
New Buck Corporation

Project # 24-309

Model: 91

AKA: Carolina 92

Type: Wood-Fired Room Heater

December 11, 2024

**ASTM E2780 Standard Test Method for
Determining Particulate Matter Emissions
from Wood Heaters
EPA Test Method 28R for Certification
and Auditing of Wood Heaters**

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Revision Summary

Date: December 11, 2024– Original Issue

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Affidavit

PFS-TECO was contracted by New Buck Corporation (New Buck) to provide testing services for the 91 Wood-Fired Room Heater per EPA Method 28R, *Certification and Auditing of Wood Heaters*. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory beginning on 7/31/2024 and ending on 8/5/2024. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed EPA Method 28R and ASTM E2780, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters*. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel*.

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

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



Aaron Kravitz, Laboratory Manager

Introduction

New Buck Corporation contracted with PFS-TECO to perform EPA certification testing on the 91 Wood-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. All testing was performed by Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed by the manufacturer at a medium burn setting in accordance with ASTM E2780.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- A separate, independent, third filter train was utilized to determine 1st hour emissions for all test runs.
- A total of 4 test runs were completed - one test run in each of the 4 specified burn rate categories. All runs have been found to be appropriate, no anomalies occurred. See the Run Narrative section for further detail on each run.
- Each fuel load consisted of two different fuel lengths. The firebox of this appliance is tapered both back and front – the rear firebox length is 18.75”, the maximum firebox length is 24.5”, and the front firebox length is 22”. The fuel load consists of four 4x4 fuel pieces, with the front and rear pieces 18.5” long (based on the 22” dimension) and the middle two pieces 20.25” long (based on the 24.5” dimension). Fuel lengths were the same for all runs.

Wood Heater Identification and Testing

- Appliance Tested: **91**
- Serial Number: **PFS Tracking Number 211**
- Manufacturer: **New Buck Corporation**
- Catalyst: **Yes**
- Heat exchange blower: **Integral**
- Type: **Wood Stove**
- Style: **Free Standing Wood Stove**
- Date Received: **Monday, July 15, 2024**
- Testing Period – Start: **Wednesday, July 31, 2024**
Finish: **Monday, August 05, 2024**
- Test Location: **PFS TECO**
11785 SE Hwy 212
Clackamas, OR 97015
- Elevation: **~131 Feet above sea level**
- Test Technician(s): **Aaron Kravitz**
- Observers: **None**

Test Procedures and Equipment

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

Equipment List:

Equipment ID#	Equipment Description
50	Digiweigh DWP12i Platform Scale
129	APEX XC-60-ED Digital Emissions Sampling Box A
130	APEX XC-60-ED Digital Emissions Sampling Box B
204	APEX XC-50-DIR Digital Emissions Sampling Box C
55	Apex Ambient Air Sample Box
137	California Analytical ZRE CO ₂ /CO/O ₂ IR ANALYZER
94	Moisture meter calibration block
95	Anemometer
97	10 lb audit weight
107	Sartorius Analytical Balance
109A/B	Troemner 100mg/200mg Audit Weights
111	Microtector
217	Microtector Micrometer
115	Delmhorst Wood Moisture Meter
190	Mettler 3'x3' floor scale w/digital weight indicator
207	Dewalt Tape Measure
208	Digital Calipers
216	Temperature Logger
CC505834	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

A total of 4 test runs were performed on the 91. The weighted average emissions rate for the 4 run test series was measured to be **1.3 g/hr** with a Higher Heating Value efficiency of **80%**. The average CO emission rate for the 4 tests was **0.6 g/min**. The New Buck Model 91 Wood-Fired Room Heater meets the 2020 cribwood 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

	Cat. 2 ≤ 1.00 kg/hr	Cat. 2 0.80 - 1.25 kg/hr	Cat. 3 1.25 - 1.90 kg/hr	Cat. 4 Max Burn Rate
Date	7/31/2024	8/5/2024	8/2/2024	8/1/2024
Run Number	1	4	3	2
Emission Rate (g/hr)	0.58	0.79	1.50	3.43
Burn Rate (kg/hr)	0.93	1.20	1.54	3.08
Heat Output (Btu/hr)	14,206	18,103	22,733	43,190
Overall Efficiency (% HHV)	81%	81%	79%	75%
CO Emissions (g/MJ Output)	0.36	0.19	1.79	1.85
CO Emissions (g/kg Dry Fuel)	5.71	3.09	27.87	27.50
CO Emissions (g/min)	0.09	0.06	0.71	1.40
Emissions – 1 st hr (g/hr)	3.27	1.74	6.46	7.70
Weighted particulate emission average of 4 test runs: 1.3 grams per hour.				
Weighted average HHV efficiency of 4 test runs: 80%.				
Average CO Emissions Rate: 0.6 g/min				

Test Run Narrative

Run 1

Run 1 was performed on 7/31/24 as an attempted category 1 test, per EPA Method 28R. The total test time was 520 minutes. The particulate emissions rate for the test was 0.58 g/hr, the burn rate was 0.93 kg/hr with an HHV efficiency of 81.1%. All test results were appropriate and valid. There were no anomalies and all test criteria were met. This test meets the burn rate requirements described in EPA Method 28 Section 8.1.1.3.2 as a category 2 test with a burn rate of 1.00 kg/hr or less for wood stoves that cannot be operated at burn rates less than 0.8 kg/hr. This test was performed with the air control set to its lowest setting, it is not possible to operate the stove at a lower air setting. Therefore, this test will be used in lieu of a category 1 test.

Run 2

Run 2 was performed on 8/1/2024 as a category 4 test, per EPA Method 28R. The total test time was 155 minutes. The particulate emissions rate for the test was 3.43 g/hr, the burn rate was 3.08 kg/hr with an HHV efficiency of 75.0%. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 3

Run 3 was performed on 8/2/2024 as a category 3 test, per EPA Method 28R. The total test time was 324 minutes. The particulate emissions rate for the test was 1.50 g/hr, the burn rate was 1.54 kg/hr with an HHV efficiency of 78.7%. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 4

Run 4 was performed on 8/5/2024 as a category 2 test, per EPA Method 28R. The total test time was 404 minutes. The particulate emissions rate for the test was 0.79 g/hr, the burn rate was 1.20 kg/hr with an HHV efficiency of 80.7%. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of the ASTM 2780 and ASTM E2515. A summary of facility conditions, fuel burned, and run times are listed below.

Run	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	74	74.9	23.7	31.1	29.85	19.86	21.52	20.9	520
2	83	83.6	54.9	48.7	29.80	26.98	21.56	23.6	155
3	80	85	28.9	40	29.95	23.27	22.18	21.3	324
4	76	73	25.5	34.5	29.87	18.17	21.38	20.7	404

Appliance Operation and Test Settings

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

Settings & Run Notes

	Pre-Burn Air Setting	Test Run Air and Fan Settings
Run 1	Air control fully closed Boost air fully closed	Air control fully closed Boost air fully closed Fan on auto - low
Run 2	Air control fully open Boost air fully open	Air control fully open Boost air fully open Fan on auto - high
Run 3	Air control open 0.37" Boost air fully closed	Air control open 0.37" Boost air fully closed Fan on auto – med high
Run 4	Air control open 0.10" Boost air fully closed	Air control open 0.10" Boost air fully closed Fan on auto – med low

Appliance Description

Model(s): 91, Carolina 92

Appliance Type: Wood-Fired Room Heater

Total Firebox Volume: 3.30 ft³

Usable Firebox Volume: 3.07 ft³

Model Variants: The 91 is available in one additional variant, the Carolina 92. The 91 and Carolina 92 are both fireplace insert models that differ only in exterior cladding and are identical in all respects that affect emissions.

Air Introduction System Air is introduced into three different areas of the fire chamber, all of which are supplied by the two controllable openings at the bottom of the firebox. and is controlled by two sliding control rods. Secondary air is introduced into the fire box through the bottom, it is then channeled up into the secondary air tubes located under the baffle.

Baffles: A ¼" hot rolled steel plate is used to mount the combustor and bypass door. A sliding flue bypass is incorporated into the baffle, when opened it allow products of combustion to bypass the catalyst and flow directly to the flue outlet. When closed products of combustion are directed through the catalyst mounted near the front of the baffle system.

Catalytic Combustor: Three Applied Ceramics 25 cell per inch combustors are used, each combustor measures 2" x 3.5" x 6.0". All three combustors are placed into one housing and wrapped with a ceramic gasket.

Combustor Temperature Monitoring System: A combustor monitoring thermometer is located at the front of the firebox, and is inserted into the flue gas stream such that it is located within 1" of the catalyst exit.

Refractory Insulation: The firebox is lined with 1.25" thick high-density firebrick.

Flue Outlet: 8-inch exhaust outlet located on the top of the appliance.

Fan: A 160 CFM room air fan is supplied as factory-installed equipment; it features a variable speed control mounted in the power supply cord.

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

Firebox Volume Calculation

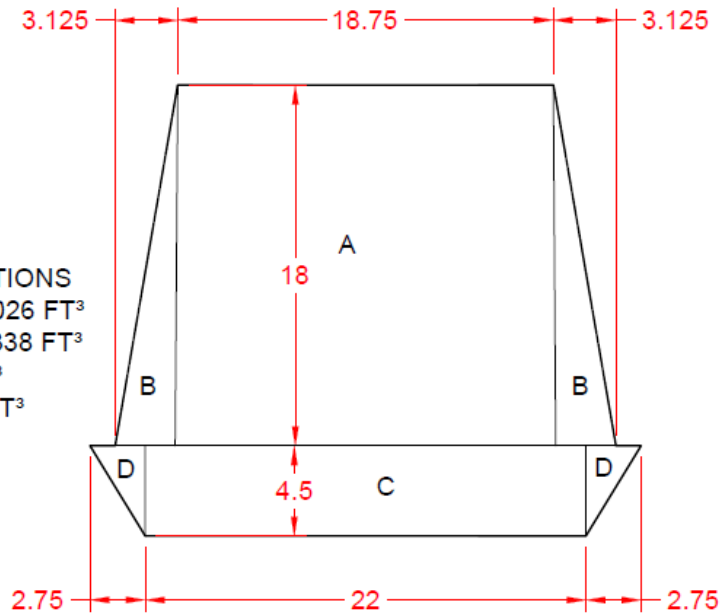
HEIGHT SECTION A & B = 10.375"
 HEIGHT SECTION C & D
 (USABLE)= 11"

HEIGHT SECTION C & D (NON-
 USABLE)= 14.25"

USABLE VOLUME OF DIFFERENT SECTIONS
 A= 18.75" X 18" X 10.375" / 1728 IN³ = 2.026 FT³
 B= 3.125" X 18" X 10.375" / 1728 IN³ = 0.338 FT³
 C= 22" X 4.5" X 11" / 1728 IN³ = 0.630 FT³
 D= 2.75" X 4.5" X 11" / 1728 IN³ = 0.079 FT³

TOTAL USABLE = 3.07 FT³

TOTAL OVERALL = 3.30 FT³



Appliance Front



Appliance Left



Appliance Right



Appliance Rear



Test Fuel Properties

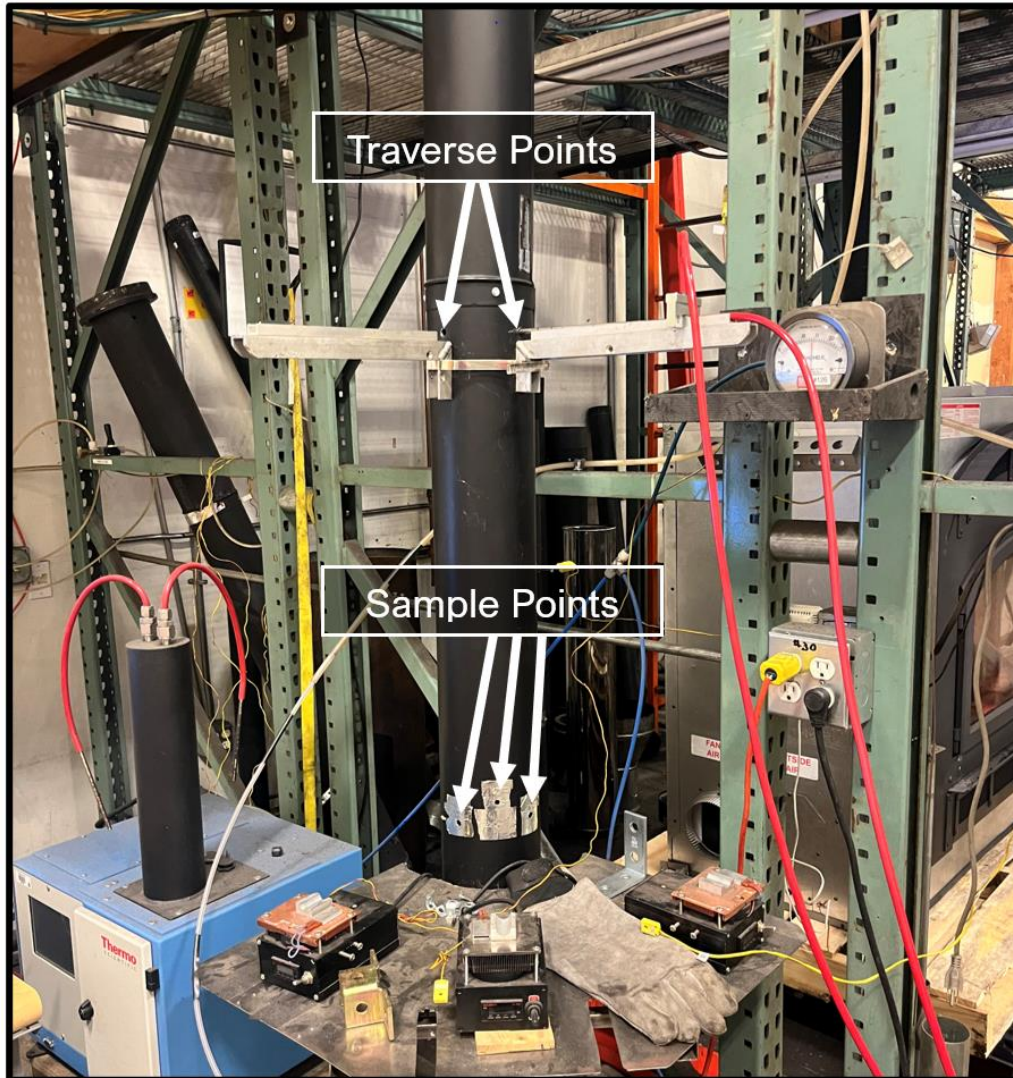
Test fuel used was Douglas Fir dimensional lumber, air-dried to the specified moisture content range. A typical fuel load is pictured below:

Typical Fuel Load



Sampling Locations and Descriptions

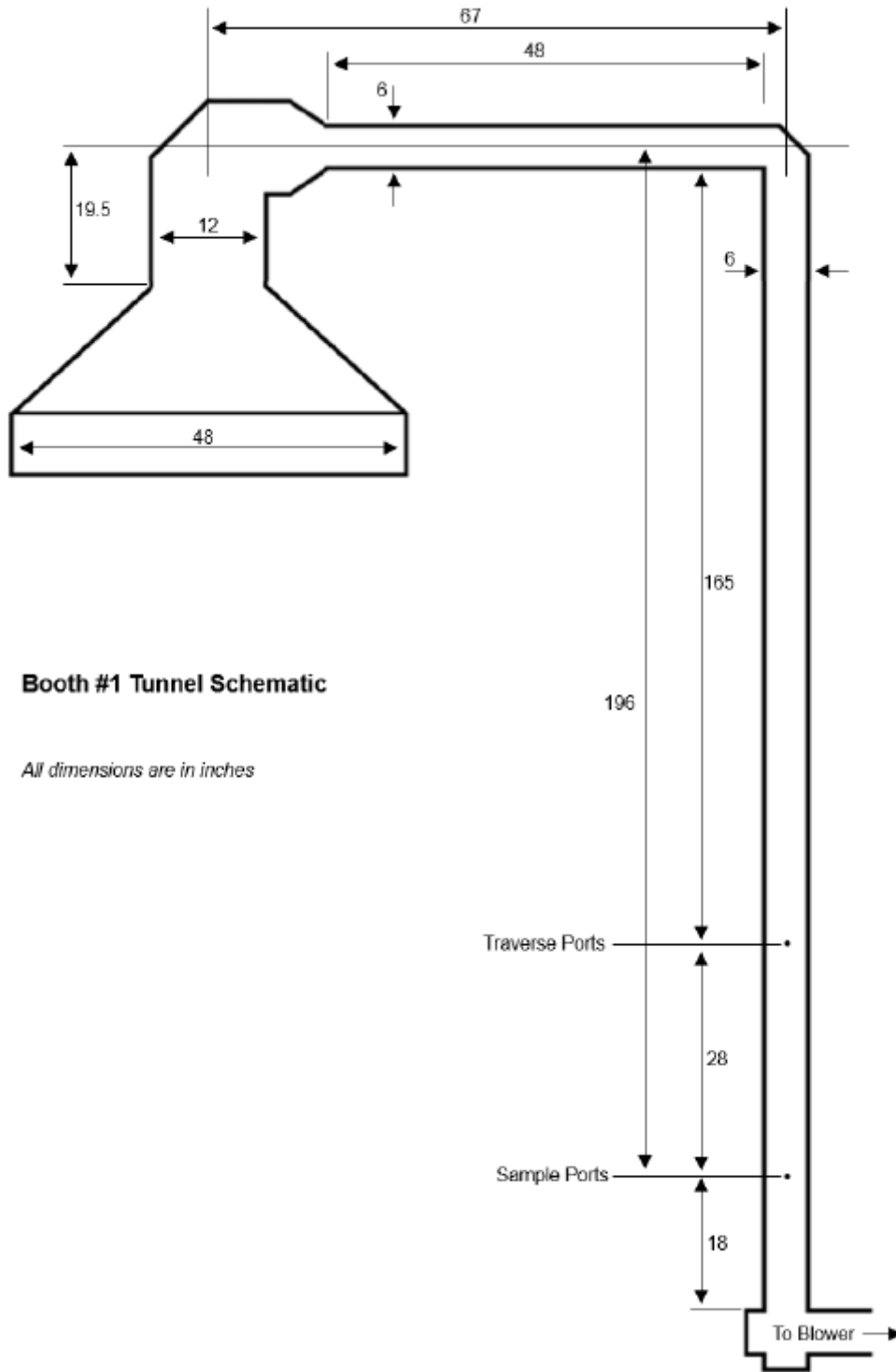
Sample ports are located 16.5 feet downstream from any disturbances and 3.5 feet upstream from any disturbances. Flow rate traverse data was collected 8 feet downstream from any disturbances and 4 feet upstream from any disturbances. (See below).



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

Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel was 6 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used.

Analytical Methods Description

All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings dessicated for a minimum of 24 hours, and then weighed in pairs 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 and ASTM E2515-11. 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: 200 Ethan Allen Drive, Spruce Pine, NC 28777 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 – Run Data -page 24, Filter data-page 218, Conditioning -page 197, Sample Calculations-page 199, Tunnel Schematic -Page 18

Appendix B – Labels and Manuals – page 224 Non-CBI PDF

Appendix C –Equipment Calibration Records – Page 305 Non-CBI PDF

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

Appendix A: Test Run Data

EPA Method 28R Weighted Average Emissions

Client: Buck Stove
 Stove Model: 91
 Test Dates: 7/31/24 - 8/5/24
 Job Number: 24-330

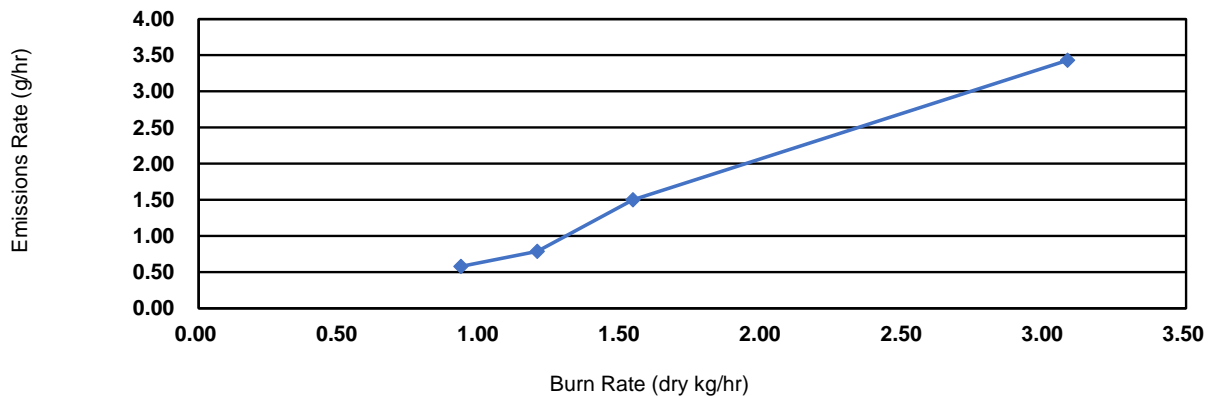
Signature/Date: 

Weighted Average Particulate Emissions (g/hr):	1.3
Weighted Average HHV Efficiency (%):	79.5%
Weighted Average LHV Efficiency (%):	86.0%
Average CO Emissions (g/min):	0.6

Individual Run Summaries

<p>Run Number: 1 Burn Rate (dry kg/hr): 0.93 Emissions Rate (g/hr): 0.58 HHV Efficiency (%): 81.1% LHV Efficiency (%): 87.7% Weighting Percentage (%): 32.96%</p>	<p>Run Number: 4 Burn Rate (dry kg/hr): 1.20 Emissions Rate (g/hr): 0.79 HHV Efficiency (%): 80.7% LHV Efficiency (%): 87.2% Weighting Percentage (%): 27.35%</p>
<p>Run Number: 3 Burn Rate (dry kg/hr): 1.54 Emissions Rate (g/hr): 1.50 HHV Efficiency (%): 78.7% LHV Efficiency (%): 85.1% Weighting Percentage (%): 26.10%</p>	<p>Run Number: 2 Burn Rate (dry kg/hr): 3.08 Emissions Rate (g/hr): 3.43 HHV Efficiency (%): 75.0% LHV Efficiency (%): 81.1% Weighting Percentage (%): 13.59%</p>

Emission Rate vs Burn Rate Plot



WOOD STOVE TEST DATA PACKET
ASTM E2780/E2515



Run 1 Data Summary

Client:	Buck Stove
Model:	91
Job #:	24-330
Tracking #:	211
Test Date:	7/31/2024



Technician Signature

9/3/2024

Date

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Burn Rate (kg/hr):	0.93
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	53.115	84.523	81.729	9.366
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.4			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11548.0			
Average Gas Meter Temperature (°F)	75.2	95.6	100.6	84.5
Total Sample Volume (dscf)	52.931	80.924	77.595	9.117
Average Tunnel Temperature (°F)	90.9			
Total Time of Test (min)	520			
Total Particulate Catch (mg)	0.1	4.0	4.2	2.6
Particulate Concentration, dry-standard (g/dscf)	0.0000019	0.0000494	0.0000541	0.0002852
Total PM Emissions (g)	0.19	4.76	5.23	3.27
Particulate Emission Rate (g/hr)	0.02	0.55	0.60	3.27
Emissions Factor (g/kg)	-	0.59	0.65	-
Difference from Average Total Particulate Emissions (g)	-	0.24	0.24	-
Difference from Average Total Particulate Emissions (%)	-	4.7%	4.7%	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

Final Average Results	
Total Particulate Emissions (g)	4.99
Particulate Emission Rate (g/hr)	0.58
Emissions Factor (g/kg)	0.62
HHV Efficiency (%)	81.1%
LHV Efficiency (%)	87.7%
CO Emissions (g/min)	0.09

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	82.9	OK
Face Velocity	< 30 ft/min	9.2	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min:73.7/Max:76.3	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	84.4	OK

B415.1 Efficiency Results

Manufacturer: Buck Stove
Model: 91
Date: 07/31/24
Run: 1
Control #: 24-330
Test Duration: 520
Output Category: 2

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	81.1%	87.7%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	81.5%	88.1%

Output Rate (kJ/h)	14,975	14,206	(Btu/h)
Burn Rate (kg/h)	0.93	2.05	(lb/h)
Input (kJ/h)	18,465	17,516	(Btu/h)

Test Load Weight (dry kg)	8.08	17.80	dry lb
MC wet (%)	17.26		
MC dry (%)	20.87		
Particulate (g)	4.99		
CO (g)	46		
Test Duration (h)	8.67		

Emissions	Particulate	CO
g/MJ Output	0.04	0.36
g/kg Dry Fuel	0.62	5.71
g/h	0.58	5.32
g/min	0.01	0.09
lb/MM Btu Output	0.09	0.83

Air/Fuel Ratio (A/F)	19.04
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VERSION:

2.4

4/15/2010

WOODSTOVE FUEL DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	18.50	22.1				
2x4	18.50	19.3				
2x4	18.50	19.9				
2x4	18.50	20.4				
2x4	18.50	20.7				
2x4	18.50	19.4				
2x4	18.50	22.9				
2x4	18.50	19.9				
Total Fuel Weight (lbs):		19.86	Average Moisture (%DB):		20.6	

Firebox Volume (ft³): 3.07
 Total 2x4 Crib Weight, with spacers (lbs): 0.00
 Total 4x4 Crib Weight, with spacers (lbs): 21.52
 Total Wet Fuel Weight, with spacers (lbs): 21.52

Coal Bed Range (20-25%):
 Min (lbs): 4.30
 Max (lbs): 5.38

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
4x4	18.50	4.74	19.7	22.0	23.2	3.90
4x4	20.25	5.22	19.3	23.2	19.9	4.32
4x4	20.25	5.40	19.4	19.8	20.5	4.50
4x4	18.50	4.88	21.0	23.0	19.4	4.03
Total Dry Weight, no spacers (lbs):						16.75
Total Dry Weight, with spacers (lbs):						17.84

Spacer Moisture Readings (%DB)						
19.1	15.0					
18.7	14.9					
15.3	17.4					
17.4	16.6					
16.3	15.8					
18.1	19.1					
14.8	19.2					
16.2	18.0					

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft ³ , DB)	30.5	OK
Loading Density	6.3 - 7.7 (lbs/ft ³ , WB)	7.01	OK
2x4 Fuel Mix	35 - 65 % of total weight	N/A	N/A

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: **Buck Stove**
 Model: **91**
 Run #: **1**
 Test Start Time: **11:08**

Job #: **24-330**
 Tracking #: **211**
 Technician: **AK**
 Date: **7/31/2024**

Total Sampling Time (min): **520**
 Recording Interval (min): **1**

Meter Box γ Factor: **1.004 (A)**
 Meter Box γ Factor: **1.005 (B)**
 Meter Box γ Factor: **1.004 (C)**
 Meter Box γ Factor: **1.013 (Ambient)**

Induced Draft Check (in. H₂O): **0**
 Smoke Capture Check (%): **100%**
 Date Flue Pipe Last Cleaned: **7/30/2024**
 Test Fuel Scale Audit (lbs): **10.00**
 Platform Scale Audit (lbs): **10.0**

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.85	29.84	29.85
Relative Humidity (%)	23.7	31.1	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:	53.115 ft ³		

Sample Train Leak Checks			
	Pre-test	Post-test	
(A)	0.000	0.000	cfm @ -6 in. Hg
(B)	0.000	0.000	cfm @ -7 in. Hg
(C)	0.000	0.001	cfm @ -7 in. Hg
(Ambient)	0.000	0.000	cfm @ -12 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

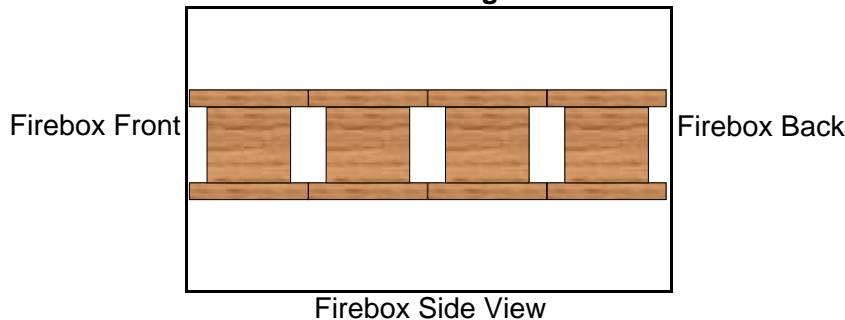
Point	dP (in H ₂ O)	Temp (°F)
1	0.052	89
2	0.088	89
3	0.094	89
4	0.050	89
5	0.058	88
6	0.088	88
7	0.092	88
8	0.054	88
Center	0.093	88

Dilution Tunnel H₂O: **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** ft²
 V_{strav}: **17.99** ft/sec
 V_{scnt}: **20.62** ft/sec
 F_p: **0.873** [ratio]
 Initial Tunnel Flow: **199.4** scf/min

Static Pressure: **-0.160** in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type:	D. Fir
HHV (kJ/kg)	19,810
%C	48.73
%H	6.87
%O	43.9
%Ash	0.5
MC (%DB)	20.9

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Recording Interval (min): 1
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
0	5.50	-0.075	582	735	526	427	276	509.1	478	76	
1	5.40	-0.072	588	734	526	427	280	511.1	395	76	
2	5.31	-0.069	590	732	522	427	284	510.9	348	77	
3	5.25	-0.065	593	727	518	425	288	510.1	319	76	
4	5.19	-0.062	594	721	513	423	292	508.6	297	76	
5	5.12	-0.063	595	714	508	419	295	506.3	283	76	
6	5.09	-0.060	594	707	500	415	299	502.9	271	76	
7	5.03	-0.059	591	700	494	412	301	499.5	262	76	
8	4.99	-0.058	591	693	487	408	303	496.5	253	75	
9	4.97	-0.056	590	686	482	404	305	493.3	246	75	
10	4.95	-0.054	588	678	477	399	306	489.7	240	75	
11	4.93	-0.053	585	671	470	394	308	485.5	235	75	
12	4.89	-0.051	583	664	469	389	309	482.6	229	75	
13	4.88	-0.050	580	656	463	385	309	478.4	225	75	
14	4.86	-0.048	576	649	455	380	309	473.9	221	75	
15	4.85	-0.047	574	641	449	375	309	469.4	218	75	
16	4.82	-0.047	570	634	444	370	309	465.5	214	75	
17	4.80	-0.047	567	627	440	365	308	461.5	211	75	
18	4.79	-0.046	563	620	436	360	308	457.2	208	75	
19	4.78	-0.045	559	613	431	356	307	453.1	206	75	
20	4.76	-0.045	555	606	427	350	307	448.8	203	75	
21	4.73	-0.044	552	599	422	345	306	444.7	200	75	
22	4.73	-0.041	548	593	416	340	305	440.4	197	75	
23	4.72	-0.043	544	586	413	336	304	436.4	194	75	
24	4.72	-0.042	540	579	407	331	302	432.1	192	74	
25	4.70	-0.040	537	573	403	327	301	428.0	189	74	
26	4.71	-0.039	532	566	400	322	300	424.0	186	74	
27	4.69	-0.040	529	560	396	318	298	420.2	184	75	
28	4.70	-0.038	525	555	395	314	297	417.2	182	75	
29	4.68	-0.039	522	549	393	310	297	414.1	180	74	
30	4.69	-0.037	518	544	390	306	296	410.6	179	74	
31	4.68	-0.038	513	538	385	303	295	406.7	177	74	
32	4.67	-0.037	509	532	383	299	294	403.6	175	74	
33	4.66	-0.035	506	527	380	295	293	400.1	173	74	
34	4.67	-0.037	502	522	376	292	292	396.7	172	74	
35	4.64	-0.034	498	516	373	288	291	393.1	170	74	
36	4.66	-0.036	494	511	371	284	290	390.0	168	74	
37	4.64	-0.034	490	506	367	281	289	386.4	167	74	
38	4.64	-0.033	487	500	361	277	288	382.7	166	74	
39	4.64	-0.033	484	495	360	274	287	379.7	165	74	
40	4.64	-0.033	479	491	356	270	285	376.3	163	74	
41	4.60	-0.033	476	485	353	267	284	373.0	162	74	
42	4.63	-0.070	473	481	350	263	283	369.9	255	74	
43	4.61	-0.039	468	475	346	260	281	366.1	225	74	
44	4.61	-0.036	465	471	344	257	280	363.2	200	74	

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Recording Interval (min): 1
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
45	4.60	-0.034	461	466	342	254	278	360.0	185	74	
46	4.61	-0.031	458	461	338	251	277	356.8	176	74	
47	4.59	-0.032	455	457	336	248	276	354.2	169	74	
48	4.59	-0.033	451	453	333	245	274	351.3	164	74	
49	4.59	-0.031	448	449	330	242	273	348.2	161	74	
50	4.59	-0.031	445	444	328	239	272	345.8	158	74	
51	4.58	-0.031	441	441	324	236	271	342.7	155	74	
52	4.58	-0.029	439	436	323	234	270	340.2	153	74	
53	4.55	-0.030	436	432	320	231	269	337.5	151	74	
54	4.55	-0.028	433	429	317	228	268	334.8	150	74	
55	4.54	-0.027	430	424	314	226	266	332.0	148	74	
56	4.55	-0.027	427	421	313	224	265	329.8	146	74	
57	4.54	-0.027	424	417	310	221	264	327.1	146	74	
58	4.52	-0.028	422	413	307	219	263	324.8	144	74	
59	4.51	-0.028	419	409	306	217	262	322.5	143	73	
60	4.50	-0.025	417	406	302	214	261	319.9	142	74	

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.088	0.05	77	0.2		21.52		97	243	76	74
1	0.096	0.096	0.086	2.16	77	1.0	-	21.46	-0.06	110	275	78	74
2	0.256	0.160	0.085	2.23	77	0.9	-	21.37	-0.09	106	270	78	74
3	0.403	0.147	0.085	2.25	77	0.9	-	21.17	-0.20	105	278	79	74
4	0.553	0.150	0.086	2.29	77	1.0	-	20.89	-0.28	106	297	80	74
5	0.701	0.148	0.087	2.31	77	1.0	-	20.59	-0.30	109	322	80	74
6	0.852	0.151	0.088	2.34	77	1.0	-	20.47	-0.12	101	290	78	74
7	1.003	0.151	0.087	2.36	77	1.0	-	20.42	-0.05	96	267	79	74
8	1.157	0.154	0.086	2.38	77	1.0	-	20.35	-0.07	95	255	79	74
9	1.308	0.151	0.086	2.40	77	1.0	-	20.29	-0.06	93	245	79	74
10	1.463	0.155	0.082	2.42	78	1.0	95	20.23	-0.06	93	238	79	74
11	1.613	0.150	0.086	2.42	78	1.0	-	20.18	-0.05	92	233	79	74
12	1.772	0.159	0.086	2.43	78	1.0	-	20.12	-0.06	92	229	79	74
13	1.922	0.150	0.085	2.43	78	1.0	-	20.07	-0.05	91	226	79	74
14	2.078	0.156	0.085	2.44	78	1.0	-	20.01	-0.06	91	223	79	74
15	2.230	0.152	0.088	2.46	79	1.0	-	19.95	-0.06	91	221	79	74
16	2.387	0.157	0.089	2.45	79	1.0	-	19.89	-0.06	90	218	79	74
17	2.539	0.152	0.084	2.45	79	1.0	-	19.85	-0.04	90	216	79	74
18	2.695	0.156	0.087	2.46	79	1.0	-	19.79	-0.06	90	215	79	74
19	2.851	0.156	0.086	2.47	79	1.0	-	19.73	-0.06	89	213	79	74
20	3.006	0.155	0.089	2.48	80	1.0	99	19.68	-0.05	89	212	79	74
21	3.164	0.158	0.087	2.48	80	1.0	-	19.61	-0.07	89	212	79	74
22	3.316	0.152	0.085	2.48	80	1.0	-	19.55	-0.06	89	211	79	74
23	3.475	0.159	0.086	2.50	81	1.0	-	19.50	-0.05	89	211	79	74
24	3.630	0.155	0.087	2.50	81	1.0	-	19.43	-0.07	89	212	79	74
25	3.788	0.158	0.086	2.51	81	1.0	-	19.39	-0.04	89	211	79	74
26	3.945	0.157	0.088	2.50	81	1.0	-	19.32	-0.07	89	210	79	74
27	4.103	0.158	0.090	2.51	82	1.0	-	19.26	-0.06	89	210	79	74
28	4.259	0.156	0.088	2.51	82	1.0	-	19.20	-0.06	89	210	79	74
29	4.413	0.154	0.087	2.51	82	1.0	-	19.14	-0.06	89	209	79	74
30	4.573	0.160	0.086	2.52	83	1.0	99	19.08	-0.06	89	209	79	74
31	4.728	0.155	0.091	2.53	83	1.0	-	19.02	-0.06	89	209	79	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.888	0.160	0.085	2.53	83	1.0	-	18.97	-0.05	89	208	79	74
33	5.044	0.156	0.086	2.53	83	1.0	-	18.91	-0.06	89	209	79	74
34	5.203	0.159	0.087	2.53	84	1.0	-	18.85	-0.06	89	209	79	74
35	5.363	0.160	0.087	2.54	84	1.0	-	18.78	-0.07	89	209	79	74
36	5.517	0.154	0.086	2.54	84	1.0	-	18.72	-0.06	89	210	79	74
37	5.679	0.162	0.086	2.54	85	1.0	-	18.65	-0.07	89	213	79	74
38	5.835	0.156	0.088	2.54	85	1.0	-	18.58	-0.07	89	216	79	74
39	5.996	0.161	0.090	2.54	85	1.0	-	18.50	-0.08	90	220	79	74
40	6.157	0.161	0.088	2.55	85	1.0	99	18.44	-0.06	90	223	79	74
41	6.313	0.156	0.090	2.55	86	1.0	-	18.35	-0.09	90	224	80	74
42	6.472	0.159	0.090	2.55	86	1.0	-	18.27	-0.08	90	226	79	74
43	6.629	0.157	0.087	2.55	86	1.0	-	18.19	-0.08	90	229	80	74
44	6.789	0.160	0.086	2.57	86	1.0	-	18.10	-0.09	91	232	80	74
45	6.948	0.159	0.087	2.55	87	1.0	-	18.02	-0.08	91	234	80	74
46	7.107	0.159	0.087	2.56	87	1.0	-	17.93	-0.09	91	236	80	74
47	7.268	0.161	0.088	2.57	87	1.0	-	17.85	-0.08	91	239	80	74
48	7.425	0.157	0.086	2.57	87	1.0	-	17.76	-0.09	91	241	80	74
49	7.586	0.161	0.086	2.58	88	1.0	-	17.67	-0.09	92	244	80	74
50	7.744	0.158	0.088	2.56	88	1.0	99	17.56	-0.11	92	246	80	74
51	7.905	0.161	0.089	2.58	88	1.0	-	17.47	-0.09	92	247	80	74
52	8.066	0.161	0.086	2.58	88	1.0	-	17.39	-0.08	92	250	80	74
53	8.223	0.157	0.086	2.58	88	1.0	-	17.28	-0.11	92	252	80	74
54	8.387	0.164	0.086	2.59	89	1.0	-	17.18	-0.10	93	254	80	74
55	8.548	0.161	0.088	2.58	89	1.0	-	17.06	-0.12	93	257	80	74
56	8.704	0.156	0.086	2.58	89	1.0	-	16.95	-0.11	93	258	80	74
57	8.866	0.162	0.088	2.59	89	1.0	-	16.84	-0.11	93	260	80	74
58	9.024	0.158	0.085	2.59	89	1.0	-	16.72	-0.12	94	260	80	74
59	9.186	0.162	0.087	2.59	89	1.0	-	16.63	-0.09	94	259	80	74
60	9.345	0.159	0.088	2.59	90	1.0	99	16.51	-0.12	93	260	80	74
61	9.506	0.161	0.088	2.60	90	1.0	-	16.42	-0.09	93	260	80	74
62	9.668	0.162	0.088	2.59	90	1.0	-	16.33	-0.09	93	257	80	74
63	9.827	0.159	0.087	2.59	90	1.0	-	16.24	-0.09	93	257	80	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.989	0.162	0.087	2.61	90	1.0	-	16.15	-0.09	93	257	80	74
65	10.150	0.161	0.087	2.61	91	1.0	-	16.08	-0.07	93	255	81	75
66	10.308	0.158	0.088	2.61	91	1.0	-	15.99	-0.09	93	255	80	74
67	10.473	0.165	0.085	2.60	91	1.0	-	15.91	-0.08	93	252	81	75
68	10.631	0.158	0.088	2.61	91	1.0	-	15.84	-0.07	93	253	80	74
69	10.796	0.165	0.085	2.61	91	1.0	-	15.75	-0.09	93	254	81	75
70	10.959	0.163	0.087	2.61	91	1.0	100	15.66	-0.09	93	254	81	74
71	11.114	0.155	0.088	2.60	91	1.0	-	15.59	-0.07	94	253	81	74
72	11.279	0.165	0.088	2.62	92	1.0	-	15.51	-0.08	93	254	81	74
73	11.438	0.159	0.086	2.62	92	1.0	-	15.43	-0.08	93	253	81	75
74	11.600	0.162	0.089	2.61	92	1.0	-	15.35	-0.08	94	252	81	75
75	11.763	0.163	0.087	2.62	92	1.0	-	15.26	-0.09	94	253	81	75
76	11.923	0.160	0.087	2.62	92	1.0	-	15.18	-0.08	94	252	81	75
77	12.085	0.162	0.087	2.63	92	1.0	-	15.11	-0.07	93	253	81	75
78	12.248	0.163	0.090	2.62	92	1.0	-	15.02	-0.09	93	253	81	75
79	12.410	0.162	0.088	2.63	93	1.0	-	14.94	-0.08	94	252	81	75
80	12.575	0.165	0.089	2.63	93	1.0	100	14.86	-0.08	94	251	81	75
81	12.731	0.156	0.087	2.63	93	1.0	-	14.78	-0.08	94	251	81	75
82	12.894	0.163	0.088	2.62	93	1.0	-	14.71	-0.07	93	252	81	75
83	13.057	0.163	0.086	2.64	93	1.0	-	14.62	-0.09	93	252	81	75
84	13.216	0.159	0.088	2.62	93	1.0	-	14.55	-0.07	93	249	81	75
85	13.381	0.165	0.089	2.63	93	1.0	-	14.47	-0.08	93	246	81	75
86	13.541	0.160	0.088	2.63	93	1.0	-	14.40	-0.07	93	246	81	75
87	13.704	0.163	0.088	2.63	93	1.0	-	14.33	-0.07	93	246	81	75
88	13.867	0.163	0.090	2.63	93	1.0	-	14.25	-0.08	93	244	81	75
89	14.028	0.161	0.087	2.64	94	1.0	-	14.17	-0.08	93	243	81	75
90	14.190	0.162	0.092	2.62	94	1.0	98	14.10	-0.07	93	243	81	75
91	14.355	0.165	0.086	2.64	94	1.0	-	14.03	-0.07	93	242	81	75
92	14.513	0.158	0.089	2.62	94	1.0	-	13.96	-0.07	93	242	81	75
93	14.681	0.168	0.088	2.64	94	1.0	-	13.87	-0.09	93	244	81	75
94	14.843	0.162	0.089	2.64	94	1.0	-	13.79	-0.08	93	244	81	75
95	15.002	0.159	0.089	2.64	94	1.0	-	13.70	-0.09	93	245	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.165	0.163	0.086	2.63	94	1.0	-	13.61	-0.09	94	248	81	75
97	15.326	0.161	0.085	2.64	94	1.0	-	13.52	-0.09	94	251	81	75
98	15.489	0.163	0.089	2.63	94	1.0	-	13.43	-0.09	94	252	81	75
99	15.654	0.165	0.086	2.65	94	1.1	-	13.33	-0.10	94	253	81	75
100	15.812	0.158	0.087	2.63	94	1.0	99	13.22	-0.11	94	255	81	75
101	15.978	0.166	0.091	2.64	95	1.0	-	13.12	-0.10	94	259	81	75
102	16.138	0.160	0.088	2.64	95	1.0	-	13.02	-0.10	94	260	81	75
103	16.301	0.163	0.090	2.63	95	1.0	-	12.91	-0.11	94	263	81	75
104	16.465	0.164	0.089	2.64	95	1.0	-	12.80	-0.11	94	264	81	75
105	16.626	0.161	0.090	2.65	95	1.1	-	12.71	-0.09	95	265	81	75
106	16.789	0.163	0.090	2.64	95	1.0	-	12.61	-0.10	95	264	81	75
107	16.956	0.167	0.086	2.64	95	1.0	-	12.52	-0.09	95	265	81	75
108	17.116	0.160	0.088	2.64	95	1.0	-	12.42	-0.10	95	264	81	75
109	17.279	0.163	0.086	2.65	95	1.0	-	12.31	-0.11	95	266	81	75
110	17.441	0.162	0.088	2.64	95	1.0	100	12.24	-0.07	95	262	81	75
111	17.602	0.161	0.086	2.65	95	1.0	-	12.15	-0.09	95	261	81	75
112	17.768	0.166	0.089	2.64	95	1.0	-	12.04	-0.11	94	259	81	75
113	17.928	0.160	0.086	2.65	95	1.0	-	11.95	-0.09	94	258	81	75
114	18.092	0.164	0.090	2.64	95	1.0	-	11.87	-0.08	94	256	81	75
115	18.255	0.163	0.090	2.65	95	1.0	-	11.79	-0.08	94	256	81	75
116	18.417	0.162	0.089	2.65	95	1.0	-	11.71	-0.08	94	255	81	75
117	18.580	0.163	0.087	2.64	95	1.0	-	11.63	-0.08	94	254	81	75
118	18.745	0.165	0.087	2.65	95	1.0	-	11.55	-0.08	94	252	81	75
119	18.904	0.159	0.090	2.64	96	1.1	-	11.49	-0.06	94	251	81	75
120	19.073	0.169	0.087	2.63	96	1.0	100	11.42	-0.07	94	250	81	75
121	19.233	0.160	0.086	2.65	96	1.0	-	11.36	-0.06	94	247	81	75
122	19.394	0.161	0.084	2.64	96	1.1	-	11.31	-0.05	94	246	81	75
123	19.558	0.164	0.088	2.65	96	1.0	-	11.26	-0.05	94	243	81	75
124	19.719	0.161	0.086	2.64	96	1.0	-	11.20	-0.06	93	241	81	75
125	19.883	0.164	0.085	2.64	96	1.0	-	11.14	-0.06	93	241	81	75
126	20.047	0.164	0.084	2.63	96	1.1	-	11.08	-0.06	94	240	81	75
127	20.206	0.159	0.085	2.65	96	1.0	-	11.02	-0.06	93	239	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.373	0.167	0.087	2.64	96	1.0	-	10.98	-0.04	93	238	81	75
129	20.533	0.160	0.088	2.63	96	1.0	-	10.92	-0.06	93	237	81	75
130	20.697	0.164	0.088	2.64	96	1.0	100	10.86	-0.06	93	236	81	75
131	20.864	0.167	0.086	2.62	96	1.0	-	10.81	-0.05	93	235	81	75
132	21.022	0.158	0.086	2.63	96	1.0	-	10.75	-0.06	93	236	81	75
133	21.184	0.162	0.086	2.63	96	1.0	-	10.70	-0.05	93	235	81	75
134	21.350	0.166	0.086	2.63	96	1.0	-	10.63	-0.07	93	234	81	75
135	21.508	0.158	0.087	2.63	96	1.1	-	10.57	-0.06	93	233	81	75
136	21.675	0.167	0.086	2.64	96	1.0	-	10.51	-0.06	93	233	81	75
137	21.835	0.160	0.087	2.63	96	1.0	-	10.43	-0.08	93	232	81	75
138	21.998	0.163	0.085	2.64	96	1.0	-	10.39	-0.04	93	231	81	75
139	22.166	0.168	0.088	2.63	96	1.1	-	10.34	-0.05	93	231	81	75
140	22.323	0.157	0.085	2.64	96	1.0	100	10.28	-0.06	93	231	81	75
141	22.487	0.164	0.086	2.64	96	1.1	-	10.23	-0.05	93	231	81	75
142	22.651	0.164	0.089	2.65	96	1.1	-	10.17	-0.06	93	230	81	75
143	22.811	0.160	0.087	2.63	96	1.0	-	10.12	-0.05	92	229	81	75
144	22.976	0.165	0.088	2.64	96	1.1	-	10.07	-0.05	92	229	81	75
145	23.139	0.163	0.085	2.63	96	1.0	-	10.02	-0.05	92	226	81	75
146	23.300	0.161	0.086	2.64	96	1.1	-	9.97	-0.05	92	227	81	75
147	23.469	0.169	0.085	2.64	96	1.1	-	9.93	-0.04	92	227	81	75
148	23.626	0.157	0.086	2.64	96	1.0	-	9.88	-0.05	92	225	81	75
149	23.790	0.164	0.086	2.63	96	1.1	-	9.84	-0.04	92	223	81	75
150	23.954	0.164	0.087	2.64	96	1.0	101	9.79	-0.05	92	223	81	75
151	24.115	0.161	0.088	2.64	96	1.1	-	9.76	-0.03	92	222	81	75
152	24.279	0.164	0.087	2.65	97	1.0	-	9.72	-0.04	92	221	81	75
153	24.443	0.164	0.088	2.62	97	1.1	-	9.67	-0.05	92	222	81	75
154	24.603	0.160	0.085	2.64	97	1.0	-	9.64	-0.03	92	222	81	75
155	24.769	0.166	0.086	2.64	97	1.0	-	9.59	-0.05	92	222	81	75
156	24.930	0.161	0.086	2.65	97	1.0	-	9.55	-0.04	92	222	81	75
157	25.096	0.166	0.086	2.65	97	1.1	-	9.52	-0.03	92	221	81	75
158	25.257	0.161	0.087	2.64	97	1.1	-	9.46	-0.06	92	221	81	75
159	25.421	0.164	0.086	2.65	97	1.1	-	9.43	-0.03	92	220	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.582	0.161	0.084	2.64	97	1.1	101	9.38	-0.05	92	220	81	75
161	25.748	0.166	0.084	2.64	97	1.1	-	9.34	-0.04	92	220	81	75
162	25.907	0.159	0.086	2.63	97	1.1	-	9.30	-0.04	92	220	81	75
163	26.073	0.166	0.086	2.64	97	1.1	-	9.24	-0.06	92	220	81	75
164	26.235	0.162	0.086	2.64	97	1.1	-	9.20	-0.04	92	220	81	75
165	26.396	0.161	0.085	2.64	97	1.1	-	9.16	-0.04	92	221	81	75
166	26.563	0.167	0.087	2.64	97	1.1	-	9.11	-0.05	91	221	81	75
167	26.722	0.159	0.087	2.64	97	1.0	-	9.06	-0.05	92	222	81	75
168	26.887	0.165	0.088	2.63	97	1.1	-	9.01	-0.05	92	221	81	75
169	27.051	0.164	0.089	2.65	97	1.0	-	8.95	-0.06	92	222	81	75
170	27.212	0.161	0.086	2.64	97	1.1	101	8.91	-0.04	92	221	81	75
171	27.377	0.165	0.089	2.66	97	1.1	-	8.87	-0.04	92	223	81	75
172	27.541	0.164	0.089	2.63	97	1.1	-	8.80	-0.07	92	222	81	75
173	27.700	0.159	0.086	2.63	97	1.1	-	8.76	-0.04	92	223	81	75
174	27.867	0.167	0.087	2.64	97	1.1	-	8.72	-0.04	92	223	81	75
175	28.027	0.160	0.087	2.64	97	1.1	-	8.66	-0.06	92	223	81	75
176	28.191	0.164	0.086	2.64	97	1.1	-	8.61	-0.05	91	223	81	75
177	28.359	0.168	0.087	2.65	97	1.1	-	8.56	-0.05	91	223	81	75
178	28.517	0.158	0.087	2.65	97	1.1	-	8.51	-0.05	91	225	81	75
179	28.680	0.163	0.085	2.64	97	1.1	-	8.46	-0.05	91	225	81	75
180	28.846	0.166	0.085	2.65	97	1.1	101	8.41	-0.05	91	224	81	75
181	29.005	0.159	0.088	2.64	97	1.1	-	8.36	-0.05	92	226	81	75
182	29.171	0.166	0.086	2.65	97	1.1	-	8.31	-0.05	92	226	81	75
183	29.333	0.162	0.085	2.63	97	1.0	-	8.26	-0.05	92	226	81	75
184	29.497	0.164	0.085	2.65	97	1.1	-	8.20	-0.06	92	228	81	75
185	29.661	0.164	0.086	2.64	97	1.1	-	8.16	-0.04	92	228	81	75
186	29.820	0.159	0.085	2.64	97	1.0	-	8.11	-0.05	92	228	81	75
187	29.985	0.165	0.085	2.64	97	1.1	-	8.07	-0.04	92	226	81	75
188	30.150	0.165	0.086	2.65	97	1.1	-	8.03	-0.04	92	223	81	75
189	30.311	0.161	0.087	2.64	97	1.0	-	7.98	-0.05	91	223	81	75
190	30.475	0.164	0.088	2.65	97	1.0	100	7.94	-0.04	91	221	81	75
191	30.643	0.168	0.086	2.64	97	1.0	-	7.91	-0.03	91	220	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	30.799	0.156	0.086	2.64	97	1.1	-	7.86	-0.05	91	219	81	75
193	30.966	0.167	0.087	2.64	97	1.1	-	7.83	-0.03	91	218	81	75
194	31.126	0.160	0.087	2.63	97	1.1	-	7.79	-0.04	91	218	81	75
195	31.290	0.164	0.086	2.64	97	1.1	-	7.75	-0.04	91	217	81	75
196	31.454	0.164	0.088	2.63	97	1.0	-	7.72	-0.03	91	217	81	75
197	31.618	0.164	0.086	2.64	97	1.1	-	7.68	-0.04	91	217	81	75
198	31.779	0.161	0.087	2.64	97	1.0	-	7.65	-0.03	91	216	81	75
199	31.944	0.165	0.088	2.64	97	1.1	-	7.61	-0.04	91	215	81	75
200	32.104	0.160	0.087	2.63	97	1.0	100	7.57	-0.04	91	216	81	75
201	32.269	0.165	0.087	2.65	97	1.0	-	7.53	-0.04	91	214	81	75
202	32.433	0.164	0.087	2.63	97	1.1	-	7.51	-0.02	91	214	81	75
203	32.593	0.160	0.086	2.65	97	1.0	-	7.48	-0.03	91	212	81	75
204	32.763	0.170	0.086	2.64	97	1.0	-	7.44	-0.04	91	212	81	75
205	32.921	0.158	0.087	2.65	97	1.1	-	7.40	-0.04	91	212	81	75
206	33.085	0.164	0.086	2.65	97	1.0	-	7.37	-0.03	91	212	81	75
207	33.249	0.164	0.086	2.65	97	1.1	-	7.34	-0.03	91	211	81	75
208	33.411	0.162	0.085	2.64	97	1.1	-	7.32	-0.02	91	210	81	75
209	33.575	0.164	0.086	2.64	97	1.0	-	7.28	-0.04	91	211	81	75
210	33.741	0.166	0.087	2.64	97	1.0	100	7.25	-0.03	91	210	81	75
211	33.899	0.158	0.086	2.63	97	1.1	-	7.20	-0.05	91	209	81	75
212	34.067	0.168	0.084	2.64	97	1.1	-	7.20	0.00	90	208	81	75
213	34.228	0.161	0.087	2.63	97	1.1	-	7.16	-0.04	90	207	81	75
214	34.392	0.164	0.088	2.64	97	1.0	-	7.13	-0.03	91	206	81	75
215	34.556	0.164	0.087	2.64	97	1.1	-	7.10	-0.03	91	205	81	75
216	34.716	0.160	0.085	2.63	97	1.0	-	7.08	-0.02	91	204	81	75
217	34.881	0.165	0.088	2.64	97	1.0	-	7.04	-0.04	91	205	81	75
218	35.045	0.164	0.086	2.65	97	1.1	-	7.02	-0.02	90	204	81	75
219	35.210	0.165	0.086	2.64	97	1.0	-	6.99	-0.03	90	202	81	75
220	35.371	0.161	0.088	2.65	97	1.0	100	6.98	-0.01	91	202	81	75
221	35.536	0.165	0.090	2.63	97	1.1	-	6.95	-0.03	90	201	81	75
222	35.696	0.160	0.086	2.65	97	1.1	-	6.92	-0.03	90	200	81	75
223	35.863	0.167	0.089	2.64	97	1.1	-	6.90	-0.02	90	199	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.023	0.160	0.088	2.63	97	1.0	-	6.87	-0.03	90	199	81	75
225	36.189	0.166	0.088	2.65	97	1.0	-	6.86	-0.01	90	195	81	75
226	36.352	0.163	0.086	2.63	98	1.1	-	6.84	-0.02	90	192	81	75
227	36.513	0.161	0.087	2.65	97	1.1	-	6.81	-0.03	89	189	81	75
228	36.678	0.165	0.086	2.64	98	1.0	-	6.80	-0.01	89	188	81	75
229	36.842	0.164	0.087	2.65	98	1.0	-	6.77	-0.03	89	186	81	75
230	37.006	0.164	0.086	2.65	98	1.1	100	6.75	-0.02	89	184	81	75
231	37.168	0.162	0.090	2.65	98	1.0	-	6.74	-0.01	89	183	81	75
232	37.332	0.164	0.088	2.65	98	1.0	-	6.72	-0.02	89	183	81	75
233	37.493	0.161	0.088	2.65	98	1.0	-	6.71	-0.01	89	181	81	75
234	37.660	0.167	0.087	2.64	98	1.0	-	6.69	-0.02	89	180	81	75
235	37.823	0.163	0.085	2.64	98	1.0	-	6.67	-0.02	89	180	81	75
236	37.985	0.162	0.087	2.64	98	1.0	-	6.66	-0.01	89	179	81	75
237	38.149	0.164	0.088	2.65	98	1.1	-	6.64	-0.02	89	178	81	75
238	38.311	0.162	0.089	2.65	98	1.0	-	6.63	-0.01	89	178	81	75
239	38.477	0.166	0.088	2.64	98	1.1	-	6.60	-0.03	88	177	81	75
240	38.640	0.163	0.087	2.65	98	1.0	100	6.58	-0.02	88	177	81	75
241	38.800	0.160	0.085	2.64	98	1.0	-	6.57	-0.01	88	175	81	75
242	38.965	0.165	0.084	2.64	98	1.0	-	6.56	-0.01	88	175	81	75
243	39.130	0.165	0.086	2.64	98	1.0	-	6.54	-0.02	88	174	81	75
244	39.293	0.163	0.089	2.66	98	1.0	-	6.52	-0.02	88	175	81	75
245	39.457	0.164	0.087	2.65	98	1.1	-	6.50	-0.02	88	173	81	75
246	39.618	0.161	0.087	2.65	98	1.1	-	6.49	-0.01	88	173	81	75
247	39.785	0.167	0.087	2.65	98	1.1	-	6.47	-0.02	88	172	81	75
248	39.947	0.162	0.089	2.65	98	1.1	-	6.46	-0.01	88	171	81	75
249	40.109	0.162	0.087	2.65	98	1.1	-	6.43	-0.03	88	171	81	75
250	40.273	0.164	0.089	2.65	98	1.0	99	6.43	0.00	88	170	81	75
251	40.438	0.165	0.089	2.65	98	1.0	-	6.41	-0.02	88	169	81	75
252	40.598	0.160	0.090	2.64	98	1.0	-	6.40	-0.01	88	169	81	75
253	40.764	0.166	0.088	2.65	98	1.0	-	6.38	-0.02	88	168	81	75
254	40.928	0.164	0.089	2.64	98	1.0	-	6.36	-0.02	88	168	81	75
255	41.088	0.160	0.087	2.65	98	1.1	-	6.35	-0.01	88	167	80	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.256	0.168	0.087	2.63	98	1.0	-	6.34	-0.01	88	167	80	75
257	41.417	0.161	0.087	2.66	98	1.1	-	6.32	-0.02	87	166	80	75
258	41.581	0.164	0.086	2.63	98	1.0	-	6.29	-0.03	88	170	80	75
259	41.746	0.165	0.086	2.64	98	1.0	-	6.27	-0.02	88	178	80	75
260	41.908	0.162	0.088	2.65	98	1.0	99	6.25	-0.02	88	181	80	75
261	42.071	0.163	0.090	2.64	98	1.0	-	6.22	-0.03	88	185	80	75
262	42.237	0.166	0.085	2.66	98	1.1	-	6.20	-0.02	89	187	80	75
263	42.397	0.160	0.087	2.64	98	1.0	-	6.17	-0.03	89	188	80	75
264	42.563	0.166	0.088	2.64	98	1.1	-	6.15	-0.02	89	188	80	75
265	42.727	0.164	0.085	2.64	98	1.1	-	6.12	-0.03	89	188	80	75
266	42.887	0.160	0.085	2.65	98	1.0	-	6.11	-0.01	89	188	81	75
267	43.055	0.168	0.089	2.65	98	1.1	-	6.09	-0.02	89	189	81	75
268	43.215	0.160	0.091	2.65	98	1.1	-	6.07	-0.02	89	189	81	75
269	43.380	0.165	0.087	2.64	98	1.0	-	6.04	-0.03	89	190	81	75
270	43.544	0.164	0.089	2.65	98	1.1	99	6.02	-0.02	89	191	81	75
271	43.706	0.162	0.086	2.65	98	1.0	-	5.99	-0.03	89	191	81	75
272	43.870	0.164	0.086	2.63	98	1.1	-	5.98	-0.01	89	191	81	75
273	44.035	0.165	0.087	2.64	98	1.0	-	5.95	-0.03	89	191	81	75
274	44.196	0.161	0.089	2.64	98	1.1	-	5.92	-0.03	89	191	81	75
275	44.361	0.165	0.086	2.65	98	1.0	-	5.91	-0.01	89	191	81	76
276	44.526	0.165	0.089	2.64	98	1.1	-	5.88	-0.03	89	191	81	75
277	44.686	0.160	0.086	2.65	98	1.1	-	5.86	-0.02	89	192	81	75
278	44.853	0.167	0.087	2.65	98	1.1	-	5.84	-0.02	89	192	81	75
279	45.014	0.161	0.087	2.66	98	1.0	-	5.82	-0.02	89	192	81	75
280	45.178	0.164	0.087	2.64	98	1.1	99	5.79	-0.03	89	192	81	76
281	45.343	0.165	0.086	2.64	98	1.0	-	5.78	-0.01	89	192	81	76
282	45.505	0.162	0.085	2.65	98	1.1	-	5.75	-0.03	89	192	81	76
283	45.669	0.164	0.090	2.64	98	1.0	-	5.73	-0.02	89	192	81	76
284	45.834	0.165	0.086	2.65	98	1.0	-	5.70	-0.03	89	192	81	76
285	45.995	0.161	0.085	2.63	98	1.1	-	5.68	-0.02	89	191	81	76
286	46.160	0.165	0.085	2.65	98	1.1	-	5.65	-0.03	90	192	81	76
287	46.325	0.165	0.086	2.65	98	1.1	-	5.63	-0.02	89	192	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	46.486	0.161	0.088	2.65	98	1.1	-	5.61	-0.02	89	192	81	76
289	46.653	0.167	0.086	2.64	98	1.0	-	5.59	-0.02	89	191	81	76
290	46.814	0.161	0.087	2.65	98	1.0	100	5.57	-0.02	90	191	81	76
291	46.978	0.164	0.088	2.65	98	1.1	-	5.55	-0.02	90	191	81	75
292	47.143	0.165	0.088	2.65	98	1.0	-	5.53	-0.02	90	192	81	76
293	47.305	0.162	0.088	2.64	98	1.0	-	5.50	-0.03	89	191	81	76
294	47.470	0.165	0.088	2.64	98	1.1	-	5.48	-0.02	90	191	81	76
295	47.634	0.164	0.086	2.64	98	1.0	-	5.47	-0.01	89	191	81	76
296	47.796	0.162	0.088	2.65	98	1.0	-	5.45	-0.02	90	191	81	76
297	47.960	0.164	0.087	2.65	98	1.0	-	5.41	-0.04	89	191	81	76
298	48.126	0.166	0.088	2.64	98	1.1	-	5.40	-0.01	90	191	81	76
299	48.286	0.160	0.084	2.65	98	1.1	-	5.38	-0.02	90	191	81	76
300	48.453	0.167	0.086	2.65	98	1.0	101	5.36	-0.02	90	190	81	76
301	48.614	0.161	0.087	2.65	98	1.1	-	5.34	-0.02	90	191	81	76
302	48.779	0.165	0.086	2.65	98	1.1	-	5.31	-0.03	90	191	81	76
303	48.944	0.165	0.087	2.65	98	1.0	-	5.29	-0.02	90	192	81	76
304	49.105	0.161	0.085	2.65	98	1.1	-	5.27	-0.02	90	191	81	76
305	49.270	0.165	0.085	2.64	98	1.1	-	5.23	-0.04	90	191	81	76
306	49.435	0.165	0.086	2.66	98	1.0	-	5.21	-0.02	90	192	81	76
307	49.597	0.162	0.088	2.65	98	1.0	-	5.19	-0.02	90	191	81	76
308	49.761	0.164	0.088	2.66	98	1.0	-	5.16	-0.03	90	191	81	76
309	49.927	0.166	0.086	2.65	98	1.1	-	5.14	-0.02	90	191	81	76
310	50.089	0.162	0.089	2.64	98	1.1	100	5.12	-0.02	90	191	81	76
311	50.254	0.165	0.087	2.65	98	1.1	-	5.09	-0.03	90	192	81	76
312	50.416	0.162	0.084	2.65	98	1.0	-	5.06	-0.03	90	193	81	76
313	50.579	0.163	0.089	2.65	98	1.0	-	5.03	-0.03	90	193	81	76
314	50.748	0.169	0.086	2.64	98	1.1	-	5.00	-0.03	90	193	81	76
315	50.905	0.157	0.089	2.65	98	1.1	-	4.99	-0.01	90	193	81	76
316	51.071	0.166	0.086	2.64	98	1.0	-	4.96	-0.03	90	193	81	76
317	51.236	0.165	0.087	2.64	98	1.1	-	4.94	-0.02	90	193	81	76
318	51.401	0.165	0.085	2.65	98	1.1	-	4.91	-0.03	90	193	81	76
319	51.562	0.161	0.088	2.63	98	1.0	-	4.88	-0.03	90	194	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	51.728	0.166	0.087	2.65	98	1.1	100	4.86	-0.02	90	194	81	76
321	51.887	0.159	0.087	2.64	98	1.1	-	4.82	-0.04	90	194	81	76
322	52.056	0.169	0.087	2.66	98	1.1	-	4.80	-0.02	90	194	81	76
323	52.217	0.161	0.088	2.65	98	1.1	-	4.77	-0.03	90	195	81	76
324	52.379	0.162	0.087	2.65	98	1.1	-	4.72	-0.05	90	195	81	76
325	52.549	0.170	0.090	2.63	98	1.0	-	4.71	-0.01	90	196	81	76
326	52.707	0.158	0.086	2.65	98	1.1	-	4.68	-0.03	90	196	81	76
327	52.872	0.165	0.088	2.64	98	1.1	-	4.65	-0.03	90	196	81	76
328	53.037	0.165	0.087	2.65	98	1.0	-	4.62	-0.03	90	197	81	76
329	53.199	0.162	0.085	2.64	98	1.1	-	4.58	-0.04	90	198	81	76
330	53.362	0.163	0.086	2.65	98	1.0	100	4.55	-0.03	90	199	81	76
331	53.528	0.166	0.086	2.64	98	1.0	-	4.52	-0.03	90	199	81	76
332	53.689	0.161	0.085	2.64	98	1.0	-	4.49	-0.03	90	199	81	76
333	53.855	0.166	0.088	2.65	98	1.1	-	4.47	-0.02	90	199	81	76
334	54.019	0.164	0.088	2.65	98	1.1	-	4.43	-0.04	90	199	81	76
335	54.180	0.161	0.089	2.65	98	1.0	-	4.40	-0.03	90	199	81	76
336	54.347	0.167	0.087	2.64	98	1.1	-	4.36	-0.04	90	200	81	76
337	54.508	0.161	0.087	2.66	98	1.0	-	4.33	-0.03	90	200	81	76
338	54.673	0.165	0.089	2.64	98	1.1	-	4.30	-0.03	90	201	81	76
339	54.838	0.165	0.089	2.64	98	1.1	-	4.27	-0.03	90	201	81	76
340	55.000	0.162	0.090	2.66	98	1.1	100	4.24	-0.03	90	202	81	76
341	55.164	0.164	0.090	2.64	98	1.1	-	4.21	-0.03	90	202	81	76
342	55.329	0.165	0.089	2.65	98	1.1	-	4.17	-0.04	90	203	81	76
343	55.491	0.162	0.087	2.65	98	1.1	-	4.14	-0.03	90	203	81	76
344	55.658	0.167	0.088	2.65	98	1.1	-	4.11	-0.03	90	204	81	76
345	55.821	0.163	0.087	2.64	98	1.1	-	4.09	-0.02	90	203	81	76
346	55.981	0.160	0.088	2.65	99	1.1	-	4.05	-0.04	90	204	81	76
347	56.149	0.168	0.088	2.64	99	1.0	-	4.01	-0.04	90	204	81	76
348	56.310	0.161	0.085	2.64	99	1.1	-	3.98	-0.03	90	204	81	76
349	56.474	0.164	0.086	2.64	99	1.1	-	3.95	-0.03	91	206	81	76
350	56.640	0.166	0.087	2.65	99	1.1	99	3.91	-0.04	91	206	81	76
351	56.801	0.161	0.088	2.66	99	1.1	-	3.89	-0.02	91	206	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	56.966	0.165	0.087	2.65	99	1.1	-	3.85	-0.04	91	206	81	76
353	57.131	0.165	0.089	2.66	99	1.1	-	3.82	-0.03	91	206	81	76
354	57.293	0.162	0.089	2.65	99	1.0	-	3.79	-0.03	91	206	81	76
355	57.457	0.164	0.090	2.65	99	1.0	-	3.76	-0.03	91	207	81	76
356	57.624	0.167	0.088	2.65	99	1.0	-	3.72	-0.04	91	207	81	76
357	57.783	0.159	0.088	2.64	99	1.0	-	3.69	-0.03	91	208	81	76
358	57.950	0.167	0.089	2.65	99	1.0	-	3.64	-0.05	91	208	81	76
359	58.114	0.164	0.088	2.65	99	1.1	-	3.62	-0.02	91	209	81	76
360	58.275	0.161	0.085	2.65	99	1.1	101	3.58	-0.04	91	210	81	76
361	58.443	0.168	0.087	2.65	99	1.1	-	3.55	-0.03	91	210	81	76
362	58.604	0.161	0.088	2.66	99	1.1	-	3.52	-0.03	91	211	81	76
363	58.769	0.165	0.086	2.65	99	1.0	-	3.49	-0.03	91	211	81	76
364	58.934	0.165	0.087	2.65	99	1.1	-	3.45	-0.04	91	211	81	76
365	59.096	0.162	0.088	2.64	99	1.1	-	3.42	-0.03	91	212	81	76
366	59.261	0.165	0.087	2.65	99	1.1	-	3.39	-0.03	91	211	81	76
367	59.426	0.165	0.087	2.66	99	1.0	-	3.36	-0.03	91	211	81	76
368	59.588	0.162	0.086	2.66	99	1.1	-	3.34	-0.02	91	211	81	76
369	59.753	0.165	0.085	2.66	99	1.0	-	3.31	-0.03	91	210	81	76
370	59.918	0.165	0.086	2.64	99	1.1	101	3.27	-0.04	91	211	81	76
371	60.078	0.160	0.088	2.66	99	1.1	-	3.24	-0.03	91	210	81	76
372	60.247	0.169	0.086	2.66	99	1.0	-	3.22	-0.02	91	211	81	76
373	60.408	0.161	0.087	2.65	99	1.0	-	3.19	-0.03	91	210	81	76
374	60.572	0.164	0.088	2.67	99	1.0	-	3.16	-0.03	91	209	81	76
375	60.738	0.166	0.086	2.64	99	1.1	-	3.14	-0.02	91	208	81	76
376	60.898	0.160	0.086	2.65	99	1.1	-	3.11	-0.03	91	208	81	76
377	61.064	0.166	0.088	2.65	99	1.0	-	3.09	-0.02	91	207	81	76
378	61.229	0.165	0.087	2.66	99	1.1	-	3.06	-0.03	91	208	81	76
379	61.394	0.165	0.087	2.65	99	1.0	-	3.04	-0.02	91	208	81	76
380	61.556	0.162	0.087	2.65	99	1.0	100	3.01	-0.03	91	207	81	76
381	61.722	0.166	0.086	2.65	99	1.1	-	2.97	-0.04	91	207	81	76
382	61.882	0.160	0.087	2.64	99	1.1	-	2.96	-0.01	91	207	81	76
383	62.048	0.166	0.087	2.67	99	1.1	-	2.93	-0.03	91	206	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	62.213	0.165	0.088	2.65	99	1.1	-	2.89	-0.04	91	206	81	76
385	62.374	0.161	0.086	2.66	99	1.0	-	2.88	-0.01	91	206	81	76
386	62.542	0.168	0.085	2.65	99	1.0	-	2.85	-0.03	91	206	81	76
387	62.703	0.161	0.086	2.66	99	1.0	-	2.83	-0.02	91	206	81	76
388	62.868	0.165	0.088	2.65	99	1.1	-	2.79	-0.04	91	205	81	76
389	63.033	0.165	0.087	2.65	99	1.0	-	2.77	-0.02	91	205	81	76
390	63.195	0.162	0.087	2.66	99	1.1	100	2.74	-0.03	91	206	81	76
391	63.360	0.165	0.089	2.64	99	1.1	-	2.72	-0.02	91	205	81	76
392	63.524	0.164	0.087	2.66	99	1.0	-	2.68	-0.04	91	205	81	76
393	63.687	0.163	0.087	2.65	99	1.0	-	2.66	-0.02	91	205	81	76
394	63.854	0.167	0.085	2.65	99	1.1	-	2.64	-0.02	91	205	81	76
395	64.017	0.163	0.085	2.65	99	1.0	-	2.61	-0.03	91	205	81	76
396	64.181	0.164	0.088	2.65	99	1.1	-	2.59	-0.02	91	205	81	76
397	64.345	0.164	0.085	2.65	99	1.1	-	2.56	-0.03	91	205	81	76
398	64.508	0.163	0.089	2.64	99	1.1	-	2.54	-0.02	91	206	81	76
399	64.670	0.162	0.090	2.65	99	1.0	-	2.51	-0.03	91	205	81	76
400	64.840	0.170	0.086	2.64	99	1.0	101	2.48	-0.03	91	205	81	76
401	64.999	0.159	0.087	2.66	99	1.1	-	2.45	-0.03	91	204	81	76
402	65.163	0.164	0.090	2.64	99	1.0	-	2.43	-0.02	91	205	81	76
403	65.328	0.165	0.086	2.65	99	1.1	-	2.40	-0.03	91	205	81	76
404	65.491	0.163	0.085	2.66	99	1.0	-	2.37	-0.03	91	204	81	76
405	65.655	0.164	0.086	2.64	99	1.1	-	2.34	-0.03	91	204	81	76
406	65.821	0.166	0.088	2.65	99	1.0	-	2.34	0.00	91	205	81	76
407	65.982	0.161	0.088	2.65	99	1.1	-	2.31	-0.03	91	205	81	76
408	66.147	0.165	0.087	2.66	99	1.0	-	2.28	-0.03	91	205	81	76
409	66.313	0.166	0.084	2.65	99	1.0	-	2.26	-0.02	91	205	81	76
410	66.473	0.160	0.086	2.66	99	1.0	100	2.22	-0.04	91	204	81	76
411	66.641	0.168	0.088	2.65	99	1.1	-	2.20	-0.02	91	203	81	76
412	66.803	0.162	0.089	2.65	99	1.1	-	2.17	-0.03	91	204	81	76
413	66.968	0.165	0.085	2.66	99	1.0	-	2.15	-0.02	91	203	81	76
414	67.133	0.165	0.088	2.64	99	1.0	-	2.11	-0.04	91	204	81	76
415	67.294	0.161	0.089	2.66	99	1.1	-	2.09	-0.02	91	204	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	67.460	0.166	0.086	2.65	99	1.1	-	2.05	-0.04	91	204	81	76
417	67.625	0.165	0.087	2.66	99	1.0	-	2.03	-0.02	91	204	81	76
418	67.787	0.162	0.087	2.65	99	1.1	-	2.00	-0.03	91	204	81	76
419	67.951	0.164	0.085	2.65	99	1.0	-	1.97	-0.03	91	203	81	76
420	68.118	0.167	0.087	2.65	99	1.1	101	1.96	-0.01	91	203	81	76
421	68.278	0.160	0.087	2.65	99	1.0	-	1.93	-0.03	91	204	81	76
422	68.444	0.166	0.087	2.65	99	1.1	-	1.90	-0.03	91	204	81	76
423	68.609	0.165	0.089	2.64	99	1.1	-	1.87	-0.03	91	204	81	76
424	68.770	0.161	0.085	2.66	99	1.0	-	1.85	-0.02	91	204	81	76
425	68.938	0.168	0.086	2.64	99	1.1	-	1.80	-0.05	91	204	81	76
426	69.099	0.161	0.086	2.65	99	1.0	-	1.79	-0.01	91	204	81	76
427	69.264	0.165	0.088	2.65	99	1.1	-	1.75	-0.04	91	204	81	76
428	69.433	0.169	0.088	2.65	99	1.1	-	1.73	-0.02	91	203	81	76
429	69.591	0.158	0.088	2.66	99	1.1	-	1.70	-0.03	91	203	81	76
430	69.756	0.165	0.085	2.64	99	1.0	101	1.68	-0.02	91	204	81	76
431	69.921	0.165	0.084	2.66	99	1.1	-	1.65	-0.03	91	204	81	76
432	70.083	0.162	0.087	2.65	99	1.0	-	1.62	-0.03	91	205	81	76
433	70.248	0.165	0.086	2.66	99	1.1	-	1.59	-0.03	91	205	81	76
434	70.414	0.166	0.088	2.65	99	1.1	-	1.56	-0.03	91	205	81	76
435	70.574	0.160	0.089	2.65	99	1.0	-	1.53	-0.03	91	205	81	76
436	70.741	0.167	0.088	2.66	99	1.0	-	1.51	-0.02	91	206	81	76
437	70.905	0.164	0.086	2.65	99	1.1	-	1.49	-0.02	90	205	81	76
438	71.066	0.161	0.087	2.65	99	1.1	-	1.46	-0.03	91	206	81	76
439	71.237	0.171	0.085	2.65	99	1.1	-	1.43	-0.03	91	206	81	76
440	71.395	0.158	0.087	2.66	99	1.1	101	1.41	-0.02	91	205	81	76
441	71.560	0.165	0.086	2.65	99	1.1	-	1.38	-0.03	91	206	81	76
442	71.725	0.165	0.087	2.65	99	1.1	-	1.35	-0.03	91	205	81	76
443	71.888	0.163	0.086	2.65	99	1.1	-	1.33	-0.02	91	205	81	76
444	72.052	0.164	0.087	2.64	99	1.1	-	1.30	-0.03	91	205	81	76
445	72.217	0.165	0.086	2.66	99	1.1	-	1.28	-0.02	91	206	81	76
446	72.380	0.163	0.086	2.66	99	1.1	-	1.25	-0.03	90	206	81	76
447	72.545	0.165	0.086	2.67	99	1.0	-	1.23	-0.02	91	206	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	72.710	0.165	0.087	2.64	99	1.0	-	1.20	-0.03	90	205	81	76
449	72.870	0.160	0.084	2.64	99	1.0	-	1.18	-0.02	90	205	81	76
450	73.039	0.169	0.088	2.65	99	1.0	100	1.16	-0.02	90	205	81	76
451	73.200	0.161	0.088	2.65	99	1.0	-	1.13	-0.03	90	205	81	76
452	73.363	0.163	0.085	2.65	99	1.1	-	1.12	-0.01	90	203	81	76
453	73.533	0.170	0.086	2.65	99	1.0	-	1.09	-0.03	90	203	81	76
454	73.691	0.158	0.086	2.67	99	1.1	-	1.07	-0.02	90	201	81	76
455	73.857	0.166	0.089	2.65	99	1.1	-	1.05	-0.02	90	201	81	76
456	74.022	0.165	0.086	2.65	99	1.0	-	1.03	-0.02	90	201	81	76
457	74.184	0.162	0.086	2.65	99	1.1	-	1.01	-0.02	90	201	81	76
458	74.348	0.164	0.086	2.65	99	1.0	-	1.00	-0.01	90	200	81	75
459	74.514	0.166	0.087	2.65	99	1.0	-	0.97	-0.03	90	202	81	75
460	74.678	0.164	0.086	2.65	99	1.1	100	0.95	-0.02	90	200	81	75
461	74.841	0.163	0.088	2.66	99	1.0	-	0.94	-0.01	90	199	81	75
462	75.006	0.165	0.086	2.64	99	1.1	-	0.91	-0.03	90	199	81	75
463	75.167	0.161	0.086	2.66	99	1.1	-	0.90	-0.01	90	199	81	75
464	75.335	0.168	0.085	2.65	99	1.1	-	0.88	-0.02	90	198	81	75
465	75.496	0.161	0.088	2.65	99	1.0	-	0.87	-0.01	90	197	81	76
466	75.661	0.165	0.086	2.66	99	1.1	-	0.83	-0.04	90	198	81	75
467	75.827	0.166	0.088	2.66	99	1.1	-	0.81	-0.02	90	198	81	75
468	75.987	0.160	0.087	2.66	99	1.1	-	0.79	-0.02	90	196	81	75
469	76.153	0.166	0.085	2.65	99	1.1	-	0.78	-0.01	90	196	81	75
470	76.318	0.165	0.088	2.66	99	1.1	100	0.76	-0.02	90	195	81	75
471	76.480	0.162	0.086	2.64	99	1.1	-	0.75	-0.01	90	195	81	75
472	76.645	0.165	0.086	2.65	99	1.0	-	0.73	-0.02	90	195	81	75
473	76.811	0.166	0.086	2.65	99	1.0	-	0.71	-0.02	90	194	81	75
474	76.971	0.160	0.086	2.65	99	1.1	-	0.70	-0.01	90	194	81	75
475	77.140	0.169	0.085	2.66	99	1.0	-	0.67	-0.03	89	193	81	75
476	77.302	0.162	0.088	2.65	99	1.0	-	0.66	-0.01	89	193	81	75
477	77.464	0.162	0.085	2.66	99	1.1	-	0.64	-0.02	89	193	81	75
478	77.634	0.170	0.086	2.65	99	1.1	-	0.63	-0.01	89	192	81	75
479	77.792	0.158	0.087	2.66	99	1.0	-	0.60	-0.03	89	191	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	77.958	0.166	0.087	2.66	99	1.0	100	0.59	-0.01	89	191	81	75
481	78.123	0.165	0.087	2.66	99	1.0	-	0.58	-0.01	89	191	81	75
482	78.284	0.161	0.087	2.66	99	1.1	-	0.56	-0.02	89	191	81	75
483	78.450	0.166	0.088	2.64	99	1.0	-	0.54	-0.02	89	190	81	75
484	78.614	0.164	0.085	2.66	99	1.0	-	0.52	-0.02	89	190	81	75
485	78.777	0.163	0.086	2.65	99	1.1	-	0.52	0.00	89	189	81	75
486	78.942	0.165	0.087	2.66	99	1.0	-	0.49	-0.03	89	188	81	75
487	79.108	0.166	0.088	2.66	99	1.0	-	0.48	-0.01	89	188	81	75
488	79.268	0.160	0.089	2.64	99	1.1	-	0.46	-0.02	89	188	81	75
489	79.437	0.169	0.087	2.66	99	1.0	-	0.45	-0.01	89	188	81	75
490	79.599	0.162	0.085	2.65	99	1.1	101	0.44	-0.01	89	187	81	75
491	79.760	0.161	0.084	2.66	99	1.1	-	0.42	-0.02	89	187	81	75
492	79.928	0.168	0.088	2.65	99	1.0	-	0.40	-0.02	89	187	81	75
493	80.089	0.161	0.085	2.66	99	1.1	-	0.37	-0.03	89	187	80	75
494	80.254	0.165	0.087	2.65	99	1.1	-	0.36	-0.01	89	186	80	75
495	80.420	0.166	0.086	2.65	99	1.0	-	0.35	-0.01	89	186	80	75
496	80.582	0.162	0.086	2.65	99	1.0	-	0.34	-0.01	89	185	80	75
497	80.747	0.165	0.087	2.64	99	1.1	-	0.33	-0.01	89	185	80	75
498	80.912	0.165	0.087	2.66	99	1.1	-	0.31	-0.02	89	184	80	75
499	81.074	0.162	0.087	2.65	99	1.0	-	0.29	-0.02	89	185	80	75
500	81.239	0.165	0.086	2.66	99	1.0	101	0.27	-0.02	89	185	80	75
501	81.405	0.166	0.088	2.65	99	1.0	-	0.26	-0.01	88	184	80	75
502	81.565	0.160	0.087	2.65	99	1.0	-	0.24	-0.02	89	184	80	75
503	81.733	0.168	0.086	2.65	99	1.1	-	0.22	-0.02	88	184	80	75
504	81.896	0.163	0.087	2.64	99	1.1	-	0.22	0.00	88	184	80	75
505	82.058	0.162	0.085	2.66	99	1.1	-	0.20	-0.02	88	183	80	75
506	82.226	0.168	0.086	2.65	99	1.1	-	0.19	-0.01	88	183	80	75
507	82.387	0.161	0.087	2.66	99	1.1	-	0.17	-0.02	88	182	80	75
508	82.552	0.165	0.084	2.65	99	1.1	-	0.16	-0.01	88	182	80	75
509	82.717	0.165	0.088	2.66	99	1.0	-	0.15	-0.01	88	182	80	75
510	82.880	0.163	0.085	2.66	99	1.0	101	0.13	-0.02	88	182	80	75
511	83.044	0.164	0.086	2.65	99	1.0	-	0.12	-0.01	88	182	80	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>Buck Stove</u>	Job #: <u>24-330</u>
Model: <u>91</u>	Tracking #: <u>211</u>
Run #: <u>1</u>	Technician: <u>AK</u>
	Date: <u>7/31/2024</u>

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	83.212	0.168	0.087	2.67	99	1.0	-	0.11	-0.01	88	180	80	75
513	83.372	0.160	0.087	2.65	99	1.1	-	0.09	-0.02	88	180	80	75
514	83.537	0.165	0.086	2.67	99	1.1	-	0.07	-0.02	88	181	80	75
515	83.702	0.165	0.086	2.65	99	1.0	-	0.06	-0.01	88	180	80	75
516	83.863	0.161	0.087	2.66	99	1.1	-	0.06	0.00	88	179	80	75
517	84.031	0.168	0.088	2.65	99	1.0	-	0.04	-0.02	88	179	80	75
518	84.193	0.162	0.086	2.66	99	1.1	-	0.03	-0.01	88	178	80	75
519	84.356	0.163	0.086	2.66	99	1.1	-	0.02	-0.01	88	178	80	75
520	84.523	0.167	0.086	2.65	99	1.1	101	0.00	-0.02	88	178	80	75
Avg/Tot	84.523	0.163	0.087	2.62	95.6	1.0	100			90.9	211.7	80.7	75.2

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		0.07	77	1.2		79	-0.056	2.13	0.043
1	0.103	0.103	2.36	77	1.9	-	81	-0.058	1.65	0.119
2	0.250	0.147	2.37	77	1.8	-	82	-0.058	3.48	0.088
3	0.400	0.150	2.36	77	2.0	-	82	-0.064	7.77	0.151
4	0.551	0.151	2.37	77	1.5	-	83	-0.065	10.88	0.982
5	0.700	0.149	2.36	77	2.1	-	83	-0.069	11.95	0.999
6	0.851	0.151	2.35	77	2.1	-	82	-0.058	10.51	0.654
7	1.000	0.149	2.35	78	1.8	-	82	-0.054	6.22	0.017
8	1.153	0.153	2.35	78	1.5	-	82	-0.053	5.67	0.015
9	1.301	0.148	2.35	78	1.7	-	81	-0.052	5.53	0.017
10	1.454	0.153	2.36	78	1.9	98	81	-0.052	5.49	0.017
11	1.603	0.149	2.36	78	1.6	-	81	-0.049	5.31	0.015
12	1.759	0.156	2.36	78	2.1	-	81	-0.051	5.31	0.012
13	1.908	0.149	2.36	79	2.1	-	81	-0.048	5.44	0.014
14	2.059	0.151	2.37	79	1.6	-	81	-0.049	5.48	0.015
15	2.208	0.149	2.37	79	1.6	-	81	-0.049	5.49	0.012
16	2.361	0.153	2.37	79	1.5	-	81	-0.049	5.57	0.016
17	2.510	0.149	2.37	80	2.0	-	81	-0.047	5.36	0.011
18	2.663	0.153	2.37	80	2.0	-	81	-0.047	5.43	0.014
19	2.813	0.150	2.37	80	1.8	-	81	-0.047	5.61	0.016
20	2.966	0.153	2.38	81	1.6	101	81	-0.047	5.79	0.016
21	3.119	0.153	2.38	81	1.8	-	81	-0.045	5.93	0.014
22	3.270	0.151	2.38	81	1.6	-	81	-0.045	6.09	0.013
23	3.424	0.154	2.39	82	1.5	-	81	-0.044	6.07	0.014
24	3.574	0.150	2.38	82	2.0	-	81	-0.045	6.06	0.014
25	3.728	0.154	2.38	82	2.1	-	81	-0.044	5.97	0.011
26	3.880	0.152	2.37	82	1.6	-	81	-0.047	5.98	0.012
27	4.036	0.156	2.38	83	2.0	-	81	-0.045	5.96	0.013
28	4.183	0.147	2.39	83	1.6	-	81	-0.045	5.90	0.011
29	4.339	0.156	2.39	83	1.6	-	81	-0.044	5.98	0.015
30	4.489	0.150	2.39	84	1.9	100	81	-0.046	6.00	0.016
31	4.643	0.154	2.39	84	2.0	-	81	-0.045	6.05	0.012

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.795	0.152	2.39	84	2.0	-	81	-0.045	6.13	0.014
33	4.949	0.154	2.39	85	2.0	-	81	-0.044	6.16	0.018
34	5.103	0.154	2.40	85	1.7	-	81	-0.045	6.16	0.012
35	5.256	0.153	2.39	85	2.0	-	81	-0.045	6.28	0.010
36	5.410	0.154	2.40	86	2.1	-	81	-0.045	6.37	0.012
37	5.561	0.151	2.40	86	2.0	-	81	-0.047	6.61	0.014
38	5.717	0.156	2.39	86	1.6	-	81	-0.047	6.78	0.013
39	5.871	0.154	2.40	87	2.1	-	81	-0.048	7.06	0.010
40	6.028	0.157	2.40	87	2.0	100	81	-0.045	7.30	0.015
41	6.179	0.151	2.39	87	2.0	-	81	-0.048	7.48	0.016
42	6.332	0.153	2.40	88	1.6	-	81	-0.049	7.64	0.017
43	6.485	0.153	2.41	88	1.6	-	81	-0.047	7.74	0.019
44	6.640	0.155	2.40	89	1.7	-	81	-0.049	7.93	0.015
45	6.795	0.155	2.41	89	2.0	-	81	-0.049	8.06	0.016
46	6.947	0.152	2.40	89	1.8	-	81	-0.051	8.15	0.015
47	7.103	0.156	2.40	89	1.7	-	81	-0.052	8.24	0.017
48	7.256	0.153	2.40	90	2.0	-	81	-0.049	8.40	0.018
49	7.413	0.157	2.41	90	1.9	-	81	-0.053	8.51	0.018
50	7.565	0.152	2.40	90	1.7	99	81	-0.053	8.69	0.026
51	7.721	0.156	2.40	90	1.7	-	82	-0.053	8.82	0.032
52	7.875	0.154	2.40	91	2.0	-	82	-0.054	9.00	0.046
53	8.030	0.155	2.41	91	1.7	-	82	-0.053	9.08	0.052
54	8.188	0.158	2.41	91	1.9	-	82	-0.053	9.31	0.045
55	8.341	0.153	2.40	91	2.0	-	82	-0.054	9.98	0.169
56	8.496	0.155	2.41	92	1.8	-	82	-0.056	10.01	0.175
57	8.649	0.153	2.41	92	2.0	-	82	-0.055	9.97	0.151
58	8.806	0.157	2.41	92	1.6	-	82	-0.057	9.66	0.075
59	8.959	0.153	2.41	92	2.0	-	82	-0.055	9.38	0.040
60	9.116	0.157	2.41	93	1.9	100	82	-0.058	9.08	0.020
61	9.272	0.156	2.42	93	2.0	-	82	-0.053	9.15	0.018
62	9.425	0.153	2.41	93	1.8	-	82	-0.055	8.74	0.014
63	9.582	0.157	2.40	93	2.1	-	82	-0.055	8.18	0.016

