	41.158	0.149	0.086	2.32	91.5	1.73	100	1.4	0.0	73	110	70	65.1
271	41.312	0.154	0.087	2.31	91.5	1.74	-	1.4	0.0	73	110	70	65.1
272	41.461	0.149	0.086	2.32	91.5	1.75	-	1.3	0.0	73	110	70	65
273	41.615	0.154	0.087	2.32	91.5	1.76	-	1.3	0.0	73	110	70	65
274	41.765	0.150	0.086	2.32	91.5	1.75	-	1.3	0.0	73	110	70	65.1
275	41.922	0.157	0.086	2.31	91.6	1.75	-	1.3	0.0	73	109	70	65.1
276	42.071	0.149	0.086	2.31	91.6	1.72	-	1.3	0.0	73	109	70	65.1
277	42.224	0.153	0.086	2.32	91.6	1.73	-	1.3	0.0	73	109	70	65.1
278	42.377	0.153	0.087	2.32	91.6	1.75	-	1.3	0.0	73	109	70	65.1
279	42.533	0.156	0.086	2.32	91.6	1.74	-	1.2	0.0	73	108	70	65.1
280	42.688	0.155	0.086	2.32	91.7	1.75	100	1.2	0.0	73	108	70	65.1
281	42.836	0.148	0.086	2.31	91.7	1.75	-	1.2	0.0	73	108	70	65.2
282	42.995	0.159	0.086	2.31	91.7	1.74	-	1.2	0.0	73	108	70	65.2
283	43.144	0.149	0.086	2.31	91.8	1.74	-	1.2	0.0	73	108	70	65.2
284	43.296	0.152	0.086	2.30	91.7	1.75	-	1.2	0.0	73	108	70	65.2
285	43.443	0.147	0.086	2.30	91.7	1.74	-	1.2	0.0	73	108	70	65.1
286	43.597	0.154	0.087	2.32	91.8	1.75	-	1.1	0.0	73	108	70	65.1
287	43.749	0.152	0.087	2.31	91.8	1.74	-	1.1	0.0	73	108	70	65.2
288	43.902	0.153	0.087	2.30	91.8	1.75	-	1.1	0.0	73	108	70	65.2
289	44.051	0.149	0.086	2.31	91.8	1.75	-	1.1	0.0	73	108	70	65.2
290	44.205	0.154	0.086	2.32	91.8	1.74	99	1.1	0.0	73	108	70	65.2
291	44.354	0.149	0.087	2.31	91.8	1.73	-	1.1	0.0	73	107	69	65.2
292	44.507	0.153	0.087	2.31	91.8	1.76	-	1.0	0.0	72	107	70	65.1
293	44.655	0.148	0.086	2.31	91.8	1.73	-	1.0	0.0	72	107	69	65.2
294	44.809	0.154	0.086	2.31	91.8	1.76	-	1.0	0.0	72	107	69	65.1
295	44.958	0.149	0.087	2.33	91.9	1.75	-	1.0	0.0	73	107	69	65.2
296	45.113	0.155	0.087	2.32	91.8	1.75	-	1.0	0.0	73	108	69	65.2

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	45.260	0.147	0.087	2.31	91.9	1.74	-	1.0	0.0	72	107	69	65.2
298	45.415	0.155	0.086	2.31	91.9	1.78	-	1.0	0.0	72	107	69	65.1
299	45.563	0.148	0.087	2.30	91.9	1.74	-	0.9	0.0	72	106	69	65.1
300	45.718	0.155	0.086	2.31	91.9	1.75	99	0.9	0.0	72	106	69	65.1
301	45.866	0.148	0.087	2.31	91.9	1.76	-	0.9	0.0	72	106	69	65
302	46.021	0.155	0.087	2.31	91.9	1.74	-	0.9	0.0	72	106	69	65.1
303	46.169	0.148	0.087	2.31	91.9	1.76	-	0.9	0.0	72	106	69	65.1
304	46.323	0.154	0.087	2.31	91.9	1.75	-	0.9	0.0	72	107	69	65
305	46.472	0.149	0.087	2.30	91.9	1.75	-	0.8	0.0	72	106	69	65.1
306	46.626	0.154	0.087	2.31	91.9	1.76	-	0.8	0.0	72	107	69	65.2
307	46.774	0.148	0.086	2.30	91.9	1.77	-	0.8	0.0	72	107	69	65
308	46.928	0.154	0.087	2.31	91.9	1.75	-	0.8	0.0	72	107	69	65
309	47.077	0.149	0.086	2.32	91.9	1.76	-	0.8	0.0	72	107	69	65.1
310	47.230	0.153	0.087	2.31	91.9	1.75	99	0.8	0.0	72	106	69	65.1
311	47.378	0.148	0.087	2.32	91.9	1.76	-	0.8	0.0	72	106	69	65.2
312	47.531	0.153	0.086	2.31	91.9	1.77	-	0.7	0.0	72	106	69	65
313	47.680	0.149	0.087	2.31	91.9	1.76	-	0.7	0.0	72	106	69	65
314	47.834	0.154	0.086	2.32	91.9	1.75	-	0.7	0.0	72	107	69	65
315	47.984	0.150	0.087	2.32	91.9	1.74	-	0.7	0.0	72	107	69	65
316	48.135	0.151	0.087	2.31	91.9	1.77	-	0.7	0.0	72	108	69	65
317	48.286	0.151	0.087	2.31	91.9	1.75	-	0.6	0.0	72	108	69	65
318	48.437	0.151	0.086	2.31	91.9	1.75	-	0.6	0.0	72	107	69	65.1
319	48.589	0.152	0.087	2.31	91.9	1.77	-	0.6	0.0	72	107	69	65
320	48.740	0.151	0.087	2.30	91.9	1.77	98	0.6	0.0	72	107	69	65
321	48.892	0.152	0.087	2.29	91.9	1.74	-	0.6	0.0	72	107	69	65
322	49.042	0.150	0.087	2.31	91.9	1.74	-	0.6	0.0	72	107	69	65
323	49.195	0.153	0.087	2.30	91.9	1.78	-	0.6	0.0	72	107	69	65.2
324	49.345	0.150	0.087	2.30	91.9	1.79	-	0.6	0.0	72	107	69	64.9
325	49.497	0.152	0.087	2.30	91.9	1.76	-	0.5	0.0	72	106	69	65
326	49.647	0.150	0.086	2.30	91.8	1.76	-	0.5	0.0	72	106	69	64.9
327	49.800	0.153	0.087	2.30	91.8	1.75	-	0.5	0.0	72	106	69	65.1
328	49.950	0.150	0.086	2.31	91.8	1.8	-	0.5	0.0	72	106	69	65
329	50.103	0.153	0.087	2.31	91.8	1.73	-	0.5	0.0	72	106	69	64.9

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	50.251	0.148	0.087	2.30	91.8	1.76	98	0.4	0.0	72	106	69	65
331	50.410	0.159	0.087	2.31	91.7	1.77	-	0.4	0.0	72	106	69	65
332	50.561	0.151	0.087	2.31	91.8	1.74	-	0.4	0.0	72	106	69	65
333	50.714	0.153	0.086	2.31	91.8	1.77	-	0.4	0.0	71	106	69	65
334	50.862	0.148	0.087	2.32	91.7	1.76	-	0.4	0.0	71	105	69	64.9
335	51.017	0.155	0.086	2.32	91.7	1.77	-	0.4	0.0	71	104	69	65
336	51.165	0.148	0.087	2.31	91.7	1.78	-	0.4	0.0	71	104	69	65
337	51.319	0.154	0.087	2.31	91.7	1.75	-	0.4	0.0	71	105	69	64.9
338	51.468	0.149	0.087	2.30	91.6	1.76	-	0.3	0.0	71	106	69	64.8
339	51.623	0.155	0.087	2.30	91.7	1.77	-	0.3	0.0	71	107	69	64.9
340	51.771	0.148	0.086	2.30	91.6	1.77	99	0.3	0.0	71	107	69	64.9
341	51.925	0.154	0.087	2.30	91.6	1.79	-	0.3	0.0	71	107	68	64.9
342	52.073	0.148	0.087	2.29	91.6	1.79	-	0.3	0.0	71	107	69	64.9
343	52.228	0.155	0.088	2.29	91.6	1.77	-	0.3	0.0	71	107	68	64.9
344	52.376	0.148	0.087	2.29	91.6	1.76	-	0.3	0.0	71	107	68	64.9
345	52.530	0.154	0.088	2.29	91.6	1.76	-	0.2	0.0	71	107	68	65
346	52.678	0.148	0.088	2.30	91.6	1.76	-	0.2	0.0	71	108	68	65
347	52.831	0.153	0.087	2.30	91.6	1.75	-	0.2	0.0	71	107	68	65
348	52.979	0.148	0.088	2.29	91.6	1.76	-	0.2	0.0	71	106	68	64.8
349	53.133	0.154	0.087	2.29	91.6	1.77	-	0.2	0.0	71	106	68	64.6
350	53.281	0.148	0.087	2.30	91.6	1.76	99	0.2	0.0	71	106	68	64.6
351	53.435	0.154	0.087	2.29	91.6	1.77	-	0.1	0.0	71	105	68	64.6
352	53.583	0.148	0.088	2.30	91.6	1.79	-	0.1	0.0	71	105	68	64.4
353	53.736	0.153	0.088	2.30	91.6	1.77	-	0.1	0.0	71	105	68	64.3
354	53.884	0.148	0.088	2.30	91.6	1.78	-	0.1	0.0	72	106	68	64.2
355	54.037	0.153	0.088	2.30	91.6	1.76	-	0.1	0.0	72	107	68	64.1
356	54.185	0.148	0.088	2.30	91.6	1.75	-	0.0	0.0	72	107	68	64.3
357	54.338	0.153	0.088	2.31	91.6	1.78	-	0.0	0.0	72	106	68	64.1
358	54.486	0.148	0.087	2.30	91.6	1.76	-	0.0	0.0	72	106	68	64.3
359	54.639	0.153	0.087	2.30	91.6	1.76	-	0.0	0.0	72	106	68	64.1
360	54.787	0.148	0.087	2.30	91.5	1.76	98	0.0	0.0	72	105	68	64.1
Avg/Tot	54.787	0.152	0.087	2.33	88	1.64	100			75	121	69	65

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.01	68.7	0.65		69	-0.033	9.09	0.24
1	0.119	0.119	2.49	68.7	2.1	-	69	-0.033	9.52	0.33
2	0.273	0.154	2.49	68.7	2.05	-	69	-0.032	8.49	0.26
3	0.424	0.151	2.48	68.7	1.99	-	69	-0.033	9.96	0.64
4	0.578	0.154	2.47	68.7	1.86	-	70	-0.031	9.31	0.32
5	0.729	0.151	2.47	68.9	1.82	-	70	-0.032	9.13	0.26
6	0.884	0.155	2.46	68.9	1.79	-	70	-0.035	9.43	0.28
7	1.033	0.149	2.44	69	2.36	-	70	-0.030	9.28	0.23
8	1.188	0.155	2.45	69.2	1.84	-	70	-0.031	9.56	0.26
9	1.337	0.149	2.43	69.4	2.29	-	70	-0.031	9.32	0.29
10	1.490	0.153	2.42	69.6	1.86	108	70	-0.030	10.20	0.49
11	1.639	0.149	2.41	69.8	2.12	-	70	-0.029	8.97	0.21
12	1.791	0.152	2.39	70	2.08	-	70	-0.028	9.66	0.43
13	1.941	0.150	2.38	70.2	1.89	-	70	-0.032	9.99	0.55
14	2.092	0.151	2.38	70.5	1.94	-	70	-0.030	9.86	0.43
15	2.242	0.150	2.36	70.8	2.4	-	70	-0.028	10.45	0.79
16	2.392	0.150	2.36	71.1	2.36	-	70	-0.029	9.22	0.24
17	2.542	0.150	2.35	71.3	1.97	-	70	-0.029	10.42	0.99
18	2.691	0.149	2.34	71.6	1.93	-	70	-0.027	9.61	0.49
19	2.840	0.149	2.33	71.9	2.14	-	70	-0.027	9.74	0.52
20	2.989	0.149	2.32	72.2	2.17	108	71	-0.027	8.52	0.22
21	3.138	0.149	2.32	72.5	2.25	-	71	-0.027	8.79	0.20
22	3.286	0.148	2.30	72.9	2.13	-	71	-0.027	8.60	0.21
23	3.435	0.149	2.30	73.2	2.11	-	71	-0.027	8.34	0.18
24	3.583	0.148	2.30	73.6	2.1	-	71	-0.026	5.88	0.06
25	3.731	0.148	2.29	73.9	2.19	-	71	-0.024	7.16	0.08
26	3.879	0.148	2.27	74.2	2.11	-	71	-0.027	9.94	0.78
27	4.026	0.147	2.27	74.5	2.34	-	71	-0.025	9.12	0.32
28	4.174	0.148	2.26	74.9	2.33	-	71	-0.026	9.36	0.35
29	4.320	0.146	2.25	75.2	2.29	-	71	-0.025	10.06	0.93
30	4.468	0.148	2.23	75.6	2.57	106	71	-0.025	10.33	0.99
31	4.614	0.146	2.23	75.9	2.35	-	71	-0.025	9.63	0.58

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.763	0.149	2.23	76.3	2.67	-	71	-0.024	7.98	0.20
33	4.908	0.145	2.22	76.6	2.7	-	71	-0.024	9.30	0.36
34	5.057	0.149	2.21	77	2.49	-	71	-0.024	9.79	0.57
35	5.202	0.145	2.22	77.3	2.17	-	71	-0.025	9.75	0.73
36	5.351	0.149	2.21	77.7	2.21	-	71	-0.024	10.21	1.49
37	5.494	0.143	2.20	78	2.24	-	71	-0.025	10.29	1.31
38	5.643	0.149	2.20	78.3	2.5	-	71	-0.024	9.97	0.84
39	5.786	0.143	2.19	78.7	2.43	-	71	-0.023	10.29	1.54
40	5.934	0.148	2.18	79	2.3	104	71	-0.021	9.03	0.42
41	6.077	0.143	2.17	79.3	2.44	-	71	-0.023	9.25	0.44
42	6.226	0.149	2.18	79.6	2.7	-	71	-0.022	8.33	0.28
43	6.370	0.144	2.17	80	2.56	-	71	-0.021	9.02	0.33
44	6.518	0.148	2.18	80.3	2.31	-	71	-0.021	9.17	0.44
45	6.663	0.145	2.18	80.6	2.65	-	71	-0.022	8.99	0.34
46	6.809	0.146	2.16	80.9	2.74	-	71	-0.022	9.94	0.95
47	6.954	0.145	2.16	81.2	2.71	-	71	-0.021	9.50	0.67
48	7.099	0.145	2.16	81.5	2.68	-	71	-0.022	9.62	0.57
49	7.244	0.145	2.14	81.8	2.63	-	71	-0.022	9.49	0.42
50	7.389	0.145	2.15	82.1	2.76	103	71	-0.020	9.53	0.40
51	7.535	0.146	2.15	82.4	2.84	-	71	-0.021	9.22	0.39
52	7.679	0.144	2.15	82.6	2.87	-	71	-0.020	8.58	0.19
53	7.827	0.148	2.15	82.9	2.69	-	71	-0.021	9.23	0.48
54	7.970	0.143	2.15	83.2	2.67	-	71	-0.021	9.75	0.71
55	8.117	0.147	2.14	83.4	2.4	-	71	-0.021	9.72	0.54
56	8.259	0.142	2.13	83.7	2.44	-	71	-0.020	8.53	0.24
57	8.407	0.148	2.14	84	2.83	-	71	-0.021	8.89	0.28
58	8.550	0.143	2.13	84.3	2.84	-	71	-0.021	9.85	0.95
59	8.698	0.148	2.14	84.5	2.95	-	71	-0.021	9.92	1.16
60	8.842	0.144	2.14	84.8	2.47	102	71	-0.020	9.93	1.19
61	8.988	0.146	2.14	85	2.79	-	71	-0.021	9.85	1.17
62	9.133	0.145	2.13	85.3	2.52	-	71	-0.022	8.04	0.38
63	9.277	0.144	2.13	85.5	2.65	-	71	-0.020	7.45	0.19

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.423	0.146	2.13	85.7	2.54	-	71	-0.020	6.34	0.07
65	9.567	0.144	2.13	85.9	2.68	-	71	-0.021	5.67	0.06
66	9.715	0.148	2.14	86.2	2.33	-	71	-0.020	5.58	0.04
67	9.859	0.144	2.14	86.3	2.53	-	70	-0.019	5.00	0.05
68	10.006	0.147	2.13	86.6	2.45	-	71	-0.019	5.60	0.03
69	10.149	0.143	2.13	86.9	2.81	-	71	-0.021	5.22	0.03
70	10.297	0.148	2.14	87	2.72	101	71	-0.018	5.47	0.04
71	10.439	0.142	2.13	87.3	2.38	-	70	-0.018	4.82	0.03
72	10.588	0.149	2.13	87.5	2.39	-	71	-0.018	5.01	0.03
73	10.731	0.143	2.13	87.6	2.9	-	70	-0.018	5.94	0.04
74	10.879	0.148	2.14	87.8	2.39	-	70	-0.018	5.33	0.03
75	11.024	0.145	2.14	88	2.91	-	70	-0.018	5.77	0.03
76	11.170	0.146	2.13	88.2	2.59	-	70	-0.018	6.36	0.04
77	11.316	0.146	2.14	88.4	2.77	-	70	-0.019	5.35	0.05
78	11.461	0.145	2.13	88.5	2.44	-	70	-0.018	4.76	0.03
79	11.606	0.145	2.12	88.7	2.43	-	70	-0.018	5.98	0.02
80	11.751	0.145	2.13	88.9	2.62	100	70	-0.018	5.35	0.03
81	11.899	0.148	2.13	89	2.91	-	70	-0.019	6.35	0.04
82	12.043	0.144	2.14	89.2	2.48	-	70	-0.017	6.26	0.03
83	12.192	0.149	2.13	89.4	2.74	-	70	-0.016	6.66	0.05
84	12.335	0.143	2.12	89.5	2.71	-	70	-0.019	6.00	0.05
85	12.483	0.148	2.13	89.7	2.76	-	70	-0.019	6.14	0.05
86	12.626	0.143	2.12	89.8	2.51	-	70	-0.021	5.89	0.03
87	12.773	0.147	2.13	90	2.93	-	70	-0.017	5.16	0.02
88	12.917	0.144	2.12	90.1	2.86	-	70	-0.019	5.63	0.01
89	13.065	0.148	2.13	90.2	2.56	-	70	-0.016	5.33	0.02
90	13.209	0.144	2.12	90.4	2.73	100	70	-0.019	5.07	0.03
91	13.357	0.148	2.13	90.5	2.57	-	70	-0.018	5.24	0.03
92	13.502	0.145	2.14	90.6	2.92	-	70	-0.017	4.95	0.03
93	13.648	0.146	2.13	90.7	3.01	-	70	-0.018	5.82	0.04
94	13.794	0.146	2.13	90.9	2.81	-	70	-0.019	6.23	0.03
95	13.940	0.146	2.13	91	2.53	-	70	-0.017	6.81	0.04

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	14.085	0.145	2.12	91.1	2.53	-	70	-0.022	7.07	0.07
97	14.230	0.145	2.12	91.2	2.96	-	70	-0.020	5.49	0.03
98	14.378	0.148	2.13	91.2	2.44	-	70	-0.019	5.71	0.03
99	14.522	0.144	2.12	91.3	2.45	-	70	-0.020	5.33	0.02
100	14.671	0.149	2.13	91.5	2.89	100	70	-0.020	6.00	0.03
101	14.815	0.144	2.12	91.6	2.79	-	70	-0.018	5.45	0.02
102	14.963	0.148	2.12	91.7	2.89	-	70	-0.019	5.28	0.02
103	15.106	0.143	2.12	91.7	2.68	-	70	-0.020	5.15	0.02
104	15.254	0.148	2.12	91.9	2.57	-	70	-0.018	5.16	0.01
105	15.397	0.143	2.11	92	3.01	-	70	-0.021	5.36	0.02
106	15.546	0.149	2.12	92	2.49	-	70	-0.019	4.92	0.02
107	15.690	0.144	2.12	92.1	2.47	-	70	-0.017	4.76	0.02
108	15.837	0.147	2.12	92.2	2.63	-	70	-0.018	5.65	0.02
109	15.983	0.146	2.12	92.3	3.03	-	70	-0.018	5.13	0.02
110	16.130	0.147	2.12	92.3	2.46	99	70	-0.020	5.45	0.02
111	16.275	0.145	2.12	92.5	2.48	-	70	-0.019	5.48	0.01
112	16.421	0.146	2.12	92.5	2.52	-	70	-0.019	5.18	0.02
113	16.567	0.146	2.12	92.6	2.61	-	70	-0.019	4.50	0.02
114	16.711	0.144	2.12	92.7	3	-	70	-0.020	5.62	0.01
115	16.859	0.148	2.12	92.7	2.52	-	70	-0.017	5.69	0.01
116	17.004	0.145	2.12	92.7	2.87	-	70	-0.020	4.21	0.02
117	17.151	0.147	2.12	92.8	2.47	-	70	-0.019	4.62	0.02
118	17.296	0.145	2.12	92.8	2.58	-	70	-0.019	5.93	0.01
119	17.444	0.148	2.12	92.9	3.05	-	70	-0.020	6.72	0.05
120	17.588	0.144	2.12	92.9	2.93	100	70	-0.018	7.11	0.04
121	17.736	0.148	2.12	93	2.83	-	70	-0.020	5.79	0.02
122	17.879	0.143	2.12	93.1	2.56	-	70	-0.019	5.17	0.01
123	18.027	0.148	2.11	93.1	2.65	-	70	-0.019	6.02	0.02
124	18.171	0.144	2.12	93.2	3.03	-	70	-0.018	6.42	0.02
125	18.319	0.148	2.12	93.2	2.92	-	70	-0.019	6.62	0.04
126	18.463	0.144	2.11	93.3	2.76	-	70	-0.022	6.58	0.04
127	18.612	0.149	2.11	93.4	2.88	-	70	-0.021	6.28	0.03

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	18.757	0.145	2.12	93.4	2.51	-	70	-0.020	4.97	0.01
129	18.903	0.146	2.11	93.5	3.04	-	70	-0.021	4.32	0.01
130	19.048	0.145	2.12	93.5	2.98	100	70	-0.019	5.14	0.01
131	19.194	0.146	2.11	93.6	2.88	-	70	-0.021	6.03	0.02
132	19.340	0.146	2.11	93.6	2.73	-	70	-0.021	4.86	0.02
133	19.484	0.144	2.11	93.6	3.02	-	70	-0.020	4.92	0.01
134	19.632	0.148	2.12	93.7	2.9	-	70	-0.020	5.87	0.03
135	19.776	0.144	2.11	93.7	3	-	70	-0.021	5.39	0.04
136	19.925	0.149	2.11	93.8	2.99	-	70	-0.020	5.43	0.01
137	20.068	0.143	2.11	93.8	3.06	-	70	-0.019	5.88	0.02
138	20.216	0.148	2.11	93.8	2.53	-	70	-0.021	4.99	0.01
139	20.360	0.144	2.11	93.9	3	-	70	-0.023	4.89	0.01
140	20.508	0.148	2.11	93.9	2.49	99	70	-0.021	5.17	0.01
141	20.651	0.143	2.11	94	2.85	-	69	-0.021	5.66	0.01
142	20.799	0.148	2.11	94	2.6	-	69	-0.022	6.42	0.04
143	20.943	0.144	2.11	94	2.5	-	69	-0.022	4.69	0.02
144	21.091	0.148	2.11	94	2.49	-	69	-0.021	4.09	0.02
145	21.236	0.145	2.11	94	2.53	-	69	-0.020	3.79	0.04
146	21.382	0.146	2.11	94.1	2.85	-	69	-0.021	5.32	0.02
147	21.528	0.146	2.10	94.1	2.95	-	69	-0.021	5.26	0.01
148	21.673	0.145	2.10	94.2	2.83	-	69	-0.020	5.72	0.01
149	21.819	0.146	2.10	94.2	2.64	-	69	-0.022	4.27	0.03
150	21.964	0.145	2.11	94.2	3.04	99	69	-0.019	4.73	0.02
151	22.111	0.147	2.10	94.3	2.47	-	69	-0.019	5.62	0.05
152	22.255	0.144	2.10	94.3	2.69	-	69	-0.021	5.64	0.06
153	22.404	0.149	2.11	94.4	2.87	-	69	-0.021	4.55	0.01
154	22.547	0.143	2.10	94.4	2.74	-	69	-0.019	4.14	0.02
155	22.695	0.148	2.10	94.4	2.53	-	69	-0.020	5.83	0.02
156	22.838	0.143	2.10	94.4	2.88	-	69	-0.020	6.50	0.04
157	22.985	0.147	2.10	94.4	2.53	-	69	-0.021	6.17	0.03
158	23.129	0.144	2.09	94.5	3.02	-	69	-0.021	5.66	0.02
159	23.277	0.148	2.10	94.5	2.87	-	69	-0.020	5.24	0.01

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	23.420	0.143	2.09	94.5	2.91	99	69	-0.020	5.64	0.01
161	23.568	0.148	2.10	94.5	2.78	-	69	-0.021	5.05	0.02
162	23.712	0.144	2.10	94.5	2.7	-	69	-0.019	5.46	0.03
163	23.858	0.146	2.09	94.5	2.54	-	69	-0.023	7.44	0.10
164	24.003	0.145	2.09	94.5	2.85	-	69	-0.023	5.53	0.04
165	24.148	0.145	2.09	94.5	2.89	-	69	-0.021	5.49	0.02
166	24.294	0.146	2.09	94.6	2.62	-	69	-0.020	4.99	0.01
167	24.439	0.145	2.09	94.6	2.82	-	69	-0.021	5.22	0.01
168	24.586	0.147	2.09	94.6	2.62	-	69	-0.021	5.31	0.01
169	24.730	0.144	2.09	94.6	2.8	-	69	-0.020	6.25	0.02
170	24.878	0.148	2.09	94.6	2.97	99	69	-0.020	5.79	0.02
171	25.021	0.143	2.10	94.6	3.03	-	69	-0.019	6.26	0.02
172	25.168	0.147	2.09	94.6	2.64	-	69	-0.022	6.24	0.02
173	25.310	0.142	2.08	94.6	2.51	-	69	-0.022	6.20	0.04
174	25.458	0.148	2.09	94.6	2.79	-	69	-0.021	5.52	0.01
175	25.602	0.144	2.08	94.7	2.58	-	69	-0.022	4.87	0.01
176	25.750	0.148	2.09	94.7	2.61	-	69	-0.021	4.85	0.01
177	25.894	0.144	2.09	94.7	2.58	-	69	-0.018	5.69	0.01
178	26.039	0.145	2.09	94.7	2.88	-	69	-0.021	6.19	0.02
179	26.177	0.138	2.08	94.8	2.54	-	70	-0.020	5.90	0.02
180	26.321	0.144	2.08	94.7	2.67	99	70	-0.021	5.87	0.02
181	26.467	0.146	2.09	94.8	3.01	-	70	-0.019	4.66	0.01
182	26.611	0.144	2.08	94.7	2.63	-	70	-0.020	5.87	0.02
183	26.759	0.148	2.08	94.8	2.58	-	70	-0.022	5.68	0.02
184	26.902	0.143	2.08	94.8	2.87	-	70	-0.020	5.74	0.02
185	27.049	0.147	2.08	94.7	2.76	-	70	-0.023	4.39	0.01
186	27.192	0.143	2.08	94.7	3.03	-	70	-0.021	3.97	0.02
187	27.339	0.147	2.08	94.8	3.05	-	70	-0.023	3.40	0.02
188	27.482	0.143	2.08	94.8	3.02	-	70	-0.021	3.28	0.03
189	27.629	0.147	2.08	94.8	2.59	-	70	-0.020	4.45	0.02
190	27.773	0.144	2.09	94.8	3.01	100	70	-0.021	4.94	0.01
191	27.920	0.147	2.08	94.8	2.52	-	70	-0.022	5.25	0.03

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	28.064	0.144	2.08	94.9	2.56	-	70	-0.021	4.51	0.01
193	28.209	0.145	2.08	94.8	2.6	-	70	-0.020	3.64	0.04
194	28.354	0.145	2.08	94.9	2.77	-	70	-0.020	4.13	0.01
195	28.498	0.144	2.08	95	2.56	-	70	-0.020	4.70	0.01
196	28.645	0.147	2.08	95	2.88	-	70	-0.020	3.88	0.03
197	28.789	0.144	2.08	95	2.76	-	70	-0.020	3.67	0.01
198	28.936	0.147	2.07	95	2.86	-	70	-0.020	3.41	0.02
199	29.079	0.143	2.07	95	2.93	-	70	-0.018	3.70	0.02
200	29.226	0.147	2.07	94.9	2.91	99	70	-0.020	3.76	0.02
201	29.368	0.142	2.07	95	2.71	-	70	-0.020	4.61	0.01
202	29.516	0.148	2.08	95	2.99	-	70	-0.019	3.95	0.02
203	29.659	0.143	2.07	95	2.69	-	70	-0.019	3.23	0.03
204	29.806	0.147	2.08	95	2.84	-	70	-0.019	4.09	0.01
205	29.950	0.144	2.08	95	2.95	-	70	-0.020	4.04	0.01
206	30.096	0.146	2.07	95.1	2.6	-	70	-0.019	3.29	0.02
207	30.241	0.145	2.08	95.1	2.55	-	70	-0.019	2.75	0.03
208	30.384	0.143	2.07	95.1	2.99	-	70	-0.022	3.01	0.05
209	30.531	0.147	2.08	95.1	2.87	-	70	-0.019	5.05	0.01
210	30.674	0.143	2.08	95.1	2.56	99	70	-0.018	5.65	0.02
211	30.822	0.148	2.08	95.1	2.72	-	70	-0.021	5.02	0.01
212	30.965	0.143	2.07	95.1	2.81	-	70	-0.020	3.39	0.02
213	31.112	0.147	2.08	95.2	3.07	-	70	-0.019	3.12	0.03
214	31.254	0.142	2.08	95.2	2.7	-	70	-0.020	4.08	0.02
215	31.401	0.147	2.07	95.2	3.1	-	70	-0.019	3.94	0.02
216	31.545	0.144	2.08	95.2	2.57	-	70	-0.020	3.49	0.03
217	31.692	0.147	2.08	95.2	3.04	-	70	-0.019	3.67	0.02
218	31.836	0.144	2.08	95.2	2.54	-	70	-0.019	4.16	0.01
219	31.981	0.145	2.07	95.2	2.73	-	70	-0.019	4.57	0.01
220	32.126	0.145	2.08	95.2	2.53	99	70	-0.019	4.59	0.02
221	32.269	0.143	2.07	95.2	2.53	-	70	-0.020	4.41	0.02
222	32.416	0.147	2.08	95.1	2.63	-	70	-0.019	3.75	0.01
223	32.559	0.143	2.07	95.2	2.59	-	70	-0.020	3.42	0.02

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	32.707	0.148	2.07	95.2	2.87	-	70	-0.020	3.72	0.01
225	32.849	0.142	2.07	95.2	2.64	-	70	-0.020	2.95	0.03
226	32.997	0.148	2.07	95.2	2.52	-	70	-0.019	3.44	0.02
227	33.139	0.142	2.07	95.2	2.9	-	70	-0.019	4.62	0.01
228	33.286	0.147	2.07	95.2	2.98	-	70	-0.019	4.37	0.01
229	33.429	0.143	2.07	95.2	2.66	-	70	-0.020	5.32	0.01
230	33.575	0.146	2.07	95.2	2.72	99	70	-0.022	4.77	0.01
231	33.720	0.145	2.07	95.2	3.05	-	70	-0.017	3.92	0.02
232	33.865	0.145	2.07	95.1	2.85	-	70	-0.021	4.20	0.01
233	34.010	0.145	2.07	95.2	3.02	-	70	-0.020	2.97	0.04
234	34.153	0.143	2.07	95.2	2.7	-	70	-0.018	3.30	0.04
235	34.299	0.146	2.07	95.2	2.59	-	70	-0.017	3.65	0.01
236	34.443	0.144	2.07	95.2	2.86	-	70	-0.020	2.94	0.03
237	34.590	0.147	2.07	95.2	3	-	70	-0.018	2.79	0.05
238	34.733	0.143	2.06	95.2	3.01	-	70	-0.020	3.99	0.01
239	34.880	0.147	2.07	95.2	3.04	-	70	-0.017	4.33	0.01
240	35.022	0.142	2.07	95.2	2.53	99	70	-0.021	4.30	0.01
241	35.169	0.147	2.07	95.2	3.01	-	70	-0.020	4.73	0.01
242	35.312	0.143	2.07	95.1	2.63	-	70	-0.017	3.89	0.02
243	35.458	0.146	2.07	95.2	2.9	-	70	-0.021	3.31	0.02
244	35.603	0.145	2.07	95.1	3.07	-	70	-0.019	3.41	0.02
245	35.748	0.145	2.06	95.2	2.61	-	70	-0.020	3.61	0.02
246	35.892	0.144	2.07	95.2	2.53	-	70	-0.019	4.26	0.01
247	36.035	0.143	2.06	95.2	3.07	-	70	-0.019	4.44	0.01
248	36.182	0.147	2.06	95.2	2.96	-	70	-0.018	2.88	0.03
249	36.325	0.143	2.06	95.2	2.64	-	70	-0.019	3.05	0.03
250	36.473	0.148	2.07	95.2	2.65	99	70	-0.019	4.12	0.01
251	36.615	0.142	2.06	95.2	2.97	-	70	-0.020	3.84	0.02
252	36.762	0.147	2.07	95.2	2.59	-	70	-0.016	3.77	0.02
253	36.903	0.141	2.07	95.2	2.71	-	70	-0.018	4.57	0.01
254	37.051	0.148	2.07	95.2	2.7	-	70	-0.020	4.98	0.01
255	37.193	0.142	2.06	95.2	2.51	-	70	-0.020	3.82	0.01

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	37.340	0.147	2.06	95.2	2.59	-	70	-0.019	2.87	0.02
257	37.484	0.144	2.06	95.2	2.68	-	70	-0.019	2.48	0.05
258	37.629	0.145	2.06	95.2	2.56	-	70	-0.019	2.91	0.03
259	37.773	0.144	2.06	95.2	2.66	-	70	-0.019	3.52	0.02
260	37.917	0.144	2.06	95.2	2.97	99	70	-0.017	3.76	0.03
261	38.063	0.146	2.06	95.2	2.91	-	70	-0.018	5.32	0.01
262	38.206	0.143	2.07	95.2	2.97	-	70	-0.019	4.66	0.01
263	38.353	0.147	2.06	95.3	2.77	-	70	-0.018	3.89	0.01
264	38.495	0.142	2.06	95.2	2.58	-	70	-0.018	4.39	0.01
265	38.642	0.147	2.06	95.2	2.61	-	70	-0.020	4.41	0.01
266	38.784	0.142	2.06	95.3	2.53	-	70	-0.017	3.81	0.02
267	38.930	0.146	2.06	95.3	2.95	-	70	-0.019	3.13	0.04
268	39.075	0.145	2.06	95.4	2.63	-	70	-0.019	2.97	0.05
269	39.220	0.145	2.06	95.3	2.63	-	70	-0.019	3.31	0.04
270	39.364	0.144	2.06	95.4	2.59	99	70	-0.019	4.61	0.01
271	39.507	0.143	2.06	95.4	2.62	-	70	-0.020	4.17	0.01
272	39.653	0.146	2.05	95.4	2.87	-	70	-0.018	3.59	0.01
273	39.796	0.143	2.06	95.5	2.69	-	70	-0.019	3.77	0.02
274	39.943	0.147	2.06	95.5	2.69	-	70	-0.018	3.99	0.02
275	40.086	0.143	2.05	95.5	2.79	-	70	-0.019	3.98	0.01
276	40.233	0.147	2.06	95.5	2.78	-	70	-0.018	4.11	0.01
277	40.374	0.141	2.06	95.5	2.56	-	70	-0.017	3.48	0.01
278	40.521	0.147	2.06	95.6	2.99	-	70	-0.019	3.17	0.03
279	40.663	0.142	2.06	95.6	2.59	-	70	-0.017	3.09	0.03
280	40.810	0.147	2.06	95.6	2.9	99	70	-0.019	2.86	0.04
281	40.954	0.144	2.05	95.7	3.04	-	70	-0.015	3.77	0.01
282	41.098	0.144	2.06	95.7	2.85	-	70	-0.018	4.40	0.00
283	41.242	0.144	2.05	95.6	3.06	-	70	-0.019	4.04	0.01
284	41.386	0.144	2.06	95.6	2.88	-	70	-0.018	4.04	0.00
285	41.532	0.146	2.05	95.7	2.61	-	70	-0.017	4.26	0.01
286	41.675	0.143	2.05	95.7	2.61	-	70	-0.019	3.01	0.03
287	41.822	0.147	2.05	95.7	2.6	-	70	-0.018	3.87	0.03

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	41.964	0.142	2.06	95.7	2.55	-	70	-0.017	4.52	0.01
289	42.110	0.146	2.05	95.7	2.62	-	70	-0.016	4.54	0.01
290	42.253	0.143	2.06	95.7	3.06	99	70	-0.017	2.87	0.02
291	42.399	0.146	2.05	95.7	2.58	-	70	-0.019	3.31	0.02
292	42.543	0.144	2.05	95.7	2.65	-	70	-0.019	2.68	0.04
293	42.687	0.144	2.05	95.7	2.94	-	70	-0.017	3.74	0.02
294	42.831	0.144	2.05	95.8	2.55	-	70	-0.019	4.66	0.01
295	42.974	0.143	2.05	95.8	2.53	-	70	-0.018	4.86	0.01
296	43.120	0.146	2.05	95.8	2.8	-	70	-0.017	4.67	0.00
297	43.263	0.143	2.05	95.8	2.87	-	70	-0.017	3.06	0.03
298	43.409	0.146	2.04	95.7	2.97	-	70	-0.019	3.68	0.01
299	43.551	0.142	2.05	95.7	2.98	-	70	-0.017	2.78	0.03
300	43.697	0.146	2.05	95.8	2.58	99	70	-0.016	3.04	0.04
301	43.840	0.143	2.05	95.8	3.09	-	70	-0.018	4.24	0.01
302	43.986	0.146	2.05	95.8	2.69	-	70	-0.018	4.07	0.01
303	44.130	0.144	2.05	95.8	2.84	-	70	-0.018	4.27	0.01
304	44.274	0.144	2.05	95.8	2.6	-	70	-0.016	3.90	0.01
305	44.418	0.144	2.05	95.8	3.1	-	70	-0.017	4.00	0.01
306	44.561	0.143	2.05	95.8	2.56	-	70	-0.019	4.41	0.00
307	44.707	0.146	2.05	95.8	2.9	-	70	-0.016	3.79	0.01
308	44.850	0.143	2.05	95.8	2.66	-	70	-0.017	4.30	0.01
309	44.996	0.146	2.04	95.8	2.64	-	70	-0.019	4.12	0.01
310	45.138	0.142	2.05	95.8	2.66	98	70	-0.019	4.39	0.00
311	45.284	0.146	2.04	95.9	3.04	-	70	-0.018	4.36	0.01
312	45.426	0.142	2.05	95.9	2.88	-	70	-0.017	3.40	0.02
313	45.572	0.146	2.05	95.9	2.91	-	70	-0.017	4.10	0.01
314	45.716	0.144	2.05	95.9	2.78	-	70	-0.016	5.00	0.01
315	45.860	0.144	2.05	95.9	3.09	-	70	-0.019	5.24	0.01
316	46.004	0.144	2.05	95.9	3.08	-	70	-0.017	3.61	0.01
317	46.147	0.143	2.04	95.9	2.71	-	70	-0.019	4.47	0.01
318	46.293	0.146	2.05	95.9	3.1	-	70	-0.018	3.74	0.02
319	46.436	0.143	2.05	95.9	3.1	-	70	-0.020	4.04	0.01

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	46.582	0.146	2.05	95.9	2.71	98	70	-0.017	3.66	0.01
321	46.724	0.142	2.05	95.9	2.98	-	70	-0.016	2.86	0.03
322	46.870	0.146	2.05	95.9	3.12	-	70	-0.019	3.82	0.01
323	47.012	0.142	2.05	95.9	2.56	-	70	-0.017	3.76	0.01
324	47.158	0.146	2.05	95.9	3.05	-	70	-0.018	4.46	0.01
325	47.302	0.144	2.05	95.9	2.63	-	70	-0.018	2.71	0.04
326	47.447	0.145	2.05	95.9	2.89	-	70	-0.015	3.03	0.05
327	47.590	0.143	2.04	95.9	2.6	-	70	-0.017	3.71	0.01
328	47.733	0.143	2.04	95.9	2.63	-	70	-0.018	4.40	0.01
329	47.879	0.146	2.05	95.9	2.78	-	70	-0.018	3.14	0.02
330	48.022	0.143	2.05	95.9	2.72	98	70	-0.017	3.87	0.01
331	48.168	0.146	2.04	95.9	2.9	-	70	-0.017	4.76	0.00
332	48.310	0.142	2.05	95.9	2.68	-	70	-0.019	4.15	0.01
333	48.456	0.146	2.04	95.9	3.06	-	70	-0.018	2.93	0.04
334	48.598	0.142	2.04	95.9	2.77	-	70	-0.018	2.36	0.05
335	48.744	0.146	2.05	95.9	2.76	-	70	-0.018	2.58	0.05
336	48.887	0.143	2.05	95.9	2.94	-	70	-0.018	3.19	0.02
337	49.032	0.145	2.04	95.9	2.89	-	70	-0.016	4.01	0.01
338	49.175	0.143	2.04	95.9	2.99	-	70	-0.018	5.07	0.01
339	49.318	0.143	2.04	95.9	2.73	-	70	-0.017	5.57	0.02
340	49.464	0.146	2.04	95.9	2.72	98	70	-0.018	4.24	0.01
341	49.607	0.143	2.04	95.9	3.1	-	70	-0.017	3.34	0.03
342	49.753	0.146	2.04	95.9	2.61	-	70	-0.018	3.35	0.02
343	49.894	0.141	2.04	95.9	2.57	-	70	-0.019	3.83	0.01
344	50.039	0.145	2.04	95.8	2.61	-	70	-0.016	4.80	0.01
345	50.182	0.143	2.04	95.8	2.65	-	70	-0.020	5.16	0.01
346	50.328	0.146	2.04	95.8	2.59	-	70	-0.017	5.06	0.01
347	50.471	0.143	2.04	95.8	2.88	-	70	-0.020	3.74	0.01
348	50.614	0.143	2.04	95.8	2.78	-	70	-0.016	2.61	0.02
349	50.758	0.144	2.04	95.8	2.64	-	70	-0.017	3.69	0.01
350	50.901	0.143	2.04	95.8	3.09	98	70	-0.019	4.03	0.01
351	51.047	0.146	2.05	95.8	2.62	-	69	-0.017	2.63	0.03

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	51.189	0.142	2.04	95.8	2.81	-	69	-0.018	3.34	0.02
353	51.335	0.146	2.04	95.8	2.66	-	69	-0.017	4.21	0.01
354	51.476	0.141	2.03	95.8	2.65	-	69	-0.020	5.59	0.01
355	51.623	0.147	2.04	95.7	3.08	-	69	-0.016	5.09	0.01
356	51.765	0.142	2.04	95.8	2.66	-	69	-0.020	4.23	0.01
357	51.910	0.145	2.04	95.8	2.7	-	69	-0.017	3.88	0.00
358	52.054	0.144	2.04	95.8	3.08	-	69	-0.019	3.78	0.01
359	52.196	0.142	2.03	95.8	2.75	-	69	-0.018	3.68	0.01
360	52.341	0.145	2.04	95.8	2.89	98	69	-0.019	3.87	0.01
Avg/Tot	52.341	0.145	2.11	91	2.68	100			5.41	0.11

LAB SAMPLE DATA - ASTM E2515

Client: USSC
Model: SP24iE
Run #: 1

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/26/2025

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	**A**	G01229	244.1	249.2	5.1
	B	G01230	243.7	248.4	4.7
	C - 1st Hour	G01231	243.7	247.5	3.8
	Amb	G01232	242.7	242.8	0.1
Probes	**A**	5A	116757.8	116758.3	0.5
	B	5B	116875.9	116876.3	0.4
	C - 1st Hour	5C	115856.0	115856.2	0.2
O-rings	**A**	5A	3532.5	3532.4	0.0*
	B	5B	3528.0	3527.8	0.0*
	C - 1st Hour	5C	3370.7	3369.7	0.0*

**Negative value corrected to zero*

Placed in Dessicator on:	2/26/2025

Balance Audit (mg):		200.0		200.0					
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	**A**	249.0	3/10 9:45	249.2	3/11 11:30				
	B	248.2	3/10 9:45	248.4	3/11 11:30				
	C - 1st Hour	247.3	3/10 9:45	247.5	3/11 11:30				
	Amb	242.7	3/10 9:45	242.8	3/11 11:30				
Probes	**A**	116758.1	3/10 9:45	116758.3	3/11 11:30				
	B	116876.3	3/10 9:45	116876.3	3/11 11:30				
	C - 1st Hour	115856.0	3/10 9:45	115856.2	3/11 11:30				
O-Rings	**A**	3532.2	3/10 9:45	3532.4	3/11 11:30				
	B	3527.7	3/10 9:45	3527.8	3/11 11:30				
	C - 1st Hour	3369.7	3/10 9:45	3369.7	3/11 11:30				

Train A Aggregate, mg:	**5.6**
Train B Aggregate, mg:	**5.1**
Train C Aggregate, mg:	**4.0**
Ambient Aggregate, mg:	**0.1**

ASTM E2779 Wood Heater Run Sheets

Client: **USSC** Job Number: **F24-392** Tracking #: **219**
Model: **SP24iE** Run Number: **1** Test Date: **2/26/2025**

Pellet Heater Control Settings

High Burn Rate Settings: Heat Setting 4, Damper fully open

Medium Burn Rate Settings: Heat Setting 2, Damper fully closed

Low Burn Rate Settings: Heat Setting 1, Trim setting 1/4, Damper fully closed

Preburn Notes

Preburn Start Time: 12:25

Time	Notes
	-None-

Test Notes

Test Burn Start Time: 13:38

Time	Notes
14:38 16:38	Changed Settings to Medium Changed Settings to Low

Test Burn End Time: 19:38

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.32 CO (%): 4.350

Mid Gas CO_2 (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Mid	Span
Time	11:17	11:18	11:20	2/27 9:12	2/27 9:13	2/27 9:14
CO_2	0.00	17.33	10.22	0.06	17.24	9.99
CO	0.000	4.350	2.531	0.009	4.309	2.468

Flue Gas Probe Leak Check: Initial: 0 Final: 0

Technician Signature: Date: 2/27/25

PELLET TEST DATA PACKET
ASTM E2779/E2515

Run 2 Data Summary

Client:	USSC
Model:	SP24iE
Job #:	25-392
Tracking #:	219
Test Date:	2/28/2025

Technician Signature — Date: 3/21/2025

TEST RESULTS - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

Burn Rate Summary	
High Burn Rate (dry kg/hr)	1.46
Medium Burn Rate (dry kg/hr)	0.65
Low Burn Rate (dry kg/hr)	0.44
Overall Burn Rate (dry kg/hr)	0.68

Medium Burn Rate Target: < 0.95 dry kg/hr

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter - Train C
Total Sample Volume (ft^3)	82.706	56.140	55.218	9.544
Average Gas Velocity in Dilution Tunnel (ft/sec)	20.4			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	13843.3			
Average Gas Meter Temperature (°F)	64.9	87.8	79.7	83.4
Total Sample Volume (dscf)	84.400	55.605	54.749	9.547
Average Tunnel Temperature (°F)	80.3			
Total Time of Test (min)	360			
Total Particulate Catch (mg)	0.0	2.7	2.6	1.0
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000486	0.0000475	0.0001047
Total PM Emissions (g)	0.00	4.03	3.94	1.45
Particulate Emission Rate (g/hr)	0.00	0.67	0.66	1.45
Emissions Factor (g/kg)	-	0.99	0.97	1.00
Difference from Average Total Particulate Emissions (g)	-	0.04	0.04	-
Difference from Average Total Particulate Emissions (%)	-	1.1%	1.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.01	0.01	-

Final Average Results	
Total Particulate Emissions (g)	3.99
Particulate Emission Rate (g/hr)	0.66
Emissions Factor (g/kg)	0.98
HHV Efficiency (%)	76.9%
LHV Efficiency (%)	82.4%
CO Emissions (g/min)	0.03

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	72.6	OK
Face Velocity	< 30 ft/min	8.9	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	61.3 / 66.8	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
Medium Burn Rate	< midpoint of the high and low burn rates	0.65	OK

Overall Pellet Test Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/28/25
Run: 2
Control #: 25-392
Test Duration: 360
Output Category: Integrated

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	76.9%	82.4%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	77.3%	82.9%

Output Rate (kJ/h)	10,426	9,891	**(Btu/h)**
Burn Rate (kg/h)	0.68	1.49	**(lb/h)**
Input (kJ/h)	13,554	12,857	**(Btu/h)**

Test Load Weight (dry kg)	4.06	8.94	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	3.99		
CO (g)	12		
Test Duration (h)	6.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.06	0.20
g/kg Dry Fuel	0.98	3.06
g/h	0.66	2.07
g/min	0.01	0.03
lb/MM Btu Output	0.15	0.46

Air/Fuel Ratio (A/F)	48.78

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

Max Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/28/25
Run: 2
Control #: 25-392
Test Duration: 60
Output Category: Maximum

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	81.5%	87.3%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	81.9%	87.8%

Output Rate (kJ/h)	23,811	22,587	**(Btu/h)**
Burn Rate (kg/h)	1.46	3.21	**(lb/h)**
Input (kJ/h)	29,216	27,715	**(Btu/h)**

Test Load Weight (dry kg)	1.46	3.21	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	N/A		
CO (g)	6		
Test Duration (h)	1.00		

Emissions	**Particulate**	**CO**
g/MJ Output	N/A	0.24
g/kg Dry Fuel	N/A	3.94
g/h	N/A	5.74
g/min	N/A	0.10
lb/MM Btu Output	N/A	0.56

Air/Fuel Ratio (A/F)	22.00

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

Medium Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/28/25
Run: 2
Control #: 25-392
Test Duration: 120
Output Category: Medium

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	76.2%	81.6%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	76.6%	82.0%

Output Rate (kJ/h)	9,873	9,365	**(Btu/h)**
Burn Rate (kg/h)	0.65	1.42	**(lb/h)**
Input (kJ/h)	12,960	12,294	**(Btu/h)**

Test Load Weight (dry kg)	1.29	2.85	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	N/A		
CO (g)	5		
Test Duration (h)	2.00		

Emissions	**Particulate**	**CO**
g/MJ Output	N/A	0.25
g/kg Dry Fuel	N/A	3.85
g/h	N/A	2.49
g/min	N/A	0.04
lb/MM Btu Output	N/A	0.59

Air/Fuel Ratio (A/F)	49.73

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

Minimum Burn Rate Segment Efficiency Results

Manufacturer: USSC
Model: SP24iE
Date: 02/28/25
Run: 2
Control #: 25-392
Test Duration: 180
Output Category: Minimum

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	72.4%	77.6%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	72.7%	77.9%

Output Rate (kJ/h)	6,317	5,993	**(Btu/h)**
Burn Rate (kg/h)	0.44	0.96	**(lb/h)**
Input (kJ/h)	8,729	8,281	**(Btu/h)**

Test Load Weight (dry kg)	1.31	2.88	**dry lb**
MC wet (%)	2.10		
MC dry (%)	2.15		
Particulate (g)	N/A		
CO (g)	2		
Test Duration (h)	3.00		

Emissions	**Particulate**	**CO**
g/MJ Output	N/A	0.09
g/kg Dry Fuel	N/A	1.34
g/h	N/A	0.58
g/min	N/A	0.01
lb/MM Btu Output	N/A	0.21

Air/Fuel Ratio (A/F)	79.85

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

DILUTION TUNNEL & MISC. DATA - ASTM E2779 / E2515

Client:	USSC	Job #:	25-392
Model:	SP24iE	Tracking #:	219
Run #:	2	Technician:	AK
Test Start Time:	12:28	Date:	2/28/2025

High Burn End Time (min):	60
Medium Burn End Time (min):	180
Total Sampling Time (min):	360
Recording Interval (min):	1

Meter Box γ Factor:	1.019	(A)
Meter Box γ Factor:	1.005	(B)
Meter Box γ Factor:	1.024	(C)
Meter Box γ Factor:	1.012	(Ambient)
Induced Draft Check (in. H_2O):	0	
Smoke Capture Check (%):	100%	
Date Flue Pipe Last Cleaned:	2/24/2025	
Platform Scale Audit (lbs)	10.0	

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.07	29.94	30.01
Relative Humidity (%)	31.8	35.6	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		82.706	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 @	-7	in. Hg
(C)	0.001	0.001	cfm @	-7	in. Hg
(Ambient)	0.000	0.000	cfm @	-12	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.072	79
2	0.106	79
3	0.106	79
4	0.092	79
5	0.084	79
6	0.108	79
7	0.106	79
8	0.090	79
Center	0.093	79

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	20.600	ft/sec
V_{scent}:	20.373	ft/sec
F_p:	1.011	[ratio]
Initial Tunnel Flow:	233.8	scf/min

Static Pressure: -0.160 in. H_2O

TEST FUEL PROPERTIES

Default Fuel Values

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

Actual Fuel Used Properties

Pellet Brand:	Lignetics
Pellet Fuel Grade:	PFI Premium
HHV (BTU/lb)	8627
%C	49.48
%H	6.22
%O	44.13
%Ash	0.17
MC (%WB)	2.1

PELLET STOVE PREBURN DATA - ASTM E2779

Client: USSC
Job #: 25-392
Model: SP24iE
Tracking #: 219
Run #: 2
Technician: AK
Date: 2/28/2025

Recording Interval (min): 1
Run Time (min): 64

		Average:	-0.002	209	60
Elapsed Time (min)	Scale Reading (lbs)	Weight Change (lbs)	Flue Draft (in H_2O)	Flue (°F)	Ambient (°F)
0	44.6	-	-0.002	133	58
1	44.5	-0.05	-0.001	145	58
2	44.4	-0.09	-0.002	156	58
3	44.4	-0.06	-0.004	167	58
4	44.3	-0.12	-0.002	174	58
5	44.2	-0.09	-0.001	178	58
6	44.1	-0.06	-0.004	182	59
7	44.1	-0.04	-0.003	185	59
8	44.0	-0.08	-0.002	189	59
9	43.9	-0.08	-0.002	193	59
10	43.8	-0.08	-0.002	195	59
11	43.8	-0.04	-0.002	197	59
12	43.7	-0.08	-0.002	200	59
13	43.6	-0.06	-0.001	201	59
14	43.6	-0.06	-0.001	202	59
15	43.5	-0.09	-0.003	204	59
16	43.5	0	-0.003	205	59
17	43.4	-0.06	-0.003	206	59
18	43.4	-0.07	-0.003	206	60
19	43.3	-0.05	-0.001	208	60
20	43.2	-0.08	-0.001	210	60
21	43.2	-0.03	-0.002	211	60
22	43.1	-0.12	-0.001	212	60
23	43.0	-0.07	-0.002	211	60
24	43.0	-0.03	-0.001	210	60
25	42.9	-0.06	-0.001	210	60
26	42.9	-0.05	-0.002	210	60
27	42.8	-0.06	-0.003	208	60
28	42.8	-0.06	-0.002	209	60
29	42.7	-0.05	-0.001	210	60
30	42.6	-0.08	-0.001	213	60
31	42.6	-0.07	-0.003	216	60
32	42.5	-0.03	-0.001	216	60
33	42.5	-0.06	-0.001	218	60
34	42.4	-0.05	-0.003	219	60
35	42.4	-0.05	-0.002	218	60
36	42.3	-0.06	-0.002	219	60
37	42.3	-0.05	-0.002	220	60
38	42.2	-0.06	0.000	219	60
39	42.1	-0.05	-0.002	220	60
40	42.1	-0.06	-0.001	221	60
41	42.0	-0.08	0.000	222	60
42	42.0	-0.05	0.000	223	60
43	41.9	-0.04	-0.002	223	60
44	41.9	-0.06	-0.003	222	60
45	41.8	-0.05	-0.001	223	60
46	41.7	-0.06	-0.002	222	61

PELLET STOVE PREBURN DATA - ASTM E2779

Client: USSC
Job #: 25-392
Model: SP24iE
Tracking #: 219
Run #: 2
Technician: AK
Date: 2/28/2025

47	41.7	-0.05	-0.003	222	61
48	41.6	-0.07	-0.001	222	61
49	41.6	-0.03	-0.002	222	61
50	41.5	-0.06	-0.002	221	61
51	41.5	-0.07	-0.002	222	61
52	41.4	-0.05	-0.001	223	61
53	41.3	-0.07	-0.002	223	61
54	41.3	-0.06	-0.002	223	61
55	41.2	-0.04	-0.001	222	61
56	41.2	-0.06	-0.001	224	61
57	41.1	-0.05	-0.003	223	61
58	41.1	-0.05	-0.002	221	61
59	41.0	-0.04	-0.002	222	61
60	41.0	-0.08	-0.002	223	61
61	41.0	-0.01	-0.008	223	61
62	40.9	-0.05	-0.003	223	61
63	40.8	-0.08	-0.002	223	62
64	40.8	-0.05	-0.001	224	61

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.093	0.00	65	0.05		9.1		82	223	65	61.3
1	0.132	0.132	0.093	2.18	64.9	0.93	-	9.1	-0.1	82	223	65	61.3
2	0.274	0.142	0.093	2.22	64.9	0.9	-	9.0	-0.1	82	223	65	61.5
3	0.422	0.148	0.093	2.27	65	0.95	-	9.0	0.0	82	223	66	61.3
4	0.566	0.144	0.093	2.29	65.1	0.91	-	8.9	0.0	82	222	66	61.6
5	0.713	0.147	0.093	2.30	65.1	0.95	-	8.8	-0.1	82	222	66	61.4
6	0.862	0.149	0.092	2.33	65.2	0.91	-	8.8	0.0	82	222	66	61.7
7	1.010	0.148	0.093	2.34	65.4	0.98	-	8.7	-0.1	83	224	66	61.4
8	1.160	0.150	0.093	2.37	65.4	0.93	-	8.7	-0.1	83	224	66	61.5
9	1.309	0.149	0.093	2.38	65.6	0.97	-	8.6	-0.1	83	224	66	61.5
10	1.460	0.151	0.093	2.40	65.8	0.91	97	8.6	0.0	83	224	67	61.6
11	1.610	0.150	0.092	2.42	66	0.97	-	8.5	-0.1	83	224	67	61.6
12	1.761	0.151	0.093	2.43	66.2	0.97	-	8.5	0.0	82	222	67	61.6
13	1.913	0.152	0.093	2.44	66.4	0.92	-	8.4	-0.1	83	223	67	61.6
14	2.066	0.153	0.093	2.46	66.6	0.98	-	8.3	-0.1	83	224	67	61.4
15	2.220	0.154	0.093	2.47	66.9	0.92	-	8.3	0.0	83	225	67	61.5
16	2.371	0.151	0.092	2.48	67.2	0.98	-	8.2	-0.1	83	227	67	61.8
17	2.528	0.157	0.093	2.51	67.5	0.97	-	8.2	0.0	83	227	67	61.7
18	2.678	0.150	0.092	2.52	67.7	0.99	-	8.1	-0.1	83	226	67	61.6
19	2.836	0.158	0.093	2.55	68	0.95	-	8.0	-0.1	83	226	68	61.6
20	2.988	0.152	0.092	2.55	68.3	0.98	101	8.0	0.0	83	226	68	61.8
21	3.147	0.159	0.092	2.57	68.6	0.95	-	7.9	-0.1	83	226	68	61.8
22	3.301	0.154	0.092	2.58	69	0.98	-	7.9	-0.1	83	226	68	61.8
23	3.458	0.157	0.093	2.60	69.2	0.95	-	7.8	-0.1	83	227	68	61.8
24	3.616	0.158	0.092	2.60	69.6	0.96	-	7.8	0.0	84	227	68	61.6
25	3.773	0.157	0.092	2.61	69.9	0.95	-	7.7	-0.1	84	227	68	61.7
26	3.931	0.158	0.092	2.63	70.3	0.99	-	7.7	0.0	84	227	68	61.6
27	4.086	0.155	0.092	2.62	70.6	0.99	-	7.6	-0.1	84	226	68	61.8
28	4.248	0.162	0.092	2.64	71	0.95	-	7.5	-0.1	84	227	68	62
29	4.403	0.155	0.092	2.63	71.3	0.97	-	7.5	-0.1	84	225	68	62
30	4.563	0.160	0.092	2.66	71.6	0.98	104	7.4	0.0	84	226	68	62.1
31	4.724	0.161	0.092	2.66	71.9	0.99	-	7.4	-0.1	84	226	68	62
32	4.880	0.156	0.092	2.67	72.3	0.98	-	7.3	-0.1	85	227	69	62.1

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	5.043	0.163	0.092	2.66	72.6	0.97	-	7.3	0.0	84	227	69	62.1
34	5.200	0.157	0.092	2.68	72.9	0.99	-	7.2	0.0	84	226	69	62.2
35	5.360	0.160	0.093	2.67	73.3	0.98	-	7.2	-0.1	84	225	69	62.2
36	5.522	0.162	0.092	2.69	73.7	0.98	-	7.1	0.0	84	225	69	62.2
37	5.679	0.157	0.092	2.69	73.9	1	-	7.1	-0.1	85	226	69	62.3
38	5.843	0.164	0.092	2.70	74.3	0.96	-	7.0	-0.1	85	227	69	62.5
39	6.000	0.157	0.092	2.70	74.6	0.99	-	7.0	0.0	85	227	69	62.1
40	6.162	0.162	0.092	2.71	74.9	1.01	105	6.9	-0.1	85	228	69	62.4
41	6.326	0.164	0.092	2.71	75.2	0.98	-	6.8	0.0	84	226	69	62.5
42	6.482	0.156	0.092	2.70	75.6	0.98	-	6.8	-0.1	85	226	69	62.6
43	6.648	0.166	0.091	2.73	75.8	1	-	6.7	0.0	85	227	69	62.5
44	6.807	0.159	0.092	2.73	76.2	0.99	-	6.7	-0.1	85	226	69	62.6
45	6.969	0.162	0.091	2.72	76.5	0.98	-	6.6	-0.1	85	226	69	62.7
46	7.132	0.163	0.092	2.74	76.7	1.01	-	6.6	-0.1	85	226	69	62.6
47	7.292	0.160	0.091	2.74	77	0.98	-	6.5	0.0	85	225	69	62.8
48	7.455	0.163	0.092	2.75	77.3	0.97	-	6.5	-0.1	85	226	70	62.9
49	7.619	0.164	0.091	2.75	77.6	1	-	6.4	-0.1	85	226	70	63.2
50	7.778	0.159	0.091	2.75	77.9	0.99	106	6.4	-0.1	85	226	70	63.3
51	7.944	0.166	0.091	2.75	78.2	1.01	-	6.3	0.0	85	225	70	63.2
52	8.104	0.160	0.091	2.75	78.4	0.98	-	6.3	-0.1	85	225	70	63.1
53	8.267	0.163	0.091	2.46	78.6	0.94	-	6.2	0.0	85	225	70	63.2
54	8.423	0.156	0.091	2.47	78.9	0.93	-	6.2	-0.1	85	226	70	63.2
55	8.574	0.151	0.091	2.47	79.2	0.94	-	6.1	-0.1	86	226	70	63.1
56	8.731	0.157	0.091	2.48	79.4	0.91	-	6.1	0.0	86	226	70	63.2
57	8.882	0.151	0.091	2.46	79.6	0.94	-	6.0	-0.1	86	225	70	63.5
58	9.041	0.159	0.091	2.47	79.9	0.94	-	6.0	0.0	85	225	70	63.5
59	9.193	0.152	0.091	2.47	80	0.92	-	5.9	0.0	86	223	70	63.3
60	9.349	0.156	0.092	2.48	80.3	0.93	102	5.9	-0.1	86	224	70	63.4
61	9.502	0.153	0.091	2.49	80.5	0.96	-	5.8	0.0	85	217	70	63.6
62	9.658	0.156	0.091	2.47	80.8	0.95	-	5.8	0.0	84	211	70	63.7
63	9.815	0.157	0.092	2.49	81	0.94	-	5.8	0.0	84	206	70	63.6
64	9.969	0.154	0.091	2.49	81.3	0.95	-	5.8	0.0	84	202	70	63.3
65	10.126	0.157	0.091	2.48	81.5	0.94	-	5.8	0.0	84	199	70	63.2

