New Buck Corporation

Project # 20-592
Model: 81
Type: Wood-Fired Room Heater
June 3, 2020

ASTM E3053 Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel (EPA ALT-125)

Contact: Mr. Brian Schwock
200 Ethan Allen Drive
Spruce Pine, NC 28777
bschwock@buckstove.com
828-765-6144

Prepared by: Aaron Kravitz, Testing Supervisor

11785 SE Highway 212 – Suite 305
Clackamas, OR 97015-9050
(503) 650-0088
WWW.PFSTECO.COM

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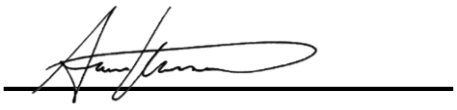
Affidavit

PFS-TECO was contracted by New Buck Corporation to provide testing services for the 81 Wood-Fired Room Heater per ASTM E3053, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel*, which was approved for use under EPA ALT-125. All testing and associated procedures were conducted at Nelke Consulting LLC beginning on 4/7/2020 and ending on 4/9/2020. Nelke Consulting's laboratory is located at 30522 SE Leavenworth Ct, Eagle Creek, OR 97022. Testing procedures followed ASTM E3053, with variances as described in EPA ALT-125. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel,* with the exception of caveats described in EPA ALT-125. A copy of EPA ALT-125 is included in Appendix A for reference, as required by the approval letter.

PFS-TECO is accredited by the U.S. Environmental Protection Agency for the certification and auditing of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards for Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces, Methods 28R, 28WHH, 28 WHH-PTS, and all methods listed in Sections 60.534 and 60.5476. PFS-TECO holds EPA Accreditation Certificate Numbers 4 and 4M (mobile). PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2005 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

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



Aaron Kravitz, Testing Supervisor

Introduction

New Buck Corporation of Spruce Pine, NC contracted with PFS-TECO to perform EPA certification testing on the model 81 Wood-Fired Room Heater. All testing was performed at Nelke Consulting LLC in Eagle Creek, OR. All testing was performed by Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed per ASTM E3053.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- Front filters were changed on sample train A at one hour for all 3 test runs.
- A total of 3 test runs were completed. Test runs were performed in accordance with ASTM E3053. For the three test runs used in the weighted average, no anomalies occurred. See the Run Narrative section for further detail on each run.

Wood Heater Identification and Testing

- Appliance Tested: *81*
- Serial Number: *Un-serialized Prototype – PFS Tracking Number 0064*
- Manufacturer*: New Buck Corporation*
- Catalyst: *No*
- Heat exchange blower: *Optional*
- Type: *Wood Stove*
- Style: *Free Standing*
- Date Received: *Monday, April 06, 2020*
- Testing Period – Start: *Tuesday, April 07, 2020*
  Finish: *Thursday, April 09, 2020 9*
- Test Location: *Nelke Consulting LLC*
  30522 SE Leavenworth Ct, Eagle Creek, OR
- Elevation: *~500 Feet above sea level*
- Test Technician(s): *Aaron Kravitz*
- Observers: *Gary Nelke of Nelke Consulting.*

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Aaron Kravitz. All procedures used are directly from ASTM E3053 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
N/A	United 3'x3' floor scale w/digital weight indicator
050	Digiweigh DWP12i Platform Scale
053	APEX XC-60 Digital Emissions Sampling Box A
054	APEX XC-60 Digital Emissions Sampling Box B
057	California Analytical ZRE CO2/CO/O2 IR ANALYZER
064	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
051	10 lb audit weight
090	Dewalt Tape Measure
092	Digital Calipers
095	Anemometer
111	Microtector
115	Delmhorst Wood Moisture Meter
CC50101	Gas Analyzer Calibration Span Gas
BSG-00543	Gas Analyzer Calibration Zero Gas

Results

The weighted average emissions rate for the 3 run test series was measured to be **1.1 g/hr** with a Higher Heating Value efficiency of **70%.** The average CO emission rate for the 3 tests was **1.1 g/min.** The New Buck Corporation model 81 Wood-Fired Room Heater meets the 2020 cordwood PM emission standard of ≤ 2.5 g/hr per CFR 40 part 60, §60.532 (c).