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	9.736	0.154	2.42	94	1.9	-	82	-0.053	7.92	0.020
65	9.894	0.158	2.42	94	2.1	-	82	-0.054	7.74	0.009
66	10.047	0.153	2.42	94	1.7	-	82	-0.053	7.66	0.016
67	10.204	0.157	2.42	94	1.7	-	82	-0.054	7.69	0.015
68	10.361	0.157	2.42	95	1.9	-	82	-0.054	7.72	0.015
69	10.518	0.157	2.42	95	1.6	-	82	-0.054	7.79	0.010
70	10.676	0.158	2.43	95	1.7	100	82	-0.054	7.87	0.013
71	10.827	0.151	2.42	95	1.7	-	82	-0.054	7.84	0.019
72	10.985	0.158	2.43	95	2.1	-	82	-0.054	7.74	0.015
73	11.139	0.154	2.43	95	2.1	-	82	-0.052	7.76	0.014
74	11.296	0.157	2.42	95	1.8	-	82	-0.055	7.79	0.012
75	11.454	0.158	2.43	96	2.1	-	82	-0.055	7.83	0.014
76	11.607	0.153	2.43	96	1.6	-	82	-0.054	7.81	0.016
77	11.765	0.158	2.43	96	2.0	-	82	-0.054	7.82	0.009
78	11.920	0.155	2.42	96	2.0	-	82	-0.055	7.79	0.014
79	12.080	0.160	2.43	96	2.0	-	83	-0.055	7.83	0.014
80	12.235	0.155	2.43	97	1.6	100	83	-0.053	7.84	0.016
81	12.390	0.155	2.44	97	1.9	-	83	-0.055	7.85	0.011
82	12.547	0.157	2.44	97	2.0	-	83	-0.055	7.81	0.014
83	12.701	0.154	2.42	97	1.8	-	83	-0.056	7.78	0.012
84	12.861	0.160	2.43	97	2.1	-	83	-0.053	7.75	0.009
85	13.015	0.154	2.43	97	1.7	-	83	-0.051	7.67	0.016
86	13.173	0.158	2.43	98	1.6	-	83	-0.052	7.70	0.012
87	13.329	0.156	2.43	98	1.6	-	83	-0.052	7.59	0.015
88	13.486	0.157	2.43	98	1.7	-	83	-0.055	7.57	0.014
89	13.643	0.157	2.43	98	1.7	-	83	-0.054	7.51	0.012
90	13.798	0.155	2.43	98	1.6	98	83	-0.052	7.50	0.012
91	13.958	0.160	2.44	98	2.1	-	83	-0.051	7.76	0.011
92	14.112	0.154	2.43	98	2.1	-	83	-0.054	8.24	0.011
93	14.273	0.161	2.43	98	2.1	-	83	-0.054	8.57	0.014
94	14.430	0.157	2.43	98	2.1	-	83	-0.053	8.95	0.016
95	14.582	0.152	2.43	99	1.9	-	83	-0.055	9.25	0.013

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	14.741	0.159	2.43	99	2.0	-	83	-0.053	9.60	0.017
97	14.896	0.155	2.44	99	1.6	-	83	-0.053	9.95	0.026
98	15.054	0.158	2.43	99	1.9	-	83	-0.056	10.17	0.046
99	15.210	0.156	2.43	99	1.8	-	83	-0.057	10.36	0.047
100	15.368	0.158	2.44	99	1.6	99	83	-0.056	10.55	0.069
101	15.525	0.157	2.44	99	1.7	-	83	-0.058	10.67	0.092
102	15.681	0.156	2.43	99	1.7	-	83	-0.058	10.79	0.137
103	15.840	0.159	2.43	99	1.9	-	83	-0.057	10.18	0.086
104	15.994	0.154	2.44	99	1.9	-	83	-0.057	9.94	0.034
105	16.153	0.159	2.44	100	1.6	-	83	-0.057	9.85	0.030
106	16.311	0.158	2.44	100	2.1	-	83	-0.056	9.67	0.024
107	16.468	0.157	2.44	100	2.0	-	83	-0.057	9.51	0.014
108	16.628	0.160	2.44	100	2.0	-	83	-0.053	9.54	0.063
109	16.780	0.152	2.44	100	1.8	-	83	-0.059	9.55	0.050
110	16.939	0.159	2.44	100	2.1	100	83	-0.057	9.42	0.046
111	17.095	0.156	2.44	100	1.6	-	83	-0.054	9.63	0.056
112	17.253	0.158	2.44	100	2.1	-	83	-0.056	9.49	0.040
113	17.410	0.157	2.44	100	2.1	-	83	-0.057	9.27	0.036
114	17.566	0.156	2.44	100	1.6	-	83	-0.057	9.07	0.018
115	17.726	0.160	2.44	100	2.1	-	83	-0.056	8.92	0.015
116	17.880	0.154	2.44	100	1.9	-	83	-0.055	8.66	0.014
117	18.039	0.159	2.43	100	2.0	-	83	-0.056	8.62	0.015
118	18.197	0.158	2.44	100	2.1	-	83	-0.055	8.58	0.016
119	18.352	0.155	2.43	101	1.7	-	83	-0.052	8.00	0.009
120	18.515	0.163	2.43	101	1.7	100	83	-0.054	7.52	0.014
121	18.669	0.154	2.43	101	1.8	-	83	-0.053	7.33	0.011
122	18.825	0.156	2.43	101	1.6	-	83	-0.051	7.14	0.011
123	18.983	0.158	2.43	101	1.8	-	83	-0.052	7.16	0.012
124	19.139	0.156	2.43	101	1.8	-	83	-0.053	7.19	0.014
125	19.298	0.159	2.43	101	1.8	-	83	-0.052	6.94	0.011
126	19.454	0.156	2.43	101	1.9	-	83	-0.053	6.98	0.010
127	19.613	0.159	2.43	101	1.5	-	83	-0.054	7.11	0.017

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	19.768	0.155	2.43	101	1.8	-	83	-0.051	7.05	0.013
129	19.927	0.159	2.43	101	1.6	-	83	-0.051	7.05	0.013
130	20.085	0.158	2.43	101	1.8	100	83	-0.051	7.01	0.009
131	20.243	0.158	2.43	101	1.7	-	83	-0.051	7.05	0.007
132	20.401	0.158	2.43	101	1.6	-	83	-0.052	7.21	0.010
133	20.555	0.154	2.43	101	1.6	-	83	-0.050	7.53	0.011
134	20.714	0.159	2.42	101	2.1	-	83	-0.050	7.81	0.010
135	20.872	0.158	2.43	101	2.0	-	83	-0.047	7.85	0.012
136	21.027	0.155	2.43	101	1.6	-	83	-0.048	7.83	0.014
137	21.187	0.160	2.42	101	1.8	-	83	-0.053	7.84	0.023
138	21.343	0.156	2.43	101	2.1	-	83	-0.048	7.84	0.034
139	21.503	0.160	2.42	101	2.0	-	83	-0.051	7.70	0.013
140	21.658	0.155	2.43	102	2.0	100	83	-0.049	7.62	0.012
141	21.815	0.157	2.44	102	2.1	-	83	-0.050	7.42	0.016
142	21.973	0.158	2.43	102	1.8	-	83	-0.049	7.34	0.014
143	22.129	0.156	2.43	102	1.6	-	83	-0.047	7.34	0.012
144	22.288	0.159	2.43	102	1.6	-	83	-0.050	7.34	0.009
145	22.444	0.156	2.42	102	1.6	-	83	-0.048	7.30	0.010
146	22.602	0.158	2.42	102	2.1	-	82	-0.051	7.21	0.016
147	22.763	0.161	2.43	102	1.7	-	82	-0.047	7.13	0.013
148	22.916	0.153	2.43	102	2.1	-	82	-0.046	7.00	0.012
149	23.076	0.160	2.43	102	2.1	-	82	-0.049	7.22	0.014
150	23.231	0.155	2.44	102	2.1	101	82	-0.047	6.93	0.012
151	23.390	0.159	2.43	102	1.9	-	82	-0.047	6.91	0.009
152	23.548	0.158	2.44	102	1.7	-	82	-0.045	6.90	0.012
153	23.704	0.156	2.43	102	1.6	-	82	-0.047	6.88	0.016
154	23.863	0.159	2.43	102	2.0	-	82	-0.047	6.90	0.016
155	24.019	0.156	2.43	102	1.5	-	82	-0.046	6.88	0.013
156	24.177	0.158	2.43	102	2.1	-	82	-0.046	6.95	0.012
157	24.338	0.161	2.43	102	2.0	-	82	-0.044	7.02	0.013
158	24.492	0.154	2.44	102	1.8	-	82	-0.047	7.05	0.012
159	24.653	0.161	2.43	102	2.0	-	82	-0.047	7.16	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	24.806	0.153	2.43	102	2.1	101	82	-0.043	7.27	0.015
161	24.966	0.160	2.43	102	1.6	-	82	-0.048	7.33	0.017
162	25.121	0.155	2.43	102	2.1	-	82	-0.046	7.45	0.008
163	25.280	0.159	2.43	102	1.6	-	82	-0.046	7.51	0.011
164	25.438	0.158	2.44	102	1.6	-	82	-0.045	7.64	0.011
165	25.594	0.156	2.44	102	1.6	-	82	-0.045	7.68	0.008
166	25.755	0.161	2.43	102	2.0	-	82	-0.046	7.77	0.016
167	25.909	0.154	2.43	102	1.9	-	82	-0.048	7.85	0.015
168	26.068	0.159	2.43	102	2.1	-	82	-0.048	7.89	0.018
169	26.227	0.159	2.43	102	1.9	-	82	-0.048	7.94	0.017
170	26.382	0.155	2.43	102	1.6	101	82	-0.048	7.97	0.013
171	26.542	0.160	2.43	102	1.7	-	82	-0.046	7.89	0.009
172	26.697	0.155	2.44	102	1.6	-	82	-0.048	7.91	0.014
173	26.855	0.158	2.43	102	1.6	-	82	-0.046	7.94	0.009
174	27.014	0.159	2.43	102	1.6	-	82	-0.048	8.01	0.013
175	27.170	0.156	2.43	102	1.9	-	82	-0.046	8.12	0.016
176	27.329	0.159	2.43	102	1.9	-	82	-0.048	8.12	0.014
177	27.488	0.159	2.43	103	1.6	-	82	-0.047	8.11	0.013
178	27.644	0.156	2.43	103	2.0	-	82	-0.051	8.18	0.019
179	27.800	0.156	2.43	102	1.6	-	82	-0.046	8.22	0.017
180	27.959	0.159	2.43	103	1.6	101	82	-0.044	8.27	0.010
181	28.117	0.158	2.43	102	2.1	-	82	-0.048	8.49	0.024
182	28.273	0.156	2.43	103	2.0	-	82	-0.048	8.10	0.017
183	28.433	0.160	2.43	103	2.0	-	82	-0.047	8.21	0.014
184	28.590	0.157	2.43	103	1.6	-	82	-0.049	8.20	0.017
185	28.747	0.157	2.43	103	2.0	-	82	-0.046	8.23	0.021
186	28.905	0.158	2.44	103	1.6	-	82	-0.048	8.05	0.018
187	29.060	0.155	2.43	103	1.9	-	82	-0.046	7.97	0.014
188	29.221	0.161	2.43	103	1.6	-	82	-0.047	7.83	0.013
189	29.376	0.155	2.43	103	1.9	-	82	-0.048	7.68	0.015
190	29.534	0.158	2.43	103	1.8	100	82	-0.047	7.60	0.015
191	29.696	0.162	2.43	103	2.0	-	82	-0.046	7.52	0.014

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	29.849	0.153	2.43	103	1.6	-	82	-0.046	7.45	0.017
193	30.009	0.160	2.43	103	2.0	-	82	-0.046	7.45	0.011
194	30.165	0.156	2.43	103	1.6	-	82	-0.044	7.38	0.017
195	30.323	0.158	2.43	103	1.9	-	82	-0.048	7.29	0.010
196	30.480	0.157	2.43	103	1.6	-	82	-0.046	7.21	0.013
197	30.640	0.160	2.43	103	1.8	-	82	-0.047	7.22	0.012
198	30.796	0.156	2.43	103	1.8	-	82	-0.045	7.14	0.013
199	30.952	0.156	2.43	103	2.0	-	82	-0.045	7.14	0.008
200	31.112	0.160	2.43	103	1.8	100	82	-0.044	7.03	0.012
201	31.267	0.155	2.43	103	2.1	-	82	-0.046	6.99	0.011
202	31.426	0.159	2.43	103	1.9	-	82	-0.046	6.98	0.012
203	31.584	0.158	2.42	103	1.7	-	82	-0.047	6.93	0.014
204	31.743	0.159	2.43	103	1.6	-	82	-0.045	6.87	0.013
205	31.901	0.158	2.43	103	2.0	-	82	-0.041	6.99	0.016
206	32.056	0.155	2.44	103	1.7	-	82	-0.043	6.76	0.013
207	32.215	0.159	2.43	103	2.0	-	82	-0.046	6.77	0.013
208	32.374	0.159	2.44	103	1.9	-	82	-0.046	6.70	0.011
209	32.529	0.155	2.43	103	2.0	-	82	-0.044	6.61	0.011
210	32.689	0.160	2.43	103	1.8	100	82	-0.043	6.48	0.012
211	32.845	0.156	2.43	103	1.6	-	82	-0.044	6.38	0.011
212	33.003	0.158	2.43	103	2.0	-	82	-0.043	6.34	0.011
213	33.162	0.159	2.43	103	1.6	-	82	-0.043	6.31	0.011
214	33.321	0.159	2.44	103	1.6	-	82	-0.042	6.22	0.010
215	33.478	0.157	2.43	103	1.6	-	82	-0.043	6.25	0.013
216	33.634	0.156	2.43	103	1.6	-	82	-0.043	6.23	0.011
217	33.793	0.159	2.43	103	1.6	-	82	-0.043	6.23	0.012
218	33.950	0.157	2.43	103	1.6	-	82	-0.042	6.23	0.010
219	34.109	0.159	2.43	103	2.0	-	82	-0.042	6.32	0.006
220	34.266	0.157	2.43	103	1.9	100	82	-0.042	6.31	0.011
221	34.422	0.156	2.43	103	1.7	-	82	-0.043	6.34	0.013
222	34.582	0.160	2.43	103	1.9	-	82	-0.042	6.28	0.009
223	34.737	0.155	2.42	103	1.8	-	82	-0.043	6.25	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	34.897	0.160	2.43	103	2.0	-	82	-0.040	6.16	0.006
225	35.057	0.160	2.43	103	1.6	-	82	-0.040	6.00	0.008
226	35.211	0.154	2.43	103	1.8	-	82	-0.037	5.97	0.013
227	35.372	0.161	2.44	103	1.6	-	82	-0.040	5.88	0.011
228	35.526	0.154	2.43	103	1.6	-	82	-0.038	5.81	0.011
229	35.686	0.160	2.43	103	2.0	-	82	-0.038	5.70	0.009
230	35.846	0.160	2.43	103	1.8	100	82	-0.037	5.68	0.011
231	35.999	0.153	2.43	103	2.0	-	82	-0.039	5.69	0.007
232	36.160	0.161	2.43	103	1.7	-	82	-0.038	5.69	0.010
233	36.315	0.155	2.43	103	1.7	-	82	-0.037	5.64	0.007
234	36.474	0.159	2.44	103	1.6	-	82	-0.035	5.63	0.008
235	36.636	0.162	2.44	103	1.6	-	82	-0.036	5.58	0.009
236	36.789	0.153	2.43	103	1.7	-	82	-0.036	5.59	0.007
237	36.949	0.160	2.43	103	2.1	-	82	-0.036	5.52	0.010
238	37.105	0.156	2.43	103	1.8	-	82	-0.035	5.53	0.009
239	37.266	0.161	2.43	103	1.8	-	82	-0.036	5.51	0.011
240	37.422	0.156	2.43	103	1.7	100	82	-0.034	5.51	0.009
241	37.579	0.157	2.43	103	1.7	-	82	-0.036	5.53	0.009
242	37.738	0.159	2.42	103	2.1	-	82	-0.036	5.52	0.010
243	37.895	0.157	2.43	103	1.6	-	82	-0.035	5.23	0.013
244	38.056	0.161	2.44	103	1.7	-	82	-0.034	5.22	0.007
245	38.211	0.155	2.43	103	1.6	-	82	-0.035	5.20	0.008
246	38.370	0.159	2.43	103	2.1	-	82	-0.034	5.24	0.009
247	38.530	0.160	2.42	103	2.1	-	82	-0.033	5.21	0.015
248	38.685	0.155	2.43	103	1.8	-	82	-0.035	5.22	0.008
249	38.844	0.159	2.44	103	1.6	-	82	-0.033	5.24	0.011
250	39.000	0.156	2.43	103	1.6	99	82	-0.032	5.28	0.011
251	39.160	0.160	2.43	103	1.9	-	82	-0.034	5.24	0.010
252	39.318	0.158	2.44	103	1.9	-	82	-0.031	5.27	0.010
253	39.474	0.156	2.43	103	1.6	-	82	-0.034	5.23	0.009
254	39.635	0.161	2.43	103	1.9	-	82	-0.033	5.26	0.007
255	39.790	0.155	2.44	103	1.8	-	82	-0.033	5.27	0.009

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	39.950	0.160	2.43	103	1.8	-	82	-0.030	5.28	0.008
257	40.108	0.158	2.44	103	1.9	-	82	-0.035	5.28	0.008
258	40.264	0.156	2.43	103	2.1	-	82	-0.036	5.31	0.006
259	40.425	0.161	2.42	103	2.1	-	82	-0.036	5.41	0.009
260	40.580	0.155	2.43	103	2.1	99	82	-0.038	5.65	0.008
261	40.740	0.160	2.43	103	2.1	-	82	-0.036	5.72	0.009
262	40.899	0.159	2.44	103	1.6	-	82	-0.036	5.74	0.008
263	41.054	0.155	2.43	103	1.7	-	82	-0.038	5.83	0.007
264	41.215	0.161	2.43	103	2.0	-	82	-0.037	5.88	0.007
265	41.370	0.155	2.43	103	1.8	-	82	-0.039	5.89	0.011
266	41.529	0.159	2.43	103	1.6	-	82	-0.037	5.89	0.011
267	41.688	0.159	2.43	103	2.0	-	82	-0.039	5.87	0.012
268	41.844	0.156	2.43	103	1.9	-	82	-0.038	5.91	0.011
269	42.004	0.160	2.43	103	2.1	-	82	-0.038	5.90	0.010
270	42.161	0.157	2.44	103	2.0	99	82	-0.038	5.91	0.008
271	42.319	0.158	2.43	103	1.6	-	82	-0.036	5.89	0.010
272	42.477	0.158	2.43	103	1.6	-	82	-0.041	5.89	0.008
273	42.635	0.158	2.44	103	1.7	-	82	-0.039	5.82	0.012
274	42.793	0.158	2.43	103	2.1	-	82	-0.039	5.76	0.013
275	42.950	0.157	2.43	103	2.1	-	82	-0.038	5.78	0.011
276	43.109	0.159	2.43	103	1.7	-	82	-0.039	5.76	0.011
277	43.267	0.158	2.43	103	1.7	-	82	-0.038	5.75	0.010
278	43.425	0.158	2.43	103	1.7	-	82	-0.038	5.79	0.005
279	43.584	0.159	2.43	103	1.7	-	82	-0.041	5.76	0.008
280	43.740	0.156	2.43	103	1.8	99	82	-0.039	5.84	0.005
281	43.900	0.160	2.44	103	1.7	-	82	-0.038	5.88	0.008
282	44.055	0.155	2.42	103	1.7	-	82	-0.041	5.88	0.008
283	44.215	0.160	2.43	103	1.8	-	82	-0.039	5.87	0.007
284	44.373	0.158	2.43	103	1.6	-	82	-0.040	5.83	0.008
285	44.530	0.157	2.43	103	1.8	-	82	-0.038	5.77	0.013
286	44.691	0.161	2.44	103	2.1	-	82	-0.040	5.75	0.008
287	44.846	0.155	2.44	103	1.7	-	82	-0.039	5.69	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	45.006	0.160	2.43	103	2.0	-	82	-0.039	5.70	0.009
289	45.164	0.158	2.43	103	2.0	-	82	-0.040	5.67	0.012
290	45.320	0.156	2.43	104	1.6	100	82	-0.039	5.66	0.009
291	45.481	0.161	2.43	103	2.1	-	82	-0.037	5.60	0.006
292	45.636	0.155	2.44	103	2.0	-	82	-0.037	5.63	0.009
293	45.796	0.160	2.43	103	2.0	-	82	-0.037	5.57	0.010
294	45.955	0.159	2.44	104	1.5	-	82	-0.039	5.53	0.008
295	46.110	0.155	2.43	104	1.7	-	82	-0.039	5.56	0.009
296	46.271	0.161	2.43	104	1.6	-	82	-0.039	5.57	0.007
297	46.427	0.156	2.44	104	1.6	-	82	-0.040	5.55	0.005
298	46.586	0.159	2.43	104	1.8	-	82	-0.038	5.54	0.009
299	46.745	0.159	2.43	104	1.7	-	82	-0.040	5.56	0.009
300	46.901	0.156	2.44	104	2.1	100	82	-0.040	5.64	0.013
301	47.062	0.161	2.44	104	2.0	-	82	-0.038	5.76	0.007
302	47.218	0.156	2.43	104	1.6	-	82	-0.039	5.73	0.008
303	47.376	0.158	2.43	104	1.5	-	82	-0.036	5.79	0.010
304	47.535	0.159	2.43	104	1.6	-	82	-0.040	5.81	0.010
305	47.692	0.157	2.43	104	1.6	-	82	-0.038	5.82	0.011
306	47.852	0.160	2.43	104	1.7	-	82	-0.038	5.83	0.008
307	48.008	0.156	2.43	104	1.6	-	82	-0.039	5.83	0.009
308	48.168	0.160	2.43	104	1.6	-	82	-0.042	5.85	0.009
309	48.325	0.157	2.44	104	2.1	-	82	-0.040	5.83	0.008
310	48.485	0.160	2.43	104	1.6	100	82	-0.042	5.85	0.007
311	48.642	0.157	2.43	104	1.6	-	82	-0.040	5.90	0.008
312	48.798	0.156	2.43	104	2.1	-	82	-0.036	5.93	0.007
313	48.958	0.160	2.43	104	2.1	-	82	-0.039	5.94	0.007
314	49.118	0.160	2.43	104	2.0	-	82	-0.040	5.95	0.008
315	49.274	0.156	2.43	104	1.6	-	82	-0.039	5.93	0.006
316	49.432	0.158	2.44	104	2.1	-	82	-0.040	5.96	0.010
317	49.589	0.157	2.43	104	1.9	-	82	-0.038	5.93	0.011
318	49.751	0.162	2.43	104	1.5	-	82	-0.041	5.93	0.008
319	49.904	0.153	2.43	104	1.8	-	82	-0.039	5.91	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	50.064	0.160	2.43	104	2.0	99	82	-0.040	6.13	0.009
321	50.222	0.158	2.43	104	1.6	-	82	-0.040	6.21	0.009
322	50.382	0.160	2.43	104	2.1	-	82	-0.040	6.23	0.010
323	50.540	0.158	2.44	104	2.0	-	82	-0.041	6.33	0.009
324	50.695	0.155	2.43	104	1.9	-	82	-0.039	6.29	0.011
325	50.857	0.162	2.43	104	1.8	-	82	-0.039	6.29	0.012
326	51.013	0.156	2.44	104	1.7	-	82	-0.039	6.35	0.008
327	51.169	0.156	2.43	104	2.0	-	82	-0.040	6.35	0.007
328	51.330	0.161	2.43	104	2.1	-	82	-0.042	6.40	0.012
329	51.485	0.155	2.44	104	2.1	-	82	-0.041	6.39	0.009
330	51.645	0.160	2.43	104	2.1	100	82	-0.041	6.40	0.006
331	51.804	0.159	2.43	104	2.0	-	82	-0.041	6.43	0.011
332	51.959	0.155	2.43	104	1.6	-	82	-0.042	6.53	0.011
333	52.120	0.161	2.43	104	1.6	-	82	-0.041	6.51	0.009
334	52.276	0.156	2.43	104	1.6	-	82	-0.042	6.51	0.007
335	52.435	0.159	2.43	104	1.6	-	82	-0.044	6.46	0.008
336	52.594	0.159	2.43	104	1.8	-	82	-0.043	6.49	0.009
337	52.750	0.156	2.44	104	1.6	-	82	-0.042	6.50	0.008
338	52.911	0.161	2.43	104	1.6	-	82	-0.040	6.53	0.010
339	53.067	0.156	2.43	104	1.6	-	82	-0.043	6.53	0.006
340	53.225	0.158	2.43	104	1.5	99	82	-0.043	6.53	0.010
341	53.384	0.159	2.43	104	1.6	-	82	-0.041	6.54	0.009
342	53.541	0.157	2.42	104	1.9	-	82	-0.042	6.54	0.011
343	53.700	0.159	2.43	104	1.6	-	83	-0.043	6.55	0.011
344	53.860	0.160	2.43	104	1.6	-	83	-0.043	6.59	0.009
345	54.017	0.157	2.43	104	1.7	-	83	-0.043	6.61	0.007
346	54.174	0.157	2.43	104	1.8	-	83	-0.041	6.59	0.009
347	54.332	0.158	2.43	104	1.7	-	83	-0.042	6.56	0.010
348	54.491	0.159	2.43	104	1.6	-	83	-0.043	6.61	0.006
349	54.647	0.156	2.43	104	1.6	-	83	-0.046	6.57	0.008
350	54.807	0.160	2.43	104	1.6	99	83	-0.043	6.56	0.011
351	54.964	0.157	2.43	104	1.9	-	83	-0.043	6.57	0.009

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	55.123	0.159	2.43	104	2.1	-	83	-0.042	6.56	0.009
353	55.282	0.159	2.44	104	1.8	-	83	-0.044	6.59	0.008
354	55.438	0.156	2.44	104	2.1	-	83	-0.041	6.57	0.009
355	55.598	0.160	2.44	104	1.7	-	83	-0.042	6.67	0.009
356	55.754	0.156	2.43	104	1.6	-	83	-0.042	6.86	0.006
357	55.914	0.160	2.43	104	1.5	-	83	-0.044	6.88	0.010
358	56.073	0.159	2.44	104	2.1	-	83	-0.042	6.84	0.012
359	56.229	0.156	2.43	104	1.6	-	83	-0.044	6.80	0.007
360	56.390	0.161	2.43	104	1.6	101	83	-0.043	6.76	0.010
361	56.545	0.155	2.43	104	1.8	-	83	-0.046	6.68	0.011
362	56.705	0.160	2.43	104	1.6	-	83	-0.042	6.62	0.010
363	56.863	0.158	2.43	104	1.7	-	83	-0.045	6.62	0.012
364	57.019	0.156	2.43	104	2.1	-	83	-0.045	6.35	0.010
365	57.181	0.162	2.43	104	1.5	-	83	-0.041	6.24	0.012
366	57.336	0.155	2.44	104	1.8	-	83	-0.043	6.17	0.010
367	57.496	0.160	2.44	104	2.0	-	83	-0.041	6.13	0.007
368	57.655	0.159	2.44	104	2.1	-	83	-0.043	6.08	0.007
369	57.811	0.156	2.43	104	1.6	-	83	-0.043	5.99	0.010
370	57.972	0.161	2.43	104	1.8	101	83	-0.044	6.03	0.008
371	58.127	0.155	2.43	104	1.7	-	83	-0.042	6.02	0.009
372	58.287	0.160	2.43	104	2.0	-	83	-0.044	6.02	0.006
373	58.447	0.160	2.43	104	2.0	-	83	-0.043	5.98	0.004
374	58.602	0.155	2.43	104	1.5	-	83	-0.045	5.92	0.009
375	58.763	0.161	2.43	104	1.9	-	83	-0.043	5.93	0.005
376	58.919	0.156	2.43	104	1.5	-	83	-0.043	5.95	0.011
377	59.078	0.159	2.44	105	1.8	-	83	-0.042	6.03	0.010
378	59.238	0.160	2.44	105	2.0	-	83	-0.041	6.03	0.013
379	59.396	0.158	2.43	104	1.9	-	83	-0.041	5.96	0.008
380	59.555	0.159	2.43	105	2.1	100	83	-0.044	5.96	0.005
381	59.711	0.156	2.44	104	1.6	-	83	-0.043	5.99	0.008
382	59.869	0.158	2.43	105	2.0	-	83	-0.044	5.96	0.008
383	60.029	0.160	2.43	105	1.8	-	83	-0.043	5.93	0.009

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
384	60.185	0.156	2.44	105	1.6	-	83	-0.040	5.91	0.006
385	60.346	0.161	2.43	104	1.6	-	83	-0.043	5.89	0.006
386	60.502	0.156	2.44	104	1.6	-	83	-0.044	5.91	0.009
387	60.661	0.159	2.43	104	1.6	-	83	-0.044	5.90	0.008
388	60.820	0.159	2.43	104	2.1	-	83	-0.040	5.90	0.006
389	60.977	0.157	2.44	104	2.0	-	83	-0.043	5.87	0.008
390	61.137	0.160	2.44	104	2.1	100	83	-0.041	5.88	0.008
391	61.294	0.157	2.44	105	2.1	-	83	-0.042	5.92	0.009
392	61.453	0.159	2.44	105	2.1	-	83	-0.042	5.89	0.008
393	61.611	0.158	2.43	105	1.9	-	83	-0.043	5.89	0.009
394	61.771	0.160	2.44	105	1.6	-	83	-0.041	5.89	0.007
395	61.928	0.157	2.43	105	2.1	-	83	-0.042	5.86	0.008
396	62.088	0.160	2.43	105	1.6	-	83	-0.040	5.84	0.008
397	62.245	0.157	2.43	105	1.6	-	83	-0.041	5.78	0.008
398	62.402	0.157	2.43	105	1.9	-	83	-0.041	5.78	0.009
399	62.561	0.159	2.43	105	1.5	-	83	-0.044	5.79	0.009
400	62.722	0.161	2.43	105	1.6	100	83	-0.043	5.75	0.008
401	62.876	0.154	2.43	105	1.9	-	83	-0.043	5.71	0.007
402	63.036	0.160	2.43	105	1.7	-	83	-0.041	5.69	0.009
403	63.193	0.157	2.43	105	2.1	-	83	-0.041	5.66	0.009
404	63.352	0.159	2.43	105	2.1	-	83	-0.043	5.58	0.009
405	63.511	0.159	2.44	105	2.1	-	83	-0.043	5.61	0.007
406	63.668	0.157	2.43	105	2.0	-	83	-0.040	5.50	0.008
407	63.828	0.160	2.43	105	1.6	-	83	-0.041	5.54	0.005
408	63.984	0.156	2.43	105	1.6	-	83	-0.040	5.57	0.007
409	64.144	0.160	2.44	105	1.9	-	83	-0.041	5.55	0.008
410	64.303	0.159	2.44	105	1.7	100	83	-0.041	5.57	0.008
411	64.460	0.157	2.44	105	2.1	-	83	-0.042	5.56	0.009
412	64.620	0.160	2.45	105	1.7	-	83	-0.042	5.55	0.008
413	64.780	0.160	2.43	105	1.5	-	83	-0.043	5.60	0.006
414	64.936	0.156	2.43	105	1.6	-	83	-0.044	5.62	0.007
415	65.095	0.159	2.44	105	1.5	-	83	-0.043	5.64	0.009

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
416	65.252	0.157	2.43	105	1.9	-	83	-0.042	5.66	0.007
417	65.413	0.161	2.44	105	2.1	-	83	-0.042	5.75	0.010
418	65.568	0.155	2.43	105	2.0	-	83	-0.044	5.68	0.007
419	65.728	0.160	2.43	105	1.6	-	83	-0.044	5.72	0.007
420	65.887	0.159	2.44	105	1.7	100	83	-0.042	5.71	0.011
421	66.043	0.156	2.43	105	1.6	-	83	-0.043	5.74	0.007
422	66.205	0.162	2.44	105	1.6	-	83	-0.041	5.69	0.007
423	66.360	0.155	2.43	105	1.5	-	83	-0.043	5.72	0.009
424	66.520	0.160	2.44	105	2.1	-	83	-0.040	5.72	0.010
425	66.679	0.159	2.44	105	1.6	-	83	-0.042	5.77	0.009
426	66.835	0.156	2.44	105	1.9	-	83	-0.044	5.77	0.007
427	66.997	0.162	2.44	105	2.1	-	83	-0.044	5.83	0.006
428	67.154	0.157	2.43	105	1.6	-	83	-0.041	5.81	0.008
429	67.312	0.158	2.44	105	1.8	-	83	-0.042	5.81	0.008
430	67.471	0.159	2.44	105	1.6	101	83	-0.042	5.82	0.008
431	67.627	0.156	2.43	105	1.8	-	83	-0.045	5.81	0.009
432	67.788	0.161	2.43	105	1.7	-	83	-0.042	5.81	0.009
433	67.944	0.156	2.43	105	2.1	-	83	-0.045	5.75	0.008
434	68.104	0.160	2.43	105	1.6	-	83	-0.045	5.76	0.007
435	68.263	0.159	2.43	105	1.8	-	83	-0.041	5.72	0.010
436	68.418	0.155	2.43	105	2.0	-	83	-0.043	5.68	0.008
437	68.580	0.162	2.43	105	2.0	-	83	-0.043	5.71	0.010
438	68.736	0.156	2.44	105	1.7	-	83	-0.042	5.71	0.011
439	68.898	0.162	2.44	105	1.8	-	83	-0.041	5.67	0.009
440	69.055	0.157	2.44	105	2.1	101	83	-0.041	5.61	0.009
441	69.211	0.156	2.43	105	1.8	-	83	-0.042	5.62	0.008
442	69.372	0.161	2.44	105	2.0	-	83	-0.040	5.57	0.007
443	69.527	0.155	2.44	105	1.5	-	83	-0.043	5.54	0.009
444	69.688	0.161	2.43	105	1.7	-	83	-0.044	5.47	0.012
445	69.847	0.159	2.44	105	1.7	-	83	-0.044	5.43	0.006
446	70.003	0.156	2.44	105	1.7	-	83	-0.042	5.30	0.011
447	70.164	0.161	2.44	105	2.0	-	83	-0.046	5.35	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
448	70.320	0.156	2.43	105	2.1	-	83	-0.043	5.26	0.008
449	70.479	0.159	2.44	105	1.9	-	83	-0.044	5.26	0.009
450	70.639	0.160	2.44	105	1.9	100	83	-0.043	5.24	0.005
451	70.795	0.156	2.44	105	1.8	-	83	-0.044	5.15	0.008
452	70.956	0.161	2.43	105	1.8	-	82	-0.041	5.10	0.009
453	71.114	0.158	2.44	105	1.9	-	82	-0.041	5.09	0.006
454	71.271	0.157	2.43	105	1.7	-	83	-0.041	5.00	0.011
455	71.431	0.160	2.43	105	1.6	-	83	-0.043	5.00	0.009
456	71.588	0.157	2.44	105	2.1	-	83	-0.041	4.99	0.009
457	71.748	0.160	2.43	105	1.9	-	82	-0.041	4.94	0.008
458	71.904	0.156	2.44	105	2.1	-	82	-0.042	4.91	0.007
459	72.063	0.159	2.42	105	1.7	-	82	-0.044	4.86	0.008
460	72.226	0.163	2.44	105	2.0	100	82	-0.042	4.80	0.005
461	72.379	0.153	2.44	105	2.1	-	82	-0.040	4.80	0.010
462	72.540	0.161	2.43	105	1.5	-	82	-0.042	4.90	0.006
463	72.697	0.157	2.43	105	2.1	-	82	-0.040	4.85	0.008
464	72.855	0.158	2.43	105	2.0	-	82	-0.045	4.80	0.007
465	73.014	0.159	2.43	105	2.1	-	82	-0.041	4.81	0.010
466	73.171	0.157	2.44	105	1.5	-	82	-0.042	4.72	0.007
467	73.332	0.161	2.44	105	1.7	-	82	-0.042	4.72	0.009
468	73.489	0.157	2.44	105	1.6	-	82	-0.039	4.75	0.007
469	73.648	0.159	2.43	105	1.6	-	82	-0.041	4.74	0.008
470	73.806	0.158	2.43	105	1.7	100	82	-0.041	4.69	0.008
471	73.964	0.158	2.43	105	1.5	-	82	-0.040	4.66	0.005
472	74.124	0.160	2.44	105	1.9	-	82	-0.038	4.64	0.009
473	74.281	0.157	2.44	105	1.6	-	82	-0.040	4.63	0.009
474	74.440	0.159	2.44	105	1.7	-	82	-0.040	4.61	0.008
475	74.601	0.161	2.43	105	1.7	-	82	-0.039	4.60	0.008
476	74.756	0.155	2.44	105	1.8	-	82	-0.039	4.61	0.006
477	74.916	0.160	2.44	105	1.5	-	82	-0.038	4.55	0.009
478	75.076	0.160	2.44	105	2.1	-	82	-0.040	4.53	0.007
479	75.233	0.157	2.44	105	1.6	-	82	-0.039	4.52	0.008

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
480	75.391	0.158	2.44	105	1.5	100	82	-0.039	4.49	0.006
481	75.549	0.158	2.44	105	2.1	-	82	-0.039	4.49	0.008
482	75.708	0.159	2.43	105	1.8	-	82	-0.039	4.48	0.007
483	75.865	0.157	2.43	105	1.9	-	82	-0.038	4.48	0.010
484	76.025	0.160	2.44	105	2.1	-	82	-0.038	4.46	0.007
485	76.183	0.158	2.44	105	2.0	-	82	-0.041	4.44	0.006
486	76.341	0.158	2.44	105	1.5	-	82	-0.039	4.43	0.006
487	76.500	0.159	2.43	105	1.7	-	82	-0.040	4.43	0.007
488	76.657	0.157	2.43	105	2.1	-	82	-0.039	4.42	0.009
489	76.820	0.163	2.44	105	2.0	-	82	-0.039	4.41	0.010
490	76.975	0.155	2.44	105	1.8	100	82	-0.038	4.40	0.010
491	77.134	0.159	2.44	105	1.7	-	82	-0.040	4.43	0.005
492	77.293	0.159	2.44	105	1.6	-	82	-0.039	4.39	0.005
493	77.450	0.157	2.44	105	2.0	-	82	-0.038	4.40	0.009
494	77.609	0.159	2.44	105	1.5	-	82	-0.036	4.45	0.009
495	77.767	0.158	2.44	105	1.9	-	82	-0.039	4.54	0.008
496	77.926	0.159	2.44	105	1.9	-	82	-0.040	4.53	0.006
497	78.085	0.159	2.44	105	2.1	-	82	-0.038	4.45	0.007
498	78.242	0.157	2.44	105	1.8	-	82	-0.037	4.50	0.007
499	78.402	0.160	2.44	105	1.6	-	82	-0.039	4.47	0.011
500	78.560	0.158	2.43	105	2.1	101	82	-0.037	4.45	0.008
501	78.719	0.159	2.44	105	1.7	-	82	-0.038	4.38	0.010
502	78.878	0.159	2.44	105	1.5	-	82	-0.037	4.39	0.011
503	79.035	0.157	2.43	105	1.8	-	82	-0.037	4.38	0.009
504	79.194	0.159	2.44	105	2.0	-	82	-0.037	4.37	0.006
505	79.351	0.157	2.44	105	1.6	-	82	-0.038	4.21	0.008
506	79.511	0.160	2.44	105	2.0	-	82	-0.038	4.08	0.009
507	79.670	0.159	2.44	105	1.6	-	82	-0.039	4.12	0.007
508	79.827	0.157	2.44	105	2.0	-	82	-0.037	4.05	0.007
509	79.987	0.160	2.44	105	1.7	-	82	-0.037	4.05	0.008
510	80.144	0.157	2.44	105	2.1	101	82	-0.038	4.08	0.006
511	80.304	0.160	2.44	105	2.1	-	82	-0.038	4.01	0.008

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
512	80.465	0.161	2.44	105	1.8	-	82	-0.036	4.00	0.006
513	80.620	0.155	2.44	105	2.0	-	82	-0.038	4.01	0.009
514	80.780	0.160	2.44	105	2.1	-	82	-0.037	4.01	0.007
515	80.936	0.156	2.43	105	1.7	-	82	-0.035	4.02	0.007
516	81.096	0.160	2.44	105	1.6	-	82	-0.036	4.04	0.008
517	81.256	0.160	2.44	105	1.8	-	82	-0.037	4.21	0.005
518	81.412	0.156	2.44	105	1.5	-	82	-0.035	4.21	0.009
519	81.573	0.161	2.44	105	1.7	-	82	-0.033	4.22	0.007
520	81.729	0.156	2.43	105	2.0	101	82	-0.037	4.24	0.006
Avg/Tot	81.729	0.157	2.42	100.6	1.8	100	82.2	-0.044	6.41	0.019

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	-0.004		0.03	79	0.5		77
1	0.122	0.126	1.06	78	1.7	-	77
2	0.273	0.151	1.06	78	1.6	-	77
3	0.423	0.150	1.06	78	1.8	-	78
4	0.574	0.151	1.07	79	1.7	-	78
5	0.725	0.151	1.07	79	1.7	-	78
6	0.876	0.151	1.07	79	1.9	-	78
7	1.028	0.152	1.08	79	1.7	-	78
8	1.180	0.152	1.09	79	1.7	-	78
9	1.333	0.153	1.10	79	1.9	-	78
10	1.485	0.152	1.09	80	1.7	98	78
11	1.638	0.153	1.09	80	1.9	-	78
12	1.795	0.157	1.10	80	1.7	-	78
13	1.948	0.153	1.10	80	1.7	-	78
14	2.099	0.151	1.10	81	1.9	-	79
15	2.253	0.154	1.10	81	1.9	-	78
16	2.406	0.153	1.10	81	1.8	-	78
17	2.560	0.154	1.10	81	1.9	-	78
18	2.715	0.155	1.10	82	1.7	-	78
19	2.870	0.155	1.11	82	1.8	-	78
20	3.024	0.154	1.11	82	1.9	100	79
21	3.178	0.154	1.11	83	1.7	-	79
22	3.334	0.156	1.12	83	1.7	-	78
23	3.490	0.156	1.12	83	1.9	-	78
24	3.646	0.156	1.13	83	1.7	-	78
25	3.801	0.155	1.12	83	1.9	-	78
26	3.961	0.160	1.13	83	1.8	-	78
27	4.118	0.157	1.13	84	1.8	-	78
28	4.270	0.152	1.13	84	1.7	-	78
29	4.428	0.158	1.13	84	1.7	-	78
30	4.586	0.158	1.14	84	1.9	100	78
31	4.742	0.156	1.14	85	1.7	-	78

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32	4.901	0.159	1.14	85	1.7	-	78
33	5.059	0.158	1.15	85	1.9	-	78
34	5.216	0.157	1.14	85	1.8	-	78
35	5.375	0.159	1.14	86	1.7	-	78
36	5.534	0.159	1.15	86	1.9	-	78
37	5.691	0.157	1.14	86	1.9	-	78
38	5.850	0.159	1.15	86	1.7	-	78
39	6.010	0.160	1.15	87	1.8	-	79
40	6.170	0.160	1.15	87	1.7	101	79
41	6.329	0.159	1.16	87	1.7	-	79
42	6.485	0.156	1.15	88	1.7	-	79
43	6.645	0.160	1.16	88	1.7	-	79
44	6.803	0.158	1.15	88	1.9	-	79
45	6.963	0.160	1.15	88	1.9	-	79
46	7.123	0.160	1.16	89	1.8	-	79
47	7.281	0.158	1.15	89	1.8	-	79
48	7.442	0.161	1.16	89	1.7	-	79
49	7.600	0.158	1.16	89	1.8	-	79
50	7.761	0.161	1.16	89	1.7	101	79
51	7.921	0.160	1.16	89	1.7	-	79
52	8.081	0.160	1.16	90	1.9	-	79
53	8.241	0.160	1.16	90	1.8	-	79
54	8.403	0.162	1.16	90	1.7	-	79
55	8.564	0.161	1.16	90	1.7	-	79
56	8.720	0.156	1.15	91	1.8	-	79
57	8.882	0.162	1.16	90	1.8	-	79
58	9.040	0.158	1.16	91	1.9	-	79
59	9.202	0.162	1.16	91	1.9	-	79
60	9.362	0.160	1.17	91	1.8	101	79
Avg/Tot	9.366	0.156	1.11	84.5	1.7	100	78.5

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	399	397	313	212	260	316.2	497.1
1	404	394	317	211	263	317.9	461.7
2	402	390	319	211	265	317.4	439.3
3	402	387	323	210	268	318.3	439.2
4	401	385	331	210	271	319.5	468.8
5	401	386	339	210	274	322.0	548.5
6	410	388	336	211	276	324.2	580.1
7	412	387	330	211	276	323.1	604.2
8	411	385	323	211	275	321.1	616.3
9	410	383	319	211	273	318.9	616.1
10	408	380	314	211	270	316.3	609.9
11	405	377	308	210	268	313.6	602.7
12	402	374	304	210	265	311.0	594.7
13	400	370	301	210	263	308.8	587.9
14	397	367	296	209	261	306.1	583.1
15	395	364	293	209	260	303.9	580.9
16	391	361	289	208	258	301.5	577.2
17	389	358	286	207	257	299.3	575.5
18	387	355	284	206	255	297.4	573.7
19	384	352	282	205	254	295.4	573.5
20	382	350	280	205	253	293.6	573.1
21	379	347	277	204	251	291.5	573.8
22	377	345	276	203	250	290.1	574.3
23	375	342	274	202	249	288.2	576.7
24	373	340	272	201	248	286.5	579.3
25	371	337	271	200	246	284.9	581.1
26	369	335	268	199	245	283.3	582.8
27	368	333	267	198	244	281.9	584.1
28	366	331	266	198	243	280.6	585.3
29	364	329	264	197	242	279.1	586.4
30	363	327	262	196	241	277.7	586.9
31	361	325	262	196	240	276.6	589.8
32	360	323	260	195	239	275.2	594.1
33	358	321	259	195	238	274.1	597.6
34	357	319	258	194	237	273.0	600.6
35	356	318	257	193	236	271.9	603.8
36	355	316	256	193	235	270.8	607.5
37	354	315	254	193	234	269.7	615.7
38	352	313	253	192	233	268.7	626.4
39	351	312	253	192	232	267.9	639.4
40	350	310	252	192	231	267.1	653.6
41	349	309	252	192	231	266.3	669.2
42	349	308	251	192	230	265.8	682.1
43	348	306	252	192	229	265.3	694.7
44	347	305	251	193	228	264.8	707.5
45	346	304	251	193	227	264.3	718.7
46	346	304	251	194	226	264.1	730.8
47	346	303	251	195	225	264.0	741.6

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
48	346	302	251	196	224	263.9	752.7	
49	346	302	251	197	224	263.8	763.9	
50	346	302	250	198	223	263.5	775.0	
51	346	301	251	200	222	263.9	785.1	
52	346	301	251	201	221	264.2	796.8	
53	347	301	250	203	221	264.2	808.1	
54	347	301	253	205	220	265.2	815.9	
55	349	302	257	207	219	266.7	807.3	
56	351	303	258	209	219	267.8	788.6	
57	353	304	259	211	218	269.1	766.9	
58	356	305	260	213	217	270.2	750.7	
59	359	306	260	214	217	271.3	737.0	
60	361	307	263	216	216	272.7	728.5	
61	364	308	263	217	216	273.4	721.0	
62	367	309	263	218	215	274.2	713.2	
63	369	309	263	218	215	274.7	709.3	
64	371	309	263	219	214	275.2	706.5	
65	372	309	262	219	214	275.2	704.3	
66	373	309	262	220	213	275.3	703.0	
67	373	309	262	220	213	275.4	700.3	
68	374	309	261	220	212	275.2	699.1	
69	375	309	261	220	212	275.3	698.2	
70	375	309	260	220	211	275.0	698.2	
71	376	309	259	220	211	274.9	697.6	
72	376	309	260	220	210	275.0	697.5	
73	376	309	261	220	210	275.1	697.8	
74	376	309	260	220	209	275.0	697.9	
75	377	309	260	220	208	274.9	698.4	
76	377	309	260	220	208	274.9	698.1	
77	378	309	261	220	208	275.2	699.1	
78	378	309	261	221	207	275.2	700.8	
79	379	310	260	221	207	275.1	700.8	
80	379	310	260	221	207	275.2	702.8	
81	379	310	261	221	206	275.4	703.8	
82	380	310	260	221	206	275.1	705.1	
83	379	310	260	221	205	275.1	705.4	
84	380	310	260	221	205	275.2	706.0	
85	380	310	259	221	205	275.1	706.8	
86	381	310	260	222	204	275.1	707.9	
87	381	310	259	222	204	275.1	707.5	
88	381	310	260	222	203	275.1	708.5	
89	381	310	259	222	203	274.8	708.3	
90	381	310	259	222	203	274.8	707.8	
91	381	310	258	222	202	274.6	714.9	
92	381	310	260	222	202	274.9	733.0	
93	381	310	260	222	201	274.9	758.1	
94	381	310	259	222	201	274.7	785.1	
95	382	310	260	223	200	274.9	811.0	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	382	310	261	223	200	275.2	833.3
97	383	311	261	224	200	275.6	854.2
98	383	311	262	226	199	276.1	875.2
99	383	312	262	227	199	276.6	893.8
100	384	312	263	229	199	277.2	910.5
101	385	313	264	231	198	278.3	926.1
102	385	314	265	234	198	279.1	940.0
103	386	315	267	236	198	280.4	946.6
104	387	317	271	239	198	282.3	927.7
105	389	319	273	242	197	284.0	897.8
106	390	321	275	245	197	285.7	870.0
107	392	323	276	247	197	287.0	847.6
108	394	325	277	249	197	288.1	827.5
109	395	326	276	250	196	288.6	811.8
110	397	327	278	250	196	289.5	798.8
111	399	328	278	251	196	290.1	791.7
112	400	329	278	252	195	290.7	790.2
113	402	329	278	251	195	291.0	789.6
114	403	330	278	251	195	291.4	788.1
115	404	331	278	251	194	291.7	785.1
116	406	331	278	251	194	291.9	781.9
117	407	332	278	251	194	292.1	777.1
118	408	332	278	250	193	292.4	770.6
119	409	332	278	250	193	292.5	766.4
120	409	333	278	249	193	292.3	759.9
121	410	333	279	249	193	292.5	754.1
122	410	333	279	248	192	292.3	748.7
123	409	333	280	247	192	292.2	742.7
124	409	333	280	246	192	292.0	737.6
125	408	333	280	245	191	291.6	731.0
126	408	333	281	244	191	291.5	726.9
127	408	333	282	243	191	291.2	721.5
128	407	334	283	242	190	291.2	715.8
129	406	335	283	241	190	290.8	710.3
130	405	335	282	240	190	290.3	704.9
131	404	336	281	239	190	289.9	701.1
132	403	337	282	238	189	289.7	698.2
133	402	339	280	236	189	289.3	693.9
134	400	341	280	235	189	289.1	690.7
135	399	343	279	234	189	288.6	687.3
136	397	344	280	233	189	288.7	686.9
137	395	346	277	232	188	287.8	688.2
138	394	348	277	231	188	287.6	690.9
139	393	350	277	230	188	287.4	694.6
140	391	352	276	229	188	287.1	700.4
141	390	354	276	228	187	286.9	705.6
142	388	355	275	227	187	286.3	709.5
143	386	356	275	226	187	286.1	712.7

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	384	357	274	226	187	285.5	715.8
145	383	358	275	225	187	285.5	717.1
146	382	360	274	224	186	285.1	717.2
147	381	361	273	223	186	284.9	715.9
148	380	362	274	222	186	284.8	714.3
149	378	362	274	222	186	284.3	712.3
150	377	361	274	222	186	283.8	712.0
151	376	360	273	221	186	282.9	713.2
152	376	358	272	220	186	282.4	715.3
153	374	357	271	220	185	281.4	716.0
154	373	355	270	219	185	280.6	715.0
155	372	354	270	219	185	280.0	714.2
156	372	352	269	218	185	279.3	712.5
157	371	351	269	218	185	278.7	712.2
158	370	350	268	218	185	277.9	709.3
159	370	348	268	217	185	277.5	710.0
160	369	347	268	217	185	277.1	709.9
161	369	346	267	217	185	276.6	710.9
162	368	345	267	216	184	276.2	712.0
163	369	344	266	216	184	275.8	713.5
164	368	343	266	216	184	275.4	715.4
165	368	343	266	215	184	275.1	718.5
166	368	341	266	215	184	274.9	721.1
167	368	341	265	215	184	274.6	722.6
168	368	340	265	215	184	274.4	726.5
169	368	339	265	215	184	274.3	730.1
170	369	339	266	215	184	274.5	732.7
171	369	338	266	215	184	274.5	734.9
172	369	338	266	215	184	274.3	737.6
173	370	337	266	215	184	274.3	737.7
174	370	336	264	215	184	274.0	742.7
175	370	336	265	215	185	274.2	746.1
176	371	335	266	216	185	274.3	751.7
177	371	335	265	216	185	274.3	756.2
178	371	335	264	216	185	274.2	759.2
179	371	334	265	217	185	274.3	761.6
180	371	334	264	217	185	274.3	765.2
181	372	334	264	218	185	274.5	766.6
182	372	334	265	218	185	274.9	767.4
183	373	334	266	218	185	275.4	766.2
184	373	334	265	219	185	275.2	764.9
185	374	334	265	219	185	275.3	767.0
186	374	334	265	220	185	275.6	770.1
187	374	334	265	220	186	275.8	769.1
188	375	334	265	221	186	275.9	766.5
189	375	334	266	221	186	276.2	764.7
190	376	333	265	222	186	276.2	760.0
191	376	333	265	222	186	276.3	756.1

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	376	333	267	222	186	276.8	750.8
193	376	333	265	222	186	276.6	746.9
194	377	333	266	222	186	276.7	740.7
195	377	333	266	222	186	276.8	736.7
196	378	332	266	222	186	276.8	730.9
197	378	332	266	222	187	277.0	725.9
198	378	332	266	222	187	276.9	720.6
199	379	332	266	222	187	276.9	715.8
200	379	332	266	221	187	276.8	712.7
201	379	331	265	221	187	276.6	707.6
202	380	331	265	220	187	276.4	705.3
203	379	331	266	220	187	276.4	701.4
204	379	330	264	219	187	275.9	698.8
205	379	330	264	219	187	275.7	696.0
206	379	329	263	218	187	275.4	693.2
207	379	329	263	217	188	275.2	691.2
208	379	329	264	217	188	275.2	687.9
209	379	328	263	216	188	274.8	684.9
210	379	328	262	216	188	274.4	681.3
211	379	327	261	215	188	273.9	678.1
212	379	327	262	214	188	273.8	674.8
213	379	326	262	213	188	273.6	670.4
214	379	326	261	213	188	273.2	665.7
215	379	325	260	212	188	272.7	661.2
216	378	325	260	211	188	272.4	657.0
217	378	324	259	210	188	271.8	652.5
218	378	324	258	210	188	271.3	650.8
219	377	323	259	209	188	271.1	645.5
220	377	322	258	208	188	270.8	642.7
221	376	322	258	207	188	270.1	638.8
222	376	321	257	207	188	269.8	637.3
223	375	321	257	206	188	269.2	635.6
224	374	320	257	205	188	269.0	632.8
225	374	319	257	204	188	268.5	626.8
226	373	319	256	203	188	268.0	621.4
227	373	318	256	202	189	267.5	617.2
228	372	317	256	202	189	267.2	613.0
229	371	317	255	201	189	266.6	609.3
230	370	316	254	200	189	265.9	604.8
231	370	315	254	199	189	265.4	601.7
232	369	314	253	199	189	264.7	598.8
233	368	313	253	198	189	264.2	595.9
234	368	313	253	197	189	263.9	592.1
235	366	312	252	196	189	263.1	589.3
236	366	311	251	195	189	262.5	585.0
237	365	310	251	194	189	262.0	581.7
238	364	310	250	194	189	261.3	578.4
239	363	309	249	193	189	260.7	574.1

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	362	308	250	192	189	260.3	572.7
241	362	307	249	191	189	259.7	569.5
242	361	307	248	190	189	258.9	566.2
243	360	306	248	189	189	258.3	564.6
244	359	305	245	189	189	257.5	560.3
245	358	304	245	188	189	256.8	558.6
246	357	303	244	187	189	256.3	556.3
247	356	302	244	186	189	255.5	552.8
248	355	302	243	186	189	254.8	550.1
249	354	301	242	185	189	254.1	547.2
250	353	300	242	184	189	253.7	543.9
251	353	299	241	183	189	253.0	542.1
252	352	298	241	183	189	252.4	539.9
253	351	297	240	182	189	251.6	537.0
254	350	297	239	181	189	251.0	534.4
255	349	296	239	181	188	250.4	532.0
256	348	295	238	180	188	249.8	531.6
257	347	294	237	179	188	249.0	530.0
258	346	293	237	178	188	248.5	534.6
259	345	293	236	178	188	247.7	541.0
260	344	292	236	177	188	247.3	544.2
261	343	292	235	177	187	246.8	542.6
262	343	291	236	176	187	246.6	540.8
263	342	291	236	176	187	246.3	539.6
264	341	291	236	175	187	246.0	538.5
265	341	291	236	175	187	245.7	536.6
266	341	290	236	174	187	245.5	535.7
267	340	290	236	174	186	245.3	535.4
268	339	290	237	173	186	245.2	534.4
269	339	290	237	173	186	245.0	534.2
270	338	290	238	173	186	244.9	534.3
271	338	291	237	172	186	244.8	533.9
272	338	291	237	172	186	244.5	535.3
273	338	290	237	172	186	244.5	535.2
274	337	290	237	171	186	244.2	535.6
275	337	291	237	171	186	244.1	536.1
276	337	291	237	171	186	244.1	536.0
277	336	291	237	171	186	243.9	536.9
278	336	291	236	170	185	243.6	537.0
279	336	291	237	170	185	243.6	536.6
280	335	291	237	170	185	243.6	537.2
281	335	291	237	170	185	243.4	538.0
282	334	291	237	169	185	243.4	538.0
283	334	291	237	169	185	243.3	539.2
284	333	291	237	169	185	243.0	541.3
285	333	291	236	169	185	243.0	541.4
286	333	292	237	169	185	242.9	541.3
287	332	292	235	169	185	242.5	541.2

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	332	292	236	169	185	242.7	541.6
289	332	292	235	168	185	242.4	540.8
290	332	292	236	168	185	242.5	540.6
291	332	292	236	168	184	242.6	539.2
292	331	293	235	168	184	242.3	538.9
293	330	292	236	168	184	242.2	538.4
294	330	293	235	168	184	242.0	537.8
295	330	293	236	168	184	242.0	537.5
296	330	293	235	168	184	241.8	538.6
297	329	293	236	168	184	241.9	540.8
298	329	293	235	168	184	241.6	541.7
299	329	293	235	168	184	241.5	543.0
300	328	293	234	167	184	241.2	544.5
301	327	293	235	168	183	241.2	545.4
302	327	294	234	167	183	241.0	547.3
303	327	294	234	167	183	240.8	549.0
304	326	294	234	167	183	240.8	550.3
305	326	294	233	167	183	240.6	552.3
306	326	294	233	167	183	240.7	553.9
307	326	294	234	167	183	240.8	557.2
308	326	294	233	167	183	240.7	559.4
309	326	294	233	167	183	240.7	561.0
310	326	294	233	167	183	240.7	562.8
311	327	295	234	167	183	240.9	564.8
312	327	295	233	167	183	241.0	566.1
313	327	295	233	167	183	240.9	567.9
314	327	295	233	167	183	241.0	569.6
315	327	295	232	168	183	240.9	570.4
316	327	296	233	167	183	241.2	572.3
317	327	296	232	168	183	241.2	573.1
318	327	296	233	168	183	241.5	575.3
319	328	296	233	168	183	241.5	577.0
320	327	297	234	168	183	241.7	577.2
321	327	297	233	168	183	241.7	580.5
322	328	298	232	168	183	241.6	583.6
323	328	298	232	168	183	241.8	586.6
324	328	299	232	168	183	242.1	590.3
325	329	299	232	168	183	242.2	594.3
326	329	300	232	168	183	242.3	598.4
327	329	301	232	168	183	242.6	601.0
328	329	301	232	169	183	242.8	603.8
329	329	301	232	169	183	242.8	609.0
330	330	302	232	169	183	243.0	612.6
331	330	303	230	169	183	243.0	615.1
332	330	303	231	170	183	243.4	618.5
333	330	304	232	170	183	243.7	622.0
334	331	304	233	170	183	244.0	626.0
335	331	304	232	170	183	243.9	627.8

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
336	331	304	233	170	183	244.2	630.6	
337	332	305	233	171	183	244.5	631.6	
338	332	306	233	171	183	244.8	633.2	
339	332	306	233	171	183	244.9	635.6	
340	332	307	233	171	183	245.3	636.6	
341	332	308	234	172	183	245.5	638.3	
342	333	308	234	172	183	245.9	637.7	
343	333	309	235	172	183	246.2	639.7	
344	333	309	235	173	183	246.6	641.1	
345	334	310	234	173	183	246.8	642.3	
346	334	311	235	174	183	247.2	643.3	
347	335	311	235	174	183	247.7	645.4	
348	335	312	236	174	183	248.0	644.6	
349	335	313	236	174	183	248.2	645.2	
350	335	314	237	175	183	248.7	643.8	
351	336	315	237	175	183	249.0	644.0	
352	336	315	237	176	183	249.3	643.5	
353	336	316	236	176	183	249.5	643.5	
354	337	317	238	176	183	250.0	642.6	
355	337	317	238	177	183	250.3	643.1	
356	337	318	238	177	183	250.6	642.8	
357	338	319	240	177	183	251.3	644.2	
358	338	320	241	178	183	251.7	646.0	
359	339	321	240	178	183	252.1	649.9	
360	338	321	241	179	183	252.4	651.9	
361	339	322	241	179	183	252.6	652.6	
362	339	323	241	179	183	252.9	652.7	
363	339	324	242	180	183	253.3	654.4	
364	339	325	243	180	183	253.7	653.2	
365	339	325	242	180	183	253.7	651.7	
366	339	326	241	180	183	253.8	649.0	
367	339	327	241	181	183	254.1	643.4	
368	340	328	241	181	183	254.4	638.3	
369	340	328	241	181	183	254.6	632.8	
370	340	329	241	182	183	254.7	628.6	
371	340	330	241	182	183	255.0	624.8	
372	340	330	241	182	183	255.2	620.7	
373	341	331	242	182	183	255.5	615.9	
374	341	331	241	182	183	255.5	613.4	
375	341	332	242	182	183	255.8	611.9	
376	340	332	242	182	183	255.9	610.3	
377	341	333	242	182	183	256.0	608.5	
378	340	334	244	182	183	256.5	608.4	
379	340	334	243	181	183	256.5	607.0	
380	340	335	245	181	183	256.8	604.3	
381	341	335	243	181	183	256.7	602.8	
382	341	336	245	181	183	257.3	601.8	
383	341	337	246	181	183	257.4	599.5	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	340	337	245	181	183	257.4	599.1
385	341	338	246	181	183	257.6	596.8
386	340	338	246	181	183	257.7	596.3
387	340	339	246	181	183	257.7	596.5
388	340	339	246	180	183	257.8	595.9
389	340	340	247	180	183	258.0	596.0
390	340	340	246	180	183	258.0	595.5
391	340	341	245	180	183	257.8	594.1
392	340	341	247	180	183	258.3	593.9
393	340	341	247	180	183	258.2	594.1
394	339	342	247	180	183	258.2	594.3
395	339	342	248	180	183	258.4	593.3
396	339	342	248	180	183	258.5	593.6
397	338	343	247	180	183	258.1	593.2
398	338	343	248	180	183	258.4	592.9
399	338	343	247	179	183	258.1	593.7
400	338	343	248	179	183	258.1	594.7
401	337	343	248	179	183	258.2	594.7
402	337	343	249	179	183	258.3	595.2
403	337	344	249	179	183	258.2	594.8
404	336	344	248	179	183	258.0	596.4
405	336	344	248	179	183	258.0	594.1
406	336	344	248	179	183	257.9	593.3
407	335	344	248	179	183	257.7	593.1
408	335	344	249	179	183	257.8	592.8
409	335	344	247	179	183	257.4	592.7
410	334	343	249	179	183	257.5	590.8
411	333	343	248	179	183	257.3	589.9
412	333	343	248	179	182	257.0	588.8
413	333	343	249	179	182	257.0	587.8
414	332	342	248	179	182	256.8	586.5
415	332	343	248	179	182	256.7	584.2
416	332	342	250	178	182	256.8	584.4
417	331	342	249	178	182	256.5	585.1
418	331	342	249	178	182	256.3	586.9
419	330	342	249	178	182	256.4	586.2
420	330	342	249	178	182	256.2	587.1
421	330	342	249	178	182	256.3	588.8
422	330	342	249	178	182	256.3	589.3
423	329	343	249	178	182	256.1	591.0
424	329	343	249	178	182	256.1	591.9
425	329	343	249	178	182	256.0	593.1
426	329	343	249	177	182	256.0	595.8
427	328	343	249	177	182	256.0	597.1
428	328	343	249	177	182	255.9	598.8
429	328	343	250	178	182	256.0	601.9
430	328	343	250	178	182	256.0	603.2
431	327	343	250	177	182	256.0	604.7

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	328	343	250	178	182	256.0	606.5
433	327	344	250	177	182	256.0	606.7
434	327	343	249	177	182	255.9	608.6
435	327	343	250	177	182	255.9	609.0
436	327	344	250	178	182	255.9	611.5
437	327	343	249	177	182	255.8	612.1
438	326	343	249	178	182	255.7	611.9
439	327	343	249	178	182	255.7	612.4
440	326	344	249	178	182	255.8	612.2
441	326	343	249	178	182	255.7	612.0
442	326	344	248	178	182	255.6	612.3
443	326	344	248	178	182	255.6	612.7
444	325	344	249	178	182	255.6	610.0
445	325	344	249	178	182	255.5	608.4
446	325	344	247	178	182	255.2	607.5
447	324	344	248	178	182	255.3	605.7
448	324	344	247	178	182	255.0	603.8
449	324	344	248	178	182	255.2	601.7
450	324	344	246	178	182	254.6	599.9
451	323	344	246	178	182	254.6	597.9
452	323	344	247	178	182	254.6	595.4
453	323	343	246	178	182	254.3	592.9
454	322	343	246	178	181	254.0	590.5
455	322	343	245	178	181	253.8	587.8
456	322	343	246	178	181	253.9	585.1
457	322	343	246	177	181	253.8	582.1
458	321	343	245	177	181	253.5	579.8
459	321	343	245	177	181	253.3	577.6
460	321	343	245	177	181	253.0	573.8
461	320	342	244	177	181	252.7	572.7
462	320	342	244	176	181	252.6	568.7
463	320	342	243	176	180	252.2	566.1
464	319	342	242	176	180	251.7	562.3
465	319	342	241	176	180	251.6	559.4
466	318	342	240	175	180	251.2	556.8
467	318	342	241	175	180	251.0	553.7
468	317	341	241	175	180	250.8	551.8
469	317	341	240	174	180	250.3	549.4
470	316	341	240	174	180	250.0	548.5
471	316	341	239	174	179	249.8	546.0
472	315	340	240	173	179	249.5	543.5
473	314	340	239	173	179	249.1	541.6
474	314	340	239	173	179	248.7	540.0
475	313	340	238	173	179	248.4	538.9
476	313	339	238	172	179	248.2	538.6
477	312	339	238	172	178	247.9	536.9
478	311	339	238	172	178	247.5	535.1
479	311	339	238	171	178	247.3	533.6

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

Stove ΔT: 84

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	310	338	237	171	178	246.8	532.0
481	310	338	236	171	178	246.3	530.9
482	309	338	236	170	177	246.1	528.8
483	308	337	237	170	177	245.9	528.2
484	308	337	237	170	177	245.7	527.0
485	307	337	237	169	177	245.4	524.4
486	306	337	236	169	176	244.9	523.0
487	305	337	235	169	176	244.2	521.7
488	305	336	235	168	176	243.9	520.0
489	304	336	235	168	176	243.6	519.4
490	304	335	236	168	176	243.6	518.3
491	303	335	235	167	175	243.0	516.8
492	302	335	234	167	175	242.5	515.7
493	301	335	234	167	174	242.1	514.6
494	301	334	235	166	174	242.0	513.6
495	300	334	234	166	174	241.6	513.2
496	299	334	234	166	174	241.2	514.2
497	299	334	234	166	173	241.0	513.1
498	298	333	233	165	173	240.6	513.9
499	298	333	234	165	173	240.4	512.8
500	297	333	233	165	172	239.8	513.2
501	296	332	233	164	172	239.6	512.6
502	296	332	233	164	172	239.3	512.4
503	295	331	233	164	172	238.9	511.9
504	295	331	232	164	171	238.6	511.4
505	294	331	232	163	171	238.1	509.6
506	293	331	231	163	171	237.7	508.2
507	293	330	232	163	170	237.6	505.9
508	292	330	231	162	170	237.1	503.2
509	291	330	231	162	169	236.7	501.9
510	290	329	230	162	169	236.1	498.4
511	290	328	229	162	169	235.5	495.8
512	289	328	230	162	168	235.2	493.0
513	288	327	229	161	168	234.7	490.4
514	288	326	228	161	168	234.2	488.5
515	287	326	229	161	167	233.8	486.9
516	286	325	229	160	167	233.5	485.1
517	286	324	228	160	167	232.9	484.3
518	285	324	228	160	166	232.7	482.6
519	284	323	228	160	166	232.2	483.1
520	284	322	228	159	166	231.7	482.0
Average	351.1	325.3	253.0	194.0	192.6	263.2	631.1

LAB SAMPLE DATA - ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 1

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 7/31/2024

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01109	244.6	248.0	3.4
	B	G01110	244.6	248.5	3.9
	C - 1st Hour	G01111	244.8	247.3	2.5
	Amb	G01112	244.1	244.2	0.1
Probes	A	14A	116635.1	116635.3	0.2
	B	14B	116621.1	116621.1	0.0
	C - 1st Hour	14C	116531.6	116531.7	0.1
O-rings	A	14A	3342.7	3343.1	0.4
	B	14B	3367.4	3367.7	0.3
	C - 1st Hour	14C	3444.7	3444.7	0.0

Placed in Dessicator on: 7/31/2024

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	248.0	8/3 15:30	248.0	8/5 10:30				
	B	248.7	8/3 15:30	248.5	8/5 10:30				
	C - 1st Hour	247.5	8/3 15:30	247.3	8/5 10:30				
	Amb	244.3	8/3 15:30	244.2	8/5 10:30				
Probes	A	116635.2	8/3 15:30	116635.3	8/5 10:30				
	B	116621.2	8/3 15:30	116621.1	8/5 10:30				
	C - 1st Hour	116531.8	8/3 15:30	116531.7	8/5 10:30				
O-Rings	A	3343.0	8/3 15:30	3343.1	8/5 10:30				
	B	3367.6	8/3 15:30	3367.7	8/5 10:30				
	C - 1st Hour	3444.8	8/3 15:30	3444.7	8/5 10:30				

Train A Aggregate, mg:	4.0
Train B Aggregate, mg:	4.2
Train C Aggregate, mg:	2.6
Ambient, mg:	0.1

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove Job Number: 24-330 Tracking #: 211
 Model: Model 91 Run Number: 1 Test Date: 7/31/24

Wood Heater Run Notes

Test Control Settings

Primary Air Setting(s): Fully Closed
 Boost Air Setting(s): Fully Closed
 Targeted Burn Category: I

Preburn Notes

Time	Notes
41:00	Stirred coals, door open 30 sec

Test Notes

Test Burn Start Time: 11:08 Test Fuel Loaded by: 35 seconds
 Door Closed: 40 seconds Air Control Set at: 300 seconds
 Other Loading Notes: Bypass closed @ 0:45, Fan on low @ 10:00

Time	Notes
	-None-

Test Burn End Time: 19:48

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO₂ (%): 16.98 CO (%): 4.300
 Mid Gas CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	10:16	10:17	10:19	8/1 9:10	8/1 9:11	8/1 9:12
CO ₂	0.00	17.00	10.09	0.06	16.99	10.16
CO	0.000	4.301	2.530	0.006	4.291	2.502

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

Technician Signature: 

Date: 8/1/2024

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove

Job Number: 24-330

Tracking #: 211

Model: Model 91

Run Number: 1

Test Date: 7/31/24



Test Fuel Front/Side View



Test Fuel Iso View



Test Fuel Loaded in Stove



Air Setting

Technician Signature: 

Date: 8/1/2024

WOOD STOVE TEST DATA PACKET
ASTM E2780/E2515



Run 2 Data Summary

Client:	Buck Stove
Model:	91
Job #:	24-330
Tracking #:	211
Test Date:	8/1/2024



Technician Signature

9/3/2024

Date

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Burn Rate (kg/hr):	3.08
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	15.307	24.702	23.790	9.013
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.9			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11776.3			
Average Gas Meter Temperature (°F)	83.6	94.8	97.1	88.7
Total Sample Volume (dscf)	14.995	23.457	22.847	8.692
Average Tunnel Temperature (°F)	124.4			
Total Time of Test (min)	155			
Total Particulate Catch (mg)	0.2	7.0	7.1	5.8
Particulate Concentration, dry-standard (g/dscf)	0.0000133	0.0002984	0.0003108	0.0006673
Total PM Emissions (g)	0.41	8.67	9.05	7.70
Particulate Emission Rate (g/hr)	0.16	3.36	3.50	7.70
Emissions Factor (g/kg)	-	1.09	1.14	-
Difference from Average Total Particulate Emissions (g)	-	0.19	0.19	-
Difference from Average Total Particulate Emissions (%)	-	2.1%	2.1%	
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	8.86
Particulate Emission Rate (g/hr)	3.43
Emissions Factor (g/kg)	1.11
HHV Efficiency (%)	75.0%
LHV Efficiency (%)	81.1%
CO Emissions (g/min)	1.40

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	83.1	OK
Face Velocity	< 30 ft/min	8.9	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:81.4/Max:84.3	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	14.9	OK

B415.1 Efficiency Results

Manufacturer: Buck Stove
Model: 91
Date: 08/01/24
Run: 2
Control #: 24-330
Test Duration: 155
Output Category: 4

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	75.0%	81.1%
Combustion Efficiency	98.3%	98.3%
Heat Transfer Efficiency	76.3%	82.5%

Output Rate (kJ/h)	45,530	43,190	(Btu/h)
Burn Rate (kg/h)	3.06	6.75	(lb/h)
Input (kJ/h)	60,707	57,587	(Btu/h)

Test Load Weight (dry kg)	7.92	17.45	dry lb
MC wet (%)	19.07		
MC dry (%)	23.57		
Particulate (g)	8.86		
CO (g)	218		
Test Duration (h)	2.58		

Emissions	Particulate	CO
g/MJ Output	0.08	1.85
g/kg Dry Fuel	1.12	27.50
g/h	3.43	84.28
g/min	0.06	1.40
lb/MM Btu Output	0.18	4.30

Air/Fuel Ratio (A/F)	13.29
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VERSION:

2.4

4/15/2010

WOODSTOVE FUEL DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	18.50	23.5		2x4	18.50	23.8
2x4	18.50	23.0		2x4	18.50	24.4
2x4	18.50	19.2		2x4	18.50	22.7
2x4	18.50	24.1		2x4	18.50	24.6
2x4	18.50	24.2				
2x4	18.50	19.5				
2x4	18.50	21.0				
2x4	18.50	19.8				
Total Fuel Weight (lbs):		26.98	Average Moisture (%DB):		22.5	

Firebox Volume (ft³): 3.07
 Total 2x4 Crib Weight, with spacers (lbs): 0.00
 Total 4x4 Crib Weight, with spacers (lbs): 21.56
 Total Wet Fuel Weight, with spacers (lbs): 21.56

Coal Bed Range (20-25%):
 Min (lbs): 4.31
 Max (lbs): 5.39

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
4x4	18.50	4.72	23.1	24.1	22.5	3.83
4x4	20.25	5.14	22.0	24.8	24.1	4.16
4x4	20.25	5.25	24.4	24.5	22.9	4.24
4x4	18.50	4.85	24.6	22.5	23.3	3.93
Total Dry Weight, no spacers (lbs):						16.15
Total Dry Weight, with spacers (lbs):						17.55

Spacer Moisture Readings (%DB)						
14.9	14.9					
13.4	11.9					
12.0	14.7					
14.9	14.3					
15.6	16.6					
11.8	15.6					
13.6	12.5					
15.8	14.5					

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft ³ , DB)	29.4	OK
Loading Density	6.3 - 7.7 (lbs/ft ³ , WB)	7.02	OK
2x4 Fuel Mix	35 - 65 % of total weight	N/A	N/A

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Buck Stove	Job #: 24-330
Model: 91	Tracking #: 211
Run #: 2	Technician: AK
Test Start Time: 12:17	Date: 8/1/2024

Total Sampling Time (min): **155**
 Recording Interval (min): **1**

Meter Box γ Factor: **0.996 (A)**
 Meter Box γ Factor: **1.012 (B)**
 Meter Box γ Factor: **1.004 (C)**
 Meter Box γ Factor: **1.013 (Ambient)**

Induced Draft Check (in. H₂O): **0**
 Smoke Capture Check (%): **100%**
 Date Flue Pipe Last Cleaned: **7/30/2024**
 Test Fuel Scale Audit (lbs): **10.00**
 Platform Scale Audit (lbs): **10.0**

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.83	29.77	29.80
Relative Humidity (%)	54.9	48.7	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:	15.307 ft ³		

Sample Train Leak Checks			
	Pre-test	Post-test	
(A)	0.000	0.000	cfm @ -7 in. Hg
(B)	0.000	0.000	cfm @ -7 in. Hg
(C)	0.001	0.000	cfm @ -7 in. Hg
(Ambient)	0.000	0.000	cfm @ -12 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.058	75
2	0.090	75
3	0.094	75
4	0.056	75
5	0.060	75
6	0.092	75
7	0.096	75
8	0.056	75
Center	0.099	75

Dilution Tunnel H₂O: **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** ft²

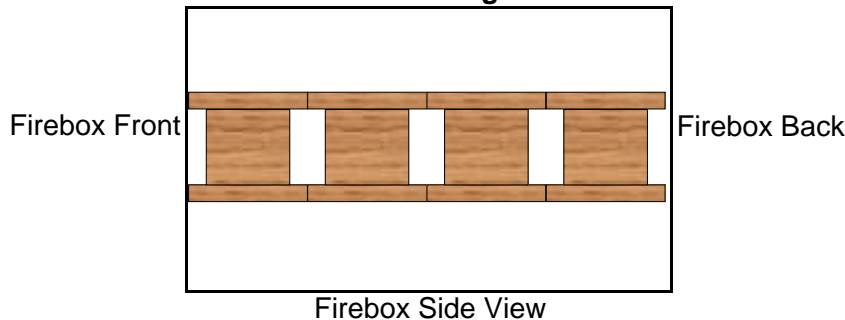
V_{strav}: **18.20** ft/sec
 V_{scnt}: **21.03** ft/sec
 F_p: **0.866** [ratio]

Initial Tunnel Flow: **206.6** scf/min

Static Pressure: **-0.160** in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type:	D. Fir
HHV (kJ/kg)	19,810
%C	48.73
%H	6.87
%O	43.9
%Ash	0.5
MC (%DB)	23.6

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Recording Interval (min): 1
 Run Time (min): 102

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
0	20.33	-0.089	613	684	670	476	436	575.5	489	78	
1	20.01	-0.090	625	684	613	468	438	565.5	478	78	
2	19.72	-0.088	625	679	585	458	433	556.0	472	78	
3	19.39	-0.088	622	672	564	449	425	546.6	471	79	
4	19.09	-0.089	619	666	547	441	416	537.6	470	78	
5	18.78	-0.091	615	661	528	434	408	528.9	465	78	
6	18.47	-0.088	612	656	516	427	400	521.9	468	78	
7	18.16	-0.089	609	651	505	421	392	515.5	466	78	
8	17.85	-0.089	605	647	495	415	386	509.5	467	78	
9	17.54	-0.088	602	642	486	411	380	504.2	464	78	
10	17.24	-0.089	598	638	478	406	375	499.0	463	78	
11	16.92	-0.087	595	635	471	402	370	494.5	463	78	
12	16.61	-0.087	592	632	465	399	365	490.5	464	78	
13	16.29	-0.088	589	628	461	396	361	487.0	462	78	
14	16.04	-0.087	586	626	457	393	358	483.9	463	79	
15	15.71	-0.088	584	623	453	389	356	481.0	463	78	
16	15.40	-0.086	582	621	447	387	353	477.7	462	78	
17	15.11	-0.089	580	618	445	385	351	475.7	459	78	
18	14.80	-0.088	577	616	442	382	348	473.1	460	78	
19	14.50	-0.089	575	615	439	380	346	471.1	459	78	
20	14.17	-0.088	574	614	437	378	344	469.3	459	78	
21	13.89	-0.088	573	612	435	376	341	467.4	458	78	
22	13.57	-0.088	573	611	432	374	339	465.8	456	78	
23	21.85	-0.091	571	610	433	374	337	465.2	485	79	
24	21.43	-0.091	572	607	432	373	335	463.7	474	79	
25	20.98	-0.089	569	601	427	371	333	460.2	466	78	
26	20.60	-0.092	567	594	422	370	331	456.8	462	78	
27	20.14	-0.090	562	587	420	370	329	453.6	461	78	
28	19.72	-0.089	559	581	415	369	328	450.3	463	78	
29	19.34	-0.090	556	576	412	368	326	447.6	462	78	
30	18.92	-0.089	552	571	412	368	325	445.5	460	78	
31	18.52	-0.091	548	568	410	367	324	443.3	461	78	
32	18.11	-0.090	547	565	405	367	322	441.2	461	78	
33	17.68	-0.089	544	563	405	367	321	439.8	461	78	
34	17.23	-0.089	542	560	406	365	319	438.4	462	78	
35	16.84	-0.089	539	559	406	364	318	437.4	460	79	
36	16.41	-0.089	539	558	403	364	317	436.3	459	78	
37	15.96	-0.088	538	557	403	362	316	435.2	456	79	
38	15.45	-0.088	537	556	404	361	315	434.6	462	79	
39	15.04	-0.090	537	556	406	360	314	434.7	458	79	
40	14.56	-0.089	537	556	406	360	313	434.2	458	79	
41	14.12	-0.088	537	557	407	359	312	434.3		79	
42	13.66	-0.090	536	557	406	359	311	434.0	459	79	
43	13.25	-0.087	537	558	407	360	310	434.4	456	79	
44	12.84	-0.086	536	559	407	361	310	434.3	457	79	

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Recording Interval (min): 1
 Run Time (min): 102

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
45	12.45	-0.087	536	560	411	361	309	435.4	458	80	
46	12.04	-0.087	536	561	412	362	308	435.9	457	80	
47	11.64	-0.088	537	562	413	363	307	436.4	458	80	
48	11.25	-0.088	537	564	414	363	306	436.9	456	80	
49	10.88	-0.086	537	566	415	364	306	437.5	456	80	
50	10.51	-0.087	537	568	416	364	305	438.2	454	80	
51	10.17	-0.087	537	571	416	365	305	438.7	454	80	
52	9.84	-0.086	538	575	419	365	304	440.2	454	80	
53	9.51	-0.087	538	580	420	365	304	441.5	451	80	
54	9.20	-0.086	539	585	423	366	304	443.3	450	80	
55	8.93	-0.086	539	590	425	366	303	444.5	450	80	
56	8.57	-0.086	540	596	431	366	303	447.0	469	80	
57	8.30	-0.088	542	602	433	367	304	449.5	460	80	
58	8.03	-0.089	544	607	434	367	304	451.1	456	81	
59	7.79	-0.087	548	611	432	367	304	452.2	452	82	
60	7.59	-0.085	550	615	433	368	304	453.7	451	82	
61	7.43	-0.087	551	617	435	368	304	455.0	446	83	
62	7.29	-0.086	555	619	439	368	304	457.0	442	83	
63	7.15	-0.085	558	620	443	367	304	458.4	443	83	
64	7.01	-0.085	559	620	443	367	305	458.6	435	83	
65	6.90	-0.083	561	619	442	365	304	458.4	430	83	
66	6.79	-0.084	563	618	440	363	305	457.5	428	83	
67	6.67	-0.082	565	616	443	360	305	457.6	422	83	
68	6.57	-0.082	567	614	444	357	305	457.3	419	83	
69	6.46	-0.083	568	612	438	355	305	455.4	417	83	
70	6.36	-0.083	570	610	443	352	304	455.6	415	83	
71	6.22	-0.081	570	608	444	349	304	454.7	414	83	
72	6.11	-0.080	572	606	448	345	304	454.9	414	83	
73	6.02	-0.080	573	605	449	343	303	454.7	411	83	
74	5.93	-0.080	573	603	449	340	303	453.6	410	83	
75	5.83	-0.081	574	602	449	337	303	453.0	410	82	
76	5.75	-0.080	576	600	446	334	302	451.6	407	83	
77	5.67	-0.079	576	598	445	331	302	450.4	406	83	
78	5.59	-0.079	577	596	441	329	302	448.8	404	83	
79	5.53	-0.079	578	593	439	326	301	447.4	400	83	
80	5.46	-0.079	578	590	437	324	301	445.8	399	83	
81	5.41	-0.078	578	586	434	320	301	443.9	395	82	
82	5.35	-0.078	579	583	436	318	300	443.0	392	83	
83	5.27	-0.077	577	580	435	315	300	441.3	390	83	
84	5.23	-0.077	576	577	434	312	300	439.8	388	83	
85	5.17	-0.076	576	574	433	310	299	438.4	386	83	
86	5.10	-0.076	574	571	432	307	299	436.6	384	83	
87	5.07	-0.076	573	569	425	304	299	433.9	383	82	
88	5.01	-0.078	570	565	419	302	299	430.7	382	82	
89	4.97	-0.075	568	563	414	299	298	428.4	379	83	

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Recording Interval (min): 1
 Run Time (min): 102

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
90	4.93	-0.073	565	561	410	296	298	426.1	377	83	
91	4.86	-0.074	563	558	408	294	298	424.2	374	82	
92	4.83	-0.073	561	556	402	291	298	421.5	371	82	
93	4.78	-0.074	558	555	402	289	298	420.4	368	83	
94	4.74	-0.074	555	554	399	286	298	418.1	365	83	
95	4.69	-0.073	554	553	400	283	297	417.3	363	83	
96	4.65	-0.072	553	551	396	281	296	415.4	361	82	
97	4.61	-0.072	550	549	395	279	296	413.9	359	83	
98	4.55	-0.072	548	547	395	276	296	412.5	359	83	
99	4.48	-0.071	547	545	392	274	296	410.8	356	82	
100	4.45	-0.072	545	543	389	271	296	408.7	355	82	
101	4.42	-0.071	543	541	389	269	296	407.7	353	82	
102	4.37	-0.072	542	539	387	267	296	406.2	351	82	

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	-0.002		0.097	0.00	81	0.1		21.56		127	374	77	83
1	0.103	0.105	0.099	2.26	81	1.0	-	21.32	-0.24	144	400	80	83
2	0.251	0.148	0.096	2.31	81	1.0	-	21.09	-0.23	132	381	80	82
3	0.404	0.153	0.097	2.35	81	1.0	-	20.88	-0.21	127	378	80	83
4	0.554	0.150	0.098	2.39	81	1.0	-	20.63	-0.25	126	381	79	83
5	0.709	0.155	0.097	2.42	81	1.0	-	20.37	-0.26	126	388	79	82
6	0.863	0.154	0.099	2.43	81	1.0	-	20.13	-0.24	126	393	79	83
7	1.018	0.155	0.098	2.44	81	1.0	-	19.87	-0.26	126	400	79	83
8	1.175	0.157	0.096	2.45	82	1.0	-	19.64	-0.23	127	402	79	83
9	1.328	0.153	0.096	2.45	82	1.0	-	19.37	-0.27	127	405	80	83
10	1.486	0.158	0.099	2.46	82	1.0	95	19.11	-0.26	127	407	80	83
11	1.638	0.152	0.096	2.46	82	1.0	-	18.84	-0.27	127	408	80	81
12	1.798	0.160	0.098	2.47	82	1.0	-	18.58	-0.26	127	411	80	82
13	1.951	0.153	0.099	2.47	83	1.0	-	18.33	-0.25	127	411	80	82
14	2.107	0.156	0.096	2.46	83	1.0	-	18.07	-0.26	128	414	81	83
15	2.263	0.156	0.099	2.47	83	1.0	-	17.79	-0.28	128	415	81	82
16	2.419	0.156	0.099	2.47	83	1.0	-	17.53	-0.26	128	415	81	83
17	2.578	0.159	0.099	2.46	84	1.0	-	17.28	-0.25	128	415	81	83
18	2.730	0.152	0.098	2.47	84	1.0	-	17.03	-0.25	128	416	81	83
19	2.889	0.159	0.099	2.46	84	1.1	-	16.77	-0.26	128	416	81	83
20	3.043	0.154	0.098	2.48	84	1.1	100	16.52	-0.25	128	417	81	83
21	3.202	0.159	0.098	2.47	85	1.0	-	16.26	-0.26	129	418	81	83
22	3.356	0.154	0.098	2.48	85	1.1	-	16.00	-0.26	129	420	81	83
23	3.513	0.157	0.098	2.48	85	1.1	-	15.75	-0.25	129	422	81	83
24	3.671	0.158	0.100	2.49	86	1.1	-	15.49	-0.26	129	424	81	83
25	3.826	0.155	0.097	2.49	86	1.1	-	15.24	-0.25	130	426	81	83
26	3.985	0.159	0.098	2.48	86	1.1	-	15.00	-0.24	130	427	81	83
27	4.139	0.154	0.097	2.47	86	1.1	-	14.75	-0.25	130	428	81	83
28	4.299	0.160	0.097	2.49	87	1.1	-	14.51	-0.24	130	427	81	83
29	4.453	0.154	0.098	2.48	87	1.1	-	14.28	-0.23	130	429	81	84
30	4.612	0.159	0.097	2.48	87	1.1	101	14.03	-0.25	131	428	81	83
31	4.771	0.159	0.098	2.50	88	1.1	-	13.79	-0.24	131	429	82	83

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.926	0.155	0.097	2.49	88	1.1	-	13.55	-0.24	131	428	82	83
33	5.085	0.159	0.097	2.49	88	1.1	-	13.34	-0.21	131	429	82	83
34	5.241	0.156	0.098	2.49	88	1.1	-	13.08	-0.26	131	429	82	82
35	5.401	0.160	0.100	2.50	89	1.1	-	12.88	-0.20	131	427	82	83
36	5.557	0.156	0.096	2.49	89	1.1	-	12.66	-0.22	131	427	82	83
37	5.715	0.158	0.098	2.49	89	1.1	-	12.46	-0.20	131	428	82	83
38	5.875	0.160	0.097	2.49	90	1.1	-	12.25	-0.21	130	428	82	83
39	6.030	0.155	0.098	2.50	90	1.1	-	12.07	-0.18	130	427	82	83
40	6.191	0.161	0.097	2.51	90	1.1	101	11.88	-0.19	130	425	82	83
41	6.347	0.156	0.098	2.51	90	1.1	-	11.71	-0.17	130	422	82	83
42	6.506	0.159	0.098	2.51	91	1.1	-	11.53	-0.18	129	422	82	83
43	6.664	0.158	0.098	2.51	91	1.1	-	11.35	-0.18	130	419	82	83
44	6.822	0.158	0.095	2.52	91	1.1	-	11.18	-0.17	130	418	81	84
45	6.982	0.160	0.098	2.52	91	1.1	-	11.03	-0.15	130	417	81	84
46	7.138	0.156	0.097	2.52	92	1.1	-	10.84	-0.19	129	416	81	84
47	7.300	0.162	0.099	2.52	92	1.1	-	10.68	-0.16	129	413	81	84
48	7.456	0.156	0.099	2.51	92	1.1	-	10.52	-0.16	129	412	81	84
49	7.616	0.160	0.098	2.53	92	1.1	-	10.36	-0.16	129	411	81	84
50	7.776	0.160	0.099	2.53	93	1.1	100	10.18	-0.18	128	410	81	84
51	7.932	0.156	0.097	2.52	93	1.1	-	10.03	-0.15	128	410	81	84
52	8.095	0.163	0.099	2.52	93	1.1	-	9.85	-0.18	128	408	81	84
53	8.251	0.156	0.097	2.52	93	1.1	-	9.67	-0.18	129	408	81	84
54	8.412	0.161	0.098	2.53	93	1.1	-	9.51	-0.16	129	408	81	84
55	8.574	0.162	0.097	2.54	94	1.1	-	9.36	-0.15	128	408	81	84
56	8.729	0.155	0.096	2.53	94	1.1	-	9.21	-0.15	128	407	81	84
57	8.892	0.163	0.097	2.53	94	1.1	-	9.04	-0.17	128	404	81	84
58	9.049	0.157	0.098	2.53	94	1.1	-	8.91	-0.13	128	403	81	84
59	9.210	0.161	0.098	2.53	94	1.1	-	8.80	-0.11	127	401	81	83
60	9.372	0.162	0.098	2.54	95	1.1	100	8.62	-0.18	127	400	81	84
61	9.528	0.156	0.098	2.55	95	1.1	-	8.51	-0.11	127	399	81	84
62	9.692	0.164	0.099	2.55	95	1.1	-	8.37	-0.14	127	395	81	84
63	9.848	0.156	0.098	2.54	95	1.2	-	8.24	-0.13	127	395	81	84