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	10.278	0.152	0.092	2.49	81.7	0.96	-	5.7	0.0	83	195	70	63.4
67	10.438	0.160	0.091	2.48	81.9	0.94	-	5.7	0.0	83	192	70	63.6
68	10.591	0.153	0.092	2.49	82	0.95	-	5.7	0.0	83	192	70	63.4
69	10.748	0.157	0.091	2.50	82.3	0.95	-	5.6	0.0	83	191	70	63.4
70	10.902	0.154	0.091	2.49	82.5	0.94	101	5.6	0.0	83	189	70	63.4
71	11.058	0.156	0.091	2.50	82.7	0.94	-	5.6	0.0	83	187	70	63.6
72	11.216	0.158	0.091	2.50	82.9	0.93	-	5.6	0.0	83	186	70	63.5
73	11.370	0.154	0.091	2.50	83	0.95	-	5.5	0.0	83	185	70	63.5
74	11.528	0.158	0.092	2.51	83.2	0.94	-	5.5	0.0	83	184	70	63.5
75	11.680	0.152	0.090	2.50	83.3	0.94	-	5.5	0.0	82	182	70	63.4
76	11.841	0.161	0.091	2.50	83.5	0.95	-	5.5	0.0	82	179	70	63.3
77	11.995	0.154	0.091	2.50	83.7	0.96	-	5.4	0.0	82	177	70	63.3
78	12.152	0.157	0.091	2.51	83.9	0.96	-	5.4	0.0	82	177	70	63.4
79	12.308	0.156	0.091	2.50	84.1	0.98	-	5.4	0.0	82	175	70	63.4
80	12.464	0.156	0.091	2.51	84.2	0.95	101	5.4	0.0	82	175	70	63.4
81	12.622	0.158	0.092	2.50	84.4	0.99	-	5.3	-0.1	82	176	70	63.5
82	12.775	0.153	0.090	2.50	84.6	0.96	-	5.3	0.0	82	176	70	63.3
83	12.936	0.161	0.091	2.49	84.7	0.99	-	5.3	0.0	81	175	70	63.4
84	13.089	0.153	0.092	2.51	84.8	0.95	-	5.3	0.0	81	173	70	63.5
85	13.247	0.158	0.091	2.50	85	0.99	-	5.2	0.0	81	172	70	63.6
86	13.403	0.156	0.091	2.50	85.2	0.98	-	5.2	0.0	81	171	70	63.5
87	13.560	0.157	0.091	2.50	85.3	0.97	-	5.2	0.0	81	171	70	63.9
88	13.719	0.159	0.091	2.50	85.4	0.98	-	5.2	0.0	81	171	70	63.9
89	13.871	0.152	0.091	2.51	85.6	0.96	-	5.1	0.0	81	172	70	63.7
90	14.032	0.161	0.091	2.50	85.6	0.99	101	5.1	0.0	81	172	70	63.6
91	14.186	0.154	0.091	2.51	85.8	1.02	-	5.1	0.0	81	173	70	63.7
92	14.345	0.159	0.091	2.51	85.9	0.96	-	5.1	0.0	81	172	70	63.6
93	14.500	0.155	0.090	2.52	86	0.97	-	5.0	0.0	81	171	70	63.8
94	14.658	0.158	0.091	2.50	86.1	0.96	-	5.0	0.0	81	171	70	63.8
95	14.816	0.158	0.091	2.50	86.2	0.99	-	5.0	0.0	81	171	70	63.8
96	14.969	0.153	0.091	2.49	86.3	0.98	-	5.0	0.0	81	170	70	63.7
97	15.129	0.160	0.091	2.49	86.5	0.99	-	4.9	0.0	81	170	70	63.7
98	15.284	0.155	0.092	2.51	86.7	0.98	-	4.9	0.0	81	170	70	63.6

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	15.444	0.160	0.091	2.51	86.8	0.97	-	4.9	0.0	80	168	70	63.9
100	15.598	0.154	0.092	2.52	86.9	0.99	100	4.9	0.0	80	168	70	63.9
101	15.755	0.157	0.091	2.50	86.9	1.01	-	4.9	0.0	80	167	70	63.8
102	15.914	0.159	0.091	2.50	87	0.99	-	4.8	0.0	80	167	70	63.7
103	16.068	0.154	0.091	2.51	87.2	1	-	4.8	0.0	80	167	70	64
104	16.228	0.160	0.091	2.50	87.2	0.98	-	4.8	0.0	81	170	70	64
105	16.382	0.154	0.091	2.50	87.3	0.97	-	4.8	0.0	80	170	70	64.1
106	16.542	0.160	0.091	2.51	87.4	1.01	-	4.7	0.0	80	169	70	64
107	16.696	0.154	0.091	2.51	87.5	0.99	-	4.7	-0.1	80	170	70	64.1
108	16.854	0.158	0.091	2.50	87.6	1.03	-	4.7	0.0	81	172	70	63.9
109	17.013	0.159	0.092	2.50	87.7	0.98	-	4.6	0.0	80	172	70	63.8
110	17.167	0.154	0.091	2.49	87.8	0.98	100	4.6	0.0	80	171	70	63.9
111	17.326	0.159	0.091	2.50	87.9	0.99	-	4.6	0.0	80	172	70	64
112	17.480	0.154	0.091	2.49	88	1.02	-	4.6	0.0	80	171	70	64.1
113	17.640	0.160	0.090	2.50	88	1	-	4.5	0.0	80	170	70	64
114	17.793	0.153	0.091	2.49	88.1	1.04	-	4.5	0.0	80	169	70	64.1
115	17.951	0.158	0.091	2.49	88.2	1.01	-	4.5	0.0	80	169	70	64
116	18.111	0.160	0.091	2.51	88.4	0.99	-	4.5	0.0	80	168	70	64
117	18.265	0.154	0.091	2.50	88.4	1.02	-	4.5	0.0	80	167	70	64.1
118	18.424	0.159	0.091	2.50	88.5	0.99	-	4.4	0.0	80	166	70	64.3
119	18.579	0.155	0.091	2.50	88.6	1.03	-	4.4	0.0	80	167	70	64.3
120	18.739	0.160	0.091	2.50	88.6	1.05	101	4.4	0.0	80	168	70	64.4
121	18.892	0.153	0.091	2.50	88.7	1.02	-	4.4	0.0	80	166	70	64.2
122	19.051	0.159	0.092	2.50	88.7	1.02	-	4.4	0.0	80	164	70	64.5
123	19.210	0.159	0.091	2.50	88.8	1.03	-	4.3	0.0	80	166	70	64.8
124	19.365	0.155	0.090	2.49	88.8	1.02	-	4.3	0.0	80	168	70	64.4
125	19.524	0.159	0.091	2.50	88.9	1.02	-	4.3	0.0	80	170	70	64.7
126	19.678	0.154	0.091	2.49	89	1.02	-	4.2	0.0	80	169	70	64.4
127	19.838	0.160	0.092	2.50	89.1	1.03	-	4.2	0.0	80	168	70	64.6
128	19.992	0.154	0.091	2.50	89.1	1.02	-	4.2	0.0	80	168	70	64.5
129	20.150	0.158	0.091	2.48	89.2	1.02	-	4.2	0.0	80	168	70	64.7
130	20.309	0.159	0.091	2.49	89.3	1.06	100	4.2	0.0	80	168	70	64.6
131	20.464	0.155	0.091	2.50	89.4	1.01	-	4.1	0.0	80	167	70	64.5

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	20.623	0.159	0.091	2.50	89.4	1.04	-	4.1	0.0	80	166	70	64.5
133	20.777	0.154	0.091	2.49	89.5	1.04	-	4.1	0.0	80	167	70	64.4
134	20.937	0.160	0.090	2.49	89.5	1.02	-	4.1	0.0	80	167	70	64.4
135	21.090	0.153	0.091	2.47	89.6	1.04	-	4.0	0.0	80	168	70	64.8
136	21.249	0.159	0.091	2.49	89.7	1.07	-	4.0	0.0	80	169	70	64.7
137	21.408	0.159	0.091	2.50	89.7	1.03	-	4.0	0.0	80	169	70	64.9
138	21.563	0.155	0.091	2.49	89.7	1.05	-	3.9	0.0	80	168	70	65.1
139	21.721	0.158	0.091	2.50	89.8	1.05	-	3.9	0.0	80	168	70	64.9
140	21.875	0.154	0.092	2.49	89.9	1.02	100	3.9	0.0	80	169	70	65
141	22.036	0.161	0.091	2.48	90	1.03	-	3.9	0.0	80	168	70	65
142	22.189	0.153	0.091	2.48	90	1.03	-	3.8	0.0	80	168	70	65
143	22.347	0.158	0.091	2.48	90.1	1.06	-	3.8	0.0	80	168	70	64.9
144	22.506	0.159	0.090	2.48	90.2	1.04	-	3.8	0.0	80	168	71	64.8
145	22.661	0.155	0.092	2.48	90.2	1.04	-	3.8	0.0	80	169	71	64.7
146	22.819	0.158	0.091	2.49	90.2	1.07	-	3.8	0.0	80	169	71	64.8
147	22.973	0.154	0.091	2.47	90.3	1.05	-	3.7	0.0	80	168	71	64.8
148	23.134	0.161	0.091	2.48	90.4	1.05	-	3.7	0.0	80	171	71	65
149	23.287	0.153	0.090	2.47	90.4	1.07	-	3.7	0.0	80	171	71	65.1
150	23.445	0.158	0.091	2.48	90.5	1.07	100	3.7	0.0	80	172	71	65
151	23.603	0.158	0.091	2.47	90.5	1.07	-	3.6	0.0	80	170	70	64.7
152	23.758	0.155	0.092	2.48	90.5	1.05	-	3.6	0.0	80	169	71	64.8
153	23.916	0.158	0.091	2.47	90.6	1.07	-	3.6	0.0	80	171	71	64.8
154	24.070	0.154	0.091	2.46	90.7	1.05	-	3.6	0.0	81	170	71	64.8
155	24.231	0.161	0.090	2.47	90.7	1.06	-	3.5	0.0	80	169	71	64.8
156	24.385	0.154	0.091	2.48	90.7	1.08	-	3.5	0.0	81	169	71	65
157	24.543	0.158	0.092	2.48	90.7	1.07	-	3.5	0.0	80	169	71	65.2
158	24.698	0.155	0.092	2.47	90.8	1.06	-	3.4	0.0	81	170	71	65.1
159	24.855	0.157	0.091	2.46	90.7	1.07	-	3.4	0.0	81	170	71	65
160	25.014	0.159	0.091	2.47	90.8	1.07	100	3.4	0.0	80	171	71	65.1
161	25.167	0.153	0.091	2.47	90.8	1.08	-	3.4	0.0	81	171	71	65.1
162	25.327	0.160	0.090	2.46	90.9	1.08	-	3.4	0.0	80	171	71	65.1
163	25.480	0.153	0.090	2.46	90.9	1.08	-	3.3	0.0	80	169	71	65.1
164	25.638	0.158	0.090	2.47	90.9	1.09	-	3.3	0.0	80	167	71	65.3

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	25.793	0.155	0.091	2.47	91	1.08	-	3.3	0.0	80	168	71	65.3
166	25.951	0.158	0.091	2.46	91	1.08	-	3.3	0.0	80	169	71	65.3
167	26.112	0.161	0.090	2.47	91.1	1.07	-	3.2	0.0	80	169	71	65.5
168	26.262	0.150	0.090	2.47	91.1	1.08	-	3.2	0.0	80	169	71	65.4
169	26.421	0.159	0.091	2.46	91.1	1.09	-	3.2	0.0	80	168	71	65.7
170	26.576	0.155	0.091	2.46	91.2	1.09	99	3.1	0.0	80	168	71	65.5
171	26.735	0.159	0.090	2.46	91.3	1.08	-	3.1	0.0	80	168	71	65.6
172	26.887	0.152	0.090	2.46	91.3	1.08	-	3.1	0.0	80	167	71	65.6
173	27.045	0.158	0.090	2.46	91.4	1.09	-	3.1	0.0	80	168	71	65.5
174	27.203	0.158	0.091	2.45	91.4	1.11	-	3.1	0.0	80	168	71	65.6
175	27.358	0.155	0.091	2.46	91.4	1.1	-	3.1	0.0	80	168	71	65.5
176	27.515	0.157	0.090	2.46	91.5	1.1	-	3.0	0.0	80	167	71	65.5
177	27.668	0.153	0.092	2.44	91.5	1.11	-	3.0	0.0	80	167	71	65.7
178	27.829	0.161	0.090	2.45	91.6	1.1	-	3.0	0.0	80	166	71	65.9
179	27.983	0.154	0.090	2.46	91.6	1.1	-	3.0	0.0	80	166	71	65.7
180	28.139	0.156	0.091	2.46	91.6	1.1	99	2.9	0.0	80	166	71	65.8
181	28.295	0.156	0.091	2.45	91.7	1.11	-	2.9	0.0	80	166	71	65.7
182	28.452	0.157	0.091	2.46	91.6	1.08	-	2.9	0.0	80	164	71	65.6
183	28.610	0.158	0.091	2.46	91.7	1.11	-	2.9	0.0	79	163	71	65.9
184	28.763	0.153	0.091	2.46	91.7	1.11	-	2.9	0.0	79	162	71	66.1
185	28.922	0.159	0.092	2.46	91.7	1.1	-	2.9	0.0	79	160	71	66.1
186	29.076	0.154	0.091	2.46	91.7	1.09	-	2.8	0.0	79	158	71	66.1
187	29.235	0.159	0.091	2.45	91.7	1.1	-	2.8	0.0	79	158	71	65.8
188	29.388	0.153	0.091	2.46	91.9	1.09	-	2.8	0.0	79	159	71	66
189	29.545	0.157	0.091	2.45	91.9	1.09	-	2.8	0.0	79	160	71	65.8
190	29.703	0.158	0.090	2.45	91.8	1.1	100	2.8	0.0	79	158	71	65.9
191	29.857	0.154	0.091	2.45	91.9	1.1	-	2.7	0.0	79	158	71	66
192	30.015	0.158	0.091	2.46	91.9	1.11	-	2.7	0.0	79	156	71	65.9
193	30.168	0.153	0.090	2.45	91.9	1.1	-	2.7	0.0	79	157	71	66.2
194	30.328	0.160	0.090	2.45	91.9	1.13	-	2.7	0.0	78	158	71	66.2
195	30.482	0.154	0.090	2.44	92	1.09	-	2.7	0.0	78	157	71	66.2
196	30.639	0.157	0.090	2.45	92	1.1	-	2.7	0.0	78	155	71	65.9
197	30.795	0.156	0.090	2.44	92	1.11	-	2.6	0.0	78	154	71	66.1

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	30.951	0.156	0.092	2.45	92.1	1.13	-	2.6	0.0	78	155	71	66.2
199	31.109	0.158	0.091	2.45	92.1	1.12	-	2.6	0.0	78	154	71	66
200	31.262	0.153	0.091	2.45	92.1	1.12	99	2.6	0.0	78	152	71	65.8
201	31.422	0.160	0.091	2.44	92.2	1.11	-	2.6	0.0	78	151	71	66
202	31.575	0.153	0.091	2.45	92.2	1.11	-	2.6	0.0	78	150	71	66
203	31.733	0.158	0.091	2.45	92.2	1.11	-	2.5	0.0	78	150	71	66.1
204	31.888	0.155	0.091	2.46	92.2	1.13	-	2.5	0.0	78	150	71	65.8
205	32.045	0.157	0.089	2.45	92.2	1.12	-	2.5	0.0	78	150	71	65.8
206	32.202	0.157	0.091	2.44	92.3	1.12	-	2.5	0.0	78	151	71	65.9
207	32.356	0.154	0.091	2.45	92.3	1.13	-	2.5	0.0	78	153	71	66.1
208	32.514	0.158	0.091	2.44	92.4	1.13	-	2.5	0.0	78	154	71	66.1
209	32.667	0.153	0.091	2.44	92.4	1.13	-	2.4	0.0	78	153	71	66
210	32.827	0.160	0.091	2.43	92.4	1.16	99	2.4	0.0	78	151	71	65.9
211	32.980	0.153	0.091	2.44	92.5	1.13	-	2.4	0.0	78	149	71	65.9
212	33.138	0.158	0.091	2.44	92.4	1.13	-	2.4	0.0	78	148	71	65.9
213	33.293	0.155	0.091	2.44	92.5	1.13	-	2.4	0.0	78	148	71	65.8
214	33.449	0.156	0.091	2.44	92.6	1.12	-	2.4	0.0	78	150	71	65.8
215	33.607	0.158	0.091	2.44	92.5	1.12	-	2.4	0.0	78	151	71	65.6
216	33.760	0.153	0.090	2.45	92.6	1.12	-	2.3	0.0	79	151	71	65.6
217	33.919	0.159	0.091	2.43	92.6	1.14	-	2.3	0.0	79	151	71	65.6
218	34.073	0.154	0.091	2.44	92.6	1.13	-	2.3	0.0	79	150	71	65.8
219	34.231	0.158	0.090	2.45	92.6	1.13	-	2.3	0.0	79	151	71	65.6
220	34.384	0.153	0.090	2.44	92.6	1.11	99	2.3	0.0	79	151	71	65.6
221	34.541	0.157	0.090	2.43	92.6	1.14	-	2.2	0.0	78	150	71	65.7
222	34.699	0.158	0.091	2.44	92.6	1.12	-	2.2	0.0	78	149	71	65.7
223	34.853	0.154	0.091	2.44	92.7	1.13	-	2.2	0.0	78	149	71	65.8
224	35.010	0.157	0.090	2.44	92.7	1.13	-	2.2	0.0	78	149	71	66
225	35.163	0.153	0.090	2.43	92.7	1.15	-	2.2	0.0	78	147	71	65.7
226	35.323	0.160	0.090	2.44	92.7	1.14	-	2.2	0.0	78	147	71	65.9
227	35.477	0.154	0.091	2.43	92.7	1.11	-	2.2	0.0	78	148	71	66
228	35.633	0.156	0.091	2.43	92.7	1.13	-	2.1	0.0	78	148	71	65.9
229	35.788	0.155	0.090	2.43	92.8	1.13	-	2.1	0.0	78	149	71	65.9
230	35.945	0.157	0.091	2.43	92.7	1.14	99	2.1	0.0	78	147	71	66.2

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	36.103	0.158	0.090	2.43	92.7	1.12	-	2.1	0.0	78	146	71	66
232	36.255	0.152	0.091	2.43	92.7	1.14	-	2.1	0.0	78	146	71	66.2
233	36.414	0.159	0.091	2.42	92.8	1.13	-	2.1	0.0	78	146	71	66
234	36.567	0.153	0.090	2.43	92.8	1.15	-	2.1	0.0	78	146	71	66
235	36.726	0.159	0.090	2.43	92.8	1.13	-	2.0	0.0	79	146	71	65.8
236	36.879	0.153	0.090	2.43	92.8	1.14	-	2.0	0.0	79	146	71	65.9
237	37.036	0.157	0.090	2.44	92.8	1.16	-	2.0	0.0	79	147	71	66
238	37.192	0.156	0.090	2.41	92.9	1.16	-	2.0	0.0	79	147	71	66
239	37.347	0.155	0.090	2.43	92.8	1.15	-	2.0	0.0	79	147	71	65.9
240	37.505	0.158	0.090	2.43	92.8	1.14	99	1.9	0.0	79	147	71	65.9
241	37.657	0.152	0.091	2.44	92.9	1.13	-	1.9	0.0	79	146	71	66
242	37.816	0.159	0.090	2.42	92.8	1.13	-	1.9	0.0	79	144	71	66
243	37.969	0.153	0.090	2.43	92.8	1.13	-	1.9	0.0	79	143	71	66
244	38.128	0.159	0.090	2.43	92.9	1.13	-	1.9	0.0	78	142	71	66
245	38.280	0.152	0.090	2.42	92.8	1.14	-	1.9	0.0	79	143	71	66
246	38.437	0.157	0.090	2.43	92.8	1.14	-	1.9	0.0	79	145	71	66
247	38.594	0.157	0.090	2.42	92.8	1.14	-	1.8	0.0	79	146	71	66
248	38.748	0.154	0.091	2.41	92.8	1.17	-	1.8	0.0	79	145	71	66
249	38.905	0.157	0.091	2.42	92.9	1.14	-	1.8	0.0	79	146	71	66
250	39.058	0.153	0.090	2.43	92.9	1.14	99	1.8	0.0	79	146	71	66
251	39.217	0.159	0.091	2.42	92.8	1.16	-	1.8	0.0	79	146	71	66
252	39.370	0.153	0.090	2.41	92.9	1.15	-	1.8	0.0	79	145	71	66.1
253	39.528	0.158	0.091	2.43	92.8	1.14	-	1.7	0.0	79	145	71	66
254	39.682	0.154	0.091	2.43	92.9	1.12	-	1.7	0.0	79	145	71	66.1
255	39.838	0.156	0.090	2.42	92.9	1.15	-	1.7	0.0	79	145	71	66
256	39.995	0.157	0.091	2.42	92.9	1.17	-	1.7	0.0	79	145	71	66
257	40.149	0.154	0.090	2.43	92.9	1.16	-	1.7	0.0	79	145	71	66
258	40.306	0.157	0.091	2.43	92.9	1.15	-	1.7	0.0	79	144	71	66.1
259	40.458	0.152	0.090	2.42	93	1.15	-	1.7	0.0	79	142	71	66.1
260	40.618	0.160	0.091	2.41	92.9	1.17	99	1.6	0.0	79	142	71	66
261	40.771	0.153	0.090	2.42	92.9	1.15	-	1.6	0.0	79	143	71	66.1
262	40.928	0.157	0.090	2.43	93	1.15	-	1.6	0.0	79	144	71	66.1
263	41.082	0.154	0.090	2.42	93	1.15	-	1.6	0.0	79	145	71	66.1

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	41.239	0.157	0.090	2.41	93	1.16	-	1.6	0.0	79	145	71	66
265	41.395	0.156	0.091	2.41	93.1	1.17	-	1.6	0.0	79	146	71	66.1
266	41.549	0.154	0.090	2.42	93.1	1.16	-	1.6	0.0	79	146	71	66.1
267	41.706	0.157	0.090	2.42	93.1	1.16	-	1.5	0.0	79	147	71	66.1
268	41.858	0.152	0.090	2.41	93.1	1.15	-	1.5	0.0	79	146	71	66.2
269	42.018	0.160	0.091	2.41	93	1.15	-	1.5	0.0	79	146	71	66
270	42.171	0.153	0.090	2.41	93.1	1.17	99	1.5	0.0	79	146	71	66
271	42.327	0.156	0.090	2.42	93.2	1.16	-	1.5	0.0	79	145	71	66
272	42.481	0.154	0.089	2.43	93.2	1.19	-	1.4	0.0	79	146	71	66
273	42.638	0.157	0.090	2.41	93.1	1.18	-	1.4	0.0	79	146	71	66.1
274	42.795	0.157	0.090	2.41	93.2	1.18	-	1.4	0.0	79	145	71	66.1
275	42.948	0.153	0.089	2.42	93.2	1.15	-	1.4	0.0	79	145	71	66.1
276	43.106	0.158	0.090	2.43	93.2	1.15	-	1.4	0.0	79	146	71	66.1
277	43.258	0.152	0.090	2.41	93.2	1.17	-	1.4	0.0	79	148	71	66.3
278	43.417	0.159	0.089	2.41	93.3	1.18	-	1.4	0.0	80	149	72	66.3
279	43.570	0.153	0.089	2.42	93.3	1.17	-	1.3	0.0	80	149	72	66.4
280	43.727	0.157	0.089	2.42	93.3	1.18	99	1.3	0.0	80	149	72	66.4
281	43.881	0.154	0.089	2.41	93.4	1.17	-	1.3	0.0	80	150	72	66.5
282	44.037	0.156	0.090	2.41	93.4	1.18	-	1.3	0.0	80	150	72	66.4
283	44.194	0.157	0.090	2.42	93.4	1.19	-	1.3	0.0	79	148	72	66.5
284	44.347	0.153	0.090	2.42	93.4	1.19	-	1.2	0.0	79	148	72	66.3
285	44.505	0.158	0.090	2.41	93.4	1.16	-	1.2	0.0	80	150	72	66
286	44.657	0.152	0.091	2.40	93.5	1.18	-	1.2	0.0	80	149	72	66.1
287	44.816	0.159	0.091	2.41	93.5	1.18	-	1.2	0.0	80	149	72	66.2
288	44.969	0.153	0.091	2.42	93.5	1.18	-	1.2	0.0	79	149	72	66.2
289	45.125	0.156	0.091	2.42	93.5	1.18	-	1.2	0.0	79	148	72	66.1
290	45.279	0.154	0.090	2.42	93.5	1.18	99	1.1	0.0	79	149	72	66
291	45.436	0.157	0.091	2.41	93.5	1.16	-	1.1	0.0	79	147	72	66
292	45.593	0.157	0.091	2.41	93.6	1.2	-	1.1	0.0	79	147	72	66.2
293	45.746	0.153	0.090	2.40	93.6	1.17	-	1.1	0.0	79	148	72	66.1
294	45.902	0.156	0.091	2.42	93.6	1.17	-	1.1	0.0	79	148	72	66
295	46.055	0.153	0.091	2.40	93.7	1.17	-	1.1	0.0	79	146	72	66
296	46.214	0.159	0.091	2.39	93.7	1.17	-	1.0	0.0	79	147	72	66

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	46.367	0.153	0.091	2.39	93.7	1.16	-	1.0	0.0	79	148	72	66
298	46.524	0.157	0.090	2.41	93.7	1.19	-	1.0	0.0	79	149	72	66
299	46.677	0.153	0.090	2.42	93.7	1.17	-	1.0	0.0	79	148	72	66
300	46.833	0.156	0.090	2.41	93.8	1.19	99	1.0	0.0	79	147	72	66.2
301	46.990	0.157	0.089	2.40	93.7	1.16	-	1.0	0.0	79	147	72	66.1
302	47.144	0.154	0.090	2.41	93.7	1.19	-	0.9	0.0	79	147	72	66.3
303	47.300	0.156	0.090	2.41	93.8	1.19	-	0.9	0.0	79	147	72	66.3
304	47.453	0.153	0.089	2.41	93.7	1.18	-	0.9	0.0	79	146	72	66.4
305	47.612	0.159	0.089	2.41	93.7	1.2	-	0.9	0.0	79	145	72	66.3
306	47.765	0.153	0.090	2.40	93.7	1.19	-	0.9	0.0	79	145	72	66.5
307	47.922	0.157	0.090	2.41	93.8	1.16	-	0.9	0.0	79	147	72	66.3
308	48.075	0.153	0.090	2.41	93.8	1.19	-	0.9	0.0	79	148	72	66.5
309	48.231	0.156	0.090	2.40	93.8	1.19	-	0.8	0.0	79	147	72	66.5
310	48.388	0.157	0.090	2.41	93.8	1.17	99	0.8	0.0	79	145	72	66.5
311	48.542	0.154	0.090	2.41	93.8	1.18	-	0.8	0.0	79	145	72	66.6
312	48.698	0.156	0.090	2.41	93.8	1.17	-	0.8	0.0	79	146	72	66.6
313	48.851	0.153	0.090	2.41	93.8	1.19	-	0.8	0.0	79	146	72	66.6
314	49.010	0.159	0.090	2.40	93.9	1.19	-	0.8	0.0	79	145	72	66.6
315	49.162	0.152	0.090	2.40	93.9	1.2	-	0.8	0.0	79	143	72	66.7
316	49.320	0.158	0.090	2.39	93.9	1.21	-	0.7	0.0	79	142	72	66.7
317	49.472	0.152	0.090	2.40	94	1.18	-	0.7	0.0	79	142	72	66.8
318	49.628	0.156	0.090	2.39	94	1.19	-	0.7	0.0	79	143	72	66.7
319	49.785	0.157	0.090	2.40	93.9	1.18	-	0.7	0.0	79	145	72	66.7
320	49.939	0.154	0.090	2.41	94	1.18	99	0.7	0.0	79	145	72	66.7
321	50.096	0.157	0.089	2.41	94	1.18	-	0.7	0.0	79	145	72	66.7
322	50.248	0.152	0.089	2.41	94	1.18	-	0.7	0.0	79	146	72	66.7
323	50.406	0.158	0.090	2.40	94.1	1.18	-	0.6	0.0	79	146	72	66.7
324	50.560	0.154	0.089	2.41	94.1	1.2	-	0.6	0.0	79	148	72	66.7
325	50.718	0.158	0.089	2.40	94.1	1.19	-	0.6	0.0	79	146	72	66.6
326	50.869	0.151	0.089	2.40	94.1	1.2	-	0.6	0.0	78	144	72	66.6
327	51.026	0.157	0.090	2.41	94.2	1.19	-	0.6	0.0	78	142	72	66.6
328	51.182	0.156	0.090	2.40	94.2	1.19	-	0.6	0.0	79	145	72	66.5
329	51.337	0.155	0.090	2.40	94.2	1.21	-	0.5	0.0	79	147	72	66.5

BOX A TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	51.494	0.157	0.089	2.40	94.2	1.21	99	0.5	0.0	79	148	72	66.6
331	51.645	0.151	0.089	2.39	94.2	1.22	-	0.5	0.0	79	146	72	66.6
332	51.803	0.158	0.090	2.40	94.2	1.2	-	0.5	0.0	78	144	72	66.5
333	51.956	0.153	0.090	2.39	94.3	1.2	-	0.5	0.0	79	144	72	66.5
334	52.115	0.159	0.089	2.39	94.3	1.2	-	0.4	0.0	79	147	72	66.6
335	52.267	0.152	0.090	2.40	94.3	1.2	-	0.4	0.0	79	148	72	66.6
336	52.423	0.156	0.090	2.42	94.3	1.18	-	0.4	0.0	79	147	72	66.6
337	52.577	0.154	0.089	2.38	94.3	1.21	-	0.4	0.0	78	146	72	66.5
338	52.733	0.156	0.090	2.40	94.3	1.22	-	0.4	0.0	78	148	72	66.4
339	52.890	0.157	0.089	2.39	94.3	1.18	-	0.4	0.0	78	149	72	66.4
340	53.042	0.152	0.090	2.39	94.3	1.2	99	0.3	0.0	78	149	72	66.4
341	53.200	0.158	0.090	2.41	94.3	1.21	-	0.3	0.0	78	149	72	66.5
342	53.351	0.151	0.089	2.38	94.3	1.2	-	0.3	0.0	78	148	72	66.5
343	53.511	0.160	0.091	2.39	94.4	1.18	-	0.3	0.0	78	146	72	66.5
344	53.663	0.152	0.089	2.39	94.4	1.2	-	0.3	0.0	78	147	72	66.4
345	53.819	0.156	0.090	2.40	94.4	1.19	-	0.3	0.0	78	147	72	66.4
346	53.973	0.154	0.090	2.40	94.3	1.22	-	0.3	0.0	78	147	72	66.4
347	54.128	0.155	0.090	2.40	94.4	1.23	-	0.2	0.0	78	146	72	66.4
348	54.285	0.157	0.090	2.39	94.4	1.22	-	0.2	0.0	78	145	72	66.4
349	54.439	0.154	0.088	2.39	94.4	1.19	-	0.2	0.0	78	144	72	66.3
350	54.594	0.155	0.089	2.39	94.4	1.19	99	0.2	0.0	78	144	72	66.2
351	54.747	0.153	0.089	2.39	94.4	1.21	-	0.2	0.0	78	144	72	66.2
352	54.905	0.158	0.090	2.38	94.5	1.19	-	0.1	0.0	78	147	72	66.3
353	55.057	0.152	0.090	2.39	94.4	1.23	-	0.1	0.0	78	149	72	66.2
354	55.215	0.158	0.089	2.39	94.5	1.2	-	0.1	0.0	78	148	72	66.2
355	55.366	0.151	0.091	2.38	94.4	1.2	-	0.1	0.0	78	148	72	66.4
356	55.523	0.157	0.090	2.39	94.4	1.21	-	0.1	0.0	78	149	72	66.5
357	55.677	0.154	0.091	2.38	94.5	1.2	-	0.1	0.0	78	151	72	66.4
358	55.833	0.156	0.091	2.39	94.5	1.21	-	0.0	0.0	78	151	72	66.3
359	55.989	0.156	0.090	2.38	94.5	1.22	-	0.0	0.0	78	150	72	66.2
360	56.140	0.151	0.091	2.38	94.5	1.21	98	0.0	0.0	78	150	72	66
Avg/Tot	56.140	0.156	0.091	2.46	88	1.08	100			80	169	70	65

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.01	63.4	0.62		65	-0.002	6.22	0.07
1	0.126	0.126	2.50	63.4	1.79	-	66	-0.002	4.41	0.02
2	0.280	0.154	2.49	63.5	1.95	-	67	-0.001	5.93	0.03
3	0.430	0.150	2.48	63.5	1.49	-	67	-0.001	6.34	0.05
4	0.585	0.155	2.48	63.6	1.96	-	67	-0.001	4.83	0.02
5	0.734	0.149	2.48	63.7	1.79	-	67	-0.001	4.75	0.02
6	0.890	0.156	2.49	63.8	2.06	-	67	-0.002	5.62	0.02
7	1.040	0.150	2.48	63.9	1.5	-	68	0.000	5.58	0.02
8	1.195	0.155	2.48	64.1	2.05	-	68	-0.003	6.36	0.04
9	1.344	0.149	2.49	64.2	1.57	-	68	-0.001	5.93	0.03
10	1.498	0.154	2.49	64.4	1.83	100	68	-0.001	5.59	0.03
11	1.649	0.151	2.48	64.6	1.54	-	68	-0.004	6.39	0.02
12	1.803	0.154	2.50	64.8	1.84	-	68	-0.002	3.12	0.02
13	1.957	0.154	2.50	65	2.02	-	68	-0.002	5.82	0.02
14	2.109	0.152	2.50	65.1	1.64	-	68	-0.001	6.28	0.02
15	2.263	0.154	2.50	65.4	2.06	-	68	-0.002	6.26	0.02
16	2.414	0.151	2.50	65.6	1.55	-	68	-0.002	7.49	0.04
17	2.569	0.155	2.49	65.9	1.98	-	69	0.000	5.56	0.02
18	2.720	0.151	2.50	66	2.08	-	69	-0.001	5.83	0.02
19	2.876	0.156	2.50	66.3	1.69	-	69	-0.002	5.78	0.03
20	3.028	0.152	2.51	66.5	1.77	102	69	-0.001	5.46	0.02
21	3.182	0.154	2.50	66.8	2.08	-	69	-0.001	6.21	0.02
22	3.334	0.152	2.51	67.1	2.06	-	69	-0.002	5.72	0.01
23	3.488	0.154	2.51	67.3	1.96	-	69	-0.001	5.90	0.03
24	3.643	0.155	2.51	67.5	1.5	-	69	-0.002	6.41	0.02
25	3.796	0.153	2.51	67.8	2.05	-	69	-0.001	5.81	0.01
26	3.950	0.154	2.51	68.1	1.94	-	69	-0.001	5.58	0.02
27	4.102	0.152	2.51	68.3	1.55	-	69	-0.003	5.11	0.01
28	4.258	0.156	2.51	68.5	2.08	-	69	-0.003	5.72	0.01
29	4.410	0.152	2.51	68.8	1.88	-	69	-0.001	5.12	0.01
30	4.566	0.156	2.51	69	1.75	102	69	-0.002	5.62	0.02
31	4.717	0.151	2.51	69.2	1.62	-	69	-0.002	5.66	0.02

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.872	0.155	2.51	69.5	1.97	-	69	-0.003	6.83	0.04
33	5.027	0.155	2.51	69.7	2.03	-	70	-0.002	5.80	0.02
34	5.181	0.154	2.51	70	1.69	-	70	-0.002	4.60	0.02
35	5.336	0.155	2.53	70.2	1.91	-	70	-0.001	4.78	0.01
36	5.488	0.152	2.52	70.4	2.08	-	70	-0.002	5.88	0.01
37	5.645	0.157	2.52	70.6	2.05	-	70	-0.002	5.41	0.04
38	5.797	0.152	2.52	70.8	1.96	-	70	-0.002	7.03	0.03
39	5.955	0.158	2.52	71.1	1.67	-	70	-0.002	5.34	0.02
40	6.106	0.151	2.52	71.4	1.52	102	70	-0.002	6.31	0.03
41	6.262	0.156	2.51	71.6	2.08	-	70	-0.002	3.70	0.01
42	6.418	0.156	2.52	71.8	1.65	-	70	-0.001	6.22	0.02
43	6.572	0.154	2.52	72	1.89	-	70	-0.002	5.47	0.01
44	6.727	0.155	2.52	72.2	1.72	-	70	-0.003	5.56	0.01
45	6.879	0.152	2.52	72.4	1.58	-	70	-0.002	5.32	0.01
46	7.038	0.159	2.52	72.6	2.07	-	70	-0.002	5.42	0.01
47	7.191	0.153	2.53	72.8	1.92	-	70	-0.001	4.92	0.01
48	7.347	0.156	2.54	72.9	1.67	-	70	-0.001	6.00	0.02
49	7.500	0.153	2.52	73.2	1.58	-	70	-0.002	5.72	0.01
50	7.657	0.157	2.53	73.3	2.05	103	70	-0.002	5.13	0.01
51	7.814	0.157	2.53	73.5	2.03	-	71	-0.003	4.97	0.01
52	7.966	0.152	2.53	73.7	2.09	-	71	-0.001	5.35	0.01
53	8.124	0.158	2.53	73.9	1.54	-	71	0.000	5.00	0.01
54	8.277	0.153	2.53	74.1	2.06	-	71	-0.001	5.41	0.01
55	8.435	0.158	2.54	74.3	1.7	-	71	-0.002	4.96	0.01
56	8.588	0.153	2.53	74.5	1.68	-	71	-0.001	5.27	0.01
57	8.745	0.157	2.53	74.7	1.58	-	71	-0.002	5.35	0.01
58	8.901	0.156	2.53	74.8	2.07	-	71	-0.003	4.54	0.01
59	9.054	0.153	2.53	74.9	1.96	-	71	-0.001	4.13	0.01
60	9.212	0.158	2.53	75.1	1.76	103	71	-0.003	5.72	0.01
61	9.366	0.154	2.53	75.2	2.07	-	71	-0.003	3.27	0.01
62	9.524	0.158	2.54	75.5	1.53	-	71	-0.002	2.64	0.02
63	9.678	0.154	2.54	75.6	1.58	-	71	-0.001	2.30	0.01

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.835	0.157	2.54	75.8	1.56	-	71	-0.003	2.89	0.01
65	9.992	0.157	2.54	75.9	1.9	-	71	-0.002	2.48	0.01
66	10.145	0.153	2.54	76	2.04	-	71	-0.001	1.51	0.02
67	10.303	0.158	2.53	76.2	1.58	-	71	-0.003	2.14	0.02
68	10.457	0.154	2.53	76.3	1.53	-	71	-0.001	3.07	0.02
69	10.615	0.158	2.54	76.5	1.96	-	71	-0.002	3.10	0.02
70	10.769	0.154	2.53	76.6	1.51	102	71	-0.003	2.33	0.01
71	10.926	0.157	2.53	76.7	1.6	-	71	-0.002	2.52	0.01
72	11.084	0.158	2.54	76.9	1.81	-	71	-0.001	2.37	0.01
73	11.237	0.153	2.54	77	2.06	-	71	-0.003	2.68	0.01
74	11.395	0.158	2.53	77.1	1.82	-	71	-0.001	2.46	0.02
75	11.549	0.154	2.53	77.2	1.56	-	71	-0.003	2.17	0.01
76	11.707	0.158	2.53	77.3	1.73	-	71	-0.001	1.54	0.01
77	11.860	0.153	2.52	77.5	1.96	-	71	-0.001	2.21	0.01
78	12.018	0.158	2.53	77.6	1.92	-	71	-0.002	2.46	0.02
79	12.175	0.157	2.53	77.7	1.85	-	71	-0.002	2.17	0.01
80	12.329	0.154	2.53	77.7	1.53	102	71	-0.003	2.02	0.01
81	12.487	0.158	2.53	77.9	1.69	-	71	-0.002	2.82	0.03
82	12.641	0.154	2.52	78	2.1	-	71	-0.002	2.64	0.01
83	12.798	0.157	2.53	78.1	1.91	-	71	-0.002	2.79	0.01
84	12.952	0.154	2.52	78.1	1.58	-	71	-0.001	1.84	0.01
85	13.109	0.157	2.52	78.2	2.03	-	71	-0.003	2.55	0.01
86	13.267	0.158	2.52	78.3	1.62	-	71	-0.002	2.12	0.01
87	13.420	0.153	2.53	78.4	1.72	-	71	-0.003	2.07	0.01
88	13.578	0.158	2.52	78.4	1.57	-	71	-0.003	2.67	0.01
89	13.732	0.154	2.52	78.5	2.02	-	71	-0.001	3.22	0.01
90	13.889	0.157	2.52	78.6	1.99	102	71	-0.003	2.26	0.00
91	14.043	0.154	2.51	78.6	1.54	-	71	-0.004	2.90	0.01
92	14.200	0.157	2.51	78.7	2.04	-	71	-0.002	2.40	0.01
93	14.357	0.157	2.52	78.8	1.62	-	71	-0.003	2.03	0.01
94	14.511	0.154	2.51	78.8	1.92	-	71	-0.002	2.73	0.02
95	14.669	0.158	2.51	78.9	1.54	-	71	-0.003	2.40	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	14.822	0.153	2.51	78.9	1.54	-	71	-0.005	2.25	0.01
97	14.979	0.157	2.51	79	1.54	-	71	-0.003	2.34	0.01
98	15.133	0.154	2.51	79.1	2.08	-	71	-0.003	2.64	0.01
99	15.291	0.158	2.51	79.2	1.54	-	71	-0.002	1.64	0.01
100	15.448	0.157	2.51	79.2	1.79	101	71	-0.004	2.30	0.01
101	15.601	0.153	2.51	79.2	1.55	-	71	-0.002	2.13	0.01
102	15.759	0.158	2.51	79.2	1.65	-	71	-0.004	2.48	0.01
103	15.912	0.153	2.50	79.4	2.12	-	71	-0.004	2.19	0.01
104	16.069	0.157	2.51	79.4	1.58	-	71	-0.003	3.71	0.02
105	16.223	0.154	2.50	79.4	2.12	-	71	-0.004	2.39	0.00
106	16.380	0.157	2.50	79.5	2.12	-	71	-0.003	1.81	0.01
107	16.537	0.157	2.50	79.5	2.1	-	71	-0.003	3.00	0.01
108	16.690	0.153	2.51	79.6	1.66	-	71	-0.002	3.57	0.02
109	16.847	0.157	2.50	79.6	2.14	-	71	-0.003	2.42	0.00
110	17.001	0.154	2.49	79.7	1.61	101	71	-0.002	2.16	0.00
111	17.158	0.157	2.50	79.8	1.95	-	71	-0.002	3.13	0.01
112	17.311	0.153	2.49	79.8	2.13	-	71	-0.001	2.24	0.01
113	17.468	0.157	2.49	79.8	2.14	-	71	-0.004	2.24	0.00
114	17.624	0.156	2.48	79.8	1.58	-	71	-0.003	2.14	0.00
115	17.777	0.153	2.50	79.8	1.99	-	71	-0.002	2.22	0.01
116	17.934	0.157	2.49	79.9	2.01	-	71	-0.003	2.32	0.01
117	18.088	0.154	2.48	80	2	-	71	-0.003	2.12	0.00
118	18.246	0.158	2.49	80	1.88	-	71	-0.003	1.98	0.00
119	18.398	0.152	2.49	80	1.67	-	71	-0.003	2.35	0.01
120	18.554	0.156	2.48	80.1	1.96	101	71	-0.003	2.63	0.01
121	18.710	0.156	2.49	80.2	2.02	-	71	-0.003	1.55	0.00
122	18.865	0.155	2.49	80.2	1.68	-	71	-0.003	1.38	0.01
123	19.021	0.156	2.49	80.2	1.75	-	71	-0.003	3.20	0.02
124	19.174	0.153	2.47	80.2	2.01	-	71	-0.002	3.51	0.02
125	19.332	0.158	2.48	80.3	1.64	-	71	-0.003	3.29	0.02
126	19.485	0.153	2.48	80.3	1.81	-	71	-0.003	2.10	0.00
127	19.641	0.156	2.49	80.4	1.59	-	71	-0.003	2.19	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	19.795	0.154	2.48	80.4	1.89	-	71	-0.004	2.22	0.01
129	19.951	0.156	2.47	80.5	1.81	-	71	-0.003	2.59	0.01
130	20.107	0.156	2.48	80.5	1.71	101	71	-0.004	2.18	0.00
131	20.260	0.153	2.48	80.6	1.95	-	71	-0.003	2.03	0.00
132	20.417	0.157	2.47	80.5	1.59	-	71	-0.003	1.81	0.01
133	20.570	0.153	2.47	80.6	1.62	-	71	-0.002	2.40	0.00
134	20.727	0.157	2.47	80.6	1.88	-	71	-0.004	2.42	0.00
135	20.879	0.152	2.47	80.7	1.85	-	71	-0.005	2.77	0.01
136	21.035	0.156	2.46	80.7	1.87	-	71	-0.002	2.89	0.01
137	21.191	0.156	2.46	80.7	1.59	-	71	-0.004	2.32	0.00
138	21.345	0.154	2.47	80.7	1.57	-	71	-0.002	2.25	0.01
139	21.501	0.156	2.47	80.8	1.64	-	71	-0.002	2.52	0.01
140	21.653	0.152	2.46	80.8	2.13	100	71	-0.004	2.75	0.00
141	21.811	0.158	2.46	80.9	1.7	-	71	-0.003	2.09	0.00
142	21.963	0.152	2.46	80.8	2.16	-	71	-0.004	1.90	0.01
143	22.118	0.155	2.46	80.9	1.63	-	71	-0.004	2.92	0.01
144	22.271	0.153	2.45	80.9	1.68	-	71	-0.002	2.40	0.00
145	22.427	0.156	2.45	81	2.15	-	71	-0.004	2.56	0.01
146	22.583	0.156	2.45	81	1.74	-	71	-0.003	2.57	0.01
147	22.735	0.152	2.45	81	2.02	-	71	-0.003	2.00	0.00
148	22.891	0.156	2.45	81.1	2.19	-	71	-0.005	3.45	0.01
149	23.044	0.153	2.44	81.1	2.03	-	71	-0.004	2.70	0.01
150	23.200	0.156	2.44	81.1	1.94	100	71	-0.003	2.69	0.01
151	23.352	0.152	2.46	81.2	2.17	-	71	-0.003	1.87	0.00
152	23.508	0.156	2.45	81.2	2.11	-	71	-0.004	2.11	0.00
153	23.661	0.153	2.44	81.2	1.91	-	71	-0.002	2.83	0.01
154	23.816	0.155	2.44	81.3	2.19	-	71	-0.003	2.73	0.00
155	23.972	0.156	2.45	81.3	2.05	-	71	-0.004	1.58	0.00
156	24.123	0.151	2.44	81.3	1.73	-	71	-0.003	2.45	0.01
157	24.279	0.156	2.43	81.3	2.2	-	71	-0.005	2.72	0.01
158	24.432	0.153	2.43	81.4	2.05	-	71	-0.003	2.80	0.01
159	24.588	0.156	2.43	81.3	1.62	-	71	-0.004	2.52	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	24.740	0.152	2.44	81.4	1.98	100	71	-0.003	2.60	0.01
161	24.895	0.155	2.44	81.4	1.84	-	71	-0.003	3.09	0.01
162	25.047	0.152	2.43	81.4	2.19	-	71	-0.004	2.22	0.00
163	25.202	0.155	2.43	81.4	2	-	71	-0.002	1.79	0.00
164	25.357	0.155	2.42	81.5	1.62	-	71	-0.002	1.82	0.01
165	25.509	0.152	2.44	81.5	1.64	-	71	-0.004	2.49	0.00
166	25.665	0.156	2.43	81.5	2	-	71	-0.003	2.71	0.01
167	25.819	0.154	2.42	81.6	1.83	-	71	-0.003	2.56	0.00
168	25.973	0.154	2.42	81.6	1.63	-	71	-0.002	2.19	0.00
169	26.124	0.151	2.42	81.6	1.92	-	71	-0.004	2.60	0.01
170	26.280	0.156	2.43	81.7	2.2	100	71	-0.004	2.13	0.00
171	26.431	0.151	2.43	81.7	1.87	-	71	-0.002	2.56	0.00
172	26.586	0.155	2.42	81.7	2.16	-	71	-0.004	1.87	0.00
173	26.740	0.154	2.41	81.7	2.21	-	71	-0.006	2.57	0.01
174	26.893	0.153	2.41	81.8	1.72	-	72	-0.005	2.52	0.00
175	27.048	0.155	2.43	81.8	2.12	-	71	-0.004	2.40	0.00
176	27.199	0.151	2.42	81.8	2.2	-	71	-0.004	2.39	0.00
177	27.355	0.156	2.41	81.8	1.66	-	71	-0.003	2.40	0.00
178	27.506	0.151	2.41	81.9	1.9	-	72	-0.004	2.03	0.00
179	27.662	0.156	2.41	81.9	1.65	-	71	-0.002	2.18	0.00
180	27.814	0.152	2.42	81.9	1.91	99	71	-0.004	3.02	0.00
181	27.968	0.154	2.42	81.9	2.22	-	71	-0.004	2.13	0.00
182	28.120	0.152	2.41	82	2.14	-	71	-0.004	1.44	0.00
183	28.275	0.155	2.41	82	1.91	-	71	-0.002	1.82	0.00
184	28.429	0.154	2.41	82	1.98	-	72	-0.004	1.98	0.00
185	28.582	0.153	2.41	82.1	2.15	-	72	-0.003	1.24	0.00
186	28.736	0.154	2.42	82.1	1.75	-	72	-0.003	1.06	0.01
187	28.887	0.151	2.41	82	1.79	-	71	-0.004	1.77	0.00
188	29.043	0.156	2.41	82.1	1.81	-	72	-0.003	2.23	0.01
189	29.194	0.151	2.41	82.1	2.19	-	72	-0.002	2.27	0.00
190	29.350	0.156	2.41	82.1	1.72	100	72	-0.003	1.29	0.01
191	29.500	0.150	2.41	82.1	2.21	-	72	-0.004	1.97	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	29.655	0.155	2.41	82.2	2.18	-	72	-0.002	1.09	0.00
193	29.807	0.152	2.40	82.2	2.01	-	72	-0.001	2.12	0.00
194	29.962	0.155	2.40	82.2	1.68	-	71	-0.003	2.25	0.00
195	30.116	0.154	2.40	82.3	2.22	-	71	-0.003	1.78	0.00
196	30.268	0.152	2.41	82.3	1.97	-	71	-0.003	1.33	0.00
197	30.422	0.154	2.40	82.3	1.67	-	71	-0.004	1.13	0.01
198	30.573	0.151	2.39	82.3	1.88	-	71	-0.006	1.97	0.00
199	30.729	0.156	2.40	82.3	1.71	-	71	-0.005	1.42	0.00
200	30.880	0.151	2.40	82.3	2.11	99	71	-0.003	0.99	0.00
201	31.036	0.156	2.40	82.4	2.08	-	71	-0.004	1.39	0.00
202	31.186	0.150	2.40	82.4	2.11	-	71	-0.005	1.09	0.00
203	31.341	0.155	2.40	82.4	2.22	-	71	-0.003	1.61	0.00
204	31.493	0.152	2.40	82.4	2.19	-	71	-0.005	1.67	0.00
205	31.647	0.154	2.40	82.4	2.16	-	71	-0.003	1.35	0.00
206	31.801	0.154	2.39	82.5	2.02	-	71	-0.004	2.14	0.00
207	31.953	0.152	2.40	82.5	2.03	-	71	-0.003	2.29	0.00
208	32.107	0.154	2.40	82.5	2.25	-	71	-0.004	2.16	0.00
209	32.257	0.150	2.39	82.5	1.76	-	71	-0.004	1.63	0.00
210	32.413	0.156	2.39	82.5	2.1	99	71	-0.005	1.28	0.00
211	32.564	0.151	2.39	82.5	1.65	-	71	-0.004	1.04	0.00
212	32.720	0.156	2.39	82.5	1.67	-	71	-0.002	1.16	0.00
213	32.870	0.150	2.40	82.6	2.04	-	71	-0.003	1.36	0.00
214	33.025	0.155	2.40	82.6	2.05	-	72	-0.003	1.79	0.00
215	33.176	0.151	2.39	82.6	2.01	-	71	-0.003	2.04	0.00
216	33.330	0.154	2.38	82.6	1.84	-	72	-0.003	1.80	0.00
217	33.483	0.153	2.39	82.6	1.71	-	72	-0.003	1.61	0.00
218	33.636	0.153	2.39	82.6	2.16	-	72	-0.002	1.45	0.00
219	33.789	0.153	2.40	82.6	1.92	-	72	-0.004	1.92	0.00
220	33.940	0.151	2.39	82.6	1.72	99	72	-0.005	1.41	0.00
221	34.094	0.154	2.38	82.6	2.24	-	72	-0.004	1.24	0.00
222	34.246	0.152	2.38	82.6	2.22	-	71	-0.005	1.36	0.00
223	34.401	0.155	2.38	82.6	1.64	-	71	-0.003	1.37	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	34.551	0.150	2.38	82.7	2.24	-	72	-0.003	1.56	0.00
225	34.706	0.155	2.39	82.6	1.92	-	72	-0.002	1.01	0.00
226	34.856	0.150	2.39	82.6	1.66	-	72	-0.003	1.39	0.00
227	35.010	0.154	2.38	82.7	1.95	-	72	-0.003	1.89	0.00
228	35.162	0.152	2.38	82.7	2.15	-	71	-0.003	1.90	0.00
229	35.316	0.154	2.38	82.7	2.18	-	72	-0.003	1.64	0.00
230	35.469	0.153	2.37	82.7	2.11	99	72	-0.003	1.22	0.01
231	35.620	0.151	2.38	82.7	2.22	-	72	-0.004	0.92	0.01
232	35.774	0.154	2.38	82.6	2.2	-	72	-0.002	1.47	0.00
233	35.924	0.150	2.38	82.7	1.79	-	71	-0.004	1.58	0.00
234	36.079	0.155	2.38	82.8	2.24	-	72	-0.005	1.33	0.00
235	36.230	0.151	2.37	82.7	2.12	-	72	-0.003	1.40	0.00
236	36.385	0.155	2.38	82.7	1.84	-	72	-0.002	1.60	0.00
237	36.536	0.151	2.38	82.7	2.16	-	72	-0.004	1.67	0.00
238	36.689	0.153	2.38	82.7	1.98	-	72	-0.004	1.51	0.00
239	36.840	0.151	2.38	82.8	2	-	72	-0.003	1.79	0.00
240	36.993	0.153	2.37	82.8	2.11	99	72	-0.003	1.40	0.00
241	37.145	0.152	2.37	82.8	2.06	-	72	-0.004	1.31	0.00
242	37.298	0.153	2.36	82.8	1.81	-	72	-0.004	0.67	0.02
243	37.451	0.153	2.36	82.8	1.67	-	72	-0.003	1.30	0.00
244	37.603	0.152	2.38	82.9	2.25	-	72	-0.004	0.87	0.00
245	37.756	0.153	2.38	82.8	1.68	-	72	-0.005	1.62	0.00
246	37.907	0.151	2.37	82.8	1.89	-	72	-0.003	1.69	0.00
247	38.061	0.154	2.36	82.9	2.26	-	72	-0.004	1.97	0.00
248	38.211	0.150	2.36	82.9	1.66	-	72	-0.004	1.13	0.00
249	38.367	0.156	2.37	82.9	2.15	-	72	-0.002	1.53	0.00
250	38.516	0.149	2.36	82.9	2.22	99	72	-0.002	1.61	0.00
251	38.671	0.155	2.37	82.9	2.08	-	72	-0.003	1.39	0.00
252	38.821	0.150	2.37	83	1.74	-	72	-0.006	1.09	0.00
253	38.975	0.154	2.37	83	1.78	-	72	-0.002	1.65	0.00
254	39.126	0.151	2.36	83	2.23	-	72	-0.004	1.43	0.00
255	39.279	0.153	2.36	83	1.88	-	72	-0.004	1.19	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	39.432	0.153	2.36	83	1.99	-	72	-0.003	1.54	0.00
257	39.584	0.152	2.36	83	1.91	-	72	-0.004	1.44	0.00
258	39.737	0.153	2.37	83.1	2.02	-	72	-0.004	1.45	0.00
259	39.887	0.150	2.37	83.1	1.82	-	72	-0.004	0.75	0.01
260	40.042	0.155	2.36	83	1.74	99	72	-0.004	1.27	0.00
261	40.191	0.149	2.36	83.1	1.68	-	72	-0.004	1.58	0.00
262	40.347	0.156	2.36	83.2	1.81	-	72	-0.005	1.58	0.00
263	40.497	0.150	2.36	83.1	1.9	-	72	-0.004	1.69	0.00
264	40.652	0.155	2.36	83.2	1.75	-	72	-0.003	1.60	0.00
265	40.801	0.149	2.37	83.2	1.73	-	72	-0.004	1.55	0.00
266	40.955	0.154	2.37	83.2	2.06	-	72	-0.003	1.39	0.00
267	41.105	0.150	2.36	83.2	2.25	-	72	-0.004	1.85	0.00
268	41.258	0.153	2.35	83.2	1.68	-	72	-0.004	1.47	0.00
269	41.411	0.153	2.35	83.2	2.04	-	72	-0.004	1.36	0.00
270	41.563	0.152	2.36	83.3	1.67	99	72	-0.003	1.52	0.00
271	41.716	0.153	2.36	83.3	1.88	-	72	-0.004	1.31	0.00
272	41.867	0.151	2.37	83.3	1.68	-	72	-0.004	1.52	0.00
273	42.020	0.153	2.36	83.4	1.86	-	72	-0.003	1.51	0.00
274	42.171	0.151	2.36	83.3	1.87	-	72	-0.003	1.14	0.00
275	42.325	0.154	2.35	83.3	1.69	-	72	-0.003	1.24	0.00
276	42.475	0.150	2.35	83.4	1.83	-	72	-0.004	2.01	0.00
277	42.630	0.155	2.36	83.4	2.11	-	72	-0.004	1.83	0.00
278	42.780	0.150	2.35	83.5	1.67	-	72	-0.004	1.95	0.00
279	42.934	0.154	2.36	83.5	1.87	-	72	-0.004	1.70	0.00
280	43.084	0.150	2.35	83.5	1.84	99	72	-0.003	1.84	0.00
281	43.237	0.153	2.35	83.5	1.88	-	72	-0.003	1.85	0.00
282	43.388	0.151	2.35	83.5	1.71	-	72	-0.004	1.45	0.00
283	43.542	0.154	2.35	83.6	1.73	-	72	-0.005	0.92	0.00
284	43.694	0.152	2.35	83.6	1.85	-	72	-0.004	1.37	0.00
285	43.846	0.152	2.35	83.6	2.02	-	72	-0.004	2.12	0.00
286	43.999	0.153	2.36	83.7	1.77	-	72	-0.004	1.36	0.00
287	44.149	0.150	2.35	83.7	1.69	-	72	-0.003	1.66	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	44.303	0.154	2.35	83.7	2.26	-	72	-0.005	1.69	0.00
289	44.452	0.149	2.34	83.7	1.73	-	72	-0.004	1.09	0.00
290	44.607	0.155	2.35	83.7	2.27	99	72	0.000	1.92	0.00
291	44.757	0.150	2.34	83.8	2.06	-	72	-0.004	0.94	0.00
292	44.911	0.154	2.34	83.7	1.98	-	72	-0.003	1.51	0.00
293	45.061	0.150	2.34	83.8	1.77	-	72	-0.005	1.81	0.00
294	45.215	0.154	2.35	83.8	1.76	-	72	-0.004	1.45	0.00
295	45.364	0.149	2.34	83.8	1.78	-	72	-0.005	0.91	0.01
296	45.517	0.153	2.35	83.8	2.27	-	72	-0.005	1.74	0.00
297	45.667	0.150	2.34	83.7	1.78	-	72	-0.005	1.80	0.00
298	45.821	0.154	2.34	83.7	2.22	-	72	-0.003	1.88	0.00
299	45.973	0.152	2.34	83.7	2.13	-	72	-0.004	1.45	0.00
300	46.124	0.151	2.34	83.8	1.96	98	72	-0.003	1.19	0.00
301	46.278	0.154	2.35	83.8	2.25	-	72	-0.004	1.39	0.00
302	46.428	0.150	2.35	83.7	1.83	-	72	-0.003	1.65	0.00
303	46.580	0.152	2.34	83.7	1.92	-	72	-0.004	1.78	0.00
304	46.730	0.150	2.34	83.7	1.88	-	72	-0.005	0.86	0.00
305	46.884	0.154	2.33	83.7	2.13	-	72	-0.004	1.19	0.00
306	47.034	0.150	2.34	83.7	2.26	-	72	-0.004	1.57	0.00
307	47.189	0.155	2.34	83.7	2.25	-	72	-0.004	1.92	0.00
308	47.338	0.149	2.34	83.8	2.26	-	72	-0.003	1.71	0.00
309	47.493	0.155	2.34	83.8	2.04	-	72	-0.002	1.21	0.00
310	47.642	0.149	2.35	83.8	1.75	99	72	-0.004	1.07	0.00
311	47.795	0.153	2.34	83.8	2.11	-	72	-0.003	1.25	0.00
312	47.945	0.150	2.35	83.8	1.71	-	72	-0.004	1.78	0.00
313	48.097	0.152	2.33	83.9	2	-	73	-0.003	1.37	0.00
314	48.249	0.152	2.34	83.8	2.21	-	73	-0.003	1.15	0.00
315	48.402	0.153	2.34	83.9	2.16	-	73	-0.003	0.96	0.00
316	48.554	0.152	2.33	83.9	1.7	-	73	-0.004	1.09	0.00
317	48.705	0.151	2.34	84	2.05	-	73	-0.003	1.28	0.00
318	48.858	0.153	2.34	83.9	1.86	-	73	-0.004	1.39	0.00
319	49.007	0.149	2.34	83.9	1.73	-	73	-0.003	2.24	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	49.161	0.154	2.34	84	1.76	99	73	-0.003	1.62	0.00
321	49.310	0.149	2.33	84	1.73	-	73	-0.003	1.41	0.00
322	49.464	0.154	2.34	84	2.03	-	73	-0.004	1.75	0.00
323	49.613	0.149	2.33	84.1	1.81	-	73	-0.004	1.57	0.00
324	49.768	0.155	2.33	84.1	1.69	-	73	-0.004	2.10	0.00
325	49.917	0.149	2.33	84.1	2.14	-	73	-0.005	1.22	0.00
326	50.071	0.154	2.33	84.1	1.72	-	73	-0.002	0.72	0.00
327	50.220	0.149	2.34	84.1	1.87	-	73	-0.003	0.99	0.01
328	50.373	0.153	2.34	84.1	1.86	-	73	-0.005	2.06	0.00
329	50.523	0.150	2.33	84.1	2.08	-	73	-0.004	2.20	0.00
330	50.676	0.153	2.32	84.1	1.92	99	73	-0.005	1.79	0.00
331	50.828	0.152	2.33	84.1	1.7	-	73	-0.004	0.93	0.00
332	50.980	0.152	2.33	84.2	2.04	-	73	-0.003	0.83	0.00
333	51.131	0.151	2.33	84.2	1.73	-	73	-0.003	1.62	0.00
334	51.283	0.152	2.33	84.2	1.9	-	73	-0.004	2.34	0.00
335	51.435	0.152	2.34	84.2	1.81	-	73	-0.003	1.88	0.00
336	51.584	0.149	2.33	84.3	2.12	-	73	-0.005	1.50	0.00
337	51.738	0.154	2.33	84.2	1.93	-	73	-0.004	1.11	0.01
338	51.887	0.149	2.33	84.2	1.78	-	73	-0.003	2.25	0.00
339	52.041	0.154	2.33	84.3	2.27	-	73	-0.004	1.70	0.00
340	52.190	0.149	2.32	84.3	2.26	98	73	-0.002	1.75	0.00
341	52.344	0.154	2.32	84.2	1.81	-	73	-0.003	1.67	0.00
342	52.493	0.149	2.32	84.3	2.28	-	73	-0.003	1.18	0.00
343	52.647	0.154	2.33	84.3	2.23	-	73	-0.005	1.02	0.00
344	52.796	0.149	2.33	84.3	2.18	-	73	-0.005	1.79	0.00
345	52.949	0.153	2.32	84.3	2.27	-	73	-0.004	1.30	0.00
346	53.099	0.150	2.33	84.3	1.96	-	73	-0.004	1.50	0.00
347	53.251	0.152	2.33	84.3	1.93	-	72	-0.004	1.38	0.00
348	53.401	0.150	2.31	84.3	2.27	-	73	-0.003	1.12	0.00
349	53.554	0.153	2.32	84.3	2.28	-	72	-0.005	1.29	0.00
350	53.705	0.151	2.32	84.3	1.72	98	72	-0.004	1.60	0.00
351	53.856	0.151	2.32	84.3	2.26	-	72	-0.003	1.48	0.00