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

Summary Table

	High Fire Test	Low Fire Test	Medium Fire Test
Date	4/7/2020	4/7/2020	4/9/2020
Run Number	1	2	3
PM Emission Rate (g/hr)	2.66	0.60	0.87
Burn Rate (kg/hr)	4.92	1.18	1.16
Heat Output (BTU/hr)	59,490	13,795	14,193
HHV Efficiency (%)	68.9%	68.6%	71.6%
LHV Efficiency (%)	74.2%	73.9%	77.1%
CO Emissions (g/MJ output)	0.99	3.37	5.61
CO Emissions (g/kg dry fuel)	12.34	41.64	72.43
CO Emissions (g/min)	1.04	0.82	1.40
1st Hour Emission Rate (g/hr)	5.71	2.82	0.90
Weighting Factor (%)	20%	40%	40%
Weighted particulate emission average of 3 test runs: 1.12 grams per hour.			
Weighted average HHV efficiency of 3 test runs: 69.8%.			
Average CO emission rate for 3 test runs: 1.1 grams per minute			

Test Run Narrative

Run 1

Run 1 was performed on 4/7/2020 as a high fire test run per ASTM E3053. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 52 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. Total test time was 148 minutes, main test fuel load burn time was 96 min. The particulate emissions rate from kindling ignition to test completion was 2.66 g/hr. The burn rate of the test fuel load was 4.92 kg/hr. The main test load portion of the run had an overall HHV efficiency of 68.9%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 2

Run 2 was performed on 4/7/2020 as a low fire test run per ASTM E3053. The overall test duration was 559 minutes. The burn rate for the test run was 1.18 kg/hr. The particulate emissions rate for the test run was 0.60 g/hr. The run had an overall HHV efficiency of 68.6%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 3

Run 3 was performed on 4/9/2020 as a medium fire test run per ASTM E3053. The overall test duration was 569 minutes. The burn rate for the test run was 1.16 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (3.05 kg/hr). The particulate emissions rate for the test run was 0.87 g/hr. The run had an overall HHV efficiency of 71.6%. The train A front filter was changed at 1 hr. There were no anomalies and all criteria were met.

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E3053 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	64	84	60	51	29.35	12.4	24.8	24.3%	148
2	80	67	55	61	29.36	24.8	29.54	22.2%	559
3	79	69	29	54	29.05	24.8	29.47	21.6%	569

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	N/A – Cold Start Ignition	Air control set to high fire test setting, blower set to high (auto)
Run 2	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to low fire test setting at 13 minutes. Blower off for first 3 min, then set to low.
Run 4	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to medium fire test setting at 14.5 minutes. Blower off for first 2 minutes, then set to medium.

Appliance Description

Model(s): 81

Appliance Type: Wood-Fired Room Heater

Firebox Volume: 2.48 ft^3

Air Introduction System: Primary Air enters the firebox from the front bottom of the appliance and is channeled up the sides on the appliance and down through the air wash, as well as through a pilot air opening in the front of the firebox. Primary air is controlled via a damper arm located below the ashlip which moves in (open) and out (closed). Secondary air is pulled through a fixed opening adjacent to the primary intake and channeled under the stove and up through 4 secondary air tubes. Dimensions on all these features can be found in Appendix D.

Baffles: A 24" x 15" x 0.50" vermiculite panel rests on top of the secondary air tubes.

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

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

Catalytic Combustor: N/A

Fan: The 81 is available with a convection fan that attached to the lower front of the appliance.