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.010	0.162	0.098	2.55	95	1.1	-	8.11	-0.13	126	394	81	84
65	10.172	0.162	0.098	2.56	95	1.1	-	7.95	-0.16	126	393	81	84
66	10.328	0.156	0.097	2.55	96	1.1	-	7.84	-0.11	126	392	82	84
67	10.493	0.165	0.099	2.56	96	1.1	-	7.73	-0.11	126	391	82	84
68	10.650	0.157	0.097	2.55	96	1.1	-	7.59	-0.14	126	390	82	84
69	10.812	0.162	0.098	2.56	96	1.1	-	7.46	-0.13	125	388	82	84
70	10.974	0.162	0.097	2.56	96	1.1	101	7.34	-0.12	125	386	82	84
71	11.131	0.157	0.098	2.55	96	1.1	-	7.21	-0.13	125	385	82	84
72	11.296	0.165	0.099	2.55	96	1.1	-	7.08	-0.13	125	385	82	84
73	11.453	0.157	0.098	2.56	97	1.1	-	6.97	-0.11	125	383	82	84
74	11.615	0.162	0.098	2.56	97	1.1	-	6.87	-0.10	124	383	82	84
75	11.776	0.161	0.094	2.57	97	1.1	-	6.74	-0.13	124	382	82	84
76	11.935	0.159	0.096	2.56	97	1.1	-	6.63	-0.11	124	383	82	84
77	12.097	0.162	0.099	2.56	97	1.1	-	6.52	-0.11	124	383	82	84
78	12.257	0.160	0.098	2.56	97	1.1	-	6.40	-0.12	124	382	82	84
79	12.418	0.161	0.097	2.57	97	1.1	-	6.27	-0.13	124	381	82	84
80	12.580	0.162	0.097	2.57	98	1.1	101	6.20	-0.07	124	380	82	84
81	12.738	0.158	0.097	2.56	98	1.1	-	6.08	-0.12	123	378	82	84
82	12.901	0.163	0.097	2.56	98	1.2	-	5.97	-0.11	123	378	82	84
83	13.062	0.161	0.097	2.57	98	1.1	-	5.87	-0.10	123	378	82	84
84	13.220	0.158	0.097	2.56	98	1.1	-	5.78	-0.09	123	376	82	84
85	13.384	0.164	0.097	2.56	98	1.1	-	5.67	-0.11	123	373	82	84
86	13.543	0.159	0.098	2.56	98	1.1	-	5.55	-0.12	123	372	82	84
87	13.704	0.161	0.097	2.56	98	1.1	-	5.48	-0.07	123	372	82	84
88	13.867	0.163	0.096	2.56	98	1.1	-	5.37	-0.11	122	373	82	84
89	14.025	0.158	0.098	2.56	98	1.1	-	5.28	-0.09	122	371	82	84
90	14.190	0.165	0.099	2.57	99	1.1	100	5.18	-0.10	122	370	82	84
91	14.347	0.157	0.097	2.57	99	1.1	-	5.09	-0.09	122	370	82	84
92	14.510	0.163	0.094	2.57	99	1.2	-	4.97	-0.12	122	370	82	84
93	14.672	0.162	0.097	2.57	99	1.1	-	4.91	-0.06	122	370	82	84
94	14.831	0.159	0.097	2.58	99	1.1	-	4.83	-0.08	122	370	82	84
95	14.995	0.164	0.098	2.58	99	1.1	-	4.72	-0.11	121	368	82	84

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.156	0.161	0.099	2.57	99	1.1	-	4.63	-0.09	121	367	82	84
97	15.317	0.161	0.098	2.57	99	1.1	-	4.53	-0.10	121	365	82	84
98	15.480	0.163	0.097	2.57	99	1.1	-	4.43	-0.10	121	367	82	84
99	15.640	0.160	0.098	2.58	99	1.1	-	4.36	-0.07	121	367	82	84
100	15.802	0.162	0.098	2.57	100	1.1	100	4.24	-0.12	121	369	82	84
101	15.965	0.163	0.099	2.57	100	1.1	-	4.16	-0.08	121	368	82	84
102	16.123	0.158	0.097	2.57	100	1.1	-	4.04	-0.12	121	368	82	84
103	16.289	0.166	0.096	2.57	100	1.1	-	3.96	-0.08	121	368	82	84
104	16.448	0.159	0.097	2.58	100	1.1	-	3.85	-0.11	121	368	82	84
105	16.610	0.162	0.098	2.57	100	1.1	-	3.74	-0.11	121	368	82	84
106	16.772	0.162	0.098	2.56	100	1.1	-	3.65	-0.09	121	369	82	84
107	16.932	0.160	0.099	2.57	100	1.1	-	3.55	-0.10	121	366	82	84
108	17.095	0.163	0.097	2.58	100	1.1	-	3.46	-0.09	121	367	82	84
109	17.257	0.162	0.098	2.56	100	1.2	-	3.38	-0.08	121	367	82	84
110	17.417	0.160	0.099	2.57	100	1.1	100	3.27	-0.11	121	365	82	84
111	17.582	0.165	0.098	2.57	100	1.1	-	3.21	-0.06	121	365	82	84
112	17.741	0.159	0.096	2.57	100	1.2	-	3.12	-0.09	121	365	82	84
113	17.903	0.162	0.097	2.57	101	1.1	-	3.04	-0.08	121	365	82	84
114	18.067	0.164	0.096	2.58	101	1.2	-	2.95	-0.09	121	364	82	84
115	18.224	0.157	0.096	2.57	101	1.1	-	2.89	-0.06	120	363	82	84
116	18.391	0.167	0.099	2.57	101	1.1	-	2.80	-0.09	120	363	82	84
117	18.549	0.158	0.099	2.58	101	1.1	-	2.71	-0.09	120	362	82	84
118	18.712	0.163	0.098	2.57	101	1.1	-	2.64	-0.07	120	363	82	84
119	18.875	0.163	0.098	2.58	101	1.1	-	2.56	-0.08	120	362	82	84
120	19.035	0.160	0.098	2.56	101	1.1	100	2.46	-0.10	120	361	82	84
121	19.198	0.163	0.098	2.58	101	1.1	-	2.39	-0.07	120	361	82	84
122	19.360	0.162	0.098	2.56	101	1.1	-	2.27	-0.12	120	361	82	84
123	19.519	0.159	0.098	2.57	101	1.2	-	2.19	-0.08	120	361	82	84
124	19.685	0.166	0.095	2.56	101	1.1	-	2.11	-0.08	120	362	82	84
125	19.843	0.158	0.096	2.57	101	1.2	-	2.03	-0.08	120	363	82	84
126	20.006	0.163	0.097	2.57	101	1.2	-	1.94	-0.09	120	364	82	84
127	20.168	0.162	0.099	2.57	101	1.2	-	1.85	-0.09	120	362	82	84

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.328	0.160	0.098	2.56	101	1.2	-	1.78	-0.07	120	361	82	84
129	20.492	0.164	0.099	2.57	101	1.2	-	1.68	-0.10	120	361	82	84
130	20.653	0.161	0.099	2.56	101	1.2	100	1.61	-0.07	120	362	82	84
131	20.814	0.161	0.098	2.56	102	1.1	-	1.52	-0.09	120	363	82	84
132	20.978	0.164	0.097	2.57	102	1.2	-	1.47	-0.05	120	363	82	84
133	21.138	0.160	0.096	2.56	102	1.1	-	1.40	-0.07	120	363	82	84
134	21.300	0.162	0.098	2.57	102	1.1	-	1.33	-0.07	120	362	82	84
135	21.464	0.164	0.099	2.57	102	1.1	-	1.24	-0.09	120	361	82	84
136	21.622	0.158	0.097	2.56	102	1.1	-	1.17	-0.07	120	360	82	84
137	21.788	0.166	0.099	2.56	102	1.2	-	1.11	-0.06	120	361	82	84
138	21.947	0.159	0.098	2.57	102	1.2	-	1.04	-0.07	120	360	82	84
139	22.110	0.163	0.096	2.56	102	1.2	-	0.96	-0.08	120	358	82	84
140	22.273	0.163	0.099	2.57	102	1.2	99	0.88	-0.08	120	359	82	84
141	22.432	0.159	0.099	2.55	102	1.2	-	0.82	-0.06	120	359	82	84
142	22.595	0.163	0.097	2.57	102	1.2	-	0.76	-0.06	120	360	82	84
143	22.758	0.163	0.097	2.56	102	1.2	-	0.70	-0.06	120	359	82	84
144	22.917	0.159	0.099	2.56	102	1.2	-	0.62	-0.08	120	358	82	84
145	23.082	0.165	0.096	2.57	102	1.2	-	0.57	-0.05	120	359	82	84
146	23.241	0.159	0.097	2.57	102	1.2	-	0.51	-0.06	120	358	82	84
147	23.404	0.163	0.097	2.57	102	1.1	-	0.42	-0.09	120	357	82	84
148	23.567	0.163	0.098	2.56	102	1.2	-	0.38	-0.04	119	355	82	84
149	23.727	0.160	0.096	2.56	102	1.1	-	0.32	-0.06	119	355	82	84
150	23.890	0.163	0.099	2.57	102	1.2	99	0.28	-0.04	119	356	82	84
151	24.052	0.162	0.097	2.58	102	1.2	-	0.19	-0.09	119	355	82	84
152	24.212	0.160	0.099	2.57	102	1.2	-	0.14	-0.05	119	354	82	84
153	24.378	0.166	0.098	2.57	102	1.1	-	0.07	-0.07	119	352	82	84
154	24.537	0.159	0.098	2.57	102	1.2	-	0.02	-0.05	119	352	82	84
155	24.700	0.163	0.098	2.58	102	1.2	100	0.00	-0.02	119	352	82	84
Avg/Tot	24.702	0.159	0.098	2.52	94.8	1.1	100			124.4	386.1	81.5	83.6

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	-0.004		0.01	81	0.7		80	-0.075	5.47	0.032
1	0.101	0.105	2.39	81	1.8	-	82	-0.077	3.66	0.123
2	0.255	0.154	2.39	81	1.7	-	83	-0.077	8.36	0.047
3	0.406	0.151	2.39	81	2.0	-	81	-0.078	9.09	0.051
4	0.560	0.154	2.39	81	1.7	-	80	-0.078	10.29	0.424
5	0.710	0.150	2.38	82	1.9	-	80	-0.081	10.74	0.598
6	0.863	0.153	2.38	82	2.1	-	80	-0.081	11.24	0.745
7	1.014	0.151	2.36	82	2.0	-	80	-0.081	11.10	0.725
8	1.167	0.153	2.37	82	2.0	-	80	-0.081	11.08	0.672
9	1.320	0.153	2.37	82	1.6	-	81	-0.082	11.15	0.642
10	1.471	0.151	2.36	82	1.6	98	81	-0.083	11.50	0.736
11	1.624	0.153	2.37	82	2.1	-	81	-0.082	11.59	0.824
12	1.773	0.149	2.36	83	1.9	-	82	-0.081	11.59	0.793
13	1.926	0.153	2.34	83	1.6	-	81	-0.081	11.71	0.882
14	2.075	0.149	2.34	83	1.7	-	80	-0.082	11.76	0.923
15	2.228	0.153	2.33	83	2.1	-	80	-0.082	11.84	0.903
16	2.377	0.149	2.33	84	2.1	-	80	-0.083	11.87	0.897
17	2.531	0.154	2.33	84	1.7	-	81	-0.082	11.80	0.840
18	2.680	0.149	2.33	84	1.8	-	81	-0.081	11.78	0.798
19	2.834	0.154	2.33	85	1.7	-	81	-0.080	11.79	0.844
20	2.982	0.148	2.32	85	2.1	101	82	-0.083	11.86	0.812
21	3.136	0.154	2.33	85	1.7	-	82	-0.084	11.92	0.881
22	3.284	0.148	2.33	85	2.1	-	82	-0.084	12.00	0.908
23	3.437	0.153	2.32	86	1.7	-	82	-0.084	12.01	0.892
24	3.586	0.149	2.32	86	1.7	-	82	-0.083	12.04	0.835
25	3.739	0.153	2.31	86	2.1	-	82	-0.085	12.04	0.804
26	3.888	0.149	2.31	87	2.0	-	82	-0.084	12.06	0.779
27	4.040	0.152	2.31	87	1.8	-	82	-0.084	12.06	0.783
28	4.191	0.151	2.31	87	2.1	-	82	-0.084	12.10	0.720
29	4.343	0.152	2.32	88	2.2	-	82	-0.085	12.10	0.661
30	4.494	0.151	2.31	88	2.1	101	82	-0.086	12.08	0.605
31	4.645	0.151	2.32	88	2.1	-	83	-0.085	11.99	0.563

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.798	0.153	2.31	89	1.6	-	82	-0.085	11.95	0.465
33	4.947	0.149	2.31	89	1.6	-	82	-0.083	11.94	0.410
34	5.100	0.153	2.31	89	1.9	-	82	-0.085	11.87	0.410
35	5.249	0.149	2.31	90	1.8	-	82	-0.083	11.78	0.340
36	5.402	0.153	2.30	90	1.8	-	82	-0.082	11.61	0.271
37	5.552	0.150	2.31	90	2.2	-	82	-0.082	11.49	0.219
38	5.707	0.155	2.31	91	1.7	-	82	-0.084	10.54	0.199
39	5.856	0.149	2.31	91	1.7	-	82	-0.084	10.18	0.186
40	6.011	0.155	2.31	91	2.2	101	82	-0.082	10.08	0.121
41	6.160	0.149	2.32	92	2.1	-	82	-0.082	9.95	0.127
42	6.314	0.154	2.31	92	1.9	-	82	-0.082	9.92	0.114
43	6.464	0.150	2.31	92	2.2	-	82	-0.082	9.85	0.099
44	6.617	0.153	2.31	92	1.7	-	82	-0.082	9.62	0.170
45	6.770	0.153	2.32	93	1.7	-	82	-0.080	9.59	0.122
46	6.922	0.152	2.32	93	1.8	-	82	-0.082	9.62	0.087
47	7.076	0.154	2.32	93	1.8	-	82	-0.083	9.61	0.061
48	7.227	0.151	2.32	94	2.1	-	82	-0.081	9.68	0.056
49	7.381	0.154	2.32	94	1.6	-	82	-0.081	9.71	0.058
50	7.531	0.150	2.31	94	2.0	100	82	-0.079	9.73	0.067
51	7.686	0.155	2.33	94	2.2	-	82	-0.080	9.82	0.111
52	7.837	0.151	2.32	95	2.0	-	82	-0.081	9.93	0.125
53	7.993	0.156	2.33	95	2.1	-	82	-0.082	10.00	0.144
54	8.143	0.150	2.33	95	2.0	-	82	-0.081	9.66	0.108
55	8.298	0.155	2.32	95	1.8	-	82	-0.084	9.41	0.037
56	8.449	0.151	2.31	96	2.1	-	82	-0.080	9.27	0.018
57	8.603	0.154	2.32	96	2.1	-	82	-0.078	9.12	0.017
58	8.757	0.154	2.33	96	1.9	-	82	-0.080	9.03	0.013
59	8.910	0.153	2.33	96	1.9	-	81	-0.079	8.92	0.014
60	9.064	0.154	2.33	97	1.7	100	82	-0.078	8.89	0.012
61	9.215	0.151	2.33	97	1.9	-	82	-0.078	8.85	0.016
62	9.371	0.156	2.34	97	2.1	-	82	-0.079	8.72	0.011
63	9.523	0.152	2.33	97	1.8	-	82	-0.080	8.77	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	9.679	0.156	2.34	97	2.2	-	81	-0.080	8.68	0.011
65	9.830	0.151	2.33	98	1.9	-	81	-0.081	8.57	0.007
66	9.985	0.155	2.33	98	2.0	-	81	-0.079	8.54	0.013
67	10.139	0.154	2.34	98	1.9	-	81	-0.078	8.55	0.009
68	10.293	0.154	2.34	98	1.8	-	81	-0.080	8.50	0.012
69	10.448	0.155	2.34	98	2.0	-	81	-0.077	8.45	0.012
70	10.600	0.152	2.34	99	2.0	100	81	-0.078	8.46	0.014
71	10.755	0.155	2.33	99	1.7	-	81	-0.078	8.45	0.015
72	10.908	0.153	2.34	99	2.0	-	81	-0.078	8.41	0.012
73	11.065	0.157	2.34	99	1.8	-	81	-0.077	8.28	0.012
74	11.216	0.151	2.34	99	2.1	-	81	-0.079	8.13	0.016
75	11.372	0.156	2.35	100	2.0	-	81	-0.077	8.03	0.015
76	11.525	0.153	2.35	100	2.1	-	81	-0.077	8.08	0.015
77	11.681	0.156	2.34	100	1.6	-	82	-0.075	8.02	0.013
78	11.836	0.155	2.34	100	1.7	-	82	-0.080	7.82	0.016
79	11.988	0.152	2.34	100	2.1	-	82	-0.080	7.73	0.016
80	12.144	0.156	2.33	100	1.9	100	82	-0.078	8.03	0.013
81	12.297	0.153	2.34	101	2.1	-	82	-0.076	8.09	0.016
82	12.455	0.158	2.35	101	1.9	-	82	-0.075	7.95	0.016
83	12.606	0.151	2.34	101	1.9	-	82	-0.076	7.88	0.009
84	12.762	0.156	2.34	101	1.7	-	82	-0.074	8.04	0.014
85	12.916	0.154	2.34	101	2.0	-	82	-0.074	8.02	0.012
86	13.071	0.155	2.34	101	1.7	-	82	-0.074	8.01	0.010
87	13.226	0.155	2.35	101	1.9	-	82	-0.076	7.97	0.012
88	13.379	0.153	2.34	102	2.1	-	82	-0.074	7.92	0.014
89	13.537	0.158	2.35	102	2.1	-	82	-0.076	7.89	0.016
90	13.690	0.153	2.35	102	2.1	100	82	-0.074	7.96	0.014
91	13.846	0.156	2.35	102	1.7	-	82	-0.074	8.06	0.013
92	13.999	0.153	2.36	102	1.8	-	82	-0.074	8.00	0.013
93	14.155	0.156	2.35	102	1.9	-	82	-0.075	8.02	0.017
94	14.311	0.156	2.35	102	1.8	-	82	-0.076	8.04	0.011
95	14.465	0.154	2.36	102	1.7	-	82	-0.073	8.12	0.015

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	14.621	0.156	2.35	102	1.8	-	82	-0.076	8.09	0.013
97	14.775	0.154	2.36	103	2.0	-	82	-0.073	8.18	0.018
98	14.933	0.158	2.36	103	1.6	-	82	-0.075	8.24	0.013
99	15.085	0.152	2.35	103	1.8	-	83	-0.074	8.25	0.019
100	15.241	0.156	2.35	103	2.1	99	83	-0.074	8.36	0.014
101	15.397	0.156	2.36	103	1.8	-	83	-0.076	8.70	0.012
102	15.553	0.156	2.36	103	2.1	-	83	-0.076	8.83	0.015
103	15.708	0.155	2.36	103	1.7	-	83	-0.075	8.91	0.013
104	15.861	0.153	2.36	103	2.1	-	83	-0.076	8.99	0.010
105	16.020	0.159	2.36	103	1.8	-	83	-0.077	9.01	0.017
106	16.173	0.153	2.36	103	2.1	-	83	-0.076	9.02	0.017
107	16.329	0.156	2.36	103	1.7	-	83	-0.073	8.63	0.009
108	16.484	0.155	2.35	104	2.2	-	83	-0.075	8.16	0.011
109	16.640	0.156	2.35	104	1.7	-	83	-0.074	7.81	0.012
110	16.795	0.155	2.35	104	1.9	99	83	-0.075	7.78	0.013
111	16.949	0.154	2.35	104	1.6	-	83	-0.075	7.79	0.012
112	17.107	0.158	2.35	104	1.7	-	83	-0.075	7.82	0.010
113	17.261	0.154	2.36	104	1.7	-	83	-0.074	7.87	0.011
114	17.417	0.156	2.35	104	1.8	-	83	-0.074	7.92	0.005
115	17.570	0.153	2.35	104	2.1	-	83	-0.073	8.07	0.008
116	17.728	0.158	2.35	104	1.6	-	83	-0.074	8.10	0.014
117	17.884	0.156	2.35	104	2.1	-	83	-0.075	8.08	0.011
118	18.037	0.153	2.35	104	2.2	-	83	-0.075	8.13	0.010
119	18.194	0.157	2.35	104	1.7	-	83	-0.074	8.15	0.009
120	18.348	0.154	2.35	104	1.6	99	83	-0.075	8.24	0.009
121	18.505	0.157	2.36	105	1.9	-	83	-0.075	8.32	0.010
122	18.658	0.153	2.35	105	1.7	-	83	-0.074	8.32	0.009
123	18.815	0.157	2.34	105	1.8	-	83	-0.073	8.52	0.010
124	18.971	0.156	2.35	105	1.7	-	83	-0.077	8.40	0.010
125	19.125	0.154	2.35	105	2.1	-	83	-0.074	8.31	0.011
126	19.281	0.156	2.34	105	2.1	-	83	-0.075	8.29	0.012
127	19.435	0.154	2.34	105	1.7	-	83	-0.075	8.28	0.005

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	19.593	0.158	2.35	105	2.0	-	83	-0.073	8.28	0.007
129	19.745	0.152	2.35	105	2.1	-	83	-0.071	8.29	0.008
130	19.902	0.157	2.34	105	2.1	99	83	-0.074	8.11	0.011
131	20.058	0.156	2.35	105	2.1	-	83	-0.075	8.06	0.010
132	20.213	0.155	2.35	105	2.0	-	83	-0.074	7.98	0.009
133	20.369	0.156	2.35	105	2.1	-	83	-0.074	7.92	0.007
134	20.522	0.153	2.34	105	1.8	-	83	-0.075	7.85	0.008
135	20.680	0.158	2.34	105	1.8	-	83	-0.074	7.75	0.008
136	20.833	0.153	2.35	105	2.1	-	83	-0.075	7.73	0.009
137	20.990	0.157	2.34	105	1.7	-	83	-0.073	7.81	0.006
138	21.145	0.155	2.35	105	2.1	-	83	-0.075	7.82	0.007
139	21.300	0.155	2.35	105	1.7	-	83	-0.075	7.82	0.004
140	21.456	0.156	2.34	106	1.6	99	83	-0.075	7.80	0.009
141	21.609	0.153	2.34	106	1.7	-	83	-0.075	7.55	0.012
142	21.768	0.159	2.35	106	2.1	-	83	-0.077	7.39	0.012
143	21.921	0.153	2.34	106	1.7	-	83	-0.075	7.27	0.008
144	22.078	0.157	2.35	106	1.7	-	83	-0.072	7.30	0.010
145	22.231	0.153	2.34	106	2.1	-	83	-0.076	7.27	0.007
146	22.388	0.157	2.35	106	1.7	-	83	-0.076	7.20	0.006
147	22.544	0.156	2.35	106	1.8	-	83	-0.073	7.11	0.006
148	22.698	0.154	2.35	106	1.7	-	83	-0.074	7.01	0.013
149	22.855	0.157	2.35	106	2.1	-	83	-0.073	6.90	0.011
150	23.009	0.154	2.34	106	1.7	99	83	-0.076	6.94	0.009
151	23.166	0.157	2.35	106	2.1	-	83	-0.073	7.05	0.007
152	23.319	0.153	2.34	106	2.2	-	83	-0.073	7.08	0.006
153	23.477	0.158	2.35	106	2.0	-	83	-0.071	7.08	0.013
154	23.633	0.156	2.35	106	1.8	-	83	-0.075	7.05	0.007
155	23.786	0.153	2.34	106	1.7	100	83	-0.074	7.11	0.007
Avg/Tot	23.790	0.153	2.33	97.1	1.9	100	82.1	-0.078	9.04	0.173

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	-0.003		-0.01	84	0.0		75
1	0.123	0.126	1.05	84	1.7	-	76
2	0.272	0.149	1.05	84	1.7	-	76
3	0.423	0.151	1.06	84	1.6	-	76
4	0.573	0.150	1.07	84	1.8	-	76
5	0.724	0.151	1.07	84	1.7	-	76
6	0.875	0.151	1.07	84	1.7	-	76
7	1.025	0.150	1.07	84	1.8	-	76
8	1.176	0.151	1.06	84	1.7	-	77
9	1.328	0.152	1.06	85	1.7	-	77
10	1.479	0.151	1.06	85	1.8	99	77
11	1.630	0.151	1.06	85	1.9	-	78
12	1.781	0.151	1.06	85	1.9	-	78
13	1.931	0.150	1.05	85	1.7	-	78
14	2.082	0.151	1.06	86	1.7	-	78
15	2.232	0.150	1.06	86	1.8	-	78
16	2.383	0.151	1.06	86	1.7	-	79
17	2.533	0.150	1.06	86	1.8	-	79
18	2.684	0.151	1.06	86	1.8	-	79
19	2.834	0.150	1.06	87	1.8	-	79
20	2.985	0.151	1.06	87	1.7	101	79
21	3.136	0.151	1.06	87	1.9	-	79
22	3.286	0.150	1.06	87	1.8	-	79
23	3.437	0.151	1.06	87	1.9	-	79
24	3.588	0.151	1.06	88	1.9	-	79
25	3.740	0.152	1.05	88	1.8	-	79
26	3.891	0.151	1.06	88	1.9	-	79
27	4.042	0.151	1.06	88	1.9	-	79
28	4.194	0.152	1.05	88	1.9	-	79
29	4.344	0.150	1.05	89	2.0	-	79
30	4.495	0.151	1.05	89	1.8	101	79
31	4.646	0.151	1.05	89	1.8	-	79

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32	4.796	0.150	1.05	89	1.9	-	79
33	4.946	0.150	1.05	89	1.9	-	79
34	5.097	0.151	1.05	90	2.0	-	79
35	5.247	0.150	1.05	90	1.8	-	79
36	5.397	0.150	1.05	90	2.0	-	79
37	5.546	0.149	1.05	90	2.0	-	79
38	5.696	0.150	1.05	90	1.8	-	79
39	5.846	0.150	1.04	91	2.0	-	79
40	5.996	0.150	1.04	91	1.8	101	79
41	6.146	0.150	1.04	91	1.9	-	79
42	6.296	0.150	1.04	91	1.9	-	79
43	6.446	0.150	1.03	91	2.0	-	79
44	6.597	0.151	1.03	91	1.9	-	79
45	6.747	0.150	1.03	92	1.8	-	79
46	6.897	0.150	1.04	92	2.0	-	79
47	7.048	0.151	1.04	92	1.9	-	79
48	7.199	0.151	1.04	92	1.8	-	79
49	7.350	0.151	1.04	92	2.0	-	79
50	7.501	0.151	1.04	92	2.0	100	79
51	7.652	0.151	1.04	93	1.9	-	79
52	7.803	0.151	1.05	93	1.8	-	79
53	7.953	0.150	1.05	93	1.9	-	79
54	8.104	0.151	1.05	93	2.0	-	79
55	8.255	0.151	1.05	93	2.0	-	79
56	8.405	0.150	1.05	93	2.0	-	79
57	8.556	0.151	1.04	94	1.8	-	79
58	8.707	0.151	1.04	94	1.9	-	79
59	8.858	0.151	1.04	94	1.8	-	79
60	9.010	0.152	1.04	94	2.0	99	79
Avg/Tot	9.013	0.150	1.03	88.7	1.8	100	78.2

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Stove ΔT: 15

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	524	538	407	267	297	406.6	692.9
1	523	542	418	269	302	410.7	673.0
2	537	537	395	268	305	408.4	662.6
3	535	532	384	266	306	404.7	683.7
4	532	527	378	265	306	401.5	712.4
5	527	523	373	263	305	398.4	746.9
6	524	519	371	263	304	396.1	780.3
7	521	517	368	263	303	394.2	803.5
8	518	515	368	263	302	393.4	817.7
9	514	513	368	264	301	392.1	829.7
10	511	512	368	265	300	391.1	844.3
11	510	510	367	266	298	390.3	856.8
12	507	510	367	268	297	389.6	864.6
13	506	509	367	269	296	389.4	872.0
14	504	508	367	272	295	389.1	879.4
15	502	507	369	273	294	389.1	887.0
16	502	506	370	274	293	389.0	896.0
17	501	506	373	276	292	389.5	903.0
18	501	505	373	278	291	389.3	907.9
19	501	505	375	279	290	389.6	911.3
20	502	504	376	281	288	390.3	914.1
21	502	504	378	282	287	390.8	917.1
22	503	504	382	284	286	391.8	918.9
23	504	505	383	286	285	392.3	920.4
24	503	506	386	287	284	393.1	920.6
25	505	506	390	288	282	394.3	920.7
26	505	507	391	290	281	394.9	920.0
27	506	509	395	292	280	396.4	918.6
28	507	510	398	294	279	397.4	916.1
29	508	512	397	295	278	398.1	914.7
30	508	515	399	297	277	399.2	913.7
31	509	517	401	299	276	400.3	912.7
32	510	520	403	300	275	401.5	911.3
33	511	523	403	301	274	402.3	909.7
34	511	525	405	303	273	403.3	907.6
35	514	528	407	303	272	404.8	905.4
36	514	531	408	304	271	405.4	902.5
37	516	533	408	305	270	406.4	898.9
38	517	535	408	306	269	407.0	893.2
39	518	537	406	307	268	407.2	887.8
40	519	537	406	307	268	407.5	883.7
41	519	538	406	308	267	407.6	879.9
42	519	538	406	308	266	407.3	875.4
43	519	539	402	307	266	406.6	870.3
44	519	538	403	307	265	406.5	864.8
45	520	538	403	307	264	406.2	859.5
46	519	538	402	306	264	405.5	854.1
47	518	537	402	306	263	405.3	849.0

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Stove ΔT: 15

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	519	537	402	305	263	405.2	843.9
49	518	537	399	304	262	404.0	839.2
50	517	537	400	304	262	403.7	835.7
51	517	537	398	303	261	403.2	832.7
52	517	537	399	302	260	403.1	830.2
53	517	537	399	301	260	402.6	827.8
54	517	537	399	300	259	402.6	825.1
55	517	537	399	299	259	402.2	820.3
56	519	537	397	298	258	402.0	814.9
57	519	537	397	298	258	401.7	810.3
58	519	536	397	297	258	401.1	805.9
59	519	535	396	295	257	400.3	802.3
60	519	534	397	294	257	400.1	799.6
61	520	532	395	293	256	399.2	797.7
62	520	531	393	293	256	398.5	795.2
63	519	530	393	291	256	397.7	792.9
64	520	528	393	289	255	397.0	790.5
65	520	527	393	288	255	396.5	788.2
66	519	526	395	286	255	396.1	786.5
67	517	525	391	285	254	394.4	785.8
68	517	524	391	284	254	393.9	784.4
69	517	523	390	283	254	393.3	782.9
70	516	523	389	281	253	392.4	780.8
71	515	522	390	280	253	392.0	778.2
72	514	521	391	279	253	391.5	775.9
73	514	521	392	278	252	391.5	774.2
74	515	520	393	276	252	391.1	773.0
75	514	520	391	276	252	390.4	771.9
76	513	519	391	274	251	389.6	770.8
77	512	518	390	273	251	388.7	769.4
78	510	517	391	272	250	388.2	769.6
79	509	515	387	271	250	386.5	772.2
80	508	514	384	271	249	385.2	775.7
81	507	512	380	269	249	383.5	776.2
82	506	510	378	269	249	382.3	774.4
83	506	510	379	268	248	382.0	771.0
84	505	510	381	267	248	382.0	764.3
85	505	510	380	266	247	381.6	757.4
86	504	510	381	265	247	381.3	752.6
87	502	510	381	264	247	381.0	750.2
88	503	510	380	263	247	380.5	749.4
89	500	510	379	262	246	379.6	748.4
90	501	510	377	261	246	378.9	746.9
91	501	508	376	260	246	378.2	745.3
92	499	508	375	259	246	377.4	743.7
93	500	507	373	259	246	377.0	741.3
94	500	506	371	257	246	376.3	738.5
95	501	506	371	257	246	376.2	736.2

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Stove ΔT: 15

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
96	500	506	370	256	246	375.6	733.8	
97	500	505	370	255	246	375.2	732.0	
98	500	504	368	254	246	374.5	729.8	
99	501	504	366	253	246	374.1	728.2	
100	502	504	366	253	247	374.4	726.8	
101	504	504	366	252	247	374.7	726.0	
102	504	504	368	252	247	374.9	725.1	
103	506	505	371	251	247	375.8	723.4	
104	509	505	371	251	247	376.5	722.5	
105	511	506	374	250	247	377.6	722.3	
106	514	507	373	250	247	378.0	722.0	
107	516	508	377	250	247	379.5	721.6	
108	518	509	379	249	248	380.5	721.8	
109	520	510	384	249	248	382.0	721.8	
110	519	510	385	249	248	382.0	720.7	
111	521	510	385	249	248	382.5	720.1	
112	521	509	385	248	248	382.3	719.7	
113	521	509	387	247	248	382.4	719.6	
114	520	508	386	247	248	382.0	718.2	
115	521	507	385	247	248	381.6	716.4	
116	522	506	383	247	248	381.3	715.5	
117	524	506	382	247	248	381.2	715.1	
118	524	505	384	246	248	381.2	714.3	
119	525	504	382	246	248	381.0	712.8	
120	528	504	380	246	248	380.9	711.6	
121	529	503	382	245	248	381.5	711.2	
122	531	503	385	245	248	382.5	709.9	
123	533	503	385	245	248	382.7	708.2	
124	535	503	387	244	248	383.3	707.6	
125	538	503	389	244	248	384.5	707.6	
126	538	503	391	244	248	384.9	708.3	
127	540	504	396	244	248	386.2	708.1	
128	541	504	398	244	248	386.8	707.6	
129	541	505	402	243	248	387.9	707.8	
130	541	506	403	243	248	388.3	708.4	
131	542	507	405	243	248	388.9	708.7	
132	541	507	408	243	248	389.6	708.1	
133	540	508	409	243	248	389.6	705.3	
134	541	508	412	243	248	390.5	702.9	
135	541	508	415	243	248	391.1	700.5	
136	541	508	415	243	249	391.1	698.0	
137	542	509	418	243	249	391.9	694.8	
138	542	510	419	243	249	392.5	691.8	
139	541	511	421	242	249	392.9	688.3	
140	541	513	423	243	249	393.7	684.1	
141	541	514	426	242	249	394.5	679.9	
142	540	516	427	242	250	395.1	676.7	
143	540	517	424	242	250	394.7	674.7	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

Stove ΔT: 15

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	539	518	425	242	250	394.9	673.1
145	538	519	426	242	250	395.0	671.2
146	538	519	426	242	251	395.1	669.1
147	537	520	426	241	251	395.0	667.8
148	538	519	424	242	251	394.7	668.4
149	536	519	422	241	252	394.0	668.6
150	534	518	420	241	252	393.2	666.9
151	534	518	420	241	252	393.0	663.5
152	534	518	419	240	253	392.8	659.9
153	534	518	417	240	253	392.2	656.9
154	535	518	417	239	253	392.5	654.3
155	533	519	416	239	254	391.8	651.6
Average	518.5	516.6	392.0	268.8	261.0	391.4	776.3

LAB SAMPLE DATA - ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 2

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/1/2024

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01113	244.4	250.6	6.2
	B	G01114	243.6	249.7	6.1
	C - 1st Hour	G01115	244.8	250.5	5.7
	Amb	G01116	244.8	245.0	0.2
Probes	A	15A	117241.5	117241.9	0.4
	B	15B	116754.2	116755.0	0.8
	C - 1st Hour	15C	116848.3	116848.4	0.1
O-rings	A	15A	3570.0	3570.4	0.4
	B	15B	3571.1	3571.3	0.2
	C - 1st Hour	15C	3397.5	3397.5	0.0

Placed in Dessicator on: 8/1/2024

Balance Audit (mg): 200.0 200.0 200.0

		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	250.8	8/3 15:30	250.6	8/5 10:30				
	B	249.6	8/3 15:30	249.7	8/5 10:30				
	C - 1st Hour	250.5	8/3 15:30	250.5	8/5 10:30				
	Amb	245.0	8/3 15:30	245.0	8/5 10:30				
Probes	A	117242.1	8/3 15:30	117241.9	8/5 10:30				
	B	116754.9	8/3 15:30	116755.2	8/5 10:30	116755.0	8/7 9:00		
	C - 1st Hour	116848.4	8/3 15:30	116848.4	8/5 10:30				
O-Rings	A	3570.5	8/3 15:30	3570.4	8/5 10:30				
	B	3571.2	8/3 15:30	3571.3	8/5 10:30				
	C - 1st Hour	3397.6	8/3 15:30	3397.5	8/5 10:30				

Train A Aggregate, mg:	7.0
Train B Aggregate, mg:	7.1
Train C Aggregate, mg:	5.8
Ambient, mg:	0.2

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove Job Number: 24-330 Tracking #: 211
 Model: Model 91 Run Number: 2 Test Date: 8/1/24

Wood Heater Run Notes

Test Control Settings

Primary Air Setting(s): Fully open
 Boost Air Setting(s): Fully open
 Targeted Burn Category: IV

Preburn Notes

Time	Notes
22:00	+8.34 lb, door open 15 sec

Test Notes

Test Burn Start Time: 12:17 Test Fuel Loaded by: 25 seconds
 Door Closed: 30 seconds Air Control Set at: 0 seconds
 Other Loading Notes: Bypass closed @ 0:35, Fan on high @ 1:00

Time	Notes
	-None-

Test Burn End Time: 14:52

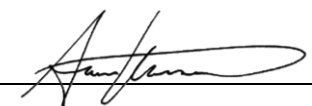
Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO₂ (%): 16.98 CO (%): 4.300
 Mid Gas CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	9:10	9:11	9:12	15:10	15:12	15:13
CO ₂	0.06	16.99	10.16	0.02	16.87	10.06
CO	0.006	4.291	2.502	-0.030	4.220	2.457

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

Technician Signature: 

Date: 8/1/2024

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove

Job Number: 24-330

Tracking #: 211

Model: Model 91

Run Number: 2

Test Date: 8/1/24



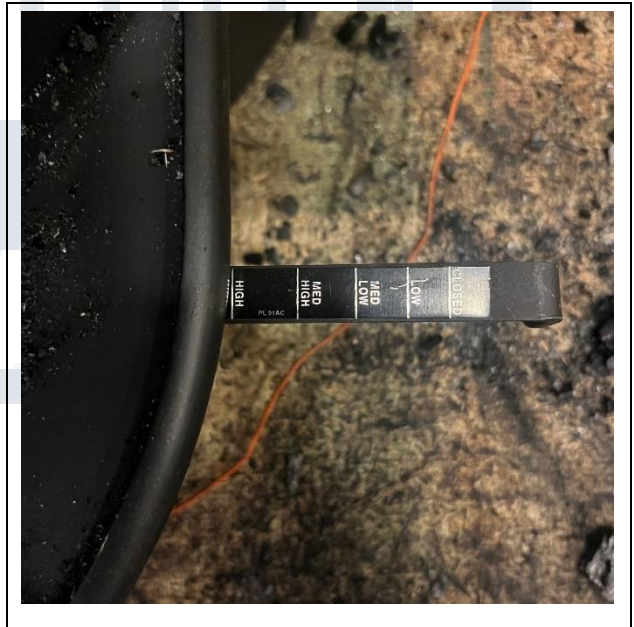
Test Fuel Front/Side View




Test Fuel Iso View



Test Fuel Loaded in Stove



Air Setting

Technician Signature: 

Date: 8/1/2024

WOOD STOVE TEST DATA PACKET
ASTM E2780/E2515



Run 3 Data Summary

Client:	Buck Stove
Model:	91
Job #:	24-330
Tracking #:	211
Test Date:	8/2/2024



Technician Signature

9/3/2024

Date

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Burn Rate (kg/hr):	1.54
---------------------------	-------------

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	31.943	52.737	50.520	9.326
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.4			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	12001.1			
Average Gas Meter Temperature (°F)	83.1	99.2	101.7	86.8
Total Sample Volume (dscf)	31.476	49.941	48.373	9.108
Average Tunnel Temperature (°F)	100.2			
Total Time of Test (min)	324			
Total Particulate Catch (mg)	0.0	6.1	6.2	4.9
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001221	0.0001282	0.0005380
Total PM Emissions (g)	0.00	7.92	8.31	6.46
Particulate Emission Rate (g/hr)	0.00	1.47	1.54	6.46
Emissions Factor (g/kg)	-	0.95	1.00	-
Difference from Average Total Particulate Emissions (g)	-	0.20	0.20	-
Difference from Average Total Particulate Emissions (%)	-	2.4%	2.4%	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	8.11
Particulate Emission Rate (g/hr)	1.50
Emissions Factor (g/kg)	0.98
HHV Efficiency (%)	78.7%
LHV Efficiency (%)	85.1%
CO Emissions (g/min)	0.71

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	84.6	OK
Face Velocity	< 30 ft/min	9.2	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min:80.1/Max:85	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	107.4	OK

WOODSTOVE FUEL DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	18.50	22.9		2x4	18.50	23.6
2x4	18.50	19.7		2x4	18.50	23.7
2x4	18.50	19.5				
2x4	18.50	19.5				
2x4	18.50	19.8				
2x4	18.50	21.9				
2x4	18.50	24.2				
2x4	18.50	24.3				
Total Fuel Weight (lbs):		23.27	Average Moisture (%DB):		21.9	

Firebox Volume (ft³): 3.07
 Total 2x4 Crib Weight, with spacers (lbs): 0.00
 Total 4x4 Crib Weight, with spacers (lbs): 22.18
 Total Wet Fuel Weight, with spacers (lbs): 22.18

Coal Bed Range (20-25%):
 Min (lbs): 4.44
 Max (lbs): 5.55

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
4x4	18.50	5.20	19.7	21.3	21.3	4.31
4x4	20.25	5.64	23.2	21.7	19.0	4.65
4x4	20.25	5.58	22.1	20.5	19.3	4.63
4x4	18.50	4.37	23.2	24.1	19.8	3.57
Total Dry Weight, no spacers (lbs):						17.15
Total Dry Weight, with spacers (lbs):						18.31

Spacer Moisture Readings (%DB)						
19.7	17.7					
21.2	19.3					
21.9	19.6					
17.5	20.0					
20.7	18.6					
21.8	20.3					
19.8	20.7					
18.9	21.2					

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft ³ , DB)	31.2	OK
Loading Density	6.3 - 7.7 (lbs/ft ³ , WB)	7.22	OK
2x4 Fuel Mix	35 - 65 % of total weight	N/A	N/A

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Buck Stove	Job #: 24-330
Model: 91	Tracking #: 211
Run #: 3	Technician: AK
Test Start Time: 10:36	Date: 8/2/2024

Total Sampling Time (min): **324**
 Recording Interval (min): **1**

Meter Box γ Factor: **0.996 (A)**
 Meter Box γ Factor: **1.012 (B)**
 Meter Box γ Factor: **1.008 (C)**
 Meter Box γ Factor: **1.013 (Ambient)**

Induced Draft Check (in. H₂O): **0**
 Smoke Capture Check (%): **100%**
 Date Flue Pipe Last Cleaned: **7/30/2024**
 Test Fuel Scale Audit (lbs): **10.00**
 Platform Scale Audit (lbs): **10.0**

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.97	29.93	29.95
Relative Humidity (%)	28.9	40.0	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:	31.943 ft³		

Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.000	cfm @	-6 in. Hg
(B)	0.000	0.000	cfm @	-7 in. Hg
(C)	0.000	0.001	cfm @	-7 in. Hg
(Ambient)	0.000	0.000	cfm @	-12 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.054	81
2	0.090	81
3	0.092	81
4	0.054	81
5	0.056	81
6	0.090	81
7	0.092	81
8	0.054	81
Center	0.096	81

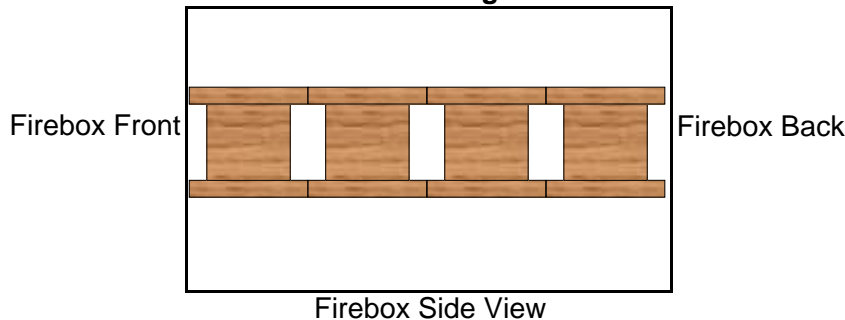
Dilution Tunnel H₂O: **2.00** percent
 Tunnel Diameter: **6** inches
 Pitot Tube Cp: **0.99** [unitless]
 Dilution Tunnel MW(dry): **29.00** lb/lb-mole
 Dilution Tunnel MW(wet): **28.78** lb/lb-mole
 Tunnel Area: **0.1963** ft²

V_{strav} : **17.94** ft/sec
 V_{scent} : **20.77** ft/sec
 F_p : **0.864** [ratio]
 Initial Tunnel Flow: **202.3** scf/min

Static Pressure: **-0.160** in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type:	D. Fir
HHV (kJ/kg)	19,810
%C	48.73
%H	6.87
%O	43.9
%Ash	0.5
MC (%DB)	21.3

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Recording Interval (min): 1
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
0	6.88	-0.092	569	613	489	400	265	467.1	492	80	
1	6.69	-0.090	574	616	499	403	268	471.8	466	80	
2	6.53	-0.089	577	618	499	405	270	473.8	449	81	
3	6.39	-0.088	581	619	500	406	274	476.0	439	81	
4	6.24	-0.087	583	620	498	407	276	476.6	432	81	
5	6.12	-0.087	585	620	498	407	279	478.0	425	81	
6	6.03	-0.085	588	620	497	407	282	478.6	421	80	
7	5.90	-0.084	587	620	496	407	284	478.8	416	81	
8	5.81	-0.083	588	620	499	405	286	479.6	411	80	
9	5.70	-0.084	588	619	495	404	289	478.8	407	80	
10	5.61	-0.084	589	618	495	401	291	478.8	404	80	
11	5.48	-0.081	588	617	494	399	293	478.0	400	80	
12	5.40	-0.080	589	616	496	396	294	478.0	396	81	
13	5.32	-0.083	590	616	491	393	296	477.1	394	80	
14	9.28	-0.086	590	615	493	390	298	477.2	412	80	
15	9.05	-0.085	590	614	495	386	300	476.9	407	80	
16	8.81	-0.084	591	613	490	384	301	475.8	407	80	
17	8.60	-0.083	591	611	485	382	303	474.2	404	81	
18	8.41	-0.084	591	609	482	379	304	472.8	400	80	
19	8.23	-0.084	591	607	479	377	305	471.7	397	80	
20	8.06	-0.083	591	606	480	374	306	471.3	395	80	
21	7.87	-0.082	591	605	479	373	306	470.9	395	80	
22	7.74	-0.083	591	604	477	371	307	469.9	391	81	
23	7.58	-0.080	591	602	478	370	307	469.6	388	80	
24	7.44	-0.081	591	601	478	368	308	469.1	384	80	
25	7.31	-0.080	591	600	473	366	308	467.4	381	80	
26	7.19	-0.078	590	599	476	362	308	467.1	376	80	
27	7.07	-0.079	590	597	473	360	308	465.5	374	80	
28	6.94	-0.079	589	596	471	357	308	464.2	371	80	
29	6.85	-0.078	588	594	469	354	308	462.7	367	80	
30	6.72	-0.078	588	592	465	351	308	460.7	365	80	
31	6.62	-0.076	587	590	464	347	307	459.1	362	80	
32	6.51	-0.077	586	588	464	344	307	457.7	359	80	
33	6.41	-0.076	586	586	461	340	307	456.0	357	80	
34	6.32	-0.077	586	583	460	337	307	454.6	355	80	
35	6.23	-0.075	585	581	459	334	306	452.9	353	80	
36	6.13	-0.075	585	578	455	330	306	450.8	351	79	
37	6.05	-0.073	584	576	455	328	306	449.7	349	80	
38	5.94	-0.074	584	573	455	324	305	448.2	346	80	
39	5.87	-0.073	583	571	453	321	305	446.5	344	80	
40	5.76	-0.074	582	569	455	319	305	445.7	342	80	
41	5.67	-0.073	581	567	453	315	304	444.0	340	80	
42	5.58	-0.072	579	565	452	312	304	442.3	339	80	
43	5.49	-0.072	579	563	451	310	304	441.2	338	80	
44	5.42	-0.073	578	561	451	307	304	440.0	337	80	

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Recording Interval (min): 1
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
45	5.30	-0.071	575	559	450	305	303	438.3	335	80	
46	5.26	-0.072	574	557	448	302	303	436.9	333	80	
47	5.19	-0.070	573	554	444	300	303	434.9	332	80	
48	5.15	-0.071	571	552	438	297	302	432.2	329	80	
49	5.08	-0.070	570	550	433	295	302	429.8	327	80	
50	5.02	-0.070	569	547	433	293	302	428.7	325	80	
51	4.98	-0.069	567	544	428	290	301	426.1	324	80	
52	4.91	-0.070	565	541	426	288	301	424.1	324	80	
53	4.88	-0.068	563	538	423	286	300	422.0	322	80	
54	4.83	-0.067	561	535	419	284	300	419.5	321	80	
55	4.78	-0.068	559	532	417	282	299	417.8	321	80	
56	4.73	-0.068	556	530	417	280	299	416.3	319	80	
57	4.69	-0.067	554	526	416	278	299	414.5	318	80	
58	4.66	-0.067	552	524	413	276	299	412.7	317	80	
59	4.59	-0.067	550	521	412	274	299	411.1	316	80	
60	4.55	-0.067	548	519	411	272	299	409.7	315	80	

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.096	0.03	79	0.1		22.18		110	345	80	80
1	0.117	0.117	0.096	2.21	79	1.0	-	22.13	-0.05	128	368	82	80
2	0.268	0.151	0.097	2.26	79	0.9	-	22.03	-0.10	117	345	82	80
3	0.413	0.145	0.097	2.29	79	0.9	-	21.91	-0.12	112	336	81	81
4	0.567	0.154	0.099	2.32	79	0.9	-	21.77	-0.14	110	333	81	81
5	0.715	0.148	0.099	2.35	79	0.9	-	21.63	-0.14	110	334	80	80
6	0.870	0.155	0.098	2.37	79	1.0	-	21.49	-0.14	109	335	80	80
7	1.020	0.150	0.098	2.40	80	0.9	-	21.34	-0.15	109	337	80	80
8	1.176	0.156	0.097	2.42	80	0.9	-	21.19	-0.15	109	338	80	80
9	1.327	0.151	0.097	2.44	80	1.0	-	21.05	-0.14	110	340	80	80
10	1.485	0.158	0.099	2.45	80	1.0	95	20.90	-0.15	110	341	79	80
11	1.640	0.155	0.095	2.46	80	1.0	-	20.74	-0.16	109	341	79	80
12	1.795	0.155	0.099	2.48	80	1.0	-	20.61	-0.13	109	340	79	80
13	1.951	0.156	0.097	2.48	81	1.0	-	20.44	-0.17	109	341	79	80
14	2.103	0.152	0.096	2.49	81	0.9	-	20.31	-0.13	109	341	79	80
15	2.262	0.159	0.097	2.50	81	0.9	-	20.10	-0.21	109	340	79	80
16	2.417	0.155	0.098	2.51	81	1.0	-	19.95	-0.15	110	340	79	80
17	2.577	0.160	0.097	2.52	82	1.0	-	19.78	-0.17	110	341	79	80
18	2.731	0.154	0.096	2.52	82	1.0	-	19.61	-0.17	110	342	79	80
19	2.890	0.159	0.096	2.52	82	0.9	-	19.43	-0.18	110	343	79	80
20	3.049	0.159	0.097	2.53	83	1.0	100	19.24	-0.19	110	345	79	80
21	3.204	0.155	0.099	2.54	83	1.0	-	19.07	-0.17	110	345	79	80
22	3.365	0.161	0.096	2.54	83	1.0	-	18.87	-0.20	110	341	79	80
23	3.524	0.159	0.097	2.55	83	1.0	-	18.69	-0.18	109	340	79	81
24	3.683	0.159	0.097	2.55	84	1.0	-	18.51	-0.18	109	339	79	81
25	3.842	0.159	0.096	2.56	84	1.0	-	18.32	-0.19	108	338	79	80
26	3.999	0.157	0.096	2.57	84	1.0	-	18.15	-0.17	109	337	79	80
27	4.158	0.159	0.097	2.57	85	1.0	-	17.97	-0.18	108	337	79	81
28	4.314	0.156	0.096	2.57	85	1.0	-	17.77	-0.20	108	338	79	81
29	4.476	0.162	0.096	2.58	85	1.0	-	17.58	-0.19	108	338	79	81
30	4.633	0.157	0.098	2.57	86	1.0	101	17.40	-0.18	108	338	79	81
31	4.793	0.160	0.098	2.58	86	1.0	-	17.23	-0.17	108	338	79	81

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.954	0.161	0.096	2.59	86	1.0	-	17.04	-0.19	108	336	79	81
33	5.111	0.157	0.097	2.58	87	1.0	-	16.88	-0.16	108	336	79	81
34	5.274	0.163	0.096	2.59	87	1.0	-	16.68	-0.20	108	337	79	81
35	5.431	0.157	0.097	2.59	87	1.0	-	16.50	-0.18	108	338	79	81
36	5.592	0.161	0.094	2.59	87	1.0	-	16.31	-0.19	108	339	79	81
37	5.757	0.165	0.098	2.59	88	1.0	-	16.15	-0.16	108	339	79	81
38	5.915	0.158	0.095	2.60	88	1.0	-	15.95	-0.20	108	340	79	81
39	6.076	0.161	0.097	2.60	88	1.0	-	15.79	-0.16	108	339	79	81
40	6.236	0.160	0.096	2.60	89	1.0	101	15.60	-0.19	108	341	79	81
41	6.394	0.158	0.096	2.61	89	1.0	-	15.44	-0.16	108	342	79	81
42	6.556	0.162	0.097	2.60	89	1.0	-	15.27	-0.17	108	342	79	81
43	6.715	0.159	0.097	2.61	89	1.0	-	15.11	-0.16	108	340	79	81
44	6.877	0.162	0.097	2.61	90	1.0	-	14.93	-0.18	108	340	79	81
45	7.038	0.161	0.098	2.61	90	1.0	-	14.78	-0.15	108	341	79	81
46	7.198	0.160	0.098	2.62	90	1.0	-	14.59	-0.19	108	343	79	81
47	7.361	0.163	0.097	2.62	90	1.0	-	14.42	-0.17	108	342	79	81
48	7.520	0.159	0.096	2.62	91	1.0	-	14.25	-0.17	108	343	79	81
49	7.682	0.162	0.097	2.62	91	1.0	-	14.08	-0.17	109	343	79	81
50	7.845	0.163	0.097	2.62	91	1.0	102	13.91	-0.17	109	344	79	81
51	8.005	0.160	0.095	2.62	91	1.0	-	13.73	-0.18	109	344	79	81
52	8.171	0.166	0.097	2.61	92	1.0	-	13.57	-0.16	108	344	79	81
53	8.329	0.158	0.097	2.62	92	1.0	-	13.39	-0.18	109	345	79	82
54	8.489	0.160	0.098	2.62	92	1.1	-	13.24	-0.15	109	344	79	82
55	8.652	0.163	0.099	2.63	92	1.0	-	13.04	-0.20	109	344	79	82
56	8.811	0.159	0.098	2.61	92	1.1	-	12.90	-0.14	109	343	79	82
57	8.974	0.163	0.097	2.62	93	1.1	-	12.73	-0.17	109	344	79	81
58	9.136	0.162	0.095	2.62	93	1.0	-	12.58	-0.15	109	343	79	82
59	9.296	0.160	0.096	2.62	93	1.1	-	12.44	-0.14	109	344	80	82
60	9.460	0.164	0.097	2.62	93	1.0	101	12.27	-0.17	109	344	80	82
61	9.620	0.160	0.096	2.62	94	1.1	-	12.14	-0.13	109	344	80	82
62	9.781	0.161	0.096	2.61	94	1.1	-	11.98	-0.16	109	344	80	82
63	9.946	0.165	0.099	2.63	94	1.1	-	11.84	-0.14	108	340	80	81

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	10.103	0.157	0.098	2.61	94	1.1	-	11.70	-0.14	108	338	80	82
65	10.272	0.169	0.097	2.63	94	1.1	-	11.54	-0.16	108	337	80	82
66	10.432	0.160	0.098	2.63	94	1.1	-	11.40	-0.14	108	335	80	82
67	10.594	0.162	0.096	2.63	95	1.1	-	11.28	-0.12	108	335	80	82
68	10.755	0.161	0.097	2.62	95	1.1	-	11.15	-0.13	108	333	80	82
69	10.915	0.160	0.098	2.63	95	1.1	-	11.01	-0.14	107	331	80	82
70	11.078	0.163	0.097	2.62	95	1.1	101	10.88	-0.13	107	329	80	82
71	11.242	0.164	0.096	2.62	95	1.1	-	10.76	-0.12	107	329	80	82
72	11.401	0.159	0.098	2.63	95	1.1	-	10.63	-0.13	107	327	80	82
73	11.567	0.166	0.099	2.63	96	1.1	-	10.51	-0.12	107	326	80	82
74	11.729	0.162	0.097	2.62	96	1.1	-	10.38	-0.13	107	326	80	82
75	11.893	0.164	0.098	2.63	96	1.1	-	10.25	-0.13	106	325	80	82
76	12.056	0.163	0.098	2.62	96	1.1	-	10.14	-0.11	106	324	80	82
77	12.217	0.161	0.099	2.63	96	1.1	-	10.00	-0.14	106	322	80	82
78	12.377	0.160	0.098	2.63	96	1.1	-	9.88	-0.12	106	322	80	83
79	12.541	0.164	0.098	2.61	96	1.1	-	9.77	-0.11	106	321	80	82
80	12.700	0.159	0.097	2.63	97	1.1	101	9.66	-0.11	106	321	80	82
81	12.866	0.166	0.097	2.62	97	1.1	-	9.56	-0.10	106	320	80	82
82	13.025	0.159	0.098	2.63	97	1.1	-	9.47	-0.09	106	319	80	83
83	13.188	0.163	0.097	2.62	97	1.1	-	9.37	-0.10	106	317	80	82
84	13.352	0.164	0.098	2.62	97	1.1	-	9.25	-0.12	105	316	80	82
85	13.512	0.160	0.098	2.62	97	1.1	-	9.15	-0.10	105	316	80	82
86	13.676	0.164	0.098	2.62	97	1.1	-	9.05	-0.10	105	316	80	83
87	13.839	0.163	0.097	2.62	98	1.1	-	8.95	-0.10	105	314	80	83
88	13.998	0.159	0.098	2.61	98	1.1	-	8.88	-0.07	105	312	80	83
89	14.164	0.166	0.097	2.61	98	1.1	-	8.79	-0.09	104	310	80	83
90	14.324	0.160	0.097	2.62	98	1.1	101	8.71	-0.08	104	307	80	83
91	14.490	0.166	0.097	2.62	98	1.1	-	8.62	-0.09	104	305	80	83
92	14.654	0.164	0.099	2.61	98	1.1	-	8.54	-0.08	103	304	80	83
93	14.815	0.161	0.098	2.63	98	1.1	-	8.47	-0.07	103	302	80	83
94	14.977	0.162	0.098	2.62	98	1.1	-	8.42	-0.05	103	301	80	83
95	15.139	0.162	0.098	2.62	98	1.1	-	8.32	-0.10	103	300	80	83

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.298	0.159	0.099	2.62	98	1.1	-	8.25	-0.07	103	298	80	83
97	15.465	0.167	0.098	2.62	99	1.1	-	8.17	-0.08	103	295	80	83
98	15.624	0.159	0.098	2.62	99	1.1	-	8.10	-0.07	102	294	80	83
99	15.788	0.164	0.097	2.62	99	1.1	-	8.02	-0.08	102	293	80	83
100	15.952	0.164	0.098	2.62	99	1.1	100	7.97	-0.05	102	292	80	83
101	16.113	0.161	0.097	2.62	99	1.1	-	7.91	-0.06	102	291	80	83
102	16.279	0.166	0.097	2.63	99	1.1	-	7.83	-0.08	102	290	80	83
103	16.443	0.164	0.098	2.63	99	1.1	-	7.76	-0.07	101	289	80	83
104	16.603	0.160	0.099	2.63	99	1.1	-	7.68	-0.08	101	288	80	83
105	16.767	0.164	0.097	2.63	99	1.1	-	7.63	-0.05	101	288	80	83
106	16.928	0.161	0.097	2.63	99	1.1	-	7.55	-0.08	101	287	80	83
107	17.090	0.162	0.096	2.63	100	1.1	-	7.48	-0.07	101	287	80	83
108	17.256	0.166	0.099	2.63	100	1.1	-	7.41	-0.07	101	287	80	83
109	17.416	0.160	0.097	2.63	100	1.1	-	7.35	-0.06	101	287	80	83
110	17.581	0.165	0.098	2.63	100	1.1	100	7.26	-0.09	101	287	80	83
111	17.748	0.167	0.099	2.64	100	1.1	-	7.20	-0.06	101	285	80	83
112	17.909	0.161	0.099	2.62	100	1.1	-	7.15	-0.05	101	285	80	83
113	18.071	0.162	0.098	2.64	100	1.1	-	7.06	-0.09	100	285	80	83
114	18.235	0.164	0.096	2.63	100	1.1	-	7.00	-0.06	100	283	80	83
115	18.395	0.160	0.098	2.64	100	1.1	-	6.94	-0.06	100	283	80	83
116	18.563	0.168	0.097	2.65	100	1.1	-	6.88	-0.06	100	279	80	83
117	18.723	0.160	0.098	2.64	100	1.1	-	6.85	-0.03	100	277	80	83
118	18.889	0.166	0.097	2.64	100	1.1	-	6.77	-0.08	100	275	80	83
119	19.056	0.167	0.096	2.63	100	1.1	-	6.72	-0.05	99	274	80	83
120	19.214	0.158	0.099	2.63	100	1.1	99	6.68	-0.04	99	273	80	83
121	19.378	0.164	0.096	2.63	101	1.1	-	6.60	-0.08	99	274	80	83
122	19.543	0.165	0.098	2.64	101	1.1	-	6.55	-0.05	99	273	80	83
123	19.704	0.161	0.096	2.63	101	1.1	-	6.51	-0.04	99	273	80	83
124	19.872	0.168	0.097	2.64	101	1.1	-	6.44	-0.07	99	273	80	83
125	20.037	0.165	0.098	2.63	101	1.1	-	6.39	-0.05	99	273	80	83
126	20.196	0.159	0.098	2.63	101	1.1	-	6.33	-0.06	99	273	80	83
127	20.361	0.165	0.094	2.64	101	1.1	-	6.28	-0.05	99	272	80	83

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.522	0.161	0.096	2.63	101	1.1	-	6.22	-0.06	99	271	80	83
129	20.687	0.165	0.099	2.63	101	1.1	-	6.17	-0.05	99	271	80	83
130	20.851	0.164	0.100	2.62	101	1.1	99	6.12	-0.05	99	269	80	83
131	21.015	0.164	0.098	2.64	101	1.1	-	6.07	-0.05	98	268	80	83
132	21.180	0.165	0.097	2.64	101	1.1	-	6.02	-0.05	98	267	80	83
133	21.342	0.162	0.098	2.64	101	1.1	-	5.96	-0.06	98	266	80	83
134	21.504	0.162	0.097	2.63	101	1.1	-	5.91	-0.05	98	266	80	83
135	21.669	0.165	0.099	2.65	101	1.1	-	5.86	-0.05	98	267	80	83
136	21.834	0.165	0.097	2.63	101	1.1	-	5.81	-0.05	98	266	80	83
137	21.994	0.160	0.097	2.64	102	1.1	-	5.74	-0.07	98	266	80	83
138	22.164	0.170	0.097	2.63	101	1.1	-	5.68	-0.06	99	266	80	83
139	22.326	0.162	0.098	2.63	102	1.1	-	5.61	-0.07	99	266	80	83
140	22.486	0.160	0.099	2.65	102	1.1	99	5.55	-0.06	98	267	80	83
141	22.652	0.166	0.098	2.63	102	1.1	-	5.51	-0.04	98	267	80	83
142	22.813	0.161	0.098	2.63	102	1.1	-	5.42	-0.09	98	266	80	83
143	22.978	0.165	0.097	2.63	102	1.1	-	5.38	-0.04	98	261	80	83
144	23.146	0.168	0.099	2.64	102	1.1	-	5.32	-0.06	97	259	80	83
145	23.308	0.162	0.098	2.63	102	1.1	-	5.27	-0.05	97	256	80	83
146	23.469	0.161	0.097	2.64	102	1.1	-	5.21	-0.06	97	255	80	83
147	23.635	0.166	0.098	2.63	102	1.1	-	5.19	-0.02	97	253	80	83
148	23.795	0.160	0.097	2.63	102	1.1	-	5.16	-0.03	97	251	80	83
149	23.962	0.167	0.096	2.63	102	1.1	-	5.11	-0.05	97	250	80	83
150	24.125	0.163	0.098	2.62	102	1.1	99	5.08	-0.03	97	249	80	83
151	24.290	0.165	0.098	2.65	102	1.1	-	5.03	-0.05	96	248	80	83
152	24.454	0.164	0.099	2.65	102	1.1	-	4.99	-0.04	96	246	80	83
153	24.615	0.161	0.098	2.64	102	1.1	-	4.96	-0.03	96	246	80	83
154	24.780	0.165	0.099	2.63	102	1.1	-	4.94	-0.02	96	244	80	83
155	24.945	0.165	0.098	2.65	102	1.1	-	4.89	-0.05	96	243	80	83
156	25.110	0.165	0.098	2.65	102	1.1	-	4.85	-0.04	96	243	80	83
157	25.275	0.165	0.096	2.63	102	1.1	-	4.82	-0.03	96	242	80	83
158	25.439	0.164	0.099	2.65	102	1.1	-	4.79	-0.03	96	240	80	83
159	25.599	0.160	0.098	2.63	102	1.1	-	4.77	-0.02	96	240	80	83

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.764	0.165	0.096	2.64	102	1.1	100	4.74	-0.03	96	239	80	83
161	25.929	0.165	0.097	2.64	102	1.1	-	4.70	-0.04	95	237	80	83
162	26.090	0.161	0.098	2.65	102	1.1	-	4.68	-0.02	95	236	81	83
163	26.261	0.171	0.096	2.63	102	1.1	-	4.68	0.00	95	235	81	83
164	26.423	0.162	0.096	2.64	102	1.1	-	4.63	-0.05	95	234	81	83
165	26.584	0.161	0.098	2.64	103	1.1	-	4.61	-0.02	95	233	81	83
166	26.750	0.166	0.097	2.64	103	1.1	-	4.59	-0.02	95	231	81	83
167	26.910	0.160	0.099	2.63	103	1.1	-	4.56	-0.03	95	231	81	83
168	27.079	0.169	0.098	2.64	103	1.1	-	4.54	-0.02	95	230	81	83
169	27.241	0.162	0.095	2.65	103	1.1	-	4.53	-0.01	95	229	81	83
170	27.403	0.162	0.099	2.64	103	1.1	99	4.49	-0.04	95	228	81	84
171	27.568	0.165	0.097	2.64	103	1.1	-	4.48	-0.01	95	227	81	83
172	27.734	0.166	0.097	2.63	103	1.1	-	4.44	-0.04	95	227	81	83
173	27.898	0.164	0.097	2.64	103	1.1	-	4.40	-0.04	95	231	81	83
174	28.064	0.166	0.098	2.65	103	1.1	-	4.39	-0.01	95	233	81	84
175	28.226	0.162	0.099	2.64	103	1.1	-	4.36	-0.03	95	234	81	83
176	28.387	0.161	0.098	2.65	103	1.1	-	4.33	-0.03	95	235	81	83
177	28.555	0.168	0.097	2.64	103	1.1	-	4.30	-0.03	95	235	81	83
178	28.716	0.161	0.097	2.64	103	1.1	-	4.27	-0.03	95	235	81	83
179	28.883	0.167	0.097	2.64	103	1.1	-	4.23	-0.04	96	236	81	84
180	29.047	0.164	0.097	2.64	103	1.1	99	4.18	-0.05	95	235	81	84
181	29.208	0.161	0.096	2.64	103	1.1	-	4.17	-0.01	95	236	81	84
182	29.374	0.166	0.095	2.65	103	1.1	-	4.14	-0.03	96	236	81	84
183	29.542	0.168	0.098	2.64	103	1.1	-	4.10	-0.04	96	236	81	84
184	29.705	0.163	0.097	2.64	103	1.1	-	4.07	-0.03	96	237	81	84
185	29.866	0.161	0.099	2.64	103	1.1	-	4.03	-0.04	96	237	81	83
186	30.033	0.167	0.099	2.63	103	1.1	-	4.01	-0.02	96	237	81	84
187	30.193	0.160	0.098	2.64	103	1.1	-	3.96	-0.05	96	237	81	84
188	30.362	0.169	0.096	2.65	103	1.1	-	3.93	-0.03	96	238	81	84
189	30.524	0.162	0.096	2.64	103	1.1	-	3.91	-0.02	96	239	81	84
190	30.686	0.162	0.093	2.66	103	1.1	101	3.84	-0.07	96	239	81	83
191	30.854	0.168	0.098	2.64	103	1.1	-	3.83	-0.01	96	239	81	83

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	31.018	0.164	0.095	2.64	103	1.1	-	3.78	-0.05	96	240	81	83
193	31.180	0.162	0.099	2.65	103	1.1	-	3.74	-0.04	96	240	81	83
194	31.346	0.166	0.097	2.64	103	1.1	-	3.69	-0.05	96	239	81	84
195	31.511	0.165	0.096	2.65	103	1.1	-	3.67	-0.02	96	239	81	84
196	31.676	0.165	0.097	2.64	103	1.1	-	3.62	-0.05	96	240	81	84
197	31.839	0.163	0.098	2.66	103	1.1	-	3.59	-0.03	96	240	81	84
198	32.001	0.162	0.094	2.64	104	1.1	-	3.57	-0.02	96	239	81	84
199	32.169	0.168	0.099	2.64	104	1.1	-	3.51	-0.06	96	239	81	84
200	32.332	0.163	0.096	2.66	104	1.1	101	3.48	-0.03	96	239	81	84
201	32.493	0.161	0.096	2.63	104	1.1	-	3.41	-0.07	96	240	81	84
202	32.659	0.166	0.096	2.65	104	1.1	-	3.40	-0.01	96	240	81	84
203	32.827	0.168	0.098	2.63	104	1.1	-	3.37	-0.03	96	241	81	84
204	32.985	0.158	0.098	2.65	104	1.1	-	3.33	-0.04	96	242	81	84
205	33.154	0.169	0.098	2.64	104	1.1	-	3.27	-0.06	96	241	81	84
206	33.315	0.161	0.100	2.64	104	1.1	-	3.22	-0.05	96	242	81	84
207	33.481	0.166	0.097	2.63	104	1.1	-	3.18	-0.04	96	243	81	84
208	33.646	0.165	0.098	2.64	104	1.1	-	3.13	-0.05	96	244	81	84
209	33.807	0.161	0.097	2.64	104	1.1	-	3.09	-0.04	96	243	81	84
210	33.973	0.166	0.099	2.63	104	1.1	100	3.06	-0.03	97	243	81	84
211	34.142	0.169	0.098	2.64	104	1.1	-	3.00	-0.06	96	244	81	84
212	34.302	0.160	0.098	2.64	104	1.1	-	2.97	-0.03	96	243	81	84
213	34.466	0.164	0.097	2.65	104	1.1	-	2.92	-0.05	97	244	81	84
214	34.634	0.168	0.095	2.64	104	1.1	-	2.87	-0.05	97	244	81	84
215	34.797	0.163	0.096	2.64	104	1.1	-	2.83	-0.04	97	245	81	84
216	34.960	0.163	0.099	2.64	104	1.1	-	2.77	-0.06	97	247	81	84
217	35.125	0.165	0.096	2.63	104	1.1	-	2.76	-0.01	97	247	81	84
218	35.289	0.164	0.098	2.63	104	1.1	-	2.70	-0.06	97	247	81	84
219	35.454	0.165	0.098	2.64	104	1.1	-	2.66	-0.04	97	247	81	84
220	35.617	0.163	0.098	2.64	104	1.1	99	2.62	-0.04	97	248	82	84
221	35.780	0.163	0.098	2.63	104	1.1	-	2.57	-0.05	97	248	82	84
222	35.950	0.170	0.098	2.64	104	1.1	-	2.55	-0.02	97	249	82	84
223	36.109	0.159	0.096	2.64	104	1.1	-	2.49	-0.06	97	249	82	84

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.274	0.165	0.098	2.64	104	1.1	-	2.45	-0.04	97	248	82	84
225	36.440	0.166	0.094	2.65	104	1.1	-	2.41	-0.04	97	247	82	84
226	36.604	0.164	0.095	2.65	104	1.1	-	2.39	-0.02	97	247	82	84
227	36.768	0.164	0.097	2.64	104	1.1	-	2.35	-0.04	97	248	82	84
228	36.933	0.165	0.097	2.65	104	1.1	-	2.30	-0.05	97	247	82	84
229	37.096	0.163	0.098	2.64	104	1.1	-	2.27	-0.03	97	247	82	84
230	37.263	0.167	0.097	2.64	104	1.1	100	2.22	-0.05	97	250	82	84
231	37.427	0.164	0.097	2.64	104	1.1	-	2.20	-0.02	97	250	82	84
232	37.588	0.161	0.096	2.63	104	1.1	-	2.14	-0.06	97	250	82	84
233	37.755	0.167	0.097	2.64	104	1.1	-	2.13	-0.01	98	250	82	84
234	37.922	0.167	0.099	2.63	104	1.1	-	2.09	-0.04	98	250	82	84
235	38.081	0.159	0.099	2.65	104	1.1	-	2.07	-0.02	98	251	82	84
236	38.249	0.168	0.097	2.63	104	1.1	-	2.04	-0.03	98	251	82	84
237	38.414	0.165	0.099	2.64	104	1.1	-	2.02	-0.02	98	250	82	84
238	38.575	0.161	0.098	2.64	104	1.1	-	1.98	-0.04	98	248	82	84
239	38.742	0.167	0.097	2.63	104	1.1	-	1.94	-0.04	98	247	82	84
240	38.902	0.160	0.098	2.64	104	1.1	99	1.93	-0.01	98	246	82	84
241	39.071	0.169	0.099	2.64	104	1.1	-	1.90	-0.03	98	245	82	84
242	39.234	0.163	0.098	2.64	104	1.1	-	1.86	-0.04	97	245	82	84
243	39.397	0.163	0.097	2.64	104	1.1	-	1.84	-0.02	97	244	82	85
244	39.562	0.165	0.098	2.63	104	1.1	-	1.83	-0.01	97	244	82	85
245	39.730	0.168	0.098	2.65	104	1.1	-	1.80	-0.03	97	244	82	85
246	39.890	0.160	0.097	2.64	104	1.1	-	1.76	-0.04	97	242	82	85
247	40.056	0.166	0.098	2.64	104	1.1	-	1.77	0.01	97	241	82	84
248	40.222	0.166	0.097	2.63	104	1.1	-	1.73	-0.04	97	240	82	84
249	40.382	0.160	0.097	2.64	104	1.1	-	1.72	-0.01	97	240	82	84
250	40.551	0.169	0.096	2.64	104	1.1	100	1.70	-0.02	97	239	82	84
251	40.718	0.167	0.097	2.64	104	1.1	-	1.68	-0.02	97	238	82	84
252	40.877	0.159	0.096	2.65	105	1.1	-	1.64	-0.04	97	238	82	84
253	41.045	0.168	0.096	2.64	104	1.1	-	1.64	0.00	97	237	82	84
254	41.207	0.162	0.096	2.64	105	1.1	-	1.62	-0.02	97	237	82	84
255	41.374	0.167	0.099	2.64	105	1.1	-	1.60	-0.02	97	237	82	84

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.539	0.165	0.098	2.63	105	1.1	-	1.58	-0.02	97	235	82	85
257	41.704	0.165	0.098	2.64	105	1.1	-	1.55	-0.03	97	235	83	84
258	41.866	0.162	0.098	2.63	105	1.1	-	1.53	-0.02	97	235	83	84
259	42.032	0.166	0.098	2.65	105	1.1	-	1.49	-0.04	97	234	83	84
260	42.195	0.163	0.098	2.64	105	1.1	100	1.49	0.00	97	234	83	84
261	42.363	0.168	0.099	2.64	105	1.1	-	1.47	-0.02	96	234	83	84
262	42.526	0.163	0.095	2.65	105	1.1	-	1.45	-0.02	96	234	83	85
263	42.689	0.163	0.097	2.64	105	1.1	-	1.42	-0.03	96	232	83	85
264	42.854	0.165	0.097	2.65	105	1.1	-	1.41	-0.01	96	232	83	84
265	43.023	0.169	0.098	2.65	105	1.1	-	1.38	-0.03	96	232	83	85
266	43.181	0.158	0.095	2.64	105	1.1	-	1.35	-0.03	96	231	83	85
267	43.349	0.168	0.098	2.65	105	1.1	-	1.34	-0.01	96	231	83	85
268	43.516	0.167	0.098	2.64	105	1.1	-	1.33	-0.01	96	231	83	85
269	43.674	0.158	0.097	2.65	105	1.1	-	1.29	-0.04	96	231	83	85
270	43.843	0.169	0.096	2.64	105	1.1	100	1.27	-0.02	96	230	83	85
271	44.004	0.161	0.099	2.65	105	1.1	-	1.24	-0.03	96	229	83	85
272	44.172	0.168	0.096	2.66	105	1.1	-	1.23	-0.01	96	229	83	85
273	44.336	0.164	0.098	2.66	105	1.1	-	1.18	-0.05	96	228	83	85
274	44.497	0.161	0.096	2.65	105	1.1	-	1.18	0.00	96	228	83	85
275	44.666	0.169	0.095	2.64	105	1.1	-	1.16	-0.02	96	228	83	85
276	44.830	0.164	0.097	2.66	105	1.1	-	1.13	-0.03	96	228	83	85
277	44.992	0.162	0.096	2.63	105	1.1	-	1.10	-0.03	96	228	83	85
278	45.157	0.165	0.099	2.64	105	1.1	-	1.10	0.00	96	227	83	85
279	45.325	0.168	0.098	2.64	105	1.1	-	1.07	-0.03	96	228	83	85
280	45.486	0.161	0.097	2.64	105	1.1	100	1.03	-0.04	96	227	83	85
281	45.652	0.166	0.097	2.64	105	1.1	-	1.02	-0.01	96	227	83	85
282	45.821	0.169	0.096	2.62	105	1.1	-	1.00	-0.02	96	227	83	85
283	45.979	0.158	0.097	2.63	105	1.1	-	0.96	-0.04	96	227	83	85
284	46.147	0.168	0.098	2.64	105	1.1	-	0.96	0.00	96	226	83	85
285	46.311	0.164	0.099	2.62	105	1.1	-	0.92	-0.04	96	225	83	85
286	46.476	0.165	0.096	2.63	105	1.1	-	0.92	0.00	96	226	83	85
287	46.642	0.166	0.098	2.62	105	1.1	-	0.87	-0.05	96	225	83	85

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	46.804	0.162	0.096	2.64	105	1.1	-	0.86	-0.01	96	225	84	85
289	46.969	0.165	0.097	2.64	105	1.1	-	0.83	-0.03	96	225	84	85
290	47.136	0.167	0.094	2.65	105	1.1	101	0.83	0.00	96	225	84	85
291	47.297	0.161	0.095	2.64	105	1.1	-	0.78	-0.05	96	225	84	85
292	47.464	0.167	0.095	2.63	105	1.1	-	0.77	-0.01	96	226	84	85
293	47.629	0.165	0.098	2.64	105	1.1	-	0.75	-0.02	96	225	84	85
294	47.793	0.164	0.098	2.64	105	1.1	-	0.72	-0.03	96	225	84	85
295	47.958	0.165	0.098	2.64	106	1.1	-	0.72	0.00	96	225	84	85
296	48.123	0.165	0.098	2.64	106	1.1	-	0.67	-0.05	96	225	84	85
297	48.286	0.163	0.097	2.64	106	1.1	-	0.65	-0.02	96	225	84	85
298	48.452	0.166	0.096	2.65	106	1.1	-	0.65	0.00	96	224	84	85
299	48.621	0.169	0.096	2.64	106	1.1	-	0.62	-0.03	96	225	84	85
300	48.780	0.159	0.093	2.64	106	1.1	101	0.60	-0.02	96	224	84	85
301	48.947	0.167	0.097	2.64	106	1.1	-	0.57	-0.03	96	224	84	85
302	49.113	0.166	0.094	2.64	106	1.1	-	0.54	-0.03	96	223	84	85
303	49.276	0.163	0.096	2.62	106	1.1	-	0.52	-0.02	96	223	84	85
304	49.443	0.167	0.096	2.64	106	1.1	-	0.50	-0.02	96	222	84	85
305	49.605	0.162	0.095	2.63	106	1.1	-	0.47	-0.03	96	221	84	85
306	49.769	0.164	0.096	2.63	106	1.1	-	0.46	-0.01	96	221	84	85
307	49.939	0.170	0.094	2.61	106	1.1	-	0.45	-0.01	96	221	84	85
308	50.099	0.160	0.095	2.63	106	1.1	-	0.41	-0.04	96	222	84	85
309	50.264	0.165	0.098	2.63	106	1.1	-	0.39	-0.02	96	221	84	85
310	50.434	0.170	0.099	2.62	106	1.1	101	0.36	-0.03	96	221	84	85
311	50.594	0.160	0.096	2.63	106	1.1	-	0.32	-0.04	96	221	84	85
312	50.758	0.164	0.099	2.63	106	1.1	-	0.31	-0.01	96	222	84	85
313	50.924	0.166	0.095	2.64	106	1.1	-	0.29	-0.02	96	222	84	85
314	51.087	0.163	0.095	2.61	106	1.1	-	0.25	-0.04	96	222	84	85
315	51.252	0.165	0.095	2.62	106	1.1	-	0.21	-0.04	96	222	84	85
316	51.421	0.169	0.096	2.63	106	1.1	-	0.20	-0.01	96	222	84	85
317	51.580	0.159	0.095	2.63	106	1.1	-	0.17	-0.03	96	222	84	85
318	51.746	0.166	0.098	2.63	106	1.1	-	0.15	-0.02	96	221	84	85
319	51.912	0.166	0.098	2.63	106	1.1	-	0.12	-0.03	96	221	84	85

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove Job #: 24-330
 Model: 91 Tracking #: 211
 Run #: 3 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	52.076	0.164	0.098	2.62	106	1.1	99	0.09	-0.03	96	221	84	85
321	52.242	0.166	0.097	2.62	106	1.1	-	0.07	-0.02	96	222	85	85
322	52.406	0.164	0.096	2.62	106	1.1	-	0.06	-0.01	96	221	85	85
323	52.571	0.165	0.097	2.62	106	1.1	-	0.02	-0.04	96	222	85	85
324	52.737	0.166	0.097	2.62	106	1.1	100	0.00	-0.02	96	223	85	85
Avg/Tot	52.737	0.163	0.097	2.61	99.2	1.1	100			100.2	271.0	81.0	83.1

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		0.05	79	1.1		82	-0.068	4.08	0.041
1	0.125	0.125	2.37	79	1.9	-	84	-0.072	2.91	0.116
2	0.277	0.152	2.38	79	2.0	-	85	-0.073	6.09	0.014
3	0.429	0.152	2.39	79	2.0	-	83	-0.073	6.63	0.016
4	0.581	0.152	2.39	79	1.8	-	82	-0.072	6.73	0.022
5	0.733	0.152	2.39	80	2.0	-	82	-0.074	7.05	0.016
6	0.883	0.150	2.38	80	2.0	-	81	-0.076	7.71	0.018
7	1.036	0.153	2.38	80	2.1	-	81	-0.076	7.37	0.021
8	1.185	0.149	2.38	80	1.6	-	81	-0.075	7.61	0.030
9	1.341	0.156	2.39	80	1.9	-	81	-0.075	7.57	0.023
10	1.492	0.151	2.38	80	1.6	100	81	-0.076	8.02	0.024
11	1.647	0.155	2.39	81	1.6	-	81	-0.075	8.13	0.022
12	1.796	0.149	2.39	81	1.9	-	81	-0.075	8.40	0.039
13	1.948	0.152	2.39	81	1.7	-	80	-0.075	8.68	0.092
14	2.097	0.149	2.38	81	1.9	-	80	-0.074	8.72	0.110
15	2.251	0.154	2.38	82	1.8	-	80	-0.076	8.98	0.136
16	2.402	0.151	2.38	82	1.6	-	80	-0.075	9.51	0.220
17	2.555	0.153	2.39	82	1.8	-	80	-0.074	9.88	0.218
18	2.708	0.153	2.39	82	1.8	-	80	-0.076	9.96	0.216
19	2.860	0.152	2.40	83	2.1	-	80	-0.074	9.93	0.418
20	3.013	0.153	2.39	83	1.6	102	80	-0.075	9.98	0.448
21	3.164	0.151	2.39	83	1.9	-	80	-0.076	10.21	0.616
22	3.318	0.154	2.38	84	1.9	-	80	-0.075	10.45	0.870
23	3.471	0.153	2.39	84	2.0	-	80	-0.073	10.36	0.606
24	3.627	0.156	2.39	84	1.9	-	80	-0.073	10.42	0.576
25	3.778	0.151	2.39	85	2.1	-	80	-0.075	10.77	0.782
26	3.932	0.154	2.38	85	1.9	-	80	-0.072	10.89	0.892
27	4.080	0.148	2.39	85	1.8	-	80	-0.072	10.99	0.907
28	4.234	0.154	2.38	86	1.6	-	80	-0.075	10.99	0.871
29	4.387	0.153	2.40	86	2.1	-	80	-0.074	10.98	0.874
30	4.541	0.154	2.40	86	1.7	102	80	-0.073	10.96	0.828
31	4.696	0.155	2.40	87	1.7	-	80	-0.074	10.99	0.782

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.847	0.151	2.39	87	2.1	-	80	-0.071	10.99	0.787
33	5.002	0.155	2.39	87	1.7	-	80	-0.071	11.09	0.784
34	5.153	0.151	2.39	88	1.8	-	80	-0.074	11.06	0.822
35	5.310	0.157	2.40	88	1.6	-	80	-0.075	11.11	0.829
36	5.461	0.151	2.39	88	1.9	-	80	-0.073	11.11	0.828
37	5.618	0.157	2.39	89	1.9	-	80	-0.075	11.21	0.817
38	5.770	0.152	2.38	89	2.0	-	80	-0.073	11.08	0.815
39	5.926	0.156	2.39	89	1.6	-	80	-0.071	11.01	0.741
40	6.080	0.154	2.39	90	1.6	102	80	-0.074	11.01	0.711
41	6.231	0.151	2.40	90	2.1	-	80	-0.073	10.99	0.716
42	6.385	0.154	2.39	90	2.0	-	80	-0.073	10.94	0.696
43	6.537	0.152	2.39	91	2.0	-	80	-0.073	10.95	0.708
44	6.694	0.157	2.39	91	1.6	-	80	-0.073	11.03	0.757
45	6.846	0.152	2.39	91	2.0	-	80	-0.073	11.05	0.762
46	7.003	0.157	2.40	91	2.0	-	80	-0.074	11.11	0.835
47	7.154	0.151	2.39	92	1.8	-	80	-0.077	11.21	0.855
48	7.309	0.155	2.39	92	1.6	-	80	-0.076	11.23	0.898
49	7.465	0.156	2.40	92	1.6	-	80	-0.073	11.21	0.894
50	7.619	0.154	2.40	93	1.8	102	80	-0.074	11.21	0.879
51	7.776	0.157	2.39	93	2.0	-	80	-0.074	11.22	0.791
52	7.929	0.153	2.39	93	2.0	-	80	-0.073	11.17	0.793
53	8.086	0.157	2.39	93	1.7	-	80	-0.074	11.16	0.755
54	8.236	0.150	2.38	94	1.8	-	80	-0.074	11.10	0.745
55	8.392	0.156	2.39	94	2.1	-	80	-0.074	11.03	0.710
56	8.545	0.153	2.38	94	2.0	-	80	-0.075	11.06	0.710
57	8.701	0.156	2.39	94	1.7	-	80	-0.072	11.04	0.696
58	8.856	0.155	2.38	95	2.0	-	80	-0.075	11.04	0.689
59	9.010	0.154	2.39	95	1.7	-	80	-0.074	11.01	0.636
60	9.166	0.156	2.38	95	1.7	101	80	-0.072	11.04	0.585
61	9.318	0.152	2.39	95	1.6	-	80	-0.073	10.94	0.548
62	9.475	0.157	2.39	96	1.9	-	81	-0.072	10.97	0.500
63	9.628	0.153	2.39	96	2.0	-	80	-0.073	10.88	0.528

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	9.784	0.156	2.39	96	1.8	-	80	-0.072	10.79	0.467
65	9.941	0.157	2.38	96	2.1	-	80	-0.074	10.75	0.430
66	10.096	0.155	2.39	96	1.9	-	80	-0.073	10.66	0.408
67	10.251	0.155	2.39	97	1.7	-	81	-0.069	10.63	0.380
68	10.402	0.151	2.39	97	2.1	-	81	-0.070	10.61	0.356
69	10.558	0.156	2.39	97	2.1	-	81	-0.073	10.52	0.385
70	10.712	0.154	2.39	97	1.6	101	81	-0.072	10.40	0.361
71	10.869	0.157	2.39	98	1.6	-	81	-0.071	10.33	0.356
72	11.022	0.153	2.39	98	1.6	-	81	-0.071	10.30	0.330
73	11.178	0.156	2.39	98	1.9	-	81	-0.071	10.20	0.300
74	11.337	0.159	2.39	98	2.0	-	81	-0.073	10.25	0.300
75	11.490	0.153	2.39	98	1.9	-	81	-0.071	10.25	0.276
76	11.647	0.157	2.38	98	1.7	-	81	-0.070	10.27	0.267
77	11.801	0.154	2.39	99	1.9	-	81	-0.070	10.27	0.262
78	11.956	0.155	2.38	99	1.7	-	81	-0.070	10.17	0.212
79	12.108	0.152	2.38	99	2.0	-	81	-0.069	9.98	0.176
80	12.265	0.157	2.38	99	1.8	101	81	-0.070	9.70	0.155
81	12.420	0.155	2.39	99	1.8	-	81	-0.070	9.69	0.135
82	12.576	0.156	2.39	99	1.8	-	81	-0.068	9.68	0.108
83	12.731	0.155	2.38	100	2.0	-	81	-0.067	9.57	0.125
84	12.885	0.154	2.38	100	2.1	-	81	-0.070	9.60	0.055
85	13.043	0.158	2.38	100	1.7	-	81	-0.070	9.56	0.082
86	13.196	0.153	2.39	100	1.9	-	81	-0.069	9.46	0.049
87	13.353	0.157	2.38	100	1.8	-	81	-0.069	9.14	0.024
88	13.507	0.154	2.39	100	2.0	-	81	-0.068	8.50	0.025
89	13.663	0.156	2.38	100	1.9	-	81	-0.066	8.46	0.045
90	13.819	0.156	2.39	101	1.7	101	81	-0.065	8.41	0.020
91	13.975	0.156	2.38	101	2.0	-	81	-0.064	8.27	0.022
92	14.134	0.159	2.39	101	2.0	-	81	-0.064	8.11	0.031
93	14.287	0.153	2.39	101	2.1	-	81	-0.066	8.20	0.037
94	14.444	0.157	2.38	101	2.1	-	80	-0.065	8.16	0.046
95	14.595	0.151	2.38	101	1.8	-	80	-0.064	8.14	0.072