BOX B TEST DATA - ASTM E2779 / ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	54.008	0.152	2.32	84.3	1.85	-	72	-0.004	2.60	0.00
353	54.159	0.151	2.32	84.3	2.24	-	72	-0.004	1.96	0.00
354	54.311	0.152	2.33	84.4	1.87	-	72	-0.005	1.47	0.00
355	54.460	0.149	2.32	84.4	2.01	-	72	-0.004	1.45	0.00
356	54.613	0.153	2.32	84.3	1.87	-	72	-0.003	1.68	0.00
357	54.762	0.149	2.31	84.3	1.74	-	72	-0.004	2.49	0.00
358	54.915	0.153	2.31	84.3	1.75	-	72	-0.003	1.52	0.00
359	55.064	0.149	2.31	84.3	2.13	-	72	-0.005	1.20	0.00
360	55.218	0.154	2.31	84.3	1.83	98	72	-0.003	1.42	0.00
Avg/Tot	55.218	0.153	2.42	80	1.90	100			2.51	0.01

LAB SAMPLE DATA - ASTM E2515

Client: USSC
Model: SP24iE
Run #: 2

Job #: 25-392
Tracking #: 219
Technician: AK
Date: 2/28/2025

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	**A**	G01233	243.8	246.1	2.3
	B	G01234	244.3	246.4	2.1
	C - 1st Hour	G01235	244.2	245.0	0.8
	Amb	G01236	243.5	243.5	0.0
Probes	**A**	6A	116384.2	116384.6	0.4
	B	6B	115956.0	115956.0	0.0
	C - 1st Hour	6C	115129.3	115129.4	0.1
O-rings	**A**	6A	3388.4	3388.4	0.0
	B	6B	3609.0	3609.5	0.5
	C - 1st Hour	6C	3395.1	3395.2	0.1

Placed in Dessicator on:	2/28/2025

		Balance Audit (mg):	200.0		200.0					
			Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	**A**		246.2	3/10 9:45	246.1	3/11 11:30				
	B		246.4	3/10 9:45	246.4	3/11 11:30				
	C - 1st Hour		245.0	3/10 9:45	245.0	3/11 11:30				
	Amb		243.6	3/10 9:45	243.5	3/11 11:30				
Probes	**A**		116384.5	3/10 9:45	116384.6	3/11 11:30				
	B		115956.1	3/10 9:45	115956.0	3/11 11:30				
	C - 1st Hour		115129.6	3/10 9:45	115129.4	3/11 11:30				
O-Rings	**A**		3388.4	3/10 9:45	3388.4	3/11 11:30				
	B		3609.5	3/10 9:45	3609.5	3/11 11:30				
	C - 1st Hour		3395.2	3/10 9:45	3395.2	3/11 11:30				

Train A Aggregate, mg:	**2.7**
Train B Aggregate, mg:	**2.6**
Train C Aggregate, mg:	**1.0**
Ambient Aggregate, mg:	**0.0**

ASTM E2779 Wood Heater Run Sheets

Client: **USSC** Job Number: **F24-392** Tracking #: **219**
Model: **SP24iE** Run Number: **2** Test Date: **2/28/2025**

Pellet Heater Control Settings

High Burn Rate Settings: Heat Setting 4, Damper fully open

Medium Burn Rate Settings: Heat Setting 2, Damper fully closed

Low Burn Rate Settings: Heat Setting 1, Trim setting 1/4, Damper fully closed

Preburn Notes

Preburn Start Time: 11:23

Time	Notes
	-None-

Test Notes

Test Burn Start Time: 12:28

Time	Notes
13:28 15:28	Changed Settings to Medium Changed Settings to Low

Test Burn End Time: 18:28

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 17.32 CO (%): 4.350

Mid Gas CO_2 (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Mid	Span
Time	12:09	12:10	12:11	18:33	18:34	18:35
CO_2	0.00	17.34	10.21	0.11	17.39	10.31
CO	0.000	4.352	2.525	0.016	4.371	2.579

Flue Gas Probe Leak Check: Initial: 0 Final: 0

Technician Signature: Date: 2/28/25

ASTM E2515 - Glass Fiber Filters

Paired Filter Weights

Date:	1/27/25	1/30/25	-	-			
Time:	0830	0915	-	-			
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
G01221	244.9	244.9	-	-	A	24-367	#4
G01222	244.2	244.2	-	-	A		
G01223	241.4	241.5	-	-	A		
G01224	245.4	245.6	-	-	A		
G01225	244.3	244.2	-	-	A		#5
G01226	242.9	242.9	-	-	A		
G01227	244.2	244.0	-	-	A		
G01228	244.1	244.2	-	-	A		
G01229	243.9	244.1	-	-	A	24-342	#1
G01230	243.7	243.7	-	-	A		
G01231	243.6	243.7	-	-	A		
G01232	242.6	242.7	-	-	A		
G01233	243.7	243.8	-	-	A		#2
G01234	244.1	244.3	-	-	A		
G01235	244.2	244.2	-	-	A		
G01236	243.3	243.5	-	-	A		

Date:							
Time:							
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
G01237							
G01238							
G01239							
G01240							
G01241							
G01242							
G01243							
G01244							
G01245							
G01246							
G01247							
G01248							
G01249							
G01250							
G01251							
G01252							

ASTM E2515 - Probe Samples 1-10

Date:	1/20/25	1/27/25	1/30/25				
Time:	09:30	0820	12:30				
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
1A	115627.4	115627.6	-	-	A	24-367	#2
1B	115902.5	115902.7	-	-	A		
1C	116433.3	116433.5	-	-	A		
2A	116058.0	116058.5	116058.4	-	A	24-367	#3
2B	116173.8	116174.5	116174.3	-	A		
2C	116429.0	116429.2	-	-	A		
3A	115881.1	115881.3	-	-	A	24-367	#4
3B	116121.0	116121.2	-	-	A		
3C	116618.4	116618.6	-	-	A		
4A	116023.7	116024.0	116023.9	-	A	24-367	#5
4B	116182.7	116183.0	116182.9	-	A		
4C	116998.2	116998.6	116998.5	-	A		
5A	116757.7	116757.8	-	-	A	24-392	#1
5B	116875.9	116875.9	-	-	A		
5C	115855.6	115855.9	115856.0	-	A		

Date:	2/26/25	2/28/25					
Time:	15:15	10:15					
	Weight 1	**Weight 2**	**Weigth 3**	**Weight 4**	**Initial**	**Project**	**Run**
6A	116384.0	116384.2	-	-	A	24-392	A #1/2
6B	115955.8	115956.0	-	-	A		
6C	115129.3	115129.3	-	-	A		
7A	116559.2	116559.2	-	-	A		
7B	117129.7	117129.8	-	-	A		
7C	116551.7	116551.7	-	-	A		
8A	116634.4	116634.3	-	-	A		
8B	116666.5	116666.5	-	-	A		
8C	116663.6	116663.7	-	-	A		
9A	116531.3	116531.2	-	-	A		
9B	117738.7	117738.7	-	-	A		
9C	116603.7	116603.6	-	-	A		
10A	116647.1	116647.0	-	-	A		
10B	117754.4	117754.3	-	-	A		
10C	116729.1	116728.9	-	-	A		

ASTM E2515 - O-Ring Samples 1-10

Paired Weights

	Date:	Time:	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
	1/20/25	0930							
1A			3565.8	3565.2	3565.0	-	A	24-317	#2
1B			3554.2	3553.7	3553.5	-	A		
1C			4164.8	4163.7	4163.5	-	A		
	1/27/25	0830							
2A			3550.9	3550.3	3550.1	-	A	24-317	#3
2B			3570.2	3569.4	3569.0	3569.1	A		
2C			3387.5	3386.2	3385.9	3386.0	A		
	1/30/25	1230							
3A			3577.4	3576.4	3576.2	-	A	24-367	#4
3B			3565.6	3564.7	3564.6	-	A		
3C			3618.7	3618.7	3618.6	-	A		
	2/3/24	0900							
4A			3373.2	3371.8	3371.4	3371.5	A	24-367	#5
4B			3577.0	3576.3	3575.9	3576.1	A		
4C			3368.9.0	3367.8	3367.1	3367.3	A		
5A			3533.6	3532.7	3532.5	-	A	24-392	#1
5B			3528.9	3528.1	3528.0	-	A		
5C			3372.2	3370.8	3370.7	-	A		

	Date:	Time:	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
	2/26/24	15:00							
6A			3388.2	3388.4	-	-	A	24-392	#2
6B			3608.8	3609.0	-	-	A		
6C			3394.9	3395.1	-	-	A		
	2/28/24	10:00							
7A			3567.4	3567.6	-	-	A		#2
7B			3518.7	3518.7	-	-	A		
7C			3400.2	3400.2	-	-	A		
8A			3548.2	3548.2	-	-	A		
8B			3352.1	3352.2	-	-	A		
8C			3582.0	3582.0	-	-	A		
9A			3576.2	3576.3	-	-	A		
9B			3519.3	3519.4	-	-	A		
9C			3421.9	3422.1	-	-	A		
10A			3355.1	3355.2	-	-	A		
10B			3566.5	3566.5	-	-	A		
10C			3360.3	3360.2	-	-	A		

Twin Ports Testing, Inc.
1301 North 3rd Street
Superior, WI 54880
p: 715-392-7114
p: 800-373-2562
f: 715-392-7163
www.twinportstesting.com

Analytical Test Report

Report No: USR:W224-0189-01
Issue No: 1

Client: PFS-TECO
11785 SE Hwy 212, Ste 305
Clackamas, OR 97015
Attention: Sebastian Button

PO No:

Signed: Katy Jahr
Katy Jahr
Chemistry Lab Supervisor
Date of Issue: 5/13/2024

Sample Details

Sample Log No:	W224-0189-01	**Sample Date:**	
Sample Designation:	Lignetics Pellets (Mill # 16036)	**Sample Time:**	
Sample Recognized As:	Wood Pellets	**Arrival Date:**	4/26/2024

Test Results

	METHOD	UNITS	MOISTURE FREE	AS RECEIVED
Moisture Total	ASTM E871	wt. %		2.10
Ash	ASTM D1102	wt. %	0.17	0.17
Volatile Matter	ASTM D3175	wt. %	80.51	78.82
Fixed Carbon by Difference	ASTM D3172	wt. %	19.31	18.91
Sulfur	ASTM D4239	wt. %	0.070	0.069
SO_2	Calculated	lb/mmbtu		0.163
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.71	18.27
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8627	8445
Carbon	ASTM D5373	wt. %	49.48	48.44
Hydrogen*	ASTM D5373	wt. %	6.22	6.09
Nitrogen	ASTM D5373	wt. %	< 0.20	< 0.20
Oxygen*	ASTM D3176	wt. %	> 43.86	> 42.94
*Note: As received values do not include hydrogen and oxygen in the total moisture.				
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft^3		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

Comments:

PJLA Testing
Accreditation #60243

227 Industrial Park Road
South Pittsburg, Tennessee
37380 USA

usstove.com
1 800 750 2723

UNITED STATES STOVE Co
ESTº 1869

February 4, 2025

RE: Operational Instructions for SP24E

High burn: setting 4 damper fully open

Medium burn setting 2 damper fully closed

Low burn setting 1 and hit the feed adjust button to show 1 & 4 lights are lit and air damper fully closed

Equations and Sample Calculations – ASTM E2779 & E2515

Client	USSC
Model:	SP24iE
Tracking #:	219
Run:	2

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

M_{Bdb} – Weight of test fuel burned during test run, dry basis, kg

M_{BSidb} – Weight of test fuel burned during test run segment *i* , dry basis, kg

BR – Average dry burn rate over full integrated test run, kg/hr

BR_{Si} – Average dry burn rate over test run segment *i* , kg/hr

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

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

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

m_n – Total Particulate Matter Collected, mg

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

E_T – Total Particulate Emissions, g

PR - Proportional Rate Variation

PM_R – Average particulate emissions for full integrated test run, g/hr

PM_F – Average particulate emission factor for full integrated test run, g/dry kg of fuel burned

M_{Bdb} – Weight of test fuel burned during test run, dry basis, kg
ASTM E2779 equation (1)

$$M_{Bdb} = (M_{Swb} - M_{Ewb})(100/(100 + FM))$$

Where,

FM = average fuel moisture of test fuel, % dry basis
M_{Swb} = weight of test fuel in hopper at start of test run, wet basis, kg
M_{Ewb} = weight of test fuel in hopper at end of test run, wet basis, kg

Sample Calculation:

FM = 2.15 %
M_{Swb} = 9.1 lbs
M_{Ewb} = 0.0 lbs
0.4536 = Conversion factor from lbs to kg

M_{Bdb} = [(9.1 x 0.4536) - (0.0 x 0.4536)] (100/(100 + 2.145)

M_{Bdb} = **4.05** kg

M_{BSidb} – Weight of test fuel burned during test run segment *i* , dry basis, kg
ASTM E2779 equation (2)

$$M_{BSidb} = (MS_{Siwb} - M_{ESiwb})(100/(100 + FM))$$

Where,

M_{SSiwb} = weight of test fuel in hopper at start of test run segment *i* , wet basis, kg

M_{ESiwb} = weight of test fuel in hopper at end of test run segment *i* , wet basis, kg

Sample Calculation (from medium burn rate segment):

FM = 2.15 %

M_{SSiwb} = 5.9 lbs

M_{ESiwb} = 2.9 lbs

0.4536 = Conversion factor from lbs to kg

M_{BSidb} = [(5.9 x 0.4536) - (2.9 x 0.4536)] (100/(100 + 2)

M_{BSidb} = **1.29** kg

BR – Average dry burn rate over full integrated test run, kg/hr
ASTM E2779 equation (3)

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

Where,

θ = Total length of full integrated test run, min

Sample Calculation:

M_{Bdb} = 4.05 kg
θ = 360 min

$$BR = \frac{60 \times 4.05}{360}$$

BR = **0.68** kg/hr

BR_{Si} – Average dry burn rate over test run segment *i* , kg/hr
ASTM E2779 equation (4)

$$BR_{Si} = \frac{60\ M_{BSidb}}{\theta_{Si}}$$

Where,

θ_{Si} = Total length of test run segment *i* , min

Sample Calculation (from medium burn rate segment):

M_{BSidb} = 1.29 kg
θ = 120 min

$$BR = \frac{60 \times 1.29}{120}$$

BR = **0.65** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equations (9)

$$V_s = F_p \times K_p \times C_P \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_s}{P_s \times M_s}}$$

Where:

F_p	=	Adjustment factor for center of tunnel pitot tube placement, Fp = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)
v_{scent}	=	Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec
v_{strav}	=	Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec
k_p	=	Pitot tube constant, 85.49
C_p	=	Pitot tube coefficient: 0.99, unitless
ΔP*	=	Velocity pressure in the dilution tunnel, in H_2O
T_s	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
P_{bar}	=	Barometric pressure at test site, in. Hg
P_g	=	Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)
M_s	=	**The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{20.60}{20.37} = 1.011$$

$$V_s = 1.011 \times 85.49 \times 0.99 \times 0.301 \times \left(\frac{80.3 + 460}{\left(30.01 + \frac{-0.16}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **20.40** ft/s

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

**The ASTM test standard mistakenly identifies Ms as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

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

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

Where:

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

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 20.40 \times 0.1963 \times \frac{528}{80.3 + 460} \times \frac{30.01 + \frac{-0.16}{13.6}}{29.92}$$

Q_{sd} = **13843.3** dscf/hr

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

ASTM E2515 equation (6)

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

Where:

K_1	=	17.64 °R/in. Hg
V_m	=	Volume of gas sample measured at the dry gas meter, dcf
Y	=	Dry gas meter calibration factor, dimensionless
P_{bar}	=	Barometric pressure at the testing site, in. Hg
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train A:

$$V_{m(std)} = 17.64 \times 56.140 \times 1.019 \times \frac{\left(30.01 + \frac{2.46}{13.6}\right)}{(87.8 + 460)}$$

$V_{m(std)}$ = **55.605** dscf

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 55.218 \times 1.005 \times \frac{\left(30.01 + \frac{2.42}{13.6}\right)}{(79.7 + 460)}$$

$V_{m(std)}$ = **54.749** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 82.71 \times 1.012 \times \frac{\left(\underline{30.01} + \frac{0.00}{13.6}\right)}{(64.9 + 460)}$$

$V_{m(std)}$ = **84.400** dscf

m_n – Total Particulate Matter Collected, mg
ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg

m_f = mass of particulate matter from filters, mg

m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A:

m_n = 0.4 + 2.3 + 0.0

m_n = **2.7** mg

Using equation for Train B:

m_n = 0.0 + 2.1 + 0.5

m_n = **2.6** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions, g/dscf
ASTM E2515 equation (13)

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

Where:

K_2	=	Constant, 0.001 g/mg
m_n	=	Total mass of particulate matter collected in the sampling train, mg
$V_{m(std)}$	=	Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train A:

$$C_s = 0.001 \times \frac{2.7}{55.605}$$

C_s = **0.00005** g/dscf

For Train B:

$$C_s = 0.001 \times \frac{2.6}{54.749}$$

C_s = **0.00005** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{84.400}$$

C_r = **0.000000** g/dscf

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

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

Where:

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

Sample calculation:

For Train A

E_T = (0.000049 - 0.000000) x 13843.3 x 360 /60

E_T = **4.03** g

For Train B

E_T = (0.000047 - 0.000000) x 13843.3 x 360 /60

E_T = **3.94** g

Average

E = **3.99** g

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

7.5% of the average =	0.30
Train A difference (%) =	**1.1%**
Train B difference (%)=	**1.1%**

PR - Proportional Rate Variation

ASTM E2515 equation (16)

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

Where:

θ = Total sampling time, min

θ_i = Length of recording interval, min

V_{mi} = Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf

V_m = Volume of gas sample as measured by dry gas meter, dcf

V_{si} = Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec

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

T_{mi} = Absolute average dry gas meter temperature during the "ith" time interval, ^oR

T_m = Absolute average dry gas meter temperature, ^oR

T_{si} = Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR

T_s = Absolute average gas temperature in the dilution tunnel, ^oR

Sample calculation (for the first 10 minute interval of Train A):

$$PR = \left(\frac{360 \times 1.46 \times 20.40 \times (87.8 + 460) \times (82.6 + 460)}{10 \times 56.14 \times 20.69 \times (80.3 + 460) \times (65.8 + 460)} \right) \times 100$$

PR = **97** %

PM_R – Average particulate emissions for full integrated test run, g/hr
ASTM E2779 equation (5)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation:

E_T (Dual train average) = 3.99 g

θ = 360 min

$PM_R = 60 \times (3.99 / 360)$

PM_R = **0.66** g/hr

PM_F – Average particulate emission factor for full integrated test run, g/dry kg of fuel burned
ASTM E2779 equation (6)

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

Where,

E_T = Total particulate emissions, grams

M_{Bdb} = Weight of test fuel burned during test run, dry basis, kg

Sample Calculation:

E_T (Dual train average) = 3.99 g

M_{Bdb} = 4.05 kg

PM_F = 3.99 / 4.05)

PM_F = **0.98** g/kg

Stack Loss Efficiency and CO emissions calculations are done in accordance with CSA B415.1, using the password protected excel spreadsheet provided with the test standard. No alterations or alternative calculations are used for determining efficiency or CO emissions. The following pages are a sample of the calculations page from the B415.1 Spreadsheet (V2_4 - Dated April 15, 2010).

Manufacturer: USSC
Model: SP24iE
Date: 02/28/25
Run: 2
Control #: 25-392
Test Duration: 360 min

Note: In the "Input data", "Calc. % O_2", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a]. [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

	HHV	LHV
Eff	76.92%	82.44%
Comb Eff	99.50%	99.50%
HT Eff	77.31%	82.85%
Output	10,426	kJ/h
Burn Rate	0.68	kg/h
Grams CO	12	g
Input	13,554	kJ/h
MC wet	2.10	

Ultimate CO_2
$CO_{2\text{-ult}}$ 20.28
F_0 1.017

Overall Heating Efficiency:	76.92%	Air Fuel Ratio (A/F)		
Combustion Efficiency:	99.50%	Dry Molecular Weight (M_d)	29.13	
Heat Transfer Efficiency:	77.31%	Dry Moles Exhaust Gas (N_d):	1691.68	%HC
		Air Fuel Ratio (A/F)	48.78	0.8

Heat Output:	9,891	Btu/h	10,426	kJ/h
Heat Input:	12,857	Btu/h	13,554	kJ/h
Burn Duration:	6.00	h		
Burn Rate:	1.49	lb/h	0.676	kg/h
Stack Temp:	169.2	Deg. F	76.2	Deg. C

Averages	0.01	2.51	9.55	20.86	18.35	76.28	18.27	102.7%	76.5%	#DIV/0!	63.21	1.56	62.31	1.54	62.02	81415	4.12
INPUT DATA			Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt	% Wet	Dry Wt.	% Dry		
Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (°C)	Room Temp (°C)	Eff %	Transfer %	Eff %	Fuel Ratio	Now Wt	Consumed x	Now Wt_{dn}	Comsumed y	Total Input	Carbon /12= [a]
0	4.14	0.07	6.22	222.4%	20.74	14.48	106.2	16.3	99.7%	83.6%	83.3%	19.0	4.14	0.00	4.06	0.00	0	4.12
1	4.12	0.02	4.41	358.0%	20.80	16.38	105.8	16.3	100.7%	80.2%	80.7%	27.1	4.12	0.66	4.03	0.66	846	4.12
2	4.08	0.03	5.93	240.8%	20.75	14.81	106.0	16.3	100.4%	83.2%	83.5%	20.1	4.08	1.42	4.00	1.42	534	4.12
3	4.06	0.05	6.34	217.4%	20.73	14.37	105.9	16.4	100.0%	83.8%	83.8%	18.7	4.06	1.97	3.98	1.97	445	4.12
4	4.04	0.02	4.83	317.6%	20.78	15.94	105.7	16.3	100.5%	81.2%	81.7%	24.7	4.04	2.52	3.95	2.52	490	4.12
5	4.01	0.02	4.75	325.6%	20.79	16.03	105.3	16.4	100.6%	81.1%	81.6%	25.2	4.01	3.18	3.93	3.18	445	4.12
6	3.99	0.02	5.62	259.3%	20.76	15.12	105.6	16.3	100.4%	82.8%	83.1%	21.2	3.99	3.61	3.91	3.61	534	4.12
7	3.96	0.02	5.58	262.3%	20.76	15.17	106.4	16.5	100.5%	82.6%	83.1%	21.4	3.96	4.49	3.87	4.49	579	4.12
8	3.93	0.04	6.36	216.9%	20.73	14.35	106.7	16.3	100.1%	83.8%	83.9%	18.7	3.93	5.04	3.85	5.04	490	4.12
9	3.91	0.03	5.93	240.3%	20.75	14.80	106.8	16.4	100.3%	83.1%	83.4%	20.1	3.91	5.70	3.82	5.70	490	4.12
10	3.88	0.03	5.59	261.2%	20.76	15.16	106.7	16.4	100.4%	82.6%	82.9%	21.3	3.88	6.24	3.80	6.24	490	4.12
11	3.86	0.02	6.39	216.0%	20.73	14.33	106.6	16.4	100.3%	83.8%	84.1%	18.7	3.86	6.90	3.78	6.90	401	4.12
12	3.84	0.02	3.12	545.5%	20.84	17.71	105.3	16.4	101.1%	75.4%	76.2%	38.3	3.84	7.23	3.76	7.23	445	4.12
13	3.81	0.02	5.82	247.6%	20.75	14.92	105.9	16.4	100.5%	83.1%	83.5%	20.5	3.81	8.00	3.73	8.00	668	4.12
14	3.77	0.02	6.28	222.3%	20.74	14.45	106.8	16.4	100.4%	83.7%	84.0%	19.0	3.77	8.87	3.70	8.87	579	4.12
15	3.75	0.02	6.26	222.6%	20.74	14.46	107.2	16.3	100.3%	83.6%	83.9%	19.1	3.75	9.42	3.67	9.42	534	4.12
16	3.72	0.04	7.49	169.5%	20.70	13.19	108.1	16.4	100.1%	84.9%	85.0%	15.9	3.72	10.19	3.64	10.19	534	4.12
17	3.70	0.02	5.56	263.3%	20.76	15.19	108.1	16.6	100.5%	82.4%	82.8%	21.5	3.70	10.73	3.62	10.73	445	4.12
18	3.68	0.02	5.83	246.5%	20.75	14.91	107.9	16.5	100.4%	82.9%	83.2%	20.5	3.68	11.28	3.60	11.28	490	4.12
19	3.65	0.03	5.78	249.3%	20.75	14.96	107.8	16.4	100.4%	82.8%	83.1%	20.6	3.65	11.94	3.57	11.94	490	4.12
20	3.63	0.02	5.46	269.9%	20.76	15.29	107.7	16.4	100.5%	82.3%	82.7%	21.9	3.63	12.49	3.55	12.49	490	4.12
21	3.60	0.02	6.21	225.7%	20.74	14.52	108.0	16.6	100.4%	83.4%	83.8%	19.2	3.60	13.14	3.52	13.14	534	4.12
22	3.57	0.01	5.72	253.6%	20.75	15.03	107.8	16.6	100.5%	82.7%	83.2%	20.9	3.57	13.80	3.50	13.80	534	4.12
23	3.54	0.03	5.90	242.0%	20.75	14.83	108.1	16.6	100.3%	83.0%	83.2%	20.2	3.54	14.46	3.47	14.46	490	4.12
24	3.52	0.02	6.41	215.4%	20.73	14.31	108.4	16.6	100.3%	83.7%	83.9%	18.6	3.52	15.01	3.45	15.01	445	4.12
25	3.50	0.01	5.81	248.5%	20.75	14.94	108.4	16.4	100.5%	82.8%	83.2%	20.6	3.50	15.55	3.42	15.55	445	4.12
26	3.48	0.02	5.58	262.5%	20.76	15.17	108.1	16.5	100.5%	82.4%	82.9%	21.4	3.48	16.10	3.40	16.10	534	4.12
27	3.44	0.01	5.11	296.1%	20.77	15.66	107.8	16.4	100.7%	81.6%	82.1%	23.4	3.44	16.87	3.37	16.87	534	4.12
28	3.42	0.01	5.72	253.6%	20.75	15.02	108.2	16.6	100.6%	82.7%	83.1%	20.9	3.42	17.42	3.35	17.42	490	4.12
29	3.39	0.01	5.12	295.1%	20.77	15.65	107.4	16.7	100.7%	81.7%	82.2%	23.4	3.39	18.07	3.32	18.07	445	4.12
30	3.38	0.02	5.62	260.1%	20.76	15.13	107.6	16.7	100.5%	82.6%	83.0%	21.3	3.38	18.51	3.30	18.51	445	4.12
31	3.35	0.02	5.66	257.0%	20.76	15.09	107.8	16.7	100.4%	82.6%	83.0%	21.1	3.35	19.17	3.28	19.17	579	4.12
32	3.32	0.04	6.83	195.0%	20.72	13.86	108.4	16.7	100.1%	84.2%	84.3%	17.4	3.32	19.93	3.25	19.93	534	4.12

Moisture Content M_{Cwb}: 2.1

Combustion Efficiency:	99.50%		Moisture of Wood (wet basis):	2.1	Dry kg : 4.06
Total Input (kJ):	81,324	77,132 (Btu)	Initial Dry Weight Wt_{do} (kg):	4.06	CA: 49
Total Output (kJ):	62,558	59,333 (Btu)	Moisture Content Dry	2.15	HY: 6
Efficiency:	76.92%				OX: 44.13
Total CO (g):	12.43				

Load Weight (kg):	**4.14**				
Fuel Heating	**HHV**	**LHV**		**HHV**	**LHV**
Value in kj/kg - CV:	**20,053**	**18,712**	Btu/lb	**8627.0**	**8050.0**

6.22	2.76	20052.95	2.10	79.14	20.99	0.60	1.93	-0.03	0.06	41.84	415.24	0.09	-0.63	1732.37	32.40	1.19	349.43	2256.49	1722.23	1680.66	1660.79
Fuel Properties			**Mw**	**Mass Balance**					**kg Wood per**								**Stack**	**Heat Content Change - Ambient to Stack T**			
Hydrogen	**Oxygen**	**Calorific**	**Moisture**	**(moles/100 mole dry flue gas)**					**100 mole dfp**	**Moles per kg of Dry Wood**						**Moisture**	**Temp**	**Flue Gas Constituent**			
/1= [b]	**/16= [c]**	**Value**	**Fuel Burnt**	**[h]**	**[u]**	**[w]**	**[j]**	**[k]**	**Nk**	**CO_2**	**O_2**	**CO**	**HC**	**N_2**	**H_2O**	**Present**	**K**	**CO_2**	**O_2**	**CO**	**N_2**
6.22	2.76	20052.95	2.10	79.23	21.02	1.52	4.76	-0.01	0.15	40.90	95.28	0.48	-0.08	521.26	31.31	1.19	379.32	3526.95	2677.91	2609.88	2579.73
6.22	2.76	20052.95	2.10	79.19	21.01	1.07	3.37	-0.02	0.11	41.33	153.55	0.19	-0.21	742.46	31.57	1.19	378.98	3513.44	2667.85	2600.12	2570.07
6.22	2.76	20052.95	2.10	79.24	21.02	1.44	4.51	-0.02	0.14	41.26	103.13	0.17	-0.13	551.86	31.42	1.19	379.15	3520.20	2672.88	2605.00	2574.90
6.22	2.76	20052.95	2.10	79.24	21.02	1.55	4.84	-0.02	0.15	41.11	93.10	0.30	-0.10	513.56	31.36	1.19	379.09	3513.73	2667.94	2600.17	2570.13
6.22	2.76	20052.95	2.10	79.21	21.01	1.17	3.69	-0.02	0.12	41.30	136.16	0.19	-0.18	676.70	31.52	1.19	378.82	3506.69	2662.81	2595.24	2565.24
6.22	2.76	20052.95	2.10	79.21	21.01	1.15	3.62	-0.02	0.11	41.33	139.59	0.17	-0.19	689.75	31.54	1.19	378.43	3484.60	2646.18	2579.05	2549.24
6.22	2.76	20052.95	2.10	79.23	21.02	1.36	4.28	-0.02	0.14	41.29	111.07	0.16	-0.15	581.92	31.45	1.19	378.76	3502.33	2659.50	2592.01	2562.05
6.22	2.76	20052.95	2.10	79.23	21.02	1.35	4.25	-0.02	0.14	41.34	112.34	0.12	-0.16	586.82	31.47	1.19	379.54	3527.53	2678.09	2609.99	2579.85
6.22	2.76	20052.95	2.10	79.25	21.02	1.55	4.85	-0.02	0.15	41.16	92.88	0.25	-0.11	512.86	31.37	1.19	379.87	3547.37	2693.06	2624.55	2594.25
6.22	2.76	20052.95	2.10	79.24	21.02	1.44	4.52	-0.02	0.14	41.22	102.89	0.21	-0.13	550.85	31.41	1.19	379.93	3547.52	2693.10	2624.58	2594.28
6.22	2.76	20052.95	2.10	79.23	21.02	1.36	4.26	-0.02	0.14	41.26	111.90	0.19	-0.15	584.96	31.44	1.19	379.82	3543.01	2689.75	2621.32	2591.06
6.22	2.76	20052.95	2.10	79.26	21.02	1.55	4.86	-0.02	0.15	41.28	92.48	0.15	-0.12	511.65	31.40	1.19	379.71	3536.40	2684.76	2616.47	2586.26
6.22	2.76	20052.95	2.10	79.15	21.00	0.76	2.40	-0.02	0.08	41.36	234.58	0.26	-0.32	1048.66	31.80	1.19	378.43	3484.60	2646.18	2579.05	2549.24
6.22	2.76	20052.95	2.10	79.24	21.02	1.41	4.43	-0.02	0.14	41.33	106.04	0.12	-0.15	563.00	31.45	1.19	379.09	3511.62	2666.30	2598.57	2568.55
6.22	2.76	20052.95	2.10	79.26	21.02	1.52	4.77	-0.02	0.15	41.33	95.15	0.11	-0.13	521.85	31.42	1.19	379.93	3545.41	2691.47	2622.98	2592.70
6.22	2.76	20052.95	2.10	79.25	21.02	1.52	4.77	-0.02	0.15	41.28	95.29	0.15	-0.13	522.25	31.40	1.19	380.32	3565.40	2706.48	2637.57	2607.13
6.22	2.76	20052.95	2.10	79.29	21.03	1.82	5.69	-0.01	0.18	41.18	72.54	0.21	-0.08	436.06	31.32	1.19	381.26	3601.62	2733.38	2663.64	2632.93
6.22	2.76	20052.95	2.10	79.23	21.02	1.35	4.24	-0.02	0.13	41.30	112.79	0.16	-0.15	588.42	31.46	1.19	381.26	3595.30	2728.48	2658.84	2628.19
6.22	2.76	20052.95	2.10	79.24	21.02	1.41	4.44	-0.02	0.14	41.28	105.56	0.16	-0.14	561.06	31.43	1.19	381.04	3588.38	2723.40	2653.93	2623.33
6.22	2.76	20052.95	2.10	79.24	21.02	1.40	4.40	-0.02	0.14	41.26	106.77	0.19	-0.14	565.57	31.43	1.19	380.93	3585.98	2721.67	2652.27	2621.69
6.22	2.76	20052.95	2.10	79.23	21.02	1.32	4.16	-0.02	0.13	41.32	115.63	0.14	-0.16	599.22	31.47	1.19	380.87	3583.73	2720.00	2650.64	2620.08
6.22	2.76	20052.95	2.10	79.25	21.02	1.51	4.72	-0.02	0.15	41.32	96.64	0.11	-0.13	527.47	31.42	1.19	381.15	3590.79	2725.12	2655.58	2624.97
6.22	2.76	20052.95	2.10	79.24	21.02	1.39	4.35	-0.02	0.14	41.36	108.61	0.10	-0.15	572.80	31.46	1.19	380.93	3581.77	2718.41	2649.07	2618.53
6.22	2.76	20052.95	2.10	79.24	21.02	1.43	4.50	-0.02	0.14	41.24	103.63	0.20	-0.13	553.68	31.42	1.19	381.26	3595.30	2728.48	2658.84	2628.19
6.22	2.76	20052.95	2.10	79.26	21.02	1.55	4.87	-0.02	0.16	41.27	92.21	0.15	-0.12	510.60	31.39	1.19	381.59	3608.83	2738.55	2668.60	2637.86
6.22	2.76	20052.95	2.10	79.24	21.02	1.41	4.42	-0.02	0.14	41.35	106.39	0.10	-0.15	564.41	31.45	1.19	381.59	3613.05	2741.82	2671.80	2641.02
6.22	2.76	20052.95	2.10	79.23	21.02	1.35	4.25	-0.02	0.13	41.34	112.42	0.12	-0.16	587.14	31.47	1.19	381.26	3597.40	2730.11	2660.44	2629.77
6.22	2.76	20052.95	2.10	79.22	21.01	1.24	3.89	-0.02	0.12	41.38	126.88	0.11	-0.18	641.87	31.51	1.19	380.98	3588.24	2723.35	2653.90	2623.30
6.22	2.76	20052.95	2.10	79.24	21.02	1.39	4.35	-0.02	0.14	41.36	108.59	0.09	-0.15	572.71	31.46	1.19	381.32	3597.55	2730.16	2660.47	2629.80
6.22	2.76	20052.95	2.10	79.22	21.01	1.24	3.90	-0.02	0.12	41.39	126.45	0.10	-0.18	640.26	31.51	1.19	380.59	3564.02	2705.07	2636.11	2605.71
6.22	2.76	20052.95	2.10	79.24	21.02	1.36	4.27	-0.02	0.14	41.34	111.40	0.12	-0.15	583.27	31.46	1.19	380.71	3568.53	2708.43	2639.36	2608.93
6.22	2.76	20052.95	2.10	79.23	21.02	1.37	4.31	-0.02	0.14	41.28	110.09	0.17	-0.15	578.20	31.44	1.19	380.98	3577.70	2715.19	2645.90	2615.40
6.22	2.76	20052.95	2.10	79.26	21.02	1.66	5.20	-0.02	0.17	41.14	83.49	0.25	-0.09	477.34	31.34	1.19	381.59	3604.61	2735.29	2665.41	2634.70

			SUMS							AVERAGE	SUMS						
2119.52	2013.06	291.42	34009.57	228115.09	9246.99	929311.43	-201557.39	537794.41	19781.68	4312.19	16678.93	-1680.44	18359.4	64735.8	-1636.5	12.4	-32.5
emperature		Room Temp	Energy Losses (kJ/kg of Dry Fuel) Flue Gas Constituent							Total Loss	Total	Chemical	Sensible and	Total	Chem	Grams Produced	
CH_4	H_2O	K	CO_2	O_2	CO	N_2	CH_4	H_2O Comb	H_2O Fuel MC	Rate	Loss	Loss 1	Latent Loss	Output	Loss 2	CO	HC
3343.49	3124.98	289.43	144.26	255.15	137.16	1344.70	-71.11	1474.61	56.12	3340.89	0.00	0	0.00	0	0	0.00	0.00
3330.26	3113.31	289.43	145.20	409.64	53.55	1908.18	-187.60	1486.52	56.11	3871.60	163.37	-6	169.02	683	-6	0.22	-0.14
3336.88	3119.14	289.43	145.26	275.67	49.73	1420.99	-120.01	1479.58	56.12	3307.33	88.15	-2	90.02	446	-2	0.13	-0.06
3330.82	3113.36	289.54	144.44	248.39	85.14	1319.92	-90.80	1476.32	56.11	3239.53	71.95	0	72.08	373	0	0.19	-0.04
3323.64	3107.47	289.43	144.82	362.56	53.68	1735.89	-163.65	1483.82	56.10	3673.21	89.74	-3	92.42	400	-3	0.13	-0.07
3302.43	3088.10	289.59	144.02	369.38	47.25	1758.33	-171.17	1484.00	56.08	3687.89	81.91	-3	84.65	363	-3	0.10	-0.07
3319.51	3103.61	289.48	144.61	295.40	46.14	1490.90	-132.48	1480.41	56.10	3381.09	90.11	-2	92.41	444	-2	0.12	-0.06
3344.61	3125.09	289.65	145.83	300.85	33.84	1513.91	-139.58	1481.83	56.12	3392.82	97.96	-3	101.01	481	-3	0.10	-0.07
3363.64	3142.52	289.48	146.01	250.14	72.09	1330.48	-96.19	1477.81	56.14	3236.47	79.07	-1	79.67	411	-1	0.17	-0.04
3363.92	3142.55	289.54	146.24	277.11	59.57	1429.07	-115.40	1479.83	56.14	3332.56	81.42	-1	82.78	408	-1	0.14	-0.05
3359.50	3138.66	289.54	146.17	300.99	54.83	1515.67	-129.84	1481.23	56.14	3425.19	83.68	-2	85.51	406	-2	0.13	-0.06
3353.16	3132.85	289.59	145.97	248.29	42.41	1323.25	-108.57	1478.81	56.13	3186.29	63.69	-1	65.01	337	-1	0.08	-0.04
3302.43	3088.10	289.59	144.13	620.74	75.67	2673.29	-289.27	1496.44	56.08	4777.07	106.10	-5	110.83	339	-5	0.16	-0.12
3328.89	3111.45	289.59	145.13	282.73	34.49	1446.09	-130.64	1480.46	56.11	3314.38	110.42	-3	113.61	558	-3	0.11	-0.08
3361.99	3140.63	289.59	146.53	256.08	30.09	1353.01	-117.60	1480.01	56.14	3204.26	92.51	-3	95.04	486	-3	0.09	-0.06
3381.31	3158.09	289.48	147.17	257.89	43.29	1361.57	-112.04	1479.97	56.16	3234.00	86.19	-2	88.02	448	-2	0.11	-0.05
3416.96	3189.25	289.54	148.30	198.27	59.70	1148.10	-73.65	1476.89	56.20	3013.83	80.32	0	80.70	454	0	0.16	-0.04
3411.18	3183.50	289.71	148.48	307.74	44.55	1546.47	-135.54	1483.25	56.19	3451.14	76.65	-2	78.67	369	-2	0.10	-0.05
3404.26	3177.63	289.65	148.13	287.48	46.52	1471.86	-124.75	1481.92	56.18	3367.34	82.27	-2	84.18	408	-2	0.11	-0.05
3401.77	3175.66	289.59	147.94	290.59	53.01	1482.74	-123.59	1481.74	56.18	3388.62	82.79	-2	84.51	407	-2	0.13	-0.05
3399.56	3173.71	289.59	148.07	314.53	41.05	1570.01	-140.98	1483.51	56.18	3472.36	84.83	-2	87.27	405	-2	0.10	-0.06
3406.76	3179.61	289.71	148.38	263.35	32.32	1384.58	-118.68	1481.34	56.19	3247.48	86.55	-2	88.85	448	-2	0.08	-0.06
3397.91	3171.82	289.71	148.12	295.26	28.91	1499.89	-136.63	1482.99	56.18	3374.72	89.94	-3	92.81	445	-3	0.08	-0.07
3411.18	3183.50	289.71	148.27	282.76	55.89	1455.17	-118.03	1481.40	56.19	3361.65	82.13	-2	83.65	408	-2	0.13	-0.05
3424.46	3195.18	289.71	148.93	252.51	44.17	1346.88	-107.44	1480.65	56.21	3221.91	71.56	-1	72.96	374	-1	0.10	-0.04
3428.31	3199.01	289.59	149.41	291.71	28.49	1490.61	-133.76	1483.54	56.21	3366.21	74.76	-2	77.09	371	-2	0.06	-0.05
3413.11	3185.42	289.65	148.72	306.92	33.87	1544.04	-139.69	1483.74	56.19	3433.79	91.52	-3	94.33	443	-3	0.09	-0.07
3403.98	3177.61	289.59	148.48	345.55	30.09	1683.81	-161.21	1485.77	56.18	3588.66	95.64	-3	99.13	439	-3	0.08	-0.08
3413.40	3185.45	289.71	148.81	296.46	26.84	1506.13	-137.49	1483.51	56.19	3380.45	82.59	-3	85.28	407	-3	0.06	-0.06
3380.79	3156.31	289.82	147.51	342.06	27.70	1668.32	-161.65	1485.14	56.16	3565.24	79.18	-3	82.15	366	-3	0.06	-0.06
3385.21	3160.21	289.82	147.53	301.71	33.64	1521.71	-138.38	1482.81	56.16	3405.18	75.63	-2	77.95	370	-2	0.07	-0.06
3394.34	3168.02	289.87	147.69	298.93	47.94	1512.23	-130.36	1482.21	56.17	3414.81	98.59	-2	100.97	480	-2	0.14	-0.07
3420.60	3191.34	289.82	148.31	228.37	72.25	1257.64	-83.22	1477.97	56.20	3157.51	84.15	0	84.45	450	0	0.19	-0.04

Pre-Conditioning Data

Client:	USSC	Job #:	24-392
Model:	SP24	Tracking #:	219
Date(s):	1/23/25 - 1/28/25	Technician:	AK

Elapsed Time (hrs)	Flue (°F)	Catalyst Exit (°F)	Notes: Indicate initial air setting and any changes in in setting during conditioning, as well as weight and average moisture content of all fuel additions.
0	167	N/A	+40 lb Pellets
1	166	N/A	
2	165	N/A	
3	163	N/A	
4	167	N/A	
5	164	N/A	
6	162	N/A	
7	160	N/A	
8	157	N/A	
9	166	N/A	
10	162	N/A	
11	162	N/A	
12	164	N/A	
13	161	N/A	
14	160	N/A	
15	162	N/A	
16	160	N/A	
17	161	N/A	
18	159	N/A	
19	161	N/A	
20	163	N/A	+40 lb Pellts
21	163	N/A	
22	165	N/A	
23	165	N/A	
24	167	N/A	
25	165	N/A	
26	163	N/A	
27	158	N/A	
28	156	N/A	
29	153	N/A	
30	150	N/A	
31	149	N/A	
32	148	N/A	
33	146	N/A	
34	145	N/A	
35	143	N/A	
36	141	N/A	
37	138	N/A	+22 lb Pellets
38	133	N/A	
39	132	N/A	
40	140	N/A	
41	145	N/A	
42	150	N/A	
43	151	N/A	
44	151	N/A	
45	165	N/A	
46	162	N/A	
47	162	N/A	
48	160	N/A	
49	158	N/A	
50	153	N/A	

Signature/Date:  3/21/2025

ASTM E2515-11

Sample Collection: Verified - Yes:☒ NO:☐ (if no, explain)

Four separate, complete particulate sampling trains were used for each run. Filter face velocity at no time exceeded 150mm/sec during any test run. The dry gas meters were calibrated for the flow rates encountered during the test runs.

The 47mm filter holder assemblies consist of an aluminum front housing and polycarbonate rear housing, with the rear housing located 75mm downstream from the front housing. The front filter support frit is stainless steel.

Probe assemblies are constructed from 316 grade stainless steel tubing with an outside diameter or 6.35mm and 310mm length.

A type K thermocouple filter temperature monitor probe is installed behind the front filter housing with its tip directly exposed to the sample gas.

Sample gas drying systems are located prior to each metering system and include temperature sensors.

The metering systems include vacuum gauges, leak-free diaphragm-type pumps, and type K thermocouple temperature sensors. The gas meters have a resolution of 0.001 cubic feet.

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 E2515-11 6.1.2 is 1:1.

Dilution tunnel temperature was measured by a type K thermocouple probe.

Dilution tunnel velocity was measured prior to each run by performing a velocity traverse and monitored throughout each run by measuring pitot pressure at the tunnel centroid. Traverses were performed using a Dwyer Model 1430 Microtector in accordance with the instrument owners' manual. This includes leveling and zeroing the instrument prior to each use and performing pre- and post-test leak checks on the pitot tubing.

To monitor and log centroid pitot pressure, the pressure transducer of an Apex Instruments XC-60-DIR sample box was used. Both pieces of equipment offer precision in excess of the +/-0.001" specified in section 6.1.5 of ASTM E2515-11, and are therefore suitable for use with flows under 800 ft/min. Both pieces of equipment are plumbed to the same pitot tube, which is in accordance with the design shown in Appendix X2 of ASTM E2515-11.

The dilution tunnel is constructed in accordance with the requirements of ASTM E2515-11, as shown below:

Sample ports are located 16.5 feet downstream from any disturbances and 2 feet upstream from any disturbances. Flow rate traverse data was collected 8 feet downstream from any disturbances and 4 feet upstream from any disturbances.

Flow is induced and maintained by a centrifugal-type blower.

Test facility temperature is monitored by a type T thermocouple probe, located in a 150mm long, 50mm diameter pipe shield located in the 90-degree arc in front of the test unit, between 1-2m away, and in the horizontal plane of the test unit air intake.

Test facility airflow was measured with an anemometer capable of measuring velocities less than 20 ft/min.

Reagents and Standards: Verified - Yes:☒ NO:☐ (if no, explain)

Pall Type A/E Glass fiber 47mm filters having at least 99.95% efficiency at 0.3-micron particles were used.

Test samples were conditioned in an airtight desiccator containing calcium sulfate desiccant, with specific humidity of less than 0.005 g/liter prior to and after the testing.

Acetone was used to clean probe assemblies both prior to pretest desiccation and prior to post-test desiccation.

Calibration and Standardization: Verified - Yes:☒ NO:☐ (if no, explain)

The gas metering system is calibrated every six months traceable to NIST and demonstrating an uncertainty of +/- 0.75% of the measured volume.

All thermocouples discussed in this report are calibrated traceable to NIST every six months.

The analytical balance has a resolution of 0.1mg and is calibrated traceable to NIST every six months. Before each test and before each weighing of samples, the balance is audited with a calibrated 200mg weight.

All other measurement equipment used for this test is calibrated traceable to NIST at an appropriate interval. See Appendix C for all calibration records.

Procedures: Verified - Yes:☒ NO:☐ (if no, explain)

The following procedures were observed prior to testing:

- The dilution tunnel was cleaned with an appropriately sized steel brush.

- Induced draft was evaluated by measuring flue static pressure with the dilution tunnel blower operating and no fire in the appliance. No induced static pressure was observed (all readings <0.005” H2O) in any appliance door/air damper configuration.

- Smoke capture was evaluated by operating the appliance at a high burn rate and visually monitoring smoke collection by the hood. No less than 100% smoke collection was observed at the minimum tunnel flow rate.

Prior to ignition for each run, a velocity traverse was conducted to determine dilution tunnel velocity. Traverse points were determined in accordance with Figures 5 and 6 of ASTM E2515-11, and velocity calculated in accordance with section 9.3.2, excluding center readings. The pitot tube was placed in the center of the tunnel for the duration of each test run.

Prior to tare analysis, probes were cleaned with acetone, O-rings cleaned of any residue, and filters were visually check for pinhole leaks or irregularities. Filters, O-rings, and probes were desiccated at 20+/-5C for at least 24 hours and weighed at intervals of not less than 6 hours until constant weight was attained. Filters and O-rings were both weighed in pairs.

Tared samples were assembled into three dual filter holder assemblies (A, B, and first hour) and the single ambient filter assembly. Blunt tweezers and surgical gloves were used to avoid damage or contamination of the samples. The three dual filter assemblies were inserted to the appropriate depth in the tunnel (within the 2" diameter centroid, no closer than 1" apart).

Leak checks were performed on sampling systems as follows:

- Leak checks were performed on the pitot tube lines before and after each test run by applying a pressure differential of at least 3" H2O and sealing the pitot tube opening. Pressure remained stable for at least 15 seconds all checks of both the pressure and suction sides, confirming that no leaks were present.

- All four sampling trains were leak-checked before and after each test run. Pre-test leak checks were conducted at the vacuum level corresponding to each sample pump's flow setting, in accordance with Note 5 of ASTM E2515-11. Post-test checks were conducted at the highest vacuum level encountered during the test, or the pre-test vacuum level, whichever was greater. Of the leak rate limits (0.01 cfm or 4% of sample rate), 4% of the sample rate is lower, and at no point was the measured leakage rate greater than this.

- The portion of the sampling trains from the pumps to the dry gas meters (that is, the positive pressure section of the metering system) was leak checked semiannually during calibration. This check was performed by closing the main inlet valve and pressurizing the outlet of the dry gas meter to at least 7" H2O, and ensuring the pressure remained stable for at least 1 minute.

Sampling began at the start of each test run as defined by the applicable procedure and continued until the defined end of the test run. Readings were collected at 1-minute intervals. During all test runs, the following conditions were maintained:

- Test facility temperature was between 55 and 90 F.

- Air velocities were less than 50ft/min within 2ft of the appliance

- Filter holder temperatures were no greater than 90 F.

- Sample flow rates were maintained within 10% of the initial proportionality ratio.

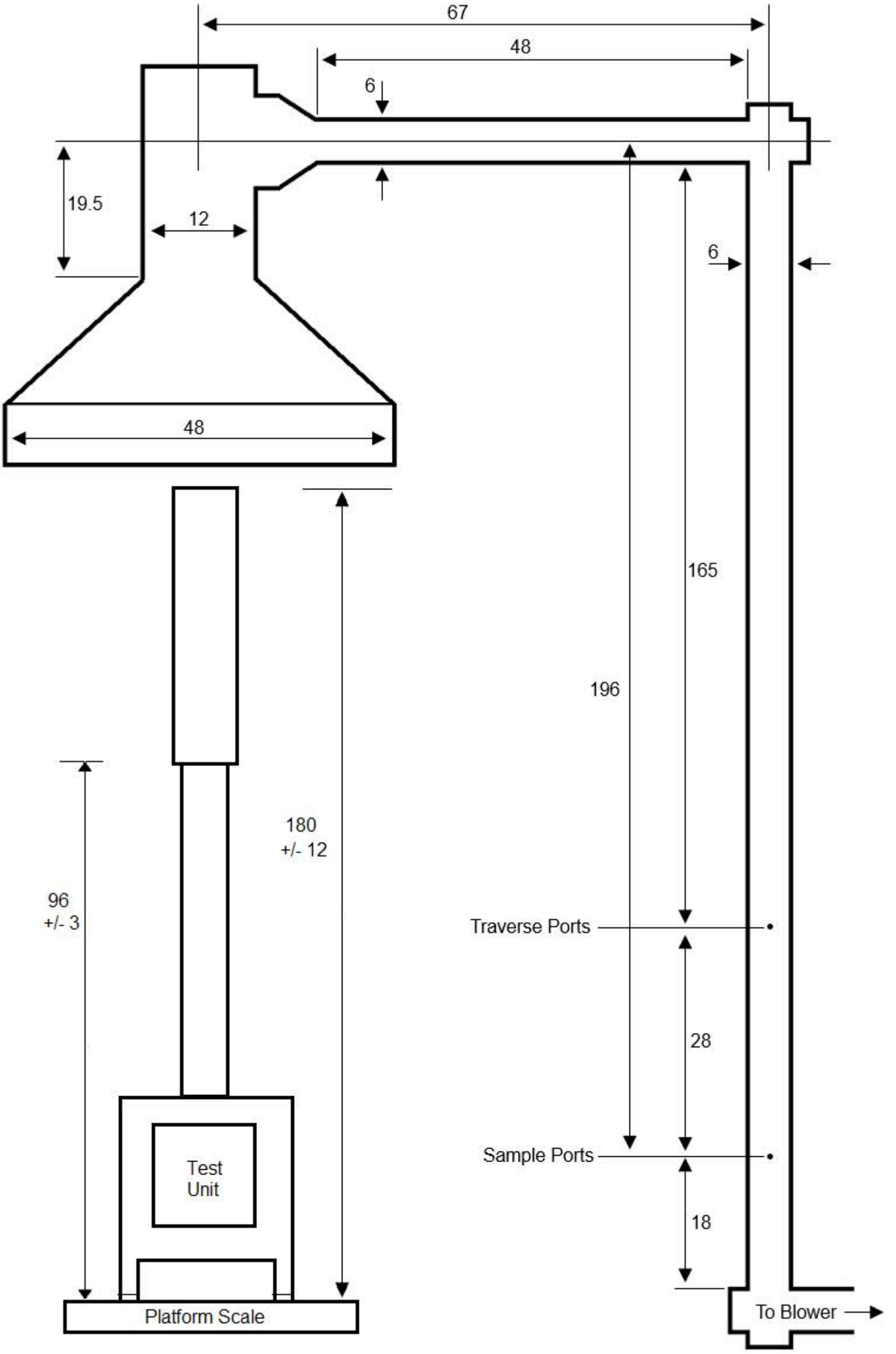
Following each test run and its associated leak checks, samples were recovered by disassembling the filter holder components and replacing them in the desiccator. The outside of the probes was cleaned with acetone prior to desiccation.

Sample weights were determined using the same analytical balance and procedures used for tare weights. Filters, O-rings, and probes were desiccated at 20+/-5C for at least 24 hours and weighed at intervals of not less than 6 hours until constant weight was attained. Filters and O-rings were both weighed in pairs. Components were not exposed to laboratory atmosphere for more than 2 minutes per weighing.

Dilution Tunnel Information Sheet

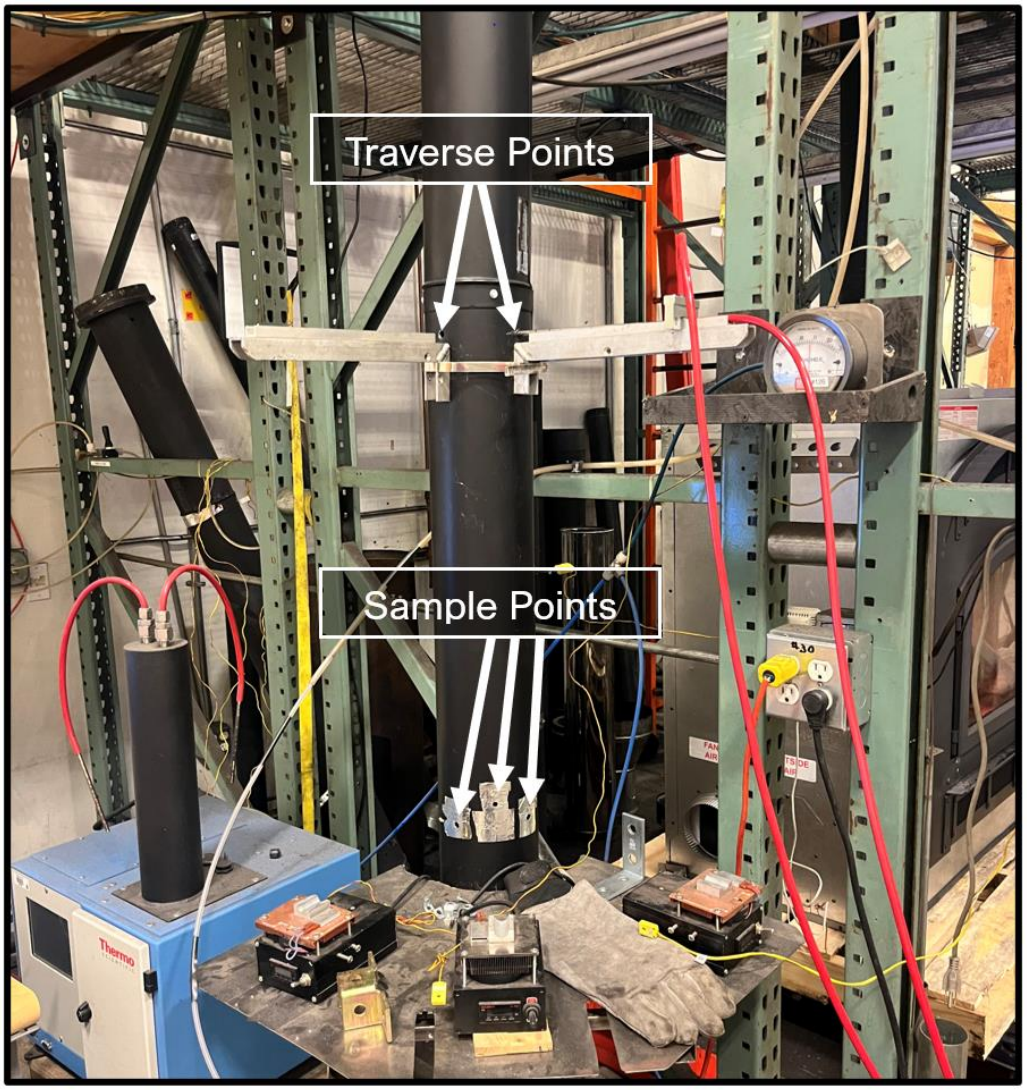
As of January 2024

1. Equipment ID number/name of the tunnel:
   Emissions Booth #1
2. Physical location of the tunnel (facility address and test bay number):
   Booth #1
   11785 SE HWY 212, Ste 305
   Clackamas, OR 97015
3. Presence (or not) of mixing baffles (EPA 5G):
   Not Present
4. Presence (or not) of mixing section (ASTM E2515):
   Present
5. A description of the tunnel turns (elbows or tees):
   Elbow from hood into mixing section, elbow from mixing section to sampling section, cleanout tee from sampling section to blower and damper section.
6. Physical diameter of the horizontal flue section:
   6”
7. Physical diameter of the tunnel at the sampling location:
   6”
8. Photograph showing the tunnel apparatus: **See photo and schematic**



Booth #1 Tunnel Schematic

All dimensions are in inches


Traverse Points
Sample Points

Aaron Kravitz

From: Aaron Kravitz
Sent: Wednesday, February 26, 2025 12:18 PM
To: John Voorhees; anthony@breckwell.com
Cc: Dustin Mantooth; Brandon Barry; John Steinert
Subject: SP24 Testing Delay

Anthony,

It's looking like some of the hardware on the stove may be faulty, so we'll have to postpone certficaton tesing... During the test run I'm noticing that the flame is very weak and the burn pot is flooding. I'm not totally sure of the cause but since it seems like the blower is running slow, I think we should replace both it and the control board. Please send the new board and exhaust blower to:

PFS-TECO
11785 SE Hwy 212 Suite 305
Clackamas, OR 97015

If the parts arrive early enough on Friday I could theoretically do the test that afternoon. Otherwise, we'll have to let EPA know that the testing is postponed until the week of March 10, since I am out of the office next week.