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	14.753	0.158	2.39	101	2.1	-	81	-0.065	8.29	0.073
97	14.909	0.156	2.39	101	1.7	-	81	-0.064	8.28	0.021
98	15.063	0.154	2.38	102	1.7	-	81	-0.065	8.32	0.017
99	15.221	0.158	2.39	102	1.9	-	80	-0.064	8.29	0.095
100	15.375	0.154	2.38	102	1.7	100	81	-0.062	8.30	0.079
101	15.532	0.157	2.39	102	2.1	-	80	-0.063	8.21	0.056
102	15.690	0.158	2.39	102	2.1	-	81	-0.062	8.07	0.066
103	15.846	0.156	2.39	102	1.9	-	81	-0.062	8.39	0.064
104	16.002	0.156	2.39	102	2.1	-	81	-0.060	8.43	0.117
105	16.154	0.152	2.39	102	1.7	-	81	-0.063	8.66	0.138
106	16.313	0.159	2.39	102	1.8	-	81	-0.060	8.74	0.136
107	16.467	0.154	2.39	102	1.6	-	81	-0.062	8.86	0.143
108	16.624	0.157	2.40	102	1.7	-	81	-0.061	8.90	0.139
109	16.779	0.155	2.40	103	1.7	-	81	-0.061	8.99	0.159
110	16.936	0.157	2.39	103	2.0	100	80	-0.062	9.01	0.168
111	17.096	0.160	2.39	103	1.7	-	81	-0.061	8.88	0.158
112	17.250	0.154	2.39	103	1.7	-	80	-0.064	8.87	0.100
113	17.406	0.156	2.39	103	2.1	-	81	-0.062	8.79	0.126
114	17.560	0.154	2.39	103	1.9	-	81	-0.063	8.68	0.020
115	17.717	0.157	2.39	103	1.9	-	81	-0.062	8.53	0.009
116	17.873	0.156	2.39	103	2.0	-	81	-0.060	8.51	0.016
117	18.030	0.157	2.40	103	1.6	-	81	-0.059	8.39	0.015
118	18.189	0.159	2.40	103	1.7	-	81	-0.059	8.35	0.013
119	18.344	0.155	2.39	103	1.7	-	81	-0.060	8.34	0.011
120	18.500	0.156	2.40	103	2.1	99	81	-0.058	8.29	0.016
121	18.654	0.154	2.39	104	2.0	-	81	-0.058	8.30	0.014
122	18.811	0.157	2.40	104	2.0	-	81	-0.061	8.28	0.011
123	18.968	0.157	2.39	104	2.0	-	81	-0.060	8.29	0.016
124	19.126	0.158	2.39	104	2.1	-	81	-0.060	8.25	0.013
125	19.285	0.159	2.39	104	1.7	-	81	-0.058	8.45	0.025
126	19.439	0.154	2.39	104	1.8	-	81	-0.058	8.29	0.016
127	19.594	0.155	2.39	104	2.1	-	81	-0.058	8.15	0.012

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	19.748	0.154	2.39	104	2.1	-	81	-0.059	8.14	0.013
129	19.907	0.159	2.39	104	1.7	-	81	-0.059	8.06	0.011
130	20.064	0.157	2.39	104	1.8	99	81	-0.058	8.02	0.014
131	20.220	0.156	2.38	104	2.0	-	81	-0.056	8.04	0.010
132	20.380	0.160	2.39	104	1.7	-	81	-0.057	7.92	0.006
133	20.532	0.152	2.40	104	1.7	-	81	-0.058	7.96	0.009
134	20.689	0.157	2.39	104	1.7	-	81	-0.058	8.08	0.008
135	20.845	0.156	2.39	104	1.8	-	81	-0.059	8.26	0.004
136	21.002	0.157	2.39	104	1.8	-	81	-0.057	8.43	0.003
137	21.158	0.156	2.39	105	2.0	-	81	-0.056	8.54	0.013
138	21.316	0.158	2.39	104	2.1	-	81	-0.059	8.79	0.007
139	21.475	0.159	2.39	105	1.9	-	81	-0.060	8.87	0.006
140	21.626	0.151	2.39	105	2.1	98	81	-0.058	8.72	0.008
141	21.784	0.158	2.39	105	1.7	-	81	-0.061	8.60	0.005
142	21.941	0.157	2.39	105	1.7	-	81	-0.059	8.57	0.008
143	22.096	0.155	2.39	105	1.7	-	81	-0.054	8.57	0.021
144	22.257	0.161	2.39	105	1.7	-	81	-0.056	8.42	0.023
145	22.412	0.155	2.38	105	2.0	-	81	-0.055	8.26	0.007
146	22.568	0.156	2.39	105	2.1	-	81	-0.054	8.11	0.004
147	22.722	0.154	2.39	105	2.0	-	81	-0.057	7.88	0.005
148	22.880	0.158	2.39	105	2.0	-	81	-0.057	7.66	0.006
149	23.038	0.158	2.39	105	1.7	-	81	-0.056	7.52	0.004
150	23.192	0.154	2.39	105	1.8	99	81	-0.053	7.37	0.005
151	23.354	0.162	2.39	105	1.7	-	81	-0.054	7.31	0.005
152	23.506	0.152	2.40	105	1.7	-	81	-0.054	7.17	0.006
153	23.664	0.158	2.39	105	2.0	-	81	-0.057	7.04	0.006
154	23.819	0.155	2.39	105	2.1	-	81	-0.053	6.89	0.007
155	23.977	0.158	2.40	105	1.8	-	81	-0.053	6.74	0.009
156	24.136	0.159	2.39	105	2.1	-	81	-0.052	6.62	0.006
157	24.292	0.156	2.39	105	1.9	-	81	-0.053	6.49	0.008
158	24.451	0.159	2.39	105	1.9	-	81	-0.050	6.49	0.005
159	24.602	0.151	2.39	105	1.9	-	81	-0.053	6.49	0.006

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	24.760	0.158	2.39	105	1.9	100	81	-0.053	6.46	0.005
161	24.918	0.158	2.39	105	1.7	-	81	-0.050	6.41	0.004
162	25.073	0.155	2.39	105	1.7	-	81	-0.052	6.34	0.007
163	25.234	0.161	2.39	105	1.9	-	81	-0.051	6.32	0.003
164	25.389	0.155	2.40	105	1.8	-	81	-0.049	6.29	0.004
165	25.544	0.155	2.39	106	2.0	-	81	-0.052	6.27	0.003
166	25.699	0.155	2.39	106	1.7	-	81	-0.052	6.25	0.003
167	25.858	0.159	2.39	106	1.9	-	81	-0.051	6.20	0.004
168	26.018	0.160	2.39	106	1.7	-	81	-0.047	6.25	0.003
169	26.169	0.151	2.38	106	1.9	-	81	-0.051	6.27	0.007
170	26.329	0.160	2.39	106	1.7	99	81	-0.048	6.17	0.004
171	26.483	0.154	2.39	106	1.9	-	81	-0.048	6.15	0.003
172	26.641	0.158	2.39	106	1.7	-	81	-0.051	6.18	0.005
173	26.802	0.161	2.39	106	2.1	-	81	-0.053	6.39	0.006
174	26.957	0.155	2.39	106	1.7	-	81	-0.052	6.49	0.004
175	27.112	0.155	2.39	106	1.9	-	81	-0.051	6.59	0.004
176	27.268	0.156	2.39	106	1.9	-	81	-0.052	6.58	0.005
177	27.427	0.159	2.39	106	1.7	-	81	-0.051	6.50	0.002
178	27.581	0.154	2.39	106	1.8	-	81	-0.053	6.63	0.006
179	27.742	0.161	2.39	106	1.9	-	81	-0.051	6.69	0.003
180	27.897	0.155	2.39	106	1.8	99	81	-0.051	6.73	0.006
181	28.051	0.154	2.39	106	1.7	-	81	-0.047	6.78	0.004
182	28.211	0.160	2.39	106	1.7	-	81	-0.050	6.81	0.004
183	28.368	0.157	2.39	106	1.7	-	81	-0.048	6.79	0.003
184	28.526	0.158	2.39	106	1.9	-	81	-0.052	6.85	0.004
185	28.681	0.155	2.39	106	1.9	-	81	-0.053	6.96	0.007
186	28.837	0.156	2.39	106	1.7	-	81	-0.052	6.97	0.004
187	28.995	0.158	2.39	106	1.7	-	81	-0.051	6.98	0.004
188	29.153	0.158	2.39	106	2.0	-	81	-0.052	7.05	0.004
189	29.309	0.156	2.39	106	2.0	-	81	-0.052	7.08	0.006
190	29.463	0.154	2.39	106	1.7	100	81	-0.053	7.10	0.002
191	29.622	0.159	2.39	106	1.7	-	81	-0.053	7.10	0.005

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	29.782	0.160	2.39	106	1.7	-	81	-0.050	7.14	0.004
193	29.934	0.152	2.39	106	2.1	-	81	-0.053	7.18	0.002
194	30.094	0.160	2.39	106	1.7	-	81	-0.051	7.16	0.005
195	30.251	0.157	2.39	106	1.8	-	81	-0.052	7.27	0.003
196	30.409	0.158	2.38	106	2.0	-	81	-0.053	7.29	0.002
197	30.563	0.154	2.39	106	2.0	-	81	-0.052	7.31	0.004
198	30.720	0.157	2.39	106	1.7	-	81	-0.051	7.32	0.003
199	30.880	0.160	2.38	106	1.7	-	81	-0.053	7.35	0.008
200	31.033	0.153	2.39	106	1.7	101	81	-0.052	7.34	0.003
201	31.192	0.159	2.39	106	2.1	-	81	-0.054	7.36	0.003
202	31.346	0.154	2.39	106	1.7	-	81	-0.052	7.38	0.002
203	31.507	0.161	2.39	106	1.8	-	81	-0.052	7.45	0.003
204	31.663	0.156	2.39	107	1.7	-	81	-0.053	7.50	0.003
205	31.817	0.154	2.39	107	2.1	-	81	-0.052	7.59	0.005
206	31.977	0.160	2.39	107	1.7	-	81	-0.051	7.57	0.003
207	32.134	0.157	2.39	107	2.1	-	81	-0.052	7.66	0.011
208	32.289	0.155	2.39	107	2.1	-	81	-0.053	7.74	0.006
209	32.446	0.157	2.39	107	1.7	-	81	-0.054	7.60	0.003
210	32.603	0.157	2.39	107	1.8	99	81	-0.053	7.62	0.004
211	32.763	0.160	2.39	107	1.9	-	81	-0.054	7.54	0.003
212	32.916	0.153	2.39	107	2.0	-	81	-0.050	7.57	0.005
213	33.076	0.160	2.39	107	1.7	-	81	-0.052	7.53	0.004
214	33.232	0.156	2.38	107	1.7	-	81	-0.054	7.52	0.007
215	33.391	0.159	2.39	107	2.0	-	81	-0.055	7.45	0.003
216	33.546	0.155	2.39	107	1.9	-	81	-0.053	7.39	0.002
217	33.701	0.155	2.39	107	2.0	-	81	-0.054	7.43	0.006
218	33.863	0.162	2.39	107	1.8	-	81	-0.051	7.34	0.005
219	34.015	0.152	2.39	107	1.7	-	81	-0.056	7.36	0.003
220	34.173	0.158	2.39	107	2.0	99	82	-0.051	7.25	0.003
221	34.329	0.156	2.38	107	2.1	-	82	-0.057	7.28	0.002
222	34.489	0.160	2.39	107	1.8	-	82	-0.054	7.23	0.002
223	34.644	0.155	2.39	107	1.9	-	82	-0.052	7.22	0.005

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	34.799	0.155	2.38	107	2.0	-	82	-0.053	7.20	0.004
225	34.959	0.160	2.39	107	1.7	-	82	-0.053	7.17	0.003
226	35.116	0.157	2.38	107	2.0	-	82	-0.051	7.12	0.002
227	35.272	0.156	2.38	107	1.9	-	82	-0.054	7.16	0.003
228	35.430	0.158	2.39	107	1.7	-	82	-0.052	7.07	0.005
229	35.584	0.154	2.39	107	1.9	-	82	-0.055	7.10	0.002
230	35.746	0.162	2.38	107	1.8	100	82	-0.055	7.04	0.003
231	35.899	0.153	2.39	107	2.0	-	82	-0.052	7.01	0.003
232	36.057	0.158	2.39	107	1.7	-	82	-0.054	6.83	0.005
233	36.213	0.156	2.39	107	1.8	-	82	-0.056	6.74	0.001
234	36.372	0.159	2.39	107	2.0	-	82	-0.055	6.74	0.003
235	36.528	0.156	2.38	107	1.7	-	82	-0.054	6.57	0.004
236	36.683	0.155	2.38	107	1.9	-	82	-0.055	6.52	0.001
237	36.844	0.161	2.39	107	1.9	-	82	-0.055	6.42	0.003
238	36.997	0.153	2.39	107	1.8	-	82	-0.054	6.36	0.003
239	37.155	0.158	2.38	107	1.8	-	82	-0.054	6.29	0.001
240	37.313	0.158	2.39	107	2.1	99	82	-0.056	6.20	0.003
241	37.470	0.157	2.38	107	1.9	-	82	-0.052	6.13	0.004
242	37.627	0.157	2.39	107	1.8	-	82	-0.054	6.06	0.004
243	37.782	0.155	2.39	107	2.1	-	82	-0.052	6.09	0.005
244	37.940	0.158	2.39	107	1.8	-	82	-0.052	6.02	0.001
245	38.100	0.160	2.39	107	1.7	-	82	-0.050	5.95	0.002
246	38.254	0.154	2.38	107	2.1	-	82	-0.053	5.93	0.001
247	38.412	0.158	2.39	107	1.9	-	82	-0.052	5.93	0.003
248	38.567	0.155	2.39	107	1.7	-	82	-0.054	5.81	0.002
249	38.727	0.160	2.39	107	2.1	-	82	-0.052	5.77	0.001
250	38.881	0.154	2.39	107	2.0	99	82	-0.053	5.72	0.003
251	39.042	0.161	2.39	107	1.7	-	82	-0.051	5.64	0.002
252	39.198	0.156	2.40	107	1.6	-	82	-0.051	5.62	0.001
253	39.352	0.154	2.39	107	2.0	-	82	-0.051	5.68	0.002
254	39.513	0.161	2.39	107	1.9	-	82	-0.050	5.61	0.002
255	39.669	0.156	2.38	107	2.1	-	82	-0.055	5.62	0.001

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	39.825	0.156	2.39	107	1.8	-	82	-0.052	5.59	0.001
257	39.986	0.161	2.38	107	2.0	-	82	-0.050	5.58	0.001
258	40.139	0.153	2.39	107	1.8	-	82	-0.051	5.62	0.001
259	40.297	0.158	2.39	107	1.8	-	82	-0.050	5.59	0.003
260	40.453	0.156	2.39	107	1.7	100	82	-0.052	5.68	0.003
261	40.614	0.161	2.39	107	1.7	-	82	-0.052	5.63	0.002
262	40.767	0.153	2.38	107	1.9	-	82	-0.050	5.70	0.001
263	40.926	0.159	2.39	107	1.7	-	82	-0.052	5.70	0.004
264	41.083	0.157	2.39	107	1.8	-	82	-0.051	5.71	0.004
265	41.242	0.159	2.39	107	1.9	-	82	-0.050	5.74	0.004
266	41.398	0.156	2.39	108	1.9	-	82	-0.051	5.73	0.003
267	41.553	0.155	2.38	108	2.0	-	82	-0.052	5.78	0.003
268	41.714	0.161	2.39	108	2.1	-	82	-0.049	5.80	0.004
269	41.869	0.155	2.39	108	2.1	-	82	-0.049	5.86	0.004
270	42.025	0.156	2.38	108	1.8	100	82	-0.048	5.88	0.003
271	42.184	0.159	2.39	108	1.7	-	82	-0.048	5.91	0.001
272	42.343	0.159	2.39	108	2.0	-	82	-0.051	5.88	0.002
273	42.498	0.155	2.39	108	1.9	-	82	-0.048	5.93	0.001
274	42.654	0.156	2.39	108	1.6	-	82	-0.049	5.98	0.001
275	42.815	0.161	2.39	108	2.0	-	82	-0.050	5.95	0.002
276	42.970	0.155	2.39	108	1.9	-	82	-0.047	5.97	0.001
277	43.125	0.155	2.39	108	2.0	-	82	-0.049	5.88	0.001
278	43.285	0.160	2.39	108	2.0	-	82	-0.049	5.81	0.002
279	43.442	0.157	2.39	108	1.6	-	82	-0.048	5.81	0.005
280	43.598	0.156	2.39	108	1.9	100	82	-0.049	5.78	0.002
281	43.757	0.159	2.39	108	1.9	-	82	-0.048	5.83	0.004
282	43.914	0.157	2.39	108	2.1	-	82	-0.047	5.85	0.003
283	44.071	0.157	2.39	108	1.7	-	82	-0.048	5.79	0.003
284	44.227	0.156	2.39	108	1.7	-	82	-0.049	5.84	0.003
285	44.385	0.158	2.39	108	1.9	-	82	-0.049	5.91	0.003
286	44.545	0.160	2.39	108	1.7	-	82	-0.048	5.96	0.001
287	44.699	0.154	2.39	108	2.1	-	82	-0.049	5.96	0.003

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	44.857	0.158	2.39	108	2.1	-	82	-0.047	6.02	0.003
289	45.013	0.156	2.39	108	1.6	-	82	-0.048	6.04	0.003
290	45.172	0.159	2.39	108	2.1	100	82	-0.045	6.01	0.002
291	45.327	0.155	2.38	108	1.9	-	82	-0.050	6.04	0.003
292	45.486	0.159	2.39	108	2.1	-	82	-0.048	5.99	0.002
293	45.643	0.157	2.39	108	1.7	-	82	-0.048	5.82	0.004
294	45.798	0.155	2.38	108	1.9	-	82	-0.048	5.79	0.003
295	45.958	0.160	2.39	108	1.8	-	82	-0.048	5.74	0.001
296	46.113	0.155	2.38	108	1.8	-	82	-0.046	5.76	0.002
297	46.271	0.158	2.38	108	1.9	-	82	-0.049	5.74	0.002
298	46.429	0.158	2.38	108	1.7	-	82	-0.049	5.71	0.001
299	46.588	0.159	2.39	108	1.6	-	82	-0.046	5.71	0.002
300	46.744	0.156	2.39	108	2.1	101	82	-0.050	5.73	0.003
301	46.900	0.156	2.39	108	1.7	-	82	-0.049	5.81	0.000
302	47.058	0.158	2.39	108	2.1	-	82	-0.048	5.83	0.001
303	47.218	0.160	2.38	108	1.7	-	82	-0.047	5.84	0.001
304	47.373	0.155	2.39	108	1.7	-	82	-0.046	5.86	0.003
305	47.531	0.158	2.39	109	1.8	-	82	-0.048	5.96	0.003
306	47.686	0.155	2.38	109	1.7	-	82	-0.048	5.99	0.001
307	47.848	0.162	2.39	108	1.9	-	82	-0.047	5.99	0.003
308	48.001	0.153	2.39	108	1.7	-	82	-0.049	6.01	0.002
309	48.159	0.158	2.38	109	1.7	-	82	-0.050	6.09	0.001
310	48.319	0.160	2.39	109	2.0	100	82	-0.043	6.17	0.001
311	48.474	0.155	2.38	109	2.0	-	82	-0.046	6.23	0.001
312	48.632	0.158	2.39	109	1.9	-	82	-0.049	6.23	0.001
313	48.787	0.155	2.38	109	1.7	-	82	-0.047	6.19	0.003
314	48.945	0.158	2.38	109	1.9	-	82	-0.048	6.33	0.002
315	49.103	0.158	2.39	109	1.9	-	82	-0.046	6.38	0.000
316	49.262	0.159	2.38	109	1.9	-	82	-0.049	6.41	0.002
317	49.418	0.156	2.39	109	2.1	-	82	-0.049	6.41	0.002
318	49.574	0.156	2.39	109	1.8	-	82	-0.047	6.42	0.001
319	49.733	0.159	2.39	109	1.9	-	82	-0.048	6.45	0.002

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	49.891	0.158	2.39	109	1.8	99	82	-0.046	6.45	0.001
321	50.047	0.156	2.38	109	1.7	-	83	-0.049	6.39	0.001
322	50.204	0.157	2.38	109	1.7	-	83	-0.044	6.35	0.002
323	50.363	0.159	2.38	109	2.1	-	83	-0.047	6.25	0.001
324	50.520	0.157	2.38	109	1.7	100	83	-0.048	6.32	0.001
Avg/Tot	50.520	0.156	2.38	101.7	1.8	100	81.1	-0.059	7.78	0.135

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	-0.003		0.02	82	0.4		80
1	0.122	0.125	1.05	82	1.7	-	80
2	0.272	0.150	1.06	82	1.8	-	81
3	0.424	0.152	1.07	82	1.7	-	81
4	0.575	0.151	1.08	82	1.7	-	81
5	0.727	0.152	1.08	82	1.6	-	81
6	0.880	0.153	1.09	82	1.8	-	81
7	1.032	0.152	1.09	82	1.9	-	81
8	1.184	0.152	1.09	82	1.9	-	82
9	1.338	0.154	1.09	83	1.7	-	82
10	1.495	0.157	1.10	83	1.8	98	82
11	1.648	0.153	1.10	83	1.7	-	82
12	1.802	0.154	1.10	83	1.7	-	82
13	1.952	0.150	1.10	83	1.9	-	82
14	2.106	0.154	1.09	84	1.8	-	82
15	2.260	0.154	1.10	84	1.7	-	82
16	2.414	0.154	1.10	84	1.9	-	82
17	2.569	0.155	1.11	84	1.8	-	82
18	2.722	0.153	1.11	84	1.9	-	82
19	2.877	0.155	1.10	85	1.7	-	82
20	3.032	0.155	1.11	85	1.7	100	82
21	3.188	0.156	1.12	85	1.8	-	82
22	3.343	0.155	1.12	85	1.7	-	82
23	3.500	0.157	1.11	85	1.9	-	83
24	3.656	0.156	1.12	86	1.7	-	82
25	3.813	0.157	1.13	86	1.9	-	83
26	3.967	0.154	1.12	86	1.8	-	83
27	4.121	0.154	1.12	86	1.7	-	83
28	4.279	0.158	1.13	86	1.9	-	83
29	4.435	0.156	1.13	87	1.8	-	83
30	4.591	0.156	1.12	87	1.8	101	83
31	4.749	0.158	1.13	87	1.9	-	83

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32	4.906	0.157	1.13	87	1.7	-	83
33	5.062	0.156	1.13	88	1.8	-	83
34	5.220	0.158	1.12	88	1.7	-	83
35	5.377	0.157	1.14	88	1.7	-	83
36	5.533	0.156	1.13	88	1.9	-	83
37	5.694	0.161	1.13	88	1.8	-	83
38	5.852	0.158	1.14	89	1.8	-	83
39	6.008	0.156	1.13	89	1.9	-	83
40	6.166	0.158	1.13	89	1.8	102	83
41	6.322	0.156	1.14	89	1.9	-	83
42	6.478	0.156	1.13	89	1.9	-	83
43	6.636	0.158	1.13	89	1.8	-	83
44	6.795	0.159	1.14	90	1.9	-	83
45	6.951	0.156	1.13	90	1.8	-	83
46	7.110	0.159	1.13	90	1.8	-	83
47	7.268	0.158	1.14	90	1.9	-	83
48	7.425	0.157	1.13	90	1.8	-	83
49	7.584	0.159	1.14	91	1.8	-	83
50	7.742	0.158	1.14	91	1.7	102	83
51	7.903	0.161	1.13	91	1.7	-	83
52	8.062	0.159	1.14	91	1.7	-	83
53	8.218	0.156	1.13	91	1.9	-	83
54	8.375	0.157	1.13	91	1.8	-	83
55	8.533	0.158	1.14	91	1.8	-	84
56	8.690	0.157	1.13	92	1.9	-	84
57	8.849	0.159	1.13	92	1.9	-	84
58	9.007	0.158	1.13	92	1.9	-	84
59	9.164	0.157	1.12	92	1.9	-	84
60	9.323	0.159	1.13	92	1.8	102	84
Avg/Tot	9.326	0.155	1.10	86.8	1.8	101	82.5

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Stove ΔT: 107

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	524	517	434	273	302	409.8	698.2
1	524	516	441	275	307	412.5	668.7
2	518	510	442	277	313	412.0	646.3
3	517	505	442	279	319	412.4	650.0
4	510	501	442	281	326	411.9	669.9
5	510	497	441	283	333	412.7	690.8
6	506	493	441	285	339	412.7	702.1
7	497	490	440	287	345	411.6	710.8
8	494	485	440	289	351	411.8	722.7
9	491	483	439	292	356	412.2	736.9
10	486	480	440	295	361	412.2	750.7
11	505	479	415	294	362	411.0	758.6
12	502	477	405	293	360	407.4	761.2
13	500	474	395	292	356	403.3	763.6
14	496	471	387	291	351	399.3	766.3
15	493	469	383	290	346	396.2	771.4
16	490	467	375	289	341	392.2	777.7
17	487	464	374	288	337	389.7	781.9
18	483	462	368	286	332	386.5	785.4
19	480	460	365	286	328	383.8	790.7
20	477	459	363	284	325	381.6	797.7
21	475	457	361	283	321	379.5	808.8
22	473	456	360	283	318	377.9	817.4
23	470	455	357	282	315	375.9	828.2
24	467	454	356	282	313	374.2	836.9
25	465	453	355	281	310	372.9	843.3
26	464	453	354	280	307	371.6	850.1
27	461	453	352	280	305	370.2	857.0
28	459	454	351	280	302	369.3	863.3
29	457	454	351	280	300	368.5	868.1
30	455	455	350	280	298	367.5	871.3
31	454	455	350	280	296	367.0	873.1
32	452	456	351	280	293	366.4	874.8
33	450	457	348	280	291	365.4	875.4
34	449	459	348	280	289	365.1	876.4
35	449	460	349	280	287	364.9	877.1
36	447	461	349	281	285	364.6	878.7
37	446	463	348	281	283	364.1	880.0
38	445	464	349	281	281	364.2	880.5
39	444	466	350	282	280	364.2	881.0
40	443	467	350	283	278	364.1	882.1
41	443	469	350	283	276	364.1	881.6
42	443	470	351	284	275	364.3	881.4
43	442	471	352	285	273	364.5	879.8
44	441	472	353	285	272	364.5	879.5
45	441	474	355	286	270	365.0	879.7
46	440	474	356	286	269	365.1	879.9
47	440	476	357	287	267	365.2	881.4

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Stove ΔT: 107

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	440	477	359	288	266	365.7	884.0
49	440	478	360	288	265	366.0	886.3
50	440	479	359	289	263	366.0	888.9
51	439	481	360	290	262	366.4	890.4
52	440	482	362	291	260	367.1	892.2
53	439	484	363	292	259	367.4	892.5
54	440	485	362	292	258	367.5	892.8
55	441	487	365	293	257	368.5	892.4
56	440	488	364	294	256	368.4	892.0
57	440	489	366	294	255	368.9	889.9
58	441	490	367	295	254	369.4	888.1
59	441	492	369	296	253	369.8	886.1
60	441	494	369	296	252	370.3	883.5
61	441	495	369	296	251	370.5	881.9
62	442	497	370	296	250	370.8	880.0
63	442	498	369	296	249	370.8	876.7
64	443	499	370	296	248	371.0	874.9
65	443	500	369	296	247	371.1	872.4
66	443	501	372	296	246	371.6	869.2
67	443	501	371	296	245	371.4	865.1
68	444	502	370	296	244	371.1	862.1
69	444	503	370	295	243	371.0	858.5
70	444	504	372	294	243	371.2	855.1
71	444	504	371	294	242	370.9	851.0
72	444	504	370	293	241	370.5	847.8
73	445	505	372	292	240	370.6	844.0
74	444	505	370	291	239	369.8	840.7
75	444	506	372	290	238	370.0	838.6
76	444	506	371	289	238	369.4	835.9
77	444	506	370	288	237	369.0	834.0
78	444	506	369	287	236	368.5	831.3
79	444	506	371	286	236	368.5	830.4
80	443	507	369	285	235	367.9	828.0
81	444	506	368	284	235	367.3	826.0
82	443	506	366	283	234	366.4	824.5
83	443	506	368	283	234	366.6	823.0
84	443	505	366	281	233	365.8	820.4
85	443	505	364	281	233	364.8	817.0
86	444	504	364	280	232	364.6	813.6
87	444	503	364	279	232	364.2	810.4
88	444	502	362	278	231	363.5	807.6
89	445	501	363	277	231	363.2	805.7
90	445	500	361	276	230	362.2	802.5
91	445	498	359	275	230	361.4	800.6
92	445	496	356	274	229	359.9	798.2
93	444	493	355	273	229	358.8	795.3
94	443	491	352	272	229	357.3	790.5
95	444	488	351	271	228	356.5	786.1

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Stove ΔT: 107

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	443	486	347	270	228	354.8	783.0
97	443	485	347	268	227	354.1	778.5
98	442	483	345	267	227	352.8	774.7
99	442	481	343	266	226	351.6	772.1
100	441	479	341	265	226	350.2	771.6
101	441	475	340	264	226	349.0	769.4
102	440	473	339	263	225	347.9	768.1
103	439	470	339	262	225	346.8	765.2
104	439	467	337	260	224	345.5	765.1
105	439	465	338	259	224	345.0	764.0
106	438	462	337	258	223	343.8	762.3
107	438	460	336	257	223	342.6	761.5
108	439	457	336	256	222	342.1	761.2
109	438	455	334	255	222	340.9	761.7
110	439	453	333	254	221	340.1	762.6
111	439	451	335	253	221	339.8	764.3
112	439	449	332	252	221	338.6	764.2
113	439	447	333	252	220	338.2	763.9
114	439	445	331	251	220	337.1	764.3
115	440	443	331	250	219	336.7	763.1
116	440	442	329	250	219	336.0	761.1
117	439	440	328	249	219	335.0	760.1
118	440	439	326	249	218	334.2	760.5
119	440	437	328	248	218	334.3	761.7
120	440	436	327	248	218	333.8	762.7
121	439	436	327	248	218	333.5	764.7
122	439	434	328	248	218	333.4	765.2
123	438	433	326	248	218	332.6	765.5
124	437	432	328	248	218	332.6	763.4
125	437	432	326	248	218	332.3	762.2
126	436	431	326	248	218	332.1	758.9
127	435	432	326	248	218	331.7	754.8
128	434	432	325	248	218	331.6	754.0
129	433	433	325	248	218	331.5	751.9
130	433	433	325	248	218	331.4	752.3
131	432	434	326	248	218	331.3	750.5
132	430	435	324	247	218	330.9	748.2
133	429	436	325	247	218	331.0	745.8
134	428	437	326	247	218	331.0	743.2
135	427	438	324	246	218	330.6	742.1
136	426	440	323	245	218	330.2	742.6
137	425	442	323	245	218	330.6	744.6
138	424	444	323	244	218	330.6	746.9
139	423	446	323	244	218	330.7	751.4
140	422	449	322	244	218	330.8	753.3
141	422	451	322	243	218	331.1	754.8
142	421	454	322	243	217	331.2	756.0
143	419	456	321	243	217	353.6	753.9

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Stove ΔT: 107

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	419	458	321	242	217	331.4	753.0
145	418	459	320	242	217	331.1	754.5
146	417	460	321	241	217	331.2	756.7
147	416	461	319	241	217	330.5	757.9
148	414	461	318	241	217	330.2	758.3
149	413	460	318	241	217	329.9	758.7
150	412	460	317	241	216	329.1	758.5
151	412	458	318	240	216	328.8	757.8
152	411	456	315	240	216	327.7	757.1
153	410	454	315	240	216	326.9	756.6
154	409	453	314	239	216	326.1	755.0
155	407	451	313	239	215	325.0	751.8
156	406	449	311	239	215	323.9	747.2
157	406	447	310	238	215	323.0	743.3
158	404	445	310	237	215	322.1	736.8
159	403	443	308	237	214	321.2	731.5
160	402	441	309	236	214	320.4	725.4
161	401	439	306	235	214	319.1	720.0
162	400	438	306	235	214	318.5	715.7
163	399	436	306	234	213	317.6	711.1
164	398	434	303	233	213	316.3	707.3
165	397	433	303	232	213	315.7	703.0
166	397	431	303	231	213	315.0	698.6
167	395	430	301	230	212	313.8	692.7
168	395	428	301	229	212	312.9	689.4
169	393	427	300	228	212	311.9	685.1
170	392	425	300	227	212	311.2	681.7
171	391	424	298	226	211	310.1	679.2
172	390	423	298	225	211	309.4	677.3
173	389	422	297	224	211	308.4	675.9
174	389	420	296	223	210	307.6	675.9
175	387	419	295	222	210	306.6	673.8
176	387	418	296	221	210	306.1	673.1
177	386	417	294	220	209	305.3	671.5
178	385	415	294	219	209	304.5	669.2
179	384	415	293	218	209	303.7	668.1
180	384	413	293	218	209	303.4	666.3
181	384	412	292	217	209	302.6	664.0
182	384	412	293	216	208	302.4	661.1
183	383	411	292	215	208	301.8	660.0
184	383	410	292	215	208	301.5	658.8
185	383	409	291	214	208	301.1	658.7
186	383	409	291	214	208	300.8	659.1
187	383	409	291	213	208	300.6	659.9
188	383	408	291	213	208	300.4	661.2
189	383	407	291	213	208	300.3	662.8
190	383	407	292	212	208	300.3	664.3
191	382	406	292	212	208	300.0	666.0

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Stove ΔT: 107

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	382	406	292	212	208	299.8	666.6
193	383	406	291	212	208	299.8	667.4
194	383	405	291	211	208	299.7	668.8
195	383	405	291	211	208	299.7	669.7
196	383	405	292	211	208	299.6	670.3
197	383	405	293	211	208	299.8	670.9
198	383	405	293	211	208	299.9	671.8
199	383	405	292	211	208	299.7	672.1
200	384	405	294	211	208	300.1	673.3
201	384	405	293	210	208	299.9	675.1
202	384	404	295	210	208	300.3	676.1
203	384	404	293	210	208	299.9	678.2
204	385	404	295	211	208	300.2	680.9
205	385	404	295	210	208	300.4	682.9
206	385	403	296	211	208	300.6	684.8
207	386	403	296	210	208	300.6	686.4
208	386	403	298	211	208	301.2	688.0
209	387	403	300	211	208	301.7	687.5
210	387	403	303	211	208	302.4	686.5
211	388	403	302	211	208	302.4	684.3
212	389	403	302	211	208	302.5	684.7
213	389	403	301	211	208	302.5	687.8
214	389	402	299	211	208	302.0	692.0
215	390	402	298	211	208	301.8	695.2
216	390	401	299	212	208	302.0	697.8
217	391	401	297	212	209	301.9	700.2
218	392	400	296	212	209	301.8	702.4
219	393	400	295	213	209	301.7	704.6
220	393	399	295	213	209	301.8	706.2
221	393	398	293	214	209	301.5	706.6
222	394	398	293	214	209	301.4	707.3
223	395	397	292	214	209	301.4	708.2
224	396	396	293	215	209	301.6	707.2
225	396	396	292	215	210	301.5	707.8
226	396	395	292	216	210	301.6	707.3
227	397	394	293	216	210	302.0	706.9
228	397	394	292	216	210	301.8	707.5
229	398	393	292	216	210	301.8	708.8
230	398	393	291	217	210	301.8	709.2
231	398	392	291	217	210	301.7	708.9
232	399	392	291	217	210	301.9	706.5
233	399	392	291	217	211	302.0	702.6
234	400	391	292	218	211	302.2	699.2
235	400	391	292	218	211	302.2	693.6
236	400	390	291	218	211	301.9	688.9
237	400	390	292	218	211	302.1	682.6
238	401	390	291	218	211	302.0	676.4
239	401	390	290	218	211	301.9	669.8

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Stove ΔT: 107

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	401	389	291	217	211	302.0	664.4
241	401	389	291	217	211	301.9	660.0
242	402	389	290	217	212	301.6	656.4
243	402	388	291	216	212	301.8	652.4
244	402	388	290	216	212	301.4	648.4
245	402	387	291	215	212	301.3	644.9
246	401	386	289	215	212	300.7	641.9
247	401	386	290	215	212	300.7	639.6
248	402	385	288	214	212	300.3	637.5
249	402	385	289	213	212	300.0	635.0
250	402	384	287	213	212	299.6	632.8
251	401	383	287	212	212	299.2	629.5
252	401	383	287	211	212	298.6	627.7
253	401	382	286	211	212	298.2	626.3
254	401	381	287	210	212	298.2	623.6
255	401	380	285	209	212	297.6	621.8
256	401	380	285	209	212	297.3	620.7
257	400	379	285	208	212	297.1	619.7
258	400	379	285	207	212	296.6	618.0
259	400	378	284	207	212	296.2	616.6
260	399	378	284	206	213	296.0	617.6
261	399	377	284	205	213	295.6	618.0
262	399	377	283	205	213	295.3	618.5
263	398	376	282	204	213	294.7	618.6
264	398	376	282	204	213	294.3	618.9
265	398	376	283	203	213	294.4	619.9
266	398	375	282	203	213	294.0	621.5
267	397	375	282	202	213	293.8	622.5
268	397	375	281	202	213	293.7	622.9
269	397	375	281	201	213	293.4	623.5
270	397	375	281	201	213	293.5	623.3
271	397	375	282	200	213	293.4	622.2
272	397	375	282	200	214	293.4	622.9
273	397	374	281	200	214	293.3	622.3
274	397	374	281	199	214	293.1	621.2
275	397	375	281	199	214	293.1	622.9
276	397	375	281	198	214	293.1	622.5
277	397	375	281	198	214	293.0	621.3
278	397	375	281	197	214	292.8	619.9
279	397	375	282	197	215	293.2	617.9
280	397	375	280	197	215	292.7	616.7
281	397	375	281	196	215	292.6	616.4
282	397	375	281	196	215	292.7	616.3
283	396	375	280	196	215	292.4	615.2
284	396	375	281	195	215	292.5	616.5
285	396	375	281	195	215	292.4	616.3
286	397	375	281	195	215	292.6	616.1
287	396	376	281	194	215	292.3	617.3

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

Stove ΔT: 107

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	396	376	280	194	215	292.2	618.0
289	397	376	281	194	215	292.4	618.8
290	397	377	281	194	215	292.5	619.9
291	396	377	281	194	215	292.4	620.8
292	396	377	281	193	215	292.4	621.5
293	396	378	281	193	215	292.5	622.3
294	396	377	281	193	215	292.5	621.5
295	397	377	281	193	215	292.4	618.4
296	396	377	281	193	215	292.3	614.4
297	396	376	281	192	215	292.0	612.6
298	396	376	282	192	215	292.1	609.1
299	396	376	282	192	215	292.0	602.7
300	397	375	282	192	215	292.3	598.3
301	397	375	284	192	215	292.4	592.0
302	397	374	284	191	216	292.5	587.1
303	398	374	285	191	216	292.7	582.6
304	399	374	285	191	216	292.7	577.7
305	400	373	287	191	216	293.3	574.0
306	401	373	288	191	216	293.4	569.6
307	401	373	289	190	216	293.6	567.0
308	401	372	291	190	216	293.9	565.4
309	403	372	291	190	216	294.2	564.5
310	404	372	292	189	216	294.7	563.6
311	405	372	294	189	216	295.2	563.6
312	406	372	295	189	217	295.6	564.6
313	408	371	297	189	217	296.1	566.2
314	409	371	298	188	217	296.5	566.7
315	410	371	299	188	217	297.0	567.6
316	411	371	301	188	217	297.5	569.3
317	412	371	303	188	217	298.3	570.1
318	413	371	305	188	217	298.9	571.4
319	415	371	306	188	218	299.4	572.5
320	416	371	309	188	218	300.1	574.1
321	417	372	309	187	218	300.5	575.6
322	418	372	310	187	218	300.9	577.0
323	419	372	312	187	218	301.6	578.0
324	420	373	314	187	218	302.4	577.3
Average	420.6	430.6	322.1	238.8	232.7	329.0	722.2

LAB SAMPLE DATA - ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 3

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/2/2024

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01117	245.0	250.8	5.8
	B	G01118	242.8	248.2	5.4
	C - 1st Hour	G01119	244.5	248.8	4.3
	Amb	G01120	245.1	245.1	0.0
Probes	A	16A	116379.9	116380.2	0.3
	B	16B	115862.5	115863.0	0.5
	C - 1st Hour	16C	114148.2	114148.4	0.2
O-rings	A	16A	3573.1	3573.1	0.0
	B	16B	3638.1	3638.4	0.3
	C - 1st Hour	16C	3601.9	3602.3	0.4

Placed in Dessicator on: 8/3/2024

Balance Audit (mg): 200.0 200.0 200.0

		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	250.9	8/5 10:30	250.8	8/7 9:00				
	B	248.3	8/5 10:30	248.2	8/7 9:00				
	C - 1st Hour	248.8	8/5 10:30	248.8	8/7 9:00				
	Amb	245.1	8/5 10:30	245.1	8/7 9:00				
Probes	A	116380.5	8/5 10:30	116380.1	8/7 9:00	116380.2	8/9 11:45		
	B	115863.6	8/5 10:30	115862.9	8/7 9:00	115863.0	8/9 11:45		
	C - 1st Hour	114148.6	8/5 10:30	114148.4	8/7 9:00				
O-Rings	A	3573.2	8/5 10:30	3573.1	8/7 9:00				
	B	3638.3	8/5 10:30	3638.4	8/7 9:00				
	C - 1st Hour	3602.4	8/5 10:30	3602.3	8/7 9:00				

Train A Aggregate, mg:	6.1
Train B Aggregate, mg:	6.2
Train C Aggregate, mg:	4.9
Ambient, mg:	0.0

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove Job Number: 24-330 Tracking #: 211
 Model: Model 91 Run Number: 3 Test Date: 8/2/24

Wood Heater Run Notes

Test Control Settings

Primary Air Setting(s): Open 0.37"
 Boost Air Setting(s): Fully Closed
 Targeted Burn Category: III

Preburn Notes

Time	Notes
13:00	+4.02 lb, door open 20 sec

Test Notes

Test Burn Start Time: 10:36 Test Fuel Loaded by: 30 seconds
 Door Closed: 40 seconds Air Control Set at: 130 seconds
 Other Loading Notes: Bypass closed @ 0:45, Fan on med high @ 11:00

Time	Notes
	-None-

Test Burn End Time: 16:00

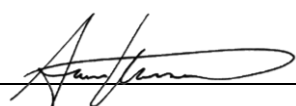
Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO₂ (%): 16.98 CO (%): 4.300
 Mid Gas CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	10:12	10:13	10:14	16:19	16:20	16:21
CO ₂	0.00	16.98	10.08	0.01	17.03	10.17
CO	0.000	4.299	2.487	-0.016	4.318	2.502

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

Technician Signature: 

Date: 8/2/2024

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove

Job Number: 24-330

Tracking #: 211

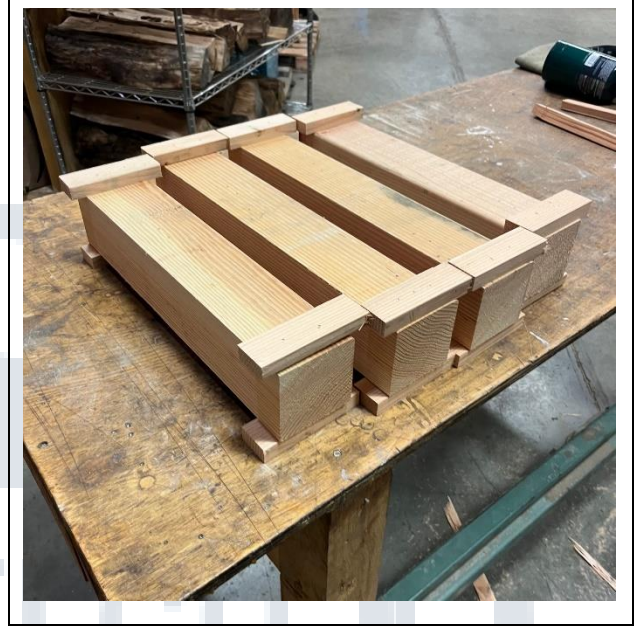
Model: Model 91

Run Number: 3

Test Date: 8/2/24



Test Fuel Front/Side View



Test Fuel Iso View



Test Fuel Loaded in Stove



Air Setting

Technician Signature: _____

Date: 8/2/2024

WOOD STOVE TEST DATA PACKET
ASTM E2780/E2515



Run 4 Data Summary

Client:	Buck Stove
Model:	91
Job #:	24-330
Tracking #:	211
Test Date:	8/5/2024



Technician Signature

9/3/2024

Date

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Burn Rate (kg/hr):	1.20
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	92.207	65.438	64.626	9.175
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.2			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11978.4			
Average Gas Meter Temperature (°F)	75.2	95.6	100.9	86.6
Total Sample Volume (dscf)	91.133	62.197	61.808	8.937
Average Tunnel Temperature (°F)	94.5			
Total Time of Test (min)	404			
Total Particulate Catch (mg)	0.0	4.3	3.9	1.3
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000691	0.0000631	0.0001455
Total PM Emissions (g)	0.00	5.58	5.09	1.74
Particulate Emission Rate (g/hr)	0.00	0.83	0.76	1.74
Emissions Factor (g/kg)	-	0.69	0.63	-
Difference from Average Total Particulate Emissions (g)	-	0.24	0.24	-
Difference from Average Total Particulate Emissions (%)	-	4.6%	4.6%	
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

Final Average Results	
Total Particulate Emissions (g)	5.33
Particulate Emission Rate (g/hr)	0.79
Emissions Factor (g/kg)	0.66
HHV Efficiency (%)	80.7%
LHV Efficiency (%)	87.2%
CO Emissions (g/min)	0.06

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	83.0	OK
Face Velocity	< 30 ft/min	9.1	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min:73/Max:76.4	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Stove Surface ΔT	<126°F	59.7	OK

B415.1 Efficiency Results

Manufacturer: Buck Stove
Model: 91
Date: 08/05/24
Run: 4
Control #: 24-330
Test Duration: 404
Output Category: 2

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	80.7%	87.2%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	81.1%	87.7%

Output Rate (kJ/h)	19,083	18,103	(Btu/h)
Burn Rate (kg/h)	1.19	2.63	(lb/h)
Input (kJ/h)	23,640	22,425	(Btu/h)

Test Load Weight (dry kg)	8.04	17.71	dry lb
MC wet (%)	17.17		
MC dry (%)	20.73		
Particulate (g)	5.33		
CO (g)	25		
Test Duration (h)	6.73		

Emissions	Particulate	CO
g/MJ Output	0.04	0.19
g/kg Dry Fuel	0.66	3.09
g/h	0.79	3.69
g/min	0.01	0.06
lb/MM Btu Output	0.10	0.45

Air/Fuel Ratio (A/F)	17.34
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VERSION:

2.4

4/15/2010

WOODSTOVE FUEL DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Preburn Fuel Information						
Size	Length (in)	Moisture Content (% DB)		Size	Length (in)	Moisture Content (% DB)
2x4	18.50	19.7				
2x4	18.50	19.5				
2x4	18.50	19.9				
2x4	18.50	24.4				
2x4	18.50	20.7				
2x4	18.50	23.7				
2x4	18.50	20.9				
2x4	18.50	21.2				
Total Fuel Weight (lbs):		18.17	Average Moisture (%DB):		21.3	

Firebox Volume (ft³): 3.07
 Total 2x4 Crib Weight, with spacers (lbs): 0.00
 Total 4x4 Crib Weight, with spacers (lbs): 21.38
 Total Wet Fuel Weight, with spacers (lbs): 21.38

Coal Bed Range (20-25%):
 Min (lbs): 4.28
 Max (lbs): 5.35

Test Fuel Information						
Size	Length (in)	Weight (lbs)	Moisture Content (%DB)			Dry Weight (lbs)
4x4	18.50	4.83	19.3	20.2	19.1	4.04
4x4	20.25	4.96	19.3	19.2	24.7	4.10
4x4	20.25	4.94	20.0	21.4	24.8	4.05
4x4	18.50	5.05	19.5	20.2	21.0	4.20
Total Dry Weight, no spacers (lbs):						16.38
Total Dry Weight, with spacers (lbs):						17.76

Spacer Moisture Readings (%DB)						
14.0	16.2					
15.3	18.4					
15.4	18.2					
16.4	15.0					
15.8	15.4					
16.7	13.7					
17.3	13.7					
16.2	17.3					

Quality Checks	Requirement	Observed	Result
Fuel Density	25 - 36 (lbs/ft ³ , DB)	29.8	OK
Loading Density	6.3 - 7.7 (lbs/ft ³ , WB)	6.96	OK
2x4 Fuel Mix	35 - 65 % of total weight	N/A	N/A

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: Buck Stove	Job #: 24-330
Model: 91	Tracking #: 211
Run #: 4	Technician: AK
Test Start Time: 14:39	Date: 8/5/2024

Total Sampling Time (min): **404**
 Recording Interval (min): **1**

Meter Box γ Factor: **0.996 (A)**
 Meter Box γ Factor: **1.012 (B)**
 Meter Box γ Factor: **1.008 (C)**
 Meter Box γ Factor: **1.004 (Ambient)**

Induced Draft Check (in. H₂O): **0**
 Smoke Capture Check (%): **100%**
 Date Flue Pipe Last Cleaned: **7/30/2024**
 Test Fuel Scale Audit (lbs): **10.00**
 Platform Scale Audit (lbs): **10.0**

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.80	29.93	29.87
Relative Humidity (%)	25.5	34.5	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:	92.207 ft³		

Sample Train Leak Checks			
	Pre-test	Post-test	
(A)	0.000	0.000	cfm @ -6 in. Hg
(B)	0.000	0.000	cfm @ -6 in. Hg
(C)	0.001	0.001	cfm @ -7 in. Hg
(Ambient)	0.001	0.001	cfm @ -15 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.056	74
2	0.092	74
3	0.092	74
4	0.060	74
5	0.054	74
6	0.092	74
7	0.094	74
8	0.058	74
Center	0.097	74

Dilution Tunnel H₂O: **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** ft²

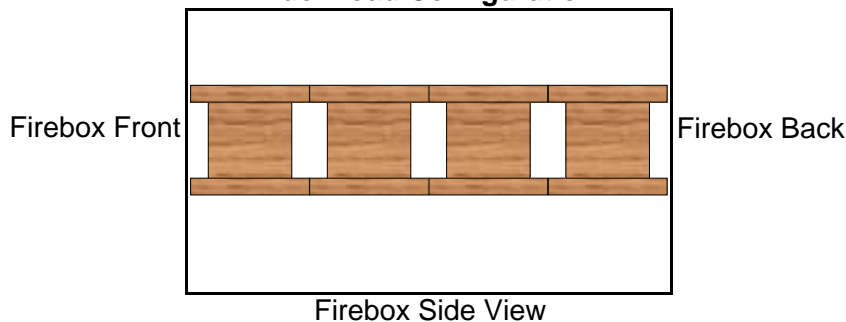
V_{strav}: **18.13** ft/sec
 V_{scnt}: **20.80** ft/sec
 F_p: **0.871** [ratio]

Initial Tunnel Flow: **206.3** scf/min

Static Pressure: **-0.160** in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type:	D. Fir
HHV (kJ/kg)	19,810
%C	48.73
%H	6.87
%O	43.9
%Ash	0.5
MC (%DB)	20.7

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Recording Interval (min): 1
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
0	6.86	-0.061	562	531	416	311	279	419.7	292	76	
1	6.82	-0.061	558	528	414	307	279	417.3	283	76	
2	6.77	-0.060	555	524	412	305	279	414.8	278	76	
3	6.71	-0.059	552	520	411	302	279	412.9	275	76	
4	6.64	-0.058	549	517	410	299	279	410.9	273	76	
5	6.58	-0.060	546	515	408	296	279	408.9	272	76	
6	6.53	-0.057	544	512	406	293	279	406.9	271	76	
7	6.46	-0.057	541	509	405	290	279	404.8	270	76	
8	6.41	-0.058	539	506	403	288	279	402.9	267	76	
9	6.38	-0.058	537	502	399	285	279	400.5	266	76	
10	6.32	-0.057	534	499	399	284	279	398.8	264	75	
11	6.26	-0.056	531	497	398	281	279	397.2	263	76	
12	6.22	-0.057	529	496	396	279	278	395.5	261	75	
13	6.17	-0.056	526	494	394	277	278	393.7	260	76	
14	6.13	-0.056	524	491	392	275	278	391.8	259	76	
15	6.07	-0.056	521	489	391	272	277	390.0	258	75	
16	6.03	-0.056	519	486	388	271	277	388.2	257	76	
17	5.98	-0.055	518	484	388	269	276	386.7	256	76	
18	5.93	-0.054	514	481	387	267	276	384.9	255	75	
19	5.89	-0.055	512	478	385	265	275	383.1	253	75	
20	5.85	-0.055	511	476	383	263	275	381.4	252	76	
21	5.80	-0.054	508	474	381	261	274	379.9	250	76	
22	5.76	-0.054	507	472	382	260	273	378.7	250	75	
23	5.72	-0.053	505	469	379	258	273	376.8	249	76	
24	5.68	-0.053	503	467	378	257	272	375.3	248	75	
25	5.64	-0.054	502	465	378	255	272	374.2	247	75	
26	5.60	-0.054	500	463	377	253	271	372.8	246	76	
27	5.54	-0.053	499	461	377	251	270	371.6	245	76	
28	5.52	-0.053	497	459	376	250	269	370.1	243	76	
29	5.47	-0.052	495	457	373	248	269	368.4	243	76	
30	5.43	-0.052	494	455	374	247	268	367.5	243	75	
31	5.39	-0.052	493	454	374	245	267	366.4	242	75	
32	5.36	-0.052	492	452	375	244	267	365.8	241	76	
33	5.31	-0.052	490	451	374	243	266	364.7	240	76	
34	5.27	-0.051	489	449	373	241	265	363.5	239	76	
35	5.25	-0.050	488	449	374	240	265	363.0	239	75	
36	5.21	-0.051	488	447	373	239	264	362.1	238	76	
37	5.16	-0.051	486	446	373	237	264	361.3	237	75	
38	5.13	-0.050	485	445	373	236	263	360.5	236	76	
39	5.08	-0.051	484	444	372	235	263	359.6	236	76	
40	5.06	-0.050	483	443	372	234	262	358.8	235	76	
41	5.02	-0.049	483	442	372	233	262	358.3	234	76	
42	4.98	-0.048	482	441	370	232	261	357.1	235	75	
43	4.94	-0.050	480	440	370	231	261	356.3	234	76	
44	4.89	-0.050	480	439	369	230	260	355.5	234	75	

WOODSTOVE PREBURN DATA - ASTM E2780

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Recording Interval (min): 1
 Run Time (min): 60

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							Flue	Ambient
			FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average			
45	4.85	-0.049	479	437	368	229	260	354.5	232	76	
46	4.81	-0.050	478	436	366	228	259	353.6	232	76	
47	4.78	-0.051	477	435	366	227	259	352.8	231	76	
48	4.73	-0.049	476	434	364	226	258	351.7	231	75	
49	4.71	-0.050	475	433	363	226	258	350.8	231	76	
50	4.68	-0.048	475	431	362	225	258	350.1	231	75	
51	4.64	-0.048	474	430	361	224	258	349.3	228	76	
52	4.61	-0.047	473	428	359	223	257	348.1	225	76	
53	4.57	-0.047	473	427	357	222	257	347.1	224	76	
54	4.53	-0.047	472	426	357	221	257	346.5	222	76	
55	4.50	-0.046	472	424	356	221	256	345.8	221	75	
56	4.48	-0.045	470	423	354	220	256	344.7	220	75	
57	4.45	-0.047	470	422	353	219	255	343.7	219	75	
58	4.43	-0.047	468	421	349	219	255	342.0	218	76	
59	4.43	-0.046	467	419	347	218	254	341.0	217	75	
60	4.41	-0.046	465	417	343	217	254	339.2	216	75	

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove

Job #: 24-330

Model: 91

Tracking #: 211

Run #: 4

Technician: AK

Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.093	0.07	79	0.2		21.38		110	267	77	76
1	0.096	0.096	0.093	2.12	79	0.9	-	21.35	-0.03	123	295	79	76
2	0.243	0.147	0.092	2.18	79	0.9	-	21.31	-0.04	111	273	79	76
3	0.389	0.146	0.094	2.21	79	0.9	-	21.18	-0.13	109	275	80	76
4	0.538	0.149	0.093	2.26	79	0.9	-	21.02	-0.16	110	288	80	76
5	0.687	0.149	0.094	2.30	79	1.0	-	20.95	-0.07	105	272	80	76
6	0.839	0.152	0.092	2.33	79	0.9	-	20.90	-0.05	100	255	80	76
7	0.990	0.151	0.095	2.35	79	0.9	-	20.84	-0.06	98	246	80	76
8	1.144	0.154	0.094	2.36	79	0.9	-	20.79	-0.05	97	240	80	76
9	1.295	0.151	0.092	2.37	80	0.9	-	20.73	-0.06	96	235	80	75
10	1.453	0.158	0.095	2.40	80	0.9	93	20.66	-0.07	95	232	80	76
11	1.603	0.150	0.094	2.39	80	1.0	-	20.61	-0.05	95	229	80	75
12	1.757	0.154	0.093	2.41	80	0.9	-	20.55	-0.06	95	226	80	76
13	1.908	0.151	0.094	2.41	80	0.9	-	20.48	-0.07	94	227	80	76
14	2.067	0.159	0.096	2.41	80	0.9	-	20.44	-0.04	94	226	80	75
15	2.219	0.152	0.096	2.43	81	0.9	-	20.38	-0.06	94	226	80	76
16	2.376	0.157	0.095	2.43	81	0.9	-	20.32	-0.06	94	225	80	76
17	2.529	0.153	0.096	2.44	81	0.9	-	20.26	-0.06	94	224	80	75
18	2.685	0.156	0.095	2.45	81	0.9	-	20.19	-0.07	94	224	80	75
19	2.843	0.158	0.096	2.45	82	1.0	-	20.13	-0.06	94	223	80	76
20	2.997	0.154	0.093	2.46	82	0.9	98	20.05	-0.08	94	222	80	76
21	3.155	0.158	0.095	2.46	82	0.9	-	19.98	-0.07	94	222	80	76
22	3.308	0.153	0.093	2.46	83	0.9	-	19.91	-0.07	94	222	80	76
23	3.469	0.161	0.092	2.48	83	0.9	-	19.85	-0.06	94	222	80	75
24	3.623	0.154	0.096	2.49	83	0.9	-	19.76	-0.09	94	222	80	75
25	3.782	0.159	0.095	2.49	83	0.9	-	19.70	-0.06	94	222	80	76
26	3.941	0.159	0.095	2.48	84	1.0	-	19.62	-0.08	94	221	80	75
27	4.094	0.153	0.094	2.49	84	0.9	-	19.55	-0.07	94	221	80	76
28	4.253	0.159	0.094	2.49	84	0.9	-	19.48	-0.07	94	221	80	75
29	4.407	0.154	0.096	2.50	85	1.0	-	19.41	-0.07	94	220	80	76
30	4.569	0.162	0.097	2.51	85	0.9	99	19.34	-0.07	94	220	80	75
31	4.724	0.155	0.094	2.51	85	1.0	-	19.27	-0.07	93	221	80	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.883	0.159	0.095	2.51	85	0.9	-	19.19	-0.08	94	221	80	76
33	5.046	0.163	0.096	2.51	86	1.0	-	19.11	-0.08	93	221	80	76
34	5.199	0.153	0.095	2.53	86	1.0	-	19.04	-0.07	93	222	80	76
35	5.360	0.161	0.094	2.52	86	0.9	-	18.97	-0.07	93	222	80	76
36	5.517	0.157	0.095	2.53	86	1.0	-	18.88	-0.09	93	222	80	76
37	5.677	0.160	0.095	2.54	87	0.9	-	18.80	-0.08	93	223	80	76
38	5.835	0.158	0.095	2.54	87	1.0	-	18.71	-0.09	94	223	80	76
39	5.994	0.159	0.093	2.53	87	1.0	-	18.63	-0.08	94	224	80	76
40	6.155	0.161	0.093	2.53	87	0.9	99	18.56	-0.07	94	226	80	76
41	6.311	0.156	0.093	2.53	88	1.0	-	18.47	-0.09	94	226	80	76
42	6.475	0.164	0.094	2.54	88	1.0	-	18.40	-0.07	94	226	80	76
43	6.630	0.155	0.093	2.55	88	0.9	-	18.31	-0.09	94	227	80	76
44	6.791	0.161	0.092	2.55	88	0.9	-	18.24	-0.07	94	227	80	76
45	6.952	0.161	0.093	2.55	89	1.0	-	18.16	-0.08	94	228	80	76
46	7.108	0.156	0.096	2.54	89	1.0	-	18.08	-0.08	94	228	80	76
47	7.272	0.164	0.095	2.57	89	1.0	-	18.00	-0.08	94	228	80	76
48	7.429	0.157	0.096	2.56	89	1.0	-	17.92	-0.08	94	230	80	76
49	7.590	0.161	0.095	2.56	90	0.9	-	17.84	-0.08	94	230	80	76
50	7.751	0.161	0.095	2.56	90	1.0	100	17.75	-0.09	94	230	80	76
51	7.908	0.157	0.096	2.55	90	0.9	-	17.68	-0.07	94	230	80	76
52	8.072	0.164	0.094	2.57	90	1.0	-	17.59	-0.09	94	231	80	76
53	8.229	0.157	0.096	2.56	90	0.9	-	17.51	-0.08	94	231	80	76
54	8.391	0.162	0.093	2.57	91	1.0	-	17.43	-0.08	94	232	80	76
55	8.555	0.164	0.094	2.57	91	1.0	-	17.33	-0.10	94	232	80	76
56	8.711	0.156	0.096	2.57	91	1.0	-	17.25	-0.08	94	232	80	76
57	8.873	0.162	0.095	2.59	91	1.0	-	17.17	-0.08	95	234	80	76
58	9.033	0.160	0.094	2.57	91	1.0	-	17.08	-0.09	95	235	80	76
59	9.194	0.161	0.095	2.58	91	1.0	-	16.99	-0.09	95	235	81	76
60	9.356	0.162	0.094	2.58	92	1.0	100	16.91	-0.08	95	237	81	76
61	9.515	0.159	0.096	2.57	92	1.0	-	16.80	-0.11	95	238	81	76
62	9.677	0.162	0.095	2.59	92	1.0	-	16.71	-0.09	95	238	81	76
63	9.839	0.162	0.095	2.59	92	1.0	-	16.62	-0.09	95	239	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.997	0.158	0.095	2.59	92	1.0	-	16.54	-0.08	95	238	81	76
65	10.162	0.165	0.093	2.58	92	1.0	-	16.44	-0.10	95	239	81	76
66	10.320	0.158	0.095	2.59	93	1.0	-	16.37	-0.07	95	241	81	76
67	10.482	0.162	0.095	2.58	93	1.0	-	16.28	-0.09	95	240	81	76
68	10.648	0.166	0.094	2.59	93	1.0	-	16.20	-0.08	95	239	81	76
69	10.806	0.158	0.094	2.59	93	1.0	-	16.11	-0.09	95	240	81	76
70	10.969	0.163	0.094	2.59	93	1.0	100	16.03	-0.08	95	240	81	76
71	11.127	0.158	0.096	2.59	93	1.0	-	15.94	-0.09	95	241	81	76
72	11.289	0.162	0.096	2.60	93	1.0	-	15.86	-0.08	95	240	81	76
73	11.452	0.163	0.096	2.61	94	1.0	-	15.78	-0.08	95	240	81	76
74	11.612	0.160	0.093	2.59	94	1.0	-	15.69	-0.09	95	240	81	76
75	11.775	0.163	0.092	2.60	94	1.0	-	15.61	-0.08	95	241	81	76
76	11.937	0.162	0.096	2.60	94	1.0	-	15.53	-0.08	95	241	81	76
77	12.096	0.159	0.093	2.60	94	1.0	-	15.44	-0.09	95	242	81	76
78	12.261	0.165	0.096	2.60	94	1.0	-	15.36	-0.08	96	243	81	76
79	12.420	0.159	0.095	2.60	94	1.0	-	15.27	-0.09	96	243	81	76
80	12.583	0.163	0.092	2.60	94	1.0	101	15.19	-0.08	96	244	81	76
81	12.748	0.165	0.097	2.61	94	1.0	-	15.10	-0.09	96	245	81	76
82	12.908	0.160	0.094	2.60	95	1.0	-	15.00	-0.10	96	246	81	76
83	13.070	0.162	0.095	2.62	95	1.0	-	14.94	-0.06	96	247	81	76
84	13.230	0.160	0.096	2.60	95	1.0	-	14.84	-0.10	96	247	81	76
85	13.392	0.162	0.095	2.61	95	1.0	-	14.76	-0.08	96	248	81	76
86	13.556	0.164	0.091	2.62	95	1.0	-	14.68	-0.08	96	248	81	76
87	13.716	0.160	0.095	2.62	95	1.0	-	14.58	-0.10	96	247	81	76
88	13.878	0.162	0.093	2.60	95	1.0	-	14.51	-0.07	96	248	81	76
89	14.043	0.165	0.095	2.60	95	1.0	-	14.44	-0.07	96	249	81	76
90	14.200	0.157	0.092	2.60	95	1.0	101	14.33	-0.11	96	249	81	76
91	14.367	0.167	0.096	2.60	95	1.0	-	14.27	-0.06	96	248	81	76
92	14.530	0.163	0.095	2.62	95	1.0	-	14.18	-0.09	96	249	81	76
93	14.689	0.159	0.094	2.60	95	1.0	-	14.09	-0.09	96	249	81	76
94	14.853	0.164	0.095	2.62	96	1.0	-	14.00	-0.09	96	249	81	76
95	15.014	0.161	0.093	2.62	96	1.0	-	13.93	-0.07	97	249	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	15.176	0.162	0.091	2.61	96	1.0	-	13.84	-0.09	97	250	81	76
97	15.341	0.165	0.095	2.62	96	1.0	-	13.76	-0.08	97	250	81	76
98	15.498	0.157	0.097	2.61	96	1.0	-	13.68	-0.08	97	249	81	76
99	15.665	0.167	0.096	2.62	96	1.0	-	13.59	-0.09	97	249	81	76
100	15.825	0.160	0.093	2.62	96	1.0	102	13.52	-0.07	97	250	81	76
101	15.988	0.163	0.094	2.62	96	1.0	-	13.44	-0.08	97	251	81	76
102	16.151	0.163	0.093	2.61	96	1.0	-	13.36	-0.08	97	251	81	76
103	16.313	0.162	0.095	2.62	96	1.0	-	13.27	-0.09	97	251	81	76
104	16.475	0.162	0.094	2.61	96	1.0	-	13.19	-0.08	97	251	81	76
105	16.640	0.165	0.095	2.62	96	1.0	-	13.11	-0.08	97	250	81	76
106	16.801	0.161	0.092	2.60	96	1.0	-	13.01	-0.10	97	250	81	76
107	16.965	0.164	0.093	2.61	96	1.0	-	12.92	-0.09	97	251	81	76
108	17.124	0.159	0.093	2.60	96	1.0	-	12.84	-0.08	97	251	81	76
109	17.288	0.164	0.094	2.61	97	1.0	-	12.76	-0.08	97	252	81	76
110	17.451	0.163	0.093	2.61	97	1.0	101	12.68	-0.08	97	251	81	76
111	17.613	0.162	0.093	2.62	97	1.0	-	12.61	-0.07	97	250	81	76
112	17.775	0.162	0.093	2.60	97	1.0	-	12.53	-0.08	97	250	81	76
113	17.940	0.165	0.095	2.61	97	1.0	-	12.45	-0.08	97	250	81	76
114	18.098	0.158	0.094	2.61	97	1.0	-	12.37	-0.08	97	249	81	76
115	18.265	0.167	0.095	2.62	97	1.0	-	12.29	-0.08	97	250	81	76
116	18.425	0.160	0.095	2.61	97	1.0	-	12.23	-0.06	97	250	81	76
117	18.588	0.163	0.094	2.62	97	1.0	-	12.15	-0.08	97	249	81	76
118	18.752	0.164	0.093	2.62	97	1.0	-	12.07	-0.08	97	250	81	76
119	18.915	0.163	0.095	2.62	97	1.0	-	12.01	-0.06	97	249	81	76
120	19.076	0.161	0.094	2.62	97	1.0	101	11.96	-0.05	97	248	81	76
121	19.241	0.165	0.094	2.62	97	1.0	-	11.89	-0.07	96	248	81	76
122	19.400	0.159	0.093	2.61	97	1.0	-	11.83	-0.06	96	246	81	76
123	19.565	0.165	0.093	2.62	97	1.0	-	11.77	-0.06	96	246	81	76
124	19.728	0.163	0.095	2.60	97	1.0	-	11.72	-0.05	96	245	81	76
125	19.889	0.161	0.094	2.63	97	1.0	-	11.68	-0.04	96	244	81	76
126	20.055	0.166	0.093	2.62	97	1.0	-	11.61	-0.07	96	243	81	76
127	20.214	0.159	0.096	2.62	97	1.0	-	11.57	-0.04	96	243	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	20.378	0.164	0.093	2.62	97	1.0	-	11.51	-0.06	96	242	81	76
129	20.542	0.164	0.094	2.61	97	1.0	-	11.46	-0.05	96	242	81	76
130	20.703	0.161	0.095	2.62	97	0.9	100	11.41	-0.05	96	241	81	76
131	20.867	0.164	0.095	2.63	98	1.0	-	11.37	-0.04	96	240	81	76
132	21.034	0.167	0.094	2.62	98	1.0	-	11.32	-0.05	96	239	81	76
133	21.191	0.157	0.093	2.63	98	1.0	-	11.27	-0.05	96	238	81	76
134	21.358	0.167	0.094	2.63	98	1.0	-	11.22	-0.05	96	238	81	76
135	21.518	0.160	0.094	2.63	98	1.0	-	11.17	-0.05	95	238	81	76
136	21.681	0.163	0.093	2.61	98	1.0	-	11.11	-0.06	96	237	81	76
137	21.846	0.165	0.094	2.63	98	1.0	-	11.07	-0.04	96	238	81	76
138	22.007	0.161	0.094	2.61	98	1.0	-	11.01	-0.06	96	238	81	76
139	22.170	0.163	0.093	2.63	98	1.0	-	10.96	-0.05	96	239	81	76
140	22.335	0.165	0.093	2.62	98	1.0	101	10.90	-0.06	95	239	81	76
141	22.494	0.159	0.094	2.62	98	1.0	-	10.84	-0.06	95	239	81	76
142	22.663	0.169	0.095	2.64	98	1.0	-	10.79	-0.05	96	240	81	76
143	22.822	0.159	0.092	2.62	98	1.0	-	10.75	-0.04	95	240	81	76
144	22.985	0.163	0.094	2.62	98	1.0	-	10.68	-0.07	95	240	81	76
145	23.150	0.165	0.092	2.63	98	1.0	-	10.62	-0.06	95	240	81	76
146	23.311	0.161	0.094	2.63	98	1.0	-	10.57	-0.05	95	240	81	76
147	23.475	0.164	0.094	2.62	98	1.0	-	10.52	-0.05	95	240	81	76
148	23.641	0.166	0.092	2.64	98	1.0	-	10.46	-0.06	95	240	81	76
149	23.799	0.158	0.096	2.62	98	1.0	-	10.39	-0.07	95	240	81	76
150	23.964	0.165	0.096	2.63	98	1.0	100	10.34	-0.05	95	240	81	76
151	24.128	0.164	0.094	2.62	98	1.0	-	10.29	-0.05	95	239	81	76
152	24.291	0.163	0.094	2.63	98	1.0	-	10.24	-0.05	95	239	81	76
153	24.455	0.164	0.093	2.63	98	1.0	-	10.19	-0.05	95	237	81	76
154	24.616	0.161	0.093	2.64	98	1.0	-	10.14	-0.05	95	238	81	76
155	24.779	0.163	0.096	2.62	98	1.0	-	10.09	-0.05	95	237	81	76
156	24.944	0.165	0.095	2.63	98	1.0	-	10.04	-0.05	95	236	81	76
157	25.105	0.161	0.095	2.62	98	1.0	-	10.00	-0.04	95	237	81	76
158	25.271	0.166	0.094	2.62	98	1.0	-	9.95	-0.05	95	236	81	76
159	25.434	0.163	0.094	2.63	98	1.0	-	9.91	-0.04	95	236	81	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	25.593	0.159	0.094	2.63	98	1.0	100	9.85	-0.06	95	235	81	76
161	25.760	0.167	0.094	2.65	98	1.0	-	9.82	-0.03	95	234	81	76
162	25.925	0.165	0.094	2.62	98	1.0	-	9.77	-0.05	95	235	81	76
163	26.084	0.159	0.094	2.64	98	1.0	-	9.72	-0.05	95	233	81	76
164	26.250	0.166	0.094	2.63	98	1.0	-	9.68	-0.04	95	233	81	76
165	26.410	0.160	0.094	2.63	98	1.0	-	9.64	-0.04	95	233	81	76
166	26.575	0.165	0.095	2.63	98	1.0	-	9.60	-0.04	95	232	81	76
167	26.739	0.164	0.093	2.64	98	1.0	-	9.55	-0.05	95	233	81	76
168	26.901	0.162	0.092	2.62	98	1.0	-	9.51	-0.04	95	232	81	76
169	27.065	0.164	0.094	2.64	98	1.0	-	9.47	-0.04	95	232	81	76
170	27.229	0.164	0.094	2.62	98	1.0	101	9.42	-0.05	95	232	81	75
171	27.389	0.160	0.094	2.63	98	1.0	-	9.38	-0.04	95	232	81	76
172	27.556	0.167	0.094	2.63	98	1.0	-	9.34	-0.04	94	232	81	76
173	27.717	0.161	0.093	2.62	98	1.0	-	9.29	-0.05	94	232	80	76
174	27.881	0.164	0.094	2.62	98	1.0	-	9.24	-0.05	94	232	81	75
175	28.045	0.164	0.093	2.63	98	1.0	-	9.20	-0.04	94	233	80	75
176	28.209	0.164	0.092	2.62	98	1.0	-	9.16	-0.04	94	233	80	76
177	28.371	0.162	0.095	2.62	98	1.0	-	9.11	-0.05	95	233	80	75
178	28.535	0.164	0.093	2.62	98	1.0	-	9.06	-0.05	95	234	80	75
179	28.699	0.164	0.093	2.62	98	1.0	-	9.02	-0.04	95	233	80	75
180	28.861	0.162	0.093	2.63	98	1.0	101	8.97	-0.05	94	233	80	75
181	29.025	0.164	0.093	2.62	98	1.0	-	8.91	-0.06	94	233	80	75
182	29.186	0.161	0.096	2.63	98	1.0	-	8.88	-0.03	95	233	80	75
183	29.352	0.166	0.093	2.63	98	1.0	-	8.82	-0.06	94	233	80	75
184	29.513	0.161	0.095	2.64	98	1.0	-	8.79	-0.03	95	234	80	75
185	29.677	0.164	0.095	2.62	98	1.0	-	8.74	-0.05	94	234	80	75
186	29.844	0.167	0.094	2.63	98	1.0	-	8.69	-0.05	94	234	80	75
187	30.003	0.159	0.095	2.63	98	1.0	-	8.63	-0.06	94	234	80	75
188	30.166	0.163	0.093	2.63	98	1.0	-	8.59	-0.04	94	234	80	75
189	30.332	0.166	0.096	2.62	98	1.0	-	8.55	-0.04	94	234	80	75
190	30.492	0.160	0.096	2.63	98	1.0	100	8.49	-0.06	94	234	80	75
191	30.658	0.166	0.094	2.64	98	1.0	-	8.44	-0.05	94	234	80	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	30.821	0.163	0.093	2.62	98	1.0	-	8.40	-0.04	95	234	80	75
193	30.982	0.161	0.094	2.63	98	1.0	-	8.34	-0.06	94	234	80	75
194	31.149	0.167	0.095	2.63	98	1.0	-	8.29	-0.05	94	234	80	75
195	31.309	0.160	0.093	2.63	98	1.0	-	8.24	-0.05	94	234	80	75
196	31.473	0.164	0.094	2.61	98	1.0	-	8.19	-0.05	94	234	80	75
197	31.640	0.167	0.095	2.64	98	1.0	-	8.13	-0.06	94	234	80	75
198	31.799	0.159	0.094	2.63	98	1.0	-	8.09	-0.04	94	234	80	75
199	31.963	0.164	0.094	2.63	98	1.0	-	8.04	-0.05	94	235	80	75
200	32.129	0.166	0.097	2.63	98	1.0	99	7.97	-0.07	94	236	80	75
201	32.288	0.159	0.095	2.62	98	1.0	-	7.92	-0.05	95	237	80	75
202	32.455	0.167	0.093	2.63	98	1.0	-	7.86	-0.06	95	237	80	75
203	32.617	0.162	0.096	2.64	98	1.0	-	7.80	-0.06	95	238	80	75
204	32.779	0.162	0.094	2.64	98	1.0	-	7.75	-0.05	95	238	80	75
205	32.946	0.167	0.093	2.62	98	1.0	-	7.69	-0.06	95	238	80	75
206	33.105	0.159	0.094	2.63	98	1.0	-	7.64	-0.05	95	239	80	75
207	33.271	0.166	0.092	2.62	98	1.0	-	7.57	-0.07	95	241	80	75
208	33.434	0.163	0.094	2.64	98	1.0	-	7.51	-0.06	95	240	80	75
209	33.596	0.162	0.095	2.62	98	1.0	-	7.46	-0.05	95	242	80	75
210	33.760	0.164	0.095	2.63	98	1.0	99	7.39	-0.07	95	242	80	75
211	33.925	0.165	0.094	2.63	98	1.0	-	7.35	-0.04	95	242	80	75
212	34.087	0.162	0.094	2.62	98	1.0	-	7.29	-0.06	95	242	80	75
213	34.252	0.165	0.094	2.63	98	1.0	-	7.23	-0.06	95	242	80	75
214	34.412	0.160	0.094	2.63	98	1.0	-	7.18	-0.05	95	243	80	75
215	34.576	0.164	0.094	2.64	98	1.0	-	7.12	-0.06	95	243	80	75
216	34.741	0.165	0.093	2.63	98	1.0	-	7.07	-0.05	95	244	80	75
217	34.902	0.161	0.094	2.63	98	1.0	-	7.03	-0.04	95	244	80	75
218	35.066	0.164	0.095	2.63	98	1.0	-	6.98	-0.05	95	244	80	75
219	35.231	0.165	0.093	2.63	98	1.0	-	6.92	-0.06	95	244	80	75
220	35.392	0.161	0.094	2.64	98	1.0	100	6.88	-0.04	95	243	80	75
221	35.557	0.165	0.093	2.64	98	1.0	-	6.83	-0.05	95	243	80	75
222	35.721	0.164	0.093	2.62	98	1.0	-	6.78	-0.05	95	243	80	75
223	35.884	0.163	0.092	2.64	98	1.0	-	6.74	-0.04	95	243	80	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	36.048	0.164	0.094	2.62	98	1.0	-	6.68	-0.06	95	243	80	75
225	36.209	0.161	0.094	2.64	98	1.0	-	6.61	-0.07	95	244	80	75
226	36.373	0.164	0.094	2.62	98	1.0	-	6.56	-0.05	95	245	80	75
227	36.537	0.164	0.094	2.63	98	1.0	-	6.51	-0.05	95	245	80	75
228	36.699	0.162	0.094	2.63	98	1.0	-	6.45	-0.06	95	246	80	75
229	36.862	0.163	0.093	2.63	98	1.0	-	6.38	-0.07	96	247	80	75
230	37.028	0.166	0.094	2.63	98	1.0	101	6.32	-0.06	96	248	80	75
231	37.188	0.160	0.094	2.62	98	1.0	-	6.24	-0.08	96	250	80	75
232	37.354	0.166	0.094	2.64	98	1.0	-	6.17	-0.07	96	251	80	75
233	37.517	0.163	0.092	2.62	98	1.0	-	6.12	-0.05	96	251	80	75
234	37.680	0.163	0.095	2.64	98	1.0	-	6.04	-0.08	96	253	80	75
235	37.845	0.165	0.095	2.63	98	1.0	-	5.97	-0.07	96	254	80	75
236	38.005	0.160	0.095	2.65	98	1.0	-	5.89	-0.08	96	255	80	75
237	38.169	0.164	0.095	2.63	98	1.0	-	5.81	-0.08	96	257	80	75
238	38.334	0.165	0.094	2.63	98	1.0	-	5.73	-0.08	97	257	80	75
239	38.495	0.161	0.094	2.62	98	1.0	-	5.65	-0.08	97	260	80	75
240	38.659	0.164	0.092	2.63	98	1.0	101	5.57	-0.08	97	260	80	75
241	38.825	0.166	0.091	2.62	98	1.0	-	5.48	-0.09	97	262	80	75
242	38.984	0.159	0.094	2.62	98	0.9	-	5.40	-0.08	97	263	80	75
243	39.151	0.167	0.093	2.63	98	1.0	-	5.32	-0.08	97	264	80	75
244	39.313	0.162	0.094	2.63	98	1.0	-	5.23	-0.09	97	265	80	75
245	39.477	0.164	0.093	2.63	98	1.0	-	5.15	-0.08	98	266	80	75
246	39.641	0.164	0.093	2.63	98	1.0	-	5.07	-0.08	98	267	80	75
247	39.801	0.160	0.092	2.63	98	1.0	-	4.99	-0.08	98	267	80	75
248	39.966	0.165	0.092	2.63	98	1.0	-	4.91	-0.08	98	268	81	75
249	40.131	0.165	0.096	2.64	98	1.0	-	4.84	-0.07	98	267	81	75
250	40.292	0.161	0.095	2.64	98	1.0	101	4.77	-0.07	98	268	81	75
251	40.456	0.164	0.094	2.64	98	1.0	-	4.71	-0.06	98	268	81	75
252	40.621	0.165	0.094	2.62	98	1.0	-	4.64	-0.07	98	269	81	75
253	40.780	0.159	0.097	2.63	98	1.0	-	4.58	-0.06	98	269	81	75
254	40.948	0.168	0.094	2.64	98	1.0	-	4.50	-0.08	97	268	81	75
255	41.109	0.161	0.092	2.62	98	1.0	-	4.46	-0.04	97	267	81	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	41.272	0.163	0.092	2.63	98	1.0	-	4.39	-0.07	97	266	81	75
257	41.438	0.166	0.094	2.62	98	1.0	-	4.33	-0.06	97	266	80	75
258	41.598	0.160	0.092	2.64	98	1.0	-	4.27	-0.06	97	266	80	75
259	41.763	0.165	0.094	2.61	98	1.0	-	4.20	-0.07	98	265	80	75
260	41.927	0.164	0.096	2.64	98	1.0	100	4.14	-0.06	97	265	80	75
261	42.088	0.161	0.094	2.63	98	1.0	-	4.08	-0.06	97	264	81	75
262	42.255	0.167	0.094	2.63	98	1.0	-	4.03	-0.05	97	263	80	75
263	42.417	0.162	0.096	2.64	98	1.0	-	3.96	-0.07	97	263	80	75
264	42.578	0.161	0.094	2.64	98	1.0	-	3.90	-0.06	97	261	80	75
265	42.745	0.167	0.095	2.62	98	1.0	-	3.86	-0.04	97	260	80	75
266	42.905	0.160	0.095	2.63	98	1.0	-	3.80	-0.06	97	260	80	75
267	43.070	0.165	0.093	2.63	98	1.0	-	3.73	-0.07	97	261	80	75
268	43.234	0.164	0.094	2.63	98	1.0	-	3.67	-0.06	97	259	80	75
269	43.396	0.162	0.093	2.63	98	0.9	-	3.62	-0.05	97	260	80	75
270	43.559	0.163	0.093	2.63	98	1.0	100	3.56	-0.06	97	259	80	75
271	43.724	0.165	0.094	2.64	98	1.0	-	3.50	-0.06	97	258	80	75
272	43.885	0.161	0.094	2.62	98	1.0	-	3.43	-0.07	97	257	80	75
273	44.050	0.165	0.094	2.63	98	1.0	-	3.38	-0.05	97	259	80	75
274	44.217	0.167	0.094	2.62	98	1.0	-	3.33	-0.05	97	258	81	75
275	44.375	0.158	0.096	2.63	98	1.0	-	3.27	-0.06	97	257	81	75
276	44.541	0.166	0.096	2.64	98	1.0	-	3.21	-0.06	97	258	81	75
277	44.702	0.161	0.094	2.64	98	1.0	-	3.15	-0.06	97	257	80	75
278	44.866	0.164	0.094	2.62	98	1.0	-	3.10	-0.05	97	258	80	75
279	45.030	0.164	0.093	2.63	98	1.0	-	3.04	-0.06	97	257	80	75
280	45.192	0.162	0.093	2.63	98	1.0	101	3.00	-0.04	97	256	80	75
281	45.355	0.163	0.093	2.62	98	1.0	-	2.95	-0.05	97	257	80	75
282	45.521	0.166	0.092	2.62	98	1.0	-	2.89	-0.06	97	256	80	75
283	45.681	0.160	0.094	2.63	98	1.0	-	2.84	-0.05	97	255	80	75
284	45.847	0.166	0.094	2.65	98	1.0	-	2.79	-0.05	97	256	80	75
285	46.010	0.163	0.095	2.63	98	1.0	-	2.74	-0.05	97	256	80	75
286	46.171	0.161	0.092	2.64	98	1.0	-	2.71	-0.03	96	255	80	75
287	46.338	0.167	0.092	2.62	98	1.0	-	2.65	-0.06	96	255	80	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	46.498	0.160	0.095	2.64	98	1.0	-	2.62	-0.03	96	255	80	75
289	46.663	0.165	0.093	2.63	98	1.0	-	2.56	-0.06	96	256	80	75
290	46.827	0.164	0.096	2.64	98	1.0	101	2.52	-0.04	96	256	80	75
291	46.988	0.161	0.093	2.62	98	1.0	-	2.46	-0.06	96	255	80	75
292	47.152	0.164	0.093	2.63	98	1.0	-	2.42	-0.04	96	254	80	75
293	47.318	0.166	0.094	2.63	98	1.0	-	2.39	-0.03	96	254	80	75
294	47.477	0.159	0.094	2.63	98	1.0	-	2.35	-0.04	96	253	80	75
295	47.644	0.167	0.095	2.62	98	1.0	-	2.30	-0.05	96	253	80	75
296	47.805	0.161	0.094	2.62	98	1.0	-	2.26	-0.04	96	253	80	75
297	47.970	0.165	0.094	2.63	98	1.0	-	2.22	-0.04	96	251	80	75
298	48.134	0.164	0.095	2.62	98	1.0	-	2.18	-0.04	96	248	80	75
299	48.294	0.160	0.094	2.64	98	1.0	-	2.15	-0.03	95	248	80	75
300	48.458	0.164	0.092	2.62	98	1.0	101	2.10	-0.05	95	246	80	75
301	48.622	0.164	0.093	2.63	98	1.0	-	2.07	-0.03	95	245	80	75
302	48.784	0.162	0.095	2.63	98	1.0	-	2.02	-0.05	95	244	80	75
303	48.949	0.165	0.096	2.63	98	1.0	-	1.99	-0.03	95	243	80	75
304	49.113	0.164	0.096	2.62	98	1.0	-	1.95	-0.04	95	242	80	75
305	49.273	0.160	0.095	2.63	98	1.0	-	1.91	-0.04	95	242	80	75
306	49.440	0.167	0.097	2.62	98	1.0	-	1.88	-0.03	95	241	80	75
307	49.600	0.160	0.095	2.63	98	1.0	-	1.85	-0.03	95	239	80	75
308	49.767	0.167	0.095	2.64	98	1.0	-	1.82	-0.03	94	239	80	75
309	49.929	0.162	0.096	2.63	98	1.0	-	1.79	-0.03	94	239	80	75
310	50.091	0.162	0.096	2.63	98	1.0	101	1.76	-0.03	94	237	80	75
311	50.255	0.164	0.095	2.63	98	1.0	-	1.73	-0.03	94	236	80	75
312	50.419	0.164	0.096	2.64	98	1.0	-	1.70	-0.03	94	235	80	75
313	50.580	0.161	0.096	2.62	98	1.0	-	1.68	-0.02	94	233	80	75
314	50.745	0.165	0.096	2.63	98	1.0	-	1.67	-0.01	94	230	80	75
315	50.909	0.164	0.096	2.62	98	1.0	-	1.65	-0.02	94	228	80	75
316	51.070	0.161	0.096	2.64	98	1.0	-	1.62	-0.03	93	226	80	75
317	51.237	0.167	0.096	2.63	98	1.0	-	1.59	-0.03	93	224	80	75
318	51.397	0.160	0.094	2.64	98	1.0	-	1.58	-0.01	93	222	80	75
319	51.561	0.164	0.094	2.61	98	1.0	-	1.55	-0.03	93	221	80	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	51.726	0.165	0.096	2.64	98	1.0	100	1.53	-0.02	93	220	80	75
321	51.888	0.162	0.096	2.62	98	1.0	-	1.53	0.00	92	218	80	75
322	52.051	0.163	0.097	2.63	98	1.0	-	1.50	-0.03	92	217	80	75
323	52.217	0.166	0.095	2.63	98	1.0	-	1.47	-0.03	93	218	80	75
324	52.376	0.159	0.094	2.62	98	1.0	-	1.45	-0.02	93	219	80	75
325	52.544	0.168	0.096	2.64	98	1.0	-	1.44	-0.01	93	218	80	75
326	52.705	0.161	0.093	2.63	98	0.9	-	1.42	-0.02	93	217	80	75
327	52.866	0.161	0.094	2.64	98	1.0	-	1.41	-0.01	92	216	80	75
328	53.033	0.167	0.095	2.62	98	1.0	-	1.38	-0.03	92	215	80	75
329	53.193	0.160	0.096	2.64	98	1.0	-	1.36	-0.02	92	214	80	75
330	53.358	0.165	0.097	2.63	98	1.0	99	1.35	-0.01	92	213	80	75
331	53.522	0.164	0.095	2.64	98	1.0	-	1.33	-0.02	92	213	80	75
332	53.684	0.162	0.095	2.62	98	1.0	-	1.31	-0.02	92	213	80	74
333	53.848	0.164	0.094	2.62	98	1.0	-	1.28	-0.03	92	212	80	74
334	54.013	0.165	0.097	2.63	98	1.0	-	1.27	-0.01	92	211	80	75
335	54.172	0.159	0.096	2.63	98	1.0	-	1.24	-0.03	91	210	80	74
336	54.340	0.168	0.094	2.64	98	1.0	-	1.22	-0.02	91	209	79	75
337	54.501	0.161	0.094	2.63	98	1.0	-	1.22	0.00	91	209	79	74
338	54.664	0.163	0.096	2.64	98	1.0	-	1.20	-0.02	91	208	79	75
339	54.830	0.166	0.094	2.63	98	1.0	-	1.18	-0.02	91	208	79	75
340	54.990	0.160	0.096	2.63	98	1.0	99	1.16	-0.02	91	208	79	74
341	55.155	0.165	0.095	2.63	98	1.0	-	1.14	-0.02	91	207	79	74
342	55.319	0.164	0.095	2.64	98	1.0	-	1.12	-0.02	91	206	79	74
343	55.481	0.162	0.095	2.62	98	1.0	-	1.10	-0.02	91	204	79	75
344	55.645	0.164	0.094	2.64	98	1.0	-	1.08	-0.02	91	204	79	74
345	55.809	0.164	0.093	2.62	98	1.0	-	1.07	-0.01	91	204	79	74
346	55.969	0.160	0.093	2.63	98	1.0	-	1.05	-0.02	91	203	79	74
347	56.139	0.170	0.093	2.64	98	1.0	-	1.04	-0.01	91	203	79	74
348	56.297	0.158	0.096	2.64	98	1.0	-	1.02	-0.02	90	202	79	74
349	56.461	0.164	0.094	2.64	98	1.0	-	1.01	-0.01	90	202	79	74
350	56.626	0.165	0.096	2.63	98	1.0	99	0.98	-0.03	90	201	79	74
351	56.787	0.161	0.096	2.64	98	1.0	-	0.97	-0.01	90	201	79	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	56.951	0.164	0.095	2.62	98	1.0	-	0.95	-0.02	90	201	79	74
353	57.116	0.165	0.096	2.63	98	1.0	-	0.93	-0.02	90	200	79	74
354	57.277	0.161	0.095	2.63	98	1.0	-	0.92	-0.01	90	200	79	74
355	57.442	0.165	0.093	2.64	98	1.0	-	0.89	-0.03	90	200	79	74
356	57.606	0.164	0.093	2.63	98	1.0	-	0.88	-0.01	90	199	79	74
357	57.766	0.160	0.096	2.64	98	1.0	-	0.86	-0.02	90	199	79	74
358	57.933	0.167	0.095	2.63	98	1.0	-	0.85	-0.01	90	199	79	74
359	58.093	0.160	0.093	2.64	98	0.9	-	0.82	-0.03	90	199	79	74
360	58.258	0.165	0.093	2.63	98	1.0	100	0.82	0.00	90	199	79	74
361	58.422	0.164	0.093	2.62	98	1.0	-	0.79	-0.03	90	198	79	74
362	58.584	0.162	0.096	2.64	98	1.0	-	0.77	-0.02	90	198	79	74
363	58.747	0.163	0.095	2.64	98	1.0	-	0.77	0.00	89	197	79	74
364	58.913	0.166	0.096	2.64	98	1.0	-	0.75	-0.02	89	197	79	74
365	59.073	0.160	0.094	2.63	98	1.0	-	0.73	-0.02	89	197	79	74
366	59.238	0.165	0.096	2.63	98	1.0	-	0.70	-0.03	89	196	79	74
367	59.402	0.164	0.095	2.63	98	1.0	-	0.68	-0.02	89	196	78	74
368	59.562	0.160	0.095	2.64	98	1.0	-	0.68	0.00	89	195	78	74
369	59.729	0.167	0.096	2.63	98	1.0	-	0.65	-0.03	89	195	78	74
370	59.892	0.163	0.095	2.63	98	1.0	100	0.65	0.00	89	195	78	74
371	60.054	0.162	0.094	2.62	98	1.0	-	0.62	-0.03	89	195	78	74
372	60.218	0.164	0.096	2.63	98	1.0	-	0.59	-0.03	89	194	78	74
373	60.379	0.161	0.096	2.62	98	1.0	-	0.58	-0.01	89	195	78	74
374	60.543	0.164	0.095	2.64	98	1.0	-	0.56	-0.02	89	194	78	74
375	60.708	0.165	0.096	2.62	98	0.9	-	0.54	-0.02	89	194	78	74
376	60.867	0.159	0.095	2.63	98	1.0	-	0.53	-0.01	89	193	78	74
377	61.035	0.168	0.096	2.63	98	1.0	-	0.50	-0.03	89	194	78	74
378	61.195	0.160	0.096	2.63	98	1.0	-	0.49	-0.01	89	193	78	74
379	61.359	0.164	0.097	2.63	98	1.0	-	0.47	-0.02	88	193	78	74
380	61.524	0.165	0.094	2.63	98	1.0	100	0.46	-0.01	89	193	78	74
381	61.684	0.160	0.093	2.63	98	1.0	-	0.42	-0.04	89	193	78	74
382	61.849	0.165	0.095	2.63	98	1.0	-	0.40	-0.02	89	193	78	74
383	62.013	0.164	0.096	2.64	98	1.0	-	0.39	-0.01	88	193	78	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	62.174	0.161	0.096	2.63	98	1.0	-	0.37	-0.02	88	193	78	73
385	62.339	0.165	0.094	2.63	97	1.0	-	0.35	-0.02	88	193	78	73
386	62.503	0.164	0.096	2.63	98	1.0	-	0.32	-0.03	88	192	78	73
387	62.663	0.160	0.096	2.63	98	1.0	-	0.31	-0.01	88	192	78	73
388	62.829	0.166	0.096	2.63	98	1.0	-	0.30	-0.01	88	191	78	74
389	62.990	0.161	0.096	2.63	98	1.0	-	0.27	-0.03	88	191	78	73
390	63.154	0.164	0.094	2.63	98	1.0	100	0.26	-0.01	88	192	78	73
391	63.318	0.164	0.096	2.63	97	1.0	-	0.24	-0.02	88	192	78	73
392	63.480	0.162	0.095	2.63	97	1.0	-	0.21	-0.03	88	192	78	73
393	63.643	0.163	0.096	2.63	97	1.0	-	0.21	0.00	88	193	78	73
394	63.809	0.166	0.096	2.63	97	1.0	-	0.18	-0.03	88	192	78	73
395	63.968	0.159	0.096	2.62	97	1.0	-	0.17	-0.01	88	192	78	73
396	64.136	0.168	0.095	2.64	97	1.0	-	0.15	-0.02	88	193	78	73
397	64.297	0.161	0.096	2.64	97	1.0	-	0.13	-0.02	88	192	78	73
398	64.458	0.161	0.095	2.64	97	1.0	-	0.11	-0.02	88	192	78	73
399	64.624	0.166	0.095	2.63	97	1.0	-	0.09	-0.02	88	192	78	73
400	64.784	0.160	0.095	2.64	97	1.0	100	0.07	-0.02	88	193	78	73
401	64.949	0.165	0.097	2.63	97	1.0	-	0.05	-0.02	88	193	78	73
402	65.113	0.164	0.092	2.64	97	1.0	-	0.04	-0.01	88	193	78	73
403	65.277	0.164	0.095	2.63	97	1.0	-	0.01	-0.03	88	193	78	73
404	65.438	0.161	0.096	2.64	97	1.0	99	0.00	-0.01	88	192	78	73
Avg/Tot	65.438	0.162	0.094	2.60	95.6	1.0	100			94.5	234.0	80.1	75.2