Thanks,
Aaron

Aaron Kravitz
Lab Manager - Portland Laboratory
PFS-TECO
11785 SE Highway 212 - Suite 305
Clackamas, OR 97015
www.pfsteco.com
503-650-0088

PFS-TECO

PFS Corporation d/b/a PFS TECO
An Employee-Owned Company

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Ken Morgan
Technical Services Director
OMNI-Test Laboratories, INC
Post Office Box 301367
Portland, Oregon, 97294

01/21/2025

Dear Mr. Morgan,

This letter is a modification of my original response letter dated December 13, 2024. This modification is made to include approval to use this alternative 40 CFR part 60, Subpart QQQQ - Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces (Subpart QQQQ). The approval to also use this alternative on central heaters under Subpart QQQQ should have been included in the original response letter. These letters are written in response to your emails and letter dated November 20, 2023, requesting that the Environmental Protection Agency approve for use an alternative test method (ATM) for demonstrating compliance with New Source Performance Standard (NSPS) Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA). Specifically, the filter weighing procedures as outlined in ASTM E2515-11 to determine compliance for wood heaters under 40 CFR Part 60. The Office of Air Quality Planning and Standards, as the delegated authority, must make the determination on any major alternatives to test methods and procedures required under 40 CFR parts 59, 60, 61, 63, and 65. Your proposed alternative test method and our approval decisions are discussed below.

Your letter outlines concerns with the gravimetric analysis of the pair of filters used to capture particulate during each compliance test. Specifically, you state that the method suggests that weighing filters and filter assemblies in pairs will reduce measurement error, but that the method provides direction inconsistent with achieving error reduction.

As detailed in your letter ASTM E2515-11 section 9.4.4 states:

> *"9.4.4 Desiccate the filters, filter gaskets, and the probe assemblies at 20 +/- 5.6°C (68 +/- 10°F) and ambient pressure for at least 24 h. Weigh each component at intervals of not less than 6 h until a constant weight is achieved. Record results to the nearest 0.1 mg. During each weighing, the period for which the components are exposed to the laboratory environment shall be less than 2 min. The filter gaskets can be weighed in sets to be used in each filter holder and kept in an identified container at all times except during sampling and weighing. The filter holder assembly after the front filter need not*

be desiccated or weighed."

As shown above, section 9.4.4 states that "…the filter gaskets may be weighed in pairs", however it does not say that you may do so for the filter tares.

In contrast, section 10.2.1 of ASTM E2515-11 states:

> *"10.2.1 Desiccate the filters and filter gaskets at 20 +/- 5.6°C (68 +/-10°F) and ambient pressure for at least 24 h. Weigh each component at intervals of at least 6 h until a constant weight is achieved. Report the results to the nearest 0.1 mg. Filters and filter gaskets may be weighed directly without a Petri dish. They may be weighed in pairs (front and back filters and front and back filter gaskets from same filter train) to reduce handling and weighing errors. During each weighing, the components shall not be exposed to the laboratory atmosphere for longer than 2 min. For the room air background sample filter and filter gasket, treat negative particulate catch weights as "zero" when determining total room air particulate weight in accordance with 10.2."*

Additionally, you point out that section 10.2.1 allows, during post-test analysis, the filters to be weighed in pairs. You also assert that not only does this section state that filters may be weighed in pairs, but it also expresses that it is advantageous to do in order to reduce handling and weighing errors.

Furthermore, during our recent discussions of this issue, you pointed out that since ASTM E2515-11 does not specify that filters may be weighed in pairs during pre-test processing, doing so would likely lead to concerns regarding whether proper procedures were being followed. Also,in response to our inquiry of whether ASTM E2515-11 could be followed as written, where one would weigh both filters independently during pre-test processing (clause 9.4.4) and in pairs during post-test processing (section 10.2.1), you point out that this defeats the intent of section 10.2.1 in that more measurements are being performed than necessary and this goes against the stated intent of reducing handling and weighing errors.

It is your opinion, given the language in ASTM E2515-11 discussed above, that the authors originally intended that both filter gaskets and filters should be weighed in pairs during both pre-test and post-test procedures in order to reduce such errors (as evidenced by the language in section 10.2.1). Based on this, you are asking for consideration and approval of an alternative test method that would allow pre-test processing (taring) of filters in pairs as is currently allowed for filter gaskets in section 9.4.4. As you state, you seek this alternative because the errors imposed by the extra weighing of independent filters can account for a very high degree of error on today's cleaner stoves where a ±0.1 mg of measured catch can mean ± 0.2 grams of emissions under ordinary conditions. In light of these circumstances, we agree that appropriate paired weighings must be done during both pre and post test weighings.

We have reviewed your request to perform the pre-test processing (taring) of filters in pairs as is currently allowed for filter gaskets in section 9.4.4 when conducting testing testing of wood heaters under Subpart AAA. Because of the similarities in the requirements, we are also approving this alternative for use on central heaters under Subpart QQQQ. This approval is contingent on the following conditions:

- All of the pieces of the filter and filter assemblies that are tared together during pre-test assessment must also be weighed together when the post-test gravimetric assessment is made and the results of these assessments must be recorded to the nearest 0.1 mg. Please note that this alternative method approval is valid until such time that Subpart AAA and QQQQ are revised or replaced to require a different certification method, and at such time, this alternative will be reconsidered and possibly withdrawn. A copy of this letter must be included in each certification test report where this alternative test method is utilized.

Since this alternative test method may be of interest to others performing testing as described in ASTM2515-11 on wood heaters subject to 40 CFR 60, Subpart AAA or central heaters subject to Subpart QQQQ, we believe it is reasonable to make it broadly applicable. Therefore, we will post this letter as ALT-154 on the EPA website at *https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods* for use by other interested parties.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Shannon Banner, EPA/OAQPS/SPPD
Lessard, Patrick, EPA/OAQPS/SPPD
Rafael Sanchez, EPA/OECA
Robert Scinta, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD
Mark Turner, EPA/OAQPS/SPPD
Richard Wayland, EPA/OAQPS/AQAD

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. John Steinert
Vice President
PFS TECO
11785 SE Hwy 212
Suite 305
Clackamas, OR 97015

02/04/2022

Dear Mr. Steinert,

I am writing you in response to your correspondence dated February 3, 2022, in which you request the use of an alternative testing procedure to demonstrate compliance with 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 test method and our approval decisions are discussed below.

According to the information provided, you seek an alternative test method for use when conducting testing on the United States Stove Company, Model KP5517 pellet heater. Currently, as required by section 60.534(a)(l)(i) of Subpart AAA, a manufacturer has the option to test their appliance in accordance with 40 CFR part 60, Appendix B, Method 28R for a crib fuel appliance or ASTM E2779-10 "Standard Test Method for Determining Particulate Matter Emissions from Pellet Heaters" (ASTM E2779-10) for a pellet fuel appliance. This request seeks an alternative to section 9.4.1.2 of ASTM E2779-10 which specifies test conditions for pellet heaters including the determination of the Medium Burn Rate Category and states that the medium burn rate must be ≤50% of the maximum burn rate.

In your request, you state that the specification for determining the medium burn rate found in ASTM E2779-10 is incorrect, and the Medium Burn Rate Category should be defined as less than 50% of the midpoint point (this is defined in the attached Memo as 50% of the span between the Maximum Burn Rate and the Low Burn Rate) between the high and low burn rates. Furthermore, your request includes a memorandum dated February 2, 2022, titled "Appropriate Calculation of Medium Burn Rate Category in ASTM E-2779 Testing" (attached) which was sent to the EPA's Office of Enforcement and Compliance Assurance. This memorandum states that an error had been uncovered in determining the appropriate Medium Burn Rate Category in ASTM E2779-10 for compliance pursuant to Subpart AAA. Specifically, section 9.4.1.2 of ASTM E2779-10 states that "the pellet heater shall be operated with the control or controls set in

the position(s) as needed to achieve a burn rate that is ≤ 50% of the maximum burn rate." Table 1 of ASTM E2779-10 also notes that the Medium Burn Rate Category test must be ≤ 50% of the maximum burn rate. The memorandum states that this is incorrect as it assumes that zero is the other bound for determining half of the maximum burn rate, and that the correct approach in determining the Medium Burn Rate Category should be at a level below 50% of the span between the Maximum Burn Rate and the Low Burn Rate (a non-zero value).

We have reviewed your request and agree that the Medium Burn Rate Category should be defined as less than 50% of the span between the high and low burn rates. Meaning that the Medium Burn Rate Category should be at a level below 50% of the span between the Maximum Burn Rate and the Low Burn Rate (a non-zero value).

Based on the information provided and with the caveats set forth below, we are approving your request for an alternative methodology used when calculating the Medium Burn Rate Category to conduct certification testing as required by Subpart AAA, section 60.534(a)(1)(i) on pellet heaters. This approval is based on the understanding that the Medium Burn Rate Category is defined as less than 50% of the span between the high and low burn rates. Additionally, this approval is based on the understanding that the lowest heat output (Btu/hr) setting available to the user, and corresponds to the lowest burn rate to be evaluated during certification testing; this is consistent with Subpart AAA, section 60.534(a)(1), 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."

With this Alternate Test Method, the following changes to ASTM E2779-10 must be followed for certification testing:

1. Medium Burn Rate Category burn rate is defined as:

   Nomenclature:
   Max = Maximum burn rate (kg/h)
   Min = Minimum burn rate (kg/h)

$$\frac{Max+Min}{2} \qquad \text{Eq.1}$$

All other requirements of ASTM E-2779-10 must be followed during the testing, and all requirements of 40 CFR part 60, Subpart AAA must be satisfied as described in your test report. A copy of this letter must be included in each certification test report where this alternative test method is utilized.

Because this alternative method may be of use to others, we feel that it is reasonable that this approval be broadly applicable to all pellet heaters tested in accordance with ASTM E2779-10 "Standard Test Method for Determining Particulate Matter Emissions from Pellet Heaters" and subject to the requirements of §60.534(a)(1)(i) of Subpart AAA. For this reason, we will post this

letter as ALT-146 on our website at *https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods* for use by other interested parties. This alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different pellet heater certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

If you have additional questions regarding this approval, please contact Angelina Brashear of my staff at 919-541-4746 or *brashear.angelina@epa.gov.*

Sincerely,

Steffan M Johnson

Steffan M. Johnson
Group Leader
Measurement Technology Group

cc: Angelina Brashear – EPA/OAQPS/AQAD
Chuck French – EPA/OAQPS/SPPD
Rafael Sanchez – EPA/OECA
Robert Scinta – EPA/OECA
Michael Toney – EPA/OAQPS/AQAD
Nathan Topham – EPA/OAQPS/SPPD
John Voorhees – United States Stove Company
Chet Wayland – EPA/OAQPS/AQAD

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

02/02/2022

SUBJECT: Appropriate calculation of Medium Burn Rate Category in ASTM E-2779 Testing

FROM: Steffan Johnson
Group Leader
Measurement Technology Group
Air Quality Assessment Division

STEFFAN JOHNSON
Digitally signed by STEFFAN JOHNSON
Date: 2022.02.02 08:28:07 -05'00'

TO: Robert Scinta, P.E.
Chief, Air Branch
Monitoring, Assistance, and Media Programs Division
Office of Compliance, Office of Enforcement and Compliance Assurance

During a recent review of pellet heater compliance test reports, the Measurement Technology Group has uncovered an error in determining the appropriate Medium Burn Rate Category when using ASTM E-2779 for compliance pursuant to 40 CFR 60, subpart AAA. Specifically, the method requirements in section 9.4.1.2 and Table 1 of that test method incorrectly require that the Medium Burn Rate Category must fall below 50% of the maximum burn rate. This is not correct as this requirement assumes then that zero is the other bound for determining half of the maximum.

9.4.1.2 *Medium Burn Rate Category*—For burn rates in the medium segment, except as allowed in 9.4.1.4 or 9.4.1.5, the pellet heater shall be operated with the control or controls set in the position(s) as needed to achieve a burn rate that is ≤50 % of the maximum burn rate.

TABLE 1

Burn Rate Segment	Maximum	Medium	Minimum
Description	Maximum achievable	≤ 50% of Maximum	Minimum achievable
Time at Burn Rate	60 +5 / – 0 minutes	120 +5 / – 0 minutes	180 +5 / – 0 minutes

The correct application of this requirement would be to determine the Medium Burn Rate Category at a level below 50% of the span between the Maximum Burn Rate and the Low Burn Rate (a non-zero value). Ergo, the correct calculation for finding that midpoint of 50% is defined as $\frac{Max+M}{2}$.

For example, if the Maximum Burn rate of an appliance is 1.79 kg/hr and the minimum is 1.23 kg/hr, the method would currently place the 50% requirement at 0.895 kg/hr. This is unachievable on this appliance and presents an impossible compliance requirement. Applying the equation laid out above the value of 1.51 is derived and, therefore, presents an appropriate and likely attainable emissions test requirement for the Medium Burn Rate Category.

During your reviews of such emissions tests, as reported to OECA and intended for compliance certification purposes, MTG recommends applying the above procedure in order to ascertain if a Medium Burn Rate was appropriately established during a compliance test.

CC:
Sarah Ayres - OECA
Angelina Brashear – OAQPS
Alice Edwards – Alaska DEC
Chuck French – OAQPS
Robert Lischinsky - OECA
Theresa Lowe - OAQPS
Rafael Sanchez – OECA
Robert Scinta - OECA
Mike Toney – OAQPS
Nathan Topham - OAQPS
Chet Wayland – OAQPS

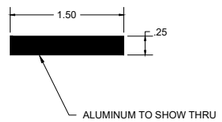
REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	3/5/25	SEH

LABELING VENDOR NOTES:

MATERIAL: 0.012 THK. ALUMINUM / 3M 9672 ADEHESIVE BACKED.

FINISH: BLACK BACKGROUND, ALUMINUM TO SHOW THRU
(ALL TEXT AND ILLUSTRATIONS) UNLESS NOTED OTHERWISE.

TEXT: ALL TEXT TO BE 0.06 HIGH UNLESS OTHERWISE SPECIFIED



1.90

ROOM HEATER, PELLET FUEL-BURNING TYPE, SUITABLE FOR MOBILE-HOME INSTALLATION
CHAUFFE-ROOM, PELLET À COMBUSTIBLE TYPE,CONÇU POUR MAISONS MOBILES.
DO NOT USE OTHER FUELS/ NE PAS UTILISER D'AUTRES COMBUSTIBLES

227 Industrial Park Rd. • South Pittsburg, TN 37380
Phone: 423-403-4031 • Web: www.breckwell.com

ENVIRONMENTAL PROTECTION AGENCY
Certified to comply with 2020 (ver/s)-Aeto emission standards. Tested to ASTM E2779 / EPA Method 28R -1.6/6 g/hr, 77% Efficiency.

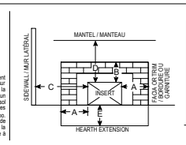
Report #: F21-689

Serial No. / N° de série

Date of Manufacture/ Date de Fabrication

Model/Modèle: SP24iE
Certified to/Certifié à ASTM E1509-2022 and Certified to/Certifié ULC S628
Maximum Input Rating: 4.0 lbs/hr- 1.81 kg/hr Electrical Rating: 115 V, 60Hz, 3 Amp. Do not obstruct the space beneath the heater. Install and use only in accordance with Manufacturer's Installation and Operating Instructions. Contact local building or fire officials about restrictions and installation inspection in your area. Use listed 3in/75mm diameter type "PL" Vent complete with components. See manufacturers installation instructions and local building codes for precautions required for passing a vent through a combustible wall or ceiling. Do Not Connect This Unit to a Chimney Flue Serving Another Appliance. Minimum clearances to combustibles: 12in/305mm to the back, 12in/305mm to the left side, 18in/457mm to the right side, 36in/914mm to the front, 9 in/200 mm to the sides and rear. This pellet fired appliance has been tested and listed for use in manufactured homes in accordance with Oregon Administrative Rules 814-23-900 through 814-23-909. For use with 1/4 in/6 mm to 3/8 in/9.5 mm diameter pelletized wood fuels only. Replace glass only with 5 mm ceramic glass. Do not route power cord beneath heater. Do not obstruct combustion air opening. Keep viewing and ash removal doors tightly closed during operation. This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

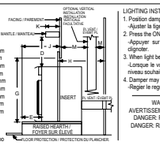
Débit Calorifique Maximum: 4.0 lbs/hr- 1.81 kg/hr. Caractéristiques Electriques: 115 V, 60Hz, 3 Amp. Ne pas obstruer l'espace sous le chauffe-eau. Installerel utiliser uniquement conformement le constructeur à la notice d'installation et d'utilisation. Contacter les autorités responsables de la construction ou des services de protection contre l'incendie sur les restrictions et l'inspection de montage dans la region. Utiliser un conduit d'evacuation certifié de type PL de 75 mm/3 po de diamètre avec ses composants. Se reporter à la notice d'installation et les codes du bâtiment locaux du fabricant pour connaître les precautions a prendre pour le passage d'un conduit d'evacuation à travers un mur ou un plafond combustible. Ne pas raccorder cette unité à un conduit de cheminée desservant un autre appareil. Inspecter et nettoyer le système d'evacuation perfectionnement. Un ect d'espacement minimum par rapport aux matériaux combustibles: 12in/305mm à l'arrière, 12in/305mm à gauche, 18in/457mm à droite, 36in/914mm à l'avant, 9 in/200 mm de chaque côté et de bois à été testé et certifiée pour être utilisé dans des maisons préfabriquées. A utiliser uniquement avec des bois de chauffage en granules de 6 mm/ 1/4 po à 9.5 mm/3/8 po. Remplacer le verre uniquement par un verre céramique de 5 mm. Ne pas acheminer de cordon d'alimentation sous l'appareil de chauffage. Ne pas obstruer l'orifice d'air de combustion. S'assurer que la vitre et la porte de retrait des cendres sont bien fermées lorsque l'appareil est en marche. Ce poêle à bois doit inspection périodique et la réparation pour un fonctionnement correct. Consultez le manuel du propriétaire pour plus d'informations. Il est contre les règlements fédéraux pour faire fonctionner ce poêle à bois d'une manière incompatible avec les instructions d'utilisation dans le manuel du propriétaire.



Minimum Clearance to Combustible Materials
Degagements Minimum Aux Materiaux Combustibles

Floor protection / Protection du plancher (continue next column) (continue vuen la seconde)	Side Facing / Parement Lateral	A	3 in/76 mm
	Top Facing / Parement Superieur	B	10 in/254 mm
Built-in fireplace installation installation du foyer encastré (Front view - vue de face)	Sidewall / Mur Lateral	C	5 in/127 mm
	Mantle/Manteau	D	14 in/356 mm
	Floor Protector / Protecteur de Plancher	E	6 in/155 mm
	Recess Width / Largeur de retrait	F	36 in/965 mm
	Recess Height / Hauteur de Retrait	G	22 in/559 mm
	Recess Depth / Profondeur de retrait	H	20 in/508 mm
	Adjacent Sidewall / Mur Lateral Adjacent	I	3.5 in/88 mm
	Hearth / Foyer	J	14 in/350 mm

RAISED HEARTH MUST BE BUILT OF 8" HOLLOW CONCRETE BLOCKS
LE FOYER SURÉLEVÉ DOIT ETRE CONSTRUIT DE BLOCS DE BETON CREUX DE 204mm/8po



LIGHTING INSTRUCTIONS/ INSTRUCTIONS D'ALLUMAGE
1. Position damper between closed and 1/4 open.
   -Ajuster la tige du regulateur de tirage entre la position fermee et 6mm (1/4 po).
2. Press the ON/OFF button. Green power light begins to blink.
   -Appuyer sur le bouton ON/OFF. (Marche/Arret). Le voyant vert se met a clignoter.
3. When light becomes solid, set desired heat level.
   -Lorsque le voyant s'arrete de clignoter et reste allume, regler le thermostat au niveau souhaite.
4. Damper may need to be adjusted based upon heat level.
   -Regler le regulateur de tirage suivant le niveau de chaleur souhaite.

WARNING -DO NOT REMOVE OR COVER THIS LABEL
AVERTISSEMENT-NE PAS ENLEVER NI RECOUVRIR CETTE ETIQUETTE
DANGER: Risk of electrical shock. Disconnect power before servising unit.
DANGER: Risque de choc électrique. Débrancher toute alimention avant de procéder a un entretien de l'appareil.

854235

21.75

TOLERANCES EXCEPT AS NOTED	HOLES ± .005"
	DECIMAL .XX = 0.03 XXX = 0.010
	ANGULAR ± 2°

DESCRIPTION	SCALE
SEE NOTES	1/2
FINISH	DWN BY
SEE NOTE	SEH
REFERENCE	DATE
SP24iE	3/5/25

SIZE	REV
B	A

UNITED STATES STOVE COMPANY
ESTABLISHED 1869

TITLE	NUMBER	SHEET
SP24 CERTIFICATION PLATE	854235	1 OF 1

Owner's Instruction and Operation Manual

BRECKWELL

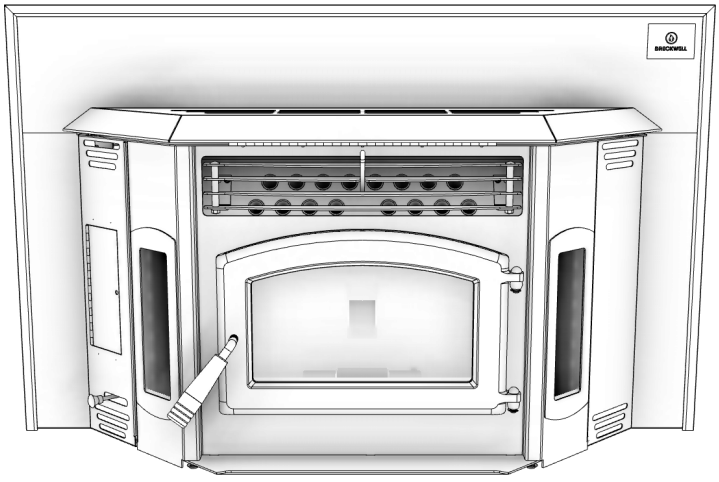
Model Number:

SP24iE

PFS® C US

Report Number: F21-689

Certified to ASTM E1509-2022 and ULC-S628-93 (R 2016)



* All Pictures In This Manual Are For Illustrative Purposes Only. Actual Product May Vary.

854234 rev A

Save These Instructions In A Safe Place For Future Reference.

SAFETY NOTICE: If this heater is not properly installed, a house fire may result. For your safety, follow the installation instructions. Never use make-shift compromises during the installation of this heater. Contact local building or fire officials about permits, restrictions and installation requirements in your area. NEVER OPERATE THIS PRODUCT WHILE UNATTENDED.

CAUTION! Please read this entire manual before you install or use your new room heater. Failure to follow instructions may result in property damage, bodily injury, or even death. Improper Installation Will Void Your Warranty!

U.S. Environmental Protection Agency

Certified to comply with 2020 particulate emissions standards.

CALIFORNIA PROPOSITION 65 WARNING:

This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects, and/or other reproductive harm. For more information, go to www.P65warnings.ca.gov

THIS MANUAL IS SUBJECT TO CHANGE WITHOUT NOTICE.

 PH. 423-403-4031

INTRODUCTION

This manual describes the installation and operation of the Breckwell, SP24(i)E wood heater. This heater meets the 2020 U.S. Environmental Protection Agency's crib wood emission limits for wood heaters sold after May 15, 2020. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 5,993 to 22,587 Btu/hr, 0.66 g/hr, and 77% efficiency.

This stove has been independently tested to ASTM E1509-2022 Standard Specification for Room Heaters, Pellet Fuel Burning Type 1, ULC-S628-93 (R 2016) Standard for Solid Fuel Room Heaters, and Oregon Administrative Rules for Mobile Homes (814-23-900 through 814-23-909) and Installation as a Stove Heater.

Heating Specifications			
Fuel Burn Rate	1-3.21 lbs /hr. (0.45-1.46 kg/hr)		* Pellet size may affect the actual rate of fuel feed, burn times, and hopper capacity. Fuel feed rates may vary by as much as 20%. Use PFI listed fuel for best results.
Hopper Capacity *	up to 70 lbs (31.75 kg)		
Flue Size	3" or 4" (77 mm or 102 mm)		
Electrical Specifications			
Electrical Rating	115 Volts AC, 60 HZ, 3.0 Amps		
Dimensions			
Fireplace Insert	Width	22" (559 mm) at fireplace rear	
		29-1/2" (750 mm) at fireplace opening	
	Height	21" (534 mm) in fireplace	
	Depth	23-1/2" (597 mm) total	
		16-3/8" (416 mm) in fireplace	
Flashing	Medium	28" (712 mm) x 44-1/2" (1131 mm) x N/A	
	Large	32" (813 mm) x 48-1/2" (1232 mm) x N/A	
Weight	Insert	250 lbs (113.4 kg)	
	Flashing	13 lbs (9 kg)	

WARNING:

IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH THE OPERATING INSTRUCTIONS IN THE OWNER'S MANUAL.

RETAIN YOUR ORIGINAL RECEIPT FOR ANY WARRANTY CLAIMS. CONTACT YOUR DEALER OR INSTALLER IF YOU NEED TO FILE A CLAIM.

Note: Register your product by using your smart phone with the QR code. Save your receipts with your records for any warranty claims.

You can also register your product online at www.breckwell.com/product-registration

INSTALLATION CHECKLIST

BRECKWELL

Your Wood Stove should be installed by a qualified installer only. An NFI qualified Installer can be found at

www.nficertified.org/public/find-an-nfi-pro/

For customer service, please contact your Breckwell dealer.

COMMISSIONING CHECKLIST

This checklist is to be completed in full by the qualified person who installs this unit. Keep this page for future reference.

Failure to install and commission according to the manufacturer's instructions and complete this checklist will invalidate the warranty.

Please Print

Customer Name:	Telephone Number:
Address:	
Model:	
Serial Number:	
Installation Company Name:	Phone Number:
Installation Technician's Name:	License Number:

DESCRIPTION OF WORK

Location of installed appliance: _____

Venting System: New Venting System ☐ Yes ☐ No If yes, Brand _____

If no, Date of inspection of existing venting system: _____

COMMISSIONING

Confirm Hearth Pad Installation as per Installation Instructions ..... ☐

Confirm proper placement of internal parts ..... ☐

Check soundness of door gasket and door seals ..... ☐

Confirm clearances to combustibles as per installation instructions in this manual ..... ☐

Check the operations of the air controls ..... ☐

Confirm the venting system is secure and sealed ..... ☐

Confirm the stove starts and operates properly ..... ☐

Check to ensure a CO alarm is installed as per local building codes and is functional ..... ☐

Explain the safe operation, proper fuel usage, cleaning, and routine maintenance requirements ..... ☐

Declaration of Completion: As the qualified person responsible for the work described above, I confirm that the appliance as associated work has been installed as per manufacturer's instructions and following any applicable building and installation codes.

Signed: _____ Print Name: _____ Date: _____

Home Owner: RETAIN THIS INFORMATION FOR FUTURE REFERENCE

FOR CUSTOMER ASSISTANCE CALL YOUR BRECKWELL DEALER.

SAFETY NOTICE

- IF THIS STOVE IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS.
- CONTACT YOUR LOCAL BUILDING OFFICIALS TO OBTAIN A PERMIT AND INFORMATION ON ANY ADDITIONAL INSTALLATION RESTRICTIONS OR INSPECTION REQUIREMENTS IN YOUR AREA.
- DO NOT PLACE CLOTHING OR OTHER FLAMMABLE ITEMS ON OR NEAR THIS STOVE.
- NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR 'FRESHEN UP' A FIRE IN THIS STOVE. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE STOVE WHILE IT IS IN USE.
- INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.
- DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT.
- YOUR STOVE REQUIRES PERIODIC MAINTENANCE AND CLEANING (SEE "MAINTENANCE"). FAILURE TO MAINTAIN YOUR STOVE MAY LEAD TO IMPROPER AND/OR UNSAFE OPERATION.
- A POWER SURGE PROTECTOR IS REQUIRED. THIS UNIT MUST BE PLUGGED INTO A 120V, 60 HZ GROUNDED ELECTRICAL OUTLET. DO NOT USE AN ADAPTER PLUG OR SEVER THE GROUNDING PLUG. DO NOT ROUTE THE ELECTRICAL CORD UNDERNEATH, IN FRONT OF, OR OVER THE HEATER. DO NOT ROUTE THE CORD IN FOOT TRAFFIC AREAS OR PINCH THE CORD UNDER FURNITURE.

CAUTION:

BURNING FUEL CREATES CARBON MONOXIDE AND CAN BE HAZARDOUS TO YOUR HEALTH IF NOT PROPERLY VENTED.

ATTENTION:

- A WORKING SMOKE DETECTOR MUST BE INSTALLED IN THE SAME ROOM AS THIS PRODUCT.
- INSTALL A SMOKE DETECTOR ON EACH FLOOR OF YOUR HOME; INCASE OF ACCIDENTAL FIRE FROM ANY CAUSE IT CAN PROVIDE TIME FOR ESCAPE.
- THE SMOKE DETECTOR MUST BE INSTALLED AT LEAST 15 FEET (4,57 M) FROM THE APPLIANCE IN ORDER TO PREVENT UNDUE TRIGGERING OF THE DETECTOR WHEN RELOADING.

CAUTION:

- DO NOT UNPLUG THE STOVE IF YOU SUSPECT A MALFUNCTION. TURN THE ON/OFF SWITCH TO "OFF' AND CONTACT YOUR DEALER. TURNING THE STOVE "OFF" DOES NOT DISCONNECT ALL POWER FROM THE STOVE.
- THE HEATER WILL NOT OPERATE DURING A POWER OUTAGE. IF A POWER OUTAGE DOES OCCUR, CHECK THE HEATER FOR SMOKE SPILLAGE AND OPEN A WINDOW IF ANY SMOKE SPILLS INTO THE ROOM.
- DO NOT OPERATE YOUR STOVE IF YOU SMELL SMOKE COMING FROM IT. TURN IT OFF, MONITOR IT, AND CALL YOUR DEALER.
- NEVER BLOCK FREE AIRFLOW THROUGH THE OPEN VENTS OF THE UNIT.

WARNING:

- IF THE STOVE IS INSTALLED IN A ROOM WITHOUT AIR CONDITIONING, OR IN AN AREA WHERE DIRECT SUNLIGHT CAN SHINE ON THE UNIT, IT IS POSSIBLE THIS CAN CAUSE THE TEMPERATURE OF THE STOVE TO RISE TO OPERATIONAL LEVELS; ONE OF THE SENSORS COULD THEN MAKE THE STOVE START ON ITS OWN. IT IS RECOMMENDED THAT THE STOVE BE UNPLUGGED WHEN NOT IN USE FOR EXTENDED AMOUNTS OF TIME (I.E. DURING THE SUMMER MONTHS).
- THE EXHAUST SYSTEM MUST BE COMPLETELY AIRTIGHT AND PROPERLY INSTALLED. THE PELLET VENT JOINTS MUST BE SEALED WITH RTV 500°F (260°C) SILICONE SEALANT, AND WITH UL-181-AP FOIL TAPE.

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We recommend that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

Breckwell Hearth highly recommends your stove be installed by a qualified NFI (US) or WETT (Canada) technician. To find the nearest qualified installer, go to:

https://nficertified.org,

https://www.wettinc.ca/

PREPARATION

Factory packaging must be removed, and some minor assembly work is required prior to installation. Access to the rear of the stove is necessary. The circuit board/control panel must be unpacked and installed in the side flashing on the insert. (See installation instructions provided with the circuit board) NOTE: Normally, your dealer will perform these functions.

IMPROPER INSTALLATION

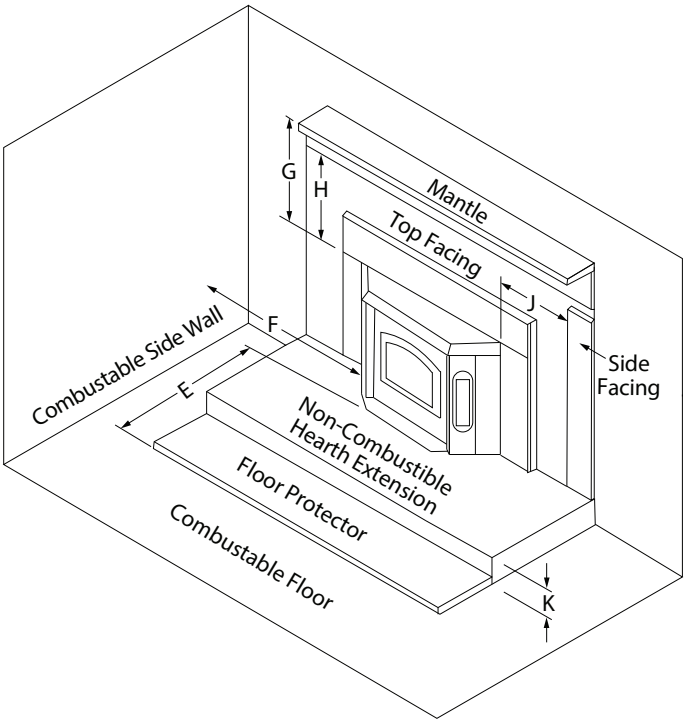
The use of other components other than stated herein could cause bodily harm, heater damage, and void your warranty. The manufacturer will not be held responsible for damage caused by the malfunction of a stove due to improper venting or installation.

FLOOR PROTECTION

This heater must have a non-combustible floor protector with an insulated rating of 'R1' installed beneath it if the floor is of combustible material.

CLEARANCES

This pellet stove has been tested and listed for installation in residential, mobile home in accordance with the clearances given below. This insert is approved for installation into code complying masonry fireplaces. This insert is also approved for use in listed factory built fireplaces (UL 127) and standard residential built-ins, including mobile home built-in installations.



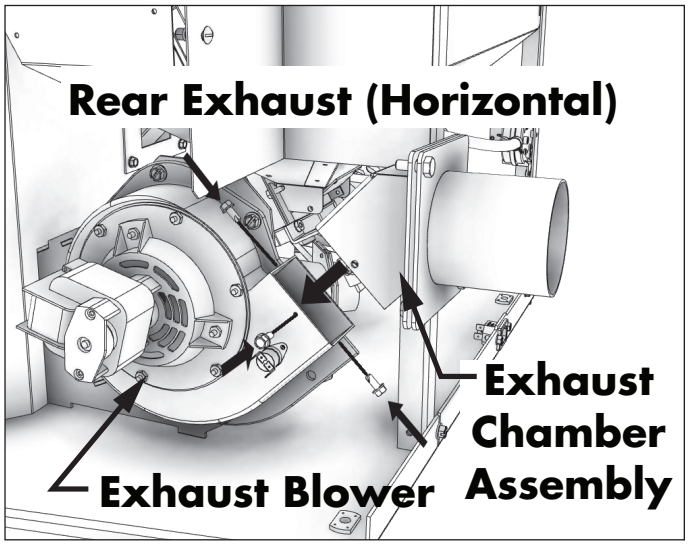
E	6″	153 mm
F	5″	127 mm
G	14″	356 mm
H	10″	254 mm
J	3″	77 mm
K	0″	0 mm

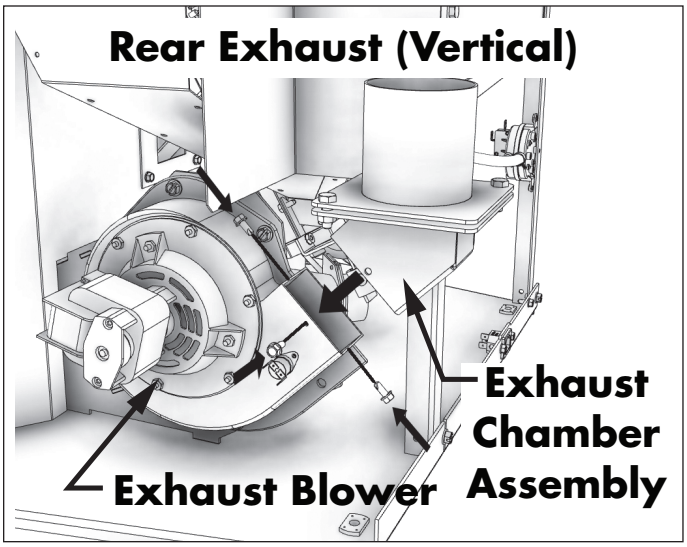
COMBUSTION AIR SUPPLY

ATTENTION:
DO NOT VENT UNDER ANY PORCH, DECK, AWNING, OR IN ANY SEMI ENCLOSED OR ROOFED AREA. DOING SO MAY RESULT IN UNPREDICTABLE AIRFLOW AT THE VENT CAP UNDER CERTAIN CONDITIONS AND CAN AFFECT THE PERFORMANCE OF YOUR STOVE, AS WELL AS, OTHER UNFORESEEABLE ISSUES.

To convert from horizontal rear exhaust to vertical rear exhaust or vice versa follow these steps:

1. Remove the four screws that are securing the exhaust chamber assembly to the exhaust blower.
2. Completely remove all silicone.
3. Apply new silicone.
4. Rotate exhaust assembly and reinstall. Reuse the four screws to secure the exhaust chamber to the exhaust blower.





WHEN OUTSIDE AIR IS NOT USED

If outside air is not used, it is important that combustion air is easily available to the air inlet. A closeable outside air register can be used in tightly insulated homes. In insert installations, flashing vents should not be restricted. The flashing should not necessarily seal the fireplace face.

IMPORTANCE OF PROPER DRAFT

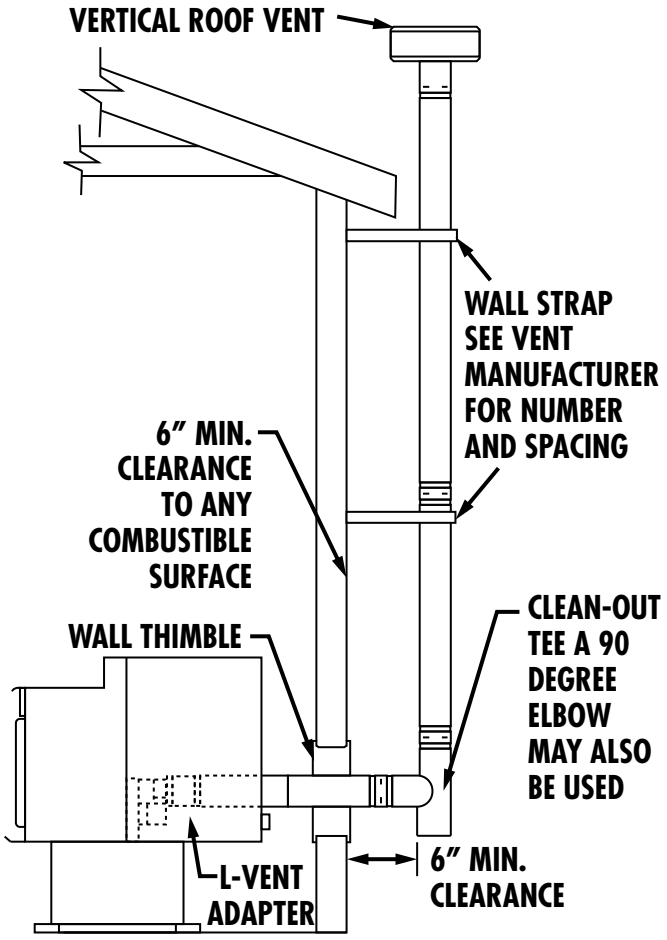
Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance. Inadequate draft may cause backpuffing into the room and 'plugging' of the chimney. Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints. An uncontrollable burn or excessive temperature indicates excessive draft. Take into account the chimney's location to ensure it is not too close to neighbors or in a valley which may cause unhealthy or nuisance conditions.

VENTING

This unit is certified for use with listed type PL-Vent, 3" or 4" diameter in size. The stove was tested with Simpson Duravent brand. Class "A" chimney is not required. Refer to the instructions provided by the vent manufacturer, especially when passing through a wall, ceiling or roof. This is a pressurized exhaust system. All vent connector joints must be sealed with 500°F (260°C) RTV silicone sealant to ensure consistent performance and avoid smoke spillage. All horizontal connector joints must be sealed with UL-181-AP foil tape. We recommend that all vertical vent connector joints be secured with a minimum of 3 screws. It is strongly recommended that you have a minimum of 6' of vertical pipe in your exhaust system. For best performance of the stove limit the number of elbows and horizontal pipe as much as possible.

WARNING:

- **INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.**
- **DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.**
- **DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS UNIT. INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.**

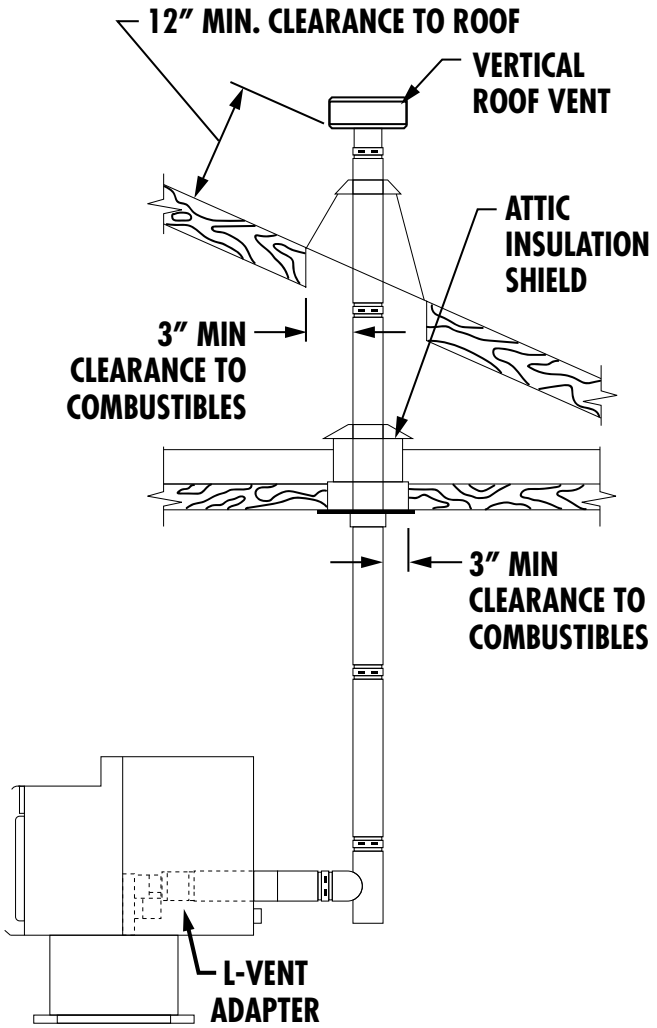


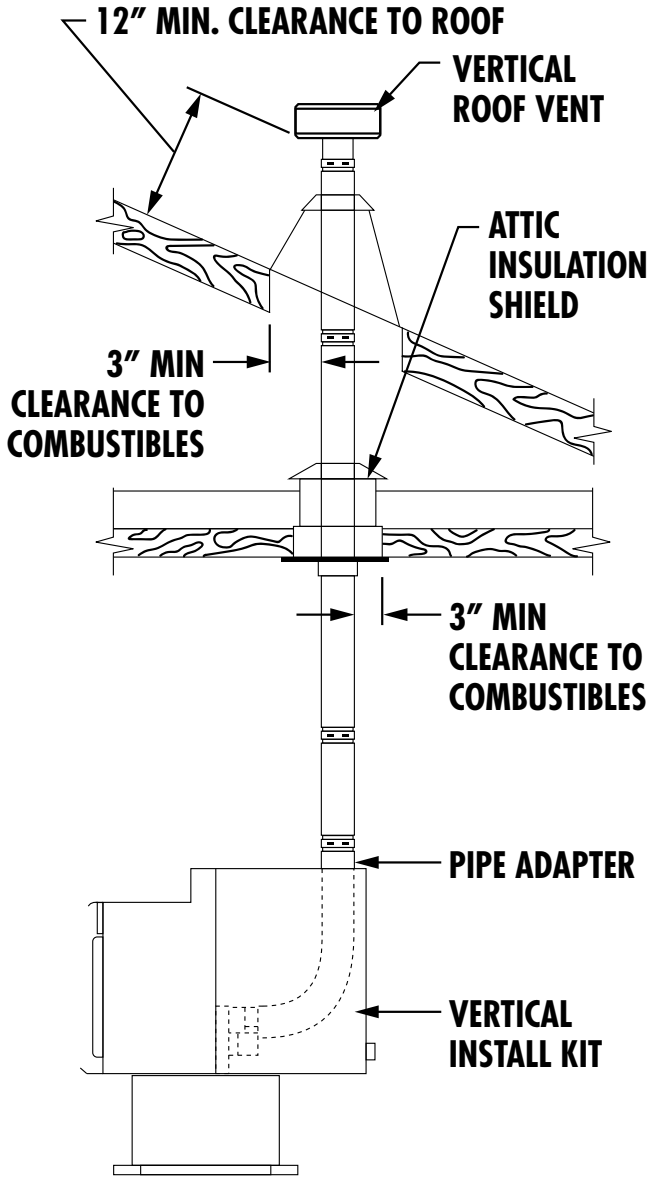
VERTICALLY WITH NEW CHIMNEY SYSTEM)

OPTION: To achieve a center vertical installation a 45° elbow and a clean-out tee can be used to offset the pipe from the exhaust outlet to the rear center of the stove.

OPTION: Install PL-Vent elbow in place of clean-out tee. Locate stove. Drop plumb bob to center of tee outlet, mark point on ceiling. Install ceiling support and PL-Vent pipe per PL-Vent manufacturer's instructions.

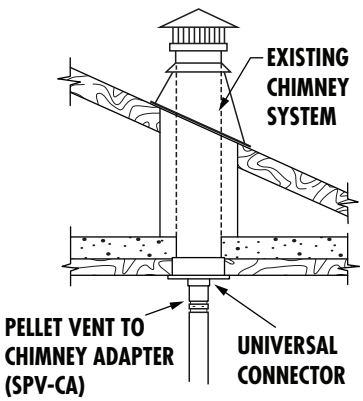
1. Always maintain 3″ clearance from combustible materials. When passing through additional floors or ceilings, always install a firestop spacer.
2. After lining up for the hole in the roof, cut either around or square hole in the roof, always 3″ larger all the way around the pipe. Install the upper edge and sides of flashing under roofing materials, nail to the roof along the upper edge. Do not nail the lower edge. Seal nail heads with non-hardening waterproof mastic.
3. Apply non-hardening, waterproof mastic where the storm collar will meet the vent and flashing. Slide the storm collar down until it sits on the flashing. Seal and install cap. Mobile home installations must use a spark arrester.

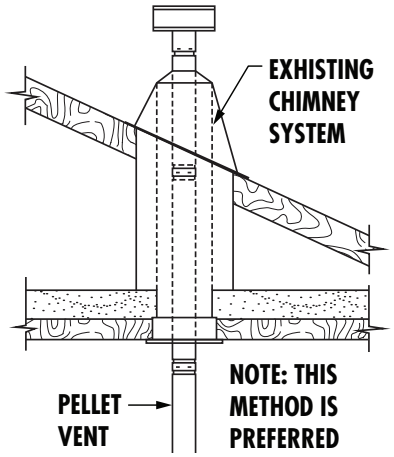




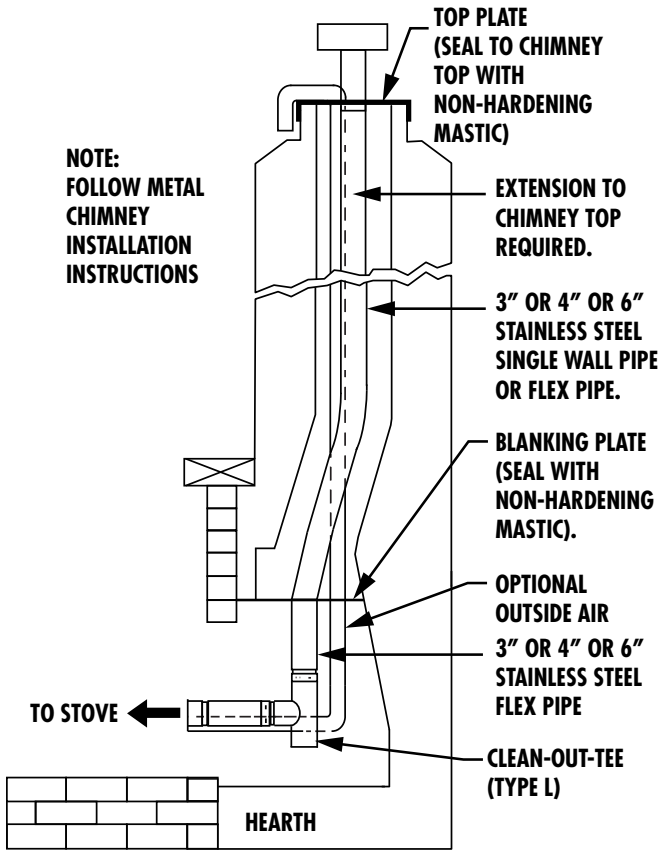
VERTICALLY INTO EXISTING CHIMNEY SYSTEM

Adapters are available to adapt from 3″ PL-Vent to 6″ or 8″ Class-A chimney. As an alternative, 3″ or 4″ PL-Vent can be run inside existing chimney to termination. This is the preferred method. Follow guidelines for equivalent vent length.





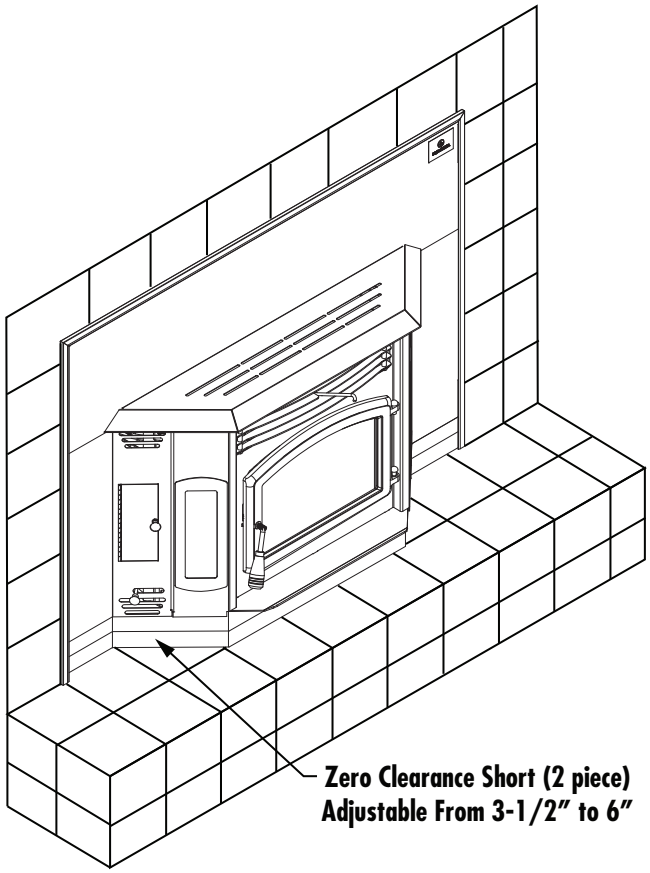
VERTICALLY INTO EXISTING MASONRY FIREPLACE



1. Have the masonry chimney inspected by a qualified chimney sweep or installer to determine its structural condition.
2. You will need a pipe length equal to the chimney height from the hearth. If outside combustion air is to be used, you will need a pipe length equal to the chimney height plus 18 inches.
3. Install a blanking plate and the chimney pipe, and if used the outside air pipe.

INSERT INSTALLATIONS

Insert installations must be vented with 3" or 4" pipe. Pipe may be single wall stainless steel flexible pipe. Vent may terminate within chimney beyond a blanking plate or extend to the chimney top. See "COMBUSTION AIR SUPPLY" for outside air access information. The fireplace and chimney should be cleaned thoroughly before starting the installation. We suggest painting the interior of particularly old and dirty fireplaces to seal any odors.



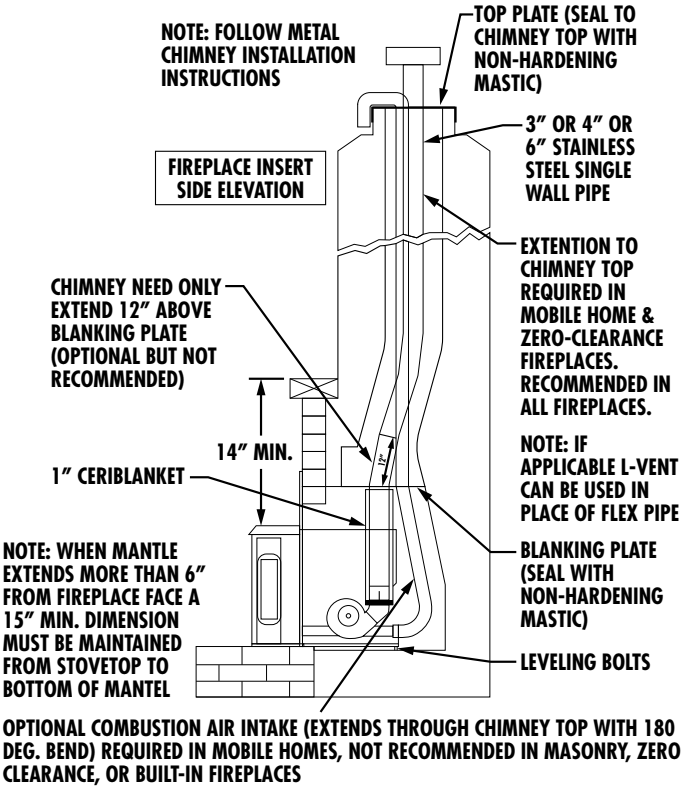
ASSEMBLING THE FLASHING SET

Follow the instructions packaged with the flashing set.

WHEN VENT PIPE EXTENDS TO CHIMNEY TOP

1. You will need a pipe length equal to the chimney height (from hearth) plus 6 inches. If outside combustion air is to be used, you will need a pipe length (see "COMBUSTION AIR SUPPLY") equal to the chimney height plus 12 inches.
2. Attach cerablanket wrap to the end of vent pipe that will connect to the stove. Use 12-inch lengths of light gauge metal wire (not included) or metallic tape (not included). This is to protect interior components from excess heat.
3. Set the insert on the hearth and slide it in far enough to attach the vent pipe (and combustion pipe if used).

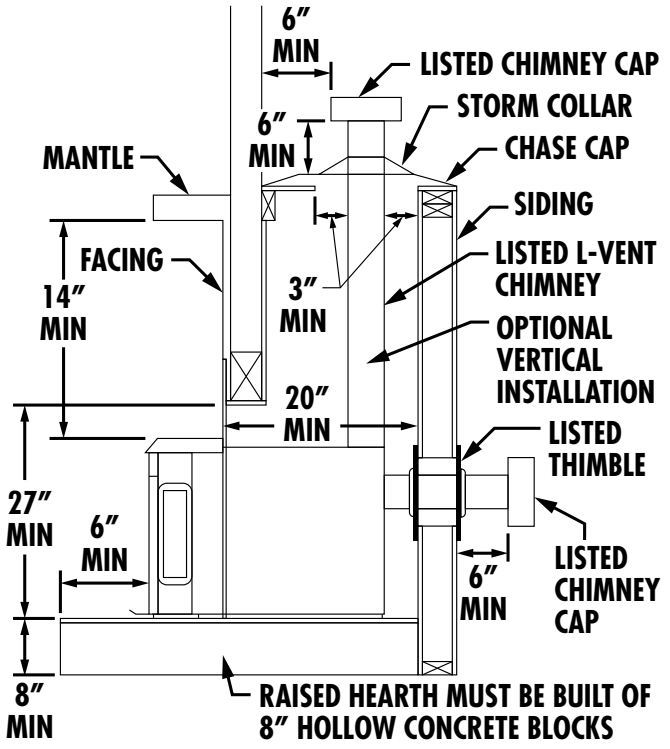
4. Attach flashing, route power cord out the side nearest a 120V receptacle. Slide in insert.
5. Measure and build chimney top. Cut out hole for vent pipe (and combustion air intake pipe, if used). Install and seal with a non-hardening mastic to prevent water leakage. Install the vent cap.



WHEN VENT PIPE EXTENDS THROUGH CHIMNEY BLANKING PLATE (MASONRY FIREPLACES ONLY)

1. You will need a pipe length that extends 12" above the blanking plate. NOTE: This installation is optional but not recommended. Outside combustion air cannot be drawn from the chimney cavity in this installation.
2. Attach cerablanket wrap to that end of vent pipe that will connect to the stove. Use 12-inch lengths of light gauge metal wire (not included) or metallic tape. This is to protect interior components from excess heat.
3. Measure and build blanking plate. Cut out hole for vent pipe (and combustion air intake pipe, if used). Install and carefully seal blanking plate with non-hardening mastic. Failure to properly seal may result in smoke spillage.
4. Slide vent pipe (and intake pipe if used) up through the blanking plate hole, leaving enough to pull back down.
5. Set the insert on the hearth, adjust the leveling bolts on the rear sides, and slide it in far enough to attach the vent pipe (and combustion air pipe if used). Be sure to seal where the pipe passes through the blanking plate.
6. Attach flashing), route power cord out the side nearest a 120V receptacle. Slide in insert.

AS A BUILT-IN FIREPLACE



The figure describe the installation vented into either a special chase built outside an outer wall or a false inside wall. This is especially suited for new construction or remodeling. The equipment compartment (sides and rear of the stove in fireplace) must be enclosed per the applicable electrical standards. NOTE: Floor protection for Built-in raised hearths requires a continuous sheet beneath to prevent the possibility of embers falling through to the combustible floor if cracks or separation should occur in the finished surface. The chase dimensions shown are minimums and must be maintained.

INSTALLATION IN TO A FACTORY BUILT (METAL) FIREPLACE

When installing into a factory built fireplace, the firebox must accept the insert without modification other than removing bolted or screwed together pieces such as smoke shelf/deflectors, ash lips, screen or door tracks and damper assemblies. These items must be reinstalled to restore the fireplace to its original operating condition if the insert is removed and not replaced. The removal of any part must not alter the integrity of the listed fireplace in any way. The factory built fireplace must be listed per UL 127. Installation

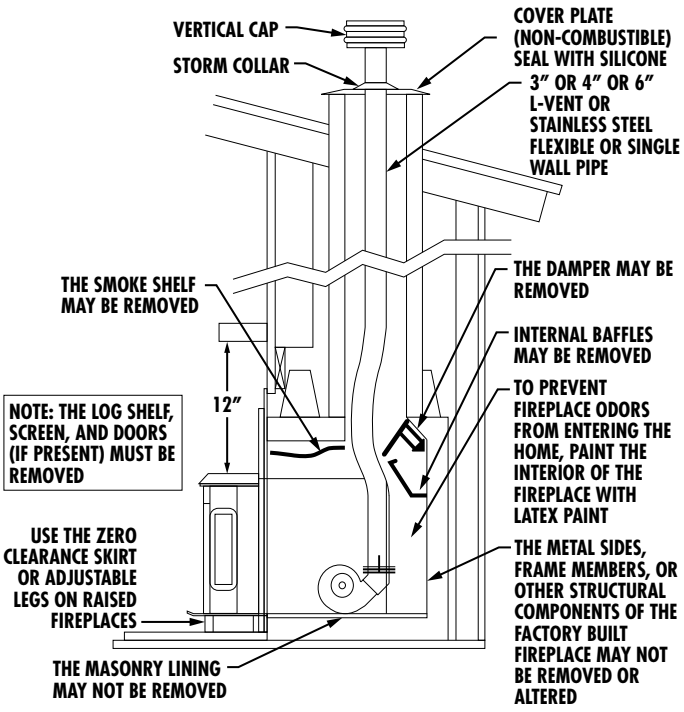
must include a full height listed chimney liner meeting type HT requirements (2100° F) per 1777 (U.S.). The liner must be securely attached to the insert flue collar and the chimney top. The damper area must be sealed to prevent room air passage to chimney cavity. Alteration of the fireplace in any manner is not permitted except with the following exceptions:

- External trim pieces, which do not affect the operation of the fireplace, may be removed proving they can be stored on or within, the fireplace for re-assembly if the insert is removed.
- The fireplace damper may be removed to install the chimney liner.

Circulating air chambers, louvers or cooling air inlet or outlet ports (i.e. in a steel fireplace liner or metal heat circulator) shall not be blocked. Means must be provided for removal of the insert to clean the chimney flue. A permanent metal warning label must be attached to the back wall of the fireplace opening stating the following:

- This fireplace has been altered to accommodate a fireplace insert and should be inspected by a qualified person prior to re-use as a conventional fireplace.
- This label is available upon request.

Final approval is contingent on the authority having jurisdiction.



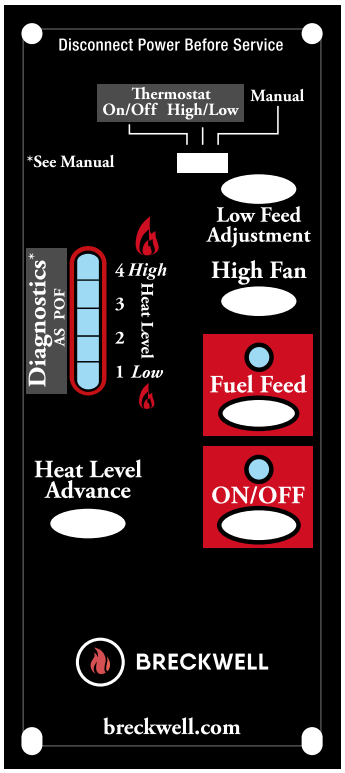
SECURING APPLIANCE TO THE FLOOR

WARNING! DO NOT INSTALL IN SLEEPING ROOM.
CAUTION! THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.
WHEN INSTALLED IN A MOBILE HOME, THE STOVE MUST BE GROUNDED DIRECTLY TO THE STEEL CHASSIS AND BOLTED TO THE FLOOR.

In addition to the previously detailed installation requirements, mobile home installations must meet the following requirements:

- This stove must be securely fastened to the floor of the mobile home using two 1/4" lag bolts that are long enough to go through both a hearth pad, if used, and the floor of the home.
- The heater must be electrically grounded to the steel chassis of the mobile home with 8 GA copper wire using a serrated or star washer to penetrate paint or protective coating to ensure grounding.
- When moving your mobile home, all exterior venting must be removed while the mobile home is being relocated. After relocation, all venting must be reinstalled and securely fastened.
- Outside Air is mandatory for mobile home installation. See the "Outside Air Supply" section and your dealer for purchasing.
- Check with your local building officials as other codes may apply.

PANEL CONTROLS



The blowers and automatic fuel supply are controlled from a panel on this unit. The control panel functions are as follows.

ON/OFF SWITCH

- When pushed the stove will automatically ignite. No other firestarter is necessary. The igniter will stay on for at least 10 and up to 15 minutes, depending on when Proof of Fire is reached. The fire should start in about 5 minutes.
- The green light located above the On/Off button (in the On/Off box) will flash during the ignition start-up period.
- The Feed Rate Advance is inoperable during the ignition start period. When the red light continuously stays on the Feed Rate Advance can be adjusted to achieve the desired heat output.

NOTE: If the stove has been shut off, and you want to re-start it while it is still warm, the "On/Off" button must be held down for 2 seconds.

FUEL FEED SWITCH

CAUTION:
DO NOT USE THIS CONTROL DURING NORMAL OPERATION BECAUSE IT COULD SMOTHER THE FIRE AND LEAD TO A DANGEROUS SITUATION.

- When the "Fuel Feed" button is pushed and held down the stove will feed pellets continuously into the burnpot.
- While the stove's auger system is feeding pellets the amber light (in the "Fuel Feed" box) will be on.

HIGH FAN SWITCH

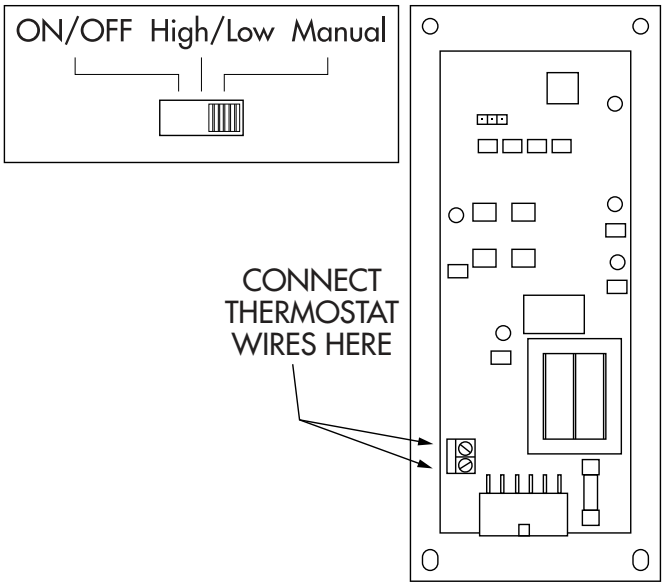
- The room air fan speed varies directly with the feed rate. The "HIGH FAN" switch overrides this variable speed function. It will set the room air blower speed to high at any feed rate setting.
- When the "High Fan" button is pushed the room air fan will switch to its highest setting.
- When this button is pushed again the room air fan will return to its original setting based on the Feed Rate Advance setting.

HEAT LEVEL ADVANCE

- This button when pushed will set the pellet feed rate, hence the heat output of your stove. The levels of heat output will incrementally change on the bar graph starting from level "1" to "4". NOTE: When dropping more than 2 heat level settings (i.e. 4 to 1) push the "High Fan" button and allow the room air fan to run at that setting for at least 5 minutes to prevent the stove from tripping the high temp thermodisc. If the high temp thermodisc does trip (see "Safety Features" section of this manual).

OPTIONAL THERMOSTAT

An optional thermostat may help you maintain a constant house temperature automatically. A millivolt thermostat is required. The control panel can be set up two ways to operate your stove in thermostat mode.



THERMOSTAT INSTALLATION

- A millivolt thermostat is required.
- Unplug stove from power outlet.
- Remove control board from stove.
- The two thermostat wires connect to the terminal block on the lower left side of the back of the control board.
- Insert the wires in the terminal side and tighten the two screws.

MODES

To switch between any of the three modes the stove must be shut off, the new mode selected, and the stove restarted.

MANUAL MODE

- Use this mode exclusively if you do not connect an optional thermostat
- In this mode the stove will operate only from the control panel as detailed in this owner's manual.

HIGH/LOW THERMOSTAT MODE

- Use this mode only if you connect a thermostat
- When engaged in this mode the stove will automatically switch between two settings. When warm enough, it will switch to the #1 or low setting. The room air blower will also slow to its lowest speed.
- The heat level advance setting on the bar graph will stay where it was initially set. When the house cools below the thermostat setting, the stove will switch to the feed rate of the heat level advance setting.

ON/OFF THERMOSTAT MODE

WARNING:
• **DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE - NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THIS STOVE. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE STOVE WHILE IT IS IN USE.**
• **HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.**

- Use this mode only if you connect a thermostat
- In this mode when the home is warm enough the stove will shut off. The fans will continue to run until the stove cools.
- When the home cools below the thermostat setting, the stove will automatically restart and run at the last feed rate setting. NOTE: When in "high/low" or "on/off" thermostat mode – Do not operate the stove higher than the #3 setting. Set damper control rod approximately 1/4" to 1/2" out. This will vary depending on elevation and weather conditions. Observe stoves operation and adjust damper as necessary.

This heater is designed to burn only PFI Premium grade pellets. DO NOT BURN:

1. Garbage;
2. Lawn clippings or yard waste;
3. Materials containing rubber, including tires;
4. Materials containing plastic;
5. Waste petroleum products, paints or paint thinners, or asphalt products;
6. Materials containing asbestos;
7. Construction or demolition debris;
8. Railroad ties or pressure-treated wood;
9. Manure or animal remains;
10. Salt water driftwood or other previously salt water saturated materials;
11. Unseasoned wood; or
12. Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater.

Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.

PROPER FUEL

ATTENTION:
THIS APPLIANCE IS DESIGNED FOR THE USE OF PELLETIZED FUEL THAT MEET OR EXCEED THE STANDARD SET BY THE PELLET FUEL INSTITUTE (PFI).

Your pellet stove is designed to burn premium hardwood pellets that comply with the Pellet Fuels Institute (PFI) standard (minimum of 40 lbs density per cubic ft, 1/4" to 5/16" diameter, length no greater than 1.5", not less than 8,200 BTU/lb, moisture under 8% by weight, ash under 1% by weight, and salt under 300 parts per million). Pellets that are soft, contain excessive amounts of loose sawdust, have been, or are wet, will result in reduced performance. Store your pellets in a dry place. DO NOT store the fuel within the installation clearances of the unit or within the space required for refuelling and ash removal. Doing so

could result in a house fire. Do not over fire or use volatile fuels or combustibles, doing so may cause a personal and property damage hazards.

THIS STOVE IS APPROVED FOR BURNING PELLETIZED WOOD FUEL ONLY ! Factory-approved pellets are those 1/4" or 5/16" in diameter and not over 1" long. Longer or thicker pellets sometimes bridge the auger flights, which prevents proper pellet feed. Burning wood in forms other than pellets is not permitted. It will violate the building codes for which the stove has been approved and will void all warranties. The design incorporates automatic feed of the pellet fuel into the fire at a carefully prescribed rate. Any additional fuel introduced by hand will not increase heat output but may seriously impair the stoves performance by generating considerable smoke. Do not burn wet pellets. The stove's performance depends heavily on the quality of your pellet fuel. Avoid pellet brands that display these characteristics:

- Excess Fines – "Fines" is a term describing crushed pellets or loose material that looks like sawdust or sand. Pellets can be screened before being placed in hopper to remove most fines.
- Binders – Some pellets are produced with materials to hold the together, or "bind" them.
- High ash content – Poor quality pellets will often create smoke and dirty glass. They will create a need for more frequent maintenance. You will have to empty the burn pot plus vacuum the entire system more often. Poor quality pellets could damage the auger. We cannot accept responsibility for damage due to poor quality pellet.

CAUTION:
• **KEEP FOREIGN OBJECTS OUT OF THE HOPPER.**
• **THE MOVING PARTS OF THIS STOVE ARE PROPELLED BY HIGH TORQUE ELECTRIC MOTORS. KEEP ALL BODY PARTS AWAY FROM THE AUGER WHILE THE STOVE IS PLUGGED INTO AN ELECTRICAL OUTLET. THESE MOVING PARTS MAY BEGIN TO MOVE AT ANY TIME WHILE THE STOVE IS PLUGGED IN.**

PRE-START-UP CHECK

Remove burn pot, making sure it is clean and none of the air holes are plugged. Clean the firebox, and then reinstall burn pot. Clean door glass if necessary (a dry cloth or paper towel is usually sufficient). Never use abrasive cleaners on the glass or door. Check fuel in the hopper, and refill if necessary.

BUILDING A FIRE

Never use a grate or other means of supporting the fuel. Use only the approved burnpot. During the start up period:

- DO NOT open the viewing door.
- DO NOT open the damper more than 1/4".
- DO NOT add pellets to the burnpot by hand.
- DO NOT use the Fuel Feed button (unless you are priming the auger after running out of pellets) a dangerous condition could result.

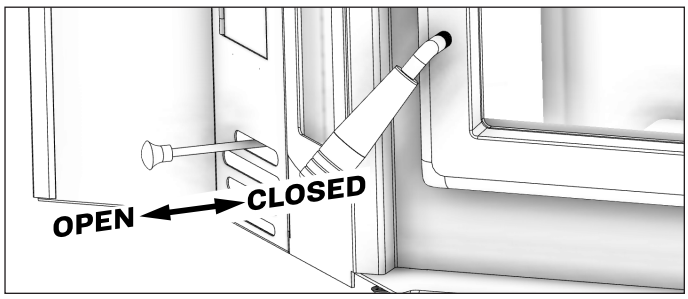
NOTE: During the first few fires, your stove will emit an odor as the high temperature paint cures or becomes seasoned to the metal. Maintaining smaller fires will minimize this. Avoid placing items on stove top during this period because paint could be affected.

AUTOMATIC IGNITOR

1. Fill hopper and clean burn pot.
2. Press "On/Off" button. Make sure green light comes on.
3. Adjust feed rate to desired setting by pressing "Heat Level Advance" button.

OPTIMAL OPERATION

This pellet stove has been certified by the US EPA to meet strict 2020 guidelines. To ensure this unit produces the minimal emissions it is critical to follow the following guidelines. To achieve a "high burn" your stove should be set on the #4 setting with air damper fully open. To achieve a "medium burn" your stove should be set on the #2 setting with air damper full closed until stopped. To achieve a "low burn" your stove should be set on the #1 setting with the air damper fully closed.



EFFICIENCY

We determined this appliance's efficiency using CSA B415.1. To achieve maximum efficiency, always use premium-grade pellets and adjust the damper as necessary (refer to the damper control section). The location of the installation can affect efficiency. Install this appliance in the main living area for maximum efficiency.

DAMPER CONTROL

The damper control rod on the stove adjusts the combustion air. This control is necessary due to the varied burn characteristics of individual installations, different pellet brands and pellet feed rates. It allows you to improve the efficiency of your stove. Providing correct combustion air will reduce the frequency of cleaning your glass door and prevent the rapid buildup of creosote inside your stove and chimney. You should adjust the damper based on the fire's appearance. A low, reddish, dirty fire can be improved by pulling the damper out slightly. A "blow torch" fire can be improved by pushing the damper in a bit. As a general rule, on lower feed rate settings, the damper should be in farther. On higher feed rates, the damper should be more open.

OPENING DOOR

CAUTION:
• **DO NOT OPERATE YOUR STOVE WITH THE VIEWING DOOR OPEN. THE AUGER WILL NOT FEED PELLETS UNDER THESE CIRCUMSTANCES AND A SAFETY CONCERN MAY ARISE FROM SPARKS OR FUMES ENTERING THE ROOM.**
• **THE FEED DOOR MUST BE CLOSED AND SEALED DURING OPERATION.**

If the door is opened while the stove is in operation it must be closed within 30 seconds or the stove will shut down. If the stove shuts down push the "ON/OFF" button to continue the operation of your stove.

ROOM AIR FAN

When starting your stove the Room Air Fan will not come on until the stove's heat exchanger warms up. This usually takes about 10 minutes from start-up.

RE-STARTING A WARM STOVE

If the stove has been shut off, and you want to re-start it while it is still warm, the "ON/OFF" button must be held down for 2 seconds.

IF STOVE RUNS OUT OF PELLETS

The fire goes out and the auger motor and blowers will run until the stove cools. This will take 30 minutes or longer depending on the heat remaining in the appliance. After the stove components stop running all lights on the display will go out and the two digit display will begin flashing "E3"

REFUELLING

CAUTION:
• **THE HOPPER AND STOVE TOP WILL BE HOT DURING OPERATION; THEREFORE, YOU SHOULD ALWAYS USE SOME TYPE OF HAND PROTECTION WHEN REFUELING YOUR STOVE.**
• **DO NOT TOUCH THE HOT SURFACES OF THE STOVE. EDUCATE ALL CHILDREN ON THE DANGERS OF A HIGH-TEMPERATURE STOVE. YOUNG CHILDREN SHOULD BE SUPERVISED WHEN THEY ARE IN THE SAME ROOM AS THE STOVE.**
• **NEVER PLACE YOUR HAND NEAR THE AUGER WHILE THE STOVE IS IN OPERATION.**
• **WE RECOMMEND THAT YOU NOT LET THE HOPPER DROP BELOW 1/4 FULL.**

WARNING:
• **KEEP HOPPER LID CLOSED AT ALL TIMES EXCEPT WHEN REFILLING.**
• **DO NOT OVERFILL HOPPER.**

TAMPER WARNING

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.

SHUTDOWN PROCEDURE

WARNING:
NEVER SHUT DOWN THIS UNIT BY UNPLUGGING IT FROM THE POWER SOURCE.

Turning your stove off is a matter of pressing the "POWER" button on the display board. The green light will turn back to red when the "POWER" button is pushed. The auger motor will stop, and the blowers will continue to operate until the internal firebox temperatures have fallen to a preset level.

1. Your stove is equipped with a high temperature thermodisc. This unit has a manual reset thermodisc. This safety switch has two functions.

A. To recognize an overheat situation in the stove and shut down the fuel feed or auger system.

B. In case of a malfunctioning convection blower, the high-temperature thermodisc will automatically shut down the auger, preventing the stove from overheating.

NOTE: On some units, once tripped, like a circuit breaker, the reset button will have to be pushed before restarting your stove. On other units the thermodisc has no reset button and will reset itself once the stove has cooled. The manufacturer recommends that you call your dealer if this occurs as this may indicate a more serious problem. A service call may be required.

2. If the combustion blower fails, an air pressure switch will automatically shut down the auger.

NOTE: Opening the stove door for more than 30 seconds during operation will cause enough pressure change to activate the air switch, shutting the fuel feed off. The stove will shut down and show "E2" on the two digit display. The stove has to fully shut down before restarting.

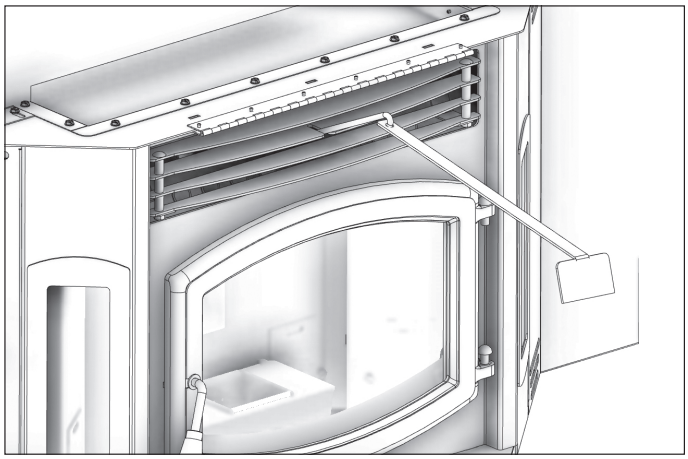
MAINTENANCE TOOL

A tool has been provided to help with the following functions:

- Stirring pellets in hopper – unlike liquids in a tank, pellets do not drain evenly into the auger. Bridging across the opening can occur. Pellets can hang up on the sides of the hopper. Occasionally "stirring" the hopper can help. NOTE: To help prevent bridging of pellets, common wax paper can be rubbed on the side walls and bottom of the hopper.
- Cleaning heat exchanger tubes.
- Scrape ashes from burnpot.

INTERIOR CHAMBERS

- **Burn Pot -** Periodically remove and clean the burn pot and the area inside the burn pot housing. In particular, it is advisable to clean out the holes in the burn pot to remove any build up that may prevent air from moving through the burn pot freely.
- **Heat Exchange Tubes –** Your stove is designed with a built-in heat exchange tube cleaner. This should be used every two or three days to remove accumulated ash on the tubes, which reduces heat transfer on this unit. Insert the handle end (with hole) of the cleaning tool onto the cleaning rod. The cleaner rod is located in the grill above the stove door. Move the cleaner rod back and forth several times to clean the heat exchanger tubes. Be sure to leave tube cleaner at the rear of the stove.

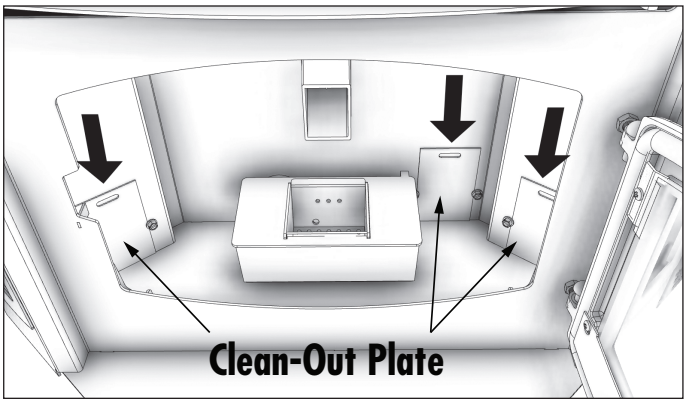


Heat Exchanger - There are four clean-out plates in the firebox in the free-standing, three in the insert that needs to be removed to clean fly ash out of the heat exchanger. These clean-out plates allow access to the chamber surrounding the firebox. The cleanouts are secured to the firebox with (2) 5/16" screws. Remove the cleanouts and vacuum out any accumulated ash. This should be done at least once per month or more frequently if large amounts of ash are noticed while cleaning or if the stove does not seem to be burning properly. In some cases, you will need to remove creosote, which can accumulate rapidly under certain conditions. A small wire brush can be used. It is important to remove this creosote because it is highly combustible. INSPECT BEHIND THESE CLEANING PLATES AT LEAST ONCE PER TON OF PELLETS BURNED UNTIL YOU ARE FAMILIAR WITH HOW ASHES AND CREOSOTE ACCUMULATE WITH YOUR OPERATING PRACTICES. Use the small wire brush to also clean the inside of the chamber walls, above the access doors.

If a vacuum is used to clean your stove, we suggest using the AV15E AshVac vacuum. The AV15E AshVac is designed for ash removal. Some regular vacuum cleaner (i.e. shop vacs) may leak ash into the room.

DO NOT VACUUM HOT ASH.

WARNING:
FAILURE TO PROPERLY MAINTENANCE THE CLEAN OUTS WILL RESULT IN POOR PERFORMANCE OF THIS STOVE.



WARNING:

IF YOU NOTICE A SMOLDERING FIRE (BURNPOT FULL BUT NO VISIBLE FLAME) AND A HEAVY SMOKE BUILDUP IN FIREBOX, IMMEDIATELY TURN OFF THE STOVE, BUT DO NOT UNPLUG IT. DO NOT OPEN THE DOOR, CHANGE THE DAMPER SETTING OR TAMPER WITH ANY CONTROLS ON THE STOVE. WAIT UNTIL FIREBOX CLEARS, AND BLOWERS SHUT DOWN, DO AS INSTRUCTED IN "PRE-START-UP CHECK" AND "BUILDING A FIRE", THEN ATTEMPT TO RESTART THE FIRE. IF THE PROBLEM PERSISTS CONTACT YOUR DEALER.

WARNING:

- **DO NOT OPERATE THE STOVE IF THE FLAME BECOMES DARK AND SOOTY OR IF THE BURNPOT OVERFILLS WITH PELLETS. TURN THE STOVE OFF, PERIODICALLY INSPECT IT, AND CALL YOUR DEALER.**
- **IF THE STOVE IS INSTALLED IN A ROOM WITHOUT AIR CONDITIONING, OR IN AN AREA WHERE DIRECT SUNLIGHT CAN SHINE ON THE UNIT, IT IS POSSIBLE THIS CAN CAUSE THE TEMPERATURE OF THE STOVE TO RISE TO OPERATIONAL LEVELS; ONE OF THE SENSORS COULD THEN MAKE THE STOVE START ON ITS OWN. IT IS RECOMMENDED THAT THE STOVE BE UNPLUGGED WHEN NOT IN USE FOR EXTENDED AMOUNTS OF TIME (I.E. DURING THE SUMMER MONTHS).**

WARNING:

NEVER TRY TO REPAIR OR REPLACE ANY PART OF THE STOVE UNLESS INSTRUCTIONS ARE GIVEN IN THIS MANUAL. ALL OTHER WORK SHOULD BE DONE BY A TRAINED TECHNICIAN.

NEVER OPERATE THIS PRODUCT WHILE UNATTENDED

CAUTION:
• FAILURE TO CLEAN AND MAINTAIN THIS UNIT AS INDICATED CAN RESULT IN POOR PERFORMANCE, SAFETY HAZARDS, FIRE, AND EVEN DEATH. • NEVER PERFORM ANY INSPECTIONS, CLEANING, OR MAINTENANCE ON A HOT STOVE. • DISCONNECT THE POWER CORD BEFORE PERFORMING ANY MAINTENANCE! NOTE: TURNING THE ON/OFF SWITCH TO "OFF" DOES NOT DISCONNECT ALL POWER TO THE ELECTRICAL COMPONENTS OF THE STOVE. • DO NOT OPERATE STOVE WITH BROKEN GLASS, LEAKAGE OF FLUE GAS MAY RESULT.

CREOSOTE FORMATION, INSPECTION, & REMOVAL

CAUTION:
THE EXHAUST SYSTEM SHOULD BE CHECKED MONTHLY DURING THE BURNING SEASON FOR ANY BUILD-UP OF SOOT OR CREOSOTE.

When any 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 cool chimney flue or a newly started fire or from a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire, which may damage the chimney or even destroy the house. Despite their high efficiency, pellet stoves can accumulate creosote under certain conditions. The chimney connector and chimney should be inspected by a qualified person annually or per ton of pellets to determine if a creosote or fly ash build-up has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire. Inspect the system at the stove connection and at the chimney top. Cooler surfaces tend to build creosote deposits quicker, so it is important to check the chimney from the top as well as from the bottom. The creosote should be removed with a brush specifically designed for the type of chimney in use. A qualified chimney sweep can perform this service. It is also recommended that before each heating season the entire system be professionally inspected, cleaned and, if necessary, repaired. To clean the chimney, disconnect the vent from the stove.

FLY ASH

This accumulates in the horizontal portion of an exhaust run. Though non-combustible, it may impede the normal exhaust flow. It should therefore be periodically removed.

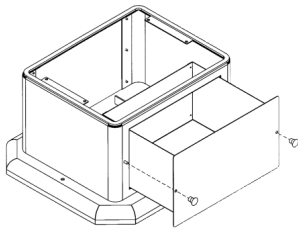
ASH REMOVAL & DISPOSAL

CAUTION:
ALLOW THE STOVE TO COOL BEFORE PERFORMING ANY MAINTENANCE OR CLEANING. ASHES MUST BE DISPOSED IN A METAL CONTAINER WITH A TIGHT FITTING LID. THE CLOSED CONTAINER OF ASHES SHOULD BE PLACED ON A NON-COMBUSTIBLE SURFACE OR ON THE GROUND, WELL AWAY FROM ALL COMBUSTIBLE MATERIALS, PENDING FINAL DISPOSAL.

Remove the ashes periodically to avoid unnecessary ash build up. Remove ashes when unit has cooled. Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all embers have been thoroughly cooled. The container shall not be used for other trash or waste disposal. If combined with combustible substances, ashes and embers may ignite. Ash removal is as follows:

Freestanding Models

1. Let the fire burn out and allow the unit to cool to room temperature.
2. With the door closed clean heat exchanger tubes.
3. Make sure the pellet stove is at room temperature before touching. Open the door, remove the burn pot and empty it into a metal container.
4. Empty ashes from the inner section into the pedestal ash bin through the opening at the bottom of the firebox. Scrape the inner section with the cleaning tool. Make sure holes are not plugged.
5. Scrape ash in the firebox into the pedestal ash bin through the opening at the bottom of the firebox or vacuum to remove ashes.



6. Periodically remove and empty the ash bin by unscrewing the two knobs on the front of the pedestal below the ash lip. Dispose of ashes properly.
7. Replace the ash bin, making sure to tighten the knobs and maintaining a good seal.
8. Replace the inner section into the burnpot; make sure it is level and pushed all the way back down and that the igniter hole is to the rear when it is reinstalled.
9. Make sure the burnpot is level and pushed all the way back in when it is reinstalled. If the collar on the burnpot attached to the fresh air tube is not pushed back to meet the firebox wall, the automatic ignitor will not work properly.

Insert

1. Let the fire burn out and allow the unit to cool to room temperature.
2. With the door closed clean heat exchanger tubes
3. Make sure the pellet stove is at room temperature before touching. Open the door, remove the burn pot and empty it into a metal container.
4. Empty ashes from burn pot. Scrape burn pot with the cleaning tool. Make sure the burnpot holes are not plugged.
5. Vacuum ashes from the firebox. BE SURE THAT ASHES ARE COOL TO THE TOUCH BEFORE VACUUMING. Some vacuum cleaners may leak ash into the room. Your vacuum cleaner should have a special filter or bag to eliminate leakage.
6. Reinstall the burn pot. Make sure it is level and pushed all the way back on. If not reinstalled properly, the Hot Rod will not work properly.

SMOKE & CO MONITORS

Burning wood naturally produces smoke and carbon monoxide(CO) emissions. CO is a poisonous gas when exposed to elevated concentrations for extended periods of time. While the modern combustion systems in heaters drastically reduce the amount of CO emitted out the chimney, exposure to the gases in closed or confined areas can be dangerous. Make sure you stove gaskets and chimney joints are in good working order and sealing properly to ensure unintended exposure. It is recommended that you use both smoke and CO monitors in areas having the potential to generate CO.

CHECK & CLEAN THE HOPPER

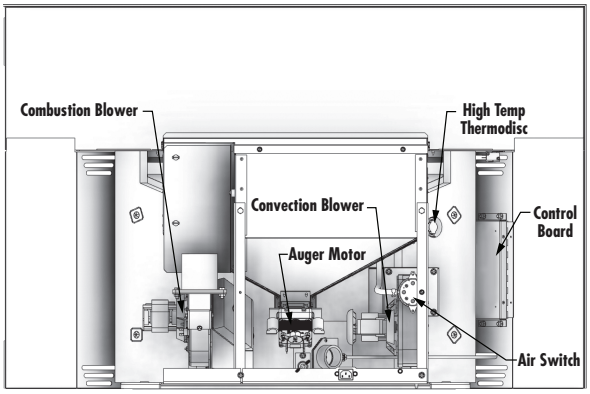
Check the hopper periodically to determine if there is any sawdust (fines) that is building up in the feed system or pellets that are sticking to the hopper surface. Clean as needed.

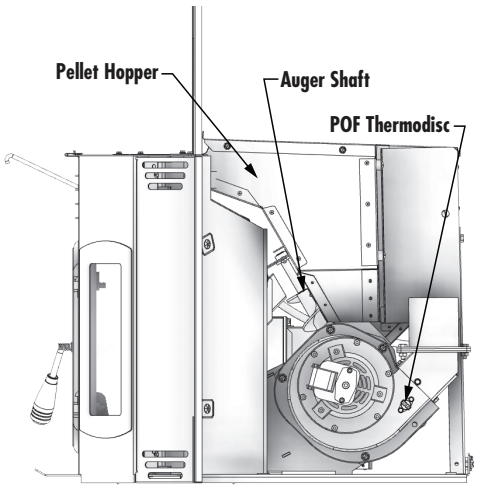
DOOR & GLASS GASKETS

Inspect the main door and glass window gaskets periodically. The main door may need to be removed to have frayed, broken, or compacted gaskets replaced by your authorized dealer. This unit's door uses a 5/8" diameter rope gasket.

BLOWER MOTORS

Clean the air holes on the motors of both the exhaust and distribution blowers annually. Remove the exhaust blower from the exhaust duct and clean out the internal fan blades as part of your fall start-up. If you have indoor pets your power motors should be inspected monthly to make sure they are free of animal hair build-up. Animal hair build-up in blowers can result in poor performance or unforeseen safety hazards. NOTE: When cleaning, be careful not to dislodge the balancing clip on the convection blower or to bend fan blades. Some stove owners lightly spray an anti-creosote chemical on the fire to help reduce creosote formation within the stove.





PAINTED SURFACES

Painted surfaces may be wiped down with a damp cloth. If scratches appear, or you wish to renew your paint, contact your authorized dealer to obtain a can of suitable high-temperature paint.

GLASS

We recommend using a high-quality glass cleaner. Should a buildup of creosote or carbon accumulate, you may wish to use 000 steel wool and water to clean the glass. DO NOT use abrasive cleaners. DO NOT perform the cleaning while the glass is HOT. Do not attempt to operate the unit with broken glass. If the glass is broken, follow these removal procedures:

1. While wearing leather gloves (or any other gloves suitable for handling broken glass), carefully remove any loose pieces of glass from the door frame.
2. Dispose of all broken glass properly. Return the damaged door to your authorized dealer for repair or replacement.
3. Neither the appliance owner nor any other unauthorized person(s) should replace the door glass. An authorized dealer must perform all repairs involving door glass.

DO NOT abuse the door glass by striking, slamming, or similar trauma. Do not operate the stove with the glass removed, cracked, or broken.

FALL START UP

Prior to starting the first fire of the heating season, check the outside area around the exhaust and air intake systems for obstructions. Clean and remove any fly ash from the exhaust venting system. Clean any screens on the exhaust system and on the outside air intake pipe. Turn all of the controls on and make sure that they are working properly. This is also a good time to give the entire stove a good cleaning throughout.

SPRING SHUTDOWN

After the last burn in the spring, remove any remaining pellets from the hopper and the auger feed system. Scoop out the pellets and then run the auger until the hopper is empty and pellets stop flowing (this can be done by pressing the "ON" button with the viewing door open). Vacuum out the hopper. Thoroughly clean the burn pot, and firebox. It may be desirable to spray the inside of the cleaned hopper with an aerosol silicone spray if your stove is in a high humidity area. The exhaust system should be thoroughly cleaned.

MAINTENANCE SCHEDULE

CAUTION:
THIS WOOD HEATER NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH OPERATING INSTRUCTIONS IN THIS MANUAL.

Use the following as a guide under average use conditions. Gaskets around door and door glass should be inspected and repaired or replaced when necessary.

	Daily	Weekly	Annually or per Ton
Burn Pot	Stirred	Emptied	
Glass	Wiped	Cleaned	
Combustion Chamber		Brushed	
Ashes			Emptied
Interior Chambers			Vacuumed
Heat Exchange Tubes		2 passes	
Combustion Blower Blades			Vacuumed / Brushed
Convection Blower Impeller			Vacuumed / Brushed
Vent System			Cleaned
Gaskets			Inspected
Hopper (end of season)			Emptied and vacuumed

STOVE SHUTS OFF AND THE # 3 LIGHT FLASHES	
Possible Causes:	Possible Remedies: (Unplug stove first when possible)
The hopper is out of pellets.	Refill the hopper.
The air damper is too far open for a low feed setting.	If burning on the low setting, you may need to close the damper all the way (push the knob in so it touches the side of the stove).
The burnpot is not pushed completely to the rear of the firebox.	Make sure that the air intake collar on the burnpot is touching the rear wall of the firebox.
The burnpot holes are blocked.	Remove the burnpot and thoroughly clean it.
The air inlet, the interior chambers, or exhaust system has a partial blockage.	Follow all cleaning procedures in the maintenance section of the owner's manual.
The hopper safety switch has failed or hopper is open.	When operating the unit, be sure the hopper lid is closed so that the hopper safety switch will activate. Check the wires leading from the hopper safety switch to the control panel and auger motor for secure connections. Use a continuity tester to test the hopper safety switch; replace if necessary.
The auger shaft is jammed.	Start by emptying the hopper. Then remove the auger motor by removing the auger pin. Remove the auger shaft inspection plate in the hopper so that you can see the auger shaft. Gently lift the auger shaft straight up so that the end of the auger shaft comes up out of the bottom auger bushing. Next, remove the two nuts that hold the top auger biscuit in. Then rotate the bottom end of the auger shaft up towards you until you can lift the shaft out of the stove. After you have removed the shaft, inspect it for bent flights, burrs, or broken welds. Remove any foreign material that might have caused the jam. Also, check the auger tube for signs of damage such as burrs, rough spots, or grooves cut into the metal that could have caused a jam.
The auger motor has failed.	Remove the auger motor from the auger shaft and try to run the unit. If the motor will turn, the shaft is jammed on something. If the motor will not turn, the motor is bad.
The Proof of Fire (POF) thermodisc has malfunctioned.	Temporarily bypass the POF thermodisc by disconnecting the two brown wires and connecting them with a short piece of wire. Then plug the stove back in. If the stove comes on and works, you need to replace the POF thermodisc. This is for testing only. DO NOT LEAVE THE THERMODISC BYPASSED. Your blowers will never shut off and if the fire went out the auger will continue to feed pellets until the hopper is empty if you leave the POF thermodisc bypassed.
The high limit thermodisc has tripped or is defective.	Wait for the stove to cool for about 30 - 45 minutes. It should now function normally. If not use the owner's manual to locate the high limit thermodisc. To test if the thermodisc is bad, you can bypass it as described previously for the POF thermodisc.
The fuse on the control board has blown.	Remove the control board. On the back there is one fuse. If it appears to be bad, replace it with a 5 Amp 250 Volt fuse. Plug the stove back in and try to run the unit.
The control board is not sending power to the POF thermodisc or other auger system components.	There should be a 5-volt (approximately) current going to the POF thermodisc after the stove has been on for 10 minutes.

STOVE FEEDS PELLETS, BUT WILL NOT IGNITE	
Possible Causes:	Possible Remedies:
Air damper open too far for ignition.	Push the air damper in closer to the side of the stove for startup. In some situations it may be necessary to have the damper completely closed for ignition to take place. After there is a flame, the damper can then be adjusted for the desired feed setting.
Blockage in igniter tube or inlet for igniter tube.	Find the igniter housing on the backside of the firewall. The air intake hole is a small hole located on bottom side of the housing. Make sure it is clear. Also, look from the front of the stove to make sure there is not any debris around the igniter element inside of the igniter housing.
The burnpot is not pushed completely to the rear of the firebox.	Make sure that the air intake collar on the burnpot is touching the rear wall of the firebox.
Bad igniter element.	Put power directly to the igniter element. Watch the tip of the igniter from the front of the stove. After about 2 minutes the tip should glow. If it does not, the element is bad.
The control board is not sending power to the igniter.	Check the voltage going to the igniter during startup. It should be a full current. If the voltage is lower than full current, check the wiring. If the wiring checks out good, the board is bad.

SMOKE SMELL COMING BACK INTO THE HOME	
Possible Causes:	Possible Remedies:
There is a leak in the vent pipe system.	Inspect all vent pipe connections. Make sure they are sealed with RTV silicone that has a temperature rating on 500 degree F or higher. Also, seal joints with UL-181-AP foil tape. Also, make sure the square to round adapter piece on the combustion blower has been properly sealed with the same RTV.
The gasket on the combustion blower has gone bad.	Inspect both gaskets on the combustion blower to make sure they are in good shape.

CONVECTION BLOWER SHUTS OFF AND COMES BACK ON	
Possible Causes:	Possible Remedies:
The convection blower is overheating and tripping the internal temperature shutoff.	Clean any dust off of the windings and fan blades. If cleaning the blower does not help, it may be bad.
Circuit board malfunction.	Test the current going to the convection blower. If there is power being sent to the blower when it is shut off, then the control board is fine. If there is NOT power being sent to the blower when it shuts off during operation, then you have a bad control board.

CONVECTION BLOWER SHUTS OFF AND COMES BACK ON	
Possible Causes:	Possible Remedies:
The convection blower is overheating and tripping the internal temperature shutoff.	Clean any dust off of the windings and fan blades. If cleaning the blower does not help, it may be bad.
Circuit board malfunction.	Test the current going to the convection blower. If there is power being sent to the blower when it is shut off, then the control board is fine. If there is NOT power being sent to the blower when it shuts off during operation, then you have a bad control board.

STOVE WILL NOT FEED PELLETS, BUT FUEL FEED LIGHT COMES ON AS DESIGNED	
Possible Causes:	Possible Remedies:
Fuse on control board blew.	Remove the control board. On the back there is one fuse. If it appears to be bad, replace it with a 5 Amp 125 Volt fuse. Plug the stove back in and try to run the unit.
High limit switch has tripped or is defective	Wait for the stove to cool for about 30 - 45 minutes. It should now function normally. If not use the owner's manual to locate the high limit thermodisc. To test if the thermodisc is bad, you can bypass it as described previously for the POF thermodisc.
Bad auger motor	Remove the auger motor from the auger shaft and try to run the unit. If the motor will turn, the shaft is jammed on something. If the motor will not turn, the motor is bad.
Auger jam	Start by emptying the hopper. Then remove the auger motor by removing the auger pin. Remove the auger shaft inspection plate in the hopper so that you can see the auger shaft. Gently lift the auger shaft straight up so that the end of the auger shaft comes up out of the bottom auger bushing. Next, remove the two nuts that hold the top auger biscuit in. Then rotate the bottom end of the auger shaft up towards you until you can lift the shaft out of the stove. After you have removed the shaft, inspect it for bent flights, burrs, or broken welds. Remove any foreign material that might have caused the jam. Also, check the auger tube for signs of damage such as burrs, rough spots, or grooves cut into the metal that could have caused a jam.
Loose wire or connector	Check all wires and connectors that connector to the auger motor, high limit switch, and the Molex connector.
Bad control board	If the fuse is good, the wires and connectors check out good, and the high limit switch did not trip, test for power going to the auger motor. If there is not a full current going to the auger motor when the fuel feed light is on, you have a bad control board.

GLASS "SOOT'S" UP AT A VERY FAST RATE FLAME IS LAZY, DARK, AND HAS BLACK TIPS AFTER STOVE HAS BEEN ON FOR A WHILE, THE BURNPOT OVERFILLS	
Possible Causes:	Possible Remedies:
Stove or vent pipe is dirty, which restricts airflow through the burnpot.	Follow all cleaning procedure in the maintenance section of the owner's manual.
Vent pipe installed improperly.	Check to make sure the vent pipe has been installed according to the criteria in the owner's manual.
Air damper is set too far in (closed) for a higher setting.	Pull the damper knob farther out away from the side of the stove and try to burn the unit again.
Burnpot holes are blocked.	Remove the burnpot and thoroughly clean it.
Air damper is broken.	Visually inspect the damper assembly. Make sure the damper plate is attached to the damper rod. When the damper rod is moved the plate should move with it.
Blockage in air intake pipe.	Visually inspect the air intake pipe that leads into the burnpot for foreign material.

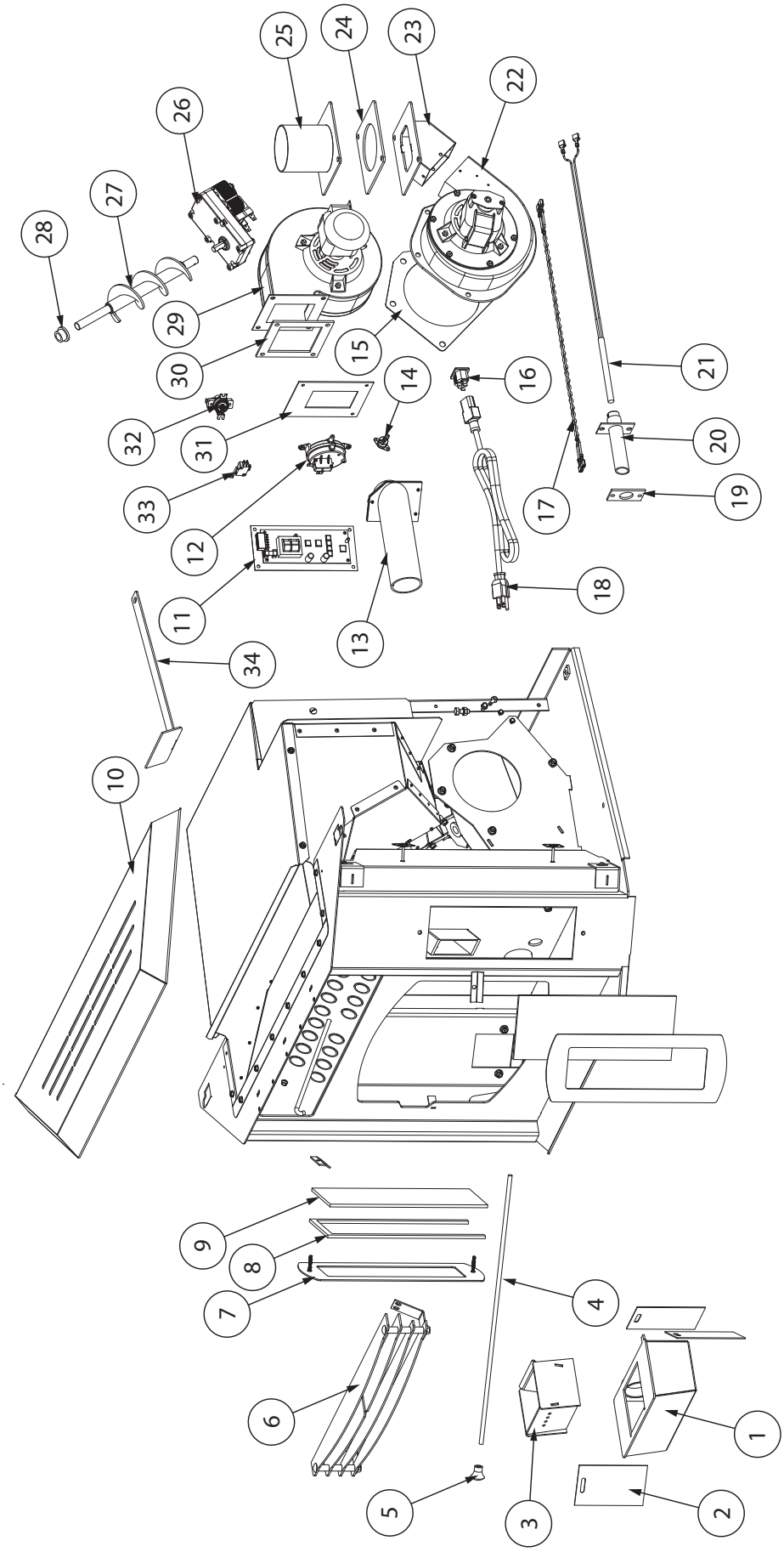
Circuit board malfunction.	Time the fuel feed light at each setting (after the stove has completed the startup cycle). Make sure the times match the auger timing chart. If the auger motor runs constantly, the board is bad.
Combustion blower is not spinning fast enough.	Test the RPM on the blower after the blades have been cleaned. The RPM should be approximately 3000 RPM.
Bad Pellets (Applies to GLASS "SOOT'S" UP AT A VERY FAST RATE Only)	The brand of pellets or the batch of pellets that are being used may be of poor quality. If possible, try a different brand of pellets. You might also want to try a brand that is made from a different type of wood (softwood vs. hardwood). Different woods have different characteristics when being burned.

HIGH LIMIT SWITCH KEEPS TRIPPING	
Possible Causes:	Possible Remedies:
The convection blower is overheating and tripping the internal temperature shutoff.	Clean any dust off of the windings and fan blades. If cleaning the blower does not help, it may be bad.
The stove is being left on the highest setting for extended periods of time.	The highest heat level setting is designed for use over short periods of time. Burning the stove on the highest setting for longer than 1 – 2 hours could lead to potential overheating situations.
Fuel other than wood pellets is being burned in the stove.	This pellet stove is designed and tested to use wood pellets. Check for signs of fuel other than wood pellets. No other types of fuel have been approved for this pellet stove. If there are signs of other types of fuel being used, stop using them immediately.
Power surge or brown out situation.	A power surge, spike, or voltage drop could cause the high limit switch to trip. Check to see if a surge protector is being used on the stove. If not, recommend one to the consumer.
High limit switch is malfunctioning.	If the other items check out ok, replace the high limit switch.

DIGITAL CIRCUIT BOARD TIMING RATES	
Heat Level Setting	
1 & 3	1.4 seconds
1	2 seconds
1 & 4	2.5 seconds
2	4 seconds
3	7 seconds
4	9 seconds
5	12 seconds
Total Cycle Time	14.5 seconds

SMOKE SMELL OR SOOT BUILD-UP

Because it is a wood-burning device, your stove may emit a faint wood-burning odor. If this increases beyond normal, or if you notice an unusual soot build-up on walls or furniture, check your exhaust system carefully for leaks. All joints should be properly sealed. Also clean your stove, following instructions in "MAINTENANCE". If problem persists, contact your dealer.



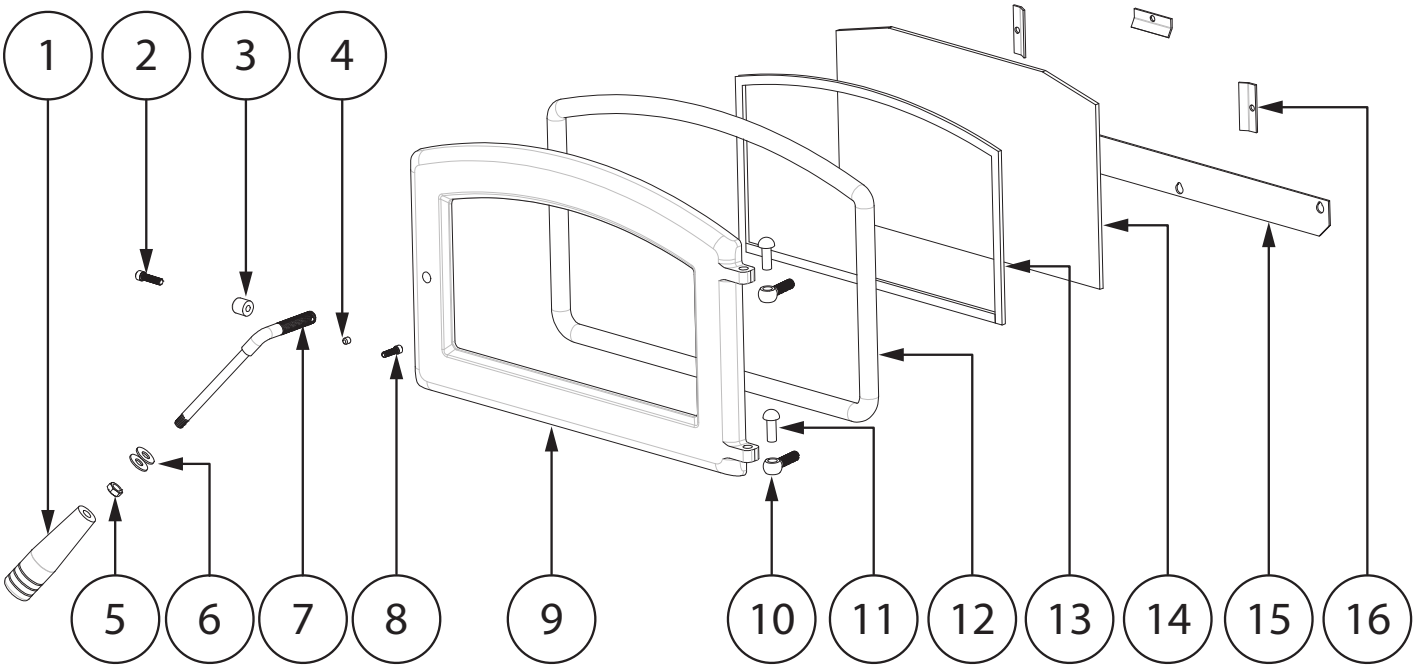
REPAIR PARTS

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.

Key	Part #	Description	Qty
1	69964	Weldment, Burnpot Housing	1
2	26799	Ash Door	3
3	894097	Weldment, Burnpot	1
4	86841	Damper Rod	1
5	891987	Plastic Knob	1
6	610341	Louver Assembly	1
7	610336	Bay Window Trim Piece	2
8	88174	Side Gasket	2
9	892614	Side Glass SP24I	2
10	610339	SP24I Lid Assy	1
11	610330	PCB 4 Setting Assy.	1
12	80549	Air Switch	1
13	610346	Damper Assy For Straight Rod	1
14	80610	Thermodisc, Low Limit POF	1
15	88100	Gasket, Exhaust Blower	1
16	80462	Receptacle, 3 Prong	1
17	80685	Harness Extension, Purple	1
18	80461	Power Supply Cord	1

Key	Part #	Description	Qty
19	88202	Igniter Housing Gasket	1
20	86999	Igniter Housing Assembly	1
21	80909	Ignitor Cartridge	1
22	80641	Blower, Exhaust	1
23	610343	Exhaust Bottom Weldment	1
24	88252	Flue Gasket	1
25	610342	Exhaust Top Weldment	1
26	80642	Drive Motor	1
27	892231	Auger Flight	1
28	891132	Agitator Bushing	1
29	80647	Blower, Distribution	1
30	88252	Flue Gasket	1
31	27986	Feed Tube Shroud	1
32	80683	Thermodisc, Surface Mount, 300°	1
33	80491	Microswitch	1
34	25589	Maintenance Tool	1
28448		Flashing L LRG Door	
SA24IBK		Brick Panel Set – Insert – Optional	

IN ORDER TO MAINTAIN WARRANTY, COMPONENTS MUST BE REPLACED USING ORIGINAL MANUFACTURERS PARTS PURCHASED THROUGH YOUR DEALER OR DIRECTLY FROM THE APPLIANCE MANUFACTURER. USE OF THIRD PARTY COMPONENTS WILL VOID THE WARRANTY.

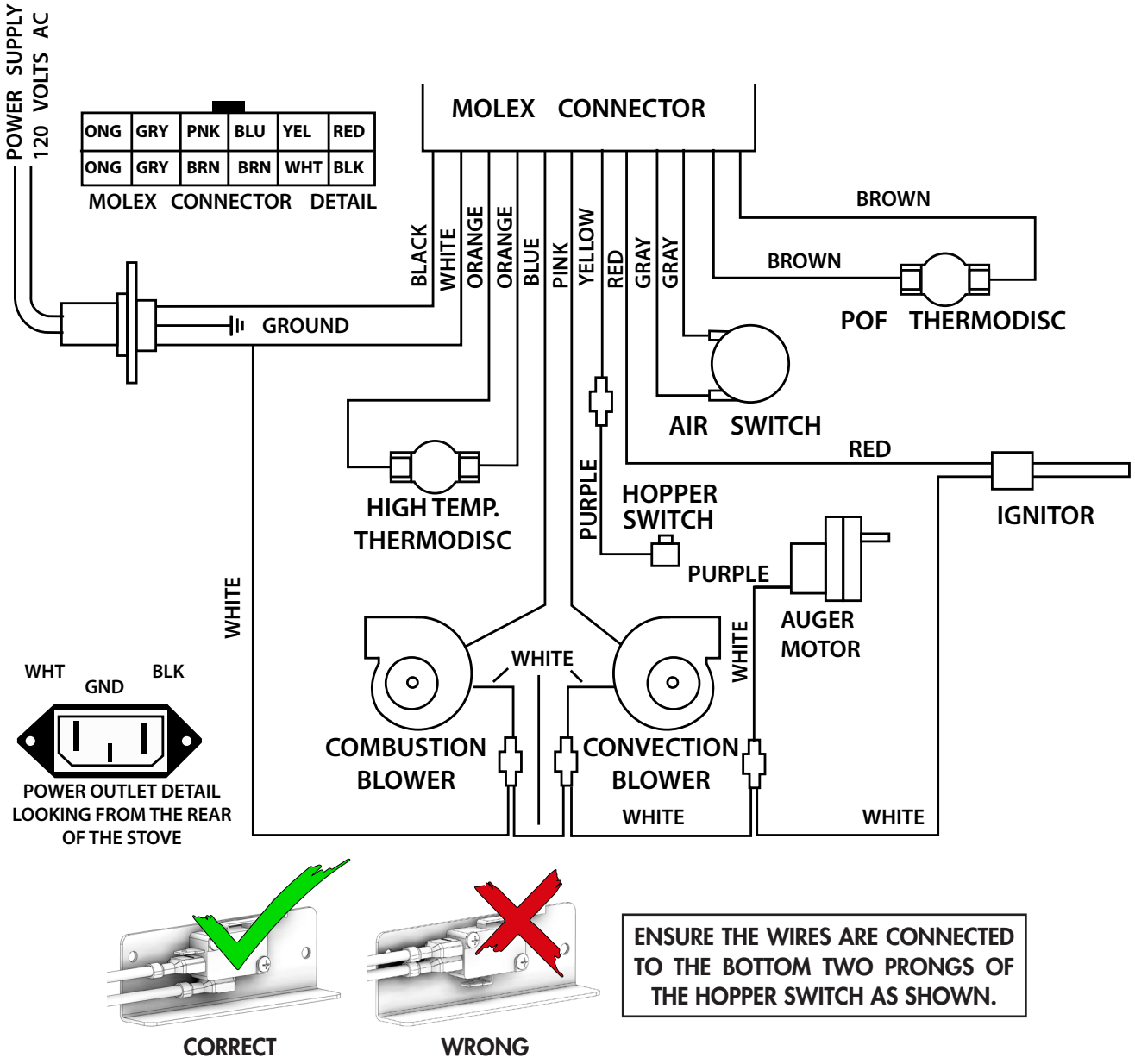


Contact an Authorized Dealer to obtain any of these parts. Never use substitute materials. Use of non-approved parts can result in poor performance and safety.

Key	Part #	Description	Qty
1	893919	Wood Handle	1
2	83788	Socket Head Screw	1
3	893062	Roller Sleeve	1
4	83242	1/4-20 x 1/4 Allen Set Screw	1
5	83178	3/8-16 Jamb Nut	1
6	83045A	Washer, 3/8"ID x 7/8" OD x 1/16 THK	2 per
7	893071	Door Handle	1
8	83633	#12 x .75 Socket HD Cap Screw	1

Key	Part #	Description	Qty
9	40915	Cast Door - 2023	1
10	83575	Hinge Pin (.370 Dia x 1.00)	2
11	40571	Hinge Block	2
12	88082	3/4 Round Rope Gasket-BLK	4.3 ft
13	88174	Glass Gasket	3.75 ft
14	894141	Door Glass	1
15	25905	Bottom Glass Retainer	1
16	25904	Glass Clip	3

IN ORDER TO MAINTAIN WARRANTY, COMPONENTS MUST BE REPLACED USING ORIGINAL MANUFACTURERS PARTS PURCHASED THROUGH YOUR DEALER OR DIRECTLY FROM THE APPLIANCE MANUFACTURER. USE OF THIRD PARTY COMPONENTS WILL VOID THE WARRANTY.



HOW TO ORDER REPAIR PARTS

CONTACT YOUR DEALER OR INSTALLER FOR PARTS AND SERVICE

The information in this owner's manual is specific to your unit. When ordering replacement parts the information in this manual will help to ensure the correct items are ordered. Before contacting customer service write down the model number and the serial number of this unit. That information can be found on the certification label attached to the back of the unit. Other information that may be needed would be the part number and part description of the item(s) in question. Part numbers and descriptions can be found in the "Repair Parts" section of this manual. Once this information has been gathered you can contact your Breckwell dealer.

Model Information			
Model Number		Dealer's Name	
Serial Number		Dealer's Phone Number	

SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

SERVICE PROVIDER

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spare part when replacement is necessary.

Service 01 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 02 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 03 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 04 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 05 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 06 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 07 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Service 08 Date: _____
Engineer Name: _____
License No.: _____
Company: _____
Telephone No.: _____
Stove Inspected: ☐ Chimney Swept: ☐
Items Replaced: _____

Manuel d'instructions et d'utilisation du propriétaire

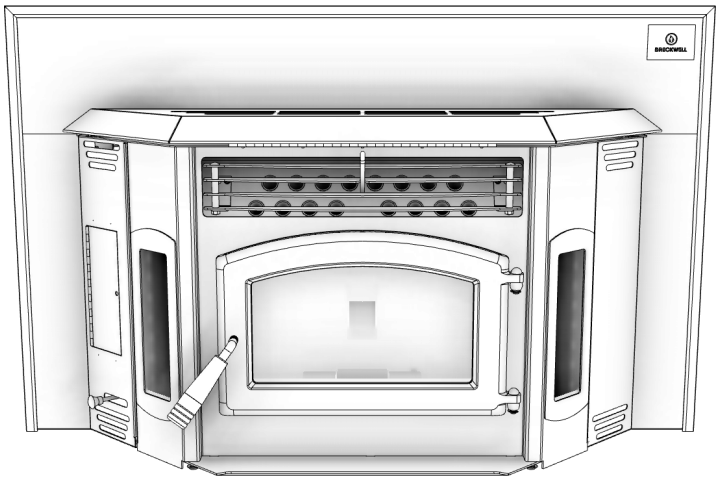
BRECKWELL

Numéro De Modèle:

SP24iE

Signaler Le Numéro: F21-689

Certifié selon ASTM E1509-2022
et ULC S628-93 (R 2016)



* Toutes les images de ce manuel sont à des fins d'illustration uniquement. Le produit réel peut varier.

Conservez ces instructions dans un endroit sûr pour référence ultérieure.

AVIS DE SÉCURITÉ: Si ce radiateur n'est pas correctement installé, un incendie peut en résulter. Pour votre sécurité, suivez les instructions d'installation. N'utilisez jamais de compromis de fortune lors de l'installation de ce radiateur. Contactez les responsables locaux du bâtiment ou des pompiers pour connaître les permis, les restrictions et les exigences d'installation dans votre région. NE JAMAIS UTILISER CE PRODUIT SANS SURVEILLANCE.

MISE EN GARDE! Veuillez lire l'intégralité de ce manuel avant d'installer ou d'utiliser votre nouveau radiateur. Le non-respect des instructions peut entraîner des dommages matériels, des blessures corporelles ou même la mort. Une installation incorrecte pourrait annuler votre garantie!

AGENCE AMÉRICAINE DE PROTECTION DE L'ENVIRONNEMENT

Certifié conforme aux normes d'émissions de particules 2020.

AVERTISSEMENT SUR LA PROPOSITION 65 DE LA CALIFORNIE:

Ce produit peut vous exposer à des produits chimiques, y compris le monoxyde de carbone, qui est connu dans l'État de Californie pour provoquer le cancer, des anomalies congénitales et / ou d'autres troubles de la reproduction. Pour plus d'informations, visitez www.P65warnings.ca.gov

CE MANUEL EST SUJET À MODIFICATION SANS PRÉAVIS.

INTRODUCTION

Ce manuel décrit l'installation et le fonctionnement du poêle à bois Breckwell SP24(i)E. Ce poêle est conforme aux limites d'émission de bois de 2020 de l'Agence américaine de protection de l'environnement pour les poêles à bois vendus après le 15 mai 2020. Dans des conditions de test spécifiques, il a été démontré que ce poêle fournit de la chaleur à des taux allant de 5 993 à 22 587 Btu/h, 0,66 g/h et une efficacité de 77 %. Ce poêle a été évalué de manière indépendante en fonction des spécifications du standard ASTM E1509-2022 pour les chauffages intérieurs et les poêles à granulés de type 1, du standard ULC/ORD 1482-90 pour les chauffages d'intérieur à combustible solide, des réglementations de l'Oregon pour les mobile-homes (814-23-900 à 814-23-909) et de l'installation comme poêle.

Spécifications de chauffage			
Taux de combustion du carburant	1 à 3,21 lb/h (0,45 à 1,46 kg/h)		* La taille des granulés peut affecter le débit réel d'alimentation en carburant, les durées de combustion et la capacité de la trémie. Les débits d'alimentation en carburant peuvent varier jusqu'à 20 %. Utilisez du carburant homologué PFI pour de meilleurs résultats.
Capacité de trémie *	jusqu'à 70 lbs (31,75 kg)		
Taille du conduit	3" or 4" (77 mm or 102 mm)		
Spécifications électriques			
Tarif Electrique	115 Volts AC, 60 HZ, 3,0 Amps		
Dimensions			
Insérer	Largeur	22 po (559 mm) à l'arrière du foyer	
		29-1/2 po (750 mm) à l'ouverture du foyer	
	Hauteur	21 po (534 mm) dans le foyer	
	Profondeur	23-1/2 po (597 mm) au total	
		16-3/8 po (416 mm) dans le foyer	
Clignotant	Moyen	28 po (712 mm) x 44-1/2 po (1131 mm) x N/A	
	Grand	32 po (813 mm) x 48-1/2 po (1232 mm) x N/A	
Poids	Insérer	250 lbs (113,4 kg)	
	Clignotant	13 lbs (9 kg)	

AVERTISSEMENT:

IL EST CONTRE LES RÈGLEMENTS FÉDÉRAUX DE FAIRE FONCTIONNER CE CHAUFFE À BOIS D'UNE MANIÈRE INCOMPATIBLE AVEC LES INSTRUCTIONS D'UTILISATION DU MANUEL DU PROPRIÉTAIRE.

CONSERVEZ VOTRE REÇU ORIGINAL POUR TOUTE RÉCLAMATION DE GARANTIE. CONTACTEZ VOTRE CONCESSIONNAIRE OU INSTALLATEUR SI VOUS DEVEZ DÉPOSER UNE RÉCLAMATION.

Remarque : Enregistrez votre produit en utilisant votre téléphone intelligent avec le code QR. Conservez vos reçus avec vos dossiers pour toute réclamation au titre de la garantie.

Vous pouvez également enregistrer votre produit en ligne sur www.breckwell.com/product-registration

LISTE DE CONTRÔLE D'INSTALLATION

Votre poêle à bois ne doit être installé que par un installateur qualifié. Un installateur qualifié NFI est disponible à l'adresse www.nficertified.org/public/find-an-nfi-pro/

Pour le service client, veuillez contacter votre revendeur Breckwell.

LISTE DE CONTRÔLE DE MISE EN SERVICE

Cette liste de contrôle doit être remplie intégralement par la personne qualifiée qui installe cet appareil. Conservez cette page pour référence future.

Le fait de ne pas installer et mettre en service selon les instructions du fabricant et de remplir cette liste de contrôle annulera la garantie.

S'il te plaît imprime

Nom du client:	Numéro de téléphone:
Adresse:	
Modèle:	
Numéro de série:	
Nom de la société d'installation:	Numéro de téléphone:
Nom du technicien d'installation:	Numéro de licence:

DESCRIPTION DU TRAVAIL

Emplacement de l'appareil installé: _____

Système de ventilation: nouveau système de ventilation ☐ Oui ☐ Non Si oui, marque _____

Si non, date d'inspection du système de ventilation existant: _____

MISE EN SERVICE

Confirmer l'installation du tapis de foyer conformément aux instructions d'installation ..... ☐

Confirmer le bon placement des pièces internes ..... ☐

Vérifier la solidité du joint de porte et des joints de porte ..... ☐

Confirmer les dégagements aux combustibles selon les instructions d'installation de ce manuel ..... ☐

Vérifier le fonctionnement des commandes pneumatiques ..... ☐

Confirmez que le système de ventilation est sécurisé et scellé ..... ☐

Confirmer que le poêle démarre et fonctionne correctement ..... ☐

Assurez-vous qu'un avertisseur de CO est installé conformément aux codes du bâtiment locaux et qu'il est fonctionnel ..... ☐

Expliquer le fonctionnement en toute sécurité, l'utilisation appropriée du carburant, le nettoyage et les exigences d'entretien de routine . ☐

Déclaration d'achèvement: En tant que personne qualifiée responsable des travaux décrits ci-dessus, je confirme que l'appareil en tant que travail associé a été installé selon les instructions du fabricant et en suivant les codes de construction et d'installation applicables.

Signé: _____ Nom en lettres moulées: _____ Date: _____

Propriétaire du domicile: CONSERVEZ CETTE INFORMATION POUR RÉFÉRENCE FUTURE

POUR UNE ASSISTANCE CLIENT, APPELEZ VOTRE REVENDEUR BRECKWELL.