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		0.08	80	1.2		79	-0.050	1.83	0.074
1	0.106	0.106	2.34	79	1.7	-	81	-0.070	1.89	0.133
2	0.255	0.149	2.35	79	1.9	-	82	-0.051	3.17	0.029
3	0.409	0.154	2.36	80	2.0	-	82	-0.065	5.40	0.081
4	0.557	0.148	2.35	80	1.7	-	83	-0.068	6.91	0.042
5	0.711	0.154	2.45	80	1.7	-	83	-0.056	6.45	0.017
6	0.864	0.153	2.45	80	1.8	-	83	-0.051	5.15	0.015
7	1.020	0.156	2.45	80	1.8	-	82	-0.053	4.95	0.018
8	1.176	0.156	2.46	80	1.5	-	82	-0.053	4.98	0.012
9	1.327	0.151	2.45	80	1.6	-	82	-0.051	5.06	0.012
10	1.487	0.160	2.46	80	2.0	97	82	-0.051	5.07	0.012
11	1.640	0.153	2.46	80	1.6	-	82	-0.051	4.99	0.011
12	1.795	0.155	2.46	81	1.8	-	82	-0.051	5.03	0.009
13	1.947	0.152	2.45	81	2.1	-	82	-0.051	5.04	0.012
14	2.103	0.156	2.45	81	1.8	-	82	-0.051	5.20	0.012
15	2.259	0.156	2.46	82	1.9	-	82	-0.051	5.18	0.016
16	2.414	0.155	2.46	82	2.1	-	82	-0.051	5.36	0.014
17	2.570	0.156	2.46	82	2.1	-	82	-0.051	5.60	0.007
18	2.723	0.153	2.46	82	1.9	-	82	-0.049	5.63	0.010
19	2.881	0.158	2.46	83	2.1	-	82	-0.050	5.81	0.015
20	3.034	0.153	2.47	83	2.0	100	82	-0.049	6.02	0.015
21	3.191	0.157	2.46	83	1.9	-	82	-0.049	6.37	0.007
22	3.346	0.155	2.47	83	1.7	-	82	-0.050	6.83	0.011
23	3.502	0.156	2.46	84	2.0	-	82	-0.050	6.68	0.015
24	3.659	0.157	2.46	84	1.9	-	82	-0.049	6.53	0.013
25	3.816	0.157	2.47	84	1.7	-	82	-0.049	6.59	0.015
26	3.975	0.159	2.47	85	1.7	-	82	-0.049	6.51	0.015
27	4.126	0.151	2.48	85	1.7	-	82	-0.047	6.50	0.014
28	4.283	0.157	2.47	85	2.0	-	82	-0.049	6.60	0.012
29	4.440	0.157	2.48	86	1.7	-	82	-0.049	6.59	0.013
30	4.596	0.156	2.48	86	1.6	100	82	-0.048	6.83	0.014
31	4.753	0.157	2.47	86	1.8	-	82	-0.051	6.92	0.014

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.908	0.155	2.48	87	1.6	-	82	-0.049	7.08	0.015
33	5.069	0.161	2.48	87	2.1	-	82	-0.049	7.24	0.013
34	5.222	0.153	2.48	87	2.0	-	82	-0.049	7.44	0.015
35	5.380	0.158	2.48	88	2.0	-	82	-0.049	7.38	0.017
36	5.538	0.158	2.49	88	1.9	-	82	-0.051	7.34	0.013
37	5.693	0.155	2.48	88	1.7	-	82	-0.049	7.63	0.013
38	5.853	0.160	2.49	89	1.8	-	82	-0.050	7.64	0.012
39	6.008	0.155	2.49	89	1.9	-	82	-0.051	7.59	0.011
40	6.166	0.158	2.48	89	2.0	100	82	-0.050	7.65	0.013
41	6.324	0.158	2.49	90	1.6	-	82	-0.051	7.61	0.018
42	6.483	0.159	2.48	90	1.6	-	82	-0.051	7.57	0.014
43	6.639	0.156	2.48	90	1.7	-	82	-0.051	7.49	0.016
44	6.796	0.157	2.48	90	1.7	-	82	-0.049	7.38	0.014
45	6.954	0.158	2.48	91	1.6	-	82	-0.051	7.35	0.013
46	7.111	0.157	2.49	91	1.6	-	82	-0.053	7.33	0.018
47	7.270	0.159	2.49	91	1.9	-	82	-0.050	7.39	0.012
48	7.429	0.159	2.49	92	1.6	-	82	-0.050	7.45	0.013
49	7.585	0.156	2.49	92	1.7	-	82	-0.050	7.57	0.012
50	7.745	0.160	2.50	92	1.8	101	82	-0.050	7.67	0.010
51	7.901	0.156	2.48	93	1.9	-	82	-0.052	7.72	0.011
52	8.061	0.160	2.49	93	1.6	-	82	-0.053	7.91	0.013
53	8.220	0.159	2.50	93	2.1	-	82	-0.052	7.95	0.014
54	8.377	0.157	2.50	93	1.6	-	82	-0.054	8.00	0.014
55	8.540	0.163	2.50	94	2.0	-	82	-0.052	8.00	0.015
56	8.693	0.153	2.49	94	1.6	-	82	-0.052	8.19	0.015
57	8.854	0.161	2.50	94	2.0	-	82	-0.051	8.49	0.038
58	9.013	0.159	2.50	94	2.0	-	82	-0.051	8.58	0.050
59	9.170	0.157	2.50	95	1.6	-	82	-0.052	8.73	0.071
60	9.331	0.161	2.50	95	2.1	100	82	-0.052	8.84	0.080
61	9.487	0.156	2.49	95	2.1	-	82	-0.052	8.79	0.081
62	9.647	0.160	2.50	95	1.7	-	82	-0.052	8.76	0.061
63	9.807	0.160	2.50	95	1.7	-	82	-0.054	8.71	0.031

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	9.963	0.156	2.50	96	1.9	-	82	-0.053	8.73	0.020
65	10.125	0.162	2.51	96	1.6	-	82	-0.055	8.65	0.019
66	10.281	0.156	2.50	96	1.8	-	82	-0.054	8.54	0.014
67	10.441	0.160	2.50	96	1.6	-	82	-0.051	8.47	0.014
68	10.603	0.162	2.50	96	1.6	-	82	-0.055	8.31	0.015
69	10.761	0.158	2.51	97	2.0	-	82	-0.053	8.27	0.010
70	10.919	0.158	2.51	97	1.6	100	82	-0.051	8.28	0.015
71	11.076	0.157	2.50	97	1.7	-	82	-0.054	8.27	0.014
72	11.237	0.161	2.51	97	2.0	-	82	-0.054	8.20	0.013
73	11.396	0.159	2.50	97	2.1	-	82	-0.054	8.21	0.013
74	11.554	0.158	2.50	98	1.9	-	82	-0.055	8.09	0.015
75	11.714	0.160	2.50	98	1.7	-	82	-0.054	8.18	0.013
76	11.873	0.159	2.51	98	1.6	-	82	-0.054	8.14	0.008
77	12.032	0.159	2.51	98	2.1	-	82	-0.058	8.17	0.013
78	12.193	0.161	2.50	98	1.6	-	82	-0.054	8.20	0.012
79	12.351	0.158	2.51	99	1.9	-	82	-0.055	8.23	0.009
80	12.511	0.160	2.51	99	2.1	101	83	-0.055	8.33	0.015
81	12.674	0.163	2.51	99	1.8	-	83	-0.054	8.33	0.015
82	12.831	0.157	2.50	99	1.9	-	83	-0.056	8.40	0.012
83	12.991	0.160	2.51	99	1.7	-	83	-0.055	8.41	0.011
84	13.148	0.157	2.51	99	2.1	-	83	-0.054	8.33	0.011
85	13.309	0.161	2.51	99	1.7	-	83	-0.056	8.27	0.015
86	13.469	0.160	2.51	99	1.7	-	83	-0.056	8.27	0.012
87	13.626	0.157	2.51	100	2.1	-	83	-0.054	8.24	0.013
88	13.789	0.163	2.51	100	1.9	-	83	-0.056	8.23	0.009
89	13.946	0.157	2.51	100	1.8	-	83	-0.058	8.19	0.010
90	14.107	0.161	2.51	100	1.9	101	83	-0.056	8.22	0.011
91	14.267	0.160	2.51	100	1.8	-	83	-0.057	8.30	0.009
92	14.428	0.161	2.51	100	1.9	-	83	-0.055	8.46	0.018
93	14.587	0.159	2.51	100	1.6	-	83	-0.056	8.44	0.013
94	14.746	0.159	2.51	100	1.6	-	83	-0.054	8.56	0.017
95	14.906	0.160	2.52	100	2.0	-	83	-0.055	8.55	0.016

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	15.067	0.161	2.51	101	1.7	-	83	-0.055	8.51	0.012
97	15.226	0.159	2.51	101	1.7	-	83	-0.054	8.34	0.014
98	15.386	0.160	2.51	101	2.0	-	83	-0.057	8.06	0.012
99	15.547	0.161	2.51	101	1.8	-	83	-0.056	8.01	0.012
100	15.705	0.158	2.52	101	1.6	101	83	-0.056	8.00	0.013
101	15.868	0.163	2.51	101	1.8	-	83	-0.056	8.00	0.012
102	16.025	0.157	2.51	101	1.6	-	83	-0.053	8.11	0.012
103	16.187	0.162	2.52	101	1.8	-	83	-0.055	7.91	0.012
104	16.347	0.160	2.51	101	1.7	-	83	-0.053	8.31	0.013
105	16.506	0.159	2.51	101	2.0	-	83	-0.056	8.40	0.014
106	16.670	0.164	2.51	101	2.0	-	83	-0.055	8.53	0.017
107	16.826	0.156	2.51	102	2.0	-	83	-0.056	8.49	0.049
108	16.987	0.161	2.51	102	2.0	-	83	-0.054	8.40	0.045
109	17.148	0.161	2.50	102	1.7	-	83	-0.056	8.25	0.017
110	17.307	0.159	2.50	102	1.6	101	83	-0.055	8.15	0.017
111	17.467	0.160	2.51	102	1.9	-	83	-0.057	7.90	0.018
112	17.628	0.161	2.51	102	2.1	-	83	-0.055	8.02	0.014
113	17.787	0.159	2.51	102	2.1	-	83	-0.057	8.35	0.028
114	17.949	0.162	2.51	102	2.1	-	83	-0.055	8.35	0.015
115	18.107	0.158	2.51	102	2.1	-	83	-0.056	8.10	0.011
116	18.269	0.162	2.51	102	1.6	-	83	-0.056	7.87	0.011
117	18.429	0.160	2.51	102	2.1	-	83	-0.057	7.71	0.012
118	18.588	0.159	2.51	102	2.0	-	83	-0.057	7.17	0.009
119	18.752	0.164	2.51	103	2.1	-	83	-0.054	7.04	0.012
120	18.909	0.157	2.51	103	1.7	101	83	-0.054	6.89	0.011
121	19.070	0.161	2.51	103	1.6	-	83	-0.057	6.73	0.010
122	19.231	0.161	2.51	103	1.7	-	83	-0.055	6.66	0.008
123	19.390	0.159	2.51	103	1.9	-	83	-0.056	6.55	0.011
124	19.551	0.161	2.50	103	2.0	-	83	-0.053	6.45	0.010
125	19.713	0.162	2.51	103	1.8	-	83	-0.055	6.52	0.011
126	19.871	0.158	2.51	103	1.6	-	83	-0.055	6.43	0.014
127	20.034	0.163	2.51	103	1.6	-	83	-0.053	6.42	0.013

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
128	20.192	0.158	2.52	103	1.6	-	83	-0.054	6.51	0.010
129	20.354	0.162	2.51	103	1.5	-	83	-0.055	6.45	0.011
130	20.515	0.161	2.52	103	2.1	100	83	-0.053	6.42	0.009
131	20.674	0.159	2.52	103	2.1	-	83	-0.053	6.45	0.012
132	20.838	0.164	2.52	103	2.1	-	83	-0.050	6.46	0.010
133	20.996	0.158	2.51	103	1.9	-	83	-0.054	6.59	0.012
134	21.155	0.159	2.52	103	1.6	-	83	-0.053	6.68	0.010
135	21.318	0.163	2.51	103	1.7	-	83	-0.052	6.70	0.010
136	21.476	0.158	2.51	103	2.1	-	83	-0.054	6.82	0.008
137	21.638	0.162	2.51	104	2.0	-	83	-0.053	6.93	0.012
138	21.800	0.162	2.52	103	2.0	-	83	-0.053	7.00	0.011
139	21.958	0.158	2.51	104	2.1	-	83	-0.056	7.10	0.011
140	22.121	0.163	2.52	104	2.1	100	83	-0.055	7.13	0.012
141	22.281	0.160	2.52	104	2.0	-	83	-0.052	7.28	0.013
142	22.443	0.162	2.52	104	2.1	-	83	-0.051	7.20	0.010
143	22.603	0.160	2.52	104	1.7	-	83	-0.054	7.24	0.009
144	22.762	0.159	2.52	104	2.1	-	82	-0.052	7.34	0.013
145	22.924	0.162	2.52	104	2.0	-	82	-0.054	7.22	0.011
146	23.086	0.162	2.52	104	2.1	-	82	-0.054	7.33	0.013
147	23.244	0.158	2.51	104	1.7	-	82	-0.052	7.30	0.010
148	23.410	0.166	2.52	104	1.7	-	82	-0.053	7.24	0.010
149	23.565	0.155	2.51	104	2.1	-	82	-0.053	7.17	0.008
150	23.728	0.163	2.52	104	2.1	100	82	-0.054	7.17	0.006
151	23.889	0.161	2.52	104	1.6	-	82	-0.054	7.08	0.008
152	24.051	0.162	2.52	104	2.1	-	82	-0.051	7.05	0.012
153	24.210	0.159	2.52	104	2.1	-	82	-0.054	6.96	0.012
154	24.372	0.162	2.52	104	1.6	-	82	-0.051	6.92	0.009
155	24.530	0.158	2.52	104	1.9	-	82	-0.053	6.81	0.013
156	24.694	0.164	2.52	104	1.6	-	82	-0.053	6.79	0.009
157	24.852	0.158	2.52	104	1.6	-	82	-0.052	6.73	0.009
158	25.017	0.165	2.52	104	1.6	-	82	-0.053	6.70	0.008
159	25.176	0.159	2.52	104	1.8	-	82	-0.050	6.66	0.011

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	25.335	0.159	2.51	104	1.8	100	82	-0.052	6.64	0.014
161	25.497	0.162	2.52	104	2.1	-	82	-0.051	6.62	0.010
162	25.661	0.164	2.52	104	1.6	-	82	-0.053	6.60	0.007
163	25.818	0.157	2.52	104	2.1	-	82	-0.054	6.48	0.008
164	25.981	0.163	2.52	104	2.1	-	82	-0.049	6.44	0.012
165	26.139	0.158	2.53	104	1.5	-	82	-0.053	6.33	0.010
166	26.302	0.163	2.52	104	2.0	-	82	-0.053	6.31	0.007
167	26.463	0.161	2.52	104	1.9	-	82	-0.052	6.40	0.010
168	26.622	0.159	2.52	104	1.5	-	82	-0.052	6.43	0.010
169	26.785	0.163	2.52	104	1.6	-	82	-0.049	6.53	0.010
170	26.945	0.160	2.52	104	1.6	100	82	-0.050	6.54	0.009
171	27.105	0.160	2.52	105	1.8	-	82	-0.051	6.58	0.011
172	27.268	0.163	2.52	104	1.8	-	82	-0.052	6.58	0.009
173	27.427	0.159	2.52	104	2.1	-	82	-0.052	6.64	0.012
174	27.589	0.162	2.52	105	2.1	-	82	-0.051	6.67	0.009
175	27.750	0.161	2.53	104	1.6	-	82	-0.050	6.74	0.009
176	27.912	0.162	2.51	104	1.5	-	82	-0.052	6.75	0.011
177	28.072	0.160	2.52	104	2.1	-	82	-0.052	6.78	0.008
178	28.233	0.161	2.52	104	2.1	-	82	-0.053	6.75	0.014
179	28.395	0.162	2.52	105	1.8	-	82	-0.052	6.76	0.011
180	28.556	0.161	2.52	105	1.6	101	82	-0.051	6.83	0.009
181	28.714	0.158	2.52	105	1.6	-	82	-0.053	6.76	0.012
182	28.877	0.163	2.52	105	1.8	-	82	-0.051	6.83	0.010
183	29.038	0.161	2.52	105	1.9	-	82	-0.054	6.78	0.011
184	29.197	0.159	2.52	105	1.6	-	82	-0.052	6.86	0.007
185	29.360	0.163	2.52	105	1.6	-	82	-0.053	6.88	0.007
186	29.523	0.163	2.52	105	1.8	-	82	-0.053	6.85	0.010
187	29.680	0.157	2.52	105	2.1	-	82	-0.050	6.71	0.008
188	29.843	0.163	2.51	105	1.6	-	82	-0.049	6.84	0.011
189	30.002	0.159	2.52	105	1.7	-	82	-0.051	6.86	0.009
190	30.164	0.162	2.53	105	2.0	100	82	-0.052	7.02	0.010
191	30.326	0.162	2.52	105	2.0	-	82	-0.053	7.06	0.009

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	30.485	0.159	2.52	105	2.0	-	82	-0.051	7.25	0.010
193	30.648	0.163	2.52	105	1.6	-	82	-0.053	7.19	0.010
194	30.808	0.160	2.51	105	1.6	-	82	-0.051	7.32	0.011
195	30.968	0.160	2.52	105	1.7	-	82	-0.053	7.35	0.007
196	31.131	0.163	2.52	105	1.6	-	82	-0.048	7.38	0.011
197	31.292	0.161	2.52	105	1.7	-	82	-0.051	7.44	0.014
198	31.452	0.160	2.52	105	1.9	-	82	-0.054	7.52	0.021
199	31.614	0.162	2.52	105	1.7	-	82	-0.054	7.62	0.011
200	31.773	0.159	2.52	105	1.8	99	82	-0.052	7.64	0.014
201	31.936	0.163	2.53	105	1.9	-	82	-0.054	7.69	0.010
202	32.096	0.160	2.52	105	2.1	-	82	-0.053	7.74	0.009
203	32.257	0.161	2.53	105	2.1	-	82	-0.050	7.83	0.014
204	32.419	0.162	2.52	105	1.7	-	82	-0.054	7.87	0.010
205	32.578	0.159	2.53	105	2.1	-	82	-0.054	7.77	0.011
206	32.740	0.162	2.52	105	2.0	-	82	-0.054	7.74	0.013
207	32.902	0.162	2.52	105	1.6	-	82	-0.056	7.76	0.017
208	33.061	0.159	2.52	105	1.6	-	82	-0.056	7.74	0.009
209	33.224	0.163	2.52	105	1.6	-	82	-0.052	7.70	0.009
210	33.383	0.159	2.52	105	2.1	99	82	-0.054	7.75	0.012
211	33.545	0.162	2.52	105	1.6	-	82	-0.054	7.69	0.013
212	33.710	0.165	2.52	105	1.9	-	82	-0.055	7.70	0.013
213	33.866	0.156	2.52	105	1.6	-	82	-0.053	7.59	0.012
214	34.027	0.161	2.52	105	1.8	-	82	-0.055	7.60	0.007
215	34.190	0.163	2.52	105	1.7	-	82	-0.057	7.43	0.011
216	34.348	0.158	2.52	105	2.1	-	82	-0.053	7.36	0.010
217	34.512	0.164	2.52	105	1.9	-	82	-0.056	7.27	0.011
218	34.670	0.158	2.52	105	1.8	-	82	-0.056	7.16	0.016
219	34.833	0.163	2.52	105	2.0	-	82	-0.055	7.10	0.010
220	34.994	0.161	2.52	105	1.7	100	82	-0.053	7.03	0.012
221	35.154	0.160	2.52	105	1.7	-	82	-0.055	7.05	0.008
222	35.315	0.161	2.52	105	2.0	-	82	-0.055	7.09	0.008
223	35.480	0.165	2.52	105	1.9	-	82	-0.053	7.15	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	35.636	0.156	2.52	105	2.1	-	82	-0.054	7.35	0.010
225	35.800	0.164	2.52	105	1.8	-	82	-0.052	7.56	0.010
226	35.958	0.158	2.52	105	2.0	-	82	-0.053	7.62	0.013
227	36.121	0.163	2.52	105	1.6	-	82	-0.054	7.84	0.010
228	36.282	0.161	2.51	105	1.8	-	82	-0.057	7.94	0.012
229	36.442	0.160	2.52	105	1.7	-	82	-0.053	8.10	0.011
230	36.603	0.161	2.52	105	2.1	100	82	-0.054	8.22	0.013
231	36.765	0.162	2.52	105	1.6	-	82	-0.056	8.22	0.013
232	36.923	0.158	2.51	105	2.1	-	82	-0.057	8.39	0.008
233	37.088	0.165	2.53	105	1.8	-	82	-0.058	8.49	0.015
234	37.249	0.161	2.52	105	1.5	-	82	-0.058	8.64	0.013
235	37.408	0.159	2.53	105	1.5	-	82	-0.057	8.83	0.035
236	37.569	0.161	2.52	105	1.5	-	82	-0.056	8.90	0.032
237	37.729	0.160	2.52	105	2.1	-	82	-0.056	8.98	0.056
238	37.891	0.162	2.52	105	1.9	-	82	-0.056	9.00	0.085
239	38.053	0.162	2.52	105	2.1	-	82	-0.057	9.18	0.075
240	38.212	0.159	2.52	105	1.7	101	82	-0.061	9.32	0.090
241	38.376	0.164	2.52	105	1.6	-	82	-0.059	9.39	0.119
242	38.534	0.158	2.52	105	1.7	-	82	-0.060	9.44	0.179
243	38.696	0.162	2.52	105	2.0	-	82	-0.061	9.48	0.207
244	38.857	0.161	2.52	105	1.9	-	82	-0.059	9.41	0.204
245	39.020	0.163	2.52	105	1.6	-	82	-0.059	9.37	0.177
246	39.179	0.159	2.52	105	2.0	-	82	-0.060	9.25	0.161
247	39.340	0.161	2.52	105	2.1	-	82	-0.061	9.13	0.106
248	39.500	0.160	2.52	105	2.1	-	82	-0.057	9.02	0.033
249	39.663	0.163	2.51	105	2.0	-	82	-0.060	8.85	0.019
250	39.821	0.158	2.52	105	2.0	101	82	-0.059	8.66	0.014
251	39.984	0.163	2.51	105	1.6	-	82	-0.059	8.46	0.014
252	40.145	0.161	2.52	105	1.6	-	82	-0.058	8.32	0.015
253	40.305	0.160	2.52	105	1.9	-	82	-0.061	8.26	0.013
254	40.467	0.162	2.52	105	2.0	-	82	-0.060	8.07	0.011
255	40.628	0.161	2.52	105	1.6	-	82	-0.061	8.19	0.015

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
256	40.788	0.160	2.52	105	1.8	-	82	-0.061	8.25	0.014
257	40.951	0.163	2.52	105	2.1	-	82	-0.058	8.19	0.013
258	41.110	0.159	2.52	105	1.9	-	82	-0.059	8.35	0.009
259	41.272	0.162	2.52	105	2.1	-	82	-0.059	8.40	0.010
260	41.434	0.162	2.52	105	1.6	100	82	-0.059	8.16	0.011
261	41.593	0.159	2.52	105	2.0	-	82	-0.058	8.07	0.013
262	41.758	0.165	2.51	105	2.1	-	82	-0.061	8.02	0.011
263	41.917	0.159	2.51	105	1.9	-	82	-0.059	8.03	0.015
264	42.076	0.159	2.52	105	1.5	-	82	-0.060	7.95	0.011
265	42.240	0.164	2.52	105	1.6	-	82	-0.059	7.85	0.011
266	42.398	0.158	2.52	105	2.0	-	82	-0.058	7.97	0.013
267	42.561	0.163	2.52	105	2.1	-	82	-0.058	7.93	0.011
268	42.722	0.161	2.52	105	1.8	-	82	-0.060	7.88	0.012
269	42.882	0.160	2.52	105	1.7	-	82	-0.057	7.88	0.010
270	43.044	0.162	2.52	105	1.9	100	82	-0.058	7.95	0.011
271	43.205	0.161	2.52	105	2.1	-	82	-0.057	7.98	0.011
272	43.365	0.160	2.52	105	1.6	-	82	-0.055	7.97	0.009
273	43.528	0.163	2.52	105	1.8	-	82	-0.060	8.03	0.010
274	43.689	0.161	2.52	105	2.1	-	82	-0.058	8.00	0.011
275	43.849	0.160	2.52	105	2.0	-	82	-0.057	8.00	0.009
276	44.011	0.162	2.52	105	1.7	-	82	-0.056	7.98	0.011
277	44.170	0.159	2.52	105	1.8	-	82	-0.058	7.93	0.013
278	44.332	0.162	2.52	105	1.6	-	82	-0.059	7.98	0.010
279	44.493	0.161	2.52	105	2.1	-	82	-0.058	7.78	0.012
280	44.653	0.160	2.52	105	1.6	101	82	-0.059	7.75	0.011
281	44.816	0.163	2.52	105	1.6	-	82	-0.056	7.58	0.011
282	44.975	0.159	2.53	105	1.9	-	82	-0.059	7.47	0.009
283	45.137	0.162	2.52	105	1.5	-	82	-0.058	7.49	0.012
284	45.299	0.162	2.52	105	1.9	-	82	-0.058	7.45	0.011
285	45.458	0.159	2.52	105	1.8	-	82	-0.056	7.35	0.009
286	45.620	0.162	2.53	105	2.0	-	82	-0.057	7.31	0.013
287	45.781	0.161	2.52	105	2.1	-	82	-0.056	7.23	0.014

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	45.941	0.160	2.52	105	1.5	-	82	-0.056	7.22	0.014
289	46.104	0.163	2.52	105	1.9	-	82	-0.056	7.27	0.013
290	46.263	0.159	2.52	105	2.1	100	82	-0.056	7.21	0.014
291	46.425	0.162	2.52	105	2.1	-	82	-0.056	7.27	0.014
292	46.586	0.161	2.52	105	2.1	-	82	-0.057	7.21	0.012
293	46.746	0.160	2.52	105	2.0	-	82	-0.055	7.20	0.007
294	46.908	0.162	2.52	105	1.5	-	82	-0.056	7.11	0.012
295	47.069	0.161	2.51	105	1.8	-	82	-0.056	7.17	0.011
296	47.229	0.160	2.52	105	1.6	-	82	-0.057	7.18	0.015
297	47.395	0.166	2.52	105	2.0	-	82	-0.055	7.08	0.013
298	47.550	0.155	2.52	105	1.7	-	82	-0.056	7.09	0.010
299	47.713	0.163	2.52	105	1.9	-	82	-0.053	7.10	0.008
300	47.874	0.161	2.52	105	1.6	100	82	-0.052	7.11	0.010
301	48.034	0.160	2.52	105	2.0	-	82	-0.052	7.02	0.013
302	48.196	0.162	2.52	105	2.1	-	82	-0.053	7.11	0.011
303	48.357	0.161	2.51	105	1.9	-	82	-0.051	7.01	0.010
304	48.517	0.160	2.52	105	2.0	-	82	-0.055	6.96	0.013
305	48.680	0.163	2.52	105	1.6	-	82	-0.055	6.78	0.008
306	48.838	0.158	2.52	104	1.8	-	81	-0.054	6.78	0.011
307	49.001	0.163	2.52	105	2.1	-	81	-0.053	6.68	0.013
308	49.165	0.164	2.53	104	1.6	-	81	-0.054	6.59	0.011
309	49.322	0.157	2.52	105	1.7	-	81	-0.054	6.54	0.012
310	49.485	0.163	2.52	105	1.6	100	81	-0.050	6.49	0.010
311	49.645	0.160	2.52	105	2.1	-	81	-0.054	6.42	0.011
312	49.805	0.160	2.52	105	2.1	-	81	-0.049	6.40	0.011
313	49.968	0.163	2.52	105	1.8	-	81	-0.050	6.31	0.013
314	50.127	0.159	2.52	105	1.6	-	81	-0.049	6.21	0.009
315	50.290	0.163	2.52	105	2.1	-	81	-0.050	6.07	0.012
316	50.451	0.161	2.52	105	1.8	-	81	-0.049	5.98	0.009
317	50.610	0.159	2.52	105	1.8	-	81	-0.048	5.91	0.010
318	50.773	0.163	2.52	105	1.9	-	81	-0.050	5.88	0.007
319	50.933	0.160	2.52	105	2.1	-	81	-0.047	5.83	0.010

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	51.094	0.161	2.52	105	1.7	99	81	-0.049	5.89	0.010
321	51.257	0.163	2.52	105	1.6	-	81	-0.048	5.81	0.012
322	51.415	0.158	2.52	105	2.1	-	81	-0.050	5.79	0.011
323	51.578	0.163	2.52	105	1.9	-	81	-0.048	5.83	0.008
324	51.739	0.161	2.52	105	1.8	-	81	-0.047	5.95	0.013
325	51.902	0.163	2.52	105	1.9	-	81	-0.048	5.99	0.009
326	52.062	0.160	2.52	104	1.8	-	81	-0.048	5.96	0.010
327	52.221	0.159	2.52	105	2.1	-	81	-0.047	5.93	0.011
328	52.382	0.161	2.52	105	1.9	-	81	-0.048	5.87	0.009
329	52.545	0.163	2.52	105	1.7	-	81	-0.047	5.84	0.011
330	52.704	0.159	2.53	105	2.1	99	81	-0.047	5.88	0.010
331	52.866	0.162	2.52	104	2.1	-	81	-0.045	5.87	0.014
332	53.028	0.162	2.53	105	2.0	-	81	-0.045	5.86	0.010
333	53.187	0.159	2.52	104	1.8	-	81	-0.048	5.87	0.008
334	53.350	0.163	2.53	104	1.9	-	81	-0.046	5.88	0.008
335	53.510	0.160	2.52	104	2.1	-	81	-0.050	5.85	0.007
336	53.671	0.161	2.53	104	1.5	-	81	-0.045	5.84	0.010
337	53.834	0.163	2.53	104	2.1	-	81	-0.046	5.84	0.008
338	53.993	0.159	2.53	104	2.1	-	81	-0.046	5.75	0.010
339	54.155	0.162	2.52	104	1.6	-	80	-0.046	5.73	0.010
340	54.316	0.161	2.53	104	1.6	99	80	-0.046	5.75	0.010
341	54.476	0.160	2.52	104	1.6	-	80	-0.047	5.74	0.010
342	54.639	0.163	2.53	104	1.8	-	80	-0.045	5.71	0.009
343	54.799	0.160	2.52	104	1.6	-	80	-0.046	5.73	0.011
344	54.959	0.160	2.53	104	1.8	-	80	-0.044	5.73	0.008
345	55.122	0.163	2.52	104	1.8	-	80	-0.046	5.73	0.008
346	55.281	0.159	2.53	104	2.0	-	80	-0.042	5.72	0.011
347	55.446	0.165	2.52	104	1.6	-	80	-0.043	5.64	0.012
348	55.605	0.159	2.53	104	1.6	-	80	-0.045	5.65	0.010
349	55.764	0.159	2.52	104	2.1	-	80	-0.043	5.68	0.007
350	55.927	0.163	2.52	104	1.9	99	80	-0.045	5.65	0.006
351	56.087	0.160	2.52	104	1.5	-	80	-0.044	5.61	0.009

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	56.248	0.161	2.53	104	1.8	-	80	-0.043	5.60	0.009
353	56.411	0.163	2.52	104	2.1	-	80	-0.042	5.62	0.012
354	56.570	0.159	2.53	104	1.6	-	80	-0.042	5.61	0.010
355	56.732	0.162	2.53	104	2.0	-	80	-0.044	5.61	0.012
356	56.894	0.162	2.53	104	2.1	-	80	-0.044	5.64	0.011
357	57.053	0.159	2.52	104	2.0	-	80	-0.042	5.60	0.010
358	57.216	0.163	2.53	104	1.6	-	80	-0.043	5.64	0.010
359	57.376	0.160	2.53	104	1.9	-	80	-0.043	5.63	0.011
360	57.537	0.161	2.53	104	1.9	100	80	-0.043	5.64	0.011
361	57.700	0.163	2.52	104	1.6	-	80	-0.045	5.62	0.011
362	57.859	0.159	2.53	104	2.1	-	80	-0.046	5.51	0.008
363	58.021	0.162	2.52	104	1.9	-	80	-0.045	5.51	0.011
364	58.183	0.162	2.53	104	1.5	-	80	-0.043	5.49	0.010
365	58.342	0.159	2.52	104	1.8	-	80	-0.041	5.51	0.008
366	58.505	0.163	2.53	104	1.7	-	80	-0.045	5.58	0.008
367	58.665	0.160	2.52	104	1.9	-	79	-0.043	5.62	0.010
368	58.826	0.161	2.53	104	1.7	-	80	-0.043	5.69	0.009
369	58.989	0.163	2.52	104	1.6	-	79	-0.043	5.73	0.011
370	59.150	0.161	2.52	104	2.0	100	79	-0.040	5.79	0.010
371	59.310	0.160	2.52	104	1.8	-	79	-0.043	5.77	0.014
372	59.471	0.161	2.53	104	1.6	-	79	-0.040	5.83	0.011
373	59.631	0.160	2.52	104	2.1	-	79	-0.044	5.81	0.009
374	59.794	0.163	2.53	104	2.1	-	79	-0.043	5.85	0.015
375	59.953	0.159	2.52	104	2.0	-	79	-0.043	5.85	0.010
376	60.114	0.161	2.52	104	1.9	-	79	-0.044	5.83	0.008
377	60.277	0.163	2.52	104	1.6	-	79	-0.042	5.90	0.007
378	60.436	0.159	2.53	104	2.0	-	79	-0.043	5.89	0.004
379	60.598	0.162	2.52	104	1.8	-	79	-0.042	5.96	0.012
380	60.760	0.162	2.53	104	1.6	99	79	-0.042	5.96	0.013
381	60.919	0.159	2.52	104	2.0	-	79	-0.044	5.97	0.007
382	61.082	0.163	2.53	104	1.7	-	79	-0.041	5.94	0.008
383	61.242	0.160	2.53	104	1.6	-	79	-0.041	5.95	0.009

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
384	61.403	0.161	2.53	104	1.9	-	79	-0.044	5.96	0.013
385	61.565	0.162	2.53	104	1.8	-	79	-0.041	6.03	0.012
386	61.724	0.159	2.53	104	1.9	-	79	-0.041	6.00	0.011
387	61.886	0.162	2.53	104	2.1	-	79	-0.042	6.03	0.013
388	62.048	0.162	2.53	104	1.9	-	79	-0.040	5.96	0.009
389	62.207	0.159	2.53	104	1.6	-	79	-0.043	6.03	0.004
390	62.371	0.164	2.53	104	1.9	100	79	-0.039	6.04	0.010
391	62.530	0.159	2.53	104	1.6	-	79	-0.040	5.98	0.014
392	62.692	0.162	2.53	104	2.1	-	79	-0.041	5.99	0.009
393	62.853	0.161	2.53	104	1.8	-	79	-0.041	5.92	0.015
394	63.013	0.160	2.53	104	2.1	-	79	-0.039	5.95	0.012
395	63.175	0.162	2.53	104	1.6	-	79	-0.040	5.90	0.009
396	63.339	0.164	2.53	104	2.1	-	79	-0.045	5.86	0.010
397	63.496	0.157	2.53	104	1.9	-	79	-0.040	5.82	0.008
398	63.660	0.164	2.53	104	2.1	-	79	-0.041	5.95	0.013
399	63.818	0.158	2.53	104	1.6	-	79	-0.042	5.88	0.011
400	63.980	0.162	2.53	104	2.1	99	79	-0.043	6.11	0.010
401	64.143	0.163	2.53	104	2.0	-	79	-0.041	6.02	0.008
402	64.302	0.159	2.53	104	1.6	-	79	-0.043	5.88	0.007
403	64.467	0.165	2.53	104	2.1	-	79	-0.042	5.79	0.010
404	64.626	0.159	2.53	104	2.0	99	79	-0.043	5.74	0.010
Avg/Tot	64.626	0.160	2.51	100.9	1.8	100	81.6	-0.052	7.05	0.017

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
0	-0.004		0.04	82	0.3		79
1	0.118	0.122	1.02	81	1.8	-	79
2	0.265	0.147	1.03	81	1.6	-	80
3	0.412	0.147	1.03	81	1.8	-	80
4	0.560	0.148	1.03	81	1.6	-	80
5	0.708	0.148	1.04	81	1.8	-	80
6	0.857	0.149	1.05	81	1.8	-	80
7	1.006	0.149	1.05	81	1.6	-	80
8	1.155	0.149	1.06	81	1.8	-	81
9	1.305	0.150	1.06	82	1.6	-	81
10	1.458	0.153	1.06	82	1.7	97	81
11	1.608	0.150	1.06	82	1.9	-	81
12	1.756	0.148	1.06	82	1.8	-	81
13	1.906	0.150	1.06	83	1.8	-	81
14	2.056	0.150	1.07	83	1.7	-	81
15	2.206	0.150	1.07	83	1.9	-	81
16	2.356	0.150	1.07	83	1.7	-	81
17	2.508	0.152	1.06	83	1.7	-	81
18	2.660	0.152	1.06	84	1.8	-	81
19	2.812	0.152	1.07	84	1.7	-	81
20	2.964	0.152	1.07	84	1.8	99	81
21	3.116	0.152	1.08	85	1.7	-	81
22	3.269	0.153	1.09	85	1.7	-	81
23	3.421	0.152	1.09	85	1.9	-	81
24	3.573	0.152	1.09	85	1.6	-	81
25	3.729	0.156	1.08	85	1.7	-	81
26	3.883	0.154	1.09	86	1.7	-	81
27	4.034	0.151	1.10	86	1.7	-	81
28	4.188	0.154	1.10	86	1.6	-	81
29	4.342	0.154	1.10	87	1.7	-	81
30	4.496	0.154	1.09	87	1.8	100	81
31	4.650	0.154	1.10	87	1.7	-	81

BOX C TEST DATA - ASTM E2780 / ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Particulate Sampling Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)
32	4.805	0.155	1.10	87	1.7	-	81
33	4.962	0.157	1.11	87	1.7	-	81
34	5.114	0.152	1.10	88	1.8	-	81
35	5.269	0.155	1.10	88	1.9	-	81
36	5.424	0.155	1.10	88	1.7	-	81
37	5.580	0.156	1.11	88	1.8	-	81
38	5.734	0.154	1.11	89	1.9	-	81
39	5.889	0.155	1.10	89	1.9	-	81
40	6.045	0.156	1.10	89	1.9	101	81
41	6.201	0.156	1.11	89	1.8	-	81
42	6.358	0.157	1.11	89	1.7	-	81
43	6.512	0.154	1.10	90	1.8	-	81
44	6.668	0.156	1.11	90	1.7	-	81
45	6.825	0.157	1.12	90	1.8	-	81
46	6.979	0.154	1.11	90	1.7	-	81
47	7.136	0.157	1.11	91	1.7	-	81
48	7.292	0.156	1.12	91	1.8	-	81
49	7.448	0.156	1.12	91	1.7	-	81
50	7.604	0.156	1.11	92	1.7	101	81
51	7.761	0.157	1.11	92	1.8	-	81
52	7.918	0.157	1.12	92	1.8	-	81
53	8.074	0.156	1.11	92	1.7	-	81
54	8.231	0.157	1.11	92	1.8	-	81
55	8.391	0.160	1.12	92	1.7	-	81
56	8.543	0.152	1.12	92	1.8	-	81
57	8.701	0.158	1.11	93	1.8	-	81
58	8.858	0.157	1.12	93	1.8	-	81
59	9.014	0.156	1.12	93	1.7	-	81
60	9.171	0.157	1.11	93	1.8	101	81
Avg/Tot	9.175	0.153	1.07	86.6	1.7	100	80.7

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	447	411	352	217	256	336.7	577.2
1	453	411	354	218	259	339.2	544.7
2	444	406	353	219	263	337.0	524.6
3	436	402	352	220	267	335.5	521.6
4	433	399	354	221	270	335.3	532.7
5	431	397	356	222	274	336.0	534.1
6	428	394	356	223	277	335.5	538.4
7	427	392	355	224	281	335.6	546.6
8	422	389	353	225	284	334.3	556.6
9	420	386	351	226	287	334.1	564.5
10	417	383	350	227	290	333.1	568.8
11	414	380	348	228	292	332.4	569.6
12	411	378	347	229	294	331.7	571.3
13	420	377	333	229	295	330.7	571.9
14	419	374	324	229	294	327.8	570.8
15	416	371	317	228	291	324.5	568.5
16	413	368	310	227	287	321.2	566.8
17	410	365	305	226	284	318.0	565.3
18	407	362	301	225	280	315.0	565.0
19	404	359	296	224	277	312.0	566.4
20	402	356	292	223	274	309.3	570.1
21	399	353	288	221	271	306.5	575.0
22	397	350	285	220	268	304.0	579.4
23	395	347	283	219	266	301.8	584.1
24	393	344	280	218	263	299.5	589.7
25	391	342	278	216	261	297.4	595.9
26	389	339	275	215	259	295.3	603.4
27	387	337	274	214	257	293.6	611.6
28	385	334	271	213	255	291.7	619.0
29	383	332	270	212	253	289.9	625.8
30	381	330	268	211	251	288.4	632.0
31	380	328	267	211	250	286.8	637.4
32	378	326	266	210	248	285.5	643.6
33	376	324	265	209	246	284.3	650.2
34	375	323	264	208	245	283.0	655.8
35	374	321	264	208	243	282.1	659.0
36	373	320	263	207	241	280.9	663.6
37	373	319	263	207	240	280.1	665.0
38	372	317	263	206	238	279.1	667.3
39	371	316	262	206	237	278.4	668.6
40	371	315	263	205	235	277.8	669.0
41	370	314	264	205	234	277.4	669.3
42	370	314	263	205	232	276.8	669.8
43	370	313	264	205	231	276.4	670.7
44	369	312	264	205	230	275.9	672.8
45	369	311	264	204	229	275.3	673.6
46	368	311	264	204	227	274.8	674.2
47	368	310	264	204	226	274.4	672.6

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
48	368	309	264	204	225	274.1	671.8	
49	367	309	263	204	224	273.5	670.3	
50	367	308	263	204	223	273.1	670.7	
51	367	308	264	204	222	272.9	670.9	
52	367	308	266	204	221	273.0	672.1	
53	367	308	266	204	220	272.8	672.9	
54	367	307	267	204	219	272.8	672.7	
55	367	308	266	204	218	272.6	673.2	
56	367	307	267	204	218	272.7	673.9	
57	367	307	267	205	217	272.5	673.3	
58	368	307	267	205	216	272.6	672.3	
59	369	307	267	205	215	272.5	671.3	
60	369	307	267	205	215	272.8	671.1	
61	371	308	267	206	214	273.0	673.1	
62	372	307	267	206	213	273.2	675.2	
63	373	308	269	206	213	273.7	678.4	
64	375	308	268	207	212	273.8	680.0	
65	376	308	269	207	211	274.1	679.5	
66	377	308	269	207	211	274.5	679.5	
67	378	309	269	207	210	274.5	679.6	
68	379	309	270	208	209	274.8	678.6	
69	380	309	270	208	209	275.0	679.3	
70	380	309	271	208	208	275.1	680.3	
71	381	310	271	209	207	275.4	680.6	
72	382	310	270	209	207	275.5	680.8	
73	382	310	272	210	206	275.9	680.9	
74	382	310	272	210	205	276.0	679.9	
75	383	311	272	210	205	276.1	679.9	
76	384	311	271	211	204	276.3	680.0	
77	384	311	273	211	204	276.7	680.3	
78	385	312	274	211	203	277.0	680.4	
79	386	312	273	211	202	277.0	680.3	
80	387	312	273	212	202	277.2	680.2	
81	387	312	274	212	201	277.3	681.2	
82	388	313	275	212	200	277.6	681.7	
83	389	313	274	213	200	277.9	681.8	
84	390	314	274	213	199	277.9	683.3	
85	390	314	275	213	199	278.2	684.4	
86	391	314	276	214	198	278.6	685.6	
87	392	315	276	214	198	278.7	686.4	
88	393	315	275	214	197	278.8	687.1	
89	393	315	276	214	196	278.8	688.6	
90	394	315	276	215	196	279.1	690.1	
91	394	316	276	215	195	279.1	690.6	
92	395	316	276	215	195	279.2	691.9	
93	396	317	276	216	194	279.4	693.3	
94	396	317	276	216	193	279.6	694.9	
95	397	317	276	216	193	279.9	696.3	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	398	318	276	217	192	280.1	698.5
97	399	318	277	217	191	280.3	698.6
98	399	318	277	217	191	280.4	698.8
99	399	318	278	217	190	280.6	697.6
100	399	318	278	218	190	280.6	697.0
101	398	319	279	218	189	280.7	697.6
102	398	319	279	219	189	280.9	698.3
103	398	320	280	219	189	280.9	699.4
104	398	320	280	220	188	281.3	701.1
105	398	321	283	220	188	281.9	701.9
106	398	322	284	220	188	282.1	704.1
107	398	323	284	220	187	282.4	708.3
108	398	324	285	221	187	282.8	712.8
109	398	325	285	221	187	282.9	717.0
110	398	326	287	221	186	283.5	719.6
111	397	327	286	221	186	283.4	720.4
112	396	329	285	222	186	283.5	720.0
113	395	332	285	222	185	283.7	717.2
114	394	335	285	222	185	284.1	713.9
115	393	339	283	222	185	284.2	712.1
116	392	343	282	222	185	284.7	709.8
117	390	347	282	222	184	285.0	707.6
118	388	350	281	222	184	285.0	708.5
119	387	352	280	222	183	284.9	709.9
120	385	354	279	222	183	284.7	708.9
121	383	356	279	222	183	284.7	707.8
122	383	357	279	222	183	284.7	705.4
123	381	359	278	222	182	284.2	701.3
124	379	359	277	222	182	283.8	696.9
125	379	360	277	221	182	283.7	693.5
126	377	360	277	221	182	283.3	691.1
127	376	360	276	221	181	282.8	689.8
128	375	360	275	221	181	282.2	690.0
129	373	359	274	220	181	281.5	691.2
130	372	359	273	220	181	281.0	694.2
131	371	358	272	220	181	280.4	696.6
132	370	357	271	219	180	279.4	698.9
133	369	356	270	219	180	278.8	701.1
134	368	355	270	219	180	278.3	702.8
135	367	354	271	218	180	277.9	703.5
136	366	354	270	218	179	277.3	704.8
137	365	353	269	217	179	276.7	706.7
138	364	352	269	217	179	276.2	709.2
139	363	351	269	217	179	275.9	711.3
140	363	351	269	217	179	275.5	714.6
141	362	350	269	217	178	275.3	715.5
142	362	350	270	216	178	275.1	716.6
143	362	349	269	217	178	274.9	716.3

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	362	348	268	216	178	274.5	716.2
145	362	348	269	216	178	274.3	715.8
146	362	347	268	216	177	274.2	715.5
147	362	347	268	216	177	274.0	712.5
148	362	347	268	216	177	274.0	709.5
149	363	346	267	216	177	273.7	705.6
150	363	345	268	216	177	273.8	701.8
151	364	345	267	216	177	273.8	698.2
152	365	345	268	216	177	273.9	694.7
153	366	344	268	216	176	273.9	692.7
154	366	344	268	215	176	273.9	689.4
155	367	343	268	215	176	273.9	685.8
156	368	343	268	215	176	274.0	681.7
157	368	343	268	215	176	273.8	677.8
158	369	342	270	214	176	274.2	673.9
159	369	341	269	214	176	273.8	671.0
160	370	341	269	213	176	273.8	669.2
161	370	341	268	213	175	273.5	668.4
162	371	340	268	212	175	273.4	666.7
163	371	340	268	212	175	273.1	665.5
164	371	339	268	212	175	272.9	664.1
165	371	338	268	211	175	272.6	663.2
166	372	338	266	211	175	272.2	661.7
167	371	337	266	210	175	272.1	661.7
168	371	336	265	210	175	271.4	662.5
169	371	335	265	209	175	271.2	663.3
170	371	334	264	209	175	270.7	665.1
171	371	333	263	209	175	270.2	666.4
172	371	332	263	208	175	269.8	668.3
173	370	331	261	208	175	269.3	670.8
174	370	331	261	208	175	269.1	671.7
175	370	330	261	208	175	268.9	674.1
176	370	330	260	207	176	268.6	675.9
177	370	329	260	207	176	268.4	677.1
178	370	329	260	207	176	268.4	679.1
179	371	329	260	207	176	268.4	680.1
180	372	328	259	207	176	268.3	681.6
181	372	328	258	207	176	268.1	683.8
182	371	327	258	207	176	267.9	683.9
183	372	327	258	206	176	267.9	685.2
184	372	327	258	206	176	267.7	685.1
185	373	327	257	206	177	267.9	684.9
186	373	326	257	206	177	267.7	685.1
187	373	325	259	206	177	267.9	685.6
188	373	325	259	206	177	268.0	685.5
189	373	325	260	206	177	268.2	685.2
190	374	325	262	206	177	268.6	684.0
191	374	325	261	206	177	268.6	683.4

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	375	325	263	206	177	269.1	682.8
193	376	325	264	206	177	269.6	681.9
194	376	325	266	206	177	270.1	680.2
195	377	325	266	206	178	270.3	679.3
196	378	325	269	206	178	271.1	680.3
197	379	326	270	206	178	271.5	682.3
198	379	326	271	206	178	272.1	686.1
199	379	327	274	206	178	272.7	690.7
200	380	327	274	206	179	273.0	695.0
201	381	328	277	206	179	273.8	700.4
202	381	328	279	206	179	274.6	703.8
203	382	329	280	206	179	275.1	708.0
204	383	330	282	206	179	276.1	711.9
205	384	331	285	206	179	276.9	714.5
206	385	332	286	206	179	277.5	714.8
207	387	333	289	206	179	278.7	713.4
208	388	333	290	207	179	279.3	712.5
209	389	333	291	207	179	280.0	710.9
210	390	334	292	207	179	280.5	710.0
211	391	334	293	208	180	281.1	710.9
212	393	334	294	208	180	281.7	711.2
213	394	334	293	208	180	281.8	711.5
214	395	335	294	209	180	282.5	710.6
215	396	335	294	209	180	282.7	709.9
216	397	335	295	209	180	283.2	708.6
217	399	335	296	210	180	283.9	705.1
218	400	335	296	210	180	284.2	702.0
219	400	335	297	211	180	284.8	697.0
220	401	336	299	211	180	285.6	692.3
221	402	336	301	211	181	286.2	688.2
222	403	336	301	212	181	286.4	684.4
223	404	337	305	212	181	287.4	681.6
224	405	337	305	212	181	287.9	680.7
225	406	338	308	212	181	288.8	681.1
226	406	339	309	212	181	289.4	681.6
227	408	339	311	212	181	290.3	680.8
228	409	340	313	213	182	291.3	679.1
229	411	341	317	213	182	292.7	677.1
230	413	342	319	213	182	293.8	676.8
231	415	344	321	213	182	295.1	676.2
232	417	345	321	213	183	295.8	677.7
233	420	346	323	214	183	297.1	680.4
234	422	348	324	214	183	298.0	684.5
235	424	349	323	214	183	298.7	691.9
236	427	350	323	215	183	299.6	699.4
237	429	351	322	215	184	300.0	705.9
238	432	352	321	216	184	300.9	712.4
239	433	353	324	216	184	302.1	718.5

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
240	436	354	323	217	184	302.8	724.6	
241	438	355	326	218	185	304.3	732.4	
242	440	357	326	219	185	305.2	739.4	
243	441	358	330	220	185	306.8	748.0	
244	443	360	330	221	186	307.9	755.1	
245	445	362	332	222	186	309.1	763.0	
246	447	363	331	223	187	309.9	767.4	
247	448	365	332	224	187	311.0	770.1	
248	451	366	334	225	188	312.8	770.8	
249	453	368	334	226	188	313.9	772.4	
250	456	370	334	227	189	315.1	775.6	
251	458	371	333	228	189	316.0	777.3	
252	459	373	333	229	190	316.9	778.0	
253	460	375	331	230	191	317.2	775.5	
254	461	377	331	231	191	318.3	773.2	
255	461	379	328	232	192	318.4	769.2	
256	461	383	326	233	193	319.0	765.8	
257	461	386	325	233	193	319.7	761.3	
258	460	390	324	234	194	320.4	757.7	
259	459	393	325	234	195	321.1	755.9	
260	459	396	326	235	195	322.1	755.0	
261	458	399	328	235	196	322.9	750.9	
262	457	402	327	235	196	323.3	745.4	
263	456	404	329	235	197	324.2	739.0	
264	455	406	329	235	197	324.5	734.1	
265	455	408	332	235	198	325.5	730.0	
266	454	410	332	235	198	325.7	726.4	
267	454	412	333	234	199	326.3	724.4	
268	453	414	335	234	199	327.1	720.9	
269	452	415	336	234	200	327.4	717.9	
270	451	417	336	234	200	327.6	714.9	
271	450	419	339	233	200	328.5	712.1	
272	450	421	338	233	201	328.6	709.7	
273	449	423	340	233	201	329.1	707.0	
274	449	425	340	233	201	329.5	704.6	
275	448	427	342	232	201	330.0	702.7	
276	448	428	342	232	202	330.4	701.3	
277	447	430	342	232	202	330.5	700.5	
278	446	432	343	232	202	330.9	699.6	
279	446	434	342	231	202	330.9	698.8	
280	445	435	343	231	202	331.1	696.8	
281	444	436	342	231	203	331.3	695.9	
282	444	437	342	231	203	331.4	694.9	
283	443	438	341	231	203	331.3	694.5	
284	442	439	341	230	203	331.1	694.5	
285	442	440	340	230	203	330.8	694.4	
286	441	440	339	230	203	330.6	694.8	
287	440	440	338	230	203	330.3	694.7	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	439	441	337	230	203	330.0	693.1
289	439	441	337	230	204	329.9	692.9
290	438	442	333	230	204	329.0	691.2
291	437	442	333	229	204	329.1	690.7
292	436	442	332	229	204	328.6	689.9
293	436	442	333	229	204	328.6	690.0
294	436	442	332	229	204	328.5	689.5
295	435	442	332	229	204	328.4	690.0
296	434	442	331	229	205	328.1	688.8
297	433	442	331	229	205	327.9	687.1
298	433	442	329	228	205	327.4	686.5
299	432	442	328	228	205	327.1	685.5
300	432	441	328	228	205	326.7	686.1
301	431	440	327	228	206	326.3	686.9
302	430	438	326	228	206	325.6	688.1
303	430	437	327	227	206	325.4	689.7
304	429	436	326	227	206	324.6	690.4
305	429	434	324	227	207	323.9	691.7
306	428	433	323	226	207	323.1	692.2
307	427	432	322	226	207	322.7	690.7
308	426	430	321	226	207	322.0	688.1
309	425	428	320	225	208	321.2	685.5
310	425	427	319	225	208	320.7	683.5
311	424	425	320	225	208	320.3	680.7
312	423	424	318	224	208	319.5	677.5
313	422	423	318	224	208	319.0	673.2
314	421	422	318	223	209	318.6	668.0
315	421	421	316	223	209	317.8	663.1
316	420	419	316	222	209	317.2	658.4
317	419	418	315	222	209	316.4	653.3
318	418	417	315	221	209	316.0	647.5
319	417	416	313	220	209	315.1	644.4
320	416	414	312	219	209	314.1	639.6
321	415	414	312	218	210	313.7	635.8
322	414	412	312	218	210	313.0	632.3
323	413	411	310	217	210	312.2	630.5
324	412	411	310	216	210	311.6	628.0
325	411	410	310	215	210	311.4	625.5
326	410	409	309	214	210	310.5	622.7
327	409	408	309	213	210	309.9	619.8
328	409	407	309	212	210	309.1	618.4
329	408	406	308	211	210	308.4	617.6
330	407	405	309	211	210	308.0	616.2
331	405	403	308	210	210	307.3	615.3
332	405	402	307	209	210	306.5	613.5
333	404	401	305	208	210	305.5	611.9
334	403	400	305	207	210	304.8	610.9
335	402	399	305	206	210	304.3	610.9

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Elapsed Time (min)	Temperature Data (°F)						Stove Surface Average	Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom			
336	401	398	303	205	210	303.4	609.8	
337	399	397	304	205	210	302.9	607.5	
338	398	396	301	204	209	301.7	605.8	
339	398	396	301	203	209	301.3	604.7	
340	397	395	301	202	209	300.7	602.8	
341	396	395	300	202	209	300.2	601.9	
342	394	394	299	201	209	299.5	601.5	
343	393	394	299	200	209	298.9	599.7	
344	392	394	298	200	208	298.3	598.1	
345	391	393	298	199	208	298.0	597.4	
346	390	394	296	198	208	297.1	595.9	
347	389	393	296	198	207	296.7	596.4	
348	387	393	294	197	207	295.8	595.9	
349	386	393	294	196	207	295.3	596.2	
350	385	393	294	196	206	294.8	596.3	
351	384	393	294	195	206	294.6	594.9	
352	383	393	293	195	206	293.8	594.3	
353	382	393	292	194	205	293.2	593.7	
354	381	393	290	193	205	292.5	593.4	
355	380	393	291	193	205	292.0	593.6	
356	378	393	290	192	204	291.6	593.0	
357	377	392	289	192	204	290.9	591.4	
358	376	392	289	191	204	290.2	591.0	
359	374	392	287	191	203	289.5	590.7	
360	373	392	287	190	203	289.0	590.9	
361	372	392	286	190	203	288.5	590.4	
362	371	392	285	189	202	287.9	590.1	
363	370	392	283	189	202	287.2	590.0	
364	368	393	283	188	202	286.7	589.5	
365	368	393	283	188	201	286.4	589.1	
366	366	393	282	188	201	285.9	588.7	
367	365	393	283	187	200	285.6	587.5	
368	364	393	283	187	200	285.2	585.3	
369	363	392	284	186	200	285.0	583.3	
370	362	392	285	186	199	284.8	581.9	
371	361	392	285	185	199	284.5	580.3	
372	360	393	286	185	199	284.3	579.2	
373	359	392	288	185	198	284.5	577.3	
374	358	392	287	185	198	283.9	577.3	
375	357	392	289	184	198	284.0	576.1	
376	357	392	290	184	197	283.8	575.5	
377	356	392	290	183	197	283.6	574.8	
378	355	392	291	183	197	283.4	573.5	
379	354	392	291	183	196	283.3	573.4	
380	354	392	293	183	196	283.3	572.2	
381	353	392	294	182	196	283.4	571.8	
382	352	391	294	182	195	283.0	569.9	
383	352	391	295	182	195	282.9	569.6	

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

Stove ΔT: 60

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	351	391	296	181	195	282.9	570.2
385	351	391	298	181	195	282.9	568.6
386	350	391	298	181	194	282.8	567.8
387	350	391	300	181	194	282.9	568.9
388	349	391	301	180	194	282.9	567.8
389	349	391	301	180	193	282.8	567.9
390	348	391	301	180	193	282.6	566.8
391	348	390	300	180	193	282.1	567.6
392	347	390	299	179	193	281.7	570.4
393	347	389	298	179	192	281.2	574.9
394	346	389	298	179	192	280.7	579.8
395	345	389	296	179	192	280.1	582.9
396	345	388	295	179	191	279.6	585.7
397	344	388	294	178	191	279.1	586.5
398	344	387	295	178	191	278.9	588.3
399	343	387	295	178	191	278.6	589.6
400	343	387	294	178	190	278.2	590.2
401	342	386	293	178	190	278.0	590.3
402	342	386	294	178	190	277.8	587.9
403	341	386	293	178	190	277.5	581.6
404	340	386	291	178	190	277.0	574.8
Average	394.3	363.0	294.1	211.8	201.3	292.9	664.1

LAB SAMPLE DATA - ASTM E2515

Client: Buck Stove
 Model: 91
 Run #: 4

Job #: 24-330
 Tracking #: 211
 Technician: AK
 Date: 8/5/2024

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01121	245.0	248.8	3.8
	B	G01122	244.6	248.5	3.9
	C - 1st Hour	G01123	245.7	246.8	1.1
	Amb	G01124	244.2	244.2	0.0
Probes	A	17A	116811.2	116811.3	0.1
	B	17B	117141.1	117141.1	0.0
	C - 1st Hour	17C	113141.6	113141.6	0.0
O-rings	A	17A	3612.9	3613.3	0.4
	B	17B	3569.0	3569.0	0.0
	C - 1st Hour	17C	3597.2	3597.4	0.2

Placed in Dessicator on: 8/5/2024

Balance Audit (mg): 200.0 200.0 200.0

		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	249.0	8/9 11:45	248.8	8/12 9:00				
	B	249.0	8/9 11:45	248.3	8/12 9:00	248.5	8/13 8:30		
	C - 1st Hour	246.9	8/9 11:45	246.8	8/12 9:00				
	Amb	244.3	8/9 11:45	244.2	8/12 9:00				
Probes	A	116811.4	8/9 11:45	116811.3	8/12 9:00				
	B	117141.3	8/9 11:45	117141.1	8/12 9:00				
	C - 1st Hour	113141.8	8/9 11:45	113141.6	8/12 9:00				
O-Rings	A	3613.3	8/9 11:45	3613.3	8/12 9:00				
	B	3569.0	8/9 11:45	3569.0	8/12 9:00				
	C - 1st Hour	3597.4	8/9 11:45	3597.4	8/12 9:00				

Train A Aggregate, mg:	4.3
Train B Aggregate, mg:	3.9
Train C Aggregate, mg:	1.3
Ambient, mg:	0.0

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove Job Number: 24-330 Tracking #: 211
 Model: Model 91 Run Number: 4 Test Date: 8/5/24

Wood Heater Run Notes

Test Control Settings

Primary Air Setting(s): Open 0.10"
 Boost Air Setting(s): Fully Closed
 Targeted Burn Category: II

Preburn Notes

Time	Notes
	-None-

Test Notes

Test Burn Start Time: 14:39 Test Fuel Loaded by: 35 seconds
 Door Closed: 45 seconds Air Control Set at: 240 seconds
 Other Loading Notes: Bypass closed @ 0:50, Fan on med low @ 5:00

Time	Notes
	-None-

Test Burn End Time: 21:23


Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO₂ (%): 16.98 CO (%): 4.300
 Mid Gas CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	10:10	10:11	10:12	8/6 9:15	8/6 9:16	8/6 9:17
CO ₂	0.00	17.04	10.18	0.04	16.97	10.00
CO	0.000	4.302	2.506	0.023	4.259	2.479

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

Technician Signature: 

Date: 8/6/2024

ASTM E2780 Wood Heater Run Sheets

Client: Buck Stove

Job Number: 24-330

Tracking #: 211

Model: Model 91

Run Number: 4

Test Date: 8/5/24



Test Fuel Front/Side View




Test Fuel Iso View



Test Fuel Loaded in Stove



Air Setting

Technician Signature: 

Date: 8/6/2024

Conditioning Data - ASTM E2780/ ASTM E2515

Manufacturer: New Buck
 Model: 91
 Tracking No.: 2372
 Project No.: 0567WS001N
 Test Date: February 2019
 Technician: Nelke Consulting
 Operation Category: Medium

Elapsed Time (hr)	Flue Gas Temp (° F)	Catalyst Exit Temp (° F)
0	449	839
1	294	1163
2	249	938
3	230	904
4	203	775
5	209	779
6	214	838
7	188	620
8	170	560
9	165	536
10	157	503
11	147	450
12	123	301
13	434	818
14	324	1205
15	292	984
16	262	956
17	272	960
18	239	691
19	208	603
20	190	533
21	180	488
22	166	420
23	408	778
24	190	853
25	166	846

Elapsed Time (hr)	Flue Gas Temp (° F)	Catalyst Exit Temp (° F)
26	156	805
27	127	538
28	120	547
29	114	527
30	100	482
31	103	519
32	108	529
33	98	459
34	111	562
35	103	492
36	102	467
37	121	614
38	341	544
39	197	729
40	174	935
41	134	920
42	120	656
43	121	636
44	133	639
45	122	721
46	119	588
47	120	618
48	107	624
49	128	532
50	128	664

Performed at Medium Burn-rate setting
 Fuel moisture between 18% & 25% DB

Technician Signature: 

Sample Calculations – ASTM E2780 & E2515

Client: Buck Stove
 Model: 91
 Run: 1

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

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

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

D_{Cdb} - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft³

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

BR – Dry burn rate, kg/hr

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

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

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

m_n – Total particulate matter collected, mg

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

E_T – Total particulate emissions, g

PR - Proportional rate variation

PM_R – Particulate emissions for test run, g/hr

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

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

ASTM E2780 equation (1)

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

Where,

FM_S = average fuel moisture of test fuel spacers, % dry basis

M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

$$FM_S = 17.0 \%$$

$$M_{Swb} = 1.3 \text{ lbs}$$

0.4536 = Conversion factor from lbs to kg

$$M_{Sdb} = [(1.3 \times 0.4536) (100 / (100 + 17.0))]$$

$$M_{Sdb} = \mathbf{0.50 \text{ kg}}$$

M_{Cdb} – Weight of test fuel crib, excluding nails and spacers, dry basis, kg
ASTM E2780 equation (2)

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

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg

FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation (test fuel piece 1):

$$M_{CPnwb} = 4.74$$

$$FM_{CPn} = 21.6$$

$$= 4.7 (100/(100+ 21.6)$$

$$= 3.9 \text{ lbs}$$

Total dry crib weight, excluding spacers = 16.75 lbs

$$M_{Cdb} = \mathbf{7.60 \text{ kg}}$$

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

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

Where,

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

Sample calculation:

$$V_C = 949.4 \text{ in}^3$$

1728 = conversion from in³ to ft³

$$D_{Cdb} = 16.75 / 949.4 * 1728$$

$$= \mathbf{30.49 \text{ lbs/ft}^3}$$

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

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

Sample calculation:

$$M_{FTAdb} = 0.5 + 7.60$$

$$= \mathbf{8.09 \text{ kg}}$$

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

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

Where,

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

Sample Calculation:

$$M_{Bdb} = 8.09 \quad \text{kg}$$
$$\theta = 520 \quad \text{min}$$

$$BR = \frac{60 \times 8.09}{520}$$

$$BR = \mathbf{0.93} \quad \text{kg/hr}$$

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

ASTM E2515 equations (9)

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

Where:

- F_p = Adjustment factor for pitot tube center point reading = $\frac{V_{strav}}{V_{scent}}$, 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 H₂O
- 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. H₂O; (in Hg = in H₂O/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:

$$F_p = \frac{17.99}{20.62} = 0.873$$

$$V_s = 0.873 \times 85.49 \times 0.99 \times 0.295 \times \left(\left(\frac{90.9}{29.85} + \frac{460}{13.6} \right) \times 28.78 \right)^{1/2}$$

$$V_s = 17.44 \text{ ft/s}$$

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

**The ASTM test standard mistakenly identifies M_s 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)

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

Where:

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

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 17.44 \times 0.1963 \times \frac{528}{90.9 + 460} \times \frac{29.85 + \frac{-0.16}{13.6}}{29.92}$$

Q_{sd} = **11548.0** dscf/hr

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

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

Where:

- K_1 = 17.64 °R/in. Hg
- V_m = Volume of gas sample measured at the dry gas meter, dcf
- Y = Dry gas meter calibration factor, dimensionless
- P_{bar} = Barometric pressure at the testing site, in. Hg
- ΔH = Average pressure differential across the orifice meter, in. H₂O
- T_m = Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train A:

$$V_{m(std)} = 17.64 \times 84.523 \times 1.004 \times \frac{\left(29.85 + \frac{2.62}{13.6} \right)}{\left(95.6 + 460 \right)}$$

$$V_{m(std)} = \mathbf{80.924} \text{ dscf}$$

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 81.729 \times 1.005 \times \frac{\left(29.85 + \frac{2.42}{13.6} \right)}{\left(100.6 + 460 \right)}$$

$$V_{m(std)} = \mathbf{77.595} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 53.12 \times 1.013 \times \frac{\left(\underline{29.845} + \frac{0.00}{13.6} \right)}{\left(75.2 + 460 \right)}$$

$$V_{m(std)} = \mathbf{52.931} \text{ dscf}$$

m_n – Total Particulate Matter Collected, mg

ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

- m_p = mass of particulate matter from probe, mg
- m_f = mass of particulate matter from filters, mg
- m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A:

$$m_n = 0.2 + 3.4 + 0.4$$

$$m_n = \mathbf{4.0} \text{ mg}$$

Using equation for Train B:

$$m_n = 0 + 3.9 + 0.3$$

$$m_n = \mathbf{4.2} \text{ mg}$$

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

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

Where:

- K₂ = 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:

$$C_s = 0.001 \times \frac{4.0}{80.92}$$

$$C_s = \mathbf{0.00005} \text{ g/dscf}$$

For Train B

$$C_s = 0.001 \times \frac{4.2}{77.60}$$

$$C_s = \mathbf{0.00005} \text{ g/dscf}$$

For Ambient Train

$$C_r = 0.001 \times \frac{0.1}{52.93}$$

$$C_r = \mathbf{0.000002} \text{ g/dscf}$$

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

$$E_T = (0.000049 - 0.000002) \times 11548.0 \times 520 /60$$
$$E_T = \mathbf{4.76} \text{ g}$$

For Train B

$$E_T = (0.000054 - 0.000002) \times 11548.0 \times 520 /60$$
$$E_T = \mathbf{5.23} \text{ g}$$

Average

$$E = \mathbf{4.99} \text{ g}$$

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, °R
- T_m = Absolute average dry gas meter temperature, °R
- T_{si} = Absolute average gas temperature in the dilution tunnel during the "ith" time interval, °R
- T_s = Absolute average gas temperature in the dilution tunnel, °R

Sample calculation (for the first 10-min interval of Train 1):

$$PR = \left(\frac{520 \times 1.463 \times 17.44 \times (92.7 + 460) \times (95.6 + 460)}{10 \times 84.523 \times 16.97 \times (90.9 + 460) \times (77.5 + 460)} \right) \times 100$$

PR = **96 %**

PM_R – Particulate emissions for test run, g/hr

ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation:

$$E_T \text{ (Dual train average)} = 4.99 \text{ g}$$

$$\theta = 520 \text{ min}$$

$$PM_R = 60 \times (4.99 / 520)$$

$$PM_R = 0.58 \text{ g/hr}$$

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

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

Sample Calculation:

$$\begin{aligned} E_T (\text{Dual train average}) &= 4.99 \text{ g} \\ M_{Bdb} &= 8.09 \text{ kg} \\ \\ PM_F &= 4.99 / 8.09 \\ \\ PM_F &= \mathbf{0.62} \text{ g/kg} \end{aligned}$$

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: Buck Stove
Model: 91
Date: 07/31/24
Run: 1
Control #: 24-330
Test Duration: 520 min

	HHV	LHV
Eff	81.10%	87.65%
Comb Eff	99.50%	99.50%
HT Eff	81.51%	88.10%
Output	14,975	kJ/h
Burn Rate	0.93	kg/h
Grams CO	46	g
Input	18,465	kJ/h
MC wet	17.26	
Averages	0.02	6.41

Note: In the "Input data", "Calc. % O₂", "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.

Overall Heating Efficiency: 81.10%
 Combustion Efficiency: 99.50%
 Heat Transfer Efficiency: 81.51%

Heat Output: 14,206 Btu/h
 Heat Input: 17,516 Btu/h

Burn Duration: 8.67 h
 Burn Rate: 2.05 lb/h
 Stack Temp: 211.6 Deg. F

Ultimate CO₂
 CO_{2-ult} 19.64
 F₀ 1.060

INPUT DATA				Oxygen Calculation			Input Data		Combust	Heat	Net	Air	Wet Wt
Elapsed	Weight	%	%	Excess	Total	Calc. %	Flue	Room	Eff	Transfer	Eff	Fuel	Now
Time	Remaining (kg)	CO [e]	CO ₂ [d]	Air EA	O ₂	O ₂ [g]	Gas (°C)	Temp (°C)	%	%	%	Ratio	Wt
0	9.76	0.04	2.13	803.5%	20.80	18.64	117.1	23.2	100.9%	62.9%	63.4%	54.8	9.76
1	9.74	0.12	1.65	1008.5%	20.82	19.11	135.2	23.2	97.5%	49.1%	47.9%	67.0	9.74
2	9.70	0.09	3.48	450.5%	20.70	17.18	132.2	23.2	99.3%	70.0%	69.6%	33.2	9.70
3	9.61	0.15	7.77	148.1%	20.42	12.58	136.8	23.2	98.8%	79.8%	78.9%	15.0	9.61
4	9.48	0.98	10.88	65.6%	20.16	8.79	147.3	23.3	93.3%	81.3%	75.8%	9.9	9.48
5	9.34	1.00	11.95	51.7%	20.09	7.64	160.9	23.2	93.7%	81.1%	75.9%	9.0	9.34
6	9.29	0.65	10.51	75.9%	20.20	9.36	143.1	23.3	95.3%	81.4%	77.6%	10.5	9.29
7	9.26	0.02	6.22	215.2%	20.53	14.31	130.8	23.4	100.4%	78.4%	78.7%	19.1	9.26
8	9.23	0.02	5.67	245.6%	20.56	14.89	124.1	23.4	100.6%	78.2%	78.6%	20.9	9.23
9	9.21	0.02	5.53	254.2%	20.57	15.04	118.2	23.3	100.5%	78.6%	79.0%	21.4	9.21
10	9.18	0.02	5.49	256.6%	20.58	15.08	114.4	23.3	100.5%	79.0%	79.4%	21.6	9.18
11	9.16	0.02	5.31	269.2%	20.59	15.28	111.6	23.4	100.6%	79.0%	79.5%	22.3	9.16
12	9.13	0.01	5.31	268.9%	20.59	15.27	109.3	23.4	100.7%	79.3%	79.8%	22.3	9.13
13	9.11	0.01	5.44	260.4%	20.58	15.14	107.7	23.3	100.6%	79.7%	80.2%	21.8	9.11
14	9.08	0.02	5.48	257.3%	20.58	15.09	106.0	23.4	100.6%	80.0%	80.4%	21.6	9.08
15	9.05	0.01	5.49	257.1%	20.58	15.08	104.9	23.4	100.6%	80.1%	80.6%	21.6	9.05
16	9.02	0.02	5.57	251.6%	20.57	14.99	103.1	23.3	100.6%	80.5%	80.9%	21.3	9.02
17	9.01	0.01	5.36	266.0%	20.59	15.22	102.3	23.4	100.7%	80.2%	80.8%	22.1	9.01
18	8.98	0.01	5.43	260.8%	20.58	15.14	101.6	23.5	100.6%	80.4%	80.9%	21.8	8.98
19	8.95	0.02	5.61	249.5%	20.57	14.96	100.8	23.3	100.5%	80.8%	81.2%	21.1	8.95
20	8.93	0.02	5.79	238.4%	20.56	14.76	99.9	23.3	100.5%	81.1%	81.6%	20.5	8.93
21	8.90	0.01	5.93	230.2%	20.55	14.61	99.9	23.3	100.5%	81.3%	81.7%	20.0	8.90
22	8.87	0.01	6.09	221.9%	20.54	14.44	99.6	23.3	100.5%	81.5%	82.0%	19.5	8.87
23	8.85	0.01	6.07	223.0%	20.54	14.46	99.7	23.3	100.5%	81.5%	81.9%	19.5	8.85
24	8.82	0.01	6.06	223.3%	20.54	14.47	99.7	23.3	100.5%	81.5%	81.9%	19.5	8.82
25	8.80	0.01	5.97	228.5%	20.55	14.57	99.4	23.3	100.6%	81.4%	81.9%	19.9	8.80
26	8.77	0.01	5.98	227.7%	20.54	14.56	98.8	23.3	100.5%	81.5%	82.0%	19.8	8.77
27	8.74	0.01	5.96	228.9%	20.55	14.58	99.0	23.3	100.5%	81.5%	81.9%	19.9	8.74
28	8.71	0.01	5.90	232.1%	20.55	14.64	99.0	23.3	100.6%	81.4%	81.9%	20.1	8.71
29	8.68	0.02	5.98	227.6%	20.54	14.56	98.6	23.3	100.5%	81.5%	81.9%	19.8	8.68
30	8.66	0.02	6.00	226.7%	20.54	14.54	98.4	23.4	100.5%	81.6%	82.0%	19.7	8.66
31	8.63	0.01	6.05	223.8%	20.54	14.48	98.2	23.4	100.5%	81.7%	82.1%	19.6	8.63
32	8.61	0.01	6.13	220.0%	20.53	14.40	98.0	23.4	100.5%	81.8%	82.2%	19.3	8.61
33	8.58	0.02	6.16	218.2%	20.53	14.37	98.2	23.4	100.4%	81.8%	82.2%	19.2	8.58
34	8.55	0.01	6.16	218.2%	20.53	14.37	98.2	23.4	100.5%	81.8%	82.2%	19.2	8.55
35	8.52	0.01	6.28	212.5%	20.53	14.25	98.4	23.4	100.5%	81.9%	82.3%	18.9	8.52
36	8.49	0.01	6.37	207.7%	20.52	14.14	98.7	23.3	100.5%	82.0%	82.4%	18.6	8.49
37	8.46	0.01	6.61	196.5%	20.50	13.88	100.8	23.4	100.4%	82.0%	82.4%	17.9	8.46

Ratio (A/F)	
Weight (M _g)	29.59
Wet Gas (N _g)	660.87
Ratio (A/F)	19.04

%HC
0.88

Combustion Efficiency: 99.50%
 Total Input (kJ): 160,033 151,783 (Btu)
 Total Output (kJ): 129,787 123,097 (Btu)
 Efficiency: 81.10%
 Total CO (g): 46.13

Moisture of Wood (wet basis): 17.2642
 Initial Dry Weight W_{t,do} (kg): 8.08
 Moisture Content Dry 20.87

Load Weight (kg): **9.76**
 Fuel Heating HHV LHV HHV
 Value in kJ/kg - CV: **19,810 18,329** Btu/lb **8522.5**

65.20	3.03	62.46	160118	4.06	6.87	2.74	19810.00	17.26	79.48	21.08	1.58	5.46	-0.02	0.16	40.85
% Wet Consumed	Dry Wt. Now	% Dry Consumed	Total Input	Fuel Properties				Mw Moisture	Mass Balance (moles/100 mole dry flue gas)					kg Wood per 100 mole dfp	
x	W _{t,dn}	y	Input	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value	Fuel Burnt	[h]	[u]	[w]	[j]	[k]	Nk	CO ₂
0.00	8.08	0.00	0	4.06	6.87	2.74	19810.00	17.26	79.18	21.00	0.53	1.87	-0.02	0.05	40.45
0.28	8.06	0.28	781	4.06	6.87	2.74	19810.00	17.26	79.12	20.99	0.43	1.51	-0.01	0.04	38.36
0.70	8.02	0.70	1078	4.06	6.87	2.74	19810.00	17.26	79.25	21.02	0.87	3.04	-0.01	0.09	39.97
1.63	7.95	1.63	1785	4.06	6.87	2.74	19810.00	17.26	79.51	21.09	1.95	6.69	0.00	0.19	40.02
2.93	7.84	2.93	2157	4.06	6.87	2.74	19810.00	17.26	79.35	21.05	2.95	9.88	0.13	0.29	37.03
4.32	7.73	4.32	1562	4.06	6.87	2.74	19810.00	17.26	79.42	21.07	3.22	10.80	0.13	0.32	37.28
4.88	7.68	4.88	632	4.06	6.87	2.74	19810.00	17.26	79.47	21.08	2.77	9.35	0.08	0.28	38.15
5.11	7.67	5.11	446	4.06	6.87	2.74	19810.00	17.26	79.46	21.08	1.53	5.30	-0.02	0.15	40.84
5.44	7.64	5.44	483	4.06	6.87	2.74	19810.00	17.26	79.43	21.07	1.39	4.83	-0.02	0.14	40.86
5.72	7.62	5.72	446	4.06	6.87	2.74	19810.00	17.26	79.42	21.07	1.36	4.72	-0.02	0.14	40.85
5.99	7.59	5.99	409	4.06	6.87	2.74	19810.00	17.26	79.42	21.07	1.35	4.68	-0.02	0.13	40.85
6.23	7.58	6.23	409	4.06	6.87	2.74	19810.00	17.26	79.40	21.06	1.30	4.53	-0.02	0.13	40.87
6.51	7.55	6.51	409	4.06	6.87	2.74	19810.00	17.26	79.41	21.06	1.31	4.53	-0.02	0.13	40.90
6.74	7.53	6.74	409	4.06	6.87	2.74	19810.00	17.26	79.41	21.06	1.34	4.64	-0.02	0.13	40.87
7.02	7.51	7.02	446	4.06	6.87	2.74	19810.00	17.26	79.42	21.07	1.35	4.68	-0.02	0.13	40.87
7.30	7.49	7.30	446	4.06	6.87	2.74	19810.00	17.26	79.42	21.07	1.35	4.68	-0.02	0.13	40.89
7.57	7.47	7.57	372	4.06	6.87	2.74	19810.00	17.26	79.42	21.07	1.37	4.75	-0.02	0.14	40.85
7.76	7.45	7.76	372	4.06	6.87	2.74	19810.00	17.26	79.41	21.06	1.32	4.57	-0.02	0.13	40.90
8.04	7.43	8.04	446	4.06	6.87	2.74	19810.00	17.26	79.41	21.06	1.34	4.63	-0.02	0.13	40.88
8.32	7.41	8.32	409	4.06	6.87	2.74	19810.00	17.26	79.42	21.07	1.38	4.78	-0.02	0.14	40.85
8.55	7.39	8.55	446	4.06	6.87	2.74	19810.00	17.26	79.44	21.07	1.42	4.93	-0.02	0.14	40.85
8.88	7.36	8.88	483	4.06	6.87	2.74	19810.00	17.26	79.45	21.07	1.46	5.06	-0.02	0.15	40.86
9.15	7.34	9.15	409	4.06	6.87	2.74	19810.00	17.26	79.46	21.08	1.50	5.19	-0.02	0.15	40.87
9.39	7.32	9.39	446	4.06	6.87	2.74	19810.00	17.26	79.45	21.08	1.49	5.17	-0.02	0.15	40.86
9.71	7.29	9.71	409	4.06	6.87	2.74	19810.00	17.26	79.45	21.08	1.49	5.16	-0.02	0.15	40.86
9.90	7.28	9.90	409	4.06	6.87	2.74	19810.00	17.26	79.45	21.07	1.47	5.08	-0.02	0.15	40.89
10.22	7.25	10.22	483	4.06	6.87	2.74	19810.00	17.26	79.45	21.07	1.47	5.10	-0.02	0.15	40.88
10.50	7.23	10.50	446	4.06	6.87	2.74	19810.00	17.26	79.45	21.07	1.47	5.08	-0.02	0.15	40.87
10.78	7.21	10.78	446	4.06	6.87	2.74	19810.00	17.26	79.45	21.07	1.45	5.03	-0.02	0.14	40.89
11.06	7.18	11.06	446	4.06	6.87	2.74	19810.00	17.26	79.45	21.07	1.47	5.10	-0.02	0.15	40.85
11.34	7.16	11.34	446	4.06	6.87	2.74	19810.00	17.26	79.45	21.07	1.48	5.11	-0.02	0.15	40.85
11.62	7.14	11.62	409	4.06	6.87	2.74	19810.00	17.26	79.45	21.08	1.49	5.16	-0.02	0.15	40.88
11.85	7.12	11.85	409	4.06	6.87	2.74	19810.00	17.26	79.46	21.08	1.51	5.22	-0.02	0.15	40.86
12.13	7.10	12.13	446	4.06	6.87	2.74	19810.00	17.26	79.46	21.08	1.52	5.25	-0.02	0.15	40.83
12.41	7.08	12.41	483	4.06	6.87	2.74	19810.00	17.26	79.46	21.08	1.51	5.25	-0.02	0.15	40.87
12.73	7.05	12.73	483	4.06	6.87	2.74	19810.00	17.26	79.47	21.08	1.54	5.34	-0.02	0.15	40.89
13.01	7.03	13.01	483	4.06	6.87	2.74	19810.00	17.26	79.48	21.08	1.57	5.42	-0.02	0.16	40.87
13.34	7.00	13.34	521	4.06	6.87	2.74	19810.00	17.26	79.49	21.08	1.63	5.63	-0.02	0.16	40.85