AVIS DE SÉCURITÉ

- SI CE POÊLE N'EST PAS INSTALLÉ CORRECTEMENT, UN INCENDIE PEUT EN RÉSULTER. POUR RÉDUIRE LES RISQUES D'INCENDIE, SUIVEZ LES INSTRUCTIONS D'INSTALLATION.
- ADRESSEZ-VOUS AUX AUTORITÉS LOCALES DE L'URBANISME POUR OBTENIR UN PERMIS ET DES RENSEIGNEMENTS SUR TOUTE AUTRE RESTRICTION À L'INSTALLATION ET SUR LES EXIGENCES D'INSPECTION DANS VOTRE RÉGION.
- NE PLACEZ AUCUN VÊTEMENT OU AUTRE OBJET INFLAMMABLE SUR OU PRÈS DU POÊLE.
- N'UTILISEZ JAMAIS D'ESSENCE, DE COMBUSTIBLE À LANTERNE DE TYPE ESSENCE, DE KÉROSÈNE, D'ESSENCE D'ALLUME-FEU OU D'AUTRES LIQUIDES SIMILAIRES POUR ALLUMER OU RAVIVER LE FEU DANS CE POÊLE. GARDEZ TOUS CES LIQUIDES ÉLOIGNÉS DU POÊLE LORSQU'IL EST EN MARCHE.
- INSTALLER L'ÉVENT AUX DÉGAGEMENTS SPÉCIFIÉS PAR LE FABRICANT DE L'ÉVENT.
- N'INSTALLEZ PAS DE REGISTRE DE TIRAGE SUR LE SYSTÈME D'ÉVACUATION DE CET APPAREIL.
- CE POÊLE DOIT ÊTRE RÉGULIÈREMENT ENTRETENU ET NETTOYÉ (VOIR LA SECTION « ENTRETIEN »). LE DÉFAUT D'ENTRETIEN DU POÊLE PEUT ENTRAÎNER UN FONCTIONNEMENT INAPPROPRIÉ ET DANGEREUX.
- UN DISJONCTEUR DOIT ÊTRE INSTALLÉ. CET APPAREIL DOIT ÊTRE BRANCHÉ SUR UNE PRISE MURALE AVEC TERRE DE 120 V, 60 Z. N'UTILISEZ PAS D'ADAPTATEUR DE PRISE ET NE COUPEZ PAS LA FICHE DE TERRE. N'ACHEMINEZ PAS LE CORDON ÉLECTRIQUE SOUS, DEVANT OU SUR LE POÊLE. NE FAITES PAS COURIR LE CORDON ÉLECTRIQUE DANS LES ZONES DE PASSAGE ET NE LE COINCEZ PAS SOUS LES MEUBLES.

ATTENTION:

ATTENTION: LA COMBUSTION DU COMBUSTIBLE GÉNÈRE DU MONOXYDE DE CARBONE QUI PEUT S'AVÉRER DANGEREUX POUR LA SANTÉ EN L'ABSENCE D'UNE VENTILATION APPROPRIÉE.

ATTENTION:

- UN DÉTECTEUR DE FUMÉE FONCTIONNEL DOIT ÊTRE INSTALLÉ DANS LA PIÈCE OÙ SE TROUVE LE POÊLE.
- INSTALLEZ UN DÉTECTEUR DE FUMÉE À CHAQUE ÉTAGE DE VOTRE MAISON; EN CAS D'INCENDIE ACCIDENTEL DÛ À N'IMPORTE QUELLE CAUSE, CE DISPOSITIF PEUT LAISSER LE TEMPS DE S'ÉCHAPPER.
- LE DÉTECTEUR DE FUMÉE DOIT ÊTRE INSTALLÉ À AU MOINS 15 PIEDS (4,57 M) DE L'APPAREIL AFIN D'ÉVITER QU'IL NE SE DÉCLENCHE INUTILEMENT LORS DU RECHARGEMENT DU POÊLE.

MISE EN GARDE:

- NE DÉBRANCHEZ PAS LE POÊLE SI VOUS SUSPECTEZ UN DYSFONCTIONNEMENT. METTEZ L'INTERRUPTEUR MARCHE / ARRÊT SUR «OFF» ET CONTACTEZ VOTRE CONCESSIONNAIRE. ÉTEINDRE LE POÊLE À «ARRÊT» NE DÉBRANCHE PAS TOUTE L'ALIMENTATION DU POÊLE.
- LE CHAUFFAGE NE FONCTIONNE PAS PENDANT UNE PANNE DE COURANT. EN CAS DE PANNE DE COURANT, VÉRIFIEZ LE CHAUFFAGE POUR DÉVERSER DE FUMÉE ET OUVREZ UNE FENÊTRE SI DE LA FUMÉE SE DÉVERSE DANS LA PIÈCE.
- NE FAITES PAS FONCTIONNER VOTRE POÊLE SI VOUS SENTEZ UNE ODEUR DE FUMÉE EN PROVENANCE. ÉTEIGNEZ-LE, SURVEILLEZ-LE ET APPELEZ VOTRE CONCESSIONNAIRE.
- NE JAMAIS BLOQUER LE FLUX D'AIR LIBRE À TRAVERS LES ÉVENTS OUVERTS DE L'APPAREIL.

ATTENTION:

- SI LE POÊLE EST INSTALLÉ DANS UNE PIÈCE SANS CLIMATISATION OU DANS UNE ZONE O WH LA LUMIÈRE DIRECTE DU SOLEIL PEUT BRILLER SUR L'APPAREIL, IL EST POSSIBLE QUE CELA PEUT CAUSER LA TEMPÉRATURE DU POÊLE À ÉLEVER À NIVEAU DE FONCTIONNEMENT; UN DES CAPTEURS POURRAIT PUIS FAIRE DÉMARRER LE POÊLE DE SON PROPRE. IL EST RECOMMANDÉ QUE LE POÊLE SOIT DÉBRANCHÉ LORSQU'IL N'EST PAS UTILISÉ POUR UNE DURÉE DE TEMPS PROLONGÉE (c.-à-d. PENDANT LES MOIS D'ÉTÉ).
- LE SYSTÈME D'ÉCHAPPEMENT DOIT ÊTRE COMPLÈTEMENT ÉTANCHE ET CORRECTEMENT INSTALLÉ. LES JOINTS D'ÉVENT À GRANULÉS DOIVENT ÊTRE SCELLÉS AVEC DU SCELLANT AU SILICONE RTV 500 ° F (260 ° C) ET AVEC LE RUBAN ALU UL-181-AP

NATIONAL FIREPLACE INSTITUTE CERTIFIÉ www.nficertified.org

Nous recommandons que nos produits de foyer à bois soient installés et entretenus par des professionnels certifiés aux États-Unis par le National Fireplace Institute (NFI) en tant que spécialiste du chauffage au bois NFI ou certifiés au Canada par le programme de formation technique en énergie du bois (WETT).

Wood Energy Technical Training www.wettinc.ca

Breckwell Hearth recommande fortement que votre poêle soit installé par un technicien qualifié NFI (US) ou WETT (Canada). Pour trouver l'installateur qualifié le plus proche, accédez à:

https://nficertified.org,

https://www.wettinc.ca/

PRÉPARATION

L'emballage d'origine doit être enlevé, et il y a quelques assemblages élémentaires à faire avant l'installation. L'accès à l'arrière du poêle est nécessaire. Le circuit intégré / panneau de contrôle doit être déballé et installé du côté du solin sur l'insert. (Voir les instructions d'installation fournies avec le circuit imprimé). NOTE: Normalement, votre revendeur se charge de ces aspects.

INSTALLATION INCORRECTE

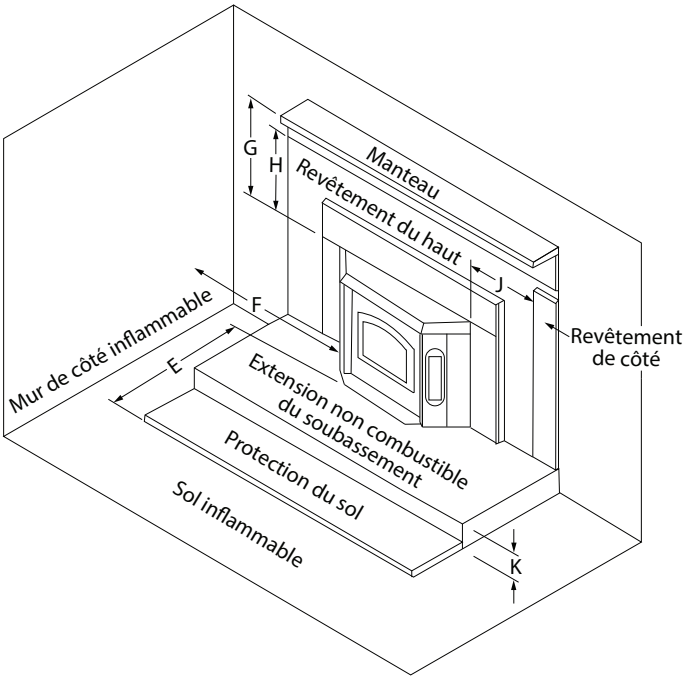
L'utilisation d'autres composants autres que ceux indiqués dans le présent document pourrait causer des blessures corporelles, des dommages au radiateur et annuler votre garantie. Le fabricant ne sera pas tenu responsable des dommages causés par le dysfonctionnement d'un poêle en raison d'une ventilation ou d'une installation incorrecte.

PROTECTION DU SOL

Cet appareil de chauffage doit avoir un protecteur de plancher incombustible avec une cote isolée de «R1» installé en dessous si le plancher est en matériau combustible.

DÉGAGEMENTS

Ce poêle à granulés a été testé et homologué pour une installation dans une maison mobile résidentielle conformément aux dégagements indiqués ci-dessous. Cet encastrable est approuvé pour une installation dans des foyers de maçonnerie conformes au code. Cet encastrable est également approuvé pour une utilisation dans les foyers préfabriqués homologués (UL 127) et les encastrés résidentiels standard, y compris les installations encastrées dans les maisons mobiles.



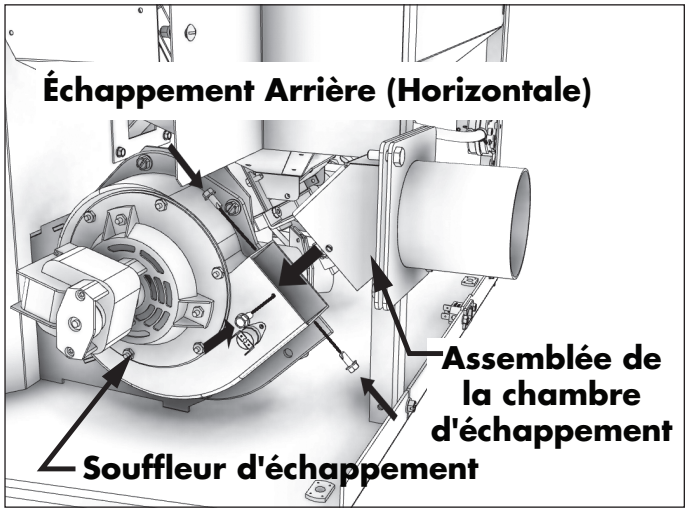
E	6 po	153 mm
F	5 po	127 mm
G	14 po	356 mm
H	10 po	254 mm
J	3 po	77 mm
K	0 po	0 mm

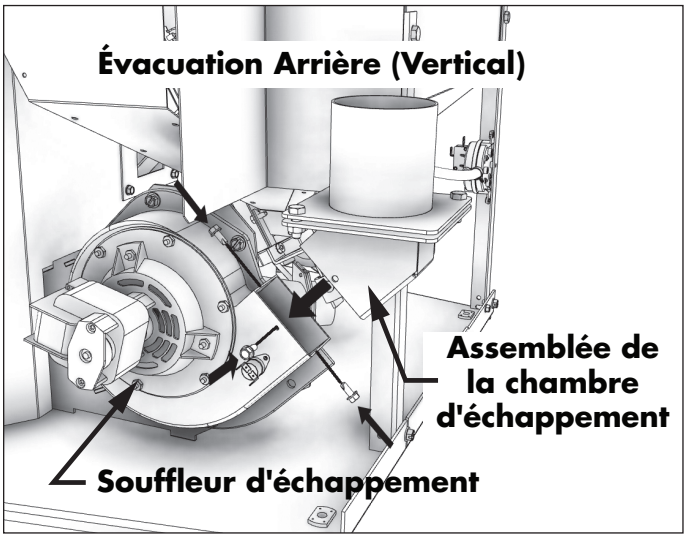
ALIMENTATION EN AIR DE COMBUSTION

ATTENTION:
NE PAS VENTILER SOUS UNE PORCHE, UNE PONT, UN AUVENT OU DANS TOUTE ZONE SEMI-CLOS OU TOIT. LE FAIRE PEUT ENTRAÎNER UN FLUX D'AIR IMPRÉVISIBLE AU BOUCHON D'ÉVENT DANS CERTAINES CONDITIONS ET PEUT AFFECTER LES PERFORMANCES DE VOTRE POÊLE, AINSI QUE D'AUTRES PROBLÈMES IN PRÉVISIBLES.

Pour passer d'un échappement arrière horizontal à un échappement arrière vertical ou vice versa, suivez ces étapes :

1. Retirez les quatre vis qui fixent l'assemblage de la chambre d'évacuation au ventilateur d'évacuation.
2. Enlevez complètement tout le silicone.
3. Appliquez du nouveau silicone.
4. Faites pivoter l'ensemble d'échappement et réinstallez-le. Réutilisez les quatre vis pour fixer la chambre d'évacuation au ventilateur d'évacuation.





QUAND L'AIR EXTÉRIEUR N'EST PAS UTILISÉ

Si l'air extérieur n'est pas utilisé, il est important que l'air de combustion soit disponible facilement dans l'entrée d'air. Une entrée d'air extérieure refermable peut être utilisée pour les maisons très isolées. Dans les installations d'inserts, les ventilations par solins ne devraient pas être limitées. Le solin ne devrait pas nécessairement sceller l'avant de la cheminée.

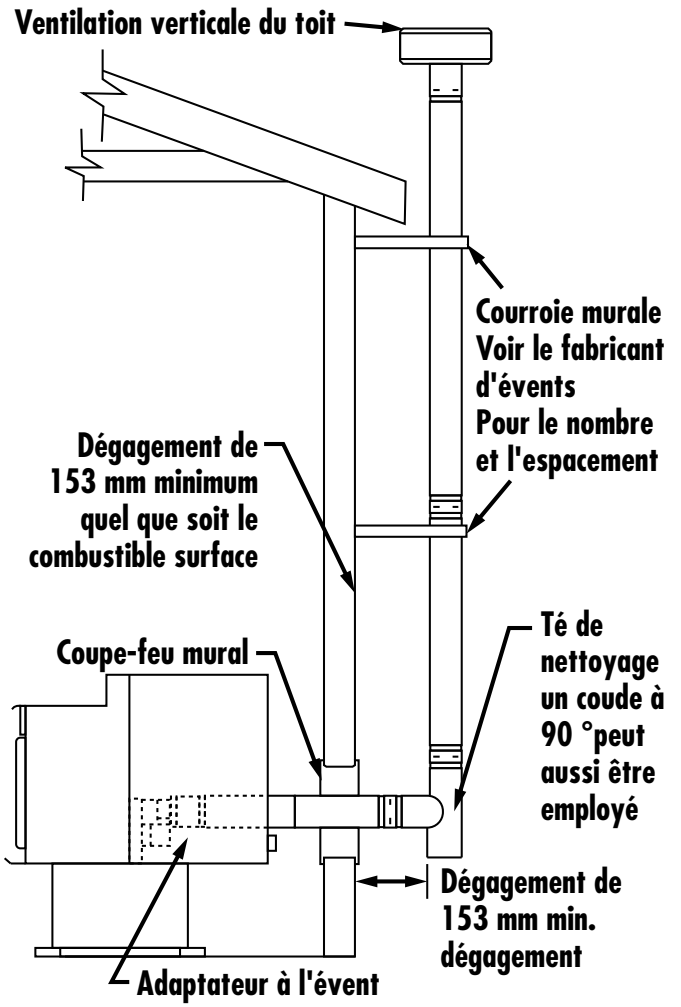
IMPORTANCE D'UN TIRAGE ADÉQUAT

Le tirage est une force déplaçant l'air de l'appareil vers la cheminée. La quantité de tirage dans votre cheminée dépend de sa longueur, son emplacement géographique local, les obstructions à proximité et autres facteurs. Trop de tirage peut causer des températures excessives dans l'appareil. Un tirage inadéquat peut causer des retours de fumée dans la pièce et causer l'obturation de la cheminée. Un tirage inadéquat causera des fuites de fumée par l'appareil dans la pièce, s'infiltrant par l'appareil, et les joints du conduit de raccordement. Un brûlage incontrôlable ou une température excessive indique un tirage excessif. Tenez compte de l'emplacement de la cheminée pour veiller à ce qu'elle ne soit pas trop près des voisins ou dans une vallée pouvant causer des conditions malsaines ou nuisibles.

SYSTÈME D'ÉVACUATION

Le poêle est homologué pour être employé avec les systèmes d'évacuation de TYPE L, de diamètre 3 po ou 4 po (env. 77 ou 102 mm). Ce poêle a été testé avec la marque Simpson Duravent. Il n'est pas nécessaire d'avoir une cheminée de Classe « A ». Reportez-vous aux instructions données par le fabricant d'évacuations, surtout quand on traverse un mur, un plafond ou un toit. C'est un système d'évacuation pressurisé. Tous les joints des connecteurs d'évacuation doivent être scellés avec des joints au silicone 500° F (260° C) RTV pour assurer une performance homogène et éviter les dégagements de fumée. Tous les connecteurs horizontaux doivent être scellés avec le ruban d'aluminium UL-181-AP. Nous recommandons que tous les connecteurs d'évacuation verticaux soient renforcés avec au moins 3 vis. Il est fortement recommandé d'avoir un tuyau vertical d'au moins 6 pi (env. 1,83 m) pour le système d'évacuation. Pour une meilleure performance du poêle, limitez le plus possible le nombre de coudes et de tuyaux horizontaux.

ATTENTION:
• INSTALLER LA VENTILATION AUX ÉVACUATIONS SPÉCIFIÉES PAR LE FABRICANT DE VENTILATION.
• NE PAS CONNECTER L'APPAREIL À UN CONDUIT DE CHEMINÉE QUI DESSERT UN AUTRE APPAREIL.
• NE PAS INSTALLER DE RÉGULATEUR DE TIRAGE DANS LE SYSTÈME D'ÉVACUATION DE CET APPAREIL.



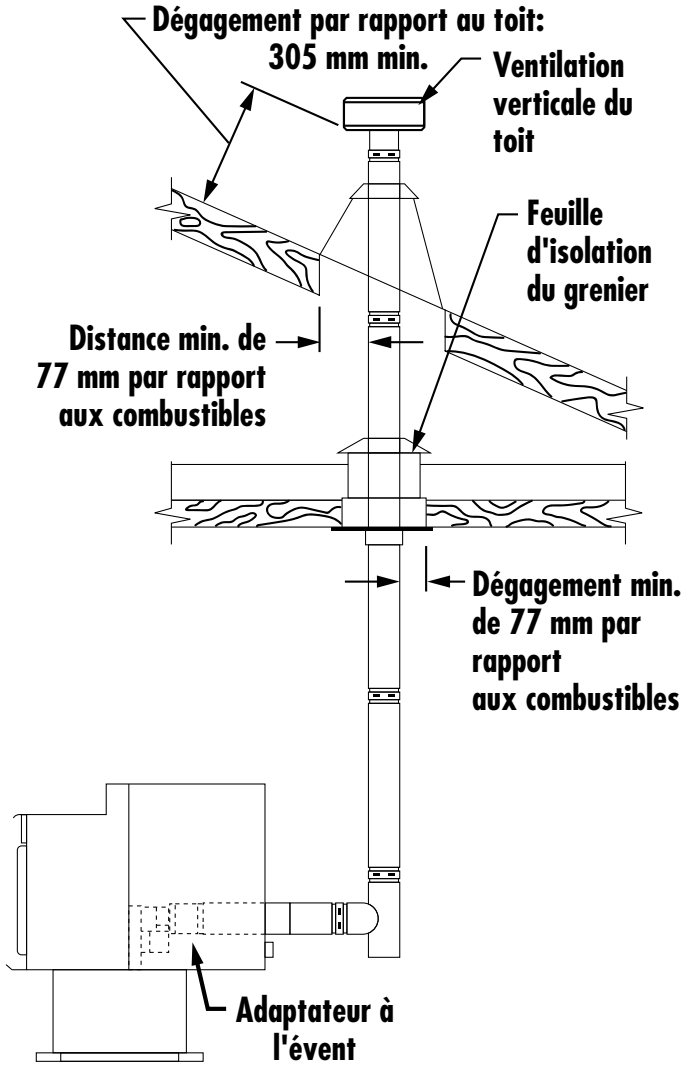
VERTICALEMENT AVEC UN NOUVEAU SYSTÈME DE CHEMINÉE)

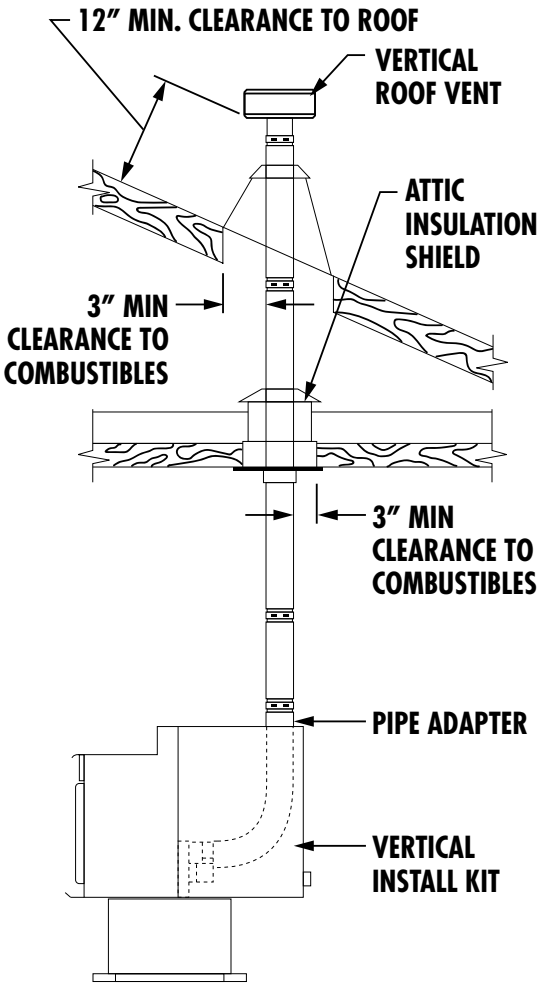
OPTION : Pour réaliser une installation verticale centrale, un coude de 45° et un té de nettoyage peuvent être utilisés pour décaler le tuyau de la sortie d'évacuation vers le centre arrière du poêle.

OPTION : Installez le coude PL-Vent à la place du té de nettoyage. Localisez le poêle. Déposez le fil à plomb au centre de la sortie du

té, marquez le point au plafond. Installez le support de plafond et le tuyau PL-Vent selon les instructions du fabricant PL-Vent.

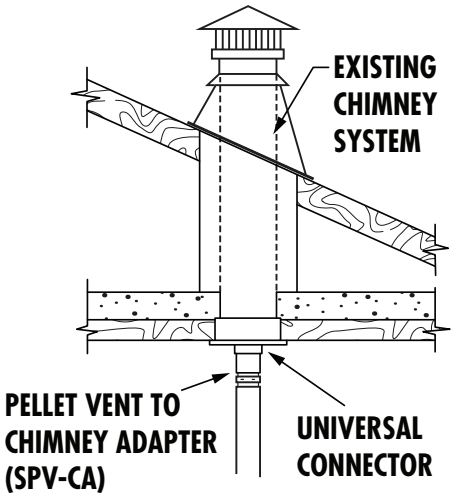
1. Maintenez toujours un dégagement de 3 pouces par rapport aux matériaux combustibles. Lorsque vous traversez des planchers ou des plafonds supplémentaires, installez toujours une entretoise coupe-feu.
2. Après vous être aligné pour le trou dans le toit, découpez un trou autour ou carré dans le toit, toujours 3 pouces plus grand tout autour du tuyau. Installez le bord supérieur et les côtés du solin sous les matériaux de toiture, clouez au toit le long du bord supérieur. Ne clouez pas le bord inférieur. Scellez les têtes de clous avec du mastic imperméable non durcissant.
3. Appliquez du mastic imperméable non durcissant à l'endroit où le collet de solin rencontrera l'évent et le solin. Faites glisser le collet de solin vers le bas jusqu'à ce qu'il repose sur le solin. Scellez et installez le capuchon. Les installations de maisons mobiles doivent utiliser un pare-étincelles.

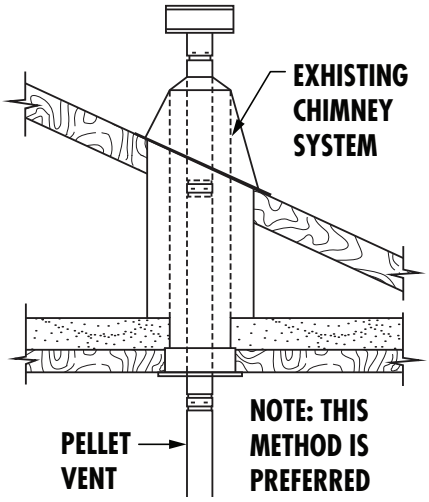




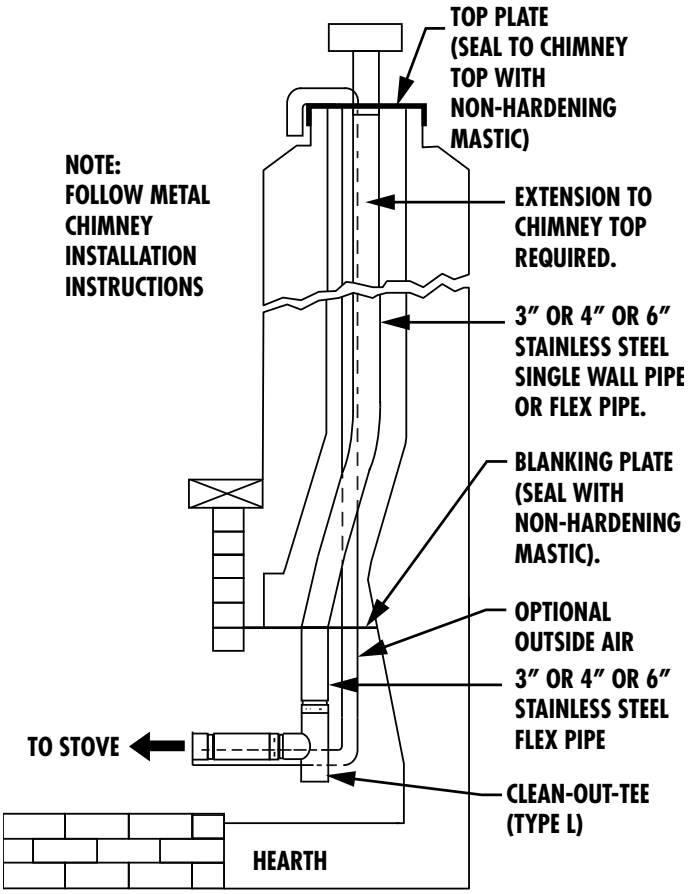
VERTICALEMENT DANS LE SYSTÈME DE CHEMINÉE EXISTANT

Des adaptateurs sont disponibles pour s'adapter d'une cheminée PL-Vent de 3 po à une cheminée de classe A de 6 po ou 8 po. Comme alternative, un PL-Vent de 3» ou 4» peut être installé à l'intérieur de la cheminée existante jusqu'à la terminaison. C'est la méthode préférée. Suivez les directives pour une longueur d'évent équivalente.





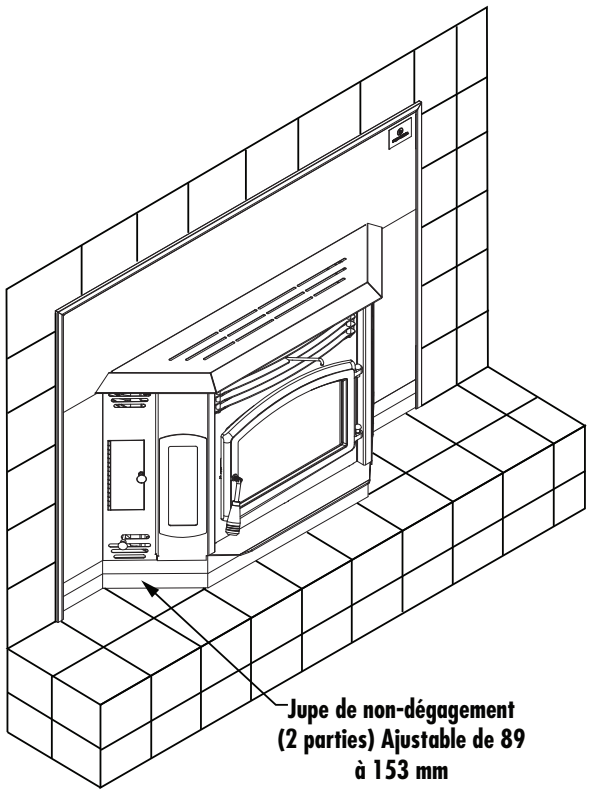
VERTICALEMENT DANS LE FOYER EN MAÇONNERIE EXISTANT



1. Faites inspecter la cheminée de maçonnerie par un ramoneur ou un installateur qualifié pour déterminer son état structurel.
2. Vous aurez besoin d'une longueur de tuyau égale à la hauteur de la cheminée à partir du foyer. Si l'air de combustion extérieur doit être utilisé, vous aurez besoin d'une longueur de tuyau égale à la hauteur de la cheminée plus 18 pouces.
3. Installez une plaque d'obturation et le tuyau de cheminée, et si utilisé le tuyau d'air extérieur.

INSTALLATIONS EN INSERT

Les installations en insert doivent être ventilées avec des tuyaux de 3 ou 4 po (env. 77 ou 102 mm). Le tuyau peut être en acier inoxydable pour un mur simple. La ventilation doit se terminer dans la cheminée derrière un cache ou s'étendre jusqu'en haut de la cheminée. Voir «ALIMENTATION EN AIR DE COMBUSTION» pour des informations sur l'accès à l'air extérieur. La cheminée et le foyer doivent être nettoyés à fond avant de démarrer l'installation. Nous suggérons de peindre l'intérieur des cheminées très anciennes et très sales pour piéger les odeurs.



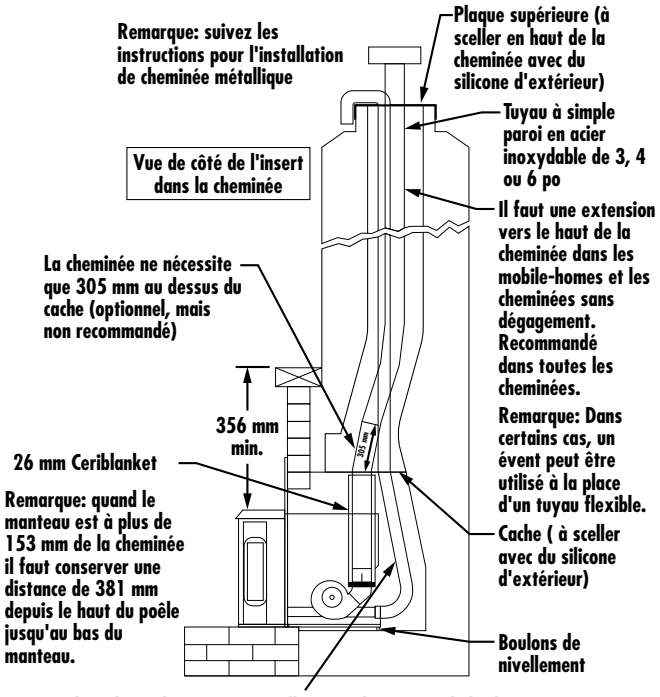
ASSEMBLAGE DES SOLINS

Suivre les instructions jointes à l'ensemble de solins

QUAND LE TUYAU DE VENTILATION VA JUSQU'AU SOMMET DE LA CHEMINÉE

1. Il faudra une longueur de tuyau égale à la hauteur de la cheminée depuis le sol plus 6 po (env. 153 mm). S'il faut utiliser l'air extérieur comme air de combustion, il faudra une longueur de tuyau (voir «ALIMENTATION EN AIR DE COMBUSTION») égale à la hauteur de la cheminée plus 12 po (env. 305 mm).
2. Garnissez l'extrémité du tuyau de ventilation relié au poêle avec une feuille de Cerablanket. Utilisez des tronçons de fil métallique de 12 po (env. 305 mm) de faible épaisseur (non fournis) ou un ruban métallique (non fourni). Ceci pour protéger l'intérieur des éléments d'une chaleur excessive.

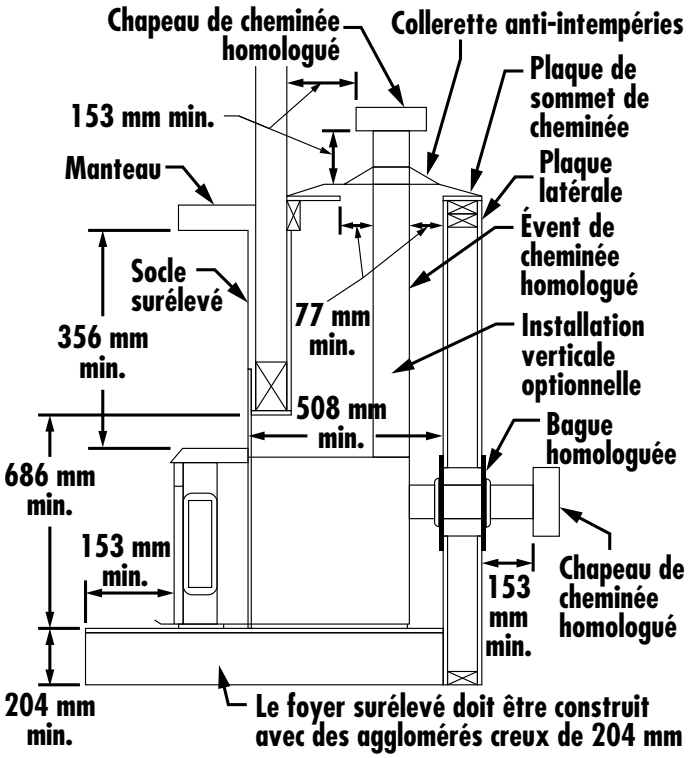
3. Présentez l'insert sur le foyer et faites le glisser assez profondément pour attacher le tuyau de ventilation (et le tuyau d'air de combustion s'il y en a un).
4. Attachez le solin, faites passer le cordon de courant vers la prise de 120 V la plus proche. Glissez-la dans l'insert.
5. Mesurez et façonnez le dessus de la cheminée. Découpez un trou pour le tuyau d'aération (et le tuyau d'alimentation en air de combustion s'il y en a un). Installez et scellez avec du silicone extérieur pour éviter les infiltrations d'eau. Installez le chapeau de l'évent.



SI LE TUYAU DE VENTILATION VA JUSQU'À LA PLAQUE DE CHEMINÉE (SEULEMENT POUR LES CHEMINÉES EN MAÇONNERIE)

1. Il vous faudra un tuyau qui dépasse de 12 po (env. 305 mm) au delà du cache. Remarque: Cette installation est optionnelle, mais elle est recommandée. L'air de combustion extérieur ne peut pas être extrait de la cavité de la cheminée dans cette installation.
2. Garnissez l'extrémité du tuyau de ventilation relié au poêle avec une feuille de Cerablanket. Utilisez des tronçons de fil métallique de 12 po (env. 305 mm) de faible épaisseur (non fournis) ou un ruban métallique (non fourni). Ceci pour protéger l'intérieur des éléments d'une chaleur excessive.
3. Mesurez et façonnez un cache. Découpez un trou pour le tuyau d'aération (et le tuyau d'alimentation en air de combustion s'il y en a un). Installez et scellez minutieusement le cache avec du silicone d'extérieur. Si le scellement est insuffisant, il peut s'ensuivre un refoulement de fumée.
4. Faites glisser le tuyau vers le haut (et le tuyau d'alimentation en air de combustion s'il y en a un) à travers le trou du cache, en laissant assez d'espace pour pouvoir le tirer vers le bas.
5. Présentez l'insert sur le foyer, ajustez les boulons de nivellement à l'arrière et faites le glisser assez profondément pour attacher le tuyau de ventilation (et le tuyau d'air de combustion s'il y en a un). Assurez-vous de sceller l'endroit où le tuyau passe à travers le cache.
6. Attachez le solin, faites passer le cordon de courant vers la prise de 120 V la plus proche. Glissez-la dans l'insert.

COMME POUR UNE CHEMINÉE ENCASTRÉE



La figure décrit l'installation ventilée soit dans une cage spéciale construite à l'extérieur d'un mur extérieur, soit dans un faux mur intérieur. Ceci est particulièrement adapté pour une nouvelle construction ou une rénovation. Les zones d'équipement (les côtés et l'arrière du poêle dans la cheminée) doivent être protégés selon les standards électriques en vigueur. Remarque: Pour les encastrés, la protection du sol prévoit une chappe continue pour empêcher les tisons de tomber jusqu'à un sol combustible au cas où il y aurait des fissures à la surface du revêtement de sol. Les dimensions de la chape sont des minimums à observer.

INSTALLATION DANS UNE CHEMINÉE PRÉFABRIQUÉE EN MÉTAL

Au cours d'une installation dans une cheminée préfabriquée, le foyer doit accueillir l'insert sans modification sinon le retrait de pièces vissées ou boulonnées ensemble comme des déflecteurs de fumée, des rebords à cendre, des glissières de portes et des assemblages de volets. Ces éléments doivent être réinstallés pour

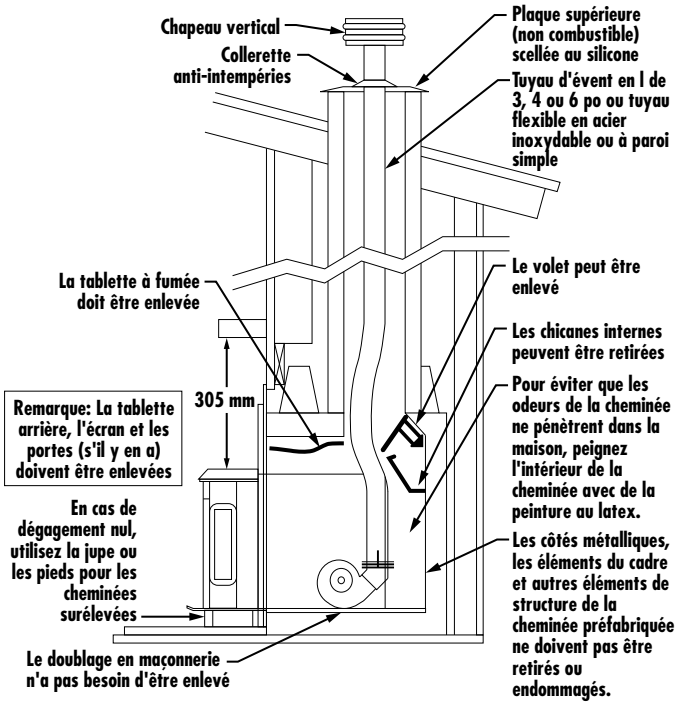
remettre la cheminée dans son état original si l'insert est démonté et n'est pas remplacé. Le démontage d'une pièce quelconque ne doit nullement altérer l'intégrité de la cheminée. La cheminée préfabriquée doit être homologuée auprès de UL 127. L'installation doit inclure cheminée chemisée de bonne grandeur répondant aux exigences de type HT (2100° F) par 1777 (U.S.). Le doublage doit être solidement fixé à la buse du conduit de fumée de l'insert et au sommet de la cheminée. La zone du volet doit être scellée pour empêcher le passage de l'air de la pièce vers le vide de la cheminée. La modification du foyer n'est pas permise, sauf dans les cas suivants:

- Les garnitures extérieures qui n'affectent pas le fonctionnement de la cheminée, peuvent être retirées et être stockées sur ou à l'intérieur de la cheminée pour être remises en place si l'insert est démonté.
- Le volet peut être retiré pour permettre l'installation d'un revêtement de cheminée.

Les chambres de circulation d'air, les déflecteurs et les entrées et sorties d'air (c.-à-d. dans une cheminée doublée de métal ou dans un circulateur d'air en métal) ne doivent pas être bloqués. Il doit y avoir la possibilité de retirer l'insert pour nettoyer le conduit de cheminée. Il faut installer une étiquette métallique à l'arrière de l'ouverture du foyer, qui précisera:

- Cette cheminée a été modifiée pour accepter un insert et devra être inspectée par une personne qualifiée avant d'être réemployée comme cheminée ordinaire.
- Cette étiquette est disponible sur demande.

L'approbation finale revient à l'autorité compétente.



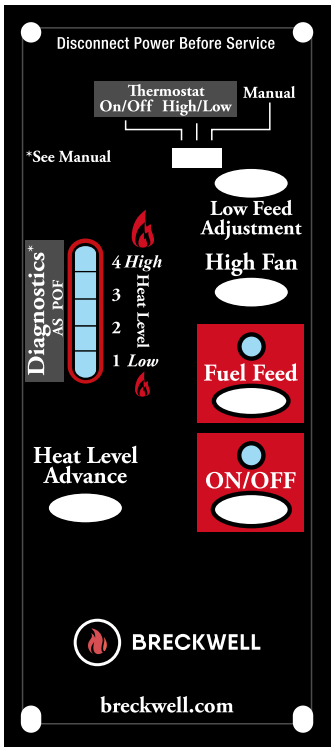
FIXATION DE L'APPAREIL AU SOL

AVERTISSEMENT! NE PAS INSTALLER DANS UNE CHAMBRE À COUCHER.
MISE EN GARDE! L'INTÉGRITÉ STRUCTURELLE DU PLANCHER, DES MURS ET DU PLAFOND / TOIT DE LA MAISON MOBILE DOIT ÊTRE MAINTENUE.
LORSQU'IL EST INSTALLÉ DANS UNE MAISON MOBILE, LE POÊLE DOIT ÊTRE MIS À LA TERRE DIRECTEMENT SUR LE CHÂSSIS D'ACIER ET BOULONNÉ AU SOL.

En plus des exigences d'installation précédemment détaillées, les installations de maisons mobiles doivent répondre aux exigences suivantes:

- Ce poêle doit être solidement fixé au plancher de la maison mobile à l'aide de deux tire-fonds de 1/4 po (0,7 mm) qui sont assez longs pour passer à la fois par un coussin de foyer, s'il est utilisé, et le plancher de la maison.
- Le radiateur doit être mis à la terre électriquement au châssis en acier de la maison mobile avec un fil de cuivre de 8 GA à l'aide d'une rondelle dentelée ou en étoile pour pénétrer la peinture ou le revêtement protecteur afin d'assurer la mise à la terre.
- Lors du déménagement de votre maison mobile, toute ventilation extérieure doit être enlevée pendant le déplacement de la maison mobile. Après le déplacement, tous les évents doivent être réinstallés et solidement fixés.
- L'air extérieur est obligatoire pour l'installation d'une maison mobile. Consultez la section «Alimentation en air extérieur» et votre revendeur pour l'achat.
- Vérifiez auprès de vos responsables locaux du bâtiment car d'autres codes peuvent s'appliquer.

PANNEAU DE COMMANDES)



Les soufflantes et l'alimentation automatique en carburant sont commandées depuis un panneau situé sur le côté droit. Les fonctions de commande du panneau sont:

COMMUTATEUR M/A

- Quand cette commande est actionnée le poêle s'allume automatiquement. Aucun autre allumeur de feu n'est nécessaire. L'allumeur reste activé de 10 à 15 minutes, selon le moment ou la présence de feu est établie. Le feu doit prendre après 5 minutes environ.
- Le voyant vert situé au-dessus du bouton de M/A (dans la case ON/OFF) va clignoter durant la période d'allumage au démarrage.
- La sélection de puissance "Heat Level Advance" est inhibée durant cette période d'allumage. Quand le précédent voyant vert reste allumé en fixe la puissance de chauffe peut être ajustée au niveau voulu avec la commande "Heat Level Advance".

REMARQUE: Si le poêle vient d'être arrêté et que vous voulez le redémarrer encore chaud, il vous faut maintenir appuyé pendant 2 secondes le bouton de la commande "ON/OFF".

COMMANDE D'ALIMENTATION EN CARBURANT

MISE EN GARDE:
N'UTILISEZ PAS CETTE COMMANDE PENDANT UN FONCTIONNEMENT NORMAL, CAR ELLE POURRAIT ÉTENDRE LE FEU ET ENTRAÎNER UNE SITUATION DANGEREUSE.

- Quand la commande "Fuel Feed" est actionnée et maintenue appuyée, le poêle va envoyer continuellement des granulés dans le pot de combustion.
- Pendant que le système de vis sans fin du poêle alimente en granulés, le voyant vert dans le carré "Fuel Feed" sera allumé.

COMMANDE DE VENTILATION RAPIDE

- La vitesse de ventilation dans la pièce varie directement en fonction du taux d'alimentation. La commande "High Fan" surpasse cette fonction de ventilation à vitesse variable. Elle fixe la vitesse de ventilation dans la pièce au maximum quelque soit le taux d'alimentation en carburant.
- Quand cette commande "High Fan" est actionnée le ventilateur tourne à son régime maximal.
- Quand cette commande est actionnée de nouveau, le ventilateur revient à sa vitesse d'origine déterminée par le réglage de "Feed Rate Advance".

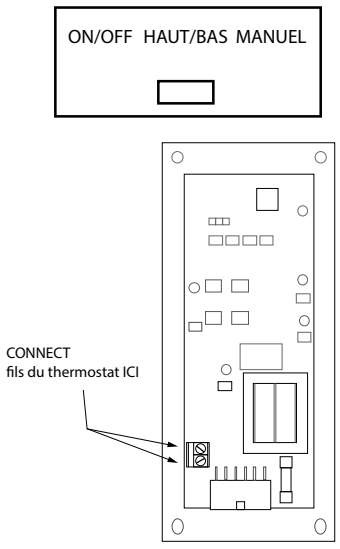
PROGRESSION DU NIVEAU DE CHAUFFE

- Quand cette commande est actionnée elle règle le taux d'alimentation en granulés, donc la puissance de chauffe de votre poêle. Ces niveaux vont progresser de façon incrémentale sur la barre indicatrice, en allant de "1" à "4".

REMARQUE: Quand vous baissez la puissance de chauffe de plusieurs niveaux (de 4 à 1), actionnez la commande "High Fan" pour ventiler à pleine puissance au moins 5 minutes, afin d'éviter que le poêle ne fasse déclencher son thermodisque pour température trop forte. S'il se déclenchait consultez "DISPOSITIFS DE SÉCURITÉ".

THERMOSTAT OPTIONNEL

Un thermostat optionnel peut vous aider à maintenir automatiquement constante la température de la maison. Un thermostat millivolt est nécessaire. Le panneau de commandes peut être configuré de deux façons pour faire fonctionner votre poêle en mode avec thermostat.



INSTALLATION DU THERMOSTAT

- Un thermostat millivolt est nécessaire
- Débranchez le poêle de la prise.
- Retirez la carte de contrôle du poêle.
- Les deux fils du thermostat se connectent aux bornes situées en bas à gauche à l'arrière de la carte de contrôle.
- Introduisez les fils à l'extrémité et serrez les deux boulons.

MODES

Pour basculer de l'un à l'autre de ces trois modes, le poêle doit être éteint, le nouveau mode sélectionné et le poêle redémarré.

MODE MANUEL

- Utilisez ce mode uniquement si vous ne connectez pas de thermostat optionnel.
- Dans ce mode, le poêle sera contrôlé uniquement à partir du panneau de contrôle selon les détails donnés dans la section «TERMOSTAT» de ce manuel utilisateur

MODE THERMOSTAT HAUT / BAS

- Utilisez ce mode uniquement si vous connectez un thermostat
- Dans ce mode, le poêle basculera automatiquement entre deux réglages. Quand il est suffisamment chaud, il basculera vers le #1 ou réglage bas. Le ventilateur d'intérieur va ralentir jusqu'à sa vitesse la plus faible.
- Le réglage «Heat Level Advance» (paramètre de niveau de chaleur) sur le graphique en barres reste à sa position initiale. Quand l'intérieur se refroidit en dessous du réglage du thermostat, le poêle bascule au mode d'alimentation du réglage du paramètre de niveau de chaleur.

MODE THERMOSTAT ON/OFF

AVERTISSEMENT:
• **N'UTILISEZ PAS DE PRODUITS CHIMIQUES OU DE FLUIDES POUR ALLUMER LE FEU - N'UTILISEZ JAMAIS D'ESSENCE, DE COMBUSTIBLE POUR LANTERNE DE TYPE ESSENCE, DE KÉROSÈNE, DE LIQUIDE À BRIQUET À CHARBON OU DE LIQUIDES SIMILAIRES POUR ALLUMER OU «RAFRAÎCHIR» UN FEU DANS CE POÊLE. GARDEZ TOUS CES LIQUIDES ÉLOIGNÉS DU POÊLE PENDANT SON UTILISATION.**
• **CHAUD EN FONCTIONNEMENT. TENIR LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES À L'ÉCART. LE CONTACT PEUT CAUSER DES BRÛLURES DE LA PEAU.**

- Utilisez ce mode uniquement si vous connectez un thermostat
- Dans ce mode, le poêle s'arrêtera quand l'intérieur est suffisamment chaud. Les ventilateurs vont continuer à fonctionner jusqu'à ce que le poêle soit tiède.
- Quand l'intérieur sera refroidi en dessous du réglage du thermostat, le poêle va redémarrer automatiquement au niveau de la dernière alimentation. Ne faites pas fonctionner le poêle au delà de #3. REMARQUE: Quand on est en mode thermostat «haut/bas» ou «On/Off» Mettez la tige du volet à environ 1/4 po à 1/2 po (env. 6 à 12 mm) Ceci varie en fonction de l'altitude et de la météo. Observez le comportement du poêle et ajustez le volet si besoin.

Le chauffage est conçu pour ne brûler que des granulés de classe supérieure PFI. NE PAS BRÛLER:

1. Des ordures;
2. Des déchets de tonte ou résidus de jardin;
3. Des matériaux contenant du caoutchouc, incluant les pneus;
4. Matériaux contenant du plastique;
5. Des déchets de produits du pétrole, des peintures ou diluants à peinture, ou des produits d'asphalte;
6. Matériaux contenant de l'amiante;
7. Débris de construction ou de démolition;
8. Traverses de voie ferrée ou bois traité sous pression;
9. Fumier ou restes d'animaux;
10. Bois de grève en eau salée ou autres matériaux précédemment saturés par de l'eau salée;
11. Bois non séché; ou
12. Produits du papier, carton, contreplaqué, ou panneau de particules. L'interdiction de brûlage de ces matériaux n'interdit pas l'utilisation d'allume-feu composés de papier, carton, sciure de bois, cire et substances similaires, aux fins de démarrer le feu dans un chauffage au bois modifié.

Le brûlage de ces matériaux peut causer des émanations de fumées toxiques ou rendre le chauffage inefficace en raison de la fumée.

CARBURANT APPROPRIÉ

AVERTISSEMENT:
L'APPAREIL EST CONÇU POUR ÊTRE UTILISÉ AVEC DU COMBUSTIBLE EN GRANULÉS CONFORME À OU EXCÉDANT LA NORME ÉTABLIE PAR LE PELLET FUEL INSTITUTE (PFI). L'UTILISATION D'AUTRES COMBUSTIBLES ANNULE LA GARANTIE.

Votre poêle à granulés est conçu pour brûler des granulés de bois dur de qualité supérieure conformes à la norme PFI (Pellet Fuels Institute) (densité minimale de 40 lb par pied cube, diamètre de 1/4 à 5/16 moins de 8 200 BTU / lb, humidité inférieure à 8% en poids, cendres inférieure à 1% en poids et sel inférieur à 300 parties par million). Les granulés mous, contenant une quantité excessive de sciure de bois en vrac, qui ont été ou sont mouillés, réduiront les performances. Rangez vos pellets dans un endroit sec. NE stockez PAS le carburant dans les dégagements d'installation de l'appareil ou dans l'espace requis pour faire le

plein et enlever les cendres. Cela pourrait provoquer un incendie. Ne pas trop brûler ou utiliser des combustibles volatiles ou des combustibles, cela pourrait causer des dommages aux personnes et à la propriété. Cet appareil n'est homologué que pour brûler du carburant sous forme de granulés de bois ! Les granulés approuvés mesurent 1/4 po. Ou 5/16 po. De diamètre et pas plus de 1 po. De long. Les granulés plus longs ou plus épais peuvent bloquer les ailettes de la tarière, ce qui empêche une bonne alimentation en granulés. Il est interdit de brûler du bois sous d'autres formes que des granulés. Il s'agirait d'une violation des codes du bâtiment pour lesquels le poêle a été approuvé, et cela annulerait toutes les garanties. La conception du poêle intègre l'alimentation automatique des granulés dans le feu selon un rythme soigneusement calculé. Un autre combustible introduit à la main n'augmenterait pas la production de chaleur, mais pourrait nuire gravement aux performances du poêle en générant beaucoup de fumée. Ne brûlez pas de granulés mouillés. Les performances du poêle dépendent fortement de la qualité des granulés. Évitez les marques de granulés qui présentent les caractéristiques suivantes :

- Un excès de fines – Le terme « fines » décrit les granulés écrasés ou les matériaux libres qui ressemblent à de la sciure ou à du sable. Il est possible de tamiser les granulés avant de les placer dans la trémie pour éliminer la plupart des fines.
- Des liants – Certains granulés sont produits avec des matériaux liants qui les agglutinent, les « lient ».
- Un contenu élevé en cendres – Ces granulés de mauvaise qualité créent souvent de la fumée et salissent la vitre. L'entretien devra être plus fréquent. Il faudra vider le pot de combustion et aspirer la totalité du système plus fréquemment. Des granulés de mauvaise qualité pourraient endommager la tarière. Nous ne pouvons accepter aucune responsabilité en cas de dommages dus à des granulés de mauvaise qualité.

AVERTISSEMENT:
• **GARDER LES OBJETS ÉTRANGERS HORS DE LA TRÉMIE.**
• **LES PIÈCES MOBILES DE CE POÊLE SONT MUES PAR DES MOTEURS ÉLECTRIQUES AU COUPLE ÉLEVÉ. ÉLOIGNEZ TOUTES LES PARTIES DU CORPS DE LA TARIÈRE LORSQUE LE POÊLE EST BRANCHÉ SUR LA PRISE ÉLECTRIQUE. CES PIÈCES MOBILES PEUVENT COMMENCER À BOUGER À TOUT MOMENT LORSQUE LE POÊLE EST BRANCHÉ.**

VÉRIFICATION AVANT LA MISE EN MARCHE

Retirez le pot de combustion, vérifier qu'il soit propre et qu'aucun des orifices d'air ne soit bouché. Nettoyez la chambre de combustion puis réinstallez le pot de combustion. Nettoyez la vitre de la porte si nécessaire (un chiffon sec ou une serviette en papier suffit généralement). N'utilisez jamais de produits nettoyants abrasifs sur la vitre ou la porte. Vérifiez le combustible dans la trémie, et remplissez-la si nécessaire.

PRÉPARER UN FEU

N'utilisez jamais de grille ou autre moyen de supporter le carburant. Utilisez uniquement le pot de combustion fourni avec ce radiateur. Le couvercle de la trémie doit être fermé pour que l'unité puisse alimenter des granulés. Pendant la période de démarrage:

- Assurez-vous que le pot de combustion ne contient pas de granulés.
- N'ouvrez PAS la porte de visualisation.
- Il se peut que le registre doive être fermé pendant le démarrage.
- N'ajoutez PAS de granulés dans le pot de combustion à la main.

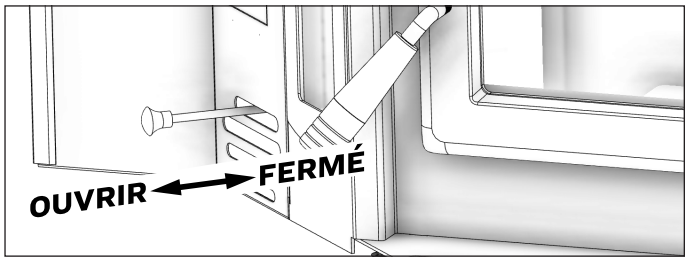
REMARQUE: Au cours des premiers incendies, votre poêle émettra une odeur lorsque la peinture à haute température durcit ou deviendra assaisonnée au métal. Le maintien de petits incendies minimisera cela. Évitez de placer des articles sur la cuisinière pendant cette période car la peinture pourrait être affectée. Les tentatives pour atteindre des débits de chaleur dépassant les spécifications de conception du réchauffeur peuvent entraîner des dommages permanents au réchauffeur.

ALLUMAGE AUTOMATIQUE

1. Remplissez la trémie et nettoyez le pot de combustion.
2. Appuyez sur le bouton « Marche/Arrêt ». Assurez-vous que le voyant vert s'allume.
3. Réglez le débit d'alimentation au réglage souhaité en appuyant sur le bouton « Avancement du niveau de chaleur ».

FONCTIONNEMENT OPTIMAL

Ce poêle à granulés a été certifié conforme aux directives strictes de 2020 par l'EPA des États-Unis. Pour garantir des émissions minimales, il est essentiel de suivre les instructions suivantes : pour une combustion élevée, réglez votre poêle sur la position 4, avec le registre d'air complètement ouvert. Pour une combustion moyenne, réglez votre poêle sur la position 2, avec le registre d'air complètement fermé jusqu'à l'arrêt. Pour une combustion basse, réglez votre poêle sur la position 1, avec le registre d'air complètement fermé.



EFFICACITÉ

Nous avons déterminé l'efficacité de cet appareil selon la norme CSA B415.1. Pour une efficacité maximale, utilisez toujours des granules de première qualité et réglez le registre au besoin (voir la section sur le réglage du registre). L'emplacement de l'installation peut affecter l'efficacité. Pour une efficacité maximale, installez cet appareil dans la pièce principale.

RÉGLAGE DU VOLET

La tige de commande du registre du poêle ajuste l'air de combustion. Ce contrôle est nécessaire étant donné les différents profils de feu des installations individuelles, les différents granulés et le débit d'alimentation en granulés. Il permet d'améliorer l'efficacité de votre poêle. Un apport d'air de combustion correct va réduire le besoin de nettoyer la porte vitrée et empêcher la formation de créosote dans votre poêle et dans la cheminée. Vous devez régler le volet en fonction de l'apparence du feu. Un feu bas, rougeâtre et sale peut être amélioré en tirant légèrement sur le volet. Un feu «en torche» peut être réduit en poussant un peu le volet. En règle générale, quand on diminue la vitesse d'alimentation, le volet devrait être plus éloigné. A des vitesses d'alimentation plus importantes, le volet devrait être plus ouvert. C'est en tâtonnant qu'on finit par trouver les bons réglages. Consultez votre revendeur si vous avez besoin d'aide. REMARQUE: Sur «1», le volet devrait être soit complètement fermé, soit ouvert approximativement de 1/8" à 1/4" (env. 3 à 6 mm). Si le volet est trop ouvert, cela peut faire éteindre le feu.

OUVERTURE DE LA PORTE

Si la porte est ouverte pendant que le poêle fonctionne, il faut la fermer pendant 30 secondes sinon le poêle va s'éteindre. Si le poêle s'éteint, pousser le bouton «On/Off» pour que le poêle continue à fonctionner.

AVERTISSEMENT:
• **NE FAITES PAS FONCTIONNER VOTRE POÊLE AVEC LA PORTE VUE OUVERTE. LA TARIÈRE N'ALIMENTERA PAS DE GRANULÉS DANS CES CIRCONSTANCES ET UN PROBLÈME DE SÉCURITÉ PEUT PROVOQUER DES ÉTINCELLES OU DES FUMÉES ENTRANT DANS LA PIÈCE.**
• **LA PORTE DOIT ÊTRE FERMÉE ET SCELLÉE PENDANT LE FONCTIONNEMENT.**

VENTILATEUR DE LA PIÈCE

Lors du démarrage du poêle, le ventilateur de la pièce ne se met pas en marche tant que l'échangeur thermique du poêle n'est pas chaud. Cela prend habituellement environ 10 minutes après le démarrage.

REDÉMARRAGE D'UN POÊLE CHAUD

Si le poêle a été éteint et que vous voulez le redémarrer alors qu'il est encore chaud, le bouton «ON / OFF» doit être maintenu enfoncé pendant 2 secondes.

SI LE POÊLE MANQUE DE GRANULÉS

Le feu s'éteint; le moteur de la tarière et les ventilateurs restent en fonctionnement jusqu'à ce que le poêle ait refroidi. Cela peut prendre 30 minutes ou plus, en fonction de la chaleur résiduelle dans l'appareil. Après l'arrêt des composants du poêle, tous les témoins de l'écran s'éteignent et l'écran à deux chiffres affiche « E3 » en clignotant.

RECHARGE EN COMBUSTIBLE

AVERTISSEMENT:
• **GARDEZ LE COUVERCLE DE LA TRÉMIE FERMÉ À TOUT MOMENT, SAUF PENDANT LE REMPLISSAGE.**
• **NE REMPLISSEZ PAS TROP LA TRÉMIE.**

AVERTISSEMENT:
• **LA TRÉMIE ET LE COUVERCLE DU POÊLE SONT CHAUDS PENDANT LE FONCTIONNEMENT ; VOUS DEVEZ TOUJOURS PROTÉGER VOS MAINS LORS DU REMPLISSAGE DU POÊLE.**
• **NE TOUCHEZ PAS AUX SURFACES CHAUDES DU POÊLE. ENSEIGNEZ AUX ENFANTS LES DANGERS DES POÊLES À HAUTE TEMPÉRATURE. LES JEUNES ENFANTS DOIVENT ÊTRE SURVEILLÉS LORSQU'ILS SE TROUVENT DANS LA MÊME PIÈCE QUE LE POÊLE.**
• **NE PLACEZ JAMAIS VOTRE MAIN PRÈS DE LA TARIÈRE LORSQUE LE POÊLE EST EN MARCHE.**
• **NOUS VOUS RECOMMANDONS DE NE PAS LAISSER LA TRÉMIE TOMBER EN DESSOUS DU 1/4 PLEIN.**

AVERTISSEMENT DE SABOTAGE

Ce poêle à bois a un taux de combustion faible minimum, défini par le fabricant, qui ne doit pas être modifié. Il est contraire à la réglementation fédérale de modifier ce paramètre ou d'utiliser ce radiateur à bois d'une manière non conforme aux instructions d'utilisation de ce manuel.

PROCÉDURE D'ARRÊT

ATTENTION:
NE JAMAIS ARRÊTER CET APPAREIL EN LE DÉBRANCHANT DE LA SOURCE D'ALIMENTATION.

Pour arrêter le poêle, il suffit d'appuyer sur la touche « POWER » du tableau d'affichage. Le témoin vert repasse au rouge lorsqu'on appuie sur la touche « POWER ». Le moteur de la tarière s'arrête et les ventilateurs continuent de fonctionner jusqu'à ce que la température de la chambre de combustion interne ait baissé jusqu'à un niveau prédéfini.

1. Ce poêle est équipé d'un thermodisque haute température. Cet appareil comporte un thermodisque à réarmement manuel. Cet interrupteur de sécurité a deux fonctions.

A. Détecter une surchauffe du poêle et arrêter le système d'alimentation en combustible ou la tarière.

B. En cas de dysfonctionnement du ventilateur de convection, le thermodisque haute température arrête automatiquement la tarière, ce qui prévient une surchauffe du poêle.

REMARQUE: Sur certains appareils, une fois le bouton de réinitialisation déclenché, comme un disjoncteur, il faut appuyer

dessus pour redémarrer le poêle. Sur d'autres appareils, le thermodisque ne comporte pas de bouton de réinitialisation et se réinitialise lorsque le poêle a refroidi. Le fabricant vous recommande de vous adresser au revendeur si cela se produit car cela peut indiquer un problème plus grave. Il peut s'avérer nécessaire d'appeler le service de réparation.

2. En cas de défaillance du ventilateur de combustion, un interrupteur pneumatique interrompt automatiquement la tarière.

REMARQUE: L'ouverture de la porte du poêle pendant plus de 30 secondes pendant le fonctionnement provoque un changement de pression suffisant pour activer l'interrupteur pneumatique qui arrête l'alimentation en combustible. Le poêle s'éteint et la mention « E2 » s'affiche sur l'écran à deux chiffres. Le poêle doit s'arrêter complètement avant de pouvoir être redémarré.

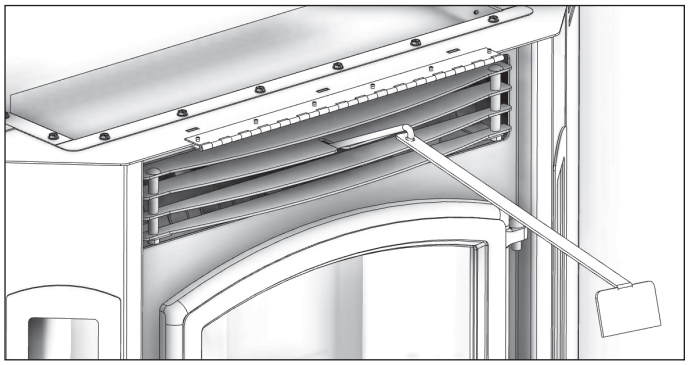
OUTIL DE MAINTENANCE

Un outil a été fourni pour vous aider avec les fonctions suivantes:

- Remuer les granulés dans la trémie - contrairement aux liquides dans un réservoir, les granulés ne s'écoulent pas uniformément dans la vis sans fin. Un pontage à travers l'ouverture peut se produire. Les granulés peuvent s'accrocher sur les côtés de la trémie. Parfois, «remuer» la trémie peut aider. REMARQUE: pour éviter le pontage des granulés, du papier ciré ordinaire peut être frotté sur les parois latérales et le fond de la trémie.
- Nettoyage des tubes de l'échangeur de chaleur.
- Grattez les cendres du pot de combustion.

CHAMBRES INTÉRIEURES

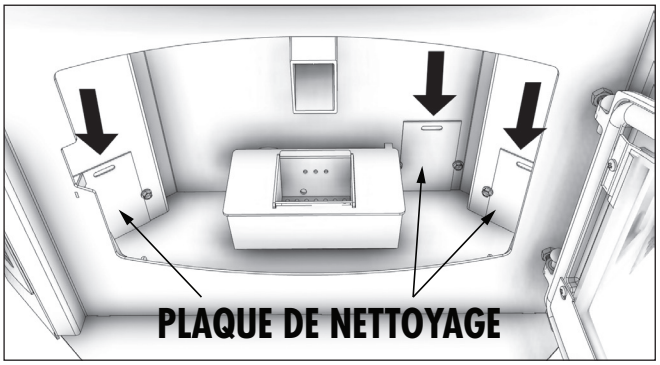
- **Pot de combustion -** Retirez et nettoyez périodiquement le pot de combustion et la zone à l'intérieur du boîtier du pot de combustion. En particulier, il est conseillé de nettoyer les trous du pot de combustion pour éliminer toute accumulation qui pourrait empêcher l'air de circuler librement dans le pot de combustion.
- **Tubes d'échange de chaleur -** Votre poêle est conçu avec un nettoyeur de tube d'échange de chaleur intégré. Ceci doit être utilisé tous les deux ou trois jours pour éliminer les cendres accumulées sur les tubes, ce qui réduit le transfert de chaleur sur cet appareil. Insérez l'extrémité de la poignée (avec trou) de l'outil de nettoyage sur la tige de nettoyage. La tige de nettoyage est située dans la grille au-dessus de la porte du poêle. Déplacez la tige de nettoyage plusieurs fois d'avant en arrière pour nettoyer les tubes de l'échangeur de chaleur. Assurez-vous de laisser le nettoyeur de tube à l'arrière du poêle.



Échangeur de chaleur - Il y a quatre plaques de nettoyage dans la chambre de combustion de l'échangeur de chaleur, trois dans l'insert qui doivent être retirées pour nettoyer les cendres volantes de l'échangeur de chaleur. Ces plaques de nettoyage permettent d'accéder à la chambre entourant la chambre de combustion. Les nettoyages sont fixés à la chambre de combustion avec (2) vis 5/16 ". Retirez les nettoyages et aspirez les cendres accumulées. Cela devrait être fait au moins une fois par mois ou plus fréquemment si de grandes quantités de cendres sont remarquées pendant le nettoyage ou si le poêle ne semble pas brûler correctement. Dans certains cas, vous devrez éliminer la créosote, qui peut s'accumuler rapidement dans certaines conditions. Une petite brosse métallique peut être utilisée. Il est important d'éliminer cette créosote car elle est hautement combustible. INSPECTEZ DERRIÈRE CES PLAQUES DE NETTOYAGE AU MOINS UNE FOIS PAR TONNE DE GRANULES BRÛLÉES JUSQU'À CE QUE VOUS SOYEZ CONNAISSANT DE LA FAÇON DONT LES CENDRES ET LE CRÉOSOTE S'ACCUMULENT AVEC VOS PRATIQUES D'UTILISATION. Utilisez la petite brosse métallique pour nettoyer également l'intérieur des parois de la chambre, au-dessus des portes d'accès. Si un aspirateur est utilisé pour nettoyer votre poêle, nous vous suggérons d'utiliser l'aspirateur AV15E AshVac. L'AV15E AshVac est conçu pour l'élimination des cendres. Certains aspirateurs ordinaires (c'est-à-dire les aspirateurs d'atelier) peuvent laisser échapper des cendres dans la pièce.

NE PAS ASPIRER LES CENDRES CHAUDES.

AVERTISSEMENT:
LE MANQUE D'ENTRETIEN CORRECTEMENT LES EXTÉRIEURS PROPRES ENTRAÎNERA UNE MAUVAISE PERFORMANCE DE CE POÊLE.



AVERTISSEMENT:
N'ESSAYEZ JAMAIS DE RÉPARER OU DE REMPLACER UNE PIÈCE DU POÊLE À MOINS QUE DES INSTRUCTIONS NE SONT DONNÉES DANS CE MANUEL. TOUS LES AUTRES TRAVAUX DOIVENT ÊTRE EFFECTUÉS PAR UN TECHNICIEN FORMÉ.

AVERTISSEMENT:
SI VOUS RECONNAISSEZ UN FEU INTELLIGENT (POT DE BRÛLEUR I PLEIN MAIS PAS DE FLAMME VISIBLE) ET UNE FORTE ACCUMULATION DE FUMÉE DANS LA BOÎTE À FEU, ÉTEIGNEZ IMMÉDIATEMENT LE POÊLE, MAIS NE LE DÉBRANCHEZ PAS. N'OUVREZ PAS LA PORTE, NE MODIFIEZ PAS LE RÉGLAGE DE L'AMORTISSEUR OU NE MODIFIEZ AUCUNE COMMANDE SUR LE POÊLE. ATTENDEZ JUSQU'À CE QUE LA BOÎTE À FEU SE DÉGAGE ET QUE LES SOUFFLERIES S'ARRÊTENT, FAITES COMME INDIQUÉ DANS «VÉRIFICATION AVANT LE DÉMARRAGE» ET «CONSTRUIRE UN FEU», PUIS TENTEZ DE REDÉMARRER LE FEU. SI LE PROBLÈME PERSISTE, CONTACTEZ VOTRE CONCESSIONNAIRE.

AVERTISSEMENT:
SI LE POÊLE EST INSTALLÉ DANS UNE PIÈCE SANS CLIMATISATION OU DANS UNE ZONE O WH LA LUMIÈRE DIRECTE DU SOLEIL PEUT BRILLER SUR L'APPAREIL, IL EST POSSIBLE QUE CELA PEUT CAUSER LA TEMPÉRATURE DU POÊLE À ÉLEVER À NIVEAU DE FONCTIONNEMENT; UN DES CAPTEURS POURRAIT PUIS FAIRE DÉMARRER LE POÊLE DE SON PROPRE. IL EST RECOMMANDÉ QUE LE POÊLE SOIT DÉBRANCHÉ LORSQU'IL N'EST PAS UTILISÉ POUR UNE DURÉE DE TEMPS PROLONGÉE (C.-À-D.PENDANT LES MOIS D'ÉTÉ).

NE JAMAIS UTILISER CE PRODUIT SANS SURVEILLANCE

MISE EN GARDE:
• NE PAS NETTOYER ET MAINTENIR CET APPAREIL COMME INDIQUÉ PEUT ENTRAÎNER DE MAUVAISES PERFORMANCES, DES RISQUES POUR LA SÉCURITÉ, UN INCENDIE ET MÊME LA MORT. • NE JAMAIS EFFECTUER D'INSPECTION, DE NETTOYAGE OU DE MAINTENANCE SUR UN POÊLE CHAUD. • DÉBRANCHEZ LE CORDON D'ALIMENTATION AVANT D'EFFECTUER TOUTE MAINTENANCE! REMARQUE: METTRE L'INTERRUPTEUR MARCHE / ARRÊT SUR «OFF» NE DÉBRANCHE PAS TOUTE L'ALIMENTATION DES COMPOSANTS ÉLECTRIQUES DU POÊLE. • NE PAS FAIRE FONCTIONNER LE POÊLE AVEC LA VITRE CASSÉE, UNE FUITE DE GAZ DE FUMÉE PEUT EN RÉSULTER.

FORMATION, INSPECTION ET ÉLIMINATION DE LA CRÉOSOTE

MISE EN GARDE:
LE SYSTÈME D'ÉCHAPPEMENT DOIT ÊTRE VÉRIFIÉ MENSUEL PENDANT LA SAISON DE BRÛLURE POUR TOUT ACCUMULATION DE SUIE OU DE CRÉOSOTE.

Lorsque le bois brûle lentement, il produit du goudron et d'autres vapeurs organiques qui se combinent avec l'humidité rejetée pour former la créosote. Les vapeurs de créosote se condensent dans un conduit de cheminée relativement froid ou si le feu vient de démarrer ou brûle lentement. Ainsi, les résidus de créosote s'accumulent sur le boisseau. Si elle prend feu, cette créosote produit un feu extrêmement chaud qui peut endommager la cheminée, voire détruire la maison. En dépit de leur grande efficacité, les poêles à granulés peuvent accumuler de la créosote dans certaines conditions. Le raccord et le conduit de cheminée doivent être inspectés par une personne qualifiée une fois par an ou par tonne de granulés pour déterminer si une accumulation de créosote ou de cendres volantes s'est produite. Si la créosote s'est accumulée, elle doit être enlevée pour réduire le risque de feu de cheminée. Inspectez le système au niveau du raccord avec le poêle et en haut de la cheminée. Les surfaces plus froides ont tendance à accumuler les dépôts de créosote plus rapidement; il est donc important de vérifier la cheminée par le haut ainsi que par le bas. La créosote doit être éliminée avec une brosse spécialement conçue pour le type de cheminée utilisé. Un ramoneur qualifié peut fournir ce service. Il est également conseillé d'inspecter, de nettoyer et si nécessaire de réparer la totalité du système avant chaque saison de chauffage. Pour nettoyer la cheminée, déconnecter l'évacuation du poêle.

CENDRES VOLANTES

Elles s'accumulent dans la portion horizontale du conduit d'évacuation. Bien qu'elles ne soient pas combustibles, elles peuvent gêner le flux normal d'évacuation. Elles doivent donc être périodiquement éliminées.

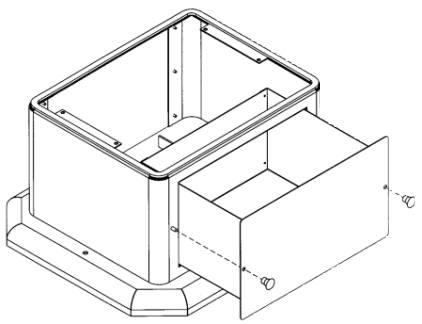
ENLÈVEMENT ET ÉLIMINATION DES CENDRES

Retirez les cendres périodiquement pour éviter l'accumulation inutile de cendres. Retirez les cendres une fois l'unité refroidie. Les cendres doivent être placées dans un récipient en métal avec un couvercle hermétique. Le contenant fermé de cendres doit être placé sur un sol incombustible ou sur le sol, bien éloigné de tout matériau combustible, en attendant l'élimination finale. Si les cendres sont éliminées par enfouissement dans le sol ou autrement dispersées localement, elles doivent être conservées dans le récipient fermé jusqu'à ce que toutes les braises aient été complètement refroidies. Le conteneur ne doit pas être utilisé pour d'autres déchets ou l'élimination des déchets. S'ils sont combinés avec des substances combustibles, les cendres et les braises peuvent s'enflammer. L'élimination des cendres est la suivante:

AVERTISSEMENT:
LAISSEZ LE POÊLE REFROIDIR AVANT D'EFFECTUER TOUT ENTRETIEN OU NETTOYAGE. LES CENDRES DOIVENT ÊTRE ÉVACUÉES DANS UN RÉCIPIENT MÉTALLIQUE DOTÉ D'UN COUVERCLE HERMÉTIQUE. LE RÉCIPIENT À CENDRES FERMÉ DOIT ÊTRE DÉPOSÉ SUR UNE SURFACE NON COMBUSTIBLE OU SUR LE SOL, BIEN À L'ÉCART DE TOUTE MATIÈRE COMBUSTIBLE, AVANT L'ÉLIMINATION DÉFINITIVE.

MODÈLES AUTOPORTANTS

1. Laissez le feu s'éteindre et laissez l'appareil refroidir à température ambiante.
2. Avec la porte fermée, nettoyer les tubes de l'échangeur de chaleur.
3. Assurez-vous que le poêle à granulés est à température ambiante avant de le toucher. Ouvrez la porte, retirez le pot de combustion et videz-le dans un récipient en métal.
4. Videz les cendres de la section intérieure dans le bac à cendres piédestal par l'ouverture au bas de la chambre de combustion. Grattez la partie intérieure avec l'outil de nettoyage. Assurez-vous que les trous ne sont pas bouchés.
5. Grattez les cendres dans la chambre de combustion dans le bac à cendres piédestal à travers l'ouverture au bas de la chambre de combustion ou passez l'aspirateur pour enlever les cendres.



6. Retirez et videz périodiquement le bac à cendres en dévissant les deux boutons à l'avant du piédestal sous la lèvre à cendres. Éliminez les cendres correctement.
7. Remettez le bac à cendres en place en veillant à bien serrer les boutons et à maintenir une bonne étanchéité.
8. Replacez la section intérieure dans le pot de combustion; assurez-vous qu'il est de niveau et poussé complètement vers le bas et que l'orifice de l'allumeur est à l'arrière quand il est réinstallé.
9. Assurez-vous que le pot de combustion est de niveau et repoussé à fond lorsqu'il est réinstallé. Si le collier du pot de combustion fixé au tube d'air frais n'est pas repoussé pour rejoindre la paroi de la chambre de combustion, l'allumeur automatique ne fonctionnera pas correctement.

Insérer

1. Laissez le feu s'éteindre et laissez l'appareil refroidir à température ambiante.
2. Avec la porte fermée, nettoyer les tubes de l'échangeur de chaleur
3. Assurez-vous que le poêle à granulés est à température ambiante avant de le toucher. Ouvrez la porte, retirez le pot de combustion et videz-le dans un récipient en métal.
4. Videz les cendres du pot de combustion. Grattez le pot de combustion avec l'outil de nettoyage. Assurez-vous que les trous du pot de combustion ne sont pas bouchés.
5. Aspirez les cendres de la chambre de combustion. ASSUREZ-VOUS QUE LES CENDRES SONT FROIDES AU TOUCHER AVANT D'ASPIRER. Certains aspirateurs peuvent laisser échapper des cendres dans la pièce. Votre aspirateur doit avoir un filtre ou un sac spécial pour éliminer les fuites.
6. Réinstallez le pot de combustion. Assurez-vous qu'il est de niveau et repoussé à fond. S'il n'est pas réinstallé correctement, le Hot Rod ne fonctionnera pas correctement.

FUMÉE ET CO MONITEURS

La combustion du bois produit naturellement le monoxyde de carbone (CO) et de la fumée. CO est un gaz toxique lorsqu'il est exposé à des concentrations élevées pendant des périodes de temps prolongées. Alors que les systèmes de combustion modernes réchauffeurs réduisent considérablement la quantité de CO émise par la cheminée, l'exposition aux gaz dans des zones fermées ou confinés peut être dangereux. Assurez-vous que vous les joints du poêle et les joints de cheminée sont en bon état de fonctionnement et d'étanchéité correctement pour assurer une exposition involontaire. Il est recommandé d'utiliser les deux écrans de fumée et de CO dans les zones ayant le potentiel de générer CO.

VÉRIFICATION ET NETTOYAGE DE LA TRÉMIE

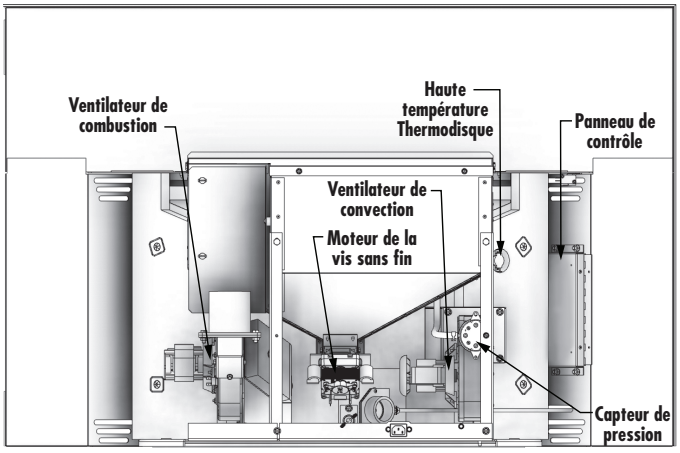
Vérifiez régulièrement la trémie pour détecter toute accumulation de sciure (particules fines) dans le système d'alimentation ou toute accumulation de granulés à sa surface. Nettoyez-la si nécessaire.

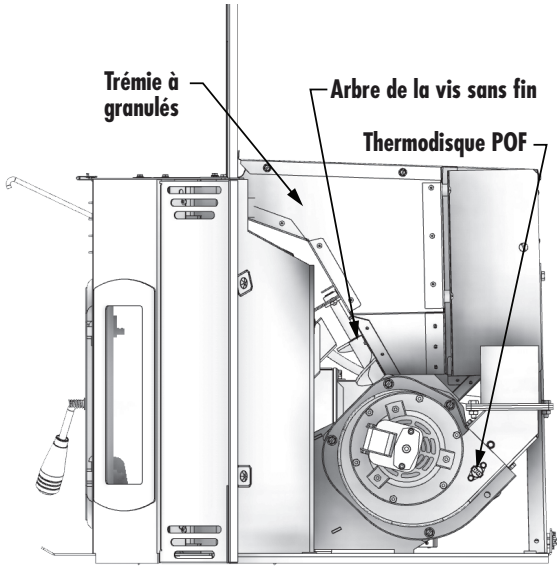
JOINTS DE PORTE ET DE VITRE

Inspecter régulièrement les principales portes et fenêtres en verre joints. La porte principale peut avoir besoin d'être enlevé pour avoir des joints effilochés, brisés ou compactés remplacés par votre revendeur agréé. La porte de cet appareil utilise un joint 5/8 po corde de diamètre.

MOTEURS DES VENTILATEURS

Nettoyez les orifices d'aération des moteurs des ventilateurs d'extraction et de distribution chaque année. Retirez le ventilateur d'évacuation du conduit d'évacuation et nettoyez les pales du ventilateur interne dans le cadre de votre démarrage d'automne. Si vous avez des animaux domestiques à l'intérieur, vos moteurs électriques doivent être inspectés tous les mois pour vous assurer qu'ils ne contiennent pas de poils d'animaux. L'accumulation de poils d'animaux dans les souffleurs peut entraîner de mauvaises performances ou des risques imprévus pour la sécurité. REMARQUE : Lors du nettoyage, veillez à ne pas déloger le clip d'équilibrage du ventilateur de convection ou à ne pas plier les pales du ventilateur. Certains propriétaires de poêle vaporisent légèrement un produit chimique anti-créosote sur le feu pour aider à réduire la formation de créosote dans le poêle.





PEINTURE DE SURFACE

Les surfaces peintes peuvent être essuyées avec un chiffon humide. Si des rayures apparaissent, ou si vous souhaitez rénover la peinture, adressez-vous au revendeur agréé qui vous fournira un bidon de peinture à haute température adaptée.

VERRE

Nous vous recommandons d'utiliser un nettoyant pour vitres de haute qualité. Si une accumulation de créosote ou de carbone s'accumule, vous pouvez utiliser de la laine d'acier et de l'eau pour nettoyer le verre. N'UTILISEZ PAS de nettoyants abrasifs. N'effectuez PAS le nettoyage lorsque la vitre est CHAUDE. N'essayez pas de faire fonctionner l'appareil avec du verre brisé. Si le verre est brisé, suivez ces procédures de retrait:

1. Tout en portant des gants en cuir (ou tout autre gants convenant à la manipulation de verre cassé), retirez soigneusement tout morceau de verre détaché du cadre de la porte.
2. Jetez correctement tout verre brisé. Renvoyez la porte endommagée à votre revendeur agréé pour réparation ou remplacement.
3. Ni le propriétaire de l'appareil ni aucune autre personne non autorisée ne doit remplacer la vitre de la porte. Un revendeur agréé doit effectuer toutes les réparations impliquant la vitre de la porte.

NE PAS maltraiter la vitre de la porte en frappant, en claquant ou en faisant un traumatisme similaire. N'utilisez pas le poêle avec la vitre enlevée, fissurée ou cassée.

MISE EN MARCHE À L'AUTOMNE

Avant de démarrer le premier feu de la saison de chauffage, vérifiez que la zone à l'extérieur des systèmes d'évacuation et d'admission d'air ne soit pas obstruée. Nettoyez et retirez les cendres volantes du système d'évacuation. Nettoyez tous les filtres du système d'évacuation et du tuyau d'entrée d'air extérieur. Activez toutes les commandes et vérifiez qu'elles fonctionnent correctement. C'est aussi le bon moment pour nettoyer à fond la totalité du poêle.

ARRÊT AU PRINTEMPS

Après la dernière flambée du printemps, retirez tous les granulés restants de la trémie et du système d'alimentation à tarière. Enlevez tout d'abord les granulés avec une pelle, puis faites fonctionner la tarière jusqu'à ce que la trémie soit vide et que les granulés cessent de couler (il suffit pour cela d'appuyer sur l'interrupteur ON en gardant la porte d'observation ouverte). Passez l'aspirateur dans la trémie. Nettoyez soigneusement le pot de combustion et la chambre de combustion. Si le poêle est dans un endroit humide, il peut être souhaitable de pulvériser du silicone en aérosol à l'intérieur de la trémie nettoyée. Le système d'évacuation doit être soigneusement nettoyé.

CALENDRIER D'ENTRETIEN

MISE EN GARDE:
CE CHAUFFE-BOIS A BESOIN D'INSPECTIONS ET DE RÉPARATIONS PÉRIODIQUES POUR UN FONCTIONNEMENT APPROPRIÉ. IL EST CONTRE LES RÈGLEMENTS FÉDÉRAUX DE FAIRE FONCTIONNER CE CHAUFFE À BOIS D'UNE MANIÈRE NON CONSTANTE AUX INSTRUCTIONS D'UTILISATION DE CE MANUEL.

Suivez le calendrier ci-dessous dans des conditions d'utilisation moyennes. Les joints autour de la porte et de la vitre doivent être inspectés et réparés ou remplacés si nécessaire.

	Quotidien	Toutes les semaines	Annuel ou par tonne
Foyer	Gratter	Vider	
Vitre	Épousseter	Nettoyer	
Chambre de combustion		Brosser	
Cendres			Vider
Chambres intérieures			Aspirer
Échangeurs de chaleur		Deux fois	
Pales du ventilateur de combustion			Aspirer / Brosser
Turbine du ventilateur de convection			Aspirer / Brosser
Système de ventilation			Nettoyer
Joints d'étanchéité			Vérifié
Trémie			Vider et aspirer

LE POÊLE S'ÉTEINT ET LE VOYANT #3 CLIGNOTE	
Causes possibles:	Solutions possibles: (Débranchez d'abord le poêle si possible)
La trémie est à court de granulés.	Remplir la trémie.
Le volet est trop ouvert pour un réglage d'alimentation faible.	Si le réglage du feu est faible, vous devez fermer le volet complètement (poussez le levier à fond de sorte qu'il touche le côté du poêle).
Le foyer n'est pas poussé complètement vers l'arrière de la chambre de combustion.	Assurez-vous que le collier de la prise d'air dans le foyer touche la paroi du fond de la chambre de combustion.
Les ouvertures du foyer sont obstruées.	Retirez le foyer et nettoyez-le à fond.
La prise d'air, les chambres intérieures ou le système d'évacuation sont partiellement bloqués.	Suivez toutes les procédures de nettoyage dans la section entretien de ce manuel.
L'interrupteur de sécurité de la trémie est déterioré ou la trémie est ouverte.	Quand le poêle fonctionne, assurez-vous que le couvercle de la trémie est fermé afin que l'interrupteur de la trémie puisse se déclencher. Vérifiez que les fils reliant l'interrupteur de sécurité de la trémie au panneau de contrôle et au moteur de la vis sans fin sont en bon état. Utilisez un détecteur de continuité pour tester l'interrupteur de sécurité de la trémie, remplacez-le si besoin.
L'arbre de la vis sans fin est bloqué.	Commencez par vider la trémie puis enlevez le moteur de la vis sans fin en retirant la fixation. Retirez la plaque d'inspection de l'arbre de la vis sans fin dans la trémie, vous pouvez voir l'arbre de la vis sans fin. Retirez doucement et verticalement l'arbre de la vis sans fin jusqu'à ce que l'extrémité de l'arbre émerge hors de la vis sans fin. Puis retirez les deux boulons qui retiennent le dessus de la vis sans fin. Puis faites tourner le bas de l'arbre de la vis sans fin jusqu'à ce que vous puissiez faire sortir l'arbre du poêle. Quand vous aurez retiré l'arbre, vérifiez-le pour tout défaut de soudure, courbure ou cassure. Retirez tout objet étranger qui aurait pu causer le problème. Vérifiez aussi le tuyau de l'arbre; y-a-t'il des signes de défaut de soudure, des irrégularités ou des rainures gravées dans le métal qui auraient pu causer le problème.
Le moteur de la vis sans fin a lâché.	Retirer le moteur de la vis sans fin de l'arbre de la vis sans fin et essayez de le faire fonctionner. Si le moteur tourne, c'est l'arbre qui est coincé par quelque chose. Si le moteur ne tourne pas, c'est le moteur qui est détraqué.
Le thermodisque «preuve de feu» (POF) a mal fonctionné	Court-circuitez temporairement le thermodisque POF en déconnectant les deux fils bruns et en les connectant avec un petit bout de fil électrique. Remettez alors le poêle en marche. Si le poêle démarre et marche, c'est qu'il faut remplacer le thermodisque POF. Ne faire cela que pour ce test. NE LAISSEZ PAS LE THERMODISQUE COURT-CIRCUITÉ. Les ventilateurs ne s'arrêteront jamais et si le feu s'est éteint, la vis sans fin va continuer à apporter des granulés jusqu'à ce que la trémie soit vide si vous laissez le thermodisque court-circuité.
La limite supérieure du thermodisque a été atteinte ou est défectueuse.	Attendez que le poêle refroidisse (30 à 45 minutes). Il devrait fonctionner normalement maintenant. Si ce n'est pas le cas, utilisez le manuel pour localiser la limite supérieure du thermodisque. Pour tester si le thermodisque est défectueux, vous pouvez le court-circuiter comme c'est décrit précédemment pour le thermodisque POF.
Le fusible du panneau de contrôle a sauté.	Retirez le panneau de contrôle. Il y a un fusible à l'arrière. S'il a l'air mauvais, remplacez-le par un fusible 5 A 125 V Rebranchez le poêle et essayez de le relancer.
Le panneau de contrôle n'envoie pas de courant au thermodisque POF ou autres composants du système de vis sans fin.	Il devrait y avoir un courant d'environ 5 V allant vers le thermodisque POF, 10 minutes après que le poêle ait démarré.

LE POÊLE EST ALIMENTÉ EN GRANULÉS, MAIS NE VEUT PAS S'ALLUMER	
Causes possibles:	Solutions possibles:
Le volet d'aération est trop ouvert pendant l'allumage.	Poussez le volet d'aération plus près du côté du poêle pour l'allumage. Dans certains cas, il peut être nécessaire de fermer complètement le volet pour l'allumage. Quand une flamme s'est formée, on peut régler le volet en fonction de la vitesse d'alimentation.
Blocage du conduit de l'allumeur ou prise pour le tuyau de l'allumeur	Trouvez l'emplacement de l'allumeur à l'arrière du coupe-feu. Le trou de la prise d'air est un petit trou situé en bas de cet emplacement. Assurez-vous qu'il est propre. Regardez aussi face au poêle pour vous assurer qu'il n'y a pas de débris autour de l'allumeur à l'intérieur de son logement.
Le foyer n'est pas poussé complètement vers l'arrière de la chambre de combustion.	Assurez-vous que le collier de la prise d'air dans le foyer touche la paroi du fond de la chambre de combustion.
Allumeur défectueux.	Mettre le courant directement sur l'allumeur. Regardez l'extrémité de l'allumeur en étant face au poêle. Après environ 2 minutes, l'extrémité devrait rougeoyer. Sinon, l'allumeur est défectueux.
Le panneau de contrôle n'envoie pas de courant à l'allumeur	Vérifiez le voltage qui arrive à l'allumeur pendant le départ du feu. Il devrait y avoir un courant maximum. Si le voltage est inférieur au courant maximum, vérifiez le câblage. Si le câblage est correct, le panneau de contrôle est défectueux.

ODEUR DE FUMÉE REFOULANT DANS LA MAISON	
Causes possibles:	Solutions possibles:
Il y a une fuite dans le système d'évacuation.	Vérifiez toutes les connexions des tuyaux d'évacuation. Assurez-vous qu'elles sont scellées avec du silicone RTV qui supporte une température de 500°F ou supérieure (260°C). Scellez également les raccords avec du ruban d'aluminium UL-181-AP. Assurez vous aussi que l'adaptateur de carré à rond sur le ventilateur de combustion a été scellé correctement avec le même RTV.
Le joint d'étanchéité sur le ventilateur de combustion est défectueux.	Inspectez les deux joints d'étanchéité du ventilateur de combustion pour vous assurer qu'ils sont corrects.

LE VENTILATEUR DE CONVECTION S'ARRÊTE PUIS REPART	
Causes possibles:	Solutions possibles:
Le ventilateur de convection est en surchauffe et disjoncte l'interrupteur de température interne.	Nettoyez et époussetez les bobinages et les pales de ventilateurs. Si ça ne suffit pas, c'est que le ventilateur est endommagé.
Mauvais fonctionnement du circuit imprimé.	Testez l'accès actuel au ventilateur de convection. Si aucun courant ne va vers ce ventilateur quand il est éteint, le panneau de contrôle est bon. Si aucun courant ne va vers le ventilateur quand il s'éteint en cours d'utilisation, c'est que le panneau de contrôle est défectueux.

LE POÊLE NE S'ALIMENTE PAS EN GRANULÉS, MAIS LE VOYANT D'ALIMENTATION S'ALLUME COMME PRÉVU	
Causes possibles:	Solutions possibles:
Le fusible du panneau de contrôle a sauté.	Retirez le panneau de contrôle. Il y a un fusible à l'arrière. S'il a l'air mauvais, remplacez-le par un fusible 5 A 125 V. Rebranchez le poêle et essayez de le relancer.
La limite supérieure du commutateur a été atteinte ou est défectueuse.	Attendez que le poêle refroidisse (30 à 45 minutes). Il devrait fonctionner normalement maintenant. Si ce n'est pas le cas, utilisez le manuel pour localiser la limite supérieure du thermodisque. Pour tester si le thermodisque est défectueux, vous pouvez le court-circuiter comme c'est décrit précédemment pour le thermodisque POF.
Moteur de la vis sans fin défectueux	Retirer le moteur de la vis sans fin de l'arbre de la vis sans fin et essayez de le faire fonctionner. Si le moteur tourne, c'est l'arbre qui est coincé sur quelque chose. Si le moteur ne tourne pas, c'est le moteur qui est détraqué.

Moteur de la vis sans fin défectueux	Commencez par vider la trémie puis enlevez le moteur de la vis sans fin en retirant la fixation. Retirez la plaque d'inspection de l'arbre de la vis sans fin dans la trémie, vous pouvez voir l'arbre de la vis sans fin. Retirez doucement et verticalement l'arbre de la vis sans fin jusqu'à ce que l'extrémité de l'arbre émerge hors de la vis sans fin. Puis retirez les deux boulons qui retiennent le dessus de la vis sans fin. Puis faites tourner le bas de l'arbre de la vis sans fin jusqu'à ce que vous puissiez faire sortir l'arbre du poêle. Quand vous aurez retiré l'arbre, vérifiez-le pour tout défaut de soudure, courbure ou cassure. Retirez tout objet étranger qui aurait pu causer le problème. Vérifiez aussi le tuyau de l'arbre; y-a-t'il des signes de défaut de soudure, des irrégularités ou des rainures gravées dans le métal qui auraient pu causer le problème.
Fil ou connecteur désserré	Vérifiez tous les fils qui connectent à la vis sans fin, au commutateur de limite supérieure et au connecteur Molex.
Mauvais panneau de contrôle	Si le fusible est bon, que les fils et connecteurs testés sont bons et que le commutateur de limite supérieure n'a pas basculé, testez quelle puissance va au moteur de la vis sans fin. S'il n'y a pas un courant maximum qui va au moteur de la vis sans fin quand le voyant «fuel feed» est allumé, vous avez un mauvais panneau de contrôle.

LA VITRE S'ENCRASSE TRÈS RAPIDEMENT LA FLAMME EST PARESSEUSE, SOMBRE ET A DES EXTRÉMITÉS NOIRES QUAND LE POÊLE A FONCTIONNÈ UN BON MOMENT, LE FOYER EST DÉBORDÉ	
Causes possibles:	Solutions possibles:
Le poêle ou les tuyaux d'évacuation sont sales, ce qui limite le flux d'air à travers le foyer.	Suivez toutes les procédures de nettoyage dans la section entretien de ce manuel.
Le tuyau d'évacuation n'est pas installé correctement.	Vérifiez que le tuyau d'évacuation a été installé selon les critères de ce manuel.
Le volet d'aération est trop fermé pour un réglage supérieur.	Tirez la manette du volet plus loin en l'éloignant du coté du poêle et essayez de relancer le feu.
Les ouvertures du foyer sont obstruées	Retirez le foyer et nettoyez-le à fond.
Le volet d'aération est cassé.	Vérifiez visuellement l'assemblage du volet. Assurez-vous que la plaque du volet est attachée à la tige du volet. Quand on fait bouger la tige du volet, la plaque du volet devrait bouger aussi.
Blocage dans le tuyau d'arrivée d'air.	Vérifiez visuellement le tuyau d'arrivée d'air qui conduit au foyer, y a-t'il des matières étrangères?
Mauvais fonctionnement du circuit imprimé.	Minutez le voyant de «fuel feed» - alimentation en combustible - à chaque paramétrage (une fois que le poêle a fini son démarrage). Assurez-vous que ce temps correspond à ce qui est prévu pour la vis sans fin. Si le moteur de la vis sans fin tourne sans arrêt, le panneau de contrôle est défectueux.
Le ventilateur de combustion ne tourne pas assez vite.	Testez la vitesse de rotation sur le ventilateur après avoir nettoyé les pales. Le La vitesse devrait être approximativement de 3000 t/min.
Mauvais granulés (Uniquement dans le cas où LA VITRE S'ENCRASSE TRÈS RAPIDEMENT)	Les marques de granulés ou le mélange maître de granulés est peut-être de mauvaise qualité. Utilisez si possible une autre marque de granulés. Vous pourriez aussi essayer une marque faite à partir d'autres essences de bois (tendre/dur). Différents bois ont des caractéristiques différentes quand on les brûle.

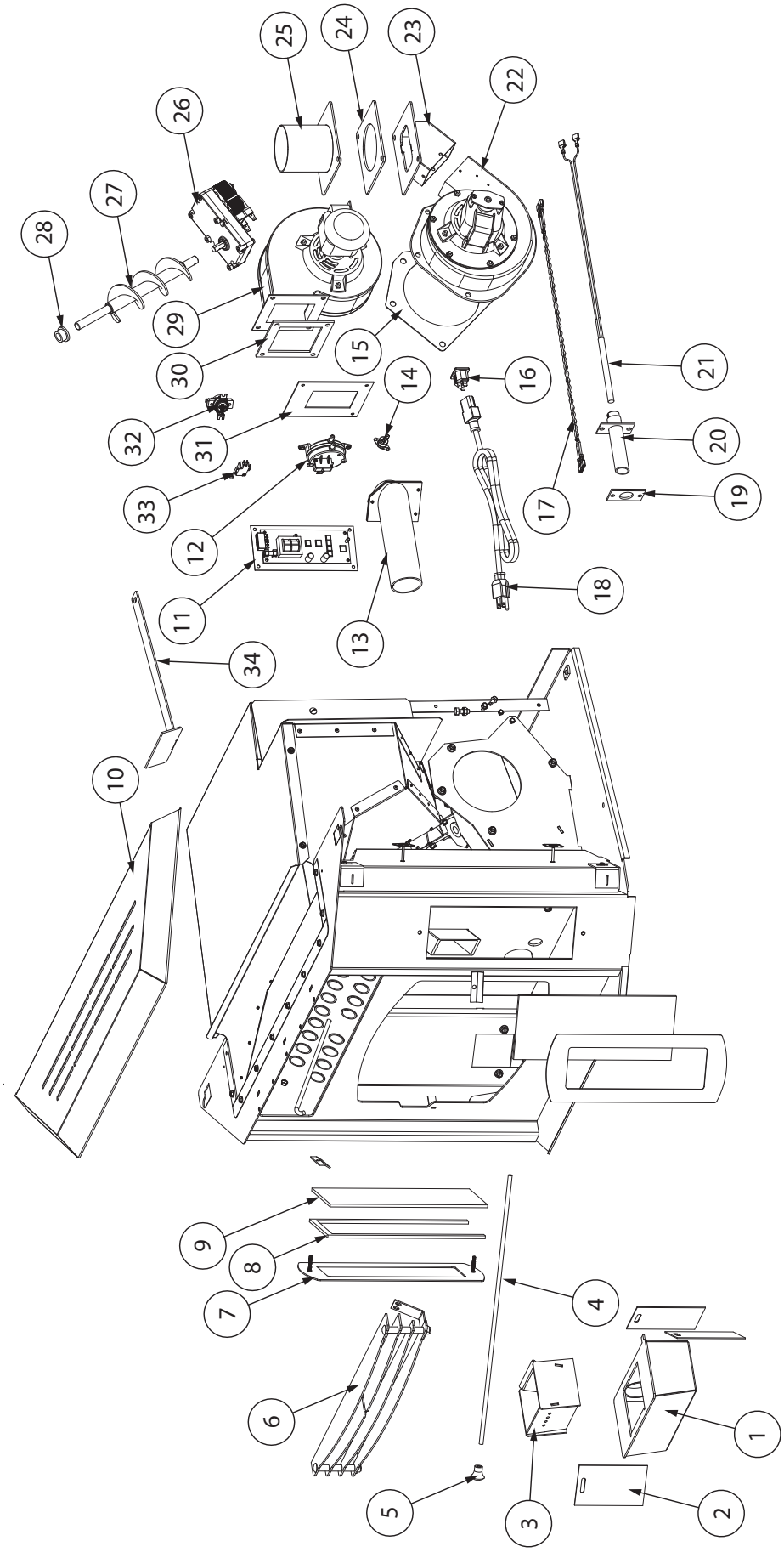
LE COMMUTATEUR DE LIMITE SUPÉRIEURE N'ARRÊTE PAS DE DISJONCTER	
Causes possibles:	Solutions possibles:
Le ventilateur de convection est en surchauffe et disjoncte l'interrupteur de température interne.	Nettoyez et époussetez les bobinages et les pales de ventilateurs. Si ça ne suffit pas, c'est que le ventilateur est endommagé.
Le poêle est resté sur le réglage maximum pendant longtemps	Le réglage à la chaleur maximale est prévu pour des périodes limitées. Faire brûler le poêle à cette allure plus de 1 à 2 heures pourrait entraîner une surchauffe.
On a utilisé un combustible autre que les granulés de bois.	Les poêles sont conçus et testés pour fonctionner aux granulés de bois. Vérifiez qu'il n'y a pas de trace de combustible autre que les granulés de bois. Aucun autre type de combustible n'a été approuvé pour les poêles à granulés. S'il y a des indices d'autres combustibles, arrêtez immédiatement de les employer.
Surtension ou baisse de tension.	Une surtension, un pic ou une chute de tension pourrait entraîner l'atteinte de la limite supérieure. Vérifiez si un onduleur est branché sur le poêle. Sinon, recommandez-en un à l'utilisateur.
Le commutateur de limite supérieure fonctionne mal.	Si les autres éléments vérifiés sont bons, remplacez le commutateur de limite supérieure.

DIFFÉRENTES CADENCES DE LA CARTE DE CIRCUIT IMPRIMÉ	
RÉGLAGE DU NIVEAU DE CHALEUR (paramètre de niveau de chaleur)	
1 & 3	1.4 secondes
1	2 secondes
1 & 4	2.5 secondes
2	4 secondes
3	7 secondes
4	9 secondes
5	12 secondes
Cycle complet	14.5 secondes

ODEUR DE FUMÈE OU ACCUMULATION DE SUIE

Comme tout appareil brûlant du bois, votre peut émettre une légère odeur de bois qui brûle. Si cela augmente, ou si vous remarquez un dépôt anormal de suie sur les murs ou les meubles, vérifiez attentivement le système d'évacuation et recherchez les fuites. Tous les raccords doivent être scellés correctement. Nettoyez régulièrement votre poêle, selon les instruction de la section «ENTRETIEN». Si le problème persiste, contactez votre revendeur.

PIÈCES DE RECHANGE



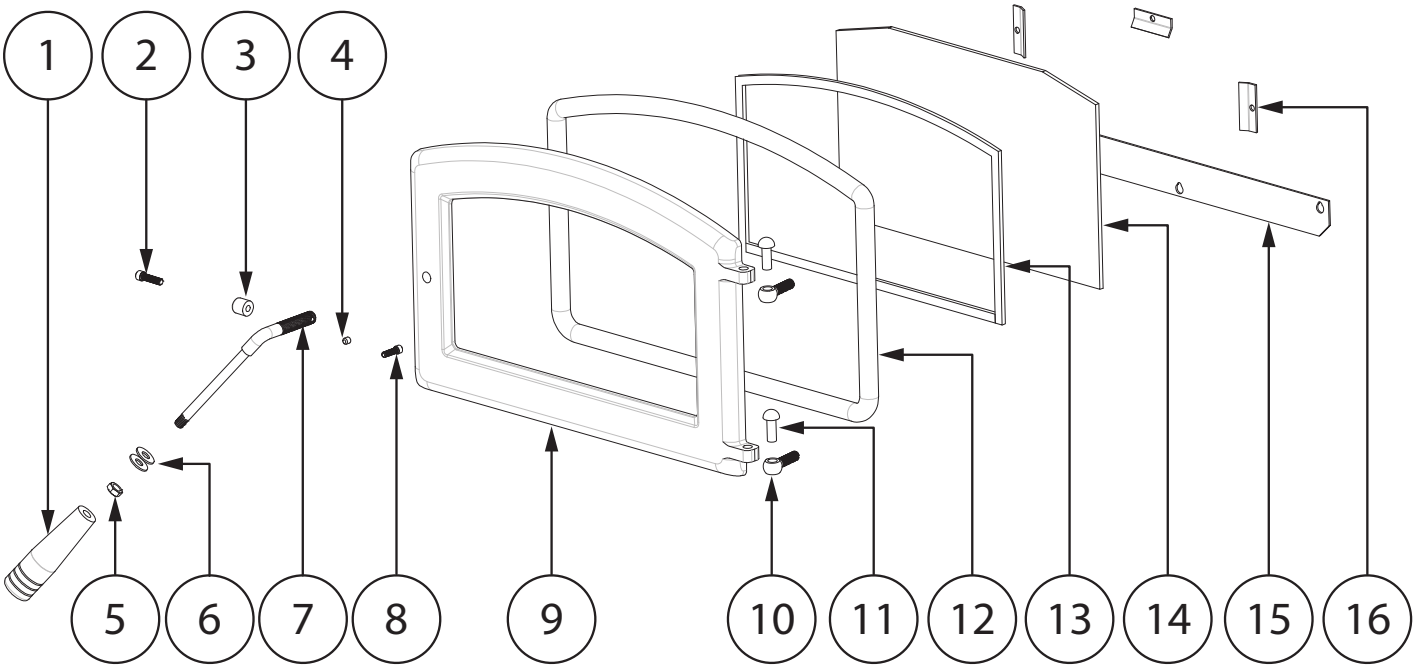
PIÈCES DE RECHANGE

Contactez un revendeur agréé pour obtenir l'une de ces pièces. N'utilisez jamais de matériaux de substitution. L'utilisation de pièces non approuvées peut entraînent des performances et une sécurité médiocres.

Clé	Partie	La Description	Qté
1	69964	Construction Soudée, Logement De Pot De Combustion	1
2	26799	Porte Cendrée	3
3	894097	Soudé, Pot De Combustion	1
4	86841	Tige D'amortisseur	1
5	891987	Bouton En Plastique	1
6	610341	Assemblage De Persiennes	1
7	610336	Garniture De Baie Vitrée	2
8	88174	Joint Latéral	2
9	892614	Verre De Côté SP24i	2
10	610339	Couvercle SP24i	1
11	610330	PCB 4 Ensemble de réglage	1
12	80549	Commutateur D'air	1
13	610346	Amortisseur Pour Tige Droite	1
14	80610	Thermodisque Limite Inférieure POF	1
15	88100	Ventilateur D'échappement Joint	1
16	80462	Réceptacle, 3 Broches	1
17	80685	Extension De Harnais, Violet	1
18	80461	Cordon D'alimentation	1

Clé	Partie	La Description	Qté
19	88202	Joint De Boîtier D'allumeur	1
20	86999	Ensemble Boîtier D'allumeur	1
21	80909	Cartouche D'allumage	1
22	80641	Ventilateur, Échappement	1
23	610343	Soudure Fond D'échappement	1
24	88252	Joint De Cheminée	1
25	610342	Soudé Supérieur D'échappement	1
26	80642	Moteur D'entraînement	1
27	892231	Vol À La Tarière	1
28	891132	Bague Agitateur	1
29	80647	Ventilateur, Distribution	1
30	88252	Joint De Cheminée	1
31	27986	Carénage Du Tube D'alimentation	1
32	80683	Thermodisque 300°	1
33	80491	Micro-Interrupteur	1
34	25589	Outil De Maintenance	1
28448		Grande Porte Clignotante	
SA24iBK		Insérer Un Ensemble De Panneaux De Briques - En Option	

AFIN DE MAINTENIR LA GARANTIE, LES COMPOSANTS DOIVENT ÊTRE REMPLACÉS PAR DES PIÈCES D'ORIGINE DU FABRICANT ACHETÉS AUPRÈS DE VOTRE REVENDEUR OU DIRECTEMENT AUPRÈS DU FABRICANT DE L'APPAREIL. L'UTILISATION DE COMPOSANTS TIERS ANNULERA LA GARANTIE.



Contactez un revendeur agréé pour obtenir l'une de ces pièces. N'utilisez jamais de matériaux de substitution. L'utilisation de pièces non approuvées peut entraînent des performances et une sécurité médiocres.

Clé	Partie	La Description	Qté
1	893919	Manche en bois	1
2	83788	Vis à tête creuse	1
3	893062	Manchon de rouleau	1
4	83242	Vis de réglage Allen 1/4-20 X 1/4	1
5	83178	Écrou de montant 3/8-16	1
6	83045A	Rondelle, 3/8" ID X 7/8" OD X 1/16 ÉPAIS	2
7	893071	Poignée de porte	1
8	83633	Vis d'assemblage HD à douille #12 x 0,75	1

Clé	Partie	La Description	Qté
9	40915	Porte coulée - 2023	1
10	83575	Goupille de charnière (.370 Dia X 1.00)	2
11	40571	Bloc de charnière	2
12	88082	Joint de corde ronde 3/4-BLK	4,3 pi
13	88174	Joint de verre	3,75 pi
14	894141	Verre de porte	1
15	25905	Support de verre inférieur	1
16	25904	Pince à verre	3

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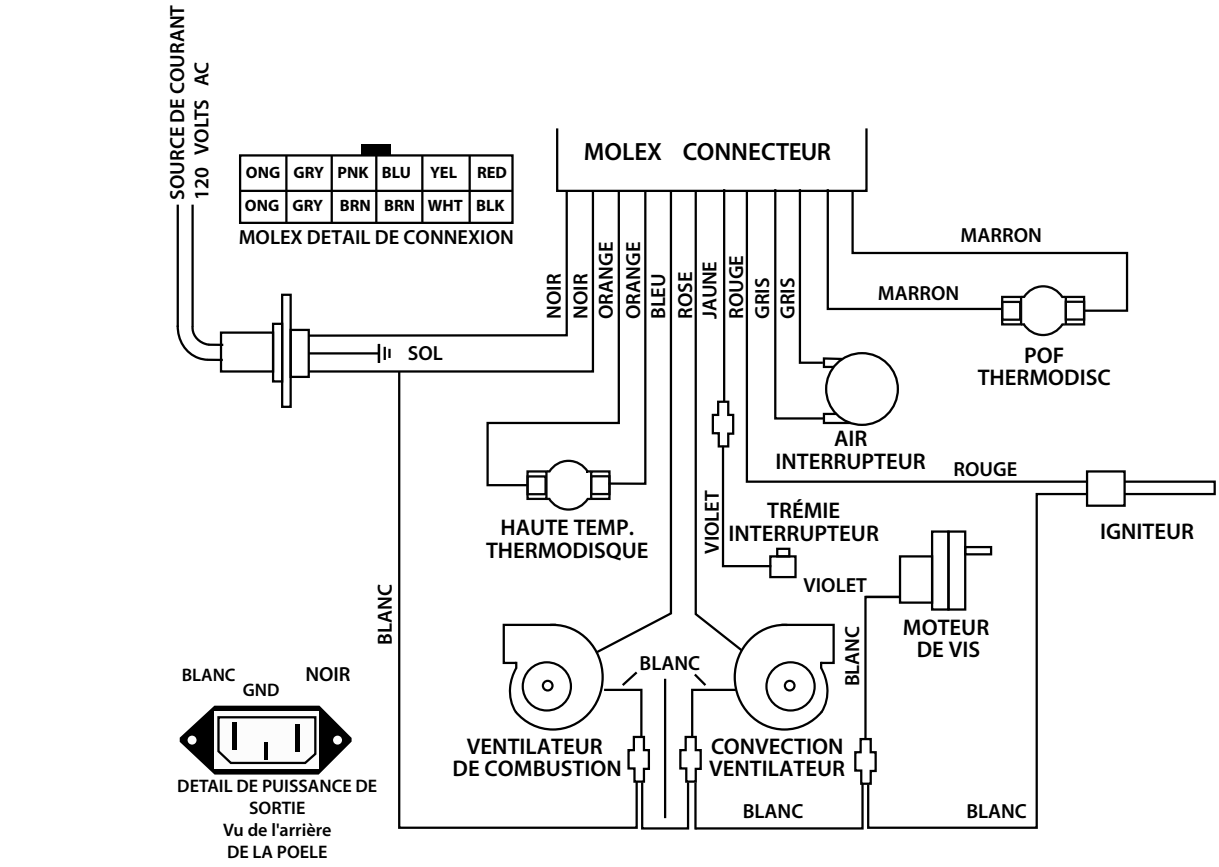
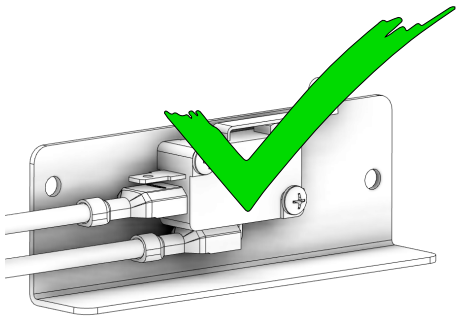
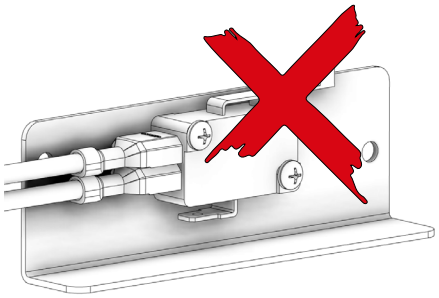




CORRECT



FAUX

ASSUREZ-VOUS QUE LES FILS SONT CONNECTÉS AUX DEUX BROCHES INFÉRIEURES DE L'INTERRUPTEUR DE LA TRÉMIE, COMME ILLUSTRÉ.

COMMENT COMMANDER DES PIÈCES DE RÉPARATION

CONTACT YOUR DEALER OR INSTALLER FOR PARTS AND SERVICE

Les informations contenues dans ce manuel du propriétaire sont spécifiques à votre appareil. Lors de la commande de pièces de rechange, les informations contenues dans ce manuel vous aideront à vous assurer que les bons articles sont commandés. Avant de contacter le service client, notez le numéro de modèle et le numéro de série de cet appareil. Cette information se trouve sur l'étiquette de certification apposée à l'arrière de l'appareil. D'autres informations qui peuvent être nécessaires sont le numéro de pièce et la description de la pièce (s) en question. Les numéros de pièces et les descriptions se trouvent dans la section «Pièces de réparation» de ce manuel. Une fois ces informations recueillies, vous pouvez contacter votre revendeur Breckwell.

Informations sur le modèle			
Numéro de modèle		Nom du revendeur	
Numéro de série		Numéro de téléphone du concessionnaire	

LIMITED LIFETIME WARRANTY (Wood and Pellet)

BRECKWELL

851937H

The operation of this unit in a manner inconsistent with the owner's manual will void the warranty and is also against federal regulations. Breckwell warrants this product to be free from defects in material and workmanship, to the original retail purchaser only, for the time period identified below, measured from the date of the initial purchase as evidenced on an invoice, canceled check, sales receipt, etc., to receipt of a claim by Breckwell or an authorized dealer, as follows:

Components Covered	Warranty Period
Firebox / Heat Exchanger	Limited Lifetime
Door	Three Year
Cabinets and Trim	One Year
Gaskets	One Year
All Electrical Components (Blower, Auger / Agitator Motor, PC Board, Switches)	One Year
Ceramic Glass	One Year
Firepot	Three Years

WARRANTY CONDITIONS

This warranty only covers Breckwell appliances that are purchased through an Breckwell authorized retailer, dealer or distributor.

This warranty is only valid while the Breckwell appliance remains at the site of original installation. This warranty does not apply to products purchased for rental use.

PROBLEM / RESOLUTION

- As purchaser, you must first contact the dealer and/or the distributor from whom you purchased your heater.
- If within a reasonable period of time, you do not receive satisfactory service from the distributor and/or dealer, write or call Breckwell, including complete details of the problem and/or problems you are experiencing, details of your installation, your proof of purchase, and the heater serial number and date code.

CLAIM PROCEDURE

Contact Breckwell for warranty service. You will be asked to provide detailed descriptions and pertinent data, including proof or purchase which will be returned upon request. Providing the heater has been installed and used in accordance with the Owner's Manual supplied with the heater and the issue does not fall under a situation of exclusion, Breckwell will either:

- Replace the defective part free of charge. Parts and/or service replacements made under the terms of this warranty are warranted only for the remaining period of the original heater warranty.
- Replace the heater free of charge. Should the heater be replaced by Breckwell "free of charge", all further warranty obligations are thereby met.
- Where the defect is of a cosmetic (non-functional) nature, Breckwell will bear reasonable expense to repair the heater, including such items as welding, painting, and incidental labor. A "reasonable expense" is defined by terms of this warranty as $30.00/hour with full refund for any purchase of parts.
- Your Customer Service Specialist will instruct you on how and if it is necessary to package and return any parts.

WARRANTY EXCLUSIONS

This warranty does not cover the following:

- Damage to or changes in surface finishes as a result of normal use. As a heating appliance, some changes in color or interior and exterior surface finishes may occur. This is not a flaw and is not covered under warranty.
- Damage to printed, plated, or enameled surfaces caused by fingerprints, accidents, misuse, scratches, melted items, or other external sources and residues left on the plated surfaces from the use of abrasive cleaners or polishes.
- Repair or replacement of parts that are subject to normal wear and tear during the warranty period. These parts include: paint, pellet, and the discoloration of glass.
- Minor expansion, contraction, or movement of certain parts causing noise. These conditions are normal and complaints related to this noise are not covered by this warranty.
- Damages resulting from: (1) failure to install, operate, or maintain the appliance in accordance with the installation instructions, operating instructions, and listing agent identification label furnished with the appliance; (2) failure to install the appliance in accordance with local building codes and/or authorities having jurisdiction; (3) shipping or improper handling; (4) improper operation, abuse, misuse, continued operation with damaged, corroded or failed components, accident, alteration, or improperly/incorrectly performed repairs; (5) environmental conditions, weather,

inadequate ventilation, negative pressure, or drafting caused by tightly sealed constructions, insufficient make-up air supply, or handling devices such as exhaust fans or forced air furnaces or other such causes; (6) use of fuels other than those specified in the operating instructions; (7) installation or use of components not supplied with appliance or any other components not expressly authorized and approved by Breckwell; (8) modification of the appliance not expressly authorized and approved by Breckwell in writing; and/or (9) interruptions or fluctuations of electrical power supply to the appliance.

- Non-Breckwell venting components, hearth components or other accessories used in conjunction with the appliance.
- Breckwell's obligation under this warranty does not extend to the appliance's capability to heat the desired space. Information is provided to assist the consumer and the dealer in selecting the proper appliance for the application. Consideration must be given to appliance location and configuration, environmental conditions, insulation and air tightness of the structure.
- Problems relating to smoking or creosote. Smoking is attributable to inadequate draft due to the design or installation of the flue system or installation of the heater itself. Creosote formation is largely attributable to improper operation of the unit and/or draft as mentioned above.
- Any cost associated with product removal and re-installation, travel, transportation, or shipping.
- Service calls to diagnose trouble (unless authorized in writing by the manufacturer, distributor, or dealer).

THIS WARRANTY IS VOID IF

- The appliance has been over-fired or operated in atmospheres contaminated by chlorine, fluorine, or other damaging chemicals. Over-firing can be identified by, but not limited to, warped plates or tubes, rust colored cast iron, bubbling, cracking and discoloration of steel or enamel finishes.
- The appliance is subjected to prolonged periods of dampness or condensation.
- There is any damage to the appliance or other components due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

LIMITATIONS OF LIABILITY

The owner's exclusive remedy and Breckwell's sole obligation under this warranty, under any other warranty, express or implied, or in contract, tort or otherwise, shall be limited to replacement, repair, or refund, in Breckwell's sole and absolute discretion. In no event will Breckwell be liable for any incidental or consequential damages. THE LIMITED WARRANTY SET FORTH HEREIN IS THE SOLE WARRANTY PROVIDED TO PURCHASER AND IS IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESS OR IMPLIED. BRECKWELL MAKES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT, OTHER THAN (i) THE LIMITED WARRANTY ABOVE, AND (ii) ANY IMPLIED WARRANTIES IMPOSED BY APPLICABLE LAW WHICH CANNOT BE WAIVED OR DISCLAIMED UNDER APPLICABLE LAW. ALL OTHER WARRANTIES OF ANY KIND, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED AND EXCLUDED TO THE FULLEST EXTENT NOT PROHIBITED BY APPLICABLE LAW. This Limited Warranty gives the purchaser specific legal rights; a purchaser may have other rights depending upon where he or she resides. Some states do not allow the exclusion or limitation of special, incidental or consequential damages, or state law may affect the duration of limitations, so the above exclusion and limitations may not be applicable.

WARRANTOR

The warrantor of record is Breckwell, 227 Industrial Park Rd., South Pittsburg, TN 37380. Phone number: 423-403-4031. Register your product on line at www.breckwell.com. Save your proof of purchase, as documented in a receipt or invoice, with your records for any claims.

et les réclamations liées à ce bruit ne sont pas couvertes par cette garantie.

Dommages causés par : (1) l'installation, l'utilisation ou la maintenance de l'appareil sans tenir compte des instructions d'installation et d'utilisation, et sans consulter l'étiquette d'identification de l'agent listé; (2) le non-respect des codes du bâtiment locaux et/ou des autorités ayant juridiction pendant l'installation de l'appareil; (3) l'expédition ou la mauvaise manutention; (4) la mauvaise utilisation, l'abus, l'utilisation continue alors que des composants sont endommagés, corrodés ou défectueux, l'utilisation après un accident, des modifications ou des réparations négligentes/incorrectes; (5) les conditions liées à l'environnement et à la météo, une mauvaise ventilation, une pression négative ou un mauvais tirage en raison de l'étanchéité de la construction, l'approvisionnement insuffisant en air d'appoint ou d'autres dispositifs tels que des ventilateurs de tirage, des chaudières à air pulsé ou toute autre cause; (6) l'utilisation de combustibles autres que ceux mentionnés dans les instructions d'utilisation; (7) l'installation ou l'utilisation de composants qui n'ont pas été fournis avec l'appareil ou de tout autre composant n'ayant pas été expressément autorisé et approuvé par Breckwell; (8) les modifications de l'appareil qui n'ont pas été expressément autorisées et approuvées par écrit par Breckwell; et/ou (9) les interruptions ou fluctuations de l'alimentation électrique de l'appareil.

- Les composants d'évacuation des gaz, composants de l'âtre ou accessoires utilisés avec l'appareil et qui n'ont pas été fournis par Breckwell.
- Les obligations de Breckwell, en vertu de cette garantie, ne couvrent pas la capacité de l'appareil à chauffer l'espace souhaité. Des informations sont fournies pour aider le consommateur et le détaillant lors de la sélection de l'appareil adéquat pour l'application envisagée. On doit tenir compte de l'emplacement et de la configuration de l'appareil, des conditions liées à l'environnement, de l'isolation et de l'étanchéité de la structure.
- Problèmes liés à la fumée ou au créosote. La fumée provient généralement d'un tirage inadéquat en raison de la conception ou de l'installation du système de conduit ou de l'installation de l'appareil de chauffage lui-même. La formation de créosote est largement attribuable au mauvais fonctionnement de l'unité et/ou du tirage, comme il est mentionné ci-dessus.
- Tous les coûts associés à l'enlèvement et à la réinstallation du produit, son déplacement, transport ou expédition.
- Les appels de service afin de diagnostiquer les problèmes (à moins d'être reconnu par écrit par le fabricant, le distributeur ou le détaillant).

CETTE GARANTIE EST ANNULÉE SI

- L'appareil a subi une surchauffe ou a été utilisé avec de l'air contaminé par le chlore, le fluor ou d'autres produits chimiques nuisibles. La surchauffe peut être établie, sans s'y limiter, par la déformation des plaques ou tubes, la couleur rouille de la fonte, l'apparition de bulles et de craquelures, et la décoloration des surfaces en acier ou émaillées.
- Si l'appareil est soumis à l'humidité ou à la condensation pendant de longues périodes.
- Dommages causés à l'appareil ou aux autres composants par l'eau ou les intempéries en raison, entre autres, d'une mauvaise installation de la cheminée ou du conduit d'évacuation.