Moisture Content M_{Cwb} : 17.2642

Dry kg : 8.08
 CA: 49
 HY: 7
 OX: 43.9

LHV
 7885.2

96.81	0.11	-0.14	532.78	34.80	11.59	372.99	2980.72	2261.27	2203.36	2178.00	2829.85	2638.08	297.13	63389.29	109642.01	
Moles per kg of Dry Wood						Moisture Present	Stack Temp K	Heat Content Change - Ambient to Stack Temperature Flue Gas Constituent						Room Temp K	CO ₂	O ₂
O ₂	CO	HC	N ₂	H ₂ O	CO ₂			O ₂	CO	N ₂	CH ₄	H ₂ O				
353.86	0.82	-0.45	1502.88	35.42	11.59	390.21	3705.98	2802.95	2729.09	2698.12	3537.06	3266.88	296.37	149.89	991.86	
443.50	2.76	-0.31	1836.11	35.14	11.59	408.32	4450.69	3353.08	3261.52	3225.18	4276.53	3903.21	296.37	170.74	1487.10	
197.34	1.01	-0.17	910.29	34.86	11.59	405.37	4328.97	3263.44	3174.83	3139.35	4155.06	3799.63	296.37	173.04	644.00	
64.83	0.78	0.01	409.82	34.50	11.59	409.98	4521.81	3405.49	3312.21	3275.37	4347.45	3963.78	296.32	180.99	220.77	
29.91	3.34	0.44	270.10	33.64	11.59	420.48	4954.18	3722.67	3618.62	3578.81	4781.66	4329.81	296.43	183.46	111.34	
23.84	3.12	0.42	247.82	33.69	11.59	434.04	5524.70	4139.48	4020.85	3977.23	5358.33	4810.17	296.37	205.95	98.69	
33.99	2.37	0.29	288.42	33.94	11.59	416.26	4776.11	3592.06	3492.44	3453.85	4602.80	4179.09	296.48	182.20	122.09	
93.99	0.11	-0.13	522.11	34.79	11.59	403.93	4260.87	3212.95	3125.92	3090.94	4087.86	3741.16	296.59	174.00	301.99	
107.31	0.11	-0.16	572.50	34.84	11.59	397.26	3988.61	3012.01	2931.48	2898.46	3817.11	3508.79	296.54	162.98	323.22	
111.09	0.13	-0.16	586.72	34.84	11.59	391.37	3749.43	2835.03	2760.13	2728.85	3580.25	3303.97	296.48	153.15	314.93	
112.16	0.13	-0.16	590.78	34.85	11.59	387.54	3592.90	2718.93	2647.65	2617.53	3425.84	3169.50	296.48	146.76	304.95	
117.69	0.12	-0.17	611.72	34.87	11.59	384.71	3475.36	2631.56	2562.96	2533.72	3310.29	3068.25	296.54	142.04	309.70	
117.53	0.09	-0.18	611.21	34.87	11.59	382.48	3384.99	2564.38	2497.83	2469.27	3221.51	2990.37	296.54	138.43	301.40	
113.79	0.11	-0.17	597.02	34.86	11.59	380.82	3319.43	2515.65	2450.60	2422.53	3157.05	2933.90	296.48	135.68	286.26	
112.47	0.11	-0.16	592.00	34.85	11.59	379.15	3249.71	2463.68	2400.18	2372.64	3088.85	2873.60	296.54	132.80	277.09	
112.38	0.09	-0.17	591.73	34.86	11.59	378.09	3204.82	2430.18	2367.67	2340.48	3045.03	2834.72	296.59	131.05	273.11	
109.94	0.12	-0.16	582.43	34.84	11.59	376.21	3134.72	2378.08	2317.18	2290.51	2976.09	2774.35	296.43	128.07	261.46	
116.27	0.08	-0.17	606.44	34.87	11.59	375.43	3099.03	2351.35	2291.21	2264.83	2941.46	2743.29	296.54	126.76	273.38	
114.00	0.11	-0.17	597.79	34.86	11.59	374.71	3065.61	2326.30	2266.87	2240.76	2909.05	2714.18	296.65	125.31	265.19	
109.01	0.12	-0.16	578.91	34.84	11.59	373.93	3040.54	2307.76	2248.92	2222.99	2884.23	2692.72	296.48	124.22	251.57	
104.18	0.11	-0.15	560.64	34.82	11.59	373.04	3004.66	2280.96	2222.92	2197.26	2849.22	2661.62	296.48	122.74	237.63	
100.58	0.10	-0.15	547.09	34.82	11.59	373.09	3009.02	2284.27	2226.14	2200.45	2853.35	2665.48	296.43	122.96	229.76	
96.91	0.09	-0.14	533.21	34.81	11.59	372.76	2995.57	2274.23	2216.39	2190.80	2840.23	2653.82	296.43	122.42	220.39	
97.39	0.09	-0.14	535.04	34.81	11.59	372.82	2997.81	2275.90	2218.02	2192.41	2842.42	2655.76	296.43	122.49	221.66	
97.53	0.09	-0.14	535.56	34.81	11.59	372.87	2997.93	2275.94	2218.04	2192.44	2842.66	2655.79	296.48	122.50	221.98	
99.81	0.08	-0.15	544.21	34.82	11.59	372.54	2986.60	2267.53	2209.89	2184.37	2831.49	2646.05	296.43	122.11	226.31	
99.47	0.08	-0.15	542.93	34.82	11.59	371.93	2961.95	2249.11	2192.02	2166.69	2807.46	2624.67	296.43	121.08	223.72	
99.98	0.09	-0.15	544.82	34.82	11.59	372.15	2968.80	2254.17	2196.92	2171.54	2814.25	2630.52	296.48	121.34	225.37	
101.39	0.08	-0.15	550.20	34.83	11.59	372.15	2968.80	2254.17	2196.92	2171.54	2814.25	2630.52	296.48	121.39	228.55	
99.43	0.10	-0.15	542.70	34.81	11.59	371.71	2950.87	2240.78	2183.92	2158.68	2796.78	2614.98	296.48	120.56	222.79	
99.02	0.11	-0.14	541.14	34.81	11.59	371.54	2942.03	2234.13	2177.45	2152.28	2788.29	2607.23	296.54	120.17	221.23	
97.77	0.08	-0.15	536.48	34.81	11.59	371.32	2933.08	2227.43	2170.95	2145.85	2779.56	2599.45	296.54	119.89	217.77	
96.08	0.09	-0.14	530.07	34.80	11.59	371.15	2926.36	2222.41	2166.07	2141.03	2773.02	2593.62	296.54	119.57	213.53	
95.29	0.12	-0.14	527.00	34.79	11.59	371.32	2933.08	2227.43	2170.95	2145.85	2779.56	2599.45	296.54	119.75	212.25	
95.31	0.08	-0.14	527.18	34.81	11.59	371.37	2933.20	2227.47	2170.97	2145.88	2779.79	2599.48	296.59	119.89	212.29	
92.82	0.07	-0.14	517.82	34.80	11.59	371.59	2944.27	2235.80	2179.07	2153.89	2790.47	2609.17	296.54	120.38	207.52	
90.72	0.08	-0.13	509.84	34.79	11.59	371.82	2957.47	2245.77	2188.77	2163.48	2803.10	2620.78	296.43	120.87	203.73	
85.80	0.09	-0.13	491.19	34.77	11.59	373.93	3038.42	2306.12	2247.32	2221.41	2882.28	2690.80	296.54	124.12	197.86	

SUMS					AVERAGE	SUMS						
15624.78	588495.80	-65326.32	845084.20	281496.93	3528.61	29145.85	-299.66	29445.51	130972.41	-300.16	46.13	-13.77
Energy Losses (kJ/kg of Dry Fuel)					Total Loss Rate	Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	Grams Produced	
Flue Gas Constituent											CO	HC
CO	N ₂	CH ₄	H ₂ O Comb	H ₂ O Fuel MC							CO	HC
233.17	4054.96	-402.48	1673.25	547.59	7248.25	0.00	0	0.00	0	0	0.00	0.00
790.54	5921.77	-278.14	1682.45	554.97	10329.42	407.14	20	387.25	374	20	3.05	-0.20
289.25	2857.74	-152.17	1665.35	553.77	6030.98	328.27	7	320.95	750	7	1.54	-0.15
222.84	1342.32	8.19	1653.89	555.67	4184.66	377.01	21	356.43	1408	21	1.96	0.01
958.03	966.65	392.99	1624.98	559.91	4797.36	522.25	146	376.72	1634	146	10.19	0.76
894.76	985.65	372.60	1643.39	565.48	4766.53	375.75	99	277.01	1186	99	6.88	0.52
679.99	996.16	260.65	1634.15	558.17	4433.40	141.46	30	111.75	491	30	2.12	0.15
31.96	1613.82	-120.67	1659.95	553.09	4214.14	94.92	-2	96.91	351	-2	0.07	-0.05
30.91	1659.37	-140.26	1653.96	550.40	4240.58	103.47	-3	106.13	380	-3	0.07	-0.06
35.89	1601.08	-143.37	1647.15	548.02	4156.86	93.63	-2	96.04	353	-2	0.08	-0.06
36.12	1546.37	-144.77	1642.62	546.46	4078.51	84.21	-2	86.45	325	-2	0.07	-0.05
33.00	1549.93	-154.12	1640.08	545.29	4065.91	83.95	-2	86.44	325	-2	0.07	-0.06
26.37	1509.23	-156.90	1637.66	544.39	4000.57	82.60	-3	85.29	326	-3	0.05	-0.06
30.04	1446.30	-149.84	1634.94	543.73	3927.12	81.08	-2	83.55	328	-2	0.06	-0.06
31.91	1404.60	-147.07	1632.55	543.03	3874.91	87.28	-3	89.86	359	-3	0.07	-0.06
25.51	1384.94	-149.86	1631.49	542.58	3838.82	86.46	-3	89.26	360	-3	0.06	-0.06
33.48	1334.07	-142.71	1628.64	541.88	3784.89	71.04	-2	73.09	301	-2	0.06	-0.05
23.97	1373.48	-156.12	1628.96	541.52	3811.94	71.55	-2	74.02	300	-2	0.04	-0.05
30.06	1339.50	-150.07	1627.31	541.18	3778.48	85.10	-3	87.80	361	-3	0.07	-0.06
33.27	1286.90	-141.44	1625.67	540.93	3721.11	76.83	-2	79.06	332	-2	0.07	-0.05
32.21	1231.87	-134.98	1623.91	540.57	3653.95	82.30	-2	84.61	364	-2	0.07	-0.05
27.50	1203.85	-131.96	1623.73	540.62	3616.45	88.24	-3	90.79	395	-3	0.07	-0.06
24.88	1168.16	-127.87	1622.89	540.48	3571.36	73.74	-2	75.86	335	-2	0.05	-0.05
26.89	1173.02	-127.66	1622.94	540.51	3579.85	80.63	-2	82.90	366	-2	0.06	-0.05
26.91	1174.19	-127.85	1622.96	540.51	3581.21	73.94	-2	76.02	335	-2	0.05	-0.05
21.49	1188.77	-133.58	1623.22	540.39	3588.71	74.09	-2	76.40	335	-2	0.04	-0.05
23.39	1176.35	-132.23	1622.33	540.15	3574.79	87.23	-3	89.88	396	-3	0.06	-0.06
25.42	1183.10	-132.03	1622.52	540.21	3585.93	80.77	-2	83.16	365	-2	0.06	-0.05
21.73	1194.78	-135.75	1622.91	540.21	3593.81	80.94	-3	83.51	365	-3	0.05	-0.05
29.22	1171.51	-129.50	1621.71	540.03	3576.32	80.55	-2	82.81	366	-2	0.06	-0.05
31.08	1164.69	-128.07	1621.29	539.94	3570.33	80.42	-2	82.60	366	-2	0.07	-0.05
23.11	1151.21	-129.91	1621.21	539.85	3543.14	73.15	-2	75.35	336	-2	0.05	-0.05
26.63	1134.89	-125.87	1620.59	539.79	3529.13	72.86	-2	74.91	336	-2	0.05	-0.05
34.04	1130.86	-121.36	1620.32	539.85	3535.73	79.64	-2	81.60	367	-2	0.08	-0.05
22.70	1131.26	-126.56	1620.87	539.85	3520.31	85.90	-3	88.43	397	-3	0.05	-0.06
18.58	1115.32	-124.86	1621.03	539.97	3497.93	85.35	-3	87.94	398	-3	0.04	-0.05
21.95	1103.02	-120.31	1620.96	540.10	3490.32	85.16	-2	87.56	398	-2	0.05	-0.05
24.68	1091.14	-112.01	1622.52	540.91	3489.23	91.69	-2	93.98	429	-2	0.06	-0.05

ASTM E2515 - Glass Fiber Filters

Date:	6/25/24	6/26/24					
Time:	0845	0830					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G01093	244.7	244.6	-	-	A	24-30A	#2
G01094	247.5	247.3	-	-	A		↓
G01095	240.4	240.3	-	-	A		#3
G01096	244.6	244.7	-	-	A		↓
G01097	243.9	244.0	-	-	A		↓
G01098	237.8	238.0	-	-	A		↓
G01099	244.3	244.2	-	-	A		#4
G01100	246.1	246.1	-	-	A		↓
G01101	245.8	245.7	-	-	A		↓
G01102	244.4	244.6	-	-	A		↓
G01103	245.1	244.9	-	-	A		#5
G01104	244.0	243.9	-	-	A		↓
G01105	244.6	244.5	-	-	A		↓
G01106	244.9	245.0	-	-	A		↓
G01107	244.2	244.4	-	-	A		
G01108	243.8	243.7	-	-	A		

Date:	6/26/24	7/1/24					
Time:	0820	1130					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G01109	244.7	244.6	-	-	A	24-330	#1
G01110	244.4	244.6	-	-	A		↓
G01111	244.47	244.8	-	-	A		↓
G01112	243.9	244.1	-	-	A		↓
G01113	244.2	244.4	-	-	A		#2
G01114	243.4	243.6	-	-	A		↓
G01115	244.6	244.8	-	-	A		↓
G01116	244.7	244.8	-	-	A		↓
G01117	245.0	245.0	-	-	A		#3
G01118	243.0	242.8	-	-	A		↓
G01119	244.3	244.5	-	-	A		↓
G01120	244.9	245.1	-	-	A		↓
G01121	244.8	245.0	-	-	A		#4
G01122	244.4	244.6	-	-	A		↓
G01123	245.7	245.7	-	-	A		↓
G01124	244.0	244.2	-	-	A		↓

ASTM E2515 - Probe Samples 11-20

Date:	6/25/24	6/26/24					
Time:	0900	0900					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	116868.4	116868.6	-	-	A	24-309	#4
11B	117342.3	117342.4	-	-	A		
11C	116188.1	116188.2	-	-	A		
12A	116708.9	116708.9	-	-	A	24-309	#3
12B	117775.1	117775.2	-	-	A		
12C	117174.0	117174.1	-	-	A		
13A	117316.6	117316.8	-	-	A	24-309	#5
13B	116943.0	116943.1	-	-	A		
13C	115651.6	115651.4	-	-	A		
14A	116634.9	116635.1	-	-	A	24-330	#1
14B	116620.9	116621.1	-	-	A		
14C	116531.6	116531.6	-	-	A		
15A	117241.5	117241.5	-	-	A	24-330	#2
15B	116754.3	116754.2	-	-	A		
15C	116848.3	116848.3	-	-	A		

Date:	7/30/24	8/1/24	8/2/24	8/3/24			
Time:	3:30 pm	13:30	15:00	13:30			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	116380.1	116379.9	-	-	A	24-330	#3
16B	115862.7	115862.5	-	-	A		
16C	114148.1	114148.2	-	-	A		
17A	116811.0	116811.2	-	-	A	24-330	#4
17B	117140.9	117141.1	-	-	A		
17C	113141.3	113141.9	113141.4	113141.86	A		
18A	117501.2	117501.0	-	-	A	24-265	#1
18B	117333.1	117333.0	-	-	A		
18C	114335.7	114335.8	-	-	A		
19A	117027.2	117027.0	-	-	A	24-265	#2
19B	117014.3	117014.1	-	-	A		
19C	114231.7	114231.9	-	-	A		
20A	115628.3	115627.9	115627.8	-	A	24-321	#1
20B	115967.6	115967.5	-	-	A		
20C	113776.2	113776.1	-	-	A		

ASTM E2515 - O-Ring Samples 11-20

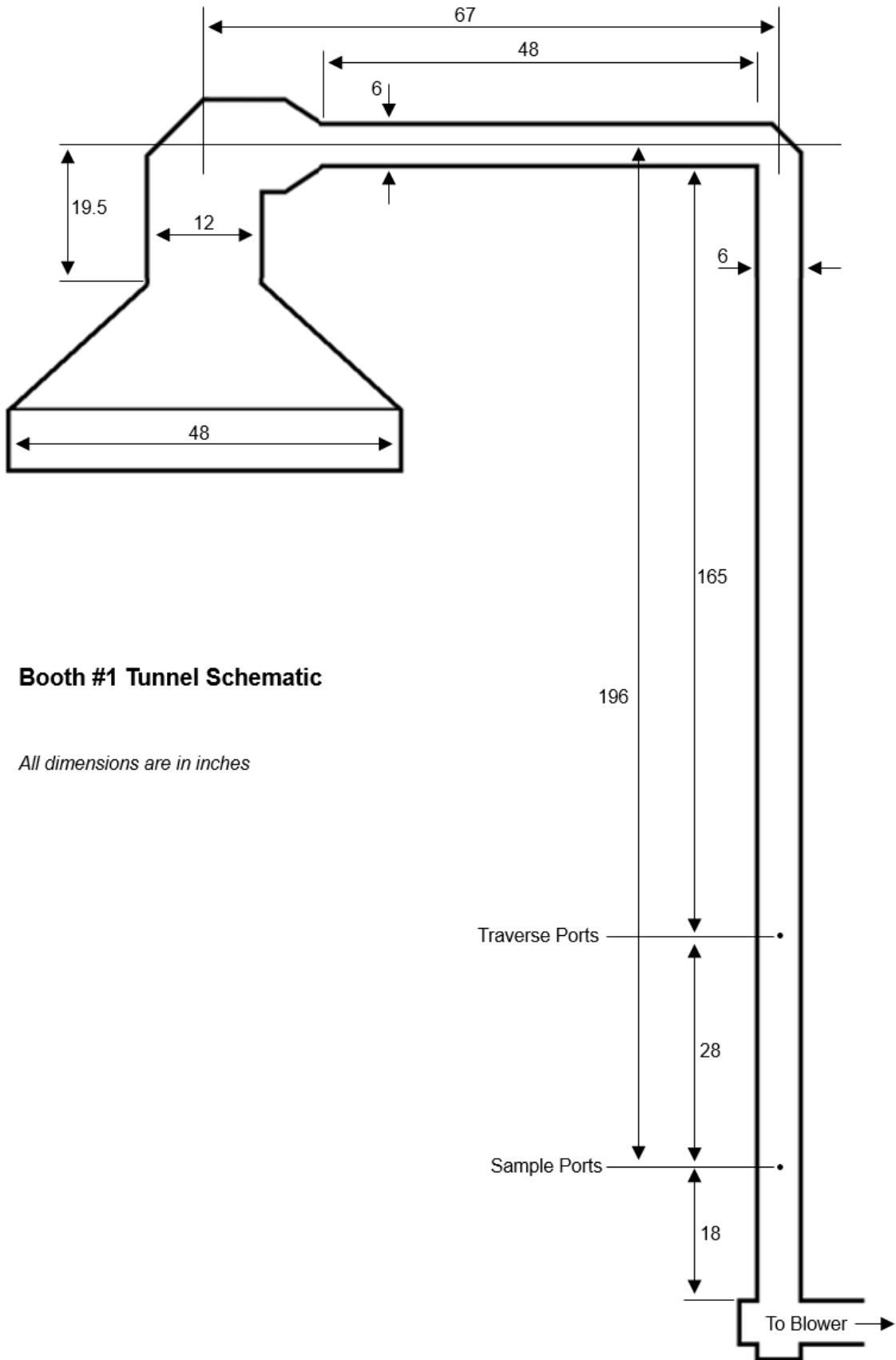
Date:	6/25/24	6/26/24					
Time:	09:00	10:00					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	3423.6	3423.5	-	-	A	24-309	#3
11B	4233.9	4233.9	-	-	A		
11C	3588.2	3588.3	-	-	A		
12A	3586.0	3585.9	-	-	A	24-309	#4
12B	3550.7	3550.8	-	-	A		
12C	3615.9	3615.9	-	-	A		
13A	3596.4	3596.5	-	-	A	24-309	#5
13B	3642.7	3642.3	-	-	A		
13C	4409.7	4409.7	-	-	A		
14A	3342.7	3342.7	-	-	A	24-330	#1
14B	3367.4	3367.4	-	-	A		
14C	3444.7	3444.7	-	-	A		
15A	3570.0	3570.0	-	-	A	24-330	#12
15B	3571.0	3571.1	-	-	A		
15C	3397.5	3397.5	-	-	N		

Date:	7/30/24	8/1/24					
Time:	3:00 pm	13:00					
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	3573.0	3573.1	-	-	A	24-330	#3
16B	3638.0	3638.1	-	-	A		
16C	3601.9	3601.9	-	-	A		
17A	3613.0	3612.9	-	-	A	24-330	#4
17B	3569.1	3569.0	-	-	A		
17C	3597.3	3597.2	-	-	A		
18A	3602.8	3602.7	-	-	A	24-265	#1
18B	3546.1	3546.1	-	-	A		
18C	3528.6	3528.5	-	-	A		
19A	3586.2	3586.1	-	-	A	24-265	#2
19B	3633.1	3633.1	-	-	A		
19C	3615.1	3615.3	-	-	A		
20A	3559.0	3558.9	-	-	A	24-321	#1
20B	3614.7	3614.7	-	-	A		
20C	3610.9	3611.0	-	-	A		

Dilution Tunnel Information Sheet

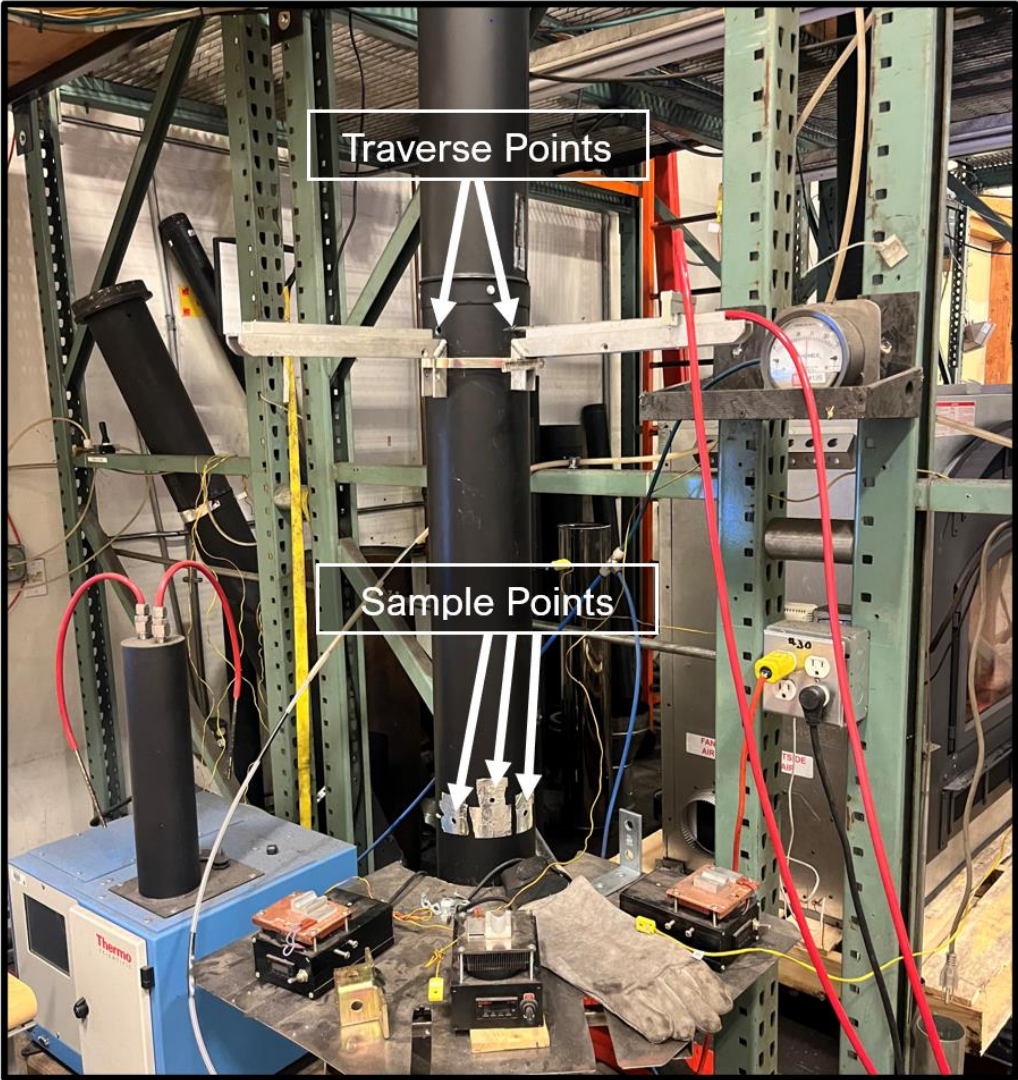
As of January 2024

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

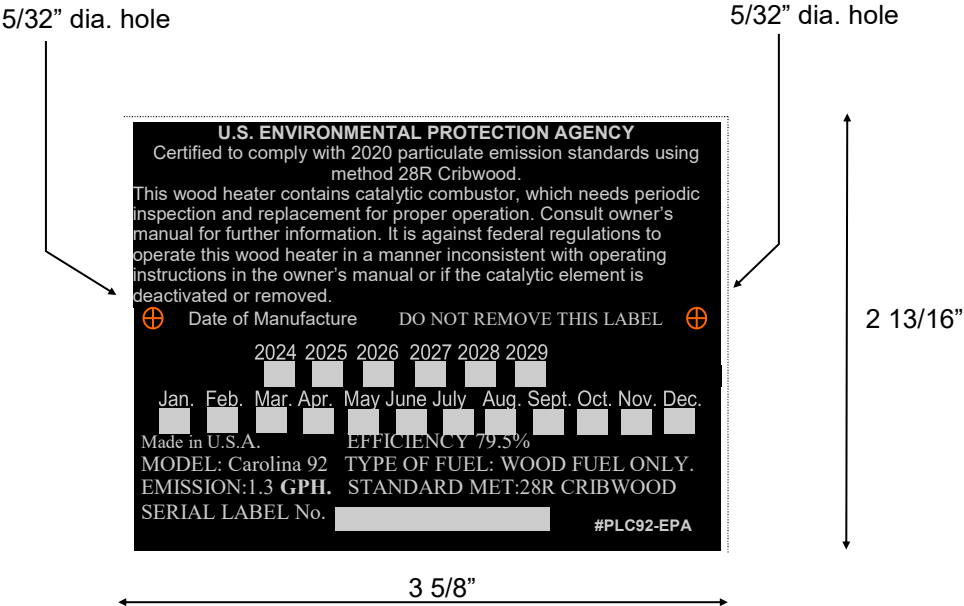
All dimensions are in inches



Appendix B: Labels & Manuals

MODEL CAROLINA 92

ADHESIVE LABEL
SILVER LETTERING ON BLACK
LEFT HEARTH SUPPORT
EPA LABEL



CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA

MASONRY FIREPLACE ACCESSORY/INSERT
ROOM HEATERS, SOLID FUEL TYPE



Manufactured by
NEW BUCK CORPORATION
P.O. BOX 69
Spruce Pine, NC 29777

SERIAL NO:

MODEL: CAROLINA 92
TESTED TO: UL 1482-2022
TEST DATE: JULY, 1991
REPORT NO. F21-743
TYPE OF FUEL: Wood Fuel Only

ELECTRICAL RATING:
115 VAC 1.2 amps 60Hz
Motor: PE910714

DANGER: Risk of electrical shock.

Disconnect power before servicing unit.

Do not route power cord beneath heater.

"Do Not Use Grate or Elevate Fire – Build Wood Fire Directly on Hearth."

Shall not be installed in a factory-built fireplace

PREVENT HOUSE FIRES

Install and use only in accordance with manufacturer's installation and operating instructions and your local building codes.

CAUTION: Special methods are required when passing chimney through a wall or ceiling, refer to local building codes. Do not pass chimney connector through a combustible surface. Do not connect this unit to a chimney flue serving another appliance.

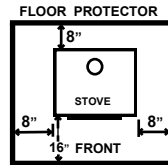
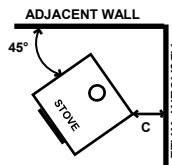
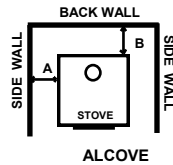
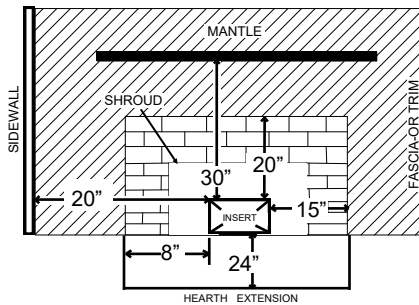
Note: Replace glass only with Part # PG265191GL. Use only a lined masonry chimney.

"Do Not Overfire– If Heater or Chimney Connector Glows, You Are Overfiring."

Install insert with a minimum of 20" clearance to combustible sidewall, 15" to side trim and 20" to top trim, 30" from top of insert to mantel or mantel supports. Floor protector must be 3/8" minimum non-combustible material or equivalent, extending 24" from front opening and 8" to both front side of unit. When used as an insert stove, install only in a masonry fireplace, built to UBC Chapter 37. Not to be installed in a factory-built fireplace. See owners manual for instruction for masonry insert installation. Do not remove brick or mortar from masonry fireplace to accommodate insert. See instruction manual for masonry insert flue connection options.

Remove and clean behind unit frequently, as creosote buildup may occur rapidly. "Inspect and Clean Chimney Frequently-Under Certain Conditions of Use, Creosote Buildup may Occur Rapidly."

Minimum clearances to Combustible Materials (in inches)



For freestanding installation, 3/8" minimum thickness non-combustible floor protection with an insulation R-Value of 1.1. must be used under the appliance, 16" beyond the front of the fuel door and 8" to each side of unit as indicated.

Installation	Clearance	Chimney & Connector	Dimensions		
			A	B	C
Residential	Standard	Note: 1	24	23	16
Residential	Standard	Note: 2	14	14	12

Note 1 : 8" inch diameter, single wall, minimum 24 MSG black or 24 NSG blued steel chimney connector pipe with a masonry chimney.

Note 2 : 8" inch diameter double walled connector pipe with a masonry chimney.

* Horizontal connector not permitted.

DO NOT REMOVE THIS LABEL

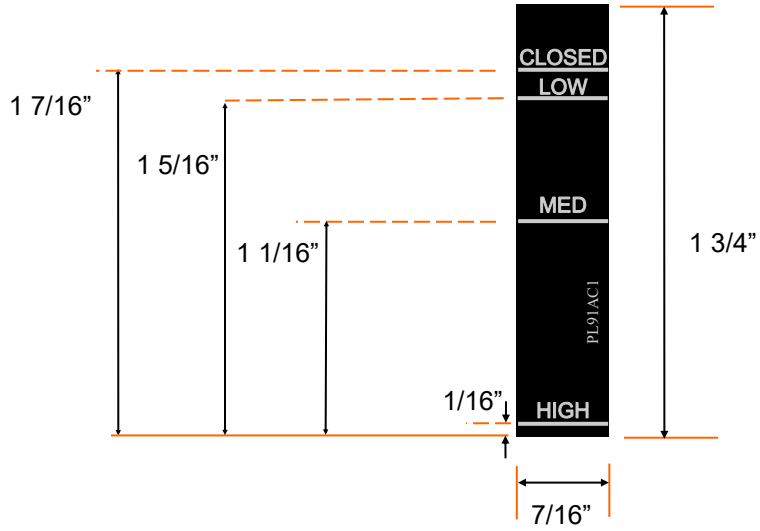
CATALYTIC CONNECTOR: Applied Ceramics, Inc., Part No. ACI-22C
The burning of metal foils, coal, plastic and garbage, sulphur and diesel oil will make the catalyst in the converter inactive. The converter is fragile: handle carefully. Neither the performance of the catalytic device nor its durability has been evaluated as part of the certification procedure. #PLC92

ADHESIVE LABEL
BLACK LETTERING ON SILVER
MDL. CAROLINA 92 LABEL– ON BACK OF STOVE

ADHESIVE BACKING

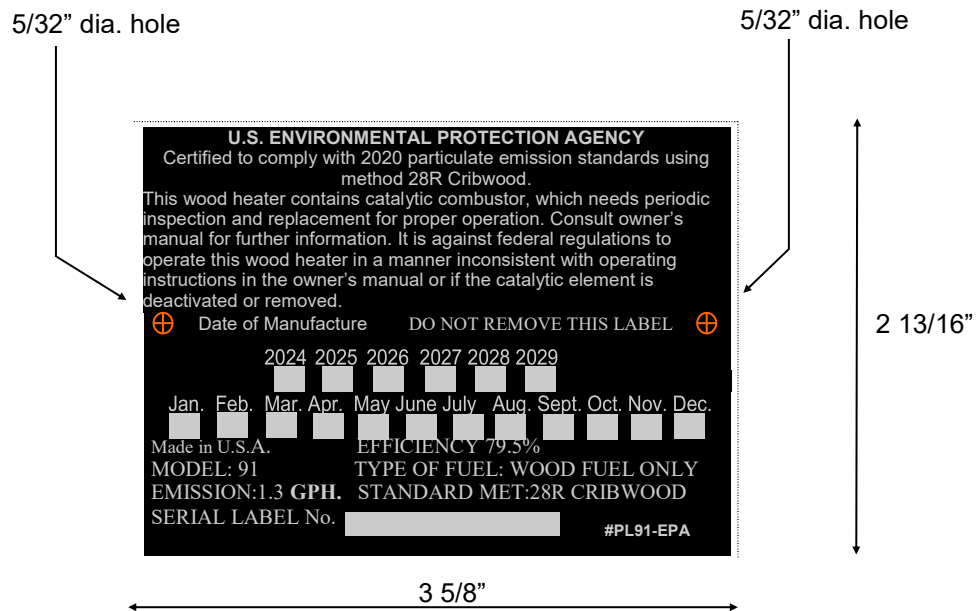
SILVER LETTERING ON BLACK- (4) SILVER LINES

91 PRIMARY AIR CONTROL ROD DRAFT INDICATOR



MODEL 91

ADHESIVE LABEL
SILVER LETTERING ON BLACK
LEFT HEARTH SUPPORT
EPA LABEL



CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA

MASONRY FIREPLACE ACCESSORY/INSERT
ROOM HEATERS, SOLID FUEL TYPE



Manufactured by
NEW BUCK CORPORATION
P.O. BOX 69
Spruce Pine, NC 29777

SERIAL NO:

MODEL: 91
TESTED TO: UL 1482-2022
TEST DATE: JULY, 1991
REPORT NO. F21-743
TYPE OF FUEL: Wood Fuel Only

ELECTRICAL RATING:
115 VAC 1.2 amps 60Hz
Motor: PE910714

DANGER: Risk of electrical shock.

Disconnect power before servicing unit.

Do not route power cord beneath heater.

"Do Not Use Grate or Elevate Fire – Build Wood Fire Directly on Hearth."

Shall not be installed in a factory-built fireplace

PREVENT HOUSE FIRES

Install and use only in accordance with manufacturer's installation and operating instructions and your local building codes.

CAUTION: Special methods are required when passing chimney through a wall or ceiling, refer to local building codes. Do not pass chimney connector through a combustible surface. Do not connect this unit to a chimney flue serving another appliance.

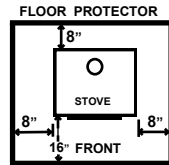
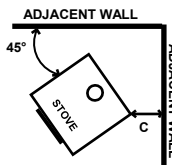
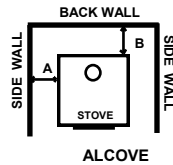
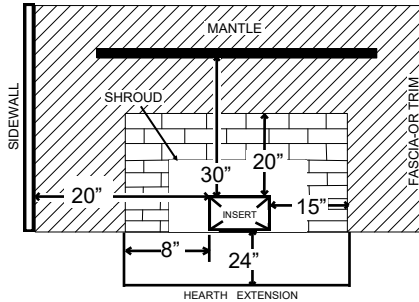
Note: Replace glass only with Part # PG265191GL. Use only a lined masonry chimney.

"Do Not Overfire– If Heater or Chimney Connector Glows, You Are Overfiring."

Install insert with a minimum of 20" clearance to combustible sidewall, 15" to side trim and 20" to top trim, 30" from top of insert to mantel or mantel supports. Floor protector must be 3/8" minimum non-combustible material or equivalent, extending 24" from front opening and 8" to both front side of unit. When used as an insert stove, install only in a masonry fireplace, built to UBC Chapter 37. Not to be installed in a factory-built fireplace. See owners manual for instruction for masonry insert installation. Do not remove brick or mortar from masonry fireplace to accommodate insert. See instruction manual for masonry insert flue connection options.

Remove and clean behind unit frequently, as creosote buildup may occur rapidly. "Inspect and Clean Chimney Frequently-Under Certain Conditions of Use, Creosote Buildup may Occur Rapidly."

Minimum clearances to Combustible Materials (in inches)



For freestanding installation, 3/8" minimum thickness non-combustible floor protection with an insulation R-Value of 1.1. must be used under the appliance, 16" beyond the front of the fuel door and 8" to each side of unit as indicated.

Installation	Clearance	Chimney & Connector	Dimensions		
			A	B	C
Residential	Standard	Note: 1	24	23	16
Residential	Standard	Note: 2	14	14	12

Note 1 : 8" inch diameter, single wall, minimum 24 MSG black or 24 NSG blued steel chimney connector pipe with a masonry chimney.

Note 2 : 8" inch diameter double walled connector pipe with a masonry chimney.

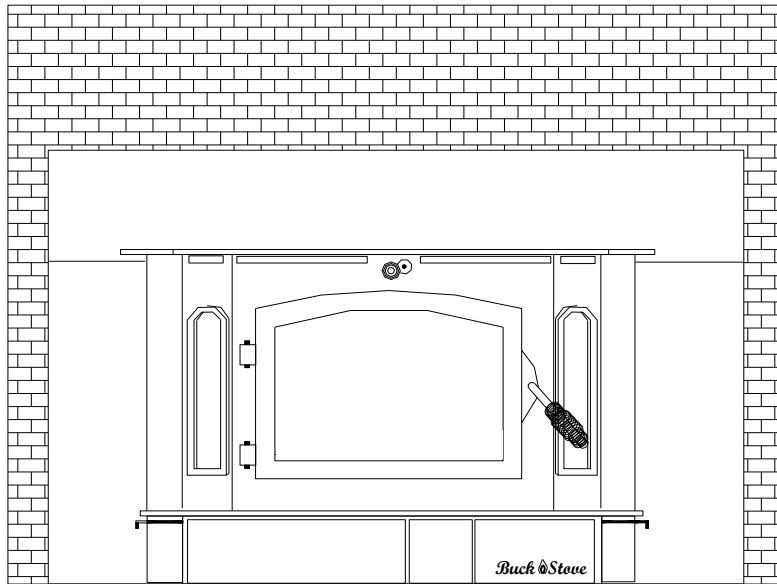
* Horizontal connector not permitted.

DO NOT REMOVE THIS LABEL

CATALYTIC CONNECTOR: Applied Ceramics, Inc., Part No. ACI-22C
The burning of metal foils, coal, plastic and garbage, sulphur and diesel oil will make the catalyst in the converter inactive. The converter is fragile; handle carefully. Neither the performance of the catalytic device nor its durability has been evaluated as part of the certification procedure. #PL91

ADHESIVE LABEL
BLACK LETTERING ON SILVER
MDL. 91 LABEL– ON BACK OF STOVE

MODEL 91 CATALYTIC UNIT



DISCLAIMER ⚠
TRIM KITS, PEDESTALS, LEGS NOT INCLUDED | SOLD SEPARATE

FIREPLACE INSERT & FREESTANDING

FEATURES

PREPARATIONS **INSTALLATION**
OPERATION **MAINTENANCE** **SAFETY**

SAFETY NOTICE ⚠

IF THIS HEATER IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT THE AUTHORITY HAVING JURISDICTION (SUCH AS MUNICIPAL BUILDING DEPARTMENT, FIRE DEPARTMENT, FIRE PREVENTION BUREAU, etc.) CONSULT BEFORE INSTALLATION TO DETERMINE THE NEED TO OBTAIN A PERMIT. KEEP THESE INSTRUCTIONS FOR FUTURE USE.

LISTED BY:  **PFS/TECO, COTTAGE GROVE, WI**
US

MANUFACTURED BY NEW BUCK CORPORATION
200 ETHAN ALLEN DRIVE,
SPRUCE PINE, N.C. 28777
www.buckstove.com

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SECTION I

When installed and operated as specified in these instructions, and as stipulated on operation and installation labels affixed to unit, **The New Buck Corporation** room heater Model 91 is one of the safest and most efficient heating systems available. The unit is designed to burn wood fuel only.

Please read this entire manual before you install and use your new room heater. Failure to follow instructions may result in property damage, bodily injury or even death.

- **NOTE: When burning any unit or appliance that combusts fuel for heat, we highly recommend use of smoke and carbon monoxide detectors in your home.**

Early signs of carbon monoxide poisoning resemble flu, with headaches, dizziness and/or nausea. If you have these signs, heater may not be working properly. Get fresh air at once!

Throughout manual, you will see this  symbol. This indicates areas of importance regarding safety. Please make a special note of these areas.



Warning: PAINT. This product can expose you to chemicals including ethyl benzene, which is known to the state of California to cause Cancer. For more information, go to www.P65Warnings.ca.gov

Install and use only in accordance with manufacturer's installation and operating instructions. Do not connect this unit to a chimney flue serving another appliance. This unit is not designed for installation in a mobile home.

ROOM HEATER FEATURES

Before attempting to install or operate your heater, it is a good idea to familiarize yourself with features and operating controls of unit. (See page 4 for reference).

OPERATING CONTROLS



WARNING: Model 91 was not designed for fire grates.

NOTE: Do not use grate, elevate fire or build wood fire directly on hearth.

1. **Bypass Damper:** The bypass damper control is located in top center of heater front just under top. It is operated by pushing or pulling rod. The damper is fully open when handle is pulled out and fully closed when it is pushed in. The damper must be **OPEN** before door is opened.
2. **Blower Control:** The blower control (Rheostat) is located on side of the unit. The rheostat is used to vary speed of blower. It can be set at any position. It must be turned on to activate automatic thermostat on stove.
3. **Primary Air Controls:** The primary air intake draft controls (4) are located at left and right bottom side of hearth. They are operated by moving handle **out** to open (to allow air into the firebox) or **in** (to control or close off) air into firebox. Shot gun air control, allows air to center of firebox of stove (4a).
4. **Warm Air Outlets:** Provides heat extraction from top of firebox.
5. **Baffles:** Directs air flow around unit for maximum heat transfer.
6. **Air Inlet:** Allows cool air near floor to be circulated through blower and back into warm air chamber of heater.
7. **Door:** Provides an "airtight" feature. The door allows a much higher burning efficiency than can be obtained with an open firebox.
8. **Hearth Extension:** Offers protection from spilled ashes and cinders.
9. **Power Cord:** Provides electrical power to operate blower.
10. **Catalyst:** Enables Unit to burn cleanly and efficiently.
11. **Catalyst Probe:** Probe is located right of the bypass damper rod. It is used to determine (catalyst) temperature.
12. **Automatic/Off/Manual Switch:** Located behind right cover door under hearth. In the "Manual" position, the blower operates continuously. In "Automatic" position, blower is controlled by internal thermostat which reacts to temperature of air between the stove walls. (Not same as the temperature showing on the Catalyst Probe.)

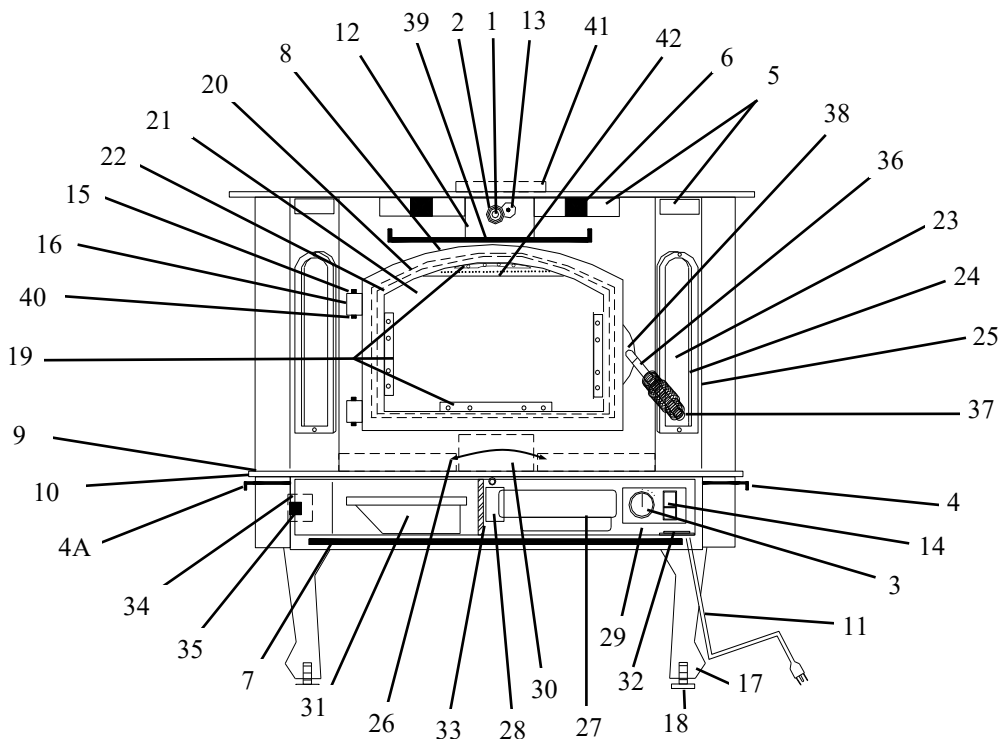
SAFETY STANDARD COMPLIANCE

The Model 91 catalytic solid fuel (wood) burning combination room heater/fireplace stove manufactured by New Buck Corporation complies with UL 1482 for residential freestanding and masonry fireplace insert installations when constructed and installed in accordance with PFS approved documentation.

EPA COMPLIANCE STATUS

This manual describes installation and operation of the **New Buck Corporation Model 91** wood heater. This heater meets the U.S. Environmental Protection Agency's Emission limits for wood heaters sold after May 15th 2020. Under specific test conditions, this heater has been shown to deliver heat at rates ranging from approximately 10,400 to 62,745 BTU/hr for the Model 91. A weighted average was used to calculate the overall efficiency across all of the burn rate categories using the higher heating value (HHV 79.5%).

MODEL 91 WOOD STOVE IDENTIFICATION



- | | |
|--|------------------------------------|
| 1. Bypass Damper | 24. Side Glass Gasket |
| 2. Bypass Damper Spring Handle | 25. Overlays |
| 3. Blower Control (Rheostat) | 26. Firebrick |
| 4. Primary Air Control Air Wash Rod for Both Sides | 27. Motor |
| 4a. Shotgun Air Control | 28. Motor Mount Bracket |
| 5. Warm Air Outlets | 29. Cover Door |
| 6. Baffles (Interior of Stove) | 30. Shotgun Air Box |
| 7. Air Inlet | 31. Ash Pan |
| 8. Door | 32. Disc Thermostat |
| 9. Hearth Extension | 33. Cover Door Hinge |
| 10. Hearth Trim | 34. Magnet Holder |
| 11. Power Cord | 35. Cover Door Magnet |
| 12. Catalyst (Interior Firebox) | 36. Door Handle |
| 13. Catalyst Probe | 37. Spring Handle |
| 14. Automatic / Off / Manual Switch | 38. -Door Latch |
| 15. Brass Cap | -Door Latch Screw |
| 16. Hinge Block | -Door Handle Bushing |
| 17. Quean Ann Legs | -Door Handle Spacer |
| 18. Leveling Screws | -Door Latch Flat Washer |
| 19. Glass Clips/Large; Side, Top, Bottom | -Door Latch Screws (Phillips Head) |
| 20. Door Gasket | -Door Latch Screws (Allan Head) |
| 21. Door Glass | 39. Lower Heat Shield |
| 22. Door Glass Gasket | 40. Hinge Pins |
| 23. Side Glass | 41. 8" Flue Exit |
| | 42. Air Wash Screen |

CATALYST EQUIPPED

"This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed."



Warning: INTERAM GASKET. This product can expose you to chemicals including aluminosilicate, which is known to the state of California to cause Cancer. For more information, go to www.P65Warnings.ca.gov

"Combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustor is not recommended unless more detailed inspection is warranted because of decreased performance. If any of these conditions exists, refer to Catalyst Troubleshooting section of this owner's manual."

CATALYST WARRANTY

The combustor supplied with this heater is a set of (3) (2" x 3-1/2" x 6" x 25" cells). Consult catalytic combustor warranty also supplied with this heater. All warranty claims should be addressed to:

Applied Ceramics
Customer Service Department
P.O. Box 29664
Atlanta, GA 30359
770-448-6888

See enclosed catalyst warranty for instructions. New Buck Corporation does not handle catalyst replacements. Customer can order directly from Applied Ceramics.

**DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.
DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS."**

PROPER FUEL SELECTION

For best results, this heater is designed to burn (dry), natural seasoned hardwood. Higher efficiencies and lower emissions generally result when burning air dried natural seasoned hardwoods, as compared to softwoods or freshly cut hardwoods. Green or freshly cut hardwoods (wood with high moisture content) will not produce the BTU's needed to heat your home. The result will be low temperature reading on the catalyst probe, thus low BTU output.

DO NOT BURN:

- | | | | |
|-----------------|--------------|------------------|----------|
| 1) Treated Wood | 3) Garbage | 5) Solvents | 7) Trash |
| 2) Coal | 4) Cardboard | 6) Colored Paper | |

Burning treated wood, garbage, solvents, colored paper or trash may result in release of toxic fumes and may poison or render the catalytic combustor ineffective.

Burning coal, cardboard or loose paper can produce soot or large flakes of char or fly ash that can coat combustor, causing smoke spillage into room and rendering combustor ineffective. (Not covered under warranty.)

ACHIEVING CATALYTIC LIGHT-OFF

The temperature in stove and gases entering combustor must be raised to between 700° F to 900° F for catalytic activity to be initiated. The temperature can be determined by the Catalyst Monitor Probe. During start up of a cold stove a medium to high firing rate must be maintained for about 15-20 minutes before pushing in the damper. This can be achieved by starting fire with dry kindling, paper and small split wood. Have the Bypass Damper fully open (pulled out). This ensures that the stove, catalyst and fuel are all stabilized at proper operating temperatures. Even though it is possible (and likely) to have gas temperatures reach 600° F within two to three minutes after a fire is started, if the fire is allowed to die down immediately it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning smoke will keep it working.

ACHIEVING CATALYTIC LIGHT-OFF WHEN REFUELING

During refueling and rekindling of a cool fire, or a fire that has burned down to charcoal phase, operate stove at a medium to high firing rate for about 15 minutes to ensure that catalyst reaches approximately 800° F.

CATALYST MONITORING

It is important to periodically monitor operation of catalytic combustor to ensure that it is functioning properly, and to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency and an increase in creosote and emissions. See Troubleshooting section for detailed instructions **BEFORE** attempting to remove catalyst.

This catalytic heater is equipped with means to monitor catalyst operation. Properly functioning combustors typically maintain temperatures in excess of 1000° F. If catalyst temperatures are not in excess of 500° F, refer to Catalyst Troubleshooting section of this owner's manual.



CAUTION AGAINST OVER-FIRING

Do not over-fire this heater.

Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to heater and to catalytic combustor.

ASH REMOVAL



CAUTION: Never remove ashes from heater with blower running. Be sure to turn room air blower off before removing ashes

Whenever ashes build up in firebox and when fire has burned down and cooled, remove excess ashes. Leave an ash bed approximately 1 inch deep on firebox bottom to help maintain a hot charcoal bed. To remove ashes the dump is located at left inner bottom. By lifting dump door, place ashes through the dump opening. The ashes fall directly into ash pan. The ash pan is located at left side under the hearth behind cover door.

NOTE: Be sure to turn room air blower off before removing ashes. Open cover door and slide ash pan out.

NOTE: Fueling and ash removal door (s) must remain closed when in operation.

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on ground, away from all combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled.

NOTE: Be sure to turn room air blower back on when job is completed.

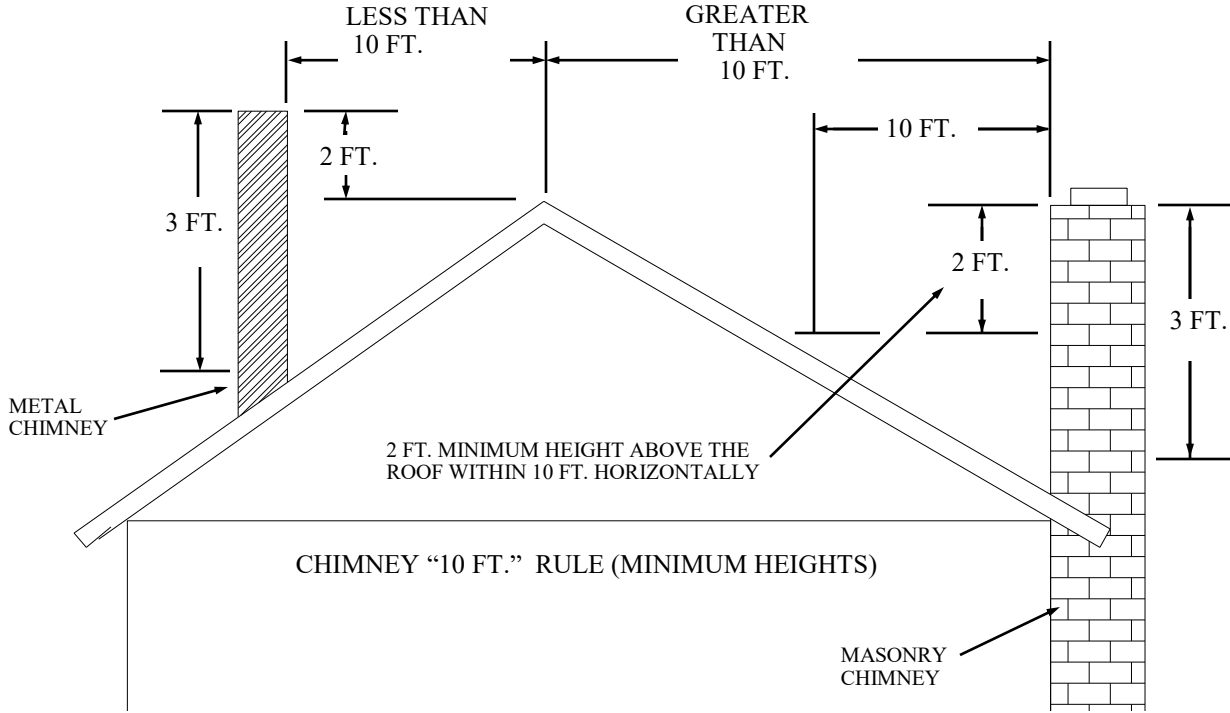
NOTE: The room heater is not to be connected to any air distribution duct.

CREOSOTE - FORMATION AND NEED FOR REMOVAL

When wood is burned slowly, it produces tar and other organic vapor, which combined with expelled moisture forms creosote. The creosote vapors condense in a relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on flue lining. When ignited, this creosote makes an extremely hot fire.

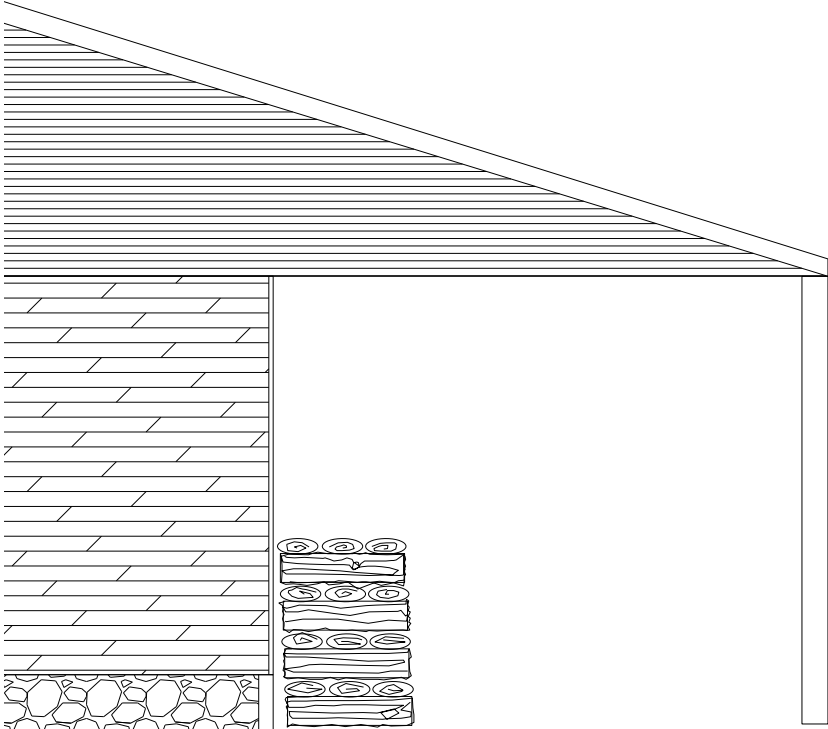
Select an installation location that will give best airflow from front of heater to remainder of home.

CHIMNEY HEIGHTS



NOTE: MINIMUM CHIMNEY HEIGHT 15 FT.

HOW TO STACK WOOD



Stack wood in crisscross pattern under a shelter to allow air flow to dry wood and to keep wood from rain. Green wood may have 50-60% moisture content. Wood seasoned outside uncovered may have 40% moisture content. Wood properly seasoned in a covered environment will have less than 20% moisture content.

SECTION II

MASONRY INSERT INSTALLATION INSTALLATION OPTIONS

This unit may be installed into an all masonry fireplace, built in accordance with Uniform Building Code and National Fire Protection Association (NFPA 211).

NOTE: Check with local building officials for any permits required for installation of this stove and notify your insurance company before proceeding with installation.

New Buck Corporation highly recommends using a chimney liner for this unit to enhance the performance (See Figure 4). Proper installation is critical to the performance of the Model 91.

Use Fireplace Kit PA FP91 for installation. An optional oversized fireplace kit is available for larger fireplaces. Check with dealer.

SAFETY NOTICE

If this appliance is not properly installed, a house fire may result. For your safety, follow the installation directions. Contact local building or fire officials about restrictions and installation inspection requirements in your area.

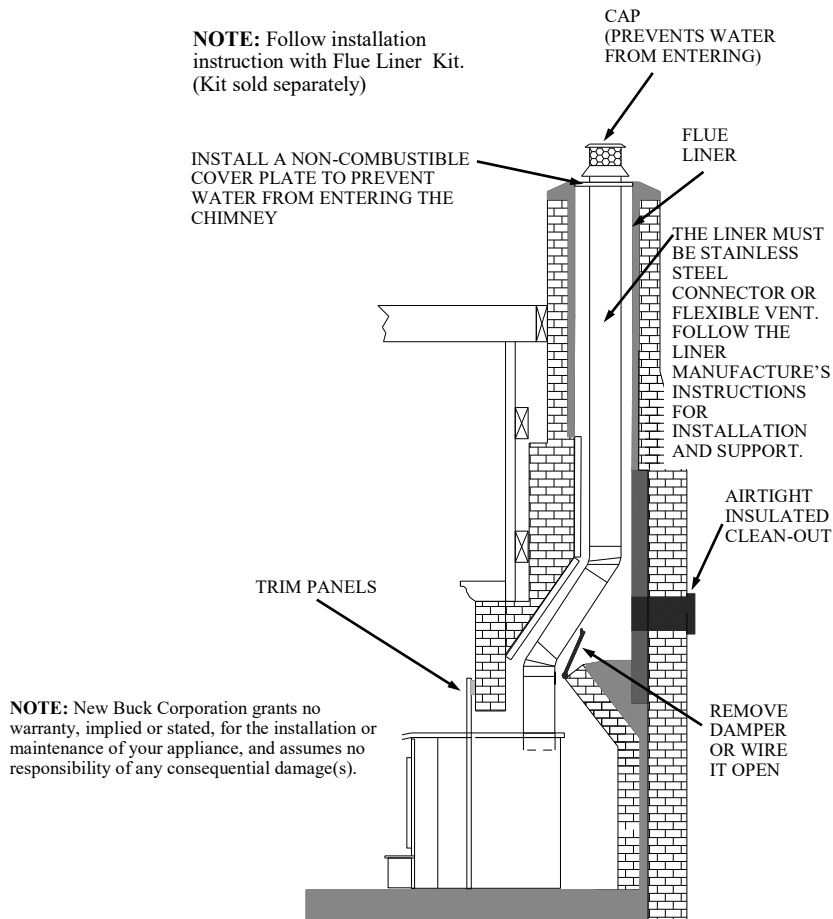


FIGURE 4

INSTALLATION (Fireplace Insert)

Minimum Clearances to Combustible Materials (in inches)

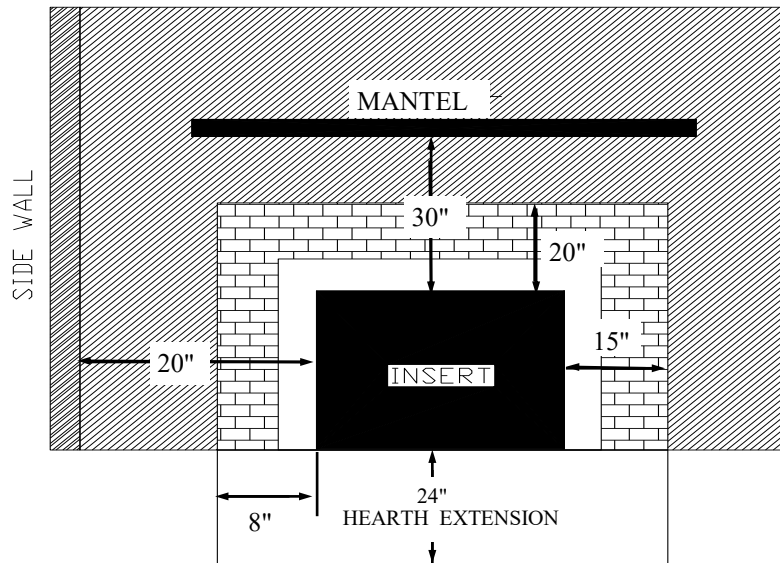


FIGURE 5
FIREPLACE INSERT

MINIMUM CLEARANCES:

The Model 91 Fireplace Insert is intended for installation in accordance with standard for chimneys, fireplaces, vents and solid-fuel burning appliances. **NFPA-211.**

NOTE-This model is not intended for installation into Zero Clearance or pre-fabricated fireplace.

1. The hearth must be of masonry construction and must extend a minimum of 24" in front of firebox opening and a minimum of 8" to either side of firebox opening.
2. If your fireplace has wood trim above it, the wood trim must be at least 20" above top of unit and may be a maximum of 1/2" thick.
3. If your fireplace has a wood mantel above the fireplace, the mantel or mantel supports must be located at a height of 30" above top of the stove.

REQUIRED FIREPLACE DIMENSIONS

Minimum fireplace dimensions:

	Height Min.	Width Min.	Depth Min.
Model 91	23 1/2"	31 3/4"	15 1/2"

POSSIBLE TOOLS NEEDED FOR INSTALLATION

We highly recommend a dealer installing your stove. If you decide to install your own stove, there are several hand tools you may need to do the job. If you do not already have them, they are readily available at most hardware stores.

Caulking gun

Large adjustable wrench (may not be needed)

Drop cloths or newspapers

Vacuum cleaner or whisk broom

Flashlight

1 tube of RTV silicone, Code 103 or 106, or high temperature rubber cement rated between 450° F- 600° F.

7/32" drill bit and drill

Socket/Ratchet Set

INSTALLATION PREPARATION

Fireplace:

1. Locate furniture and other materials away from front of fireplace to allow free access to fireplace.
2. Cover hearth and adjacent floor areas with drop cloths to protect from soiling or marring surface.
3. Remove existing fireplace damper plate.
4. Thoroughly clean the fireplace of ashes and soot.
5. Have your existing chimney inspected before inserting this unit. Some chimneys must be relined or replaced before they are safe to use.
6. Check the chimney and smoke chamber for excessive buildups of creosote or soot. Also, check for obstructions, such as bird's nests. If chimney is excessively dirty, clean it or have someone clean it professionally **BEFORE** installing or using room heater.
7. If fireplace has an ash dump or outside air provision, these must be sealed off with metal or tightly packed non-combustible insulation to prevent cold air from entering fireplace chamber.

Heater:

1. Inspect unit for any obvious physical damage.
2. Check primary air draft controls to ensure that they slide freely.
3. Check operation of damper control to ensure it will open and close properly.
4. Check Manual/Automatic Switch to ensure that motor is working. *Place switch in the "MANUAL" position. (Plug in stove.) You cannot check motor in the "AUTOMATIC" position, unless a heat gun is used to heat internal thermostat.

POSITIONING THE HEATER

When positioning heater, the following conditions **MUST** be met!

1. The front of damper opening must be positioned **BEHIND** back edge of lintel to ensure proper draft. (See Figure 6)
2. The vertical plane of fireplace front must fall **BEHIND** side panels of the unit. (In other words, it is possible to have heater too far in as well as not far enough.)
3. Center the heater in fireplace opening.

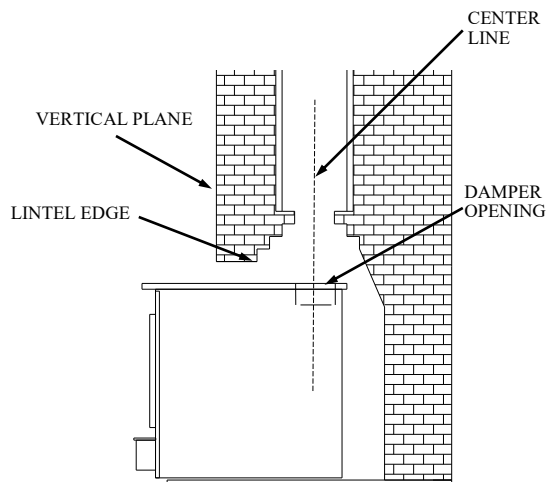


FIGURE 6 POSITIONING

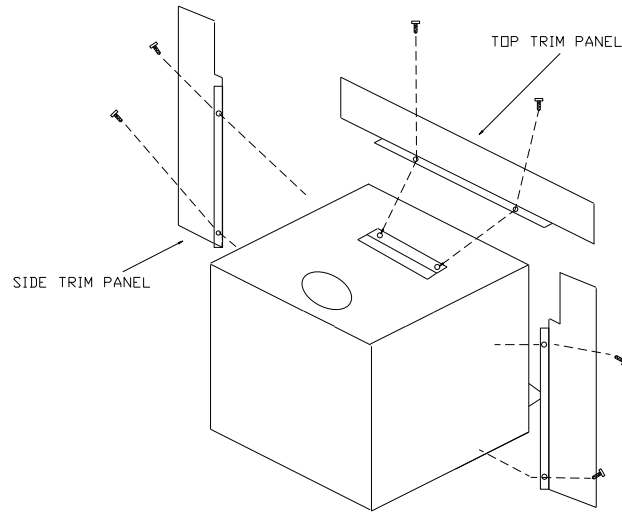


FIGURE 7 MOUNTING TRIM PANELS

MOUNTING TRIM PANELS

After unit is positioned, mark mounting position of trim panels as follows:

1. Place side trim panels directly behind the bay windows where it will be flat against face of fireplace. Mark inside edge of trim panel to make a vertical reference line. (See Figure 7)
2. Place top (long) trim panel on top of unit. The panel should be flat against outside face of fireplace, and standing vertically. Mark lower edge of trim panel with a pencil to make a reference line for mounting.
3. Slide unit out of fireplace far enough to work behind trim panel reference lines.
4. Mount side trim panels. (See Figure 7)
 - a. Position trim panel on reference line.
 - b. Drill mounting holes in center of trim panel mounting brackets to allow for adjustment in and out if necessary.
 - c. Mount trim panel using self-tapping screws provided.
5. Place top panel back on reference mark. Top trim panel mounting bracket is supplied with unit. Position bracket so it overlaps rear lip of top trim panel. Drill mounting holes in top of stove using holes in bracket as guide. Tighten screws.
6. Follow installation procedures in listed flue liner kit you are using and install heater and liner kit in fireplace.

7. Slide unit back into fireplace. Check to be sure that trim panels are properly positioned and lie flat against front of fireplace. If one or more of panels is out of position, slide unit out and reset by loosening mounting screws and repositioning in slot.
8. Reinstall top trim panel by sliding rear lip of top trim panel underneath front lip of mounting bracket.
NOTE: Mount top trim panel so that it sits in front of top of side trim panels..
9. Obtain aluminum trim provided with trim kit panels and slip over top and sides of trim panels. (Top ends of aluminum may need to be trimmed to fit.)
10. Mount top trim panel by drilling mounting holes in center of trim panel mounting bracket, with the top panel overlapping side panels.
11. Using insulation provided, peel and stick to back of panels overlapping fireplace dimensions by 1" on each side and top. (See Figure 8)
12. Using high heat silicone run a heavy bead of caulking where panels meet stove. (See Figure 8)
14. Slide unit back into fireplace. Check to be sure that trim panels are properly positioned and lie flat against front of fireplace. If panels are out of position, slide unit out and reset by loosening mounting screws and repositioning in slot. With bar, lift stove up in front. Place insulation across front and surface of hearth or bottom of fireplace to make complete seal.
15. To check seal of panels, use candle flame and go around entire area sealed by silicone and insulation. If flame leans toward inside of fireplace, add additional insulation. This ensures an airtight seal.

FINAL CHECK

1. Recheck specified clearances.
2. Remove all foreign material from firebox area.
3. Open primary air draft, shotgun air draft and damper bypass, make sure ash drawer is sealed properly.
4. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly.
5. Place 4 or 5 pieces of newspaper in stove. Light paper and close door. Ensure that stove draws properly through primary drafts.
6. Check for smoke leaks around door.
7. Open door (slowly) and check for smoke escaping from front of stove. Smoking usually indicates a defective or poorly positioned chimney. Some chimneys with a marginal draft can be preheated by lighting newspaper and holding it near the open damper with a poker or fire tong. Once chimney heats up, a proper draft can usually be obtained.

NOTE: A poor drafting chimney can lead to poor heater performance. This is not a defect of the heater, but with the chimney. Poor performance due to a poor drafting chimney is **NOT** a warranty problem.

If a thorough review of Troubleshooting Guide does not solve your problem, contact your dealer for assistance. If homeowner installed unit himself, there generally is a charge for dealer to service the stove and inspect installation.

8. The unit is painted with a specially formulated high temperature paint that cures during the first two or three firings. **DO NOT BUILD A LARGE ROARING FIRE UNTIL THIS CURING IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.** (Paint may blister or peel off. This is not covered by warranty.) You may notice a slight smoking effect and an odor of burning paint when you build the first fires. This is normal and is not a cause for alarm. In some cases these fumes will activate a smoke alarm. Opening a window near unit will allow these fumes to escape.

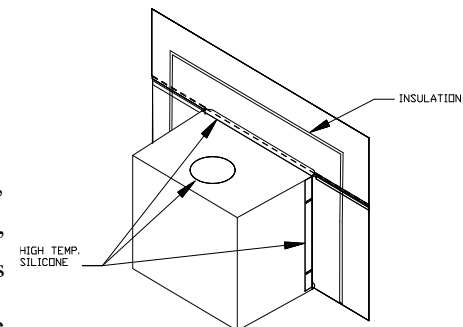
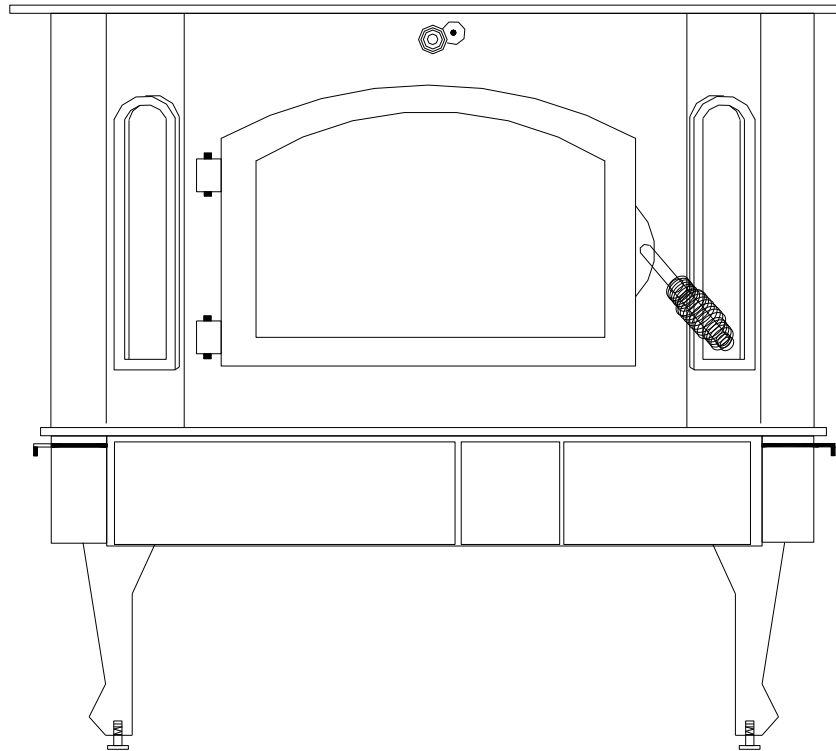


FIGURE 8

SECTION III

RESIDENTIAL FREESTANDING ROOM HEATER INSTALLATION



INSTALL

Select an installation location that will give best airflow from front of heater to remainder of home.

Extensive field and laboratory testing has shown that catalytic stoves perform best as freestanding stoves when vented into a masonry chimney that include the following:

1. A rain cap is installed on the chimney.
2. Height of chimney is at least 15 feet high.
3. Location of chimney is on interior. (Not on an outside wall)

Satisfactory results have been reported with installations other than listed above. However, draft problems are possible if a hot chimney is not maintained.



CAUTION: Do not connect this unit to a chimney flue serving another appliance.

Inspect unit for any obvious physical damage.

Remove any items from within firebox.

Plug power cord into a 115V AC outlet to test motor. Do not run power cord under unit or in high traffic areas.

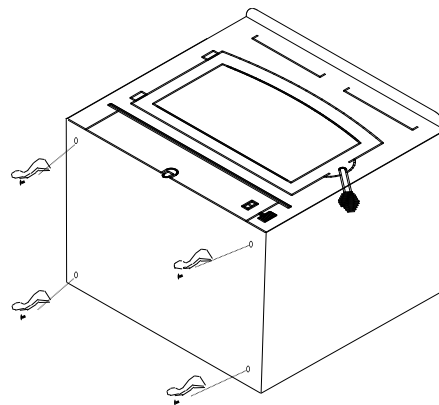
Check primary air and control to ensure that it slides freely.

LEG INSTALLATION

Use Leg Kit # FA FS9151 for Model 91

1. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.
2. Obtain four the legs and attach legs to holes in bottom of unit with bolts and washers provided. (See Figure 9).
3. Reposition heater to upright position.

FIGURE 9

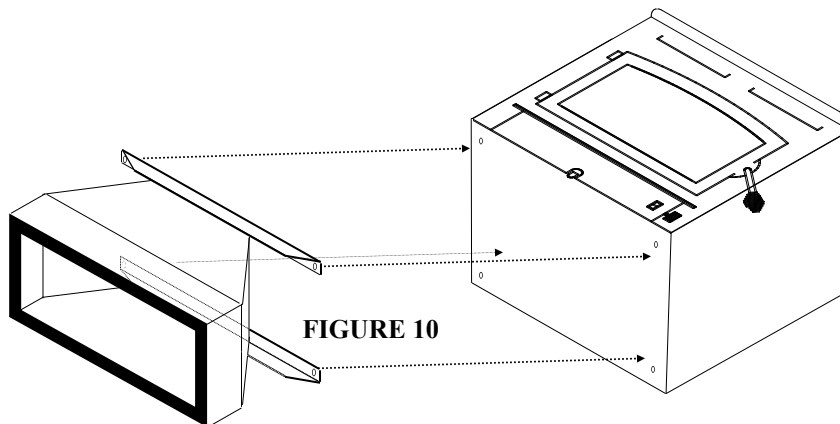


PEDESTAL INSTALLATION

Use Pedestal Kit # FA P4150B for Model 91

1. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.
2. Obtain Pedestal and place pedestal against bottom of heater. Center pedestal from left to right and from front to rear. Mark holes thru pedestal brackets onto bottom of unit. Lay the pedestal aside. Drill four 1/8" holes through marks. Replace pedestal and secure with provided screws. (See Figure 10).
4. Stand heater to upright position. Place heater in the desired location.

FIGURE 10



MINIMUM CLEARANCES

The New Buck Corporation Model 91 must be installed in compliance with instructions contained in this manual.

Clearance from combustibles walls and ceilings. (Using single wall chimney connector)

The minimum lateral distance between any part of room heater and combustibles walls is shown in (Figures 11 and 12).

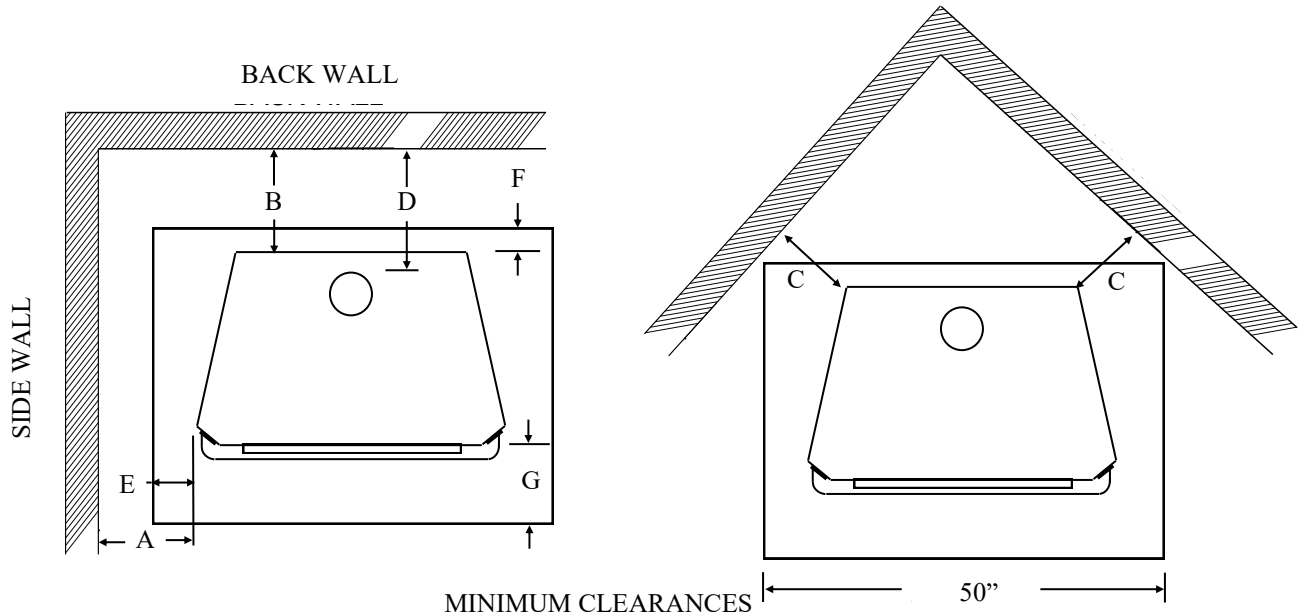


FIGURE 11

MINIMUM CLEARANCES

FIGURE 12

	A	B	C	D	E	F	G
MODEL 91	24"	23"	16"	26"	8"	3"	16"

FLOOR PROTECTION

If a freestanding model is to be installed on a combustibles floor, a non-combustible pad must be placed under unit to protect floor from burning material from the stove. The pad must be 50 inches wide. **NOTE:** The floor must extend 16" from door opening in front of stove, 8" from door opening on each side of unit and should be under the chimney connector.

Floor protector must be 3/8" in minimum thickness, non-combustible material.

NOTE: For clearance reductions using wall protectors, refer to the NFPA-211 Code.

TOOLS FOR INSTALLATION

- Drop Cloth
- Electric Drill with 7/32" drill bit
- 1/2" - 9/16" combination wrench
- 3/8" magnetic socket chuck adapter, 3/8" wrench (box or socket) or adjustable wrench
- Socket Set
- Tape Measure
- Pencil
- Level
- Screw Driver

PREPARING THE STOVE FOR INSTALLATION

1. Inspect unit for any obvious physical damage.
2. Check primary air draft controls to ensure that they operate freely.
3. Check operation of bypass damper control to ensure that it will open and close properly.
4. To attach legs, remove any items within firebox. Spread drop cloth on floor behind heater. Tilt heater so that back is on drop cloth. Attach legs to pre-drilled holes in bottom of heater. If using optional pedestal, mounting holes will need to be drilled.
5. Reposition heater to upright position.
6. Plug power cord into a **115V AC** outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. You cannot check motor when switch is in the “Off” or “Automatic” position, unless a heat gun is used to heat internal thermostat.

CHIMNEY

Ceiling Exits:

Follow chimney and chimney connector manufacturers instructions and local building codes for installation through combustible walls or ceilings. This heater can only be installed freestanding by using one of the following requirements:

- 1) Complying to the requirements for Type HT chimneys in the standard code for Factory-Built Chimneys for Residential Type and Building Heating Appliance, UL 103
- 2) A code approved masonry chimney with a flue liner.

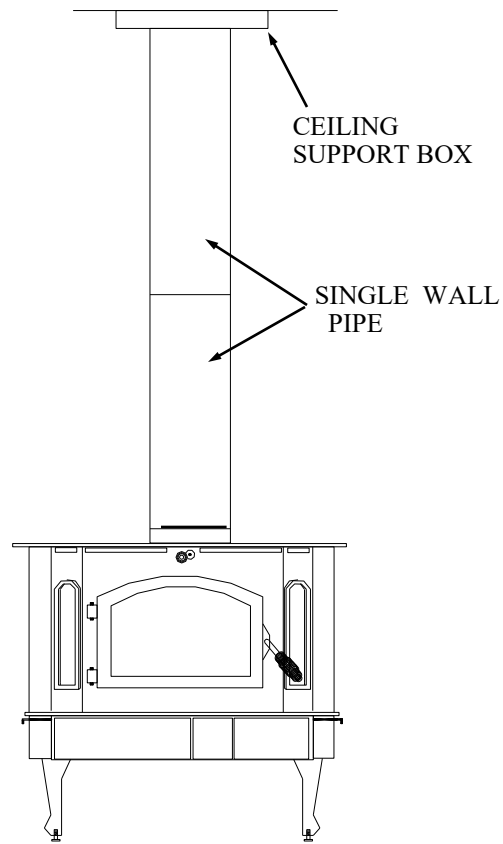


FIGURE 13

DETERMINING CHIMNEY LOCATION

A. Ceiling Exit (Using Single Wall Pipe and UL 103 HT type chimney system)

1. Suspend a plumb bob from ceiling above unit so that weight is hanging in the center of flue exit. (A small weight on a string will serve as a plumb bob.) Mark ceiling where string is suspended to locate center of chimney.
2. After locating the center of the hole, install the ceiling support box, chimney, flashing, and rain cap per the chimney manufacturer’s instructions.
3. Connect stove to ceiling support box by using #24 ga. minimum blued or black steel chimney pipe. (DO NOT use galvanized pipe.) Each section should fit into section below or into opening on stove, for drip-free operation. Secure each section together by using at least three (3) sheet metal screws or rivets. (See Figure 13).

Wall Exit into Metal Tee-Box (Using Single Wall Pipe)

TOOLS FOR INSTALLATION

Drop Cloth
 Electric Drill with 3/32" drill bit
 5/16" combination wrench
 5/16" magnetic socket chuck adapter,
 5/16" wrench (box or socket) or adjustable wrench
 Pencil Socket Set
 Level Tape Measure
 Screw Driver

1. Mark plumb line on the wall directly behind the center of heater. (See Figure 14.)
NOTE: When using #24 ga. min. steel pipe, maintain 18" between pipe and ceiling.
2. Place vertical portion of heater pipe and elbow in position and project a point onto plumb line level with center of elbow.
3. Measure so there will be at least 1/4" rise per foot of horizontal connector pipe, maintaining clearances to ceiling as noted in Figure 14. This will give you the center of the hole for chimney penetration.
4. After locating center of penetration, install tee-box and chimney as per chimney manufacturer's specifications.
5. Connect chimney pipe to tee-box using #24 ga. minimum black steel pipe. (DO NOT use galvanized pipe.) Each section should fit into section below or into opening on stove, for drip-free operation. Secure each section together by using at least three (3) sheet metal screws or rivets.

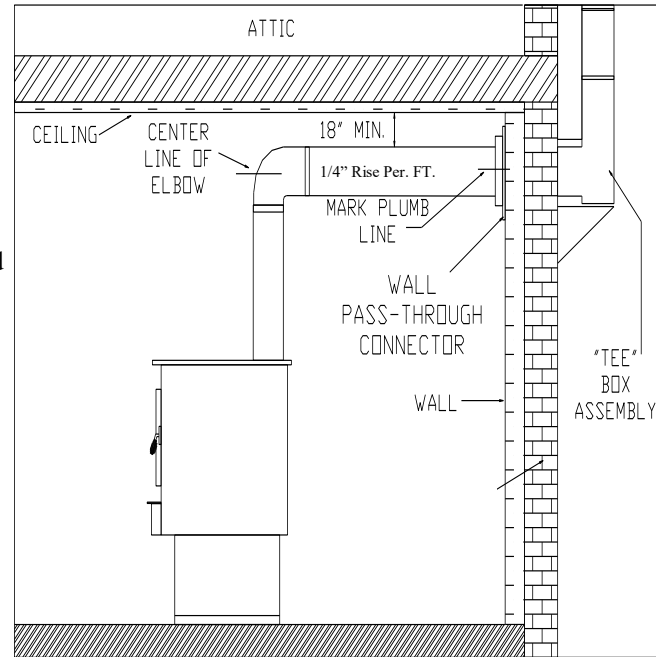


FIGURE 14

Wall Exit Into Masonry (Using Single Wall Pipe)

1. Before connecting Model 91 to a masonry chimney, determine if masonry fire-place wall pass-through connector thimble meets **NFPA-211** Code and local building codes and is a minimum of 18" from ceiling. See Figure 15. If connector thimble does not meet these codes, the pass-through connector must be modified.

Connectors may pass through walls or partitions constructed of combustible material if connector is:

- (a) Either listed for wall pass-through or is routed through a device listed for wall pass-through and is installed in accordance with conditions of listing.
- (b) Selected or fabricated in accordance with conditions and clearances as stated in **NFPA 211**-Code. Any unexposed metal that is used as part of a wall pass-through system and is exposed to flue gases shall be constructed of stainless steel or other equivalent material that will resist corrosion, softening, or cracking from flue gases at temperatures up to 1800° F.

In addition, a connector to a masonry chimney shall extend through wall to the inner face or liner but not beyond, and shall be firmly cemented to masonry.

EXCEPTION: A thimble may be used to facilitate removal of chimney connector for cleaning, in which case thimble shall be permanently cemented in place with high temperature cement.

2. Once through-the-wall thimble codes are met, simply connect chimney pipe to the wall pass-through connector using #24 ga. minimum black steel pipe as follows:
 - (a) Maintain 1/4" rise per foot (horizontal length) from the appliance to chimney.
 - (b) Each section of pipe should fit into section below or into opening on the stove for drip-free operation.
 - (c) Secure each section to each other using at least three (3) sheet metal screws or rivets.

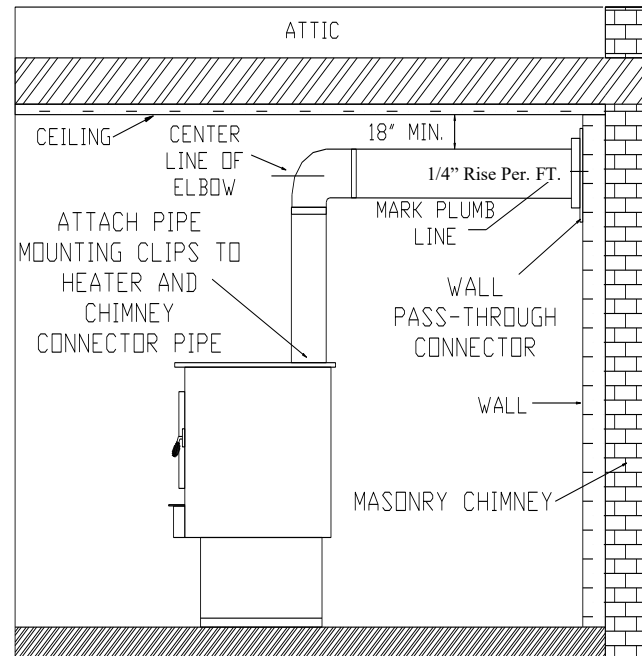


FIGURE 15

CLOSE CLEARANCE INSTALLATIONS (in inches)

Close clearance installation is possible by using 2100° double-wall chimney pipe. (See Figure 16 and Figure 17 for clearances.)

Clearance from combustible walls and ceilings.

(Using double wall chimney connector)

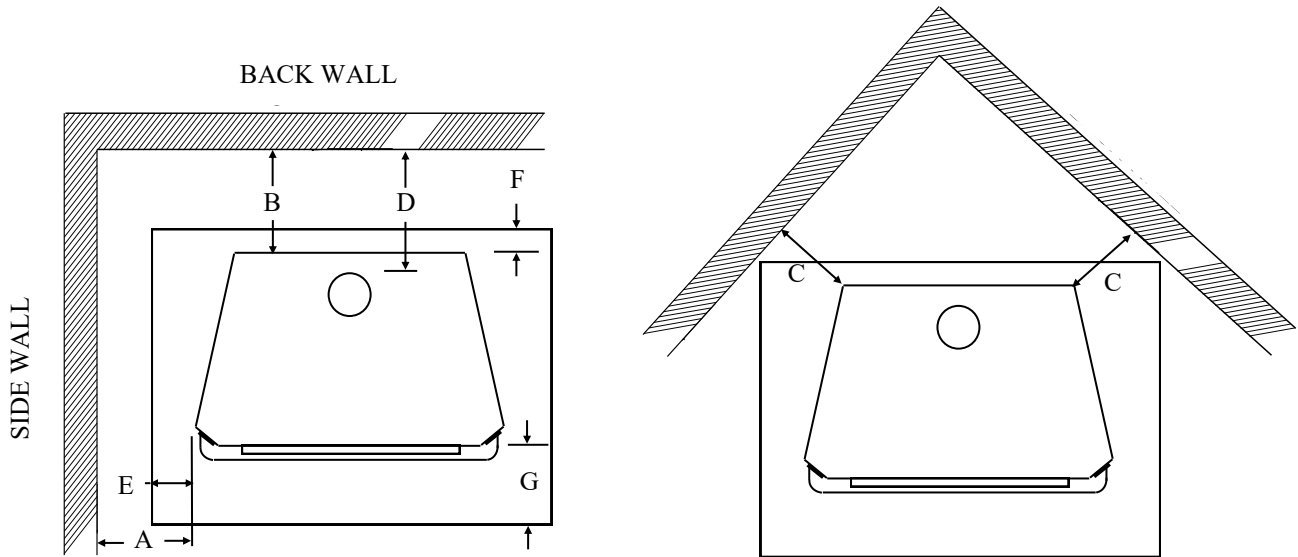


FIGURE 16

MINIMUM CLEARANCES

FIGURE 17

	A	B	C	D	E	F	G
MODEL 91	14"	14"	12"	16"	8"	8"	16"

FLOOR PROTECTION

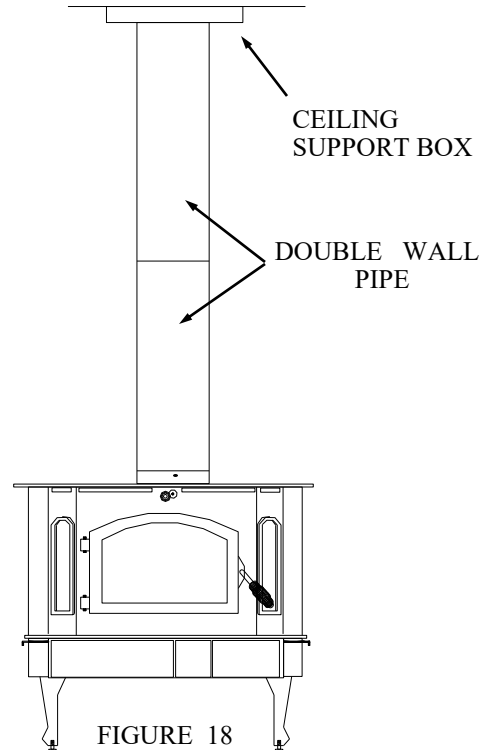
If a freestanding model is to be installed on a combustible floor, a non-combustible pad must be placed under unit to protect floor from burning material from the stove. The pad must be 50 inches wide. **NOTE:** The floor must extend 16" from door opening in front of stove, 8" from door opening on each side of unit and should be under the chimney connector.

Floor protector must be 3/8" in minimum thickness, non-combustible material.

Ceiling Exit - Close Clearance

1. Suspend a plumb bob from ceiling above unit so that weight is hanging in the center of flue exit. (A small weight on a string will serve as a plumb bob.) Mark ceiling where string is suspended to locate center of chimney hole.
2. After locating center of hole, install ceiling support box, chimney, flashing and rain cap.
3. Install Double Wall Connector and chimney system per manufacturer's written operating instructions. See manufacturer's list of tested pipes. See example of installation Figure 21.

CAUTION: Because of the high efficiency and low flue gas temperature, freestanding catalytic heaters connected to masonry chimneys with oversized flue liners may encounter drafting problems. A flue liner is recommended to help draft. A poor drafting chimney may result in poor performance from Model 91. This is not a defect of the Model 91 but a defect in the chimney. This is not a warranty problem with the Model 91. Contact dealer for possible solutions for chimney.



Example: The rear clearance for the Model 91 from page 19 is 14" (Letter B) (See Figure 16) This clearance may be reduced by 50% to 9" by using either of the wall protection devices mentioned below in Figure 19.

ALTERNATIVES FOR WALL PROTECTION

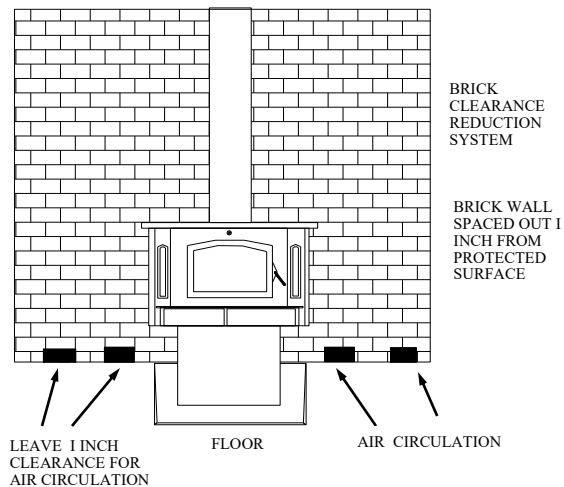
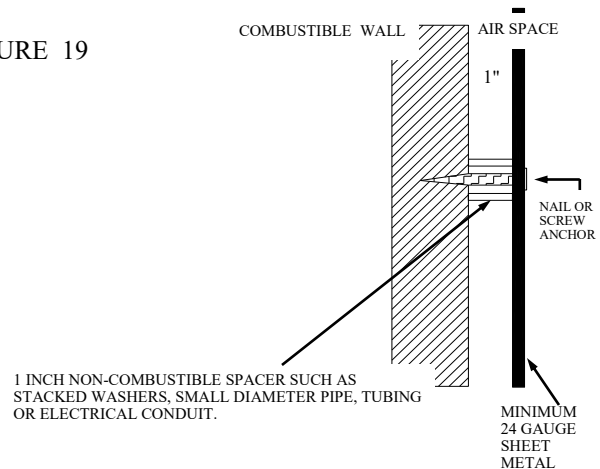
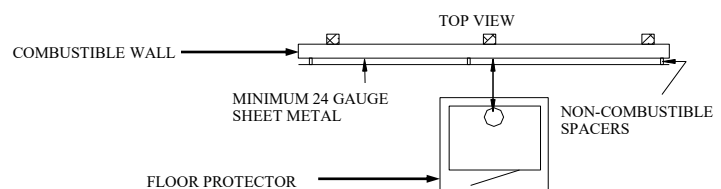
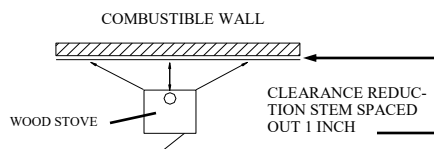


FIGURE 19



BRICK WALLS MAY BE ATTACHED TO COMBUSTIBLE WALLS USING WALL TIES IF BRICK IS USED. BE SURE FLOOR CAN WITHSTAND WEIGHT OF BRICK.

DO NOT USE FASTENERS DIRECTLY BEHIND CHIMNEY CONNECTOR OR STOVE.



Tested and Listed Wall Protector

Clearances to combustibles may be reduced if a tested and listed wall protector is installed over a combustible surface when the following conditions exist:

1. A dead air space of 1" separates listed and tested wall protector from combustible surface.
2. The tested and listed wall protector extends from floor to ceiling with a 1" clearance for air circulation at both floor and ceiling.
3. The 1" spacers (preferably ceramic rather than metal) must be located at corners rather than behind heater or chimney connector.

Unlisted and Untested Wall Protector

Wall protectors may be constructed of masonry, 24 gauge or thicker sheet metal, or non-combustible 1/2" thick insulation board. Conditions 2 and 3 above must be observed but, the air space in condition 1 must be increased to 1 1/2".

FINAL CHECK

1. Recheck specified clearances.
2. Remove all foreign material from firebox area.
3. Open primary air draft; shot-gun air draft, and damper bypass. Make sure ash drawer is sealed properly.
4. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly.
5. Place 4 or 5 pieces of newspaper in stove. Light paper and close door. Ensure that stove draws properly through primary drafts.
6. Check for smoke leaks around door.
7. Open door (slowly) and check for smoke escaping from front of stove. Smoking usually indicates a defective or poorly positioned chimney. Some chimneys with a marginal draft can be preheated by lighting newspaper and holding it near open damper with a poker or fire tong. Once chimney heats up, a proper draft can usually be obtained.

NOTE: A poor drafting chimney can lead to poor heater performance. This is not a defect of heater, but with the chimney. Poor performance due to a poor drafting chimney is **NOT** a warranty problem.

If a thorough review of Troubleshooting Guide does not solve your problem, contact your dealer for assistance. If homeowner installed unit himself, there generally is a charge for dealer to service stove and inspect installation.

8. The unit is painted with a specially formulated high temperature paint that cures during the first two or three firings. **DO NOT BUILD A LARGE ROARING FIRE UNTIL THIS CURING IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.** (Paint may blister or peel off. This is not covered by warranty.) You may notice a slight smoking effect and an odor of burning paint when you build the first fires. This is normal and is not a cause for alarm. In some cases these fumes will activate a smoke alarm. Opening a window near unit will allow these fumes to escape.

SECTION IV

WOOD HEATER SAFETY


Certain safety hazards are inherent in any wood heater installation. You should be aware of these so that a safe and proper installation can be made.

1. **FAULTY CHIMNEY:** An older masonry chimney should be thoroughly checked to be sure there are no holes or weak spots which could allow sparks or hot gases to escape. If any of these are present, a positive liner should be installed before heater is installed.
2. **HEAT CONDUCTION:** Placing combustible materials too close to a heater or chimney can be a fire hazard.

By keeping these particular hazards in mind as you install and use your room heater you can ensure a safe, reliable installation.

NOTE: Correctly place monitors in those areas that are expected to produce CO. Consult with your local fire safety officials to learn more.


The connector and/or chimney should be inspected at least once a year before heating season to determine if a creosote buildup has occurred. Any buildup of soot should be removed to prevent risk of a chimney fire. To remove chimney or chimney connector, remove screws and/or fasteners. Remove pipe and clean with a steel wire brush. Replace chimney or chimney connector and replace screws and/or fasteners.

 **CAUTION: NEVER** use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid or similar liquids to start or “freshen up” a fire in the heater. Keep all such liquids well away from the stove when it is in use. All fluids of this type give off volatile fumes and can **WILL EXPLODE!!** Don’t take a chance with the safety of your home and family.

WARNING: Hot while in operation. Keep children, clothing and furniture away from stove. Contact may cause skin burns.

HELPFUL HINTS

CURING THE PAINT ON YOUR HEATER: During the first several firings, burn small fires to cure paint and to prevent damage to the finish. It is a good idea to flip the toggle switch to “Manual” position during these first firings so the blower will run continuously. This will allow paint to cure at a slower rate and creates a better overall finish.

 **CAUTION:** Never remove ashes from your heater with the blower running.

TIPS ON FIRE BURNING

GREEN WOOD vs. NATURAL SEASONED HARD WOOD-Green wood has a high moisture content and therefore requires a hotter ignition temperature. Seasoned wood- cut at least one year before use allows for a quicker, prolonged burn and more complete combustion.

SPLIT WOOD vs. ROUND WOOD- Split wood burns easier and more rapidly, whether it’s seasoned or green. If used after starting a fire, it should be packed tightly to achieve a longer burn.

Round wood burns longer, but requires more effort to start. Inserting a round piece over a bed of red coals with damper and drafts open will help it catch fire. Round wood should be used to accomplish an all-night burn.

SECTION V

OPERATION

This section of the manual is to help you get maximum efficiency and maximum smoke (particulate) reduction from your Model 91 heater. If you should experience any difficulty or have questions concerning your heater, contact your Model 91 dealer for assistance.

1. To maximize the efficiency of your wood stove make sure it is sized properly for the space you plan to heat. Consult with your dealer for sizing your stove correctly.
2. Use dry, seasoned wood only. Using wet wood will greatly reduce your efficiency.
3. Consult with your installer/dealer to correctly place the stove in your home. An incorrectly placed stove can greatly reduce efficiency. Maximizing the efficiency of your stove will heat your house quickly, burn cleaner and use less wood.

Dry your split wood and stacked crisscross to allow for proper seasoning for 6-12 months (See Page 7 Bottom Picture) when ready to burn place the wood from front to back position in heater.

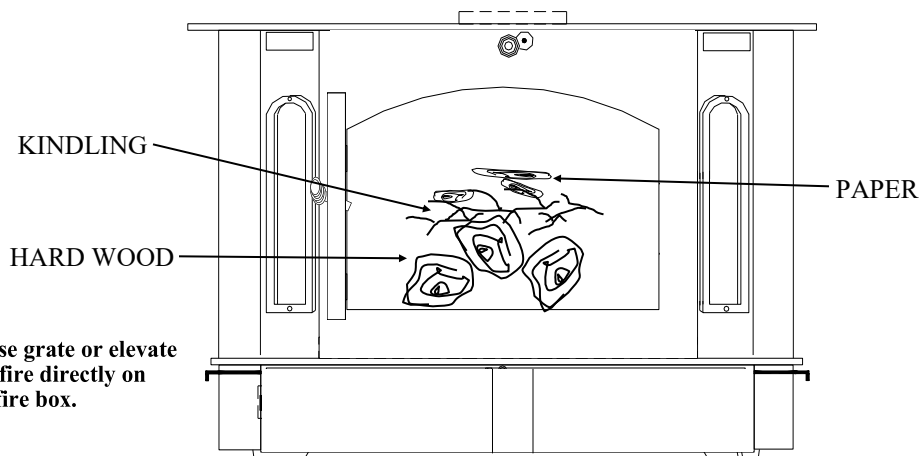
"This wood heater has a manufacturer set closed burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instruction in this manual."

NOTE: Following all suggested operating and maintenance procedures will help minimize visual emissions.

GUIDE TO THE DIFFERENT BURNING QUALITIES OF WOOD

Type of Wood	Ease of Starting	Coaling Qualities	Amount of Sparks
Apple	Poor	Excellent	Few
Ash	Fair	Good	Few
Beech	Poor	Good	Few
Birch	Good	Excellent	Moderate
Cherry	Poor	Excellent	Few
Cedar	Excellent	Poor	Many
Elm	Fair	Good	Very Few
Hemlock	Good	Low	Many
Hickory	Fair	Excellent	Moderate
Locust	Poor	Excellent	Very Few
Maple	Poor	Excellent	Few
Oak	Poor	Excellent	Few
Pine	Excellent	Poor	Moderate

The National Audubon Society recently charted the heat produced by a wood fire. They noted that heat produced by a wood fire varies greatly with kind of wood burned. Beech is considered best wood for a fire. A cord of well-seasoned Beech will produce as much heat as 169 gallons of fuel oil; Sugar Maple and Red Oak produce as much heat as 166 gallons of fuel oil; followed by White Ash 154; American Elm 130; White Birch 124; and White Pine 94.



NOTE: Do not use grate or elevate fire. Build wood fire directly on inner bottom of fire box.

BUILDING A FIRE:

1. Place "Manual/Off/Automatic" switch in "Automatic" (bottom) position for thermostat control operation. Turn rheostat knob clockwise (it will click from "Off" position to "On") so you can vary the speed of motor.
2. Open door.
3. While looking inside firebox, operate damper bypass plate in and out observing movement. This should operate freely and close completely. Open damper bypass. (Pull Out)
4. Open air controls on each side of stove (Pull Out).

The Model 91 is not designed for use with grates and irons or other methods of supporting the fuel.

NOTE: Do not use grate or elevate fire. Build wood fire directly on the firebrick of fire box.

DO NOT BUILD A LARGE ROARING FIRE! **Initially**, build 2-3 small fires in order to cure the paint on your stove.

5. Load heater with 2 or 3 pieces of (naturally seasoned hard wood), 2"-3" in diameter **placing it on floor of firebox from front to rear.**
6. Place kindling on top of dried hard wood.
7. Twist 4 or 5 pieces of non-colored newspaper in a roll and place on top of dry kindling.
8. Light newspaper, leave the door open around 2" inches for 1 1/2 to 2 1/2 minutes: Don't leave fire unattended with the door open! Shut the door.
9. After 15 to 20 minutes, close the by-pass damper completely (PUSH IN).
10. After embers and a coal bed have been established, load heater with natural seasoned hard wood, **placing it from front to rear.**
11. Remember on a new stove **DO NOT FILL** firebox during your first 2 to 3 fires! Build 2-3 small fires in order to cure the paint on your stove.

NOTE: THE FUELING DOOR MUST REMAIN CLOSED DURING OPERATION.

NOTE: Your stove is equipped with a automatic thermostat. When the stove gets hot enough, the thermostat will activate the room air blower. Set fan speed according to desired heat output.

NOTE: When refueling or removing ashes turn "OFF" room air blower. Be sure to turn room air blower back on when finished.

NOTE: Do not run power cord underneath heater, or in walk way or heavy traffic areas.

BURN RATES:

- A. **Closed Burn Rate:** Set both air controls on the left and right sides of the stove all the way to the closed position. There is a stop to keep from allowing the primary air to fully close, it 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 instruction in this manual. This burn rate is most desired and most efficient, but can only be achieved after a fire has been established and burning on its own. Close the bypass damper (push in).
 - B. **Low Burn Rate:** Pull right air control out to low which will leave the air opening underneath about 7/16". Leave the left air control pushed in at closed. Set rheostat for fan control between low to medium speed. Close the bypass damper (push in).
 - B. **Medium Burn Rate:** Pull right air control out and set it on med which will leave opening about 11/16". Leave the left air control pushed in at closed. Close bypass damper (push in). Set the rheostat for fan control halfway between low and high.
 - C. **High Burn Rate:** Set both air controls wide open. Have damper closed (push in). Set rheostat for fan control all way on high.
 - D. **Wood Loading:** During refueling, open (pull out) bypass damper to allow smoke in the firebox to escape - wait a few seconds. Open fuel door, if there happens to be any raw pieces left over place them in the rear East/West direction. Slowly add wood North/South direction, front to back . The door should be open less than one minute, close door and bypass damper. Open primary air control wide open for 5-10 minutes to charge wood, making sure the stove is burning clean and the catalyst is above 900° Fahrenheit before shutting down the burn setting.
- ◆ After most of wood has burned and if you are not planning on reloading immediately, it may be necessary to open damper bypass, then door, and rake wood and coals into a pile near front center of firebox. (Be certain wood chunks are pulled out of rear corners.) Close door and damper bypass. This step will assure continued combustion and thorough burning of wood.

You will have to experiment with fire rate until you find the particular setting for heating your home. Chimney drafts, tightness of house, doors, windows, insulation in house and atmospheric conditions all influence which setting you must have, so it may take several firings to learn setting necessary for your installation. Heating capacity is based on BTU output and conditions listed above. These conditions will affect heating capability of your heater.

Although catalytic stoves decrease ash residue, routine removal of excess ash is still necessary.

SECTION VI

PREVENTIVE MAINTENANCE / REPLACEMENT PARTS

THE CATALYSTS



Warning: This product can expose you to chemicals including aluminosilicate. Which is known to the state of California to cause Cancer. For more information, go to www.P65Warning.ca.gov

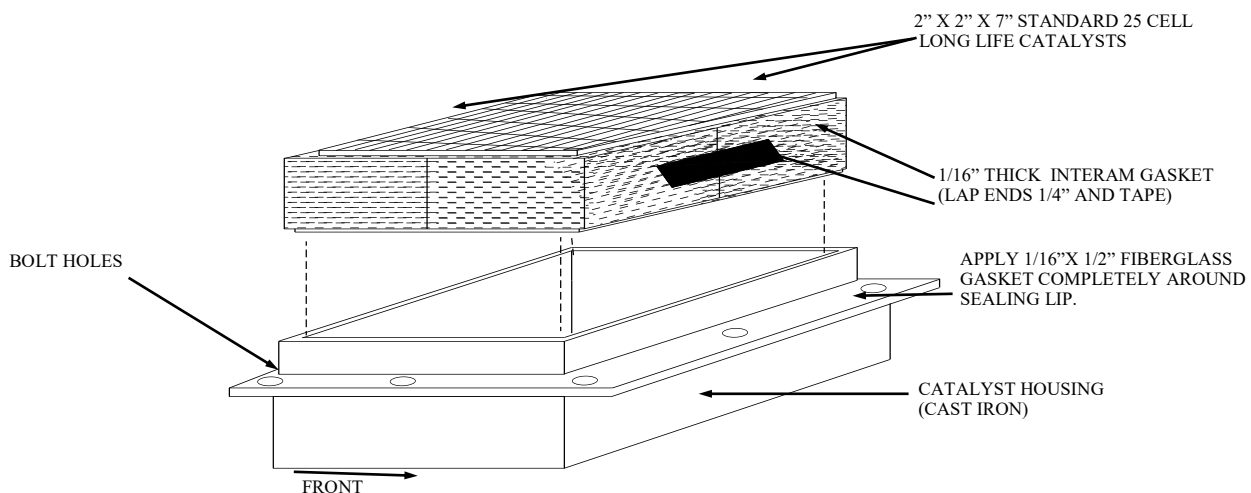
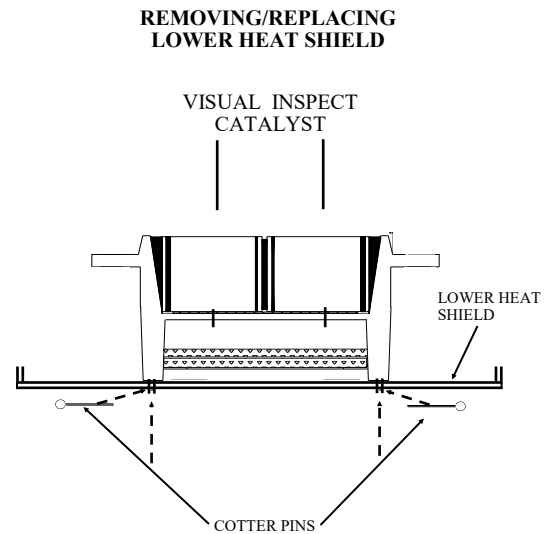
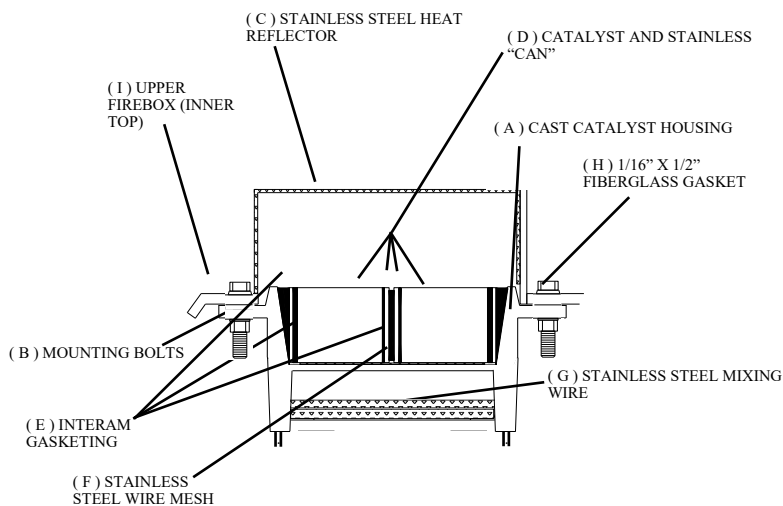
The catalysts in your stove are designed for many years of use. If after several years of use, the efficiency of stove decreases or if a notable amount of smoke is observed, catalysts may need to be replaced. See Catalyst Warranty prior to replacement. The following points are some general guidelines from catalyst manufacturer.

1. Do not “hot fire” stove. For many years retailers and installers have advised customers to build an extra hot fire to burn creosote deposits in fire system. This advice may be acceptable for non-cat stoves, but can be death to a catalyst. Why? Because the catalyst is reducing the particulate, or creosote buildup, therefore need to “hot fire” is eliminated. Proper chimney cleaning procedure should be followed.
2. Direct Flame contact is death to a catalyst. A catalyst burns by-products in the smoke. The gases such as CO, HC, and O² ignite with each other in a chemical reaction in presence of the catalyst (while passing through the honeycomb configuration). Direct flame inhibits this reaction by changing chemical make-up of catalyst breaking down substrate or ceramic. This problem is called **flame impingement**. Today’s modern stoves are designed so that flame impingement is unlikely. However, a strong, fast draft can pull flame into catalyst. Or, a hot fire, with all air controls and/or the ash door open can literally torch the catalyst. The remedy for hot fire related flame is to advise customers not to “hot fire” the stove. The customer will enjoy their catalysts longer and with better performance if these guidelines are followed. Fly ash problems also can be reduced by controlling draft.
3. The **“Glow” Misconception**: A catalyst can glow during certain stages of combustion. The determination that a catalyst is not working simply because it does not glow is inaccurate. During low burn cycle, when catalyst is doing the bulk of its work, it usually does not glow. Also, extremely dry wood (oak, ash, etc.) can burn clean enough not to produce a glow in converter. In most new stoves, you cannot see the catalyst.
4. **Light Off Temperature**: CO conversion in the Applied Ceramics catalyst begins at a very low temperature. Usually, a normal start up to produce a coal bed will produce more than sufficient temperatures to begin catalytic combustion.
5. The catalyst is not consumed or “used up”. The nature of a catalytic reaction is defined as follows, by the American Heritage Dictionary, Second College Edition: catalyst “1. Chem. A substance, usually present in small amounts relative to reactants, that modifies and especially increases rate of a chemical reaction without being consumed in process.” This means your catalyst is always there. This also means that gases that would normally go out flue system and pollute the environment are being burned to create more heat from less wood.
6. Why does a catalyst stop working? Most catalyst that are returned are either destroyed by flame impingement, broken due to accidents or mishandling or have nothing wrong with them but fly ash build-up. A catalyst can be “saturated” with by-products of wood burning such as potassium. This is chemical saturation. The prohibitive chemical will fill in the chemical “holes” that gases normally use for reaction. This process of saturation can be slowed by regular maintenance of catalyst. Saturation can take several years since there are units in use for over five years. Burning garbage, painted woods or large amounts of colored paper can poison your unit. Poisoning, however, is very difficult to do. Burning colored paper causes more of a fly ash problem than a risk of poisoning. **NEVER BURN RUBBER OR PLASTIC.**
7. Burn only dried natural seasoned hard wood. Wood should be dried for at least 12 months prior to burning. The wood should be FREE of any moisture such as RAIN or SNOW. Wet wood creates water vapor which can drop the temperature of catalyst. The results can be plugging, clogging and thermal shock to catalyst. When a catalyst has ceased to be effective, you will notice increased fuel usage and your chimney sweep will notice increased creosote in your system. Before you replace unit, review this section. If you find that your catalyst should be replaced, follow instructions for warranty replacement that were provided when your unit was purchased.
8. Cleaning catalyst with plain water can reduce build-up of catalyst-retarding chemicals. Nothing but a soft brush, low pressure air or plain water should be used to clean a catalyst. The ceramic unit is fragile in comparison to rest of the stove, so it should be handled with care. A soak in warm or hot (not boiling) water for 20 minutes is ideal. Then, allow unit to cool at room temperature and rinse under medium pressure under a faucet. Allow unit to thoroughly dry before reinstalling it or you will damage it. Finally, reinstall unit. A cleaning once every year is sufficient for most users. Clean it when you have your flue system cleaned.

MAINTENANCE

CATALYST REPLACEMENT (Off-Season Replacement Recommended)

1. Spread a drop cloth in front of stove.
2. Open door and clean out any ash.
3. You will have to remove lower stainless steel heat shield. Remove the four cotter pins holding shield in place. Lay shield aside.
4. Using penetrating oil, generously lubricate eight (8) bolt threads holding catalyst housing in place. Allow oil to penetrate.
5. **(A)**. Using a 9/16" wrench or 9/16" socket, loosen eight (8) nuts and remove catalyst housing (drop down) and place in a suitable work area. **(B)**. Nuts holding catalyst are brass. If they strip you will have to order them from dealer. **NOTE: DO NOT REPLACE WITH METAL NUTS.**
6. Using needle nose pliers, grasp front edge of stainless steel "can" which houses catalytic element and pull upward. Reposition pliers to another position and pull upward. Repeat procedure until catalyst can be removed from housing.
7. Using a small putty knife or scraper, remove any gasket that may have adhered to catalyst housing.
8. Now, obtain new catalysts #PO910115C and wrap stainless steel "can" with interam gasket and tape ends together using scotch tape or masking tape. **IMPORTANT: BEFORE STARTING TO REPLACE CATALYST, contact your dealer and order INTERAM gasket and CATALYST HOUSING Gasket.** Gaskets not covered under warranty. It may take your dealer several days to receive the gaskets.
9. Insert new catalysts into catalytic housing and push down until they are seated on the top of stainless steel wire mesh supports.
10. Reinstall catalyst housing into stove and secure in place with brass nuts.
11. Reinstall lower heat shield with cotter pins.
12. The stove is now ready for use.



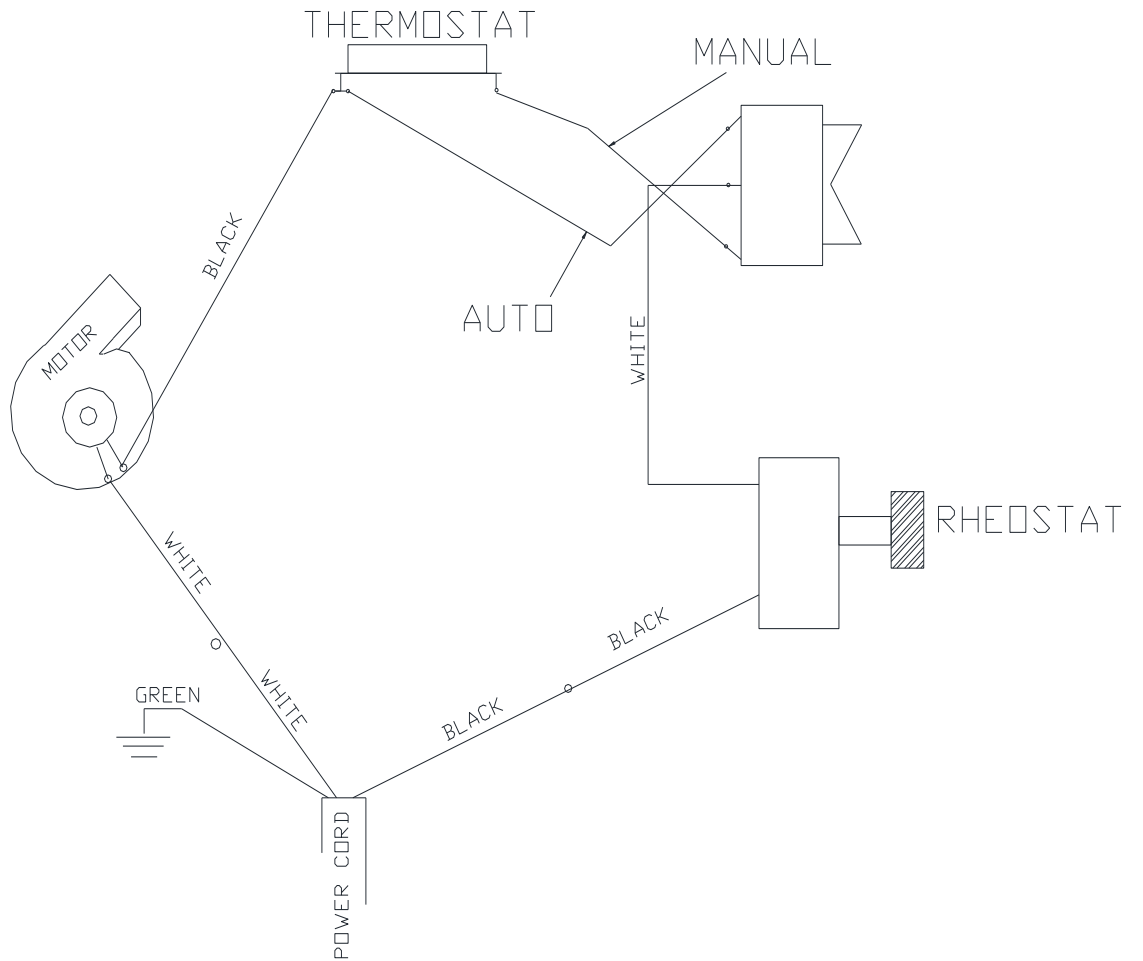
MAINTENANCE

MOTOR ASSEMBLY REPLACEMENT

(Motor, Thermostat, Rheostat, Wiring Harness)

1. Unplug heater from 115V AC outlet.
2. To replace motor you must first take the bottom cover door off. Do this by removing two screws holding it in place with a 5/16" socket, or a nut driver on a drill.
3. Next, looking to the right of the ash pan, you will find a wire screen protecting you from electrical components of this unit. There are two screws on left side of screen that hold wire screen in place. Remove two screws holding wire screen and motor assembly to vertical bar.
4. Take off the control knob and nut from the rheostat that is hooked through the wire screen. Mark and unplug wires from rheostat. Mark and unplug wires from switch. Lay wire screen aside.
5. To remove motor, mark and unhook wire servicing motor. You may remove thermostat to make it easier to work in area. Gently slide motor out and while pulling it out move the back of the motor facing you from right to left in a clockwise motion.
6. Place new motor over old motor and locate motor bracket in the same location as was on the old motor and mark holes on new motor. Remove motor bracket from old motor, line up with marks on new motor and secure bracket to new motor with screws from original motor assembly.
7. To replace motor, turn motor so that 4"x4" air discharge opening is pointing toward back of stove. The flat part of motor housing is turned up. With the air discharge opening pointing in the 2 o'clock position, start in toward unit. Rotating the back of motor counterclockwise. The air discharge opening of motor housing fits in a cavity in back of unit, that will direct air flow to proper location. Make sure air discharge opening is located firmly in opening. If thermostat was removed, replace thermostat in bracket.
8. Hook up wiring to all components, if you have replaced or unhooked them to rewire motor, rheostat or switch. If you need to see wiring diagram see page 28. If rheostat was removed, replace rheostat on to screen housing with the nut and replace control knob, reconnect wires to switch.
9. Replace motor and wire screen. Hold motor with bracket and wire cage over holes in vertical bar. Fasten motor bracket and wire cage to bar at same time to vertical bar to right of ash pan. Replace bottom cover door.
10. To replace the thermostat and to remove wire screen, follow steps 1 through 3. Gently push the thermostat up and out of thermostat bracket and replace with new thermostat. Follow step 8 and 9 to reinstall wire screen.
11. Plug heater back into a 115V AC outlet.

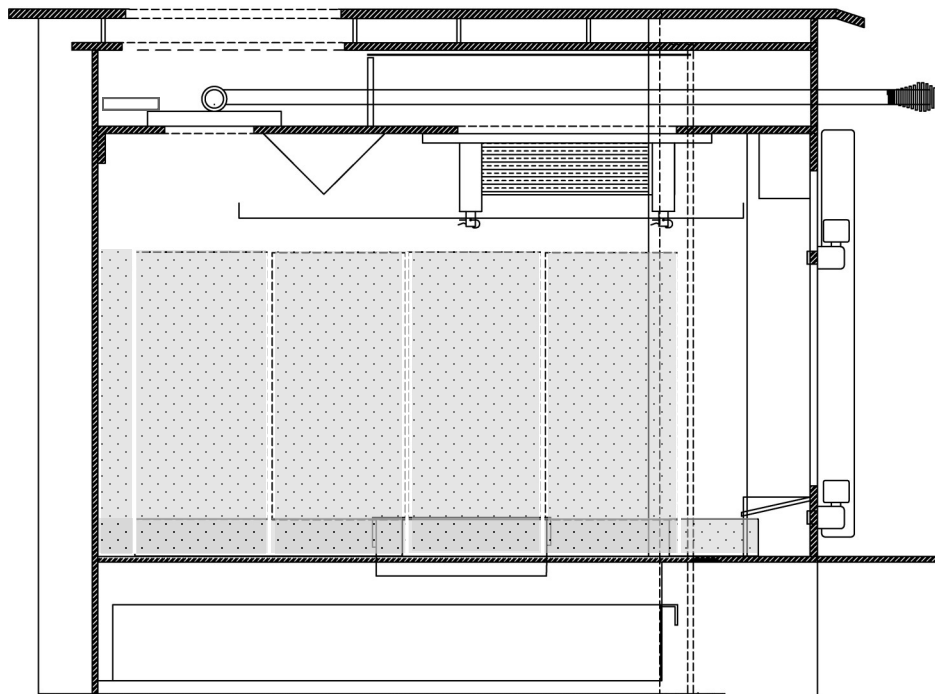
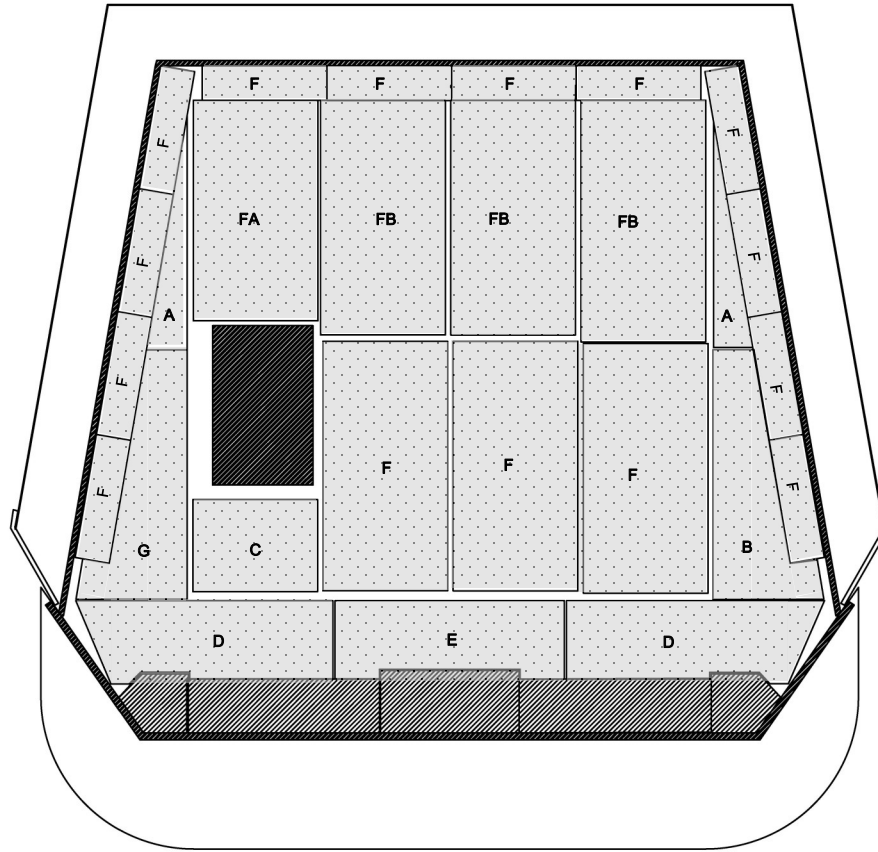
MAINTENANCE WIRING SCHEMATIC



MAINTENANCE

BRICK LAYOUT

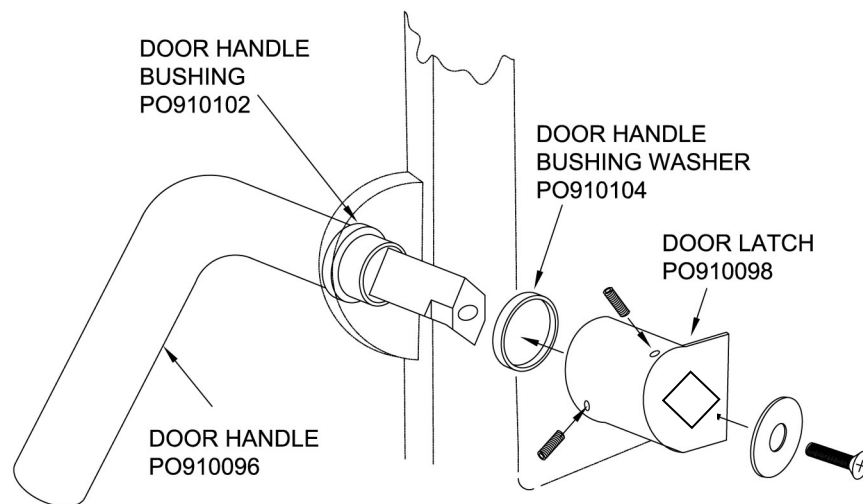
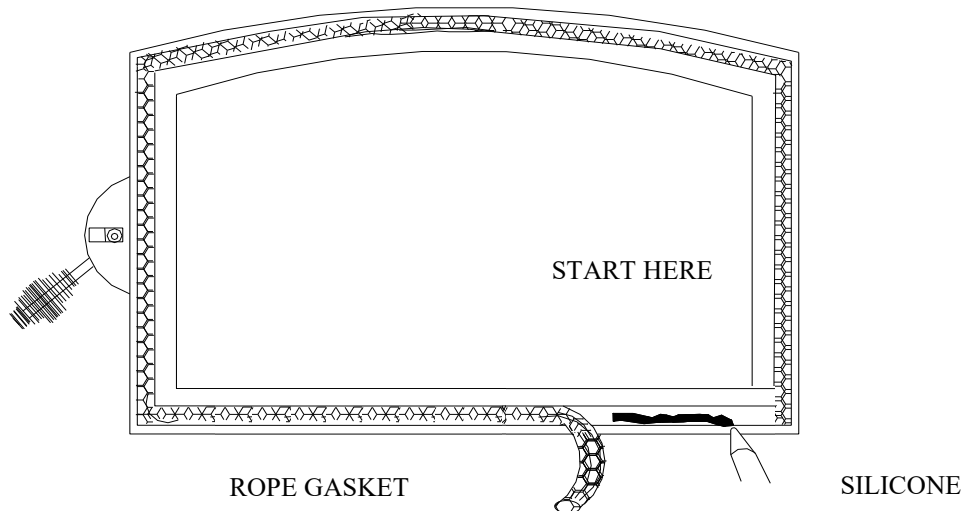
TOP VIEW



MAINTENANCE

DOOR GASKET REPLACEMENT (COLD HEATER)

1. To replace deteriorated gaskets, the following steps must be taken to ensure proper installation of gaskets.
2. Using pliers remove any worn and deteriorated gaskets.
3. Obtain proper gaskets and silicone glue from your local dealer.
4. Using a scraper, wire brush and sandpaper or steel wool, clean glue and gasket residue from door frame.
5. Measure and cut gaskets to length. Care should be taken not to stretch gaskets. What you want is a full and loose gasket weave after attachment to framing.
6. Obtain silicone glue and run a 3/16" bead inside door frame.
7. Obtain gasket (s) and place in gasket channel areas starting at lower right corner, See Below. Use a technique which assures that gasket is applied in a loose like manner. **DO NOT STRETCH GASKETS.**
8. After gasket (s) are applied to glue, use your finger and go over all gasket gently pressing gasket to the channel. Use same pressure against gasket so that final result is an evenly applied gasket.
9. Leave door open and allow at least two (2) hours for glue to dry.
10. Once gaskets are checked, heater is ready for use.
11. This should be done annually. Allowing gaskets to deteriorate can cause over-firing and shorten burn time.



MAINTENANCE

CHECK CHIMNEY

- A. Chimney should be inspected once a year.
- B. The chimney should be cleaned as necessary to remove creosote, soot, leaves, birds' nests, etc.

NOTE: A chimney cap may be installed to prevent moisture from entering chimney, to prevent sparks and burning materials from escaping chimney and to keep birds and foreign materials from entering.

NOTE: Some areas may require an approved spark arrestor.

CLEANING THE HEATER

- A. The heater should not be cleaned with any type of detergent as most all detergents have an oil base and cannot be painted over.
- B. The heater should be lightly sanded with fine sandpaper or steel wool, then repainted or touched up with high temperature paint.
- C. If the heater is located in a moist or damp location, check thoroughly for signs of condensation during times when heater is not in use.
- D. When heating season is over, heater should be cleaned out completely with a wire brush or cloth to help eliminate ash and burned wood smell.

CARE OF GLASS DOOR

The glass door on your heater permits you to enjoy the beauty of the fire while retaining efficiency of your heater. Although the type of glass used in the stove door has well established and recognized heat resistant and strength characteristics, it can be broken through improper care. To achieve maximum utility and safety of your glass door, we advise that you observe following use and safety tips:

1. Inspect glass regularly for cracks or breaks. If you detect a crack or break extinguish fire immediately and return door to your dealer for glass replacement before further use.
2. Do not slam heater door or otherwise impact glass. When closing door, make sure that no logs or other objects protrude to impact against glass.
3. Do not clean glass with materials which may scratch it (such as steel wool) or otherwise damage glass. Scratches on the glass can develop into cracks or breaks.

The glass can be cleaned with a commercial oven cleaner, providing it does not contain abrasives. A build-up on glass that has been there for a considerable length of time can be burned off with a propane torch or straight razor blade. Use protective gloves when using razor.

REPLACEMENT PARTS FOR MODEL 91

	Description	Quantity	Part Number
1.	Door Handle Assembly	1	PA 910096
2.	Door Latch	1	PC 910098
3.	Door Handle Washer	1	PH316916FW
4.	Front Door Bushing	1	PO 910102
5.	Door Handle Bushing Washer	1	PO910104
6.	Door Black	1	PA 912651B
6.	Door Gold	1	PA 912651G
7.	Door Pewter	1	PA 912651P
8.	Carling 3 Position Auto/Off/Man Switch	1	PE RC211RB
9.	Thermostat 110° Disc	1	PE 400132
10.	Power Cord	1	PE 400240
11.	Strain Relief	1	PE 400320
12.	Motor	1	PE 910714
13.	Rheostat	1	PE BC204
14.	Rheostat Knob	1	PE BC204A
15.	Glass	1	PG 265191GL
16.	Glass (Bay Side)	2	PG 27BSGL
17.	Bay Glass Overlay Black	2	PO 910454
18.	Bay Glass Overlay Gold	2	PO 910454G
19.	Bay Glass Overlay Pewter	2	PO 910454P
20.	Glass Clip	1	PO 912651
21.	Glass Clip Screws	1	PH 103238HWHS
22.	Large Spring Handle For Door	1	PO 100150B
23.	Small Spring Handle For Damper	1	POBC290B
24.	Shot Gun Air Rod	1	MF 910088
26.	Primary Air Rod	1	MF 910092
27.	Bottom Cover Door	1	MA91COVDOOR
28.	Catalyst Housing	1	PCH91
29.	Catalyst Housing Gasket Intergram 1/16"	1	PO910500
30.	Damper Rod	1	PO910012
31.	Lower Heat Shield	1	PS910011
32.	Catalyst Mixing Wire	1	PS910015
33.	Motor Guard Screen	1	PS 910105
34.	1" X 1" X 1/8" Thick Magnet	2	PODM841
35.	Fire Brick	16	PR900050

SECTION VII

TROUBLESHOOTING

Operation of any wood heater can create problems. While use of a catalytic-combustor equipped stove will substantially lessen some of these problems— such as creosote formation— other traditional wood heater problems may remain.

The following guidelines apply to operation of all wood heaters, with problems related to catalytic heater addressed where appropriate.

HEATER RELATED PROBLEMS

Problem	Possible Cause	Solution
1. Sluggish Heater Performance	1. Obstruction in chimney	1. Check cap and chimney and remove obstruction.
	2. Improperly sealed trim kit or flue liner	2. Check trim kit gasket or direct connect kit seal to fireplace and gasket as necessary to seal unit. Gasket under stove if needed. Check seal or direct connect and correct
	3. Manual damper in chimney is closed	3. Open manual damper or remove damper
	4. Closing bypass or exhaust damper too soon	4. Follow New Buck instructions for proper firing procedures
	5. Poor chimney draft	5. Flue may need extension. Oversized flue may need direct connect or positive liner.
	6. Combustor is plugged	6. See section in “Combustor Related Problems”
	7. Wet or unseasoned wood being burned	7. Burn dry, natural seasoned hard wood
2. High Fuel Consumption	1. Inexperience in catalytic operation	1. Operate stove with desired heat output in mind. Do not be overly concerned with maintaining light-off temperatures
	2. Improper regulation of draft or inlet air	2. Close inlet air control as much as possible to maintain desired heat output. Check gaskets, reinstall fiberglass gasketing around doors and glass as necessary
	3. Air leaking around door frame and/or glass	3. Check door gasket. Check adjustment of door latch.
	4. Bypass damper open	4. Close bypass damper

<p>3. Backpuffing</p>	<p>1. Gusts of wind / windy day 2. Hot combustor. (Above 1400° F)</p>	<p>1. If flue cap not on chimney, install one. 2. Increase the amount of combustion air slowly</p>
<p>4. Smoke Rollout when Heater Door is Opened</p>	<p>1. Bypass damper is closed 2. Opened door too soon after opening bypass damper 3. Wind gusts blowing</p>	<p>1. Open bypass damper 2. Open bypass damper– wait 15 -30 seconds before slowly opening door 3. Install flue cap</p>
<p>5. Low Catalytic Temperature</p>	<p>1. Bypass is open 2. Light-off not obtained 3. Fuel charge is spend 4. Combustor coated with fly ash or soot 5. Heater damper down too much</p>	<p>1. Once light-off temperatures have been reached and unit is stabilized, close bypass 2. Follow manufacturer’s operating instructions 3. Refuel as necessary for combustor operation 4. See Section VII “Preventive Maintenance” 5. Ensure that proper air mixture and draft are available for wood to burn proper</p>
<p>COMBUSTOR-RELATED PROBLEMS</p>		
<p>1. Plugging</p>	<p>1. Burning materials that produce a lot of char and fly ash 2. Burning wet, pitchy wood or burning large loads of small-diameter wood with the combustor in the operating position without light-off taking place</p>	<p>1. Do not burn materials such as garbage, gift wrap or cardboard 2. Burn dry, natural seasoned hard wood. Don’t place the combustor in the operating position until high temperatures are high enough to initiate light-off</p>
<p>2. Catalyst Peeling</p>	<p>1. Extreme temperatures at combustor surface can cause the catalyst to peel. Over-firing and flame impingement are primary causes</p>	<p>1. If severe, remove and replace catalysts. See “Catalyst Replacement” Section VI. Avoid extreme temperatures</p>
<p>3. Catalyst Masking</p>	<p>1. Not maintaining light-off temperatures</p>	<p>1. See Section VI and review operating instruction.</p>
<p>COLORED-GLASS PROBLEMS</p>		
<p>1. Glass Darkens</p>	<p>1. Buildup Creosote on Glass</p>	<p>1. Cleaning Glass. The glass inside will become colored during use from creosote buildup. The best way to clean glass, COLD STOVE, is to let creosote buildup harden. Then use razor blade to scarp of buildup of creosote. Wash glass using soapy water or glass cleaner.</p>

NEW BUCK CORPORATION (NBC)
“LIMITED WARRANTY” FOR NBC RELATED PRODUCTS

**PLEASE READ THIS WARRANTY CAREFULLY
PRODUCTS COVERED**

This warranty covers heating unit so long as it is owned by original purchaser, including optional and standard accessories purchased at same time, subject to terms, limitations and conditions herein set out.

PRODUCTS NOT COVERED

This warranty does not cover the following:
Glass, Refractory Material, Firebrick, Gaskets or Catalyst.

Catalyst is warranted by Applied Ceramic Inc. 5555 Pleasantdale Road Doraville, Ga. 30340 (770)448-6888

This warranty will not cover any damage and/or failure caused by abuse or improper installation of products covered.

WARRANTY TIME PERIODS

(A) Period I

For one (1) year from date of purchase, NBC will replace or repair, at its option, any part defective in materials or workmanship. The costs of parts only are included. The customer pays any labor or transportation charges required.

Thereafter

(B) Period II

For period after the first (5) year from the date of purchase and extending for five (5) years as long as related product is owned by original purchaser, NBC will repair or replace at its option, any part defective in materials or workmanship, with exception of: electrical motors, wiring, switches, components, optional and standard accessories and all parts not permanently attached to heating unit. Parts not permanently attached to heating unit are defined as those items designed to be removed from unit, including those removable with common hand tools. The cost of parts only are included. The customer pays any labor or transportation charges required.

PROCEDURE

Should you feel that your **heater** is defective, you should contact any NBC dealer for name of your nearest authorized heater service representative, who will instruct you on proper procedure, depending on which Warranty Time Period (Period I or Period II) applies.

If for any reason you are dissatisfied with the suggested procedures, you may contact us in writing at:

**NEW BUCK CORPORATION
Customer Service Department
P. O. Box 69
Spruce Pine, NC 28777**

CONDITIONS AND EXCLUSIONS

- (A) Replacement of parts may be in form of new or fully reconditioned parts, at NBC's option.
- (B) There are no other warranties express or implied including warranties of Merchantability, Fitness for Purpose or Otherwise except those warranties expressly stated herein.
- (C) **New Buck Corporation** is not liable for indirect, incidental or consequential damages in connection with the use of the product including any cost or expense or providing substitute equipment or service during periods of malfunction or non-use. Some states do not allow exclusion of incidental or consequential damages, so the above exclusion may not apply to you.
- (D) All warranty repairs under this warranty must be performed by an authorized Buck Stove service representative. Repairs or attempted repairs by anyone other than an authorized service representative are not covered under this warranty. In addition, these unauthorized repairs may result in additional malfunctions, correction of which is not covered by warranty.

OTHER RIGHTS

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

OWNER REGISTRATION CARD

The attached Owner Registration Card must be completed in its entirety and mailed within 30 days from date of purchase or from date of installation, if installed by a factory certified installer, to New Buck Corporation, in order for warranty coverage to begin.

PLEASE NOTE: The Owner Registration Card must contain the Authorized Dealer Code Number and the Certified Installer's number (if applicable) for warranty coverage to begin.

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To be completed by selling distributor/ dealer/ customer:

OWNER REGISTRATION CARD

Name _____
(Last) (First)

Address _____

City _____ State _____ Zip _____

CUSTOMER EMAIL:: _____

Model 91 _____ Insert: Residential _____
Model 91 _____ Freestanding: Residential _____

Serial No. _____

Date of Installation: Day _____ Month _____ Year _____

Installer's Name _____ Certification No. _____

Dealer Name _____

City _____ State _____

Dealer No. _____

Distributor Name _____

Distributor No. _____

Is appliance customer self-installed? Yes _____ No _____

Has appliance been completely checked out? Yes _____ No _____

Has customer been given appliance and operation orientation? Yes _____ No _____

- | | |
|--------------------------------------|---|
| _____ a) Damper/Door Vents | _____ g) Paint Curing |
| _____ b) Door-Handle/ Removing | _____ h) Chimney Safety |
| _____ c) Thermostat-Normal Operation | _____ i) Rain Cap |
| _____ d) Hot Surface Area | _____ j) Wood Preparation |
| _____ e) Speed Control (Rheostat) | _____ k) Installation |
| _____ f) Switch—Manual/Off/Auto | _____ l) Instructions & Clearances -
Self-Installation |

Has customer been given **WARRANTY REVIEW**? Yes _____ No _____

CUSTOMER SIGNATURE _____

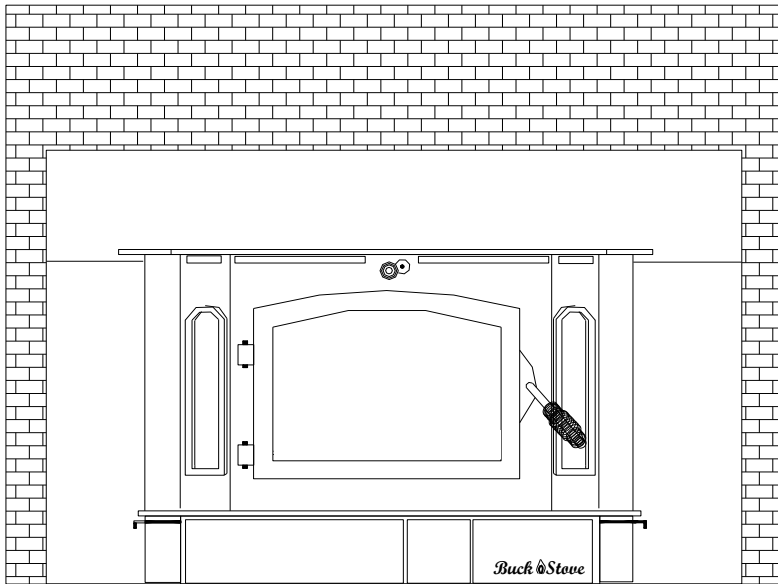
New Buck Review

DATE _____

Mail to:

NEW BUCK CORPORATION
P.O. Box 69
200 Ethan Allen Dr.
Spruce Pine, NC 28777
Email: info@buckstove.com

CAROLINA 92 CATALYTIC UNIT



DISCLAIMER ⚠
TRIM KITS, PEDESTALS, LEGS NOT INCLUDED | SOLD SEPARATE

FIREPLACE INSERT & FREESTANDING

FEATURES

PREPARATIONS **INSTALLATION**
OPERATION **MAINTENANCE** **SAFETY**

SAFETY NOTICE ⚠

IF THIS HEATER IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT THE AUTHORITY HAVING JURISDICTION (SUCH AS MUNICIPAL BUILDING DEPARTMENT, FIRE DEPARTMENT, FIRE PREVENTION BUREAU, etc.) CONSULT BEFORE INSTALLATION TO DETERMINE THE NEED TO OBTAIN A PERMIT. KEEP THESE INSTRUCTIONS FOR FUTURE USE.

LISTED BY:  PFS/TECO, COTTAGE GROVE, WI
US

MANUFACTURED BY NEW BUCK CORPORATION
200 ETHAN ALLEN DRIVE,
SPRUCE PINE, N.C. 28777
www.buckstove.com

Revised August 2024

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SECTION I

When installed and operated as specified in these instructions, and as stipulated on operation and installation labels affixed to unit, **The New Buck Corporation** room heater Carolina 92 is one of the safest and most efficient heating systems available. The unit is designed to burn wood fuel only.

Please read this entire manual before you install and use your new room heater. Failure to follow instructions may result in property damage, bodily injury or even death.

- **NOTE: When burning any unit or appliance that combusts fuel for heat, we highly recommend use of smoke and carbon monoxide detectors in your home.**

Early signs of carbon monoxide poisoning resemble flu, with headaches, dizziness and/or nausea. If you have these signs, heater may not be working properly. Get fresh air at once!

Throughout manual, you will see this  symbol. This indicates areas of importance regarding safety. Please make a special note of these areas.



Warning: PAINT. This product can expose you to chemicals including ethyl benzene, which is known to the state of California to cause Cancer. For more information, go to www.P65Warnings.ca.gov

Install and use only in accordance with manufacturer's installation and operating instructions. Do not connect this unit to a chimney flue serving another appliance. This unit is not designed for installation in a mobile home.

ROOM HEATER FEATURES

Before attempting to install or operate your heater, it is a good idea to familiarize yourself with features and operating controls of unit. (See page 4 for reference).

OPERATING CONTROLS



WARNING: Carolina 92 was not designed for fire grates.

NOTE: Do not use grate, elevate fire or build wood fire directly on hearth.

1. **Bypass Damper:** The bypass damper control is located in top center of heater front just under top. It is operated by pushing or pulling rod. The damper is fully open when handle is pulled out and fully closed when it is pushed in. The damper must be **OPEN** before door is opened.
2. **Blower Control:** The blower control (Rheostat) is located on side of the unit. The rheostat is used to vary speed of blower. It can be set at any position. It must be turned on to activate automatic thermostat on stove.
3. **Primary Air Controls:** The primary air intake draft controls (4) are located at left and right bottom side of hearth. They are operated by moving handle **out** to open (to allow air into the firebox) or **in** (to control or close off) air into firebox. Shot gun air control, allows air to center of firebox of stove (4a).
4. **Warm Air Outlets:** Provides heat extraction from top of firebox.
5. **Baffles:** Directs air flow around unit for maximum heat transfer.
6. **Air Inlet:** Allows cool air near floor to be circulated through blower and back into warm air chamber of heater.
7. **Door:** Provides an "airtight" feature. The door allows a much higher burning efficiency than can be obtained with an open firebox.
8. **Hearth Extension:** Offers protection from spilled ashes and cinders.
9. **Power Cord:** Provides electrical power to operate blower.
10. **Catalyst:** Enables Unit to burn cleanly and efficiently.
11. **Catalyst Probe:** Probe is located right of the bypass damper rod. It is used to determine (catalyst) temperature.
12. **Automatic/Off/Manual Switch:** Located behind right cover door under hearth. In the "Manual" position, the blower operates continuously. In "Automatic" position, blower is controlled by internal thermostat which reacts to temperature of air between the stove walls. (Not same as the temperature showing on the Catalyst Probe.)

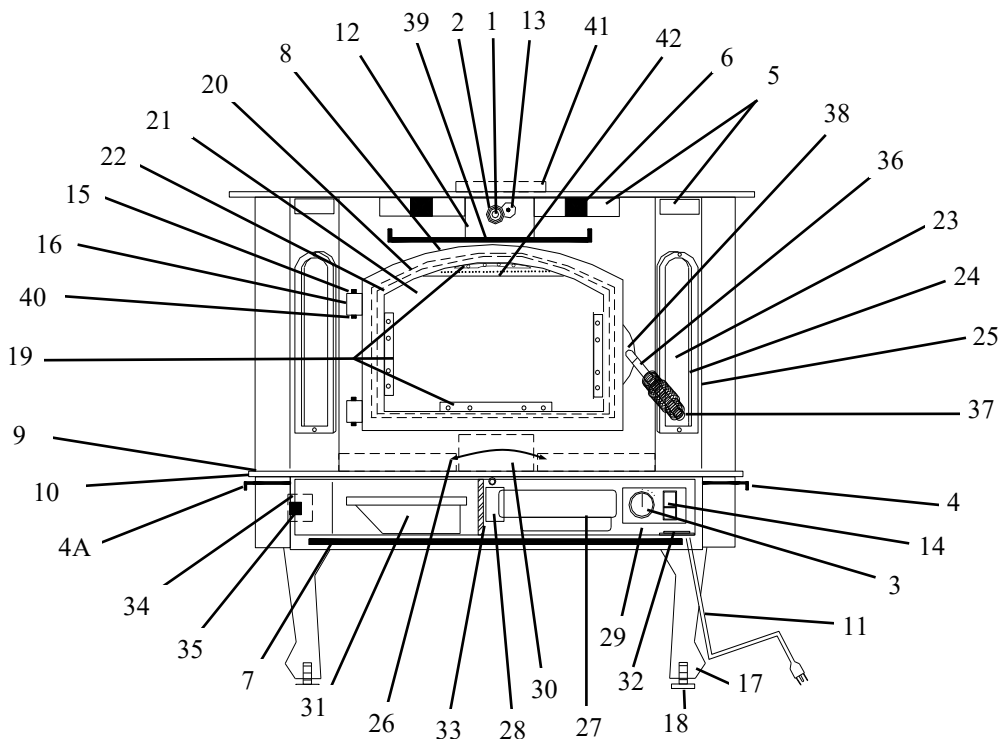
SAFETY STANDARD COMPLIANCE

The Carolina 92 catalytic solid fuel (wood) burning combination room heater/fireplace stove manufactured by New Buck Corporation complies with UL 1482 for residential freestanding and masonry fireplace insert installations when constructed and installed in accordance with PFS approved documentation.

EPA COMPLIANCE STATUS

This manual describes installation and operation of the **New Buck Corporation Carolina 92** wood heater. This heater meets the U.S. Environmental Protection Agency's Emission limits for wood heaters sold after May 15th 2020. Under specific test conditions, this heater has been shown to deliver heat at rates ranging from approximately 10,400 to 62,745 BTU/hr for the Carolina 92. A weighted average was used to calculate the overall efficiency across all of the burn rate categories using the higher heating value (HHV 79.5%).

CAROLINA 92 WOOD STOVE IDENTIFICATION



- | | |
|--|------------------------------------|
| 1. Bypass Damper | 24. Side Glass Gasket |
| 2. Bypass Damper Spring Handle | 25. Overlays |
| 3. Blower Control (Rheostat) | 26. Firebrick |
| 4. Primary Air Control Air Wash Rod for Both Sides | 27. Motor |
| 4a. Shotgun Air Control | 28. Motor Mount Bracket |
| 5. Warm Air Outlets | 29. Cover Door |
| 6. Baffles (Interior of Stove) | 30. Shotgun Air Box |
| 7. Air Inlet | 31. Ash Pan |
| 8. Door | 32. Disc Thermostat |
| 9. Hearth Extension | 33. Cover Door Hinge |
| 10. Hearth Trim | 34. Magnet Holder |
| 11. Power Cord | 35. Cover Door Magnet |
| 12. Catalyst (Interior Firebox) | 36. Door Handle |
| 13. Catalyst Probe | 37. Spring Handle |
| 14. Automatic / Off / Manual Switch | 38. -Door Latch |
| 15. Brass Cap | -Door Latch Screw |
| 16. Hinge Block | -Door Handle Bushing |
| 17. Quean Ann Legs | -Door Handle Spacer |
| 18. Leveling Screws | -Door Latch Flat Washer |
| 19. Glass Clips/Large; Side, Top, Bottom | -Door Latch Screws (Phillips Head) |
| 20. Door Gasket | -Door Latch Screws (Allan Head) |
| 21. Door Glass | 39. Lower Heat Shield |
| 22. Door Glass Gasket | 40. Hinge Pins |
| 23. Side Glass | 41. 8" Flue Exit |
| | 42. Air Wash Screen |

CATALYST EQUIPPED

"This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed."



Warning: INTERAM GASKET. This product can expose you to chemicals including aluminosilicate, which is known to the state of California to cause Cancer. For more information, go to www.P65Warnings.ca.gov

"Combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustor is not recommended unless more detailed inspection is warranted because of decreased performance. If any of these conditions exists, refer to Catalyst Troubleshooting section of this owner's manual."

CATALYST WARRANTY

The combustor supplied with this heater is a set of (3) (2" x 3-1/2" x 6" x 25" cells). Consult catalytic combustor warranty also supplied with this heater. All warranty claims should be addressed to:

Applied Ceramics
Customer Service Department
P.O. Box 29664
Atlanta, GA 30359
770-448-6888

See enclosed catalyst warranty for instructions. New Buck Corporation does not handle catalyst replacements. Customer can order directly from Applied Ceramics.

**DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.
DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS."**

PROPER FUEL SELECTION

For best results, this heater is designed to burn (dry), natural seasoned hardwood. Higher efficiencies and lower emissions generally result when burning air dried natural seasoned hardwoods, as compared to softwoods or freshly cut hardwoods. Green or freshly cut hardwoods (wood with high moisture content) will not produce the BTU's needed to heat your home. The result will be low temperature reading on the catalyst probe, thus low BTU output.

DO NOT BURN:

- | | | | |
|-----------------|--------------|------------------|----------|
| 1) Treated Wood | 3) Garbage | 5) Solvents | 7) Trash |
| 2) Coal | 4) Cardboard | 6) Colored Paper | |

Burning treated wood, garbage, solvents, colored paper or trash may result in release of toxic fumes and may poison or render the catalytic combustor ineffective.

Burning coal, cardboard or loose paper can produce soot or large flakes of char or fly ash that can coat combustor, causing smoke spillage into room and rendering combustor ineffective. (Not covered under warranty.)

ACHIEVING CATALYTIC LIGHT-OFF

The temperature in stove and gases entering combustor must be raised to between 700° F to 900° F for catalytic activity to be initiated. The temperature can be determined by the Catalyst Monitor Probe. During start up of a cold stove a medium to high firing rate must be maintained for about 15-20 minutes before pushing in the damper. This can be achieved by starting fire with dry kindling, paper and small split wood. Have the Bypass Damper fully open (pulled out). This ensures that the stove, catalyst and fuel are all stabilized at proper operating temperatures. Even though it is possible (and likely) to have gas temperatures reach 600° F within two to three minutes after a fire is started, if the fire is allowed to die down immediately it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning smoke will keep it working.

ACHIEVING CATALYTIC LIGHT-OFF WHEN REFUELING

During refueling and rekindling of a cool fire, or a fire that has burned down to charcoal phase, operate stove at a medium to high firing rate for about 15 minutes to ensure that catalyst reaches approximately 800° F.

CATALYST MONITORING

It is important to periodically monitor operation of catalytic combustor to ensure that it is functioning properly, and to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency and an increase in creosote and emissions. See Troubleshooting section for detailed instructions **BEFORE** attempting to remove catalyst.

This catalytic heater is equipped with means to monitor catalyst operation. Properly functioning combustors typically maintain temperatures in excess of 1000° F. If catalyst temperatures are not in excess of 500° F, refer to Catalyst Troubleshooting section of this owner's manual.



CAUTION AGAINST OVER-FIRING

Do not over-fire this heater.

Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to heater and to catalytic combustor.

ASH REMOVAL



CAUTION: Never remove ashes from heater with blower running. Be sure to turn room air blower off before removing ashes

Whenever ashes build up in firebox and when fire has burned down and cooled, remove excess ashes. Leave an ash bed approximately 1 inch deep on firebox bottom to help maintain a hot charcoal bed. To remove ashes the dump is located at left inner bottom. By lifting dump door, place ashes through the dump opening. The ashes fall directly into ash pan. The ash pan is located at left side under the hearth behind cover door.

NOTE: Be sure to turn room air blower off before removing ashes. Open cover door and slide ash pan out.

NOTE: Fueling and ash removal door (s) must remain closed when in operation.

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on ground, away from all combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled.

NOTE: Be sure to turn room air blower back on when job is completed.

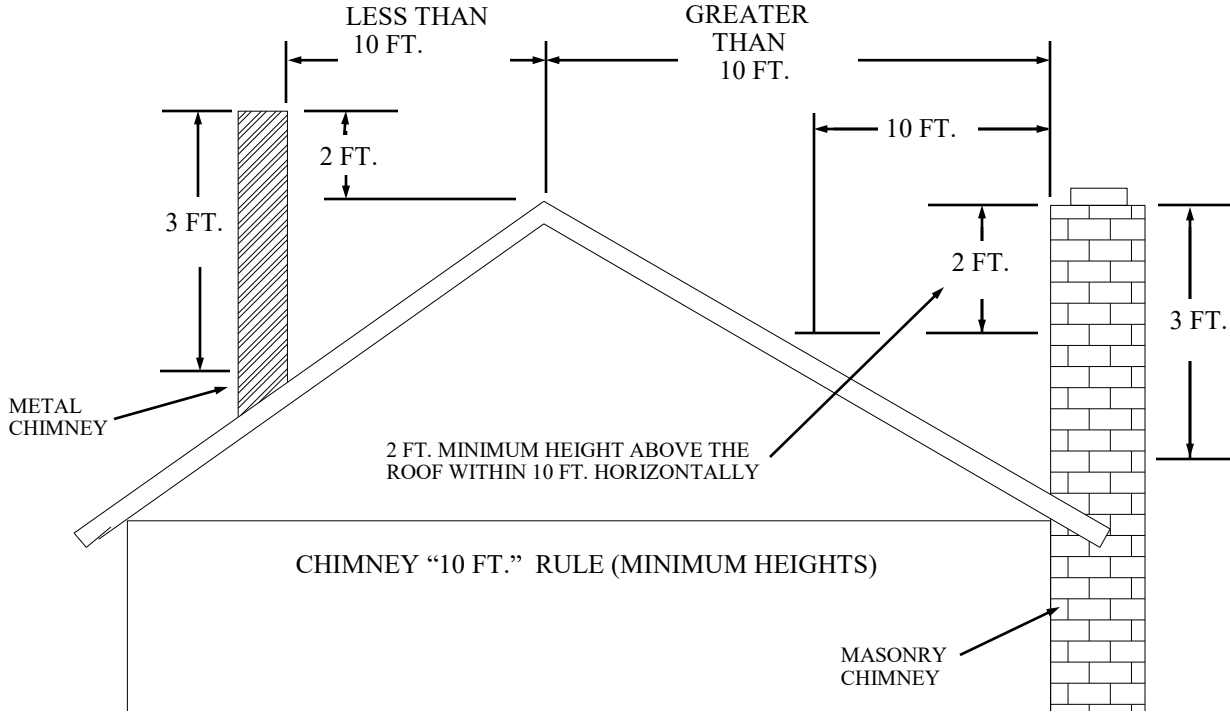
NOTE: The room heater is not to be connected to any air distribution duct.

CREOSOTE - FORMATION AND NEED FOR REMOVAL

When wood is burned slowly, it produces tar and other organic vapor, which combined with expelled moisture forms creosote. The creosote vapors condense in a relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on flue lining. When ignited, this creosote makes an extremely hot fire.

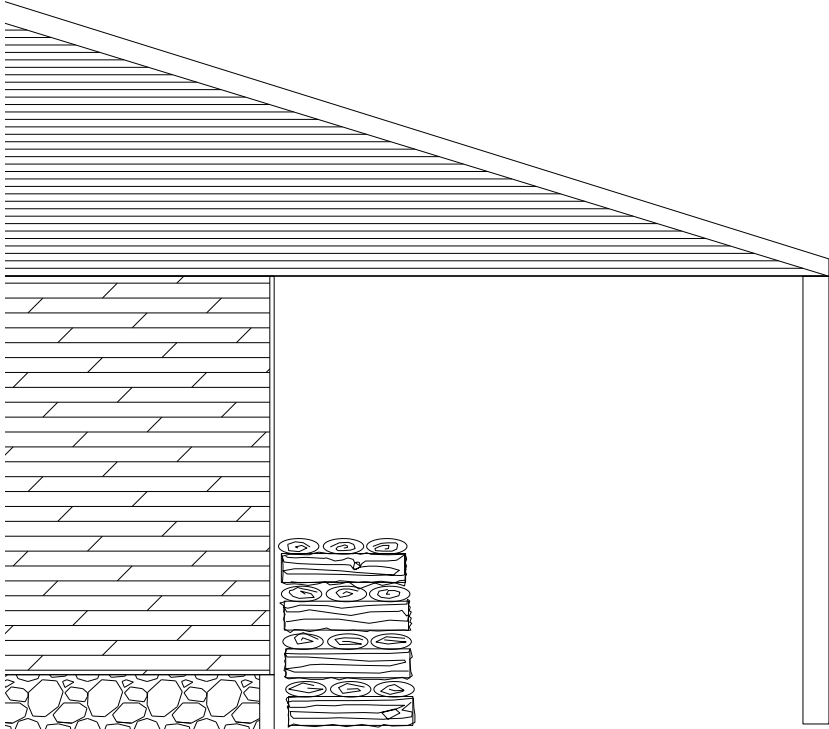
Select an installation location that will give best airflow from front of heater to remainder of home.

CHIMNEY HEIGHTS



NOTE: MINIMUM CHIMNEY HEIGHT 15 FT.

HOW TO STACK WOOD



Stack wood in crisscross pattern under a shelter to allow air flow to dry wood and to keep wood from rain. Green wood may have 50-60% moisture content. Wood seasoned outside uncovered may have 40% moisture content. Wood properly seasoned in a covered environment will have less than 20% moisture content.

SECTION II

MASONRY INSERT INSTALLATION INSTALLATION OPTIONS

This unit may be installed into an all masonry fireplace, built in accordance with Uniform Building Code and National Fire Protection Association (NFPA 211).

NOTE: Check with local building officials for any permits required for installation of this stove and notify your insurance company before proceeding with installation.

New Buck Corporation highly recommends using a chimney liner for this unit to enhance the performance (See Figure 4). Proper installation is critical to the performance of the Carolina 92.

Use Fireplace Kit PA FP91 for installation. An optional oversized fireplace kit is available for larger fireplaces. Check with dealer.

SAFETY NOTICE

If this appliance is not properly installed, a house fire may result. For your safety, follow the installation directions. Contact local building or fire officials about restrictions and installation inspection requirements in your area.

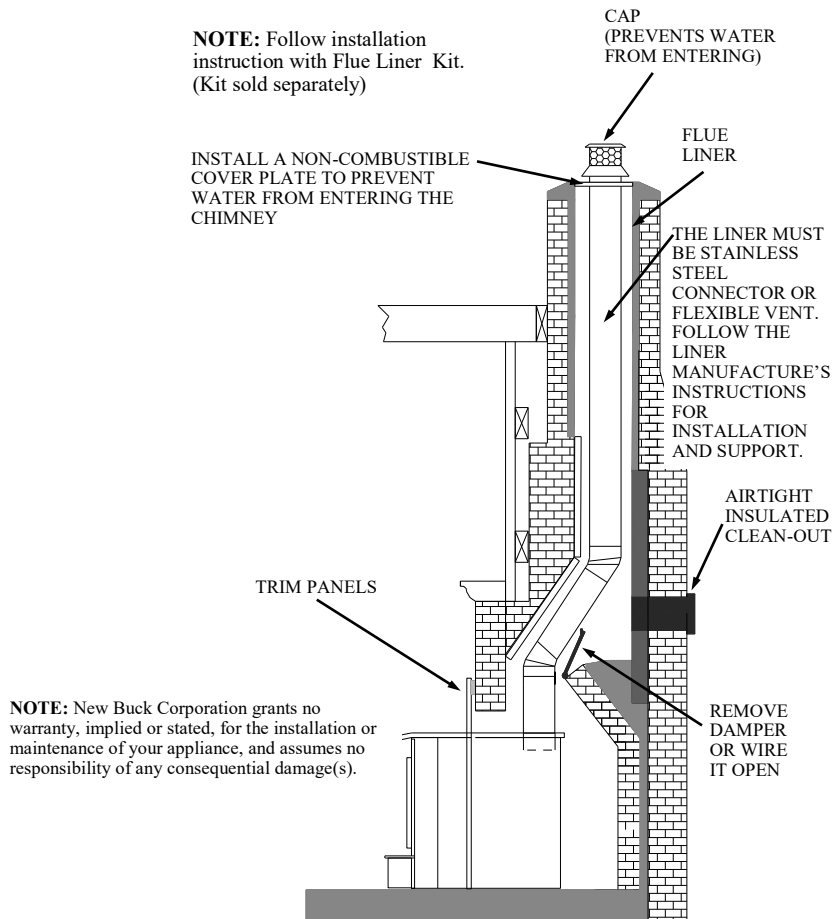


FIGURE 4

INSTALLATION (Fireplace Insert)

Minimum Clearances to Combustible Materials (in inches)

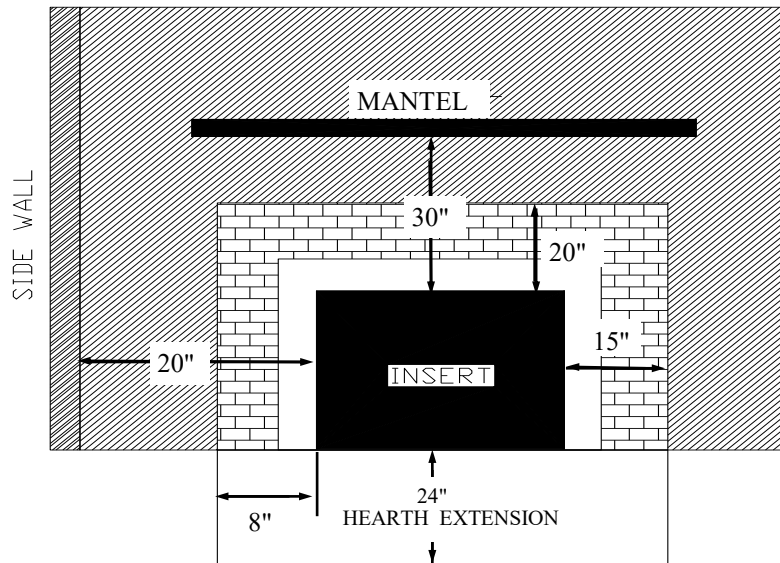


FIGURE 5
FIREPLACE INSERT

MINIMUM CLEARANCES:

The Carolina 92 Fireplace Insert is intended for installation in accordance with standard for chimneys, fireplaces, vents and solid-fuel burning appliances. **NFPA-211.**

NOTE-This model is not intended for installation into Zero Clearance or pre-fabricated fireplace.

1. The hearth must be of masonry construction and must extend a minimum of 24" in front of firebox opening and a minimum of 8" to either side of firebox opening.
2. If your fireplace has wood trim above it, the wood trim must be at least 20" above top of unit and may be a maximum of 1/2" thick.
3. If your fireplace has a wood mantel above the fireplace, the mantel or mantel supports must be located at a height of 30" above top of the stove.

REQUIRED FIREPLACE DIMENSIONS

Minimum fireplace dimensions:

	Height Min.	Width Min.	Depth Min.
Carolina 92	23 1/2"	31 3/4"	15 1/2"

POSSIBLE TOOLS NEEDED FOR INSTALLATION

We highly recommend a dealer installing your stove. If you decide to install your own stove, there are several hand tools you may need to do the job. If you do not already have them, they are readily available at most hardware stores.

Caulking gun

Large adjustable wrench (may not be needed)

Drop cloths or newspapers

Vacuum cleaner or whisk broom

Flashlight

1 tube of RTV silicone, Code 103 or 106, or high temperature rubber cement rated between 450° F- 600° F.

7/32" drill bit and drill

Socket/Ratchet Set

INSTALLATION PREPARATION

Fireplace:

1. Locate furniture and other materials away from front of fireplace to allow free access to fireplace.
2. Cover hearth and adjacent floor areas with drop cloths to protect from soiling or marring surface.
3. Remove existing fireplace damper plate.
4. Thoroughly clean the fireplace of ashes and soot.
5. Have your existing chimney inspected before inserting this unit. Some chimneys must be relined or replaced before they are safe to use.
6. Check the chimney and smoke chamber for excessive buildups of creosote or soot. Also, check for obstructions, such as bird's nests. If chimney is excessively dirty, clean it or have someone clean it professionally **BEFORE** installing or using room heater.
7. If fireplace has an ash dump or outside air provision, these must be sealed off with metal or tightly packed non-combustible insulation to prevent cold air from entering fireplace chamber.

Heater:

1. Inspect unit for any obvious physical damage.
2. Check primary air draft controls to ensure that they slide freely.
3. Check operation of damper control to ensure it will open and close properly.
4. Check Manual/Automatic Switch to ensure that motor is working. *Place switch in the "MANUAL" position. (Plug in stove.) You cannot check motor in the "AUTOMATIC" position, unless a heat gun is used to heat internal thermostat.

POSITIONING THE HEATER

When positioning heater, the following conditions **MUST** be met!

1. The front of damper opening must be positioned **BEHIND** back edge of lintel to ensure proper draft. (See Figure 6)
2. The vertical plane of fireplace front must fall **BEHIND** side panels of the unit. (In other words, it is possible to have heater too far in as well as not far enough.)
3. Center the heater in fireplace opening.

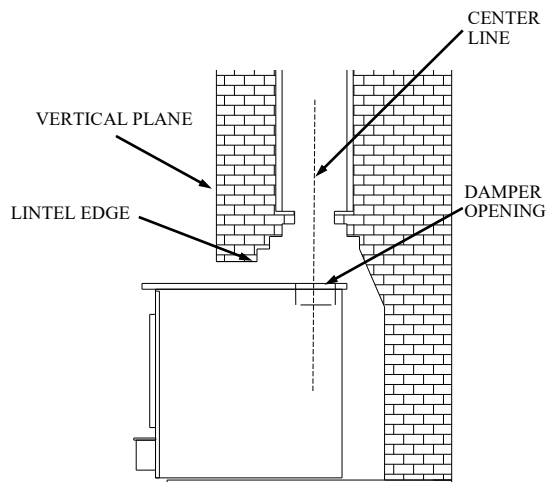


FIGURE 6 POSITIONING

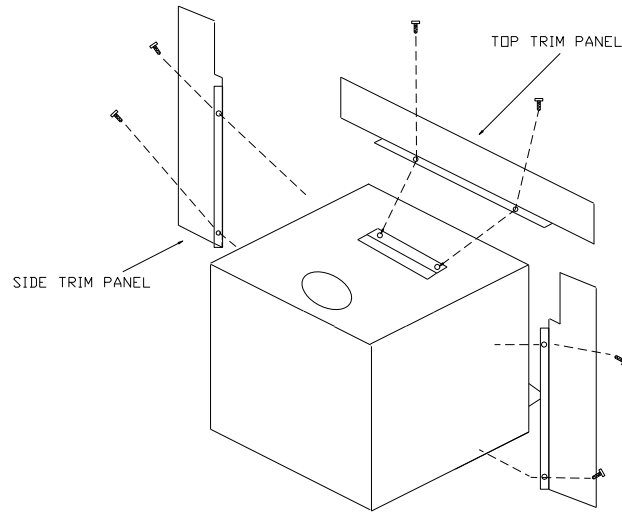


FIGURE 7 MOUNTING TRIM PANELS

MOUNTING TRIM PANELS

After unit is positioned, mark mounting position of trim panels as follows:

1. Place side trim panels directly behind the bay windows where it will be flat against face of fireplace. Mark inside edge of trim panel to make a vertical reference line. (See Figure 7)
2. Place top (long) trim panel on top of unit. The panel should be flat against outside face of fireplace, and standing vertically. Mark lower edge of trim panel with a pencil to make a reference line for mounting.
3. Slide unit out of fireplace far enough to work behind trim panel reference lines.
4. Mount side trim panels. (See Figure 7)
 - a. Position trim panel on reference line.
 - b. Drill mounting holes in center of trim panel mounting brackets to allow for adjustment in and out if necessary.
 - c. Mount trim panel using self-tapping screws provided.
5. Place top panel back on reference mark. Top trim panel mounting bracket is supplied with unit. Position bracket so it overlaps rear lip of top trim panel. Drill mounting holes in top of stove using holes in bracket as guide. Tighten screws.
6. Follow installation procedures in listed flue liner kit you are using and install heater and liner kit in fireplace.

7. Slide unit back into fireplace. Check to be sure that trim panels are properly positioned and lie flat against front of fireplace. If one or more of panels is out of position, slide unit out and reset by loosening mounting screws and repositioning in slot.
8. Reinstall top trim panel by sliding rear lip of top trim panel underneath front lip of mounting bracket.
NOTE: Mount top trim panel so that it sits in front of top of side trim panels..
9. Obtain aluminum trim provided with trim kit panels and slip over top and sides of trim panels. (Top ends of aluminum may need to be trimmed to fit.)
10. Mount top trim panel by drilling mounting holes in center of trim panel mounting bracket, with the top panel overlapping side panels.
11. Using insulation provided, peel and stick to back of panels overlapping fireplace dimensions by 1" on each side and top. (See Figure 8)
12. Using high heat silicone run a heavy bead of caulking where panels meet stove. (See Figure 8)
14. Slide unit back into fireplace. Check to be sure that trim panels are properly positioned and lie flat against front of fireplace. If panels are out of position, slide unit out and reset by loosening mounting screws and repositioning in slot. With bar, lift stove up in front. Place insulation across front and surface of hearth or bottom of fireplace to make complete seal.
15. To check seal of panels, use candle flame and go around entire area sealed by silicone and insulation. If flame leans toward inside of fireplace, add additional insulation. This ensures an airtight seal.

FINAL CHECK

1. Recheck specified clearances.
2. Remove all foreign material from firebox area.
3. Open primary air draft, shotgun air draft and damper bypass, make sure ash drawer is sealed properly.
4. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly.
5. Place 4 or 5 pieces of newspaper in stove. Light paper and close door. Ensure that stove draws properly through primary drafts.
6. Check for smoke leaks around door.
7. Open door (slowly) and check for smoke escaping from front of stove. Smoking usually indicates a defective or poorly positioned chimney. Some chimneys with a marginal draft can be preheated by lighting newspaper and holding it near the open damper with a poker or fire tong. Once chimney heats up, a proper draft can usually be obtained.

NOTE: A poor drafting chimney can lead to poor heater performance. This is not a defect of the heater, but with the chimney. Poor performance due to a poor drafting chimney is **NOT** a warranty problem.

If a thorough review of Troubleshooting Guide does not solve your problem, contact your dealer for assistance. If homeowner installed unit himself, there generally is a charge for dealer to service the stove and inspect installation.

8. The unit is painted with a specially formulated high temperature paint that cures during the first two or three firings. **DO NOT BUILD A LARGE ROARING FIRE UNTIL THIS CURING IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.** (Paint may blister or peel off. This is not covered by warranty.) You may notice a slight smoking effect and an odor of burning paint when you build the first fires. This is normal and is not a cause for alarm. In some cases these fumes will activate a smoke alarm. Opening a window near unit will allow these fumes to escape.

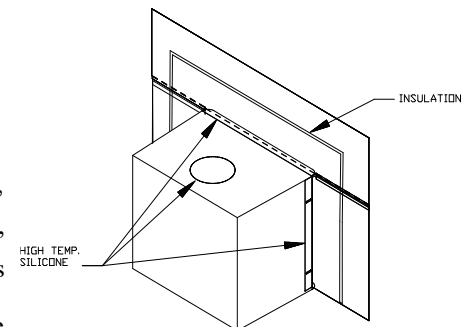
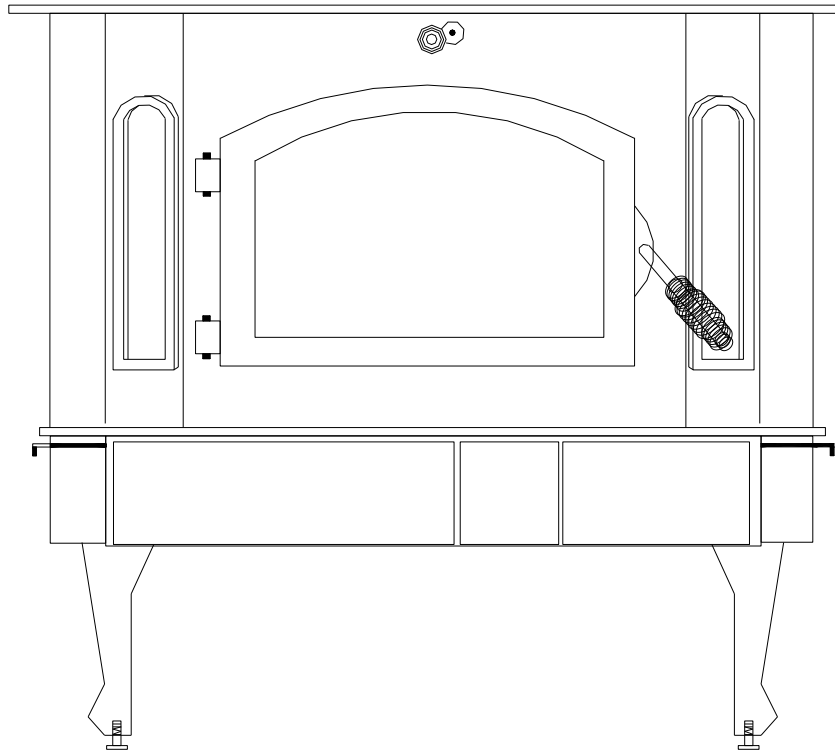


FIGURE 8

SECTION III

RESIDENTIAL FREESTANDING ROOM HEATER INSTALLATION



INSTALL

Select an installation location that will give best airflow from front of heater to remainder of home.

Extensive field and laboratory testing has shown that catalytic stoves perform best as freestanding stoves when vented into a masonry chimney that include the following:

1. A rain cap is installed on the chimney.
2. Height of chimney is at least 15 feet high.
3. Location of chimney is on interior. (Not on an outside wall)

Satisfactory results have been reported with installations other than listed above. However, draft problems are possible if a hot chimney is not maintained.



CAUTION: Do not connect this unit to a chimney flue serving another appliance.

Inspect unit for any obvious physical damage.

Remove any items from within firebox.

Plug power cord into a 115V AC outlet to test motor. Do not run power cord under unit or in high traffic areas.

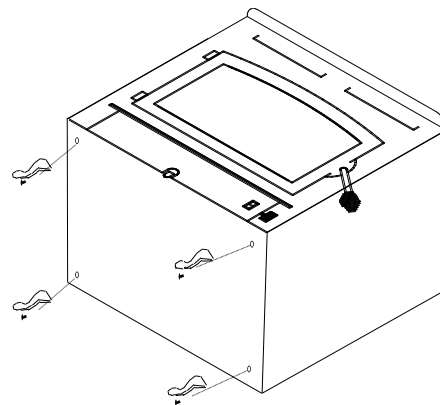
Check primary air and control to ensure that it slides freely.

LEG INSTALLATION

Use Leg Kit # FA FS9151 for Carolina 92

1. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.
2. Obtain four the legs and attach legs to holes in bottom of unit with bolts and washers provided. (See Figure 9).
3. Reposition heater to upright position.

FIGURE 9

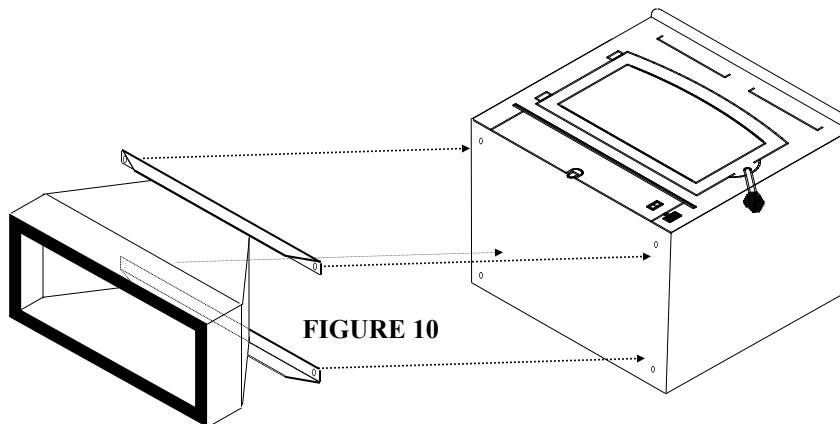


PEDESTAL INSTALLATION

Use Pedestal Kit # FA P4150B for Carolina 92

1. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.
2. Obtain Pedestal and place pedestal against bottom of heater. Center pedestal from left to right and from front to rear. Mark holes thru pedestal brackets onto bottom of unit. Lay the pedestal aside. Drill four 1/8" holes through marks. Replace pedestal and secure with provided screws. (See Figure 10).
4. Stand heater to upright position. Place heater in the desired location.

FIGURE 10



MINIMUM CLEARANCES

The New Buck Corporation Carolina 92 must be installed in compliance with instructions contained in this manual.

Clearance from combustible walls and ceilings. (Using single wall chimney connector)

The minimum lateral distance between any part of room heater and combustible walls is shown in (Figures 11 and 12).

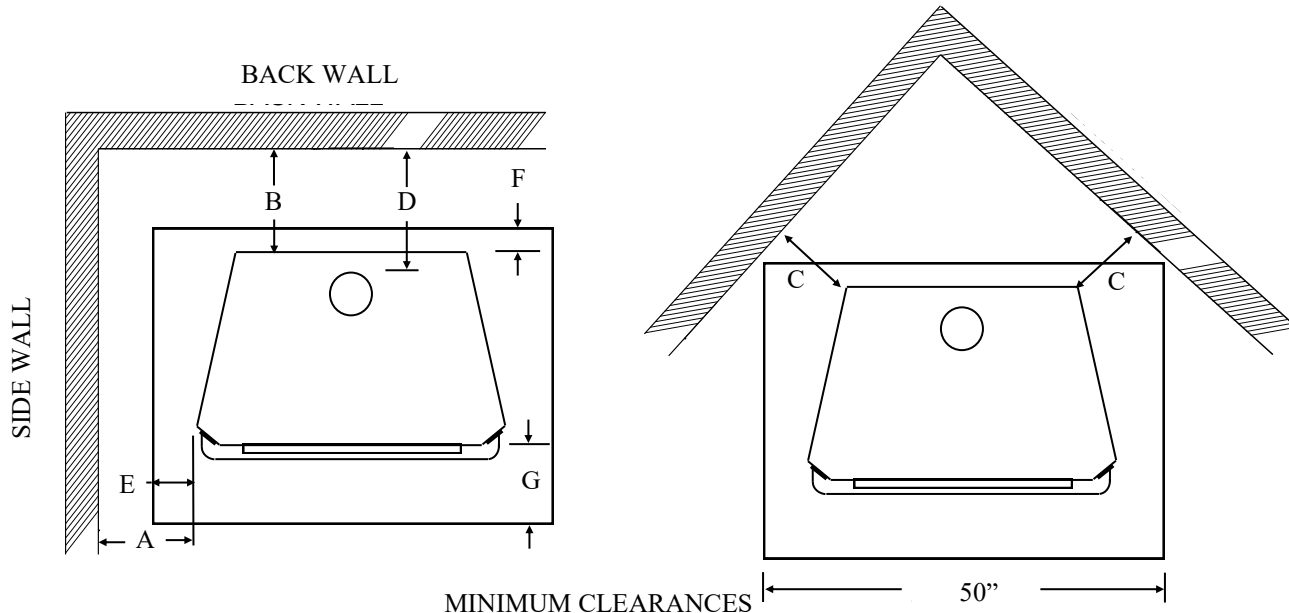


FIGURE 11

MINIMUM CLEARANCES

FIGURE 12

A B C D E F G

CAROLINA 92 24" 23" 16" 26" 8" 3" 16"

FLOOR PROTECTION

If a freestanding model is to be installed on a combustible floor, a non-combustible pad must be placed under unit to protect floor from burning material from the stove. The pad must be 50 inches wide. **NOTE:** The floor must extend 16" from door opening in front of stove, 8" from door opening on each side of unit and should be under the chimney connector.

Floor protector must be 3/8" in minimum thickness, non-combustible material.

NOTE: For clearance reductions using wall protectors, refer to the NFPA-211 Code.