RESTRICTIONS DE LA GARANTIE

Le seul recours du propriétaire et la seule obligation de Breckwell en vertu de cette garantie ou de toute autre garantie, explicite ou tacite, contractuelle, à tort ou à raison, sont limités au remplacement, à la réparation ou au remboursement. En aucun cas, Breckwell ne saurait être tenue responsable des dommages fortuits ou consécutifs. LA GARANTIE LIMITÉE INCLUSE AUX PRÉSENTE EST LA SEULE DISPONIBLE POUR L'ACHETEUR, TENANT LIEU DE TOUTES AUTRES GARANTIES OU DÉCLARATIONS, FORMELLE OU TACITE. BRECKWELL NE FAIT AUCUNE DÉCLARATION OU GARANTIE DE TOUTE SORTE, QU'ELLE SOIT TACITE OU FORMELLE, RELATIVEMENT AU PRODUIT, AUTRE QUE (i) LA GARANTIE LIMITÉE MENTIONNÉE CI-DESSUS, ET (ii) TOUTE GARANTIE TACITE IMPOSÉE PAR LE DROIT APPLICABLE PAR LAQUELLE ELLE NE PEUT ÊTRE ANNULÉE OU DÉCLINÉE SELON LE DROIT APPLICABLE. TOUTES AUTRES GARANTIES DE TOUT GENRE, INCLUANT, MAIS SANS S'Y LIMITER, AUX GARANTIES TACITES DE QUALITÉ MARCHANDE OU D'APTITUDE À L'EMPLOI, SONT DONC AUX PRÉSENTES, DÉCLINÉES ET EXCLUES JUSQU'À LA LIMITE DU DROIT APPLICABLE. Cette garantie limitée confère à l'acheteur des droits juridiques spécifiques; les droits de l'acheteur pourraient différer selon son lieu de résidence. Certains États ne permettent pas l'exclusion ou la limitation de dommages particuliers, accessoires ou indirects, ou des lois d'État peuvent avoir un impact sur la durée des limitations; ainsi, l'exclusion et les limitations précédentes pourraient ne pas s'appliquer.

GARANT

Le garant du dossier est Breckwell, 227 Industrial Park Rd., South Pittsburg, TN 37380. Numéro de téléphone: 423-403-4031. Enregistrez votre produit en ligne au www.breckwell.com. Conservez votre preuve d'achat, documentée sous forme de facture ou de reçu, en cas de réclamation.

GARANTIE À VIE LIMITÉE (Poêles À Bois Et À Granulés)

BRECKWELL

L'utilisation de cette unité en contradiction avec le manuel de l'utilisateur annulera la garantie, tout en enfreignant les règlementations fédérales. Breckwell garantit, uniquement à l'acheteur au détail original, que ce produit est exempt de défectuosités des matériaux et de qualité de l'exécution, pendant la période indiquée ci-dessous, de la date initiale d'achat prouvée par une facture, un chèque oblitéré, un reçu de vente, etc., de Breckwell ou d'un détaillant autorisé, comme suit :

Composants couverts	Période de la garantie
Boîte à feu/échangeur de chaleur	À vie limitée
Porte	Trios ans
Caissons et garniture	Un an
Joints d'étanchéité	Un an
Tous les composants électriques (ventilateur, moteur de la vis sans fin/ agitateur, carte de circuit imprimé, commutateurs)	Un an
Vitre céramique	Un an
Pot à feu	Trios ans

CONDITIONS DE LA GARANTIE

La garantie ne couvre que les appareils Breckwell achetés chez un détaillant ou distributeur Breckwell autorisé.
Cette garantie n'est valide que si l'appareil Breckwell demeure sur le site d'installation d'origine. Cette garantie ne s'applique pas aux produits achetés pour la location.

PROBLÈME / RÉSOLUTION

- En tant qu'acheteur, vous devez d'abord communiquer avec votre détaillant et/ou votre distributeur qui vous a vendu l'appareil de chauffage.
- Si vous ne recevez pas de service satisfaisant dans un délai de temps raisonnable de la part du distributeur et/ ou détaillant, écrivez à ou appelez Breckwell, avec une liste complète du et/ou des problèmes que vous éprouvez, les détails concernant l'installation, votre preuve d'achat et le numéro de série de l'appareil de chauffage ou bien le numéro du code de date.

PROCÉDURE DE RÉCLAMATION

Veuillez communiquer avec Breckwell pour obtenir du service sous garantie. On vous demandera de fournir les descriptions et données pertinentes, incluant la preuve d'achat qui sera retournée sur demande. Sous réserve que l'appareil de chauffage ait été installé et utilisé conformément avec le Manuel du propriétaire fourni avec cet appareil de chauffage et que le problème ne porte pas sur une situation d'exclusion, Breckwell :

- Remplacera sans frais la pièce défectueuse. Les pièces et/ou les remplacements d'entretien effectués selon les termes de cette garantie le sont uniquement pour le reste de la période originale de la garantie de l'appareil de chauffage.
- Remplacer l'appareil de chauffage sans frais. Si l'appareil de chauffage doit être remplacé par Breckwell « sans frais », tous les engagements au titre de cette garantie seront respectés.
- Si le défaut est de nature esthétique (non fonctionnel), Breckwell assumera les frais pour réparation de l'appareil de chauffage, incluant les éléments comme la soudure, la peinture et la main-d'œuvre accessoire. Les « frais raisonnables » définis aux termes de cette garantie sont de 30,00 $/heure avec un remboursement complet pour tout achat de pièces.
- Votre spécialiste du service clientèle vous indiquera comment et s'il est nécessaire d'emballer et de retourner des pièces

EXCLUSIONS DE LA GARANTIE

Cette garantie ne couvre pas ce qui suit :

- Dommage ou modification du fini de la surface causé par une utilisation normale. Comme il s'agit d'un appareil de chauffage, il pourrait se produire une certaine modification de la couleur et des finis de la surface intérieure et extérieure. Il ne s'agit pas d'un défaut et ce n'est pas couvert par la garantie.
- La détérioration des surfaces imprimées, plaquées ou émaillées par les marques de doigts, accidents, abus, égratignures et pièces qui ont fondu ou autres causes externes, ainsi que les résidus laissés sur les surfaces plaquées par l'utilisation de nettoyants ou produits à polir abrasifs.
- La réparation ou le remplacement des pièces soumises à une usure normale pendant la période de garantie. Ces pièces comprennent : peinture, granulés et décoloration de la vitre.
- Bruit causé par la dilatation, contraction ou déplacements mineurs de certaines pièces. Ces conditions sont normales

ENREGISTREMENT DE SERVICE

Il est recommandé que votre système de chauffage est desservi régulièrement et que le Service Interval enregistrement approprié est terminée.

FOURNISSEUR DE SERVICES

Avant de terminer l'enregistrement de service approprié ci-dessous, s'il vous plaît vous assurer que vous avez effectué le service tel que décrit dans le les instructions du fabricant. Toujours utiliser pièce de rechange indiquée par le fabricant lors de remplacement est nécessaire.

Service de 01 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 02 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 03 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 04 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 05 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 06 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 07 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Service de 08 Date: _____
Nom de l'ingénieur: _____
N° de licence.: _____
Compagnie: _____
N° de téléphone: _____
Poêle Inspecté: ☐ Cheminée balayée: ☐
Articles Remplacé: _____

Limited Warranty

The operation of this unit in a manner inconsistent with the owner's manual will void the warranty and is also against federal regulations. United States Stove Company warrants this product to be free from defects in material and workmanship, to the original retail purchaser only, for the time period identified below, measured from the date of the initial purchase as evidenced on an invoice, cancelled check, sales receipt, etc., to receipt of a claim by United States Stove Company ("USSC") or an authorized dealer, as follows:

TIME PERIOD	
Steel PartFirebox, Heat Exchanger, Door, Trim	Five Year Limited
Gaskets	One Year Limited
All Electrical Components (Blower, Auger / Agitator Motor, PC Board, Switches)	One Year Limited
Ceramic Glass	One Year Limited

WARRANTY CONDITIONS

- This warranty only covers USSC appliances that are purchased through an USSC authorized retailer, dealer or distributor.
- This warranty is only valid while the USSC appliance remains at the site of original installation. This warranty does not apply to products purchased for rental use.

CLAIM PROCEDURE

Contact United States Stove Company for warranty service. You will be asked to provide detailed descriptions and pertinent data, including proof or purchase which will be returned upon request. Providing the heater has been installed and used in accordance with the Owner's Manual supplied with the heater and the issue does not fall under a situation of exclusion, United States Stove Company will either:

- Replace the defective part free of charge. Parts and/or service replacements made under the terms of this warranty are warranted only for the remaining period of the original heater warranty.
- Replace the heater free of charge. Should the heater be replaced by United States Stove Company "free of charge", all further warranty obligations are thereby met.
- Where the defect is of a cosmetic (non-functional) nature, United States Stove Company will bear reasonable expense to repair the heater, including such items as welding, painting, and incidental labor. A "reasonable expense" is defined by terms of this warranty as $30.00/hour with full refund for any purchase of parts.

WARRANTY EXCLUSIONS

This warranty does not cover the following:

- Damage to or changes in surface finishes as a result of normal use. As a heating appliance, some changes in color or interior and exterior surface finishes may occur. This is not a flaw and is not covered under warranty.
- Damage to printed, plated, or enameled surfaces caused by fingerprints, accidents, misuse, scratches, melted items, or other external sources and residues left on the plated surfaces from the use of abrasive cleaners or polishes.
- Repair or replacement of parts that are subject to normal wear and tear during the warranty period. These parts include: paint, pellet, and the discoloration of glass.
- Minor expansion, contraction, or movement of certain parts causing noise. These conditions are normal and complaints related to this noise are not covered by this warranty.
- Damages resulting from: (1) failure to install, operate, or maintain the appliance in accordance with the installation instructions, operating instructions, and listing agent identification label furnished with the appliance; (2) failure to install the appliance in accordance with local building codes and/or authorities having jurisdiction; (3) shipping or improper handling; (4) improper operation, abuse, misuse, continued operation with damaged, corroded or failed components, accident, alteration, or improperly/incorrectly performed repairs; (5) environmental conditions, weather, inadequate ventilation, negative pressure, or drafting caused by tightly sealed constructions, insufficient make-up air supply, or handling devices such as exhaust fans or forced air furnaces or other such causes; (6) use of fuels other than those specified in the operating instructions; (7) installation or use of components not supplied with appliance or any other components not expressly authorized and approved by USSC; (8) modification of the appliance not expressly authorized and approved by USSC in writing; and/or (9) interruptions or fluctuations of electrical power supply to the appliance.
- Non-USSC venting components, hearth components or other accessories used in conjunction with the appliance.
- USSC's obligation under this warranty does not extend to the appliance's capability to heat the desired space. Information is provided to assist the consumer and the dealer in selecting the proper appliance for the application. Consideration must be given to appliance location and configuration, environmental conditions, insulation and air tightness of the structure.
- Problems relating to smoking or creosote. Smoking is attributable to inadequate draft due to the design or installation of the flue system or installation of the heater itself. Creosote formation is largely attributable to improper operation of the unit and/or draft as mentioned above.
- Any cost associated with product removal and re-installation, travel, transportation, or shipping.
- Service calls to diagnose trouble (unless authorized in writing by the manufacturer, distributor, or dealer).

THIS WARRANTY IS VOID IF

- The appliance has been over-fired or operated in atmospheres contaminated by chlorine, fluorine, or other damaging chemicals. Over-firing can be identified by, but not limited to, warped plates or tubes, rust colored cast iron, bubbling, cracking and discoloration of steel or enamel finishes.
- The appliance is subjected to prolonged periods of dampness or condensation.
- There is any damage to the appliance or other components due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

LIMITATIONS OF LIABILITY

The owner's exclusive remedy and USSC's sole obligation under this warranty, under any other warranty, express or implied, or in contract, tort or otherwise, shall be limited to replacement, repair, or refund, in USSC's sole and absolute discretion. In no event will USSC be liable for any incidental or consequential damages. THE LIMITED WARRANTY SET FORTH HEREIN IS THE SOLE WARRANTY PROVIDED TO PURCHASER AND IS IN LIEU OF ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESS OR IMPLIED. USSC MAKES NO REPRESENTATIONS OR WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT, OTHER THAN (i) THE LIMITED WARRANTY ABOVE, AND (ii) ANY IMPLIED WARRANTIES IMPOSED BY APPLICABLE LAW WHICH CANNOT BE WAIVED OR DISCLAIMED UNDER APPLICABLE LAW. ALL OTHER WARRANTIES OF ANY KIND, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED AND EXCLUDED TO THE FULLEST EXTENT NOT PROHIBITED BY APPLICABLE LAW. This Limited Warranty gives the purchaser specific legal rights; a purchaser may have other rights depending upon where he or she resides. Some states do not allow the exclusion or limitation of special, incidental or consequential damages, or state law may affect the duration of limitations, so the above exclusion and limitations may not be applicable.

WARRANTOR

The warrantor of record is United States Stove Company, PO Box 151, 227 Industrial Park Road, South Pittsburg, Tennessee 37380. Phone number: (800)-750-2723. Register your product on line at www.usstove.com. Save your proof of purchase, as documented in a receipt or invoice, with your records for any claims.

IMPORTANT

We congratulate you on your selection of United States Stove Company and its products. As the oldest solid fuel manufacturer in the United States (since 1869), the United States Stove Company is very proud of its products, service, employees, and satisfied customers. We would like to hear from you if you are not satisfied with the manner in which you have been handled by our distributor, dealer, representative, customer service department, parts department, or sales department. Please reach out to us by using any of the contact information listed above.

Garantie limitée

L'utilisation de cette unité en contradiction avec le manuel de l'utilisateur annulera la garantie, tout en enfreignant les règlementations fédérales. United States Stove Company garantit, uniquement à l'acheteur au détail original, que ce produit est exempt de défectuosités des matériaux et de qualité de l'exécution, pendant la période indiquée ci-dessous, de la date initiale d'achat prouvé par une facture, un chèque oblitéré, un reçu de vente, etc., de United States Stove Company (« USSC ») ou d'un détaillant autorisé, comme suit:

DÉLAI PRESCRIT	
Steel PartFirebox, Heat Exchanger, Door, Trim	Cinq ans limités
Joints d'étanchéité	Un an limités
Tous les composants électriques (Souffleur, moteur de la vis/agitateur, carte de circuit imprimé, commutateurs)	Un an limités
Vitre céramique	Un an limités

CONDITIONS DE LA GARANTIE

- La garantie ne couvre que les appareils USSC achetés chez un détaillant ou distributeur USSC autorisé.
- Cette garantie n'est valide que si l'appareil USSC demeure sur le site d'installation d'origine. Cette garantie ne s'applique pas aux produits achetés pour la location.

PROCÉDURE DE RÉCLAMATION

Contactez United States Stove Company pour un service sur garantie. Il vous sera demandé de fournir les descriptions et données pertinentes, incluant la preuve d'achat qui sera retournée sur demande. Sous réserve que l'appareil de chauffage ait été installé et utilisé conformément avec le Manuel du propriétaire fourni avec cet appareil de chauffage et que le problème ne porte pas sur une situation d'exclusion, United States Stove Company:

- Remplacera sans frais la pièce défectueuse. Les pièces et/ou les remplacements d'entretien effectués selon les termes de cette garantie le sont uniquement pour le reste de la période originale de la garantie de ce produit.
- Remplacer l'appareil de chauffage sans frais. Si l'appareil de chauffage doit être remplacé par United States Stove Company « sans frais », tous les engagements au titre de cette garantie seront respectés.
- Si le défaut est de nature esthétique (non fonctionnel), United States Stove Company assumera les frais pour réparation de l'appareil de chauffage, incluant les éléments comme la soudure, la peinture et la main-d'œuvre accessoire. Les « frais raisonnables » définis aux termes de cette garantie sont de 30,00 $/heure avec un remboursement complet pour tout achat de pièces.

EXCLUSIONS DE LA GARANTIE

Cette garantie ne couvre pas ce qui suit:

- Dommage ou modification du fini de la surface causé par une utilisation normale. Comme il s'agit d'un appareil de chauffage, il pourrait se produire une certaine modification de la couleur et des finis de la surface intérieure et extérieure. Il ne s'agit pas d'un défaut et ce n'est pas couvert par la garantie.
- Détérioration des surfaces imprimées, plaquées ou émaillées par les marques de doigts, accidents, abus, égratignures et pièces qui ont fondu ou autres causes externes, ainsi que les résidus laissés sur les surfaces plaquées par l'utilisation de nettoyants ou produits à polir abrasifs.
- Réparation ou remplacement des pièces soumises à une usure normale pendant la période de garantie. Ces pièces comprennent : peinture, granulés et décoloration de la vitre.
- Bruit causé par la dilatation, contraction ou déplacements mineurs de certaines pièces. Ces conditions sont normales et les réclamations liées à ce bruit ne sont pas couvertes par cette garantie.
- Dommages causés par : (1) l'installation, l'utilisation ou la maintenance de l'appareil sans tenir compte des instructions d'installation et d'utilisation, et sans consulter l'étiquette d'identification de l'agent de listé; (2) le non-respect des codes du bâtiment locaux et/ou des autorités ayant juridiction pendant l'installation de l'appareil; (3) l'expédition ou la mauvaise manutention; (4) la mauvaise utilisation, l'abus, l'utilisation continue alors que des composants sont endommagés, corrodés ou défectueux, l'utilisation après un accident, des modifications ou des réparations négligentes/incorrectes; (5) les conditions liées à l'environnement et à la météo, une mauvaise ventilation, une pression négative ou un mauvais tirage en raison de l'étanchéité de la construction, l'approvisionnement insuffisant en air d'appoint ou d'autres dispositifs tels que des ventilateurs de tirage, des chaudières à air pulsé ou toute autre cause; (6) l'utilisation de combustibles autres que ceux mentionnés dans les instructions d'utilisation; (7) l'installation ou l'utilisation de composants qui n'ont pas été fournis avec l'appareil ou de tout autre composant n'ayant pas été expressément autorisé et approuvé par USSC; (8) les modifications de l'appareil qui n'ont pas été expressément autorisées et approuvées par écrit par USSC; et/ou (9) les interruptions ou fluctuations de l'alimentation électrique de l'appareil.
- Composants d'évacuation des gaz, composants de l'âtre ou accessoires utilisés avec l'appareil et qui n'ont pas été fournis par USSC.
- Obligations de USSC, en vertu de cette garantie, ne couvrent pas la capacité de l'appareil à chauffer l'espace souhaité. Des informations sont fournies pour aider le consommateur et le détaillant lors de la sélection de l'appareil adéquat pour l'application envisagée. On doit tenir compte de l'emplacement et de la configuration de l'appareil, des conditions liées à l'environnement, de l'isolation et de l'étanchéité de la structure.
- Problèmes liés à la fumée ou au créosote. La fumée provient généralement d'un tirage inadéquat en raison de la conception ou de l'installation du système de conduit ou de l'installation de l'appareil de chauffage lui-même. La formation de créosote est largement attribuable au mauvais fonctionnement de l'unité et/ou du tirage, comme il est mentionné ci-dessus.
- Tous les coûts associés à l'enlèvement et à la réinstallation du produit, son déplacement, transport ou expédition.
- Appels de service afin de diagnostiquer les problèmes (à moins d'être reconnu par écrit par le fabricant, le distributeur ou le détaillant).

CETTE GARANTIE EST ANNULÉE SI

- L'appareil a subi une surchauffe ou a été utilisé avec de l'air contaminé par le chlore, le fluor ou d'autres produits chimiques nuisibles. La surchauffe peut être établie, sans s'y limiter, par la déformation des plaques ou tubes, la couleur rouille de la fonte, l'apparition de bulles et de craquelures, et la décoloration des surfaces en acier ou émaillées.
- L'appareil est soumis à l'humidité ou à la condensation pendant de longues périodes.
- Les dommages causés à l'appareil ou aux autres composants par l'eau ou les intempéries en raison, entre autres, d'une mauvaise installation de la cheminée ou du conduit d'évacuation.

RESTRICTIONS DE LA GARANTIE

Le seul recours du propriétaire et la seule obligation de USSC en vertu de cette garantie ou de toute autre garantie, explicite ou tacite, contractuelle, à tort ou à raison, sont limités au remplacement, à la réparation ou au remboursement. En aucun cas, USSC ne saurait être tenue responsable des dommages fortuits ou consécutifs. LA GARANTIE LIMITÉE INCLUSE AUX PRÉSENTE EST LA SEULE DISPONIBLE POUR L'ACHETEUR, TENANT LIEU DE TOUTES AUTRES GARANTIES OU DÉCLARATIONS, FORMELLE OU TACITE. USSC NE FAIT AUCUNE DÉCLARATION OU GARANTIE DE TOUTE SORTE, QU'ELLE SOIT TACITE OU FORMELLE, RELATIVEMENT AU PRODUIT, AUTRE QUE (i) LA GARANTIE LIMITÉE MENTIONNÉE CI-DESSUS, ET (ii) TOUTE GARANTIE TACITE IMPOSÉE PAR LE DROIT APPLICABLE PAR LAQUELLE ELLE NE PEUT ÊTRE ANNULÉE OU DÉCLINÉE SELON LE DROIT APPLICABLE. TOUTES AUTRES GARANTIES DE TOUT GENRE, INCLUANT, MAIS SANS S'Y LIMITER, AUX GARANTIES TACITES DE QUALITÉ MARCHANDE OU D'APTITUDE À L'EMPLOI, SONT DONC AUX PRÉSENTES, DÉCLINÉES ET EXCLUES JUSQU'À LA LIMITE DU DROIT APPLICABLE. Cette garantie limitée confère à l'acheteur des droits juridiques spécifiques; les droits de l'acheteur pourraient différer selon son lieu de résidence. Certains États ne permettent pas l'exclusion ou la limitation de dommages particuliers, accessoires ou indirects, ou des lois d'État peuvent avoir un impact sur la durée des limitations; ainsi, l'exclusion et les limitations précédentes pourraient ne pas s'appliquer.

GARANT

Le garant de ce dossier est United States Stove Company, PO Box 151, 227 Industrial Park Road, South Pittsburg, Tennessee 37380. Numéro de téléphone : (800)-750-2723. Enregistrez votre produit en ligne au www.usstove.com. Conservez votre preuve d'achat, documentée sous forme de facture ou de reçu, en cas de réclamation.

IMPORTANT

Félicitation d'avoir choisi United States Stove Company et ses produits. Étant le plus ancien fabricant de combustible solide aux États-Unis (depuis 1869), United States Stove Company est fière de ses produits, son service, ses employés, et ses clients satisfaits. Nous aimerions le savoir si vous êtes insatisfait de la façon dont vous aurait répondu l'un de nos distributeurs, détaillants, représentants, service à la clientèle, service des pièces ou service des ventes. Veuillez nous joindre en utilisant l'un des moyens pour nous contacter indiqués ci-dessous.

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

A2LA ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0182484A0912013i241204

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**
kg	0.01	QC033	12/4/24	12/28/23	12/2025

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 100 / Tol: 0.05	Test Wt: HB44 / Tol: HB44	Test Wt: 100 / Tol: 0.01	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 17.2°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.98	399.98	0.006
200	200.00	200.00	0.005
100	100.00	100.00	0.005
75	75.00	75.00	0.005
50	50.00	50.00	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	7/26/24	7/2026	20221688

Permanent Information Concerning this Equipment:
12 month calibration cycle. Scale calibrates in kg only.

Comments/Information Concerning this Calibration
12/04/2024: RH-37%

Report prepared/reviewed by: TLP **Date:** 12.04.2024 **Technician:** T.Peterson
Signature:

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.

Dry Gas Meter Calibration

DUT	
Manufacturer:	Apex
Model:	XC-60
Lab ID #:	53
Serial #:	1902130
Calibration Date:	2/1/2025
Calibration Expiration:	8/1/2025
Barometric Pressure:	30.02 in. Hg

Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer:	Apex	NI	Aquatech	Dwyer
Model:	SK25DA	9213	DBX2	W17AE
Lab ID#:	47	215	202	124
Calibration Expiration Date:	5/1/2025	2/26/2025	6/17/2025	6/16/2025
Calibration γ Factor:	0.998			

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Caibrate 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)	236.809	287.051	244.102
Standard DGM Temperature (°F)	70.6	70.3	71.8
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	8.217	10.148	8.812
DGM Temperature (°F)	80.2	86.9	91.0
DGM Pressure (in H_2O)	3.43	2.25	1.38
Net Volume for Standard DGM (ft^3)	8.363	10.137	8.620
Net Volume for DGM (ft^3)	8.217	10.148	8.812

Dry Gas Meter γ Factor	1.025	1.022	1.008
γ Factor Deviation From Average	0.007	0.004	0.011

Average Gas Meter γ Factor: 1.019

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Dry Gas Meter Calibration

DUT	
Manufacturer:	Apex
Model:	XC-60
Lab ID #:	54
Serial #:	1902133
Calibration Date:	2/1/2025
Calibration Expiration:	8/1/2025
Barometric Pressure:	30.02 in. Hg

Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer:	Apex	NI	Aquatech	Dwyer
Model:	SK25DA	9213	DBX2	W17AE
Lab ID#:	47	215	202	124
Calibration Expiration Date:	5/1/2025	2/26/2025	6/17/2025	6/16/2025
Calibration γ Factor:	0.998			

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Caibrate 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)	145.607	267.121	243.468
Standard DGM Temperature (°F)	63.5	66.0	67.5
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.095	9.615	8.854
DGM Temperature (°F)	69.9	81.0	89.9
DGM Pressure (in H_2O)	2.93	1.93	3.42
Net Volume for Standard DGM (ft^3)	5.142	9.433	8.598
Net Volume for DGM (ft^3)	5.095	9.615	8.854

Dry Gas Meter γ Factor	1.012	1.002	1.002
γ Factor Deviation From Average	0.007	0.003	0.004

Average Gas Meter γ Factor: 1.005

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Dry Gas Meter Calibration

DUT	
Manufacturer:	Apex
Model:	XC-60
Lab ID #:	55
Serial #:	810016
Calibration Date:	2/1/2025
Calibration Expiration:	8/1/2025
Barometric Pressure:	30.02 in. Hg

Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer:	Apex	NI	Aquatech	Dwyer
Model:	SK25DA	9213	DBX2	W17AE
Lab ID#:	47	215	202	124
Calibration Expiration Date:	5/1/2025	2/26/2025	6/17/2025	6/16/2025
Calibration γ Factor:	0.998			

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Caibrate 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)	148.998	157.125	207.888
Standard DGM Temperature (°F)	70.2	71.1	69.8
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.249	5.608	7.444
DGM Temperature (°F)	80.0	82.2	83.8
DGM Pressure (in H_2O)	0.00	0.00	0.00
Net Volume for Standard DGM (ft^3)	5.262	5.549	7.341
Net Volume for DGM (ft^3)	5.249	5.608	7.444

Dry Gas Meter γ Factor	1.019	1.008	1.010
γ Factor Deviation From Average	1.019	1.008	1.010

Average Gas Meter γ Factor: 1.012

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Dry Gas Meter Calibration

DUT	
Manufacturer:	Apex
Model:	XC-50-DIR
Lab ID #:	203
Serial #:	A2204292
Calibration Date:	2/1/2025
Calibration Expiration:	8/1/2025
Barometric Pressure:	30.02 in. Hg

Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer:	Apex	NI	Aquatech	Dwyer
Model:	SK25DA	9213	DBX2	W17AE
Lab ID#:	47	215	202	124
Calibration Expiration Date:	5/1/2025	2/26/2025	6/17/2025	6/16/2025
Calibration γ Factor:	0.998			

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Caibrate 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)	166.553	142.180	215.972
Standard DGM Temperature (°F)	66.2	65.6	68.1
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.748	5.020	7.675
DGM Temperature (°F)	72.1	80.1	84.0
DGM Pressure (in H_2O)	1.10	0.81	1.41
Net Volume for Standard DGM (ft^3)	5.882	5.021	7.627
Net Volume for DGM (ft^3)	5.748	5.020	7.675

Dry Gas Meter γ Factor	1.030	1.024	1.018
γ Factor Deviation From Average	0.006	0.000	0.006

Average Gas Meter γ Factor: 1.024

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Report and Certificate of Calibration

CAL-CERT CALIBRATION CERTIFICATION

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Toll Free 800-356-4662

Address 5777 SE International Way Milwaukie, OR 97222

Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #: 38860-203324-21 **Customer PO#:** 1126

Customer Name: PFS TECO

Customer Address: 11785 SE Highway 212, Suite 305

City: Clackamas **State:** OR **Zip:** 97015

Contact: Ethan Frederick

Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 | Compound Gauge | Fluke | SN: 4582643 | Cal: 01/24/2025 | Due: 01/31/2026 | Vendor: Fluke | Report #: EVL1027223
14-01349 | Thermo-Hygrometer | Comark | SN: 06210350162 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 27, 2025	**Reference:**	ASME B40.100
Recommended Due Date:	February 27, 2026	**Cal-Cert Procedure:**	CP-003
Calibration Frequency:	12 Months	**Indicating System:**	Digital
Manufacturer:	Newport Industries	**Temperature:**	67 °F
Type:	Pressure Transducer	**Humidity:**	41% RH
Model Number:	Unknown	**Cal Factor:**	None
Serial #:	Unknown	**Asset #:**	53C
Capacity:	5 In H2O	**Service Location:**	Service Address
Tolerance:	± 1.00% of Span	**As Found:**	Pass
Gauge Class:	A	**As Left:**	Pass

Instrument Range: 5.00 **Range Resolution:** 0.01 **Mode Verified:** Pressure

UUT Reading In H2O	Standard As Found In H2O	Standard Verification Reading #1 In H2O	Error In H2O	Standard Verification Reading #2 In H2O	Error In H2O	Tolerance In H2O	Expanded Uncertainty ± In H2O
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005
0.50	0.4981	0.4981	0.00	0.5048	0.00	0.05	0.018
1.25	1.2278	1.2278	-0.02	1.2351	-0.01	0.05	0.019
2.50	2.4664	2.4664	-0.03	2.4746	-0.03	0.05	0.022
3.75	3.7213	3.7213	-0.03	3.7158	-0.03	0.05	0.016
5.00	4.9584	4.9584	-0.04	4.9521	-0.05	0.05	0.018
3.75	3.7024	3.7024	-0.05	3.7233	-0.03	0.05	0.054
2.50	2.4709	2.4709	-0.03	2.4769	-0.02	0.05	0.016
1.25	1.2356	1.2356	-0.01	1.2386	-0.01	0.05	0.009
0.50	0.4978	0.4978	0.00	0.5010	0.00	0.05	0.01
0.00	0.0000	0.0000	0.00	0.0000	0.00	0.05	0.005

Manufacturer: Newport Industries **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.

Service Engineer: Samuel Owens **Date:** February 27, 2025

Quality Manager: Tony Lewandowski **Signature:** 

Report #: 38860-203324-21

Report and Certificate of Calibration

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Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #:	33086-203325-4525	**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 26, 2024	**Reference:**	ASME B40.100
Recommended Due Date:	February 26, 2025	**Cal-Cert Procedure:**	CP-003
Calibration Frequency:	12 Months	**Indicating System:**	Digital
Manufacturer:	Newport Industries	**Temperature:**	64 °F
Type:	Pressure Transducer	**Humidity:**	36% RH
Model Number:	Unknown	**Cal Factor:**	None
Serial #:	Unknown	**Asset #:**	54B
Capacity:	1 PSI	**Service Location:**	Service Address
Tolerance:	± 1.00% of Span	**As Found:**	Pass
Gauge Class:	A	**As Left:**	Pass

Instrument Range: 1.00 **Range Resolution:** 0.01 **Mode Verified:** Pressure

UUT Reading PSI	Standard As Found PSI	Standard Verification Reading #1 PSI	Error PSI	Standard Verification Reading #2 PSI	Error PSI	Tolerance PSI	Expanded Uncertainty ± PSI
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.005
0.10	0.10	0.10	0.00	0.10	0.00	0.01	0.005
0.25	0.25	0.25	0.00	0.25	0.00	0.01	0.006
0.50	0.50	0.50	0.00	0.50	0.00	0.01	0.014
0.75	0.75	0.75	0.00	0.74	-0.01	0.01	0.018
1.00	1.00	1.00	0.00	0.99	-0.01	0.01	0.013
0.75	0.76	0.76	0.01	0.76	0.01	0.01	0.005
0.50	0.50	0.50	0.00	0.51	0.01	0.01	0.015
0.25	0.25	0.25	0.00	0.26	0.01	0.01	0.017
0.10	0.11	0.11	0.01	0.11	0.01	0.01	0.008
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.005

Manufacturer: Newport Industries **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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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.

Service Engineer: Steven White **Date:** February 26, 2024

Technical Manager: Marshall Doyle **Signature:** 

Report #: 33086-203325-4525

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A2LA ACCREDITED CERT #4986.01

Report #: 38860-203325-21 **Customer PO#:** 1126

Customer Name: PFS TECO

Customer Address: 11785 SE Highway 212, Suite 305

City: Clackamas **State:** OR **Zip:** 97015

Contact: Ethan Frederick

Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 | Compound Gauge | Fluke | SN: 4582643 | Cal: 01/24/2025 | Due: 01/31/2026 | Vendor: Fluke | Report #: EVL1027223
14-01349 | Thermo-Hygrometer | Comark | SN: 06210350162 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 27, 2025	**Reference:**	ASME B40.100
Recommended Due Date:	February 27, 2026	**Cal-Cert Procedure:**	CP-003
Calibration Frequency:	12 Months	**Indicating System:**	Digital
Manufacturer:	Newport Industries	**Temperature:**	66 °F
Type:	Pressure Transducer	**Humidity:**	41% RH
Model Number:	Unknown	**Cal Factor:**	None
Serial #:	Unknown	**Asset #:**	54B
Capacity:	1 In H2O	**Service Location:**	Service Address
Tolerance:	± 1.00% of Span	**As Found:**	Pass
Gauge Class:	A	**As Left:**	Pass

Instrument Range: 1.00 **Range Resolution:** 0.01 **Mode Verified:** Pressure

UUT Reading In H2O	Standard As Found In H2O	Standard Verification Reading #1 In H2O	Error In H2O	Standard Verification Reading #2 In H2O	Error In H2O	Tolerance In H2O	Expanded Uncertainty ± In H2O
0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.005
0.10	0.1058	0.1058	0.01	0.1024	0.00	0.01	0.01
0.25	0.2534	0.2534	0.00	0.2546	0.00	0.01	0.006
0.50	0.5056	0.5056	0.01	0.5073	0.01	0.01	0.007
0.75	0.7502	0.7502	0.00	0.7589	0.01	0.01	0.023
1.00	1.0081	1.0081	0.01	1.0051	0.01	0.01	0.009
0.75	0.7533	0.7533	0.00	0.7544	0.00	0.01	0.006
0.50	0.5079	0.5079	0.01	0.5036	0.00	0.01	0.012
0.25	0.2584	0.2584	0.01	0.2576	0.01	0.01	0.006
0.10	0.1096	0.1096	0.01	0.1083	0.01	0.01	0.006
0.00	0.0000	0.0000	0.00	0.0000	0.00	0.01	0.005

Manufacturer: Newport Industries **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).

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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.

Service Engineer: Samuel Owens **Date:** February 27, 2025

Quality Manager: Tony Lewandowski **Signature:**

Report #: 38860-203325-21

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Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #:	33086-203319-4525	**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 26, 2024	**Reference:**	ASME B40.100
Recommended Due Date:	February 26, 2025	**Cal-Cert Procedure:**	CP-003
Calibration Frequency:	12 Months	**Indicating System:**	Digital
Manufacturer:	Red Lion	**Temperature:**	65 °F
Type:	Pressure Transducer	**Humidity:**	36% RH
Model Number:	Unknown	**Cal Factor:**	None
Serial #:	Unknown	**Asset #:**	203B
Capacity:	1 In H2O	**Service Location:**	Service Address
Tolerance:	± 1.00% of Span	**As Found:**	Pass
Gauge Class:	A	**As Left:**	Pass

Instrument Range: 1.00 **Range Resolution:** 0.001 **Mode Verified:** Pressure

UUT Reading In H2O	Standard As Found In H2O	Standard Verification Reading #1 In H2O	Error In H2O	Standard Verification Reading #2 In H2O	Error In H2O	Tolerance In H2O	Expanded Uncertainty ± In H2O
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005
0.100	0.098	0.098	0.00	0.099	0.00	0.01	0.0036
0.250	0.252	0.252	0.00	0.250	0.00	0.01	0.0055
0.500	0.502	0.502	0.00	0.499	0.00	0.01	0.0065
0.750	0.751	0.751	0.00	0.748	0.00	0.01	0.0086
1.000	1.001	1.001	0.00	0.998	0.00	0.01	0.0068
0.750	0.752	0.752	0.00	0.749	0.00	0.01	0.0073
0.500	0.501	0.501	0.00	0.499	0.00	0.01	0.0065
0.250	0.251	0.251	0.00	0.250	0.00	0.01	0.0024
0.100	0.103	0.103	0.00	0.101	0.00	0.01	0.0057
0.000	0.001	0.001	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.

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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.

Service Engineer: Steven White **Date:** February 26, 2024

Technical Manager: Marshall Doyle **Signature:** 

Report #: 33086-203319-4525

Report and Certificate of Calibration

CAL-CERT CALIBRATION CERTIFICATION

www.Cal-Cert.com

Toll Free 800-356-4662

Address 5777 SE International Way Milwaukie, OR 97222

Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #:	33086-203326-4525	**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 26, 2024	**Reference:**	ASME B40.100
Recommended Due Date:	February 26, 2025	**Cal-Cert Procedure:**	CP-003
Calibration Frequency:	12 Months	**Indicating System:**	Digital
Manufacturer:	Newport Industries	**Temperature:**	64 °F
Type:	Pressure Transducer	**Humidity:**	36% RH
Model Number:	Unknown	**Cal Factor:**	None
Serial #:	Unknown	**Asset #:**	54C
Capacity:	5 In H2O	**Service Location:**	Service Address
Tolerance:	± 1.00% of Span	**As Found:**	Pass
Gauge Class:	A	**As Left:**	Pass

Instrument Range: 5.00 **Range Resolution:** 0.01 **Mode Verified:** Pressure

UUT Reading In H2O	Standard As Found In H2O	Standard Verification Reading #1 In H2O	Error In H2O	Standard Verification Reading #2 In H2O	Error In H2O	Tolerance In H2O	Expanded Uncertainty ± 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	0.48	-0.02	0.05	0.045
1.25	1.25	1.25	0.00	1.23	-0.02	0.05	0.036
2.50	2.49	2.49	-0.01	2.49	-0.01	0.05	0.006
3.75	3.74	3.74	-0.01	3.74	-0.01	0.05	0.007
5.00	4.98	4.98	-0.02	4.99	-0.01	0.05	0.026
3.75	3.74	3.74	-0.01	3.74	-0.01	0.05	0.023
2.50	2.50	2.50	0.00	2.49	-0.01	0.05	0.014
1.25	1.26	1.26	0.01	1.24	-0.01	0.05	0.042
0.50	0.51	0.51	0.01	0.50	0.00	0.05	0.04
0.00	0.00	0.00	0.00	0.01	0.01	0.05	0.005

Manufacturer: Newport Industries **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.

Service Engineer: Steven White **Date:** February 26, 2024

Technical Manager: Marshall Doyle **Signature:** 

Report #: 33086-203326-4525

Report and Certificate of Calibration

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Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #: 38860-203326-21 **Customer PO#:** 1126

Customer Name: PFS TECO

Customer Address: 11785 SE Highway 212, Suite 305

City: Clackamas **State:** OR **Zip:** 97015

Contact: Ethan Frederick

Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 | Compound Gauge | Fluke | SN: 4582643 | Cal: 01/24/2025 | Due: 01/31/2026 | Vendor: Fluke | Report #: EVL1027223
14-01349 | Thermo-Hygrometer | Comark | SN: 06210350162 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 27, 2025	**Reference:**	ASME B40.100
Recommended Due Date:	February 27, 2026	**Cal-Cert Procedure:**	CP-003
Calibration Frequency:	12 Months	**Indicating System:**	Digital
Manufacturer:	Newport Industries	**Temperature:**	66 °F
Type:	Pressure Transducer	**Humidity:**	43% RH
Model Number:	Unknown	**Cal Factor:**	None
Serial #:	Unknown	**Asset #:**	54C
Capacity:	5 In H2O	**Service Location:**	Service Address
Tolerance:	± 1.00% of Span	**As Found:**	Pass
Gauge Class:	A	**As Left:**	Pass

Instrument Range: 5.00 **Range Resolution:** 0.01 **Mode Verified:** Pressure

UUT Reading In H2O	Standard As Found In H2O	Standard Verification Reading #1 In H2O	Error In H2O	Standard Verification Reading #2 In H2O	Error In H2O	Tolerance In H2O	Expanded Uncertainty ± In H2O
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005
0.50	0.4690	0.4690	-0.03	0.5120	0.01	0.05	0.112
1.25	1.2455	1.2455	0.00	1.2373	-0.01	0.05	0.022
2.50	2.4891	2.4891	-0.01	2.4813	-0.02	0.05	0.021
3.75	3.7327	3.7327	-0.02	3.7142	-0.04	0.05	0.048
5.00	4.9519	4.9519	-0.05	4.9562	-0.04	0.05	0.013
3.75	3.7261	3.7261	-0.02	3.7208	-0.03	0.05	0.015
2.50	2.4775	2.4775	-0.02	2.4740	-0.03	0.05	0.011
1.25	1.2316	1.2316	-0.02	1.2336	-0.02	0.05	0.007
0.50	0.4971	0.4971	0.00	0.4990	0.00	0.05	0.007
0.00	0.0000	0.0000	0.00	0.0000	0.00	0.05	0.005

Manufacturer: Newport Industries **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.
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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.

Service Engineer: Samuel Owens **Date:** February 27, 2025

Quality Manager: Tony Lewandowski **Signature:** 

Report #: 38860-203326-21

Report and Certificate of Calibration

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Address 5777 SE International Way Milwaukie, OR 97222

Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #: 38860-203319-21 **Customer PO#:** 1126

Customer Name: PFS TECO

Customer Address: 11785 SE Highway 212, Suite 305

City: Clackamas **State:** OR **Zip:** 97015

Contact: Ethan Frederick

Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 | Compound Gauge | Fluke | SN: 4582643 | Cal: 01/24/2025 | Due: 01/31/2026 | Vendor: Fluke | Report #: EVL1027223
14-01349 | Thermo-Hygrometer | Comark | SN: 06210350162 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 27, 2025	**Reference:**	ASME B40.100
Recommended Due Date:	February 27, 2026	**Cal-Cert Procedure:**	CP-003
Calibration Frequency:	12 Months	**Indicating System:**	Digital
Manufacturer:	Red Lion	**Temperature:**	66 °F
Type:	Pressure Transducer	**Humidity:**	43% RH
Model Number:	Unknown	**Cal Factor:**	None
Serial #:	Unknown	**Asset #:**	203B
Capacity:	1 In H2O	**Service Location:**	Service Address
Tolerance:	± 1.00% of Span	**As Found:**	Pass
Gauge Class:	A	**As Left:**	Pass

Instrument Range: 1.00 **Range Resolution:** 0.001 **Mode Verified:** Pressure

UUT Reading In H2O	Standard As Found In H2O	Standard Verification Reading #1 In H2O	Error In H2O	Standard Verification Reading #2 In H2O	Error In H2O	Tolerance In H2O	Expanded Uncertainty ± In H2O
0.000	0.00	0.00	0.00	0.00	0.00	0.01	0.0005
0.100	0.0929	0.0929	-0.01	0.0992	0.00	0.01	0.0164
0.250	0.2473	0.2473	0.00	0.2488	0.00	0.01	0.0039
0.500	0.4955	0.4955	0.00	0.4990	0.00	0.01	0.0091
0.750	0.7533	0.7533	0.00	0.7427	-0.01	0.01	0.0276
1.000	1.0045	1.0045	0.00	0.9909	-0.01	0.01	0.0354
0.750	0.7462	0.7462	0.00	0.7517	0.00	0.01	0.0143
0.500	0.4976	0.4976	0.00	0.4925	-0.01	0.01	0.0132
0.250	0.2431	0.2431	-0.01	0.2447	-0.01	0.01	0.0042
0.100	0.1020	0.1020	0.00	0.1008	0.00	0.01	0.0031
0.000	0.0000	0.0000	0.00	0.0000	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.

Service Engineer: Samuel Owens **Date:** February 27, 2025

Quality Manager: Tony Lewandowski **Signature:** 

Report #: 38860-203319-21

CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	***06/17/2024***
PO NUMBER:	1120	**CALIBRATION DUE:**	*06/17/2025*
INST. MANUFACTURER:	DWYER	**PROCEDURE:**	T.O.33K6-4-1769-1
INST. DESCRIPTION:	VELOMETER	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70°F
MODEL NUMBER:	471	**RECEIVED CONDITION:**	WITHIN MFG. SPECS.
SERIAL NUMBER:	**CP288559 ID# 095**	**LEFT CONDITION:**	WITHIN MFG. SPECS.
RATED ACCURACY:	SEE NOTES BELOW.	**AMBIENT CONDITIONS:**	763mm HGA 53% RH 70°F
UNCERTAINTY GIVEN:	± 0.43% RD ; k=2	**CERTIFICATE FILE #:**	**490265.2024**

NOTES: ± 3.0% FS (0-500 / 0-1500) ** ± 4.0% F.S. (0-5000) **± 5.0% F.S. (0-15000) ** ± 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
70	73	0 TO 200°F	0 TO 200°F
126	130	44.7	44.1
242	249	71.8	71.0
495	508	99.9	99.3
521	533		
1039	1066		
1490	1530		
507	522		
3214	3311		
4998	5156		
6975	7182		
14853	15322		

STANDARDS USED:		
A312 ± .02% RD -140 TO 1372 DEG °C TRACE# 2023004415	**DUE**	**11/13/24**
A800 flow nozzles +/- .2% RD (.2-5, 5-100, 100-1650 SCFM)TRACE# 144613547,1424683640,1583314714	**DUE**	**02/14/25**

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

Issuing Date: 06/17/2024

Approved By:

Cal. Technician: A.N.

Calibrated at: ✓ Lab
___ On-Site (Customer's)

Established 1974

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A2LA ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0134307497241204

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	12/4/24	6/12/24	6/2025

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 100 Tol: 0.0003
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 50 x 4 Tol: 0.0002
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0001

1. 100.0000	5. 99.9999	9. 99.9999
2. 100.0000	6. 100.0000	10. 100.0000
3. 100.0000	7. 100.0000	Result
4. 99.9999	8. 99.9999	0.00005

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 20.8°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	200.0007	199.9999	0.00017
100	100.0006	99.9999	0.00016
50	50.0004	50.0000	0.00015
20	20.0003	20.0000	0.00015
0.1	0.0999	0.0999	0.00015
0.05	0.0498	0.0499	0.00015

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20 kg to 1mg	2831W	3/31/24	3/2025	20240774

Permanent Information Concerning this Equipment:
6 month calibration cycle

Comments/Info Concerning this Calibration:
12/04/2024: Adjusted span. RH=36%

Report prepared/reviewed by: TLP **Date:** 12-04-2024 **Technician:** E.J. Vasko
Signature:

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards. Results relate only to the item(s) tested. Unless otherwise noted, statements of conformity do not include measurement

Certificate of Calibration

Certificate Number: 743892

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

PFS TECO
11785 SE Hwy 212
Suite 305
Clackamas, OR 97015

ACCREDITED
0723.01
Calibration

PO: 1033
Order Date: 03/08/2021
Authorized By: N/A

Property #: 097
User: N/A
Department: N/A
Make: Unknown
Model: 10 Lbs.
Serial #: 097
Description: Mass
Procedure: DCN 500901
Accuracy: Raw Data

Calibrated on: 03/18/2021
*Recommended Due: 03/18/2026
Environment: 19 °C 41 % RH
* As Received: Other - See Remarks
* As Returned: Other - See Remarks
Action Taken: Calibrated
Technician: 126

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Data is provided for your determination of acceptability. Received/returned without accessories.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
484A	Rice Lake	1kg-10kg (Class ASTM 1)	Mass Set,	05/28/2021	699197
503A	Rice Lake	1mg-200g (Class 0)	Mass Set,	09/11/2021	729241
550A	And (A&D) Co.	HP-30K	Balance 30 Kg	12/31/2021	739307
723A	Rice Lake	1mg-200g (Class 0)	Mass Set,	06/09/2021	723431

Measurement Data

Parameter / Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = ü
Mass								
Raw Data		g	4535.92370000	0.0000000	0.0000000	0.1785299	4536.1022299 g	3.5E-01 ü

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 03/25/2021 Rev # 15

Inspector

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ACCREDITED
CERTIFICATE #1550.01

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

Material	Assumed Density	Range	Tolerance Class
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/cm^3).**

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.

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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ACCREDITED
CERTIFICATE #1550.01

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.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 05/09/22

Signature David S. Thompson

Report and Certificate of Calibration

CAL-CERT CALIBRATION CERTIFICATION

www.Cal-Cert.com

Toll Free 800-356-4662

Address 5777 SE International Way Milwaukie, OR 97222

Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #: 34220-232033-4847 **Customer PO#:** 1114
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-00693 | Surface Plate | Starrett | SN: 863629 | Cal: 01/19/2024 | Due: 01/31/2025 | Vendor: Cal-Cert | Range: 12 sq ft | Report #: 32565-31044-14
LP-01346 | Thermo-Hygrometer | Comark | SN: 06210350198 | Cal: 03/08/2024 | Due: 03/31/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 33563-67215-3616

Instrument Data

Calibration Date:	April 3, 2024	**Reference:**	NAVAIR 17-20MD-06
Calibration Due Date:	April 3, 2025	**Cal-Cert Procedure:**	CP-010
Calibration Frequency:	12 Months	**Indicating System:**	Vernier
Manufacturer:	Dwyer Instruments	**Temperature:**	68 °F
Type:	Depth Micrometer	**Humidity:**	36% RH
Model Number:	Unknown	**Asset #:**	221
Serial #:	Unknown	**Service Location:**	Cal-Cert Lab
Minimum Capacity:	0.0 Inches	**As Found:**	PASS
Maximum Capacity:	1 Inches	**As Left:**	PASS
Resolution:	0.001 Inches		

Instrument Range: 1.000 Inches **Range Resolution:** 0.001 Inches

Calibration Standard Inches	As Found Inches	As Left Reading 1 Inches	As Left Reading 2 Inches	Tolerance ± Inches
0.000	0.000	0.000	0.000	0.001
0.200	0.200	0.200	0.200	0.001
0.400	0.401	0.401	0.401	0.001
0.600	0.601	0.601	0.601	0.001
0.800	0.800	0.800	0.800	0.001
1.000	1.000	1.000	1.000	0.001

Expanded Uncertainty ± 0.00115 Inches

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.

Service Engineer: Justin Roye **Date:** April 3, 2024

Quality Manager: Jason Wimmer **Signature:**

Established 1974

QUALITY CONTROL SERVICES

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A2LA ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI01C101887027241204

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Mettler	IND570 - 1000lbx0.	C101887027	#189	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.02	QC033	12/4/24	12/28/23	12/2025

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 400 Tol: 0.10	Test Wt: HB44 Tol: HB44	Test Wt: 200 Tol: 0.04	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 16.1°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	1000.02	1000.02	0.012
600	599.92	599.92	0.011
400	399.94	399.94	0.011
200	199.94	199.94	0.011
100	99.98	99.98	0.011
50	49.98	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	7/26/24	7/2026	20221688

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

12/04/2024: RH = 38%

Report prepared/reviewed by: TVP **Date:** 12.04.2024 **Technician:** E.J. Vasko

Signature:

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.

Report and Certificate of Calibration

CAL-CERT CALIBRATION CERTIFICATION

www.Cal-Cert.com

Toll Free 800-356-4662

Address 5777 SE International Way Milwaukie, OR 97222

Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #: 38860-206391-21 **Customer PO#:** 1126
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

14-00235 | Thermocouple Meter | Tegam | SN: T-276988 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 2400 °F | Report #: 36408-30865-3646
14-01349 | Thermo-Hygrometer | Comark | SN: 06210350162 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 28, 2025	**Reference:**	Navair 17-20ST-95
Recommended Due Date:	February 28, 2026	**Cal-Cert Procedure:**	CP-013
Calibration Frequency:	12 Months	**Indicating System:**	Computer
Manufacturer:	National Instruments	**Temperature:**	61 °F
Type:	Data Logger	**Humidity:**	45% RH
Model Number:	NI 9213	**Asset #:**	215 Booth 1
Serial #:	1B182FB	**Service Location:**	Service Address
Resolution:	0.1 °F	**As Found:**	Pass
Capacity:	2,500 °F	**As Left:**	Pass
Tolerance:	± 3.0 °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	0.40	0.40	0.50	0.45	0.784
	500.00	500.10	500.10	500.30	0.20	
	1000.00	1000.10	1000.10	1000.20	0.15	
	1500.00	1499.70	1499.70	1500.40	0.05	
	2000.00	2000.10	2000.10	2000.20	0.15	
	2400.00	2399.90	2399.90	2400.00	-0.05	
	0.00	0.50	0.50	0.40	0.45	

	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	0.40	0.35	0.511
	500.00	500.10	500.10	500.20	0.15	
	1000.00	1000.10	1000.10	1000.20	0.15	
	1500.00	1500.00	1500.00	1500.10	0.05	
	2000.00	1999.80	1999.80	1999.90	-0.15	
	2400.00	2399.80	2399.80	2399.80	-0.20	
	0.00	0.00	0.00	0.20	0.10	

	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	0.10	0.10	0.10	0.10	0.436
	500.00	500.00	500.00	500.00	0.00	
	1000.00	1000.00	1000.00	1000.00	0.00	
	1500.00	1500.10	1500.10	1500.00	0.05	
	2000.00	1999.80	1999.80	1999.80	-0.20	
	2400.00	2399.70	2399.70	2399.70	-0.30	
	0.00	0.10	0.10	0.00	0.05	

	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	0.00	0.00	0.00	0.00	0.511
	500.00	499.90	499.90	499.90	-0.10	
	1000.00	999.90	999.90	999.90	-0.10	
	1500.00	1499.90	1499.90	1499.90	-0.10	
	2000.00	1999.70	1999.70	1999.60	-0.35	
	2400.00	2399.50	2399.50	2399.70	-0.40	
	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±**
Catalyst	0.00	(0.30)	(0.30)	(0.30)	0.30	0.738
	500.00	499.70	499.70	499.70	-0.30	
	1000.00	999.60	999.60	999.70	-0.35	
	1500.00	1499.60	1499.60	1499.50	-0.45	
	2000.00	1999.40	1999.40	1999.40	-0.60	
	2400.00	2399.40	2399.40	2399.40	-0.60	
	0.00	(0.30)	(0.30)	0.30	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±**
Meter A	0.00	-0.40	-0.40	-0.40	0.40	0.436
	500.00	499.50	499.50	499.50	-0.50	
	1000.00	999.50	999.50	999.50	-0.50	
	1500.00	1499.50	1499.50	1499.40	-0.55	
	2000.00	1999.30	1999.30	1999.40	-0.65	
	2400.00	2399.20	2399.20	2399.20	-0.80	
	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±**
Left	0.00	-0.40	-0.40	-0.40	0.40	0.436
	500.00	499.50	499.50	499.50	-0.50	
	1000.00	999.50	999.50	999.50	-0.50	
	1500.00	1499.50	1499.50	1499.50	-0.50	
	2000.00	1999.20	1999.20	1999.30	-0.75	
	2400.00	2399.30	2399.30	2399.20	-0.75	
	0.00	-0.40	-0.40	-0.40	0.40	

Manufacturer: National Instruments **Type:** Data Logger **Serial #:** 1B182FB

	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	-0.50	-0.50	-0.50	0.50	0.436
	500.00	499.40	499.40	499.50	-0.55	
	1000.00	999.40	999.40	999.50	-0.55	
	1500.00	1499.30	1499.30	1499.30	-0.70	
	2000.00	1999.30	1999.30	1999.20	-0.75	
	2400.00	2399.10	2399.10	2399.10	-0.90	
	0.00	-0.50	-0.50	-0.40	0.45	

	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	0.436
	500.00	500.80	500.80	500.80	0.80	
	1000.00	1000.40	1000.40	1000.40	0.40	
	1500.00	1500.00	1500.00	1500.00	0.00	
	2000.00	1999.40	1999.40	1999.50	-0.55	
	2400.00	2399.10	2399.10	2399.10	-0.90	
	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	-0.50	-0.50	-0.50	0.50	0.511
	500.00	499.50	499.50	499.40	-0.55	
	1000.00	999.40	999.40	999.50	-0.55	
	1500.00	1499.40	1499.40	1499.40	-0.60	
	2000.00	1999.20	1999.20	1999.20	-0.80	
	2400.00	2399.10	2399.10	2398.90	-1.00	
	0.00	-0.50	-0.50	-0.50	0.50	

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
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Service Engineer: Samuel Owens **Date:** February 28, 2025

Quality Manager: Tony Lewandowski **Signature:**

Report #: 38860-206391-21

Report and Certificate of Calibration

CAL-CERT CALIBRATION CERTIFICATION

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Address 5777 SE International Way Milwaukie, OR 97222

Local 503-654-9620

A2LA ACCREDITED CERT #4986.01

Report #: 38860-206391-21-B **Customer PO#:** 1126
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

14-00235 | Thermocouple Meter | Tegam | SN: T-276988 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 2400 °F | Report #: 36408-30865-3646
14-01349 | Thermo-Hygrometer | Comark | SN: 06210350162 | Cal: 08/23/2024 | Due: 08/31/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 28, 2025	**Reference:**	Navair 17-20ST-95
Recommended Due Date:	February 28, 2026	**Cal-Cert Procedure:**	CP-013
Calibration Frequency:	12 Months	**Indicating System:**	Computer
Manufacturer:	National Instruments	**Temperature:**	65 °F
Type:	Data Logger	**Humidity:**	40% RH
Model Number:	NI 9213	**Asset #:**	215 Booth 1
Serial #:	1B182FB	**Service Location:**	Service Address
Resolution:	0.1 °F	**As Found:**	Pass
Capacity:	2,400 °F	**As Left:**	Pass
Tolerance:	± 3.0 °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	-0.60	-0.60	-0.60	0.60	
	500.00	499.30	499.30	499.50	-0.60	
	1000.00	999.40	999.40	999.40	-0.60	
	1500.00	1499.30	1499.30	1499.30	-0.70	0.511
	2000.00	1999.10	1999.10	1999.20	-0.85	
	2400.00	2399.00	2399.00	2399.00	-1.00	
	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±**
Meter B	0.00	-0.60	-0.60	-0.60	0.60	
	500.00	499.50	499.50	499.50	-0.50	
	1000.00	999.40	999.40	999.50	-0.55	
	1500.00	1499.40	1499.40	1499.40	-0.60	0.436
	2000.00	1999.20	1999.20	1999.30	-0.75	
	2400.00	2399.10	2399.10	2399.10	-0.90	
	0.00	-0.60	-0.60	-0.60	0.60	

Manufacturer: National Instruments **Type:** Data Logger **Serial #:** 1B182FB

	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	2.50	2.50	2.80	2.65	
	500.00	502.40	502.40	502.60	2.50	
	1000.00	1002.30	1002.30	1002.60	2.45	
	1500.00	1502.70	1502.70	1502.70	2.70	0.738
	2000.00	2002.70	2002.70	2002.30	2.50	
	2400.00	2402.80	2402.80	2403.40	3.10	
	0.00	2.80	2.80	2.80	2.80	

	Thermocouple LOGGING FUNCTION					
Channel	**Calibration Standard**	**UUT As Found**	**UUT As Left Reading 1**	**UUT As Left Reading 2**	**As Left Error**	**Expanded Uncertainty±**
Filter C	0.00	-0.20	-0.20	-0.20	0.20	
	500.80	499.80	499.80	499.60	-1.10	
	1000.40	999.70	999.70	999.60	-0.75	
	1500.00	1499.50	1499.50	1499.50	-0.50	0.511
	1999.40	1999.40	1999.40	1999.40	0.00	
	2399.10	2399.20	2399.20	2399.20	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±**
Ambient	0.00	0.00	0.00	0.00	0.00	
	20.00	18.20	18.20	18.20	-1.80	
	40.00	38.20	38.20	38.20	-1.80	
	60.00	58.10	58.10	58.20	-1.85	0.436
	80.00	78.40	78.40	78.40	-1.60	
	100.00	98.40	98.40	98.30	-1.65	
	0.00	0.00	0.00	0.00	0.00	

Remarks:

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This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Samuel Owens **Date:** February 28, 2025

Quality Manager: Tony Lewandowski **Signature:**

Report #: 38860-206391-21-B

IN CASE OF EMERGENCY: CALL 1-800-645-4633 SDS ID: P-18-0301-H DO NOT REMOVE THIS LABEL

Lot No. 70086426104
Cylinder No. DT0042934
Part No. NI CD17CO8E-AS
Volume: 99 ft3
Fill Date: 09/17/2024
Expiration Date: 09/26/2032

ProSpec
By Linde

Linde Gas & Equipment Inc.
5700 S. Alameda...
Los Angeles, ... 58

UN1956 Compressed gas, n.o.s. (Nitrogen, Oxygen)

EPA Protocol

Molar Concentration	Component	CAS
17.32 %	Carbon dioxide	124-38-9
4.35 %	Carbon monoxide	630-08-0
16.96 %	Oxygen	7782-44-7
Balance	Nitrogen	7727-37-9

Danger

CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE. MAY INCREASE RESPIRATION AND HEART RATE. ASPHYXIATING EVEN WITH ADEQUATE OXYGEN.

TLV:

Carbon dioxide 5000 ppm
Carbon monoxide 25 ppm

Obtain special instructions before use; Do not handle until all safety precautions have been read and understood; Do not breathe gas/vapors; Wash exposed skin thoroughly after handling; Do not eat, drink or smoke when using this product; Wear protective gloves/protective clothing/eye protection/face protection; IF EXPOSED or if you feel unwell: Get medical advice/attention; Get medical advice/attention if you feel unwell; Store locked up; Dispose of contents/container to ... in accordance with local/regional/national/international regulations. Contact supplier for any special requirements. Use only with equipment rated for cylinder's pressure. Close valve after each use and when empty. Protect from sunlight. Do not open valve until connected to equipment for use. Remove person to fresh air and keep

Compressed gas, n.o.s.

(Carbon Monoxide, Carbon Dioxide, Oxygen, Nitrogen)

UN1956

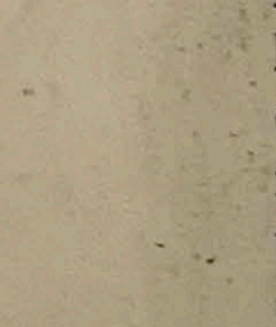
SPG 5P10162.5VM2
Part Number

Primary Standard, +/- 0.02% Absolute

2.500 % Carbon Monoxide	CAS:	630-08-0
10.00 % Carbon Dioxide	CAS:	124-38-9
10.00 % Oxygen	CAS:	7782-44-7
Balance Nitrogen	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 throroughly 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: 1-800-424-9300

NorLAB, Inc.
698 W Gowen Road
Boise, Idaho, 83705