TOOLS FOR INSTALLATION

- Drop Cloth
- Electric Drill with 7/32" drill bit
- 1/2" - 9/16" combination wrench
- 3/8" magnetic socket chuck adapter, 3/8" wrench (box or socket) or adjustable wrench
- Socket Set
- Tape Measure
- Pencil
- Level
- Screw Driver

PREPARING THE STOVE FOR INSTALLATION

1. Inspect unit for any obvious physical damage.
2. Check primary air draft controls to ensure that they operate freely.
3. Check operation of bypass damper control to ensure that it will open and close properly.
4. To attach legs, remove any items within firebox. Spread drop cloth on floor behind heater. Tilt heater so that back is on drop cloth. Attach legs to pre-drilled holes in bottom of heater. If using optional pedestal, mounting holes will need to be drilled.
5. Reposition heater to upright position.
6. Plug power cord into a **115V AC** outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. You cannot check motor when switch is in the “Off” or “Automatic” position, unless a heat gun is used to heat internal thermostat.

CHIMNEY

Ceiling Exits:

Follow chimney and chimney connector manufacturers instructions and local building codes for installation through combustible walls or ceilings. This heater can only be installed freestanding by using one of the following requirements:

- 1) Complying to the requirements for Type HT chimneys in the standard code for Factory-Built Chimneys for Residential Type and Building Heating Appliance, UL 103
- 2) A code approved masonry chimney with a flue liner.

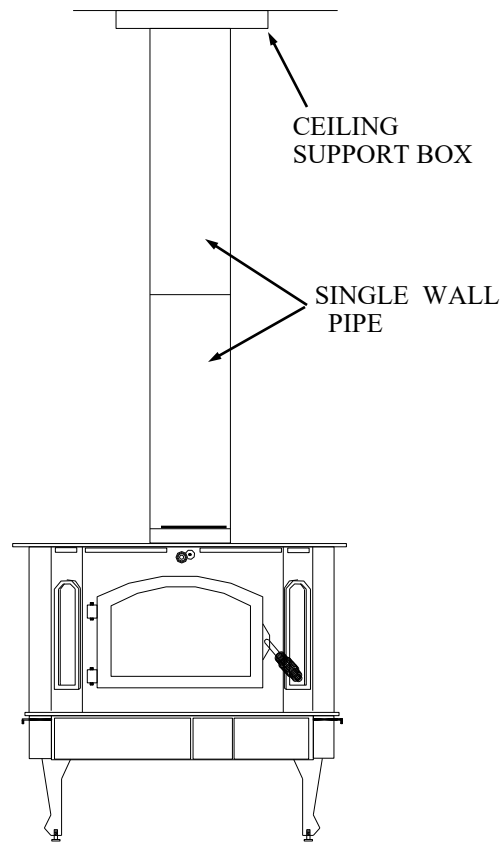


FIGURE 13

DETERMINING CHIMNEY LOCATION

A. Ceiling Exit (Using Single Wall Pipe and UL 103 HT type chimney system)

1. Suspend a plumb bob from ceiling above unit so that weight is hanging in the center of flue exit. (A small weight on a string will serve as a plumb bob.) Mark ceiling where string is suspended to locate center of chimney.
2. After locating the center of the hole, install the ceiling support box, chimney, flashing, and rain cap per the chimney manufacturer’s instructions.
3. Connect stove to ceiling support box by using #24 ga. minimum blued or black steel chimney pipe. (DO NOT use galvanized pipe.) Each section should fit into section below or into opening on stove, for drip-free operation. Secure each section together by using at least three (3) sheet metal screws or rivets. (See Figure 13).

Wall Exit into Metal Tee-Box (Using Single Wall Pipe)

TOOLS FOR INSTALLATION

Drop Cloth
 Electric Drill with 3/32" drill bit
 5/16" combination wrench
 5/16" magnetic socket chuck adapter,
 5/16" wrench (box or socket) or adjustable wrench
 Pencil Socket Set
 Level Tape Measure
 Screw Driver

1. Mark plumb line on the wall directly behind the center of heater. (See Figure 14.)
NOTE: When using #24 ga. min. steel pipe, maintain 18" between pipe and ceiling.
2. Place vertical portion of heater pipe and elbow in position and project a point onto plumb line level with center of elbow.
3. Measure so there will be at least 1/4" rise per foot of horizontal connector pipe, maintaining clearances to ceiling as noted in Figure 14. This will give you the center of the hole for chimney penetration.
4. After locating center of penetration, install tee-box and chimney as per chimney manufacturer's specifications.
5. Connect chimney pipe to tee-box using #24 ga. minimum black steel pipe. (DO NOT use galvanized pipe.) Each section should fit into section below or into opening on stove, for drip-free operation. Secure each section together by using at least three (3) sheet metal screws or rivets.

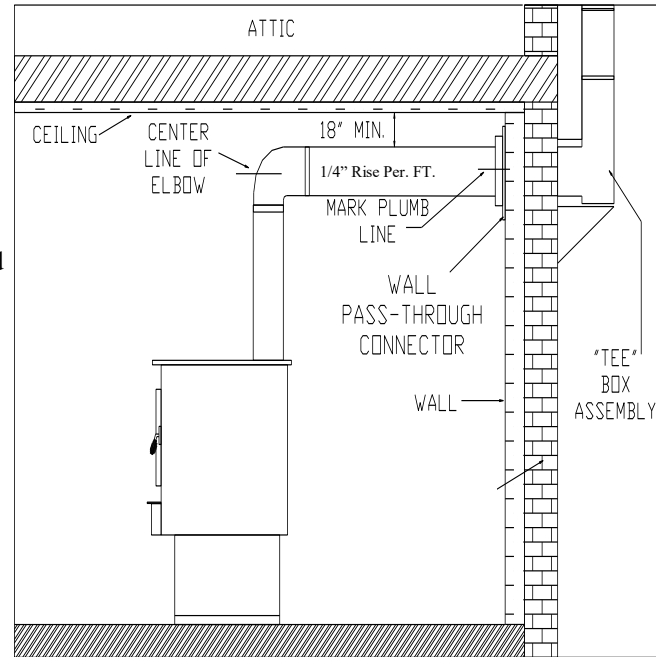


FIGURE 14

Wall Exit Into Masonry (Using Single Wall Pipe)

1. Before connecting Carolina 92 to a masonry chimney, determine if masonry fire-place wall pass-through connector thimble meets **NFPA-211** Code and local building codes and is a minimum of 18" from ceiling. See Figure 15. If connector thimble does not meet these codes, the pass-through connector must be modified.

Connectors may pass through walls or partitions constructed of combustible material if connector is:

- (a) Either listed for wall pass-through or is routed through a device listed for wall pass-through and is installed in accordance with conditions of listing.
- (b) Selected or fabricated in accordance with conditions and clearances as stated in **NFPA 211**-Code. Any unexposed metal that is used as part of a wall pass-through system and is exposed to flue gases shall be constructed of stainless steel or other equivalent material that will resist corrosion, softening, or cracking from flue gases at temperatures up to 1800° F.

In addition, a connector to a masonry chimney shall extend through wall to the inner face or liner but not beyond, and shall be firmly cemented to masonry.

EXCEPTION: A thimble may be used to facilitate removal of chimney connector for cleaning, in which case thimble shall be permanently cemented in place with high temperature cement.

2. Once through-the-wall thimble codes are met, simply connect chimney pipe to the wall pass-through connector using #24 ga. minimum black steel pipe as follows:
 - (a) Maintain 1/4" rise per foot (horizontal length) from the appliance to chimney.
 - (b) Each section of pipe should fit into section below or into opening on the stove for drip-free operation.
 - (c) Secure each section to each other using at least three (3) sheet metal screws or rivets.

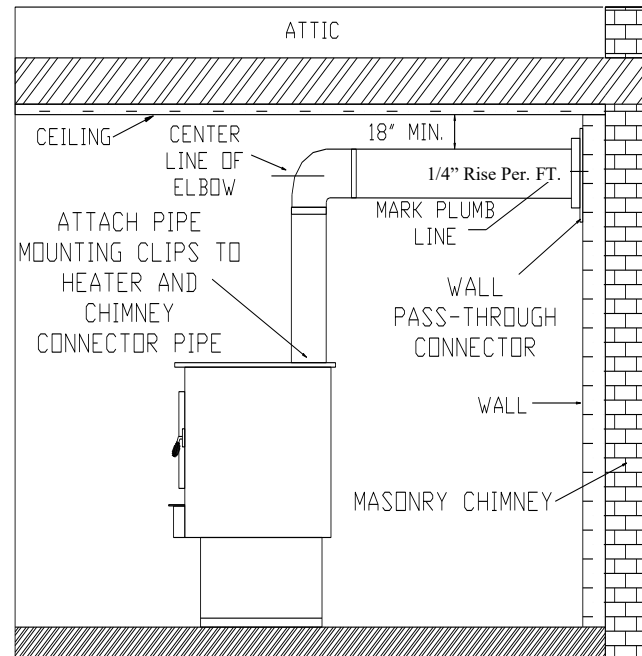


FIGURE 15

CLOSE CLEARANCE INSTALLATIONS (in inches)

Close clearance installation is possible by using 2100° double-wall chimney pipe. (See Figure 16 and Figure 17 for clearances.)

Clearance from combustible walls and ceilings.

(Using double wall chimney connector)

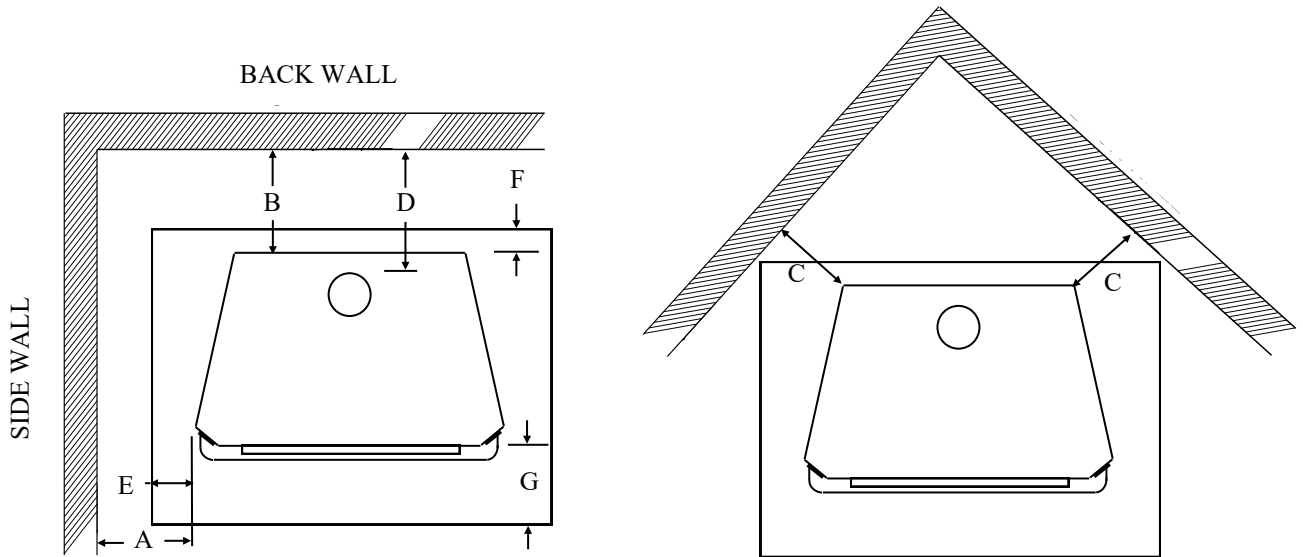


FIGURE 16

MINIMUM CLEARANCES

FIGURE 17

	A	B	C	D	E	F	G
CAROLINA 92	14"	14"	12"	16"	8"	8"	

FLOOR PROTECTION

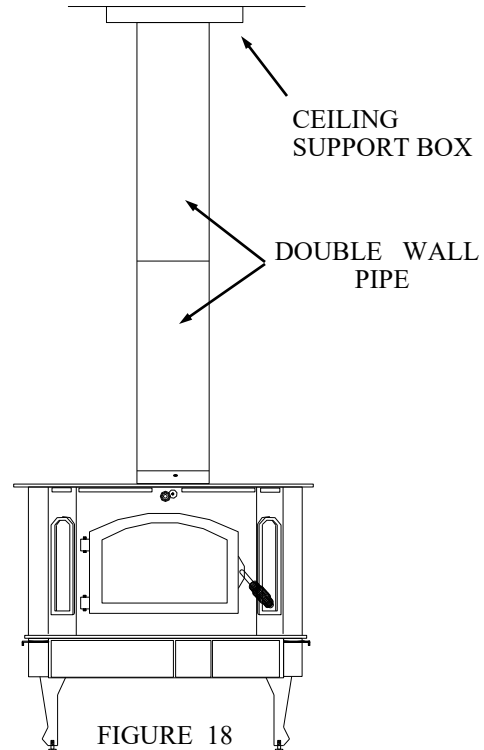
If a freestanding model is to be installed on a combustible floor, a non-combustible pad must be placed under unit to protect floor from burning material from the stove. The pad must be 50 inches wide. **NOTE:** The floor must extend 16" from door opening in front of stove, 8" from door opening on each side of unit and should be under the chimney connector.

Floor protector must be 3/8" in minimum thickness, non-combustible material.

Ceiling Exit - Close Clearance

1. Suspend a plumb bob from ceiling above unit so that weight is hanging in the center of flue exit. (A small weight on a string will serve as a plumb bob.) Mark ceiling where string is suspended to locate center of chimney hole.
2. After locating center of hole, install ceiling support box, chimney, flashing and rain cap.
3. Install Double Wall Connector and chimney system per manufacturer's written operating instructions. See manufacturer's list of tested pipes. See example of installation Figure 21.

CAUTION: Because of the high efficiency and low flue gas temperature, freestanding catalytic heaters connected to masonry chimneys with oversized flue liners may encounter drafting problems. A flue liner is recommended to help draft. A poor drafting chimney may result in poor performance from Carolina 92. This is not a defect of the Carolina 92 but a defect in the chimney. This is not a warranty problem with the Carolina 92. Contact dealer for possible solutions for chimney.



Example: The rear clearance for the Carolina 92 from page 19 is 14" (Letter B) (See Figure 16) This clearance may be reduced by 50% to 9" by using either of the wall protection devices mentioned below in Figure 19.

ALTERNATIVES FOR WALL PROTECTION

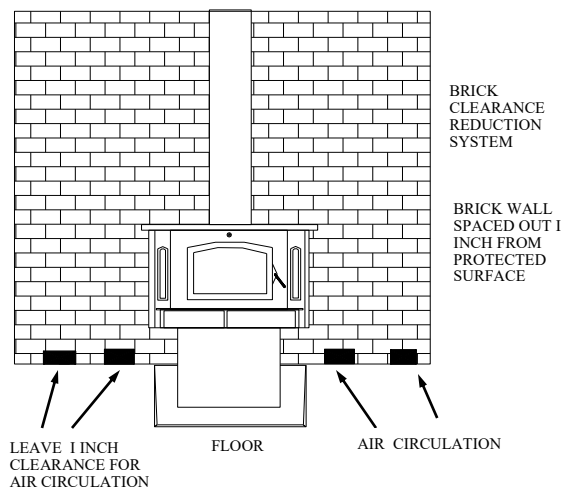
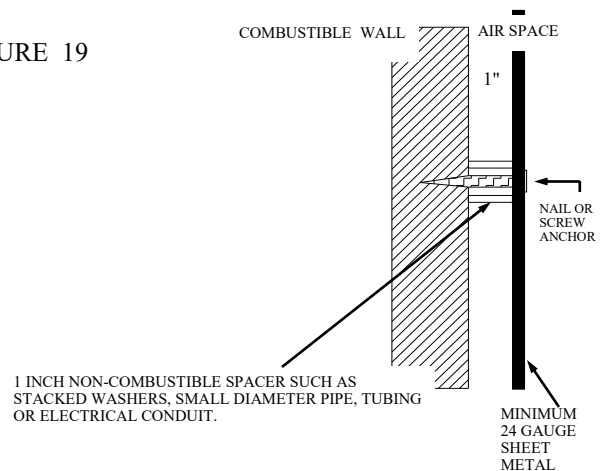
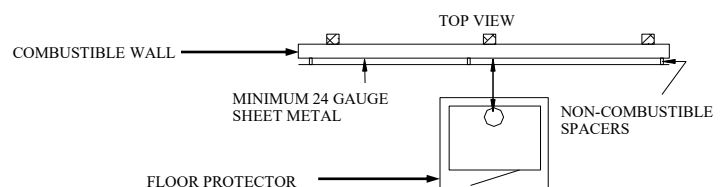
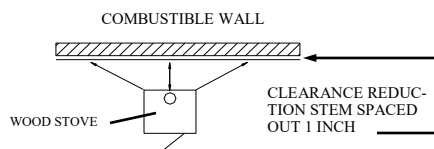


FIGURE 19



BRICK WALLS MAY BE ATTACHED TO COMBUSTIBLE WALLS USING WALL TIES IF BRICK IS USED. BE SURE FLOOR CAN WITHSTAND WEIGHT OF BRICK.

DO NOT USE FASTENERS DIRECTLY BEHIND CHIMNEY CONNECTOR OR STOVE.



Tested and Listed Wall Protector

Clearances to combustibles may be reduced if a tested and listed wall protector is installed over a combustible surface when the following conditions exist:

1. A dead air space of 1" separates listed and tested wall protector from combustible surface.
2. The tested and listed wall protector extends from floor to ceiling with a 1" clearance for air circulation at both floor and ceiling.
3. The 1" spacers (preferably ceramic rather than metal) must be located at corners rather than behind heater or chimney connector.

Unlisted and Untested Wall Protector

Wall protectors may be constructed of masonry, 24 gauge or thicker sheet metal, or non-combustible 1/2" thick insulation board. Conditions 2 and 3 above must be observed but, the air space in condition 1 must be increased to 1 1/2".

FINAL CHECK

1. Recheck specified clearances.
2. Remove all foreign material from firebox area.
3. Open primary air draft; shot-gun air draft, and damper bypass. Make sure ash drawer is sealed properly.
4. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly.
5. Place 4 or 5 pieces of newspaper in stove. Light paper and close door. Ensure that stove draws properly through primary drafts.
6. Check for smoke leaks around door.
7. Open door (slowly) and check for smoke escaping from front of stove. Smoking usually indicates a defective or poorly positioned chimney. Some chimneys with a marginal draft can be preheated by lighting newspaper and holding it near open damper with a poker or fire tong. Once chimney heats up, a proper draft can usually be obtained.
NOTE: A poor drafting chimney can lead to poor heater performance. This is not a defect of heater, but with the chimney. Poor performance due to a poor drafting chimney is **NOT** a warranty problem. If a thorough review of Troubleshooting Guide does not solve your problem, contact your dealer for assistance. If homeowner installed unit himself, there generally is a charge for dealer to service stove and inspect installation.
8. The unit is painted with a specially formulated high temperature paint that cures during the first two or three firings. **DO NOT BUILD A LARGE ROARING FIRE UNTIL THIS CURING IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.** (Paint may blister or peel off. This is not covered by warranty.) You may notice a slight smoking effect and an odor of burning paint when you build the first fires. This is normal and is not a cause for alarm. In some cases these fumes will activate a smoke alarm. Opening a window near unit will allow these fumes to escape.

SECTION IV

WOOD HEATER SAFETY


Certain safety hazards are inherent in any wood heater installation. You should be aware of these so that a safe and proper installation can be made.

1. **FAULTY CHIMNEY:** An older masonry chimney should be thoroughly checked to be sure there are no holes or weak spots which could allow sparks or hot gases to escape. If any of these are present, a positive liner should be installed before heater is installed.
2. **HEAT CONDUCTION:** Placing combustible materials too close to a heater or chimney can be a fire hazard.

By keeping these particular hazards in mind as you install and use your room heater you can ensure a safe, reliable installation.

NOTE: Correctly place monitors in those areas that are expected to produce CO. Consult with your local fire safety officials to learn more.


The connector and/or chimney should be inspected at least once a year before heating season to determine if a creosote buildup has occurred. Any buildup of soot should be removed to prevent risk of a chimney fire. To remove chimney or chimney connector, remove screws and/or fasteners. Remove pipe and clean with a steel wire brush. Replace chimney or chimney connector and replace screws and/or fasteners.

 **CAUTION: NEVER** use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid or similar liquids to start or “freshen up” a fire in the heater. Keep all such liquids well away from the stove when it is in use. All fluids of this type give off volatile fumes and can **WILL EXPLODE!!** Don’t take a chance with the safety of your home and family.

WARNING: Hot while in operation. Keep children, clothing and furniture away from stove. Contact may cause skin burns.

HELPFUL HINTS

CURING THE PAINT ON YOUR HEATER: During the first several firings, burn small fires to cure paint and to prevent damage to the finish. It is a good idea to flip the toggle switch to “Manual” position during these first firings so the blower will run continuously. This will allow paint to cure at a slower rate and creates a better overall finish.

 **CAUTION:** Never remove ashes from your heater with the blower running.

TIPS ON FIRE BURNING

GREEN WOOD vs. NATURAL SEASONED HARD WOOD-Green wood has a high moisture content and therefore requires a hotter ignition temperature. Seasoned wood- cut at least one year before use allows for a quicker, prolonged burn and more complete combustion.

SPLIT WOOD vs. ROUND WOOD- Split wood burns easier and more rapidly, whether it’s seasoned or green. If used after starting a fire, it should be packed tightly to achieve a longer burn.

Round wood burns longer, but requires more effort to start. Inserting a round piece over a bed of red coals with damper and drafts open will help it catch fire. Round wood should be used to accomplish an all-night burn.

SECTION V

OPERATION

This section of the manual is to help you get maximum efficiency and maximum smoke (particulate) reduction from your Carolina 92 heater. If you should experience any difficulty or have questions concerning your heater, contact your Carolina 92 dealer for assistance.

1. To maximize the efficiency of your wood stove make sure it is sized properly for the space you plan to heat. Consult with your dealer for sizing your stove correctly.
2. Use dry, seasoned wood only. Using wet wood will greatly reduce your efficiency.
3. Consult with your installer/dealer to correctly place the stove in your home. An incorrectly placed stove can greatly reduce efficiency. Maximizing the efficiency of your stove will heat your house quickly, burn cleaner and use less wood.

Dry your split wood and stacked crisscross to allow for proper seasoning for 6-12 months (See Page 7 Bottom Picture) when ready to burn place the wood from front to back position in heater.

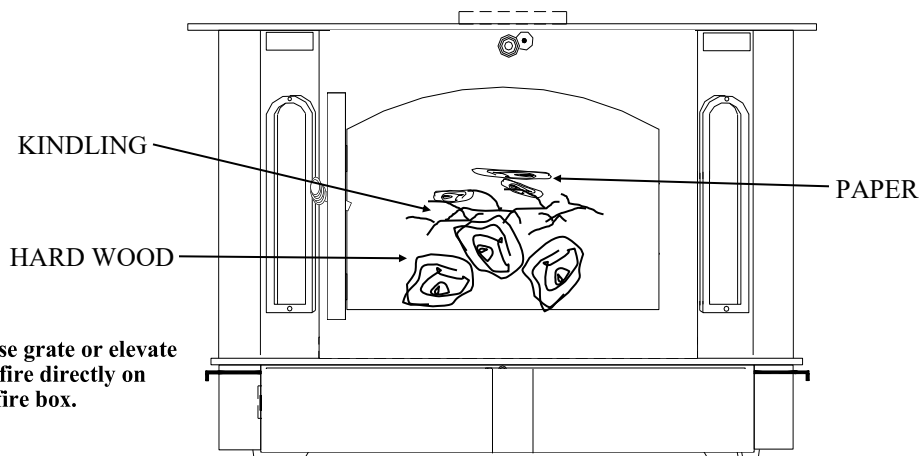
"This wood heater has a manufacturer set closed burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instruction in this manual."

NOTE: Following all suggested operating and maintenance procedures will help minimize visual emissions.

GUIDE TO THE DIFFERENT BURNING QUALITIES OF WOOD

Type of Wood	Ease of Starting	Coaling Qualities	Amount of Sparks
Apple	Poor	Excellent	Few
Ash	Fair	Good	Few
Beech	Poor	Good	Few
Birch	Good	Excellent	Moderate
Cherry	Poor	Excellent	Few
Cedar	Excellent	Poor	Many
Elm	Fair	Good	Very Few
Hemlock	Good	Low	Many
Hickory	Fair	Excellent	Moderate
Locust	Poor	Excellent	Very Few
Maple	Poor	Excellent	Few
Oak	Poor	Excellent	Few
Pine	Excellent	Poor	Moderate

The National Audubon Society recently charted the heat produced by a wood fire. They noted that heat produced by a wood fire varies greatly with kind of wood burned. Beech is considered best wood for a fire. A cord of well-seasoned Beech will produce as much heat as 169 gallons of fuel oil; Sugar Maple and Red Oak produce as much heat as 166 gallons of fuel oil; followed by White Ash 154; American Elm 130; White Birch 124; and White Pine 94.



NOTE: Do not use grate or elevate fire. Build wood fire directly on inner bottom of fire box.

BUILDING A FIRE:

1. Place "Manual/Off/Automatic" switch in "Automatic" (bottom) position for thermostat control operation. Turn rheostat knob clockwise (it will click from "Off" position to "On") so you can vary the speed of motor.
2. Open door.
3. While looking inside firebox, operate damper bypass plate in and out observing movement. This should operate freely and close completely. Open damper bypass. (Pull Out)
4. Open air controls on each side of stove (Pull Out).

The Carolina 92 is not designed for use with grates and irons or other methods of supporting the fuel.

NOTE: Do not use grate or elevate fire. Build wood fire directly on the firebrick of fire box.

DO NOT BUILD A LARGE ROARING FIRE! **Initially**, build 2-3 small fires in order to cure the paint on your stove.

5. Load heater with 2 or 3 pieces of (naturally seasoned hard wood), 2"-3" in diameter **placing it on floor of firebox from front to rear.**
6. Place kindling on top of dried hard wood.
7. Twist 4 or 5 pieces of non-colored newspaper in a roll and place on top of dry kindling.
8. Light newspaper, leave the door open around 2" inches for 1 1/2 to 2 1/2 minutes: Don't leave fire unattended with the door open! Shut the door.
9. After 15 to 20 minutes, close the by-pass damper completely (PUSH IN).
10. After embers and a coal bed have been established, load heater with natural seasoned hard wood, **placing it from front to rear.**
11. Remember on a new stove **DO NOT FILL** firebox during your first 2 to 3 fires! Build 2-3 small fires in order to cure the paint on your stove.

NOTE: THE FUELING DOOR MUST REMAIN CLOSED DURING OPERATION.

NOTE: Your stove is equipped with a automatic thermostat. When the stove gets hot enough, the thermostat will activate the room air blower. Set fan speed according to desired heat output.

NOTE: When refueling or removing ashes turn "OFF" room air blower. Be sure to turn room air blower back on when finished.

NOTE: Do not run power cord underneath heater, or in walk way or heavy traffic areas.

BURN RATES:

- A. **Closed Burn Rate:** Set both air controls on the left and right sides of the stove all the way to the closed position. There is a stop to keep from allowing the primary air to fully close, it 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 instruction in this manual. This burn rate is most desired and most efficient, but can only be achieved after a fire has been established and burning on its own. Close the bypass damper (push in).
 - B. **Low Burn Rate:** Pull right air control out to low which will leave the air opening underneath about 7/16". Leave the left air control pushed in at closed. Set rheostat for fan control between low to medium speed. Close the bypass damper (push in).
 - B. **Medium Burn Rate:** Pull right air control out and set it on med which will leave opening about 11/16". Leave the left air control pushed in at closed. Close bypass damper (push in). Set the rheostat for fan control halfway between low and high.
 - C. **High Burn Rate:** Set both air controls wide open. Have damper closed (push in). Set rheostat for fan control all way on high.
 - D. **Wood Loading:** During refueling, open (pull out) bypass damper to allow smoke in the firebox to escape - wait a few seconds. Open fuel door, if there happens to be any raw pieces left over place them in the rear East/West direction. Slowly add wood North/South direction, front to back . The door should be open less than one minute, close door and bypass damper. Open primary air control wide open for 5-10 minutes to charge wood, making sure the stove is burning clean and the catalyst is above 900° Fahrenheit before shutting down the burn setting.
- ◆ After most of wood has burned and if you are not planning on reloading immediately, it may be necessary to open damper bypass, then door, and rake wood and coals into a pile near front center of firebox. (Be certain wood chunks are pulled out of rear corners.) Close door and damper bypass. This step will assure continued combustion and thorough burning of wood.

You will have to experiment with fire rate until you find the particular setting for heating your home. Chimney drafts, tightness of house, doors, windows, insulation in house and atmospheric conditions all influence which setting you must have, so it may take several firings to learn setting necessary for your installation. Heating capacity is based on BTU output and conditions listed above. These conditions will affect heating capability of your heater.

Although catalytic stoves decrease ash residue, routine removal of excess ash is still necessary.

SECTION VI

PREVENTIVE MAINTENANCE / REPLACEMENT PARTS

THE CATALYSTS



Warning: This product can expose you to chemicals including aluminosilicate. Which is known to the state of California to cause Cancer. For more information, go to www.P65Warning.ca.gov

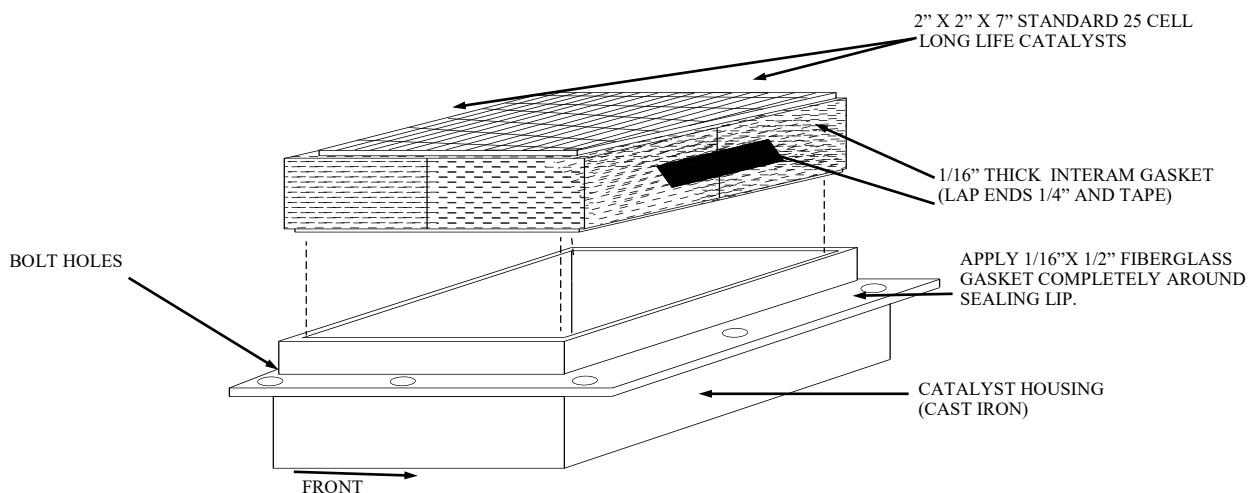
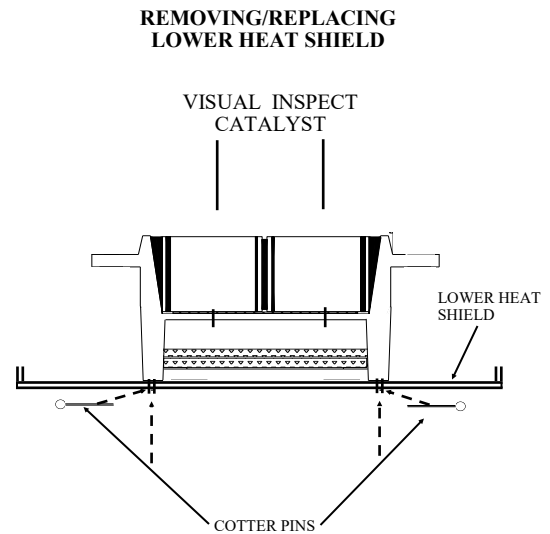
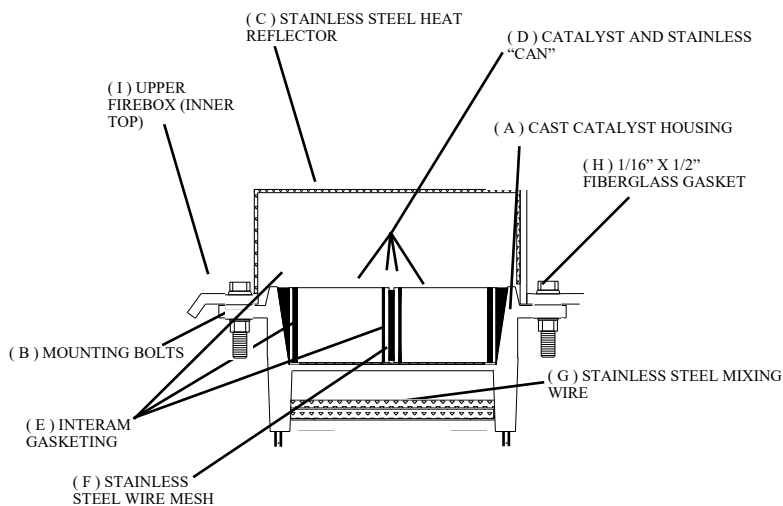
The catalysts in your stove are designed for many years of use. If after several years of use, the efficiency of stove decreases or if a notable amount of smoke is observed, catalysts may need to be replaced. See Catalyst Warranty prior to replacement. The following points are some general guidelines from catalyst manufacturer.

1. Do not “hot fire” stove. For many years retailers and installers have advised customers to build an extra hot fire to burn creosote deposits in fire system. This advice may be acceptable for non-cat stoves, but can be death to a catalyst. Why? Because the catalyst is reducing the particulate, or creosote buildup, therefore need to “hot fire” is eliminated. Proper chimney cleaning procedure should be followed.
2. Direct Flame contact is death to a catalyst. A catalyst burns by-products in the smoke. The gases such as CO, HC, and O² ignite with each other in a chemical reaction in presence of the catalyst (while passing through the honeycomb configuration). Direct flame inhibits this reaction by changing chemical make-up of catalyst breaking down substrate or ceramic. This problem is called **flame impingement**. Today’s modern stoves are designed so that flame impingement is unlikely. However, a strong, fast draft can pull flame into catalyst. Or, a hot fire, with all air controls and/or the ash door open can literally torch the catalyst. The remedy for hot fire related flame is to advise customers not to “hot fire” the stove. The customer will enjoy their catalysts longer and with better performance if these guidelines are followed. Fly ash problems also can be reduced by controlling draft.
3. The **“Glow” Misconception**: A catalyst can glow during certain stages of combustion. The determination that a catalyst is not working simply because it does not glow is inaccurate. During low burn cycle, when catalyst is doing the bulk of its work, it usually does not glow. Also, extremely dry wood (oak, ash, etc.) can burn clean enough not to produce a glow in converter. In most new stoves, you cannot see the catalyst.
4. **Light Off Temperature**: CO conversion in the Applied Ceramics catalyst begins at a very low temperature. Usually, a normal start up to produce a coal bed will produce more than sufficient temperatures to begin catalytic combustion.
5. The catalyst is not consumed or “used up”. The nature of a catalytic reaction is defined as follows, by the American Heritage Dictionary, Second College Edition: catalyst “1. Chem. A substance, usually present in small amounts relative to reactants, that modifies and especially increases rate of a chemical reaction without being consumed in process.” This means your catalyst is always there. This also means that gases that would normally go out flue system and pollute the environment are being burned to create more heat from less wood.
6. Why does a catalyst stop working? Most catalyst that are returned are either destroyed by flame impingement, broken due to accidents or mishandling or have nothing wrong with them but fly ash build-up. A catalyst can be “saturated” with by-products of wood burning such as potassium. This is chemical saturation. The prohibitive chemical will fill in the chemical “holes” that gases normally use for reaction. This process of saturation can be slowed by regular maintenance of catalyst. Saturation can take several years since there are units in use for over five years. Burning garbage, painted woods or large amounts of colored paper can poison your unit. Poisoning, however, is very difficult to do. Burning colored paper causes more of a fly ash problem than a risk of poisoning. **NEVER BURN RUBBER OR PLASTIC.**
7. Burn only dried natural seasoned hard wood. Wood should be dried for at least 12 months prior to burning. The wood should be FREE of any moisture such as RAIN or SNOW. Wet wood creates water vapor which can drop the temperature of catalyst. The results can be plugging, clogging and thermal shock to catalyst. When a catalyst has ceased to be effective, you will notice increased fuel usage and your chimney sweep will notice increased creosote in your system. Before you replace unit, review this section. If you find that your catalyst should be replaced, follow instructions for warranty replacement that were provided when your unit was purchased.
8. Cleaning catalyst with plain water can reduce build-up of catalyst-retarding chemicals. Nothing but a soft brush, low pressure air or plain water should be used to clean a catalyst. The ceramic unit is fragile in comparison to rest of the stove, so it should be handled with care. A soak in warm or hot (not boiling) water for 20 minutes is ideal. Then, allow unit to cool at room temperature and rinse under medium pressure under a faucet. Allow unit to thoroughly dry before reinstalling it or you will damage it. Finally, reinstall unit. A cleaning once every year is sufficient for most users. Clean it when you have your flue system cleaned.

MAINTENANCE

CATALYST REPLACEMENT (Off-Season Replacement Recommended)

1. Spread a drop cloth in front of stove.
2. Open door and clean out any ash.
3. You will have to remove lower stainless steel heat shield. Remove the four cotter pins holding shield in place. Lay shield aside.
4. Using penetrating oil, generously lubricate eight (8) bolt threads holding catalyst housing in place. Allow oil to penetrate.
5. **(A)**. Using a 9/16" wrench or 9/16" socket, loosen eight (8) nuts and remove catalyst housing (drop down) and place in a suitable work area. **(B)**. Nuts holding catalyst are brass. If they strip you will have to order them from dealer. **NOTE: DO NOT REPLACE WITH METAL NUTS.**
6. Using needle nose pliers, grasp front edge of stainless steel "can" which houses catalytic element and pull upward. Reposition pliers to another position and pull upward. Repeat procedure until catalyst can be removed from housing.
7. Using a small putty knife or scraper, remove any gasket that may have adhered to catalyst housing.
8. Now, obtain new catalysts #PO910115C and wrap stainless steel "can" with interam gasket and tape ends together using scotch tape or masking tape. **IMPORTANT: BEFORE STARTING TO REPLACE CATALYST, contact your dealer and order INTERAM gasket and CATALYST HOUSING Gasket.** Gaskets not covered under warranty. It may take your dealer several days to receive the gaskets.
9. Insert new catalysts into catalytic housing and push down until they are seated on the top of stainless steel wire mesh supports.
10. Reinstall catalyst housing into stove and secure in place with brass nuts.
11. Reinstall lower heat shield with cotter pins.
12. The stove is now ready for use.



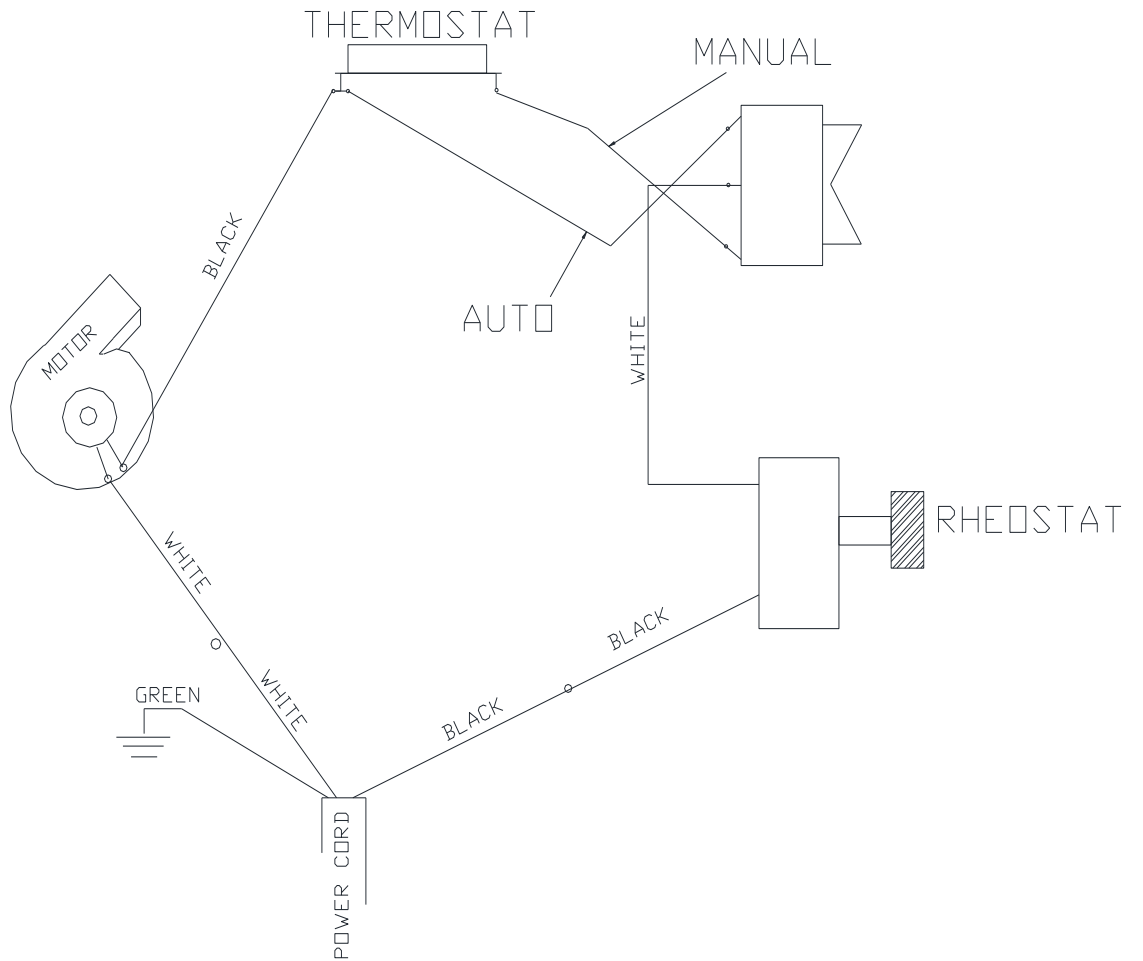
MAINTENANCE

MOTOR ASSEMBLY REPLACEMENT

(Motor, Thermostat, Rheostat, Wiring Harness)

1. Unplug heater from 115V AC outlet.
2. To replace motor you must first take the bottom cover door off. Do this by removing two screws holding it in place with a 5/16" socket, or a nut driver on a drill.
3. Next, looking to the right of the ash pan, you will find a wire screen protecting you from electrical components of this unit. There are two screws on left side of screen that hold wire screen in place. Remove two screws holding wire screen and motor assembly to vertical bar.
4. Take off the control knob and nut from the rheostat that is hooked through the wire screen. Mark and unplug wires from rheostat. Mark and unplug wires from switch. Lay wire screen aside.
5. To remove motor, mark and unhook wire servicing motor. You may remove thermostat to make it easier to work in area. Gently slide motor out and while pulling it out move the back of the motor facing you from right to left in a clockwise motion.
6. Place new motor over old motor and locate motor bracket in the same location as was on the old motor and mark holes on new motor. Remove motor bracket from old motor, line up with marks on new motor and secure bracket to new motor with screws from original motor assembly.
7. To replace motor, turn motor so that 4"x4" air discharge opening is pointing toward back of stove. The flat part of motor housing is turned up. With the air discharge opening pointing in the 2 o'clock position, start in toward unit. Rotating the back of motor counterclockwise. The air discharge opening of motor housing fits in a cavity in back of unit, that will direct air flow to proper location. Make sure air discharge opening is located firmly in opening. If thermostat was removed, replace thermostat in bracket.
8. Hook up wiring to all components, if you have replaced or unhooked them to rewire motor, rheostat or switch. If you need to see wiring diagram see page 28. If rheostat was removed, replace rheostat on to screen housing with the nut and replace control knob, reconnect wires to switch.
9. Replace motor and wire screen. Hold motor with bracket and wire cage over holes in vertical bar. Fasten motor bracket and wire cage to bar at same time to vertical bar to right of ash pan. Replace bottom cover door.
10. To replace the thermostat and to remove wire screen, follow steps 1 through 3. Gently push the thermostat up and out of thermostat bracket and replace with new thermostat. Follow step 8 and 9 to reinstall wire screen.
11. Plug heater back into a 115V AC outlet.

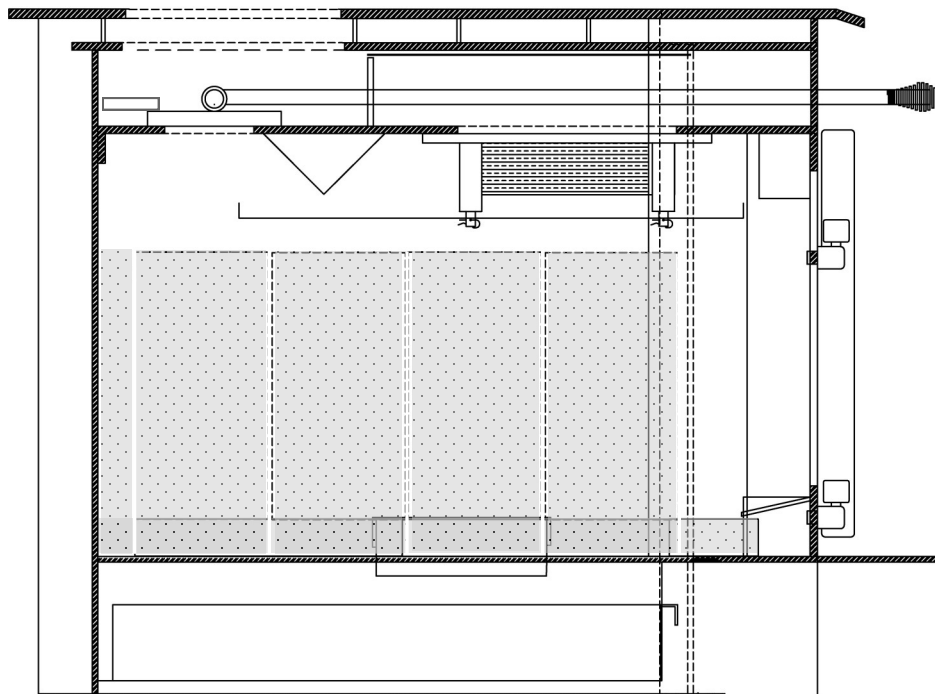
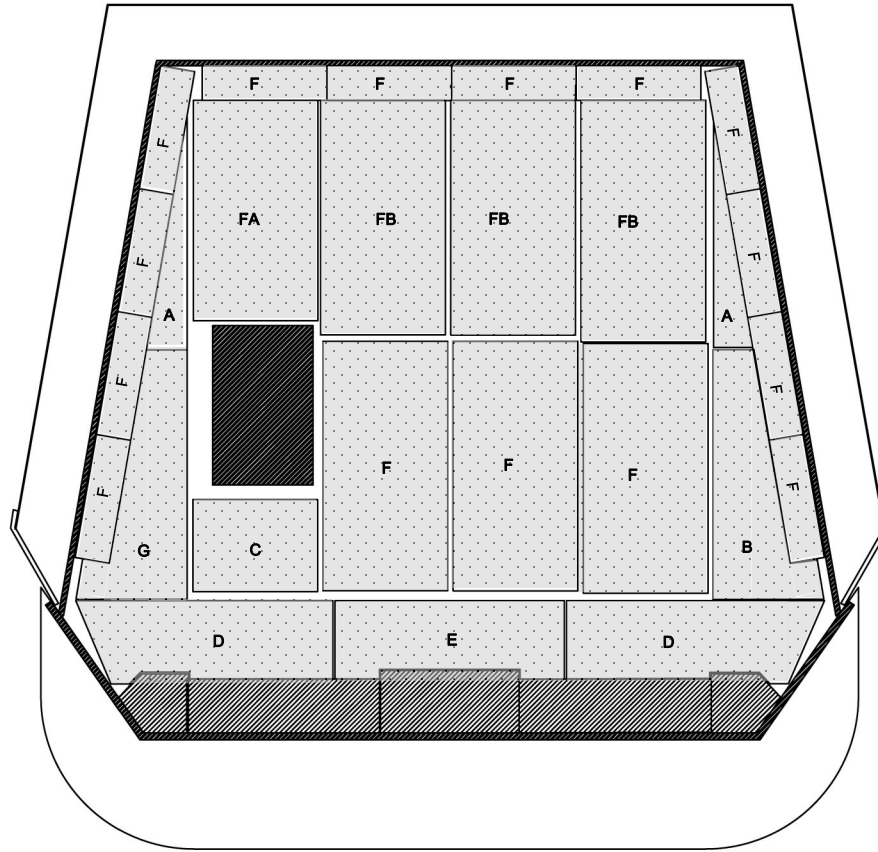
MAINTENANCE WIRING SCHEMATIC



MAINTENANCE

BRICK LAYOUT

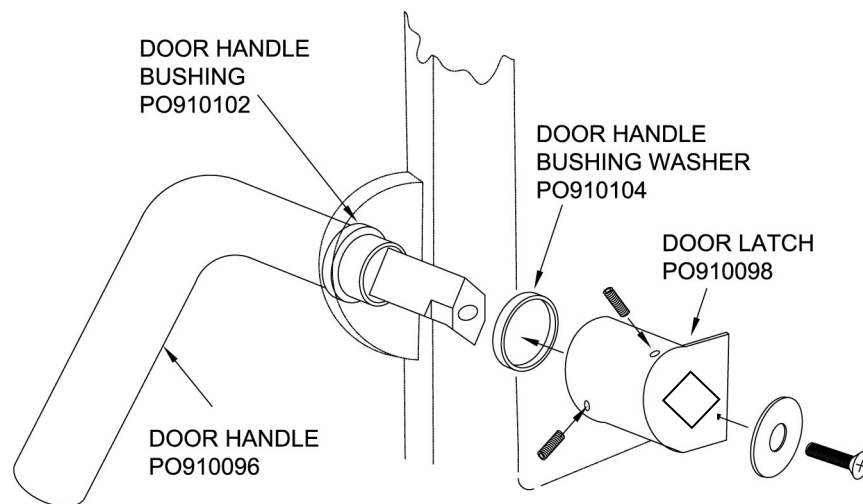
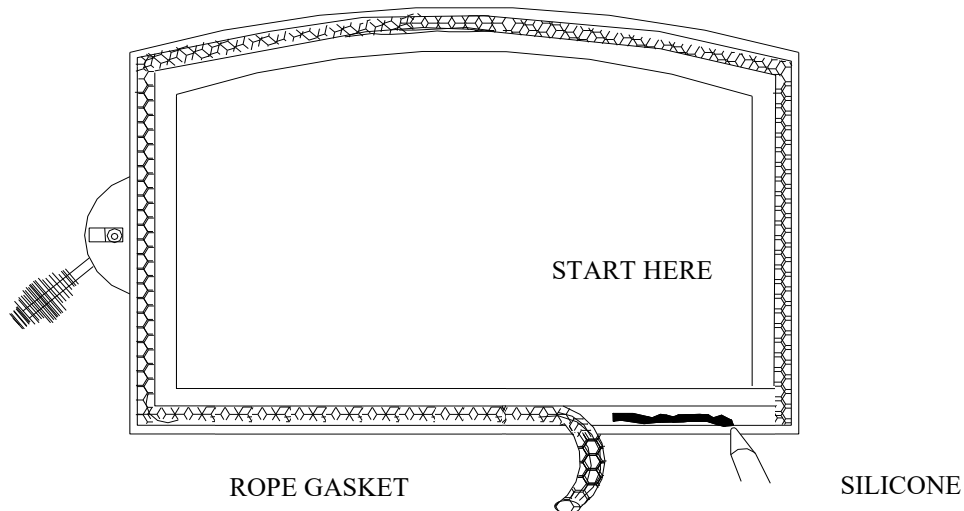
TOP VIEW



MAINTENANCE

DOOR GASKET REPLACEMENT (COLD HEATER)

1. To replace deteriorated gaskets, the following steps must be taken to ensure proper installation of gaskets.
2. Using pliers remove any worn and deteriorated gaskets.
3. Obtain proper gaskets and silicone glue from your local dealer.
4. Using a scraper, wire brush and sandpaper or steel wool, clean glue and gasket residue from door frame.
5. Measure and cut gaskets to length. Care should be taken not to stretch gaskets. What you want is a full and loose gasket weave after attachment to framing.
6. Obtain silicone glue and run a 3/16" bead inside door frame.
7. Obtain gasket (s) and place in gasket channel areas starting at lower right corner, See Below. Use a technique which assures that gasket is applied in a loose like manner. **DO NOT STRETCH GASKETS.**
8. After gasket (s) are applied to glue, use your finger and go over all gasket gently pressing gasket to the channel. Use same pressure against gasket so that final result is an evenly applied gasket.
9. Leave door open and allow at least two (2) hours for glue to dry.
10. Once gaskets are checked, heater is ready for use.
11. This should be done annually. Allowing gaskets to deteriorate can cause over-firing and shorten burn time.



MAINTENANCE

CHECK CHIMNEY

- A. Chimney should be inspected once a year.
- B. The chimney should be cleaned as necessary to remove creosote, soot, leaves, birds' nests, etc.

NOTE: A chimney cap may be installed to prevent moisture from entering chimney, to prevent sparks and burning materials from escaping chimney and to keep birds and foreign materials from entering.

NOTE: Some areas may require an approved spark arrestor.

CLEANING THE HEATER

- A. The heater should not be cleaned with any type of detergent as most all detergents have an oil base and cannot be painted over.
- B. The heater should be lightly sanded with fine sandpaper or steel wool, then repainted or touched up with high temperature paint.
- C. If the heater is located in a moist or damp location, check thoroughly for signs of condensation during times when heater is not in use.
- D. When heating season is over, heater should be cleaned out completely with a wire brush or cloth to help eliminate ash and burned wood smell.

CARE OF GLASS DOOR

The glass door on your heater permits you to enjoy the beauty of the fire while retaining efficiency of your heater. Although the type of glass used in the stove door has well established and recognized heat resistant and strength characteristics, it can be broken through improper care. To achieve maximum utility and safety of your glass door, we advise that you observe following use and safety tips:

1. Inspect glass regularly for cracks or breaks. If you detect a crack or break extinguish fire immediately and return door to your dealer for glass replacement before further use.
2. Do not slam heater door or otherwise impact glass. When closing door, make sure that no logs or other objects protrude to impact against glass.
3. Do not clean glass with materials which may scratch it (such as steel wool) or otherwise damage glass. Scratches on the glass can develop into cracks or breaks.

The glass can be cleaned with a commercial oven cleaner, providing it does not contain abrasives. A build-up on glass that has been there for a considerable length of time can be burned off with a propane torch or straight razor blade. Use protective gloves when using razor.

REPLACEMENT PARTS FOR CAROLINA 92

	Description	Quantity	Part Number
1.	Door Handle Assembly	1	PA 910096
2.	Door Latch	1	PC 910098
3.	Door Handle Washer	1	PH316916FW
4.	Front Door Bushing	1	PO 910102
5.	Door Handle Bushing Washer	1	PO910104
6.	Door Black	1	PA 912651B
6.	Door Gold	1	PA 912651G
7.	Door Pewter	1	PA 912651P
8.	Carling 3 Position Auto/Off/Man Switch	1	PE RC211RB
9.	Thermostat 110° Disc	1	PE 400132
10.	Power Cord	1	PE 400240
11.	Strain Relief	1	PE 400320
12.	Motor	1	PE 910714
13.	Rheostat	1	PE BC204
14.	Rheostat Knob	1	PE BC204A
15.	Glass	1	PG 265191GL
16.	Glass (Bay Side)	2	PG 27BSGL
17.	Bay Glass Overlay Black	2	PO 910454
18.	Bay Glass Overlay Gold	2	PO 910454G
19.	Bay Glass Overlay Pewter	2	PO 910454P
20.	Glass Clip	1	PO 912651
21.	Glass Clip Screws	1	PH 103238HWHS
22.	Large Spring Handle For Door	1	PO 100150B
23.	Small Spring Handle For Damper	1	POBC290B
24.	Shot Gun Air Rod	1	MF 910088
26.	Primary Air Rod	1	MF 910092
27.	Bottom Cover Door	1	MA91COVDOOR
28.	Catalyst Housing	1	PCH91
29.	Catalyst Housing Gasket Intergram 1/16"	1	PO910500
30.	Damper Rod	1	PO910012
31.	Lower Heat Shield	1	PS910011
32.	Catalyst Mixing Wire	1	PS910015
33.	Motor Guard Screen	1	PS 910105
34.	1" X 1" X 1/8" Thick Magnet	2	PODM841
35.	Fire Brick	16	PR900050

SECTION VII

TROUBLESHOOTING

Operation of any wood heater can create problems. While use of a catalytic-combustor equipped stove will substantially lessen some of these problems— such as creosote formation— other traditional wood heater problems may remain.

The following guidelines apply to operation of all wood heaters, with problems related to catalytic heater addressed where appropriate.

HEATER RELATED PROBLEMS

Problem	Possible Cause	Solution
1. Sluggish Heater Performance	1. Obstruction in chimney	1. Check cap and chimney and remove obstruction.
	2. Improperly sealed trim kit or flue liner	2. Check trim kit gasket or direct connect kit seal to fireplace and gasket as necessary to seal unit. Gasket under stove if needed. Check seal or direct connect and correct
	3. Manual damper in chimney is closed	3. Open manual damper or remove damper
	4. Closing bypass or exhaust damper too soon	4. Follow New Buck instructions for proper firing procedures
	5. Poor chimney draft	5. Flue may need extension. Oversized flue may need direct connect or positive liner.
	6. Combustor is plugged	6. See section in “Combustor Related Problems”
	7. Wet or unseasoned wood being burned	7. Burn dry, natural seasoned hard wood
2. High Fuel Consumption	1. Inexperience in catalytic operation	1. Operate stove with desired heat output in mind. Do not be overly concerned with maintaining light-off temperatures
	2. Improper regulation of draft or inlet air	2. Close inlet air control as much as possible to maintain desired heat output. Check gaskets, reinstall fiberglass gasketing around doors and glass as necessary
	3. Air leaking around door frame and/or glass	3. Check door gasket. Check adjustment of door latch.
	4. Bypass damper open	4. Close bypass damper

3. Backpuffing	<ol style="list-style-type: none"> 1. Gusts of wind / windy day 2. Hot combustor. (Above 1400° F) 	<ol style="list-style-type: none"> 1. If flue cap not on chimney, install one. 2. Increase the amount of combustion air slowly
4. Smoke Rollout when Heater Door is Opened	<ol style="list-style-type: none"> 1. Bypass damper is closed 2. Opened door too soon after opening bypass damper 3. Wind gusts blowing 	<ol style="list-style-type: none"> 1. Open bypass damper 2. Open bypass damper– wait 15 -30 seconds before slowly opening door 3. Install flue cap
5. Low Catalytic Temperature	<ol style="list-style-type: none"> 1. Bypass is open 2. Light-off not obtained 3. Fuel charge is spend 4. Combustor coated with fly ash or soot 5. Heater damper down too much 	<ol style="list-style-type: none"> 1. Once light-off temperatures have been reached and unit is stabilized, close bypass 2. Follow manufacturer’s operating instructions 3. Refuel as necessary for combustor operation 4. See Section VII “Preventive Maintenance” 5. Ensure that proper air mixture and draft are available for wood to burn proper
COMBUSTOR-RELATED PROBLEMS		
1. Plugging	<ol style="list-style-type: none"> 1. Burning materials that produce a lot of char and fly ash 2. Burning wet, pitchy wood or burning large loads of small-diameter wood with the combustor in the operating position without light-off taking place 	<ol style="list-style-type: none"> 1. Do not burn materials such as garbage, gift wrap or cardboard 2. Burn dry, natural seasoned hard wood. Don’t place the combustor in the operating position until high temperatures are high enough to initiate light-off
2. Catalyst Peeling	<ol style="list-style-type: none"> 1. Extreme temperatures at combustor surface can cause the catalyst to peel. Over-firing and flame impingement are primary causes 	<ol style="list-style-type: none"> 1. If severe, remove and replace catalysts. See “Catalyst Replacement” Section VI. Avoid extreme temperatures
3. Catalyst Masking	<ol style="list-style-type: none"> 1. Not maintaining light-off temperatures 	<ol style="list-style-type: none"> 1. See Section VI and review operating instruction.
COLORED-GLASS PROBLEMS		
1. Glass Darkens	<ol style="list-style-type: none"> 1. Buildup Creosote on Glass 	<ol style="list-style-type: none"> 1. Cleaning Glass. The glass inside will become colored during use from creosote buildup. The best way to clean glass, COLD STOVE, is to let creosote buildup harden. Then use razor blade to scarp of buildup of creosote. Wash glass using soapy water or glass cleaner.

NEW BUCK CORPORATION (NBC)
“LIMITED WARRANTY” FOR NBC RELATED PRODUCTS

**PLEASE READ THIS WARRANTY CAREFULLY
PRODUCTS COVERED**

This warranty covers heating unit so long as it is owned by original purchaser, including optional and standard accessories purchased at same time, subject to terms, limitations and conditions herein set out.

PRODUCTS NOT COVERED

This warranty does not cover the following:
Glass, Refractory Material, Firebrick, Gaskets or Catalyst.

Catalyst is warranted by Applied Ceramic Inc. 5555 Pleasantdale Road Doraville, Ga. 30340 (770)448-6888

This warranty will not cover any damage and/or failure caused by abuse or improper installation of products covered.

WARRANTY TIME PERIODS

(A) Period I

For one (1) year from date of purchase, NBC will replace or repair, at its option, any part defective in materials or workmanship. The costs of parts only are included. The customer pays any labor or transportation charges required.

Thereafter

(B) Period II

For period after the first (5) year from the date of purchase and extending for five (5) years as long as related product is owned by original purchaser, NBC will repair or replace at its option, any part defective in materials or workmanship, with exception of: electrical motors, wiring, switches, components, optional and standard accessories and all parts not permanently attached to heating unit. Parts not permanently attached to heating unit are defined as those items designed to be removed from unit, including those removable with common hand tools. The cost of parts only are included. The customer pays any labor or transportation charges required.

PROCEDURE

Should you feel that your **heater** is defective, you should contact any NBC dealer for name of your nearest authorized heater service representative, who will instruct you on proper procedure, depending on which Warranty Time Period (Period I or Period II) applies.

If for any reason you are dissatisfied with the suggested procedures, you may contact us in writing at:

**NEW BUCK CORPORATION
Customer Service Department
P. O. Box 69
Spruce Pine, NC 28777**

CONDITIONS AND EXCLUSIONS

- (A) Replacement of parts may be in form of new or fully reconditioned parts, at NBC's option.
- (B) There are no other warranties express or implied including warranties of Merchantability, Fitness for Purpose or Otherwise except those warranties expressly stated herein.
- (C) **New Buck Corporation** is not liable for indirect, incidental or consequential damages in connection with the use of the product including any cost or expense or providing substitute equipment or service during periods of malfunction or non-use. Some states do not allow exclusion of incidental or consequential damages, so the above exclusion may not apply to you.
- (D) All warranty repairs under this warranty must be performed by an authorized Buck Stove service representative. Repairs or attempted repairs by anyone other than an authorized service representative are not covered under this warranty. In addition, these unauthorized repairs may result in additional malfunctions, correction of which is not covered by warranty.

OTHER RIGHTS

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

OWNER REGISTRATION CARD

The attached Owner Registration Card must be completed in its entirety and mailed within 30 days from date of purchase or from date of installation, if installed by a factory certified installer, to New Buck Corporation, in order for warranty coverage to begin.

PLEASE NOTE: The Owner Registration Card must contain the Authorized Dealer Code Number and the Certified Installer's number (if applicable) for warranty coverage to begin.

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To be completed by selling distributor/ dealer/ customer:

OWNER REGISTRATION CARD

Name _____
(Last) (First)

Address _____

City _____ State _____ Zip _____

CUSTOMER EMAIL:: _____

Carolina 92 _____ Insert: Residential _____
Carolina 92 _____ Freestanding: Residential _____

Serial No. _____

Date of Installation: Day _____ Month _____ Year _____

Installer's Name _____ Certification No. _____

Dealer Name _____

City _____ State _____

Dealer No. _____

Distributor Name _____

Distributor No. _____

Is appliance customer self-installed? Yes _____ No _____

Has appliance been completely checked out? Yes _____ No _____

Has customer been given appliance and operation orientation? Yes _____ No _____

- | | |
|--------------------------------------|---|
| _____ a) Damper/Door Vents | _____ g) Paint Curing |
| _____ b) Door-Handle/ Removing | _____ h) Chimney Safety |
| _____ c) Thermostat-Normal Operation | _____ i) Rain Cap |
| _____ d) Hot Surface Area | _____ j) Wood Preparation |
| _____ e) Speed Control (Rheostat) | _____ k) Installation |
| _____ f) Switch—Manual/Off/Auto | _____ l) Instructions & Clearances -
Self-Installation |

Has customer been given **WARRANTY REVIEW?** Yes _____ No _____

CUSTOMER SIGNATURE _____

New Buck Review

DATE _____

Mail to:

NEW BUCK CORPORATION
P.O. Box 69
200 Ethan Allen Dr.
Spruce Pine, NC 28777
Email: info@buckstove.com

Appendix C: Calibrations



QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com



PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0182484A0912013i231228

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 300kg x 0.	82484A0912013i	#050	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.01	QC033	12/28/23	12/14/22	12/2024

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS		
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:			
100	0.05	HB44	HB44	100	0.01	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
As-Found:		As-Found:		As-Found:		Good Fair Poor		
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Temperature: 19.3°C		
As-Left:		As-Left:		As-Left:				
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>			

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.87	400.01	0.006
200	200.00	200.00	0.005
100	100.02	100.02	0.005
75	75.02	75.02	0.005
50	50.02	50.02	0.005
25	25.00	25.00	0.005

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	7/18/22	7/2024	20221688

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

12/28/23: RH-42.5%

Report prepared/reviewed by: R.A. Date: 12-28-23

Technician: C.Call

Signature: [Signature]

THIS CERTIFICATE SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

Member: National Conference of Standards Laboratories and Weights & Measures

Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: XC-60
 Lab ID #: 53
 Serial #: 1902130
 Calibration Date: 8/1/2024
 Calibration Expiration: 2/1/2025
 Barometric Pressure: 29.93 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer: Apex		Fuke	Aquatech	Dwyer
Model: SK25DA		52 II	DBX2	W17AE
Lab ID#: 47		196	202	124
Calibration Expiration Date: 5/1/2025		1/3/2025	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. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	196.683	150.909	260.397
Standard DGM Temperature (°F)	76.0	77.0	77.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	7.090	5.446	9.498
DGM Temperature (°F)	90.0	92.0	95.0
DGM Pressure (in H ₂ O)	3.34	1.59	2.35
Net Volume for Standard DGM (ft ³)	6.946	5.329	9.196
Net Volume for DGM (ft ³)	7.090	5.446	9.498
Dry Gas Meter γ Factor	0.995	1.000	0.993
γ Factor Deviation From Average	0.995	1.000	0.993

Average Gas Meter γ Factor

0.996

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Technician:

Dry Gas Meter Calibration

DUT

Manufacturer:	Apex
Model:	XC-60
Lab ID #:	54
Serial #:	1902133
Calibration Date:	8/1/2024
Calibration Expiration:	2/1/2025
Barometric Pressure:	29.93 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer:	Apex	Fuke	Aquatech	Dwyer
Model:	SK25DA	52 II	DBX2	W17AE
Lab ID#:	47	196	202	124
Calibration Expiration Date:	5/1/2025	1/3/2025	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. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	156.724	182.210	191.576
Standard DGM Temperature (°F)	73.0	74.0	75.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	5.412	6.423	6.840
DGM Temperature (°F)	77.0	82.0	88.0
DGM Pressure (in H ₂ O)	2.83	3.29	1.54
Net Volume for Standard DGM (ft ³)	5.535	6.435	6.765
Net Volume for DGM (ft ³)	5.412	6.423	6.840
Dry Gas Meter γ Factor	1.021	1.007	1.007
γ Factor Deviation From Average	1.021	1.007	1.007

Average Gas Meter γ Factor

1.012

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: XC-60
 Lab ID #: 55
 Serial #: 810016
 Calibration Date: 8/3/2024
 Calibration Expiration: 2/3/2025
 Barometric Pressure: 29.98 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer: Apex	Apex	Fuke	Aquatech	Dwyer
Model: SK25DA	SK25DA	52 II	DBX2	W17AE
Lab ID#: 47	47	196	202	124
Calibration Expiration Date: 5/1/2025	5/1/2025	1/3/2025	6/17/2025	6/16/2025
Calibration γ Factor: 0.998	0.998			

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	226.392	146.151	296.953
Standard DGM Temperature (°F)	81.0	82.0	82.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	8.064	5.174	10.408
DGM Temperature (°F)	85.0	86.0	86.0
DGM Pressure (in H ₂ O)	0.00	0.00	0.00
Net Volume for Standard DGM (ft ³)	7.995	5.161	10.487
Net Volume for DGM (ft ³)	8.064	5.174	10.408
Dry Gas Meter γ Factor	0.997	1.003	1.013
γ Factor Deviation From Average	0.997	1.003	1.013

Average Gas Meter γ Factor

1.004

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: XC-50-DIR
 Lab ID #: 203
 Serial #: A2204292
 Calibration Date: 8/2/2024
 Calibration Expiration: 2/2/2025
 Barometric Pressure: 29.96 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer: Apex		Fuke	Aquatech	Dwyer
Model: SK25DA		52 II	DBX2	W17AE
Lab ID#: 47		196	202	124
Calibration Expiration Date: 5/1/2025		1/3/2025	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. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	176.263	245.171	145.418
Standard DGM Temperature (°F)	79.0	80.0	81.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	6.331	8.851	5.233
DGM Temperature (°F)	96.0	98.0	98.0
DGM Pressure (in H ₂ O)	1.10	0.81	1.41
Net Volume for Standard DGM (ft ³)	6.225	8.658	5.135
Net Volume for DGM (ft ³)	6.331	8.851	5.233
Dry Gas Meter γ Factor	1.009	1.007	1.007
γ Factor Deviation From Average	1.009	1.007	1.007

Average Gas Meter γ Factor

1.008

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{std} \times (\gamma_{std}) \times (P_{bar} + P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/13.6)]$

Technician:

Report and Certificate of Calibration



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Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620

Report #: 33086-203315-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	40% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	129B
Capacity:	1 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		1.00		Range Resolution:		0.001		Mode Verified:		Pressure	
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±				
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O				
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005				
0.100	0.100	0.100	0.00	0.097	0.00	0.01	0.0067				
0.250	0.247	0.247	0.00	0.247	0.00	0.01	0.0006				
0.500	0.496	0.496	0.00	0.495	0.00	0.01	0.0011				
0.750	0.743	0.743	-0.01	0.743	-0.01	0.01	0.001				
1.000	0.992	0.992	-0.01	0.992	-0.01	0.01	0.0022				
0.750	0.745	0.745	-0.01	0.743	-0.01	0.01	0.006				
0.500	0.496	0.496	0.00	0.496	0.00	0.01	0.0009				
0.250	0.248	0.248	0.00	0.249	0.00	0.01	0.0031				
0.100	0.101	0.101	0.00	0.099	0.00	0.01	0.0049				
0.000	0.009	0.009	0.01	-0.004	0.00	0.01	0.0005				

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).**

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NC SL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature: 

Report and Certificate of Calibration



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Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620

Report #: 33086-203316-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	40% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	129C
Capacity:	5 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		5.00		Range Resolution:		0.01		Mode Verified:		Pressure	
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±				
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O				
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005				
0.50	0.50	0.50	0.00	0.49	-0.01	0.05	0.024				
1.25	1.23	1.23	-0.02	1.24	-0.01	0.05	0.014				
2.50	2.47	2.47	-0.03	2.47	-0.03	0.05	0.017				
3.75	3.71	3.71	-0.04	3.71	-0.04	0.05	0.007				
5.00	4.96	4.96	-0.04	4.95	-0.05	0.05	0.023				
3.75	3.71	3.71	-0.04	3.72	-0.03	0.05	0.041				
2.50	2.47	2.47	-0.03	2.47	-0.03	0.05	0.006				
1.25	1.24	1.24	-0.01	1.24	-0.01	0.05	0.01				
0.50	0.51	0.51	0.01	0.50	0.00	0.05	0.027				
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005				

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

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All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

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Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature: 

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Address
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Local
503-654-9620

Report #: 33086-203317-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	39% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	130B
Capacity:	1 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range: 1.00		Range Resolution: 0.001		Mode Verified: Pressure			
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005
0.100	0.099	0.099	0.00	0.098	0.00	0.01	0.0021
0.250	0.246	0.246	0.00	0.246	0.00	0.01	0.001
0.500	0.493	0.493	-0.01	0.493	-0.01	0.01	0.0009
0.750	0.748	0.748	0.00	0.741	-0.01	0.01	0.0185
1.000	0.991	0.991	-0.01	0.991	-0.01	0.01	0.0026
0.750	0.743	0.743	-0.01	0.742	-0.01	0.01	0.0025
0.500	0.494	0.494	-0.01	0.494	-0.01	0.01	0.0009
0.250	0.247	0.247	0.00	0.248	0.00	0.01	0.0026
0.100	0.098	0.098	0.00	0.100	0.00	0.01	0.0052
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
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Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:



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Report #: 33086-203318-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	39% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	130C
Capacity:	5 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		5.00		Range Resolution:		0.01		Mode Verified:		Pressure	
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±				
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O				
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005				
0.50	0.51	0.51	0.01	0.49	-0.01	0.05	0.034				
1.25	1.20	1.20	-0.05	1.24	-0.01	0.05	0.083				
2.50	2.53	2.53	0.03	2.48	-0.02	0.05	0.127				
3.75	3.70	3.70	-0.05	3.73	-0.02	0.05	0.056				
5.00	4.97	4.97	-0.03	4.98	-0.02	0.05	0.049				
3.75	3.71	3.71	-0.04	3.73	-0.02	0.05	0.061				
2.50	2.46	2.46	-0.04	2.49	-0.01	0.05	0.06				
1.25	1.21	1.21	-0.04	1.24	-0.01	0.05	0.062				
0.50	0.50	0.50	0.00	0.50	0.00	0.05	0.005				
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005				

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**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/NC SL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:





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	DM.STD. ACTUAL	UUT INDICATED	DM STD. ACTUAL
FT/MIN	FT/MIN	DEG. F	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

This Calibration Certificate shall not be reproduced except, in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date:

Approved By:

Cal. Technician:

Calibrated at: Lab

On-Site (Customer's)

06/17/2024

[Signature]

[Signature]

Page 1 of 1



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PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0134307497240612

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
g	0.0001	QC012	6/12/24	12/28/23	12/2024

FUNCTIONAL CHECKS

ECCENTRICITY		LINEARITY		STANDARD DEVIATION			ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:		
100	0.0003	50 x 4	0.0002	100	0.0001		<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
As-Found:		As-Found:		1. 99.9999	5. 99.9999	9. 100.0000	Good Fair Poor
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	2. 99.9999	6. 100.0000	10. 100.0001	
As-Left:		As-Left:		3. 100.0000	7. 100.0000	Result	Temperature: 23.1°C
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	4. 100.0000	8. 100.0000	0.00006	

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9984	200.0000	0.00018
100	99.9991	99.9999	0.00018
50	49.9996	50.0001	0.00017
20	19.9998	20.0000	0.00017
0.1	0.1000	0.1000	0.00017
0.05	0.0499	0.0500	0.00017

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	R.L./Troemner	10kg to 1mg	G782	4/27/24	4/2025	20240900

Permanent Information Concerning this Equipment:

6 month calibration cycle

Comments/Info Concerning this Calibration:

06/12/2024: Cleaned, leveled, and adjusted span. RH=37.8%

Report prepared/reviewed by: TLP

Date: 06-12-2024

Technician: T. Peterson

Signature: [Signature]

THIS CERTIFICATE SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards. Results relate only to the item(s) tested. Unless otherwise noted, statements of conformity do not include measurement

Member: National Conference of Standards Laboratories and Weights & Measures

PT ID: DIRI01

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

PO: 1033

Order Date: 03/08/2021

Authorized By: N/A



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

Property #: 097
User: N/A
Department: N/A
Make: Unknown
Model: 10 Lbs.
Serial #: 097
Description: Mass
Procedure: DCN 500901
Accuracy: Raw Data

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

Parameter

Measurement Data

Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = \bar{U}
Mass								
Raw Data		g	4535.92370000	0.0000000	0.0000000	0.1785299	4536.1022299 g	3.5E-01 \bar{U}

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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Report of Calibration

Firm: PFS-TECO
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22
Purchase Order: 1067
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner
Customer ID: Listed in Table

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Stainless Steel	7.95 g/cm ³	200 mg & 100 mg	ASTM Class 1

Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:

100 g to 1 mg Working Standards Were Calibrated: 07/02/21 Due: 07/31/22 Standards ID: 723318
Mass Comparators Used: MET-05 Tested by: D. Thompson

Conventional Mass: “The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). “Conventional Value of the Result of Weighing in Air” (Previously known as “Apparent Mass vs. 8.0 g/cm³).


Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor $k=2$ for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

page 1 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 05/09/22


Signature David S. Thompson

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Report of Calibration

Firm: PFS-TECO
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22
Purchase Order: 1067
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner
Customer ID: Listed in Table

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.93 to 21.94	760.7 to 760.8	47.8 to 47.9

Conventional Mass Value

Nominal Value	As Found Value (g)	As Found Correction* (mg)	As Left Value (g)	As Left Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200 mg, 1000101395, #109-B	0.2000082	0.0082	0.2000082	0.0082	0.0014	0.010
100 mg, 1000126267, #109-A	0.1000065	0.0065	0.1000065	0.0065	0.0014	0.010

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within ASTM Class 1 tolerances As Found.


Recalibration Due: The customer has requested a 5-year calibration cycle. The calibration due date for these weights is 05/09/27. The values listed above were found at the time of calibration. Any number of factors may cause these items to drift out of calibration before the calibration interval has expired.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2017 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 to 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 05/09/22


Signature David S. Thompson

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Report and Certificate of Calibration



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Toll Free
800-356-4682

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620

Report #: 32664-227238-5 **Customer PO#:** 1107
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: John Steinert
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

LP-00397 Gage Block Set Mitutoyo SN: 509020 Cal: 12/28/2022 Due: 12/28/2024 Vendor: BHD Test and Measurement Report #: 99826
LP-01346 Thermo-Hygrometer Comark SN: 06210350198 Cal: 02/17/2023 Due: 02/28/2024 Vendor: Cal-Cert Range: 122 °F 95 %RH Report #: 28026-67215-4239

Instrument Data

Calibration Date:	January 31, 2024	Reference:	ASME B89.1.13-2013
Calibration Due Date:	January 31, 2025	Cal-Cert Procedure:	CP-010
Calibration Frequency:	12 Months	Indicating System:	Vernier
Manufacturer:	Dwyer	Temperature:	67 °F
Type:	Micrometer	Humidity:	39% RH
Model Number:	Unknown	Asset #:	#217
Serial #:	Unknown	Service Location:	Cal-Cert Lab
Capacity:	1 Inches	As Found:	PASS
Resolution:	0.001 Inches	As Left:	PASS

Instrument Range:	1.000 Inches		Range Resolution:		0.001 Inches	
	Calibration Standard	As Found	As Left Reading 1	As Left Reading 2	Tolerance ±	Expanded Uncertainty
	Inches	Inches	Inches	Inches	Inches	Inches
	0.000	0.000	0.000	0.000	0.001	0.0006
	0.200	0.200	0.200	0.200	0.001	0.0006
	0.400	0.400	0.400	0.400	0.001	0.0006
	0.600	0.600	0.600	0.600	0.001	0.0006
	0.800	0.800	0.800	0.800	0.001	0.0006
	1.000	1.000	1.000	1.000	0.001	0.0006

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs. Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

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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.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Cameron Walling **Date:** January 31, 2024

Technical Manager: Marshall Doyle **Signature:** 



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PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI01C101887029231228

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Mettler	IND570 - 1000lbx0.	C101887029	#190	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.02	QC033	12/28/23	12/14/22	12/2024

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS		
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:			
400	0.10	HB44	HB44	200	0.04	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
As-Found:		As-Found:		As-Found:		Good Fair Poor		
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Temperature: 15.8°C		
As-Left:		As-Left:		As-Left:				
Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>	Pass: <input checked="" type="checkbox"/>	Fail: <input type="checkbox"/>			

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	N/A	1000.02	0.012
600	600.66	599.98	0.011
400	400.46	399.90	0.011
200	200.16	200.00	0.011
100	100.10	99.96	0.011
50	50.04	49.98	0.011

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	7/18/22	7/2024	20221688

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

12/28/23 - Overload at 1000lb AF. 1000lb, 600lb AL readings show overload on node 3. Hysterisis 0.10lb. RH: 45.4%

Report prepared/reviewed by: R. B. Date: 12-28-23

Technician: C.Call

Signature: [Signature]

THIS CERTIFICATE SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

Member: National Conference of Standards Laboratories and Weights & Measures

Report and Certificate of Calibration



www.Cal-Cert.com



Toll Free
800-356-4682

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620

Report #: 32102-201251-4686 Customer PO#: 1102
 Customer Name: PFS TECO
 Customer Address: 11785 SE Highway 212, Suite 305
 City: Clackamas State: OR Zip: 97015
 Contact: Ethan Frederick
 Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

10-00954 Gage Block Set Shars SN: 120018 Cal: 05/26/2023 Due: 05/26/2025 Vendor: American Gage Report #: 109141
LP-00397 Gage Block Set Mitutoyo SN: 509020 Cal: 12/28/2022 Due: 12/28/2024 Vendor: BHD Test and Measurement Report #: 99826
LP-01757 Thermo-Hygrometer Comark SN: 06257740560 Cal: 04/28/2023 Due: 04/28/2024 Report #: 29096-209333-4201

Instrument Data

Calibration Date:	December 6, 2023	Reference:	Manufacturer's Spec
Calibration Due Date:	December 6, 2024	Cal-Cert Procedure:	CP-115
Calibration Frequency:	12 Months	Indicating System:	Stamped
Manufacturer:	Starrett	Temperature:	69 °F
Type:	Tape Measure	Humidity:	51% RH
Model Number:	Exact	Asset #:	207
Serial #:	138054-2203-00002249	Service Location:	Cal-Cert Lab
Capacity:	192.00 Inches	As Found:	Pass
		As Left:	Pass

Instrument Range:	192.000 Inches	Range Resolution:	0.06250 Inches
--------------------------	----------------	--------------------------	----------------

Calibration Standard	As Found Reading	Verification Reading #1	Verification Reading #2
0.2500	0.2500	0.2500	0.2500
1.0000	1.0000	1.0000	1.0000
6.0000	6.0000	6.0000	6.0000
12.0000	12.0000	12.0000	12.0000
64.0000	64.0000	64.0000	64.0000
128.0000	128.0000	128.0000	128.0000
192.0000	192.0000	192.0000	192.0000

Expanded Uncertainty ± 0.07217 Inches

Remarks:

Metric scale not calibrated.

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs. Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
 A2LA is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

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Service Engineer: Scott McGuire Date: December 6, 2023

Technical Manager: Marshall Doyle Signature: *McDoyle*

Report and Certificate of Calibration



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Toll Free
800-356-4662

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620

Report #: 31621-201253-5 **Customer PO#:** 1102
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

LP-00397 Gage Block Set Mitutoyo SN: 509020 Cal: 12/28/2022 Due: 12/28/2024 Vendor: BHD Test and Measurement Report #: 99826
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/30/2023 Due: 01/31/2024 Range: 122 °F 95 %RH Report #: 27747-205513-4239

Instrument Data

Calibration Date:	October 23, 2023	Reference:	ASME B89.1.14 2018
Calibration Due Date:	October 23, 2024	Cal-Cert Procedure:	CP-008
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Mitutoyo	Temperature:	66 °F
Type:	Digital Caliper	Humidity:	51% RH
Model Number:	CD-P6"S	Asset #:	208
Serial #:	B22159310	Service Location:	Cal-Cert Lab
Capacity:	6 Inches	As Found:	PASS
Resolution:	0.0005 Inches	As Left:	PASS

Instrument Range:	6.0000 Inches	Range Resolution:	0.0005 Inches
--------------------------	---------------	--------------------------	---------------

Outside Jaws / Linearity				
Calibration Standard	As Found	As Left Reading 1	As Left Reading 2	Tolerance ±
Inches	Inches	Inches	Inches	Inches
0.0000	0.0000	0.0000	0.0000	0.0000
0.0500	0.0495	0.0495	0.0495	0.0010
0.3000	0.3000	0.3000	0.3000	0.0010
0.6000	0.6000	0.6000	0.6000	0.0010
1.2000	1.1995	1.1995	1.1995	0.0010
2.4000	2.4000	2.4000	2.4000	0.0010
3.5000	3.5000	3.5000	3.5000	0.0010
5.0000	5.0000	5.0000	5.0000	0.0010
6.0000	5.9995	5.9995	5.9995	0.0010

Expanded Uncertainty ± 0.00036 Inches

Scale Shift Verification			
	Target	Measured	Tolerance ±
Resolution Check	0.1005	0.10050	N/A
Depth	1.000	1.00000	0.001
Step	1.000	1.00000	0.001
Inside Jaws	1.000	0.99950	0.001
Inspections			
Jaws Parallel	Acceptable		

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs. Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
 A2LA is recognized under the ILAC mutual recognition agreement (MRA).

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Cameron Walling **Date:** October 23, 2023
Technical Manager: Marshall Doyle **Signature:** *McDoyle*

Caliper CF-008-01

Revision 17 6/30/2023

Thermocouple Readout Calibration

DUT

Manufacturer:	National Instruments
Model:	NI 9213
Lab ID #:	216
Serial #:	1E286FA
Calibration Date:	6/12/2024
Calibration Expiration:	12/12/2024
Barometric Pressure:	29.62 in. Hg



Equipment Used:	Ref. Std. TC Signal Generator
Manufacturer:	Omega
Model:	CL23A
Lab ID#:	165
Cal. Expiration Date:	1/3/2025

Calibrate in accordance with EA-10/11 • EA Guidelines on the Calibration of Temperature Indicators and Simulators by Electrical Simulation and Measurement. Use procedure specified for thermocouple indicators without cold junction compensation.

Use only calibrated, NIST traceable reference standard signal generator.

Stated uncertainty calculated with RSS method with k=2 for a 95% confidence interval.

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.1	0.1	0.906
	500	499.7	0.3	
Tunnel	1000	999.6	0.4	
Type K	1500	1499.4	0.6	
	2000	1999.2	0.8	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.3	0.3	0.906
	500	499.6	0.4	
Flue	1000	999.5	0.5	
Type K	1500	1499.3	0.7	
	2000	1999.1	0.9	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.5	0.5	0.906
	500	499.4	0.6	
Filter A	1000	999.3	0.7	
Type K	1500	1499.1	0.9	
	2000	1998.8	1.2	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	0	0	0.906
	500	500.4	0.4	
Filter B	1000	1000	0	
Type K	1500	1499.1	0.9	
	2000	1998.8	1.2	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-1	1	0.906
	500	498.9	1.1	
Filter C	1000	998.9	1.1	
Type K	1500	1498.7	1.3	
	2000	1998.3	1.7	

Thermocouple Readout Calibration

DUT

Manufacturer:	National Instruments
Model:	NI 9213
Lab ID #:	216
Serial #:	1E286FA
Calibration Date:	6/12/2024
Calibration Expiration:	12/12/2024
Barometric Pressure:	29.62 in. Hg



Equipment Used:	Ref. Std. TC Signal Generator
Manufacturer:	Omega
Model:	CL23A
Lab ID#:	165
Cal. Expiration Date:	1/3/2025

Calibrate in accordance with EA-10/11 • EA Guidelines on the Calibration of Temperature Indicators and Simulators by Electrical Simulation and Measurement. Use procedure specified for thermocouple indicators without cold junction compensation.

Use only calibrated, NIST traceable reference standard signal generator.

Stated uncertainty calculated with RSS method with k=2 for a 95% confidence interval.

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.7	0.7	0.906
	500	499.2	0.8	
Meter A	1000	999.1	0.9	
Type K	1500	1498.9	1.1	
	2000	1998.7	1.3	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-1	1	0.906
	500	499	1	
Meter B	1000	998.9	1.1	
Type K	1500	1498.6	1.4	
	2000	1998.3	1.7	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-1.3	1.3	0.906
	500	498.8	1.2	
Meter C	1000	998.7	1.3	
Type K	1500	1498.5	1.5	
	2000	1998.1	1.9	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-1.1	1.1	0.906
	500	499	1	
FB Top	1000	998.9	1.1	
Type K	1500	1498.6	1.4	
	2000	1998.3	1.7	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-1.2	1.2	0.906
	500	4998.9	4498.9	
FB Bottom	1000	998.8	1.2	
Type K	1500	1498.6	1.4	
	2000	1998.3	1.7	

Thermocouple Readout Calibration

DUT

Manufacturer:	National Instruments
Model:	NI 9213
Lab ID #:	216
Serial #:	1E286FA
Calibration Date:	6/12/2024
Calibration Expiration:	12/12/2024
Barometric Pressure:	29.62 in. Hg



Equipment Used:	Ref. Std. TC Signal Generator
Manufacturer:	Omega
Model:	CL23A
Lab ID#:	165
Cal. Expiration Date:	1/3/2025

Calibrate in accordance with EA-10/11 • EA Guidelines on the Calibration of Temperature Indicators and Simulators by Electrical Simulation and Measurement. Use procedure specified for thermocouple indicators without cold junction compensation.

Use only calibrated, NIST traceable reference standard signal generator.

Stated uncertainty calculated with RSS method with k=2 for a 95% confidence interval.

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.5	0.5	0.906
	500	499.5	0.5	
FB Back	1000	999.4	0.6	
Type K	1500	1499.1	0.9	
	2000	1998.7	1.3	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.6	0.6	0.906
	500	499.3	0.7	
FB Left	1000	999.2	0.8	
Type K	1500	1499	1	
	2000	1998.7	1.3	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.8	0.8	0.906
	500	499.1	0.9	
FB Right	1000	999.1	0.9	
Type K	1500	1498.9	1.1	
	2000	1998.6	1.4	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-0.6	0.6	0.906
	500	499.3	0.7	
Catalyst	1000	999.2	0.8	
Type K	1500	1499.1	0.9	
	2000	1998.8	1.2	

Channel	Std. TC Signal	DUT	Error	Expanded Uncertainty
	0	-1.1	1.1	0.906
	50	49.1	0.9	
Ambient	100	99.1	0.9	
Type T	150	149	1	
	200	199.1	0.9	



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DocNumber: 539508



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CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

LGEPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062-9547

Certificate Issuance Date: 05/08/2023
Linde Order Number: 72422600
Part Number: NI CD17C08E-AS
Customer PO Number: 80430965

Fill Date: 05/02/2023
Lot Number: 70086312207
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 1290 psig 99 ft3

Certified Concentration

Expiration Date:	05/08/2031	NIST Traceable
Cylinder Number:	CC505834	Expanded Uncertainty
16.98 %	Carbon dioxide	± 0.13 %
4.30 %	Carbon monoxide	± 0.03 %
17.16 %	Oxygen	± 0.05 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 05/08/2023 Term: 96 Months Expiration Date: 05/08/2031

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1. Uncertainty above is expressed as absolute expanded uncertainty at a level of confidence of approximately 95% with a coverage factor k = 2. Do Not Use this Standard if Pressure is less than 100 PSIG.

CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. Component: Carbon dioxide
Requested Concentration: 17 %
Certified Concentration: 16.98 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 04/25/2023

Reference Standard: Type / Cylinder #: NTRM / CC725981
Concentration / Uncertainty: 19.34 % ±0.03 %
Expiration Date: 01/12/2027
Traceable to: SRM # / Sample # / Cylinder #: NTRM / 190701 / CC725973
SRM Concentration / Uncertainty: 19.34% ±0.031%
SRM Expiration Date: 01/12/27

First Analysis Data:				Date			
Z:	0	R:	19.34	C:	16.98	Conc:	16.97
R:	19.36	Z:	0	C:	16.99	Conc:	16.98
Z:	0	C:	17	R:	19.35	Conc:	16.99
UOM:	%	Mean Test Assay:		16.98 %			

Second Analysis Data:				Date			
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0

2. Component: Carbon monoxide



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 thoroughly after handling. Do not eat, drink, or smoke when using this product. Wear protective gloves, protective clothing, eye protection, and/or face protection. Read and follow the Safety Data Sheet (SDS) before use.

FIRST AID: IF ON SKIN: wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing. IF exposed or concerned: Get medical advice.



WARNING: This product can expose you to Carbon Monoxide which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Lot No: 1-053-122
Serial Number: CC341544
SPG 5P10162.5VM2
Part Number
PO #: 206483
Expires: 2-2024

NorLAB

To Order Call: 800-657-6672

In Emergency Call: 1-800-424-6300
Norlab, Inc.
898 W. Gower Road
Boise, Idaho 83703