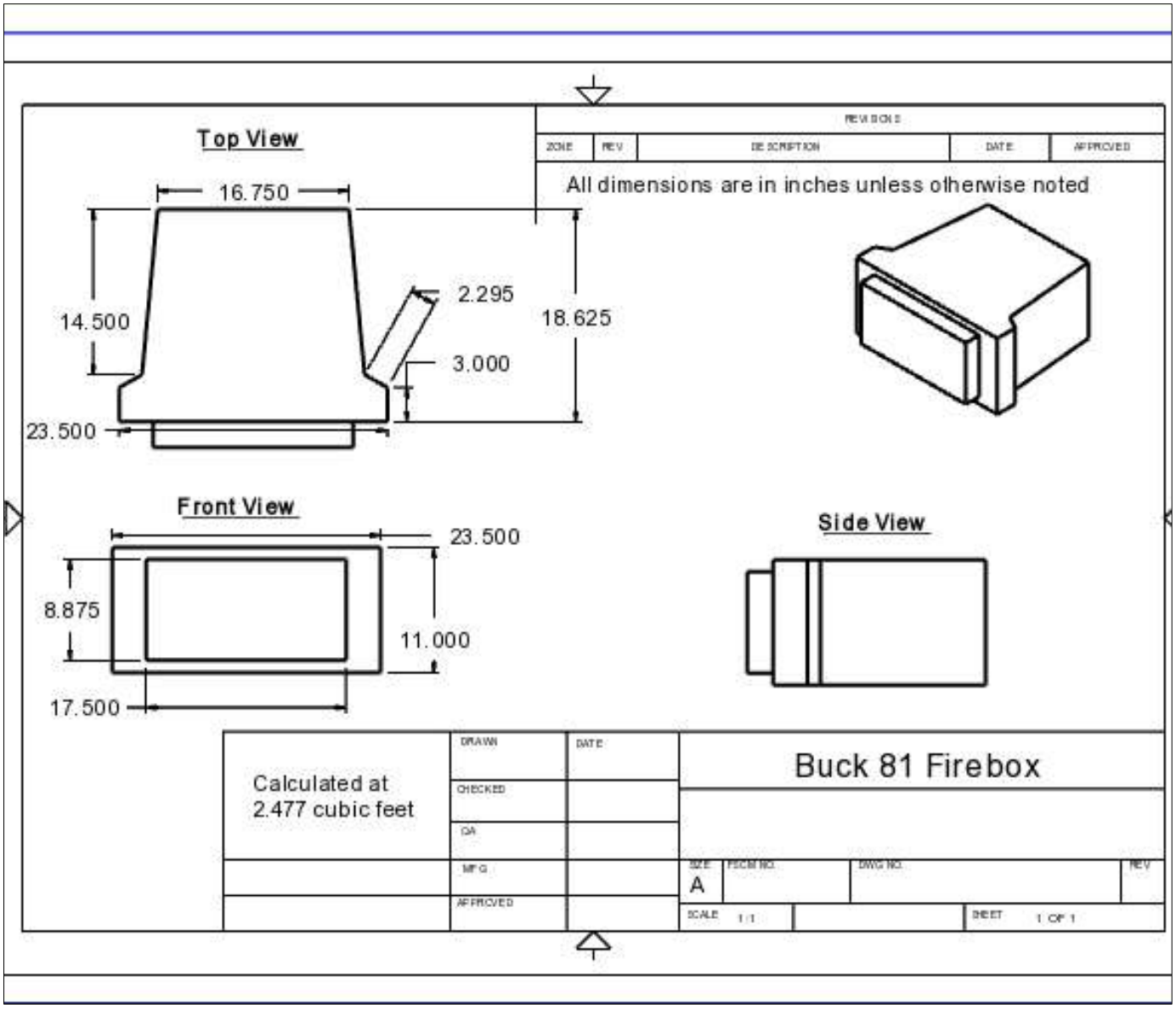
Appliance Dimensions

81 Unit Dimensions

Height	Width	Depth	Firebox Volume
24"	30"	25"	2.48 ft^3

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

Firebox Drawing



Appliance Front

Appliance Left

Appliance Right

Appliance Rear

Test Fuel Properties

Test fuel used was cherry cordwood, split and air-dried to the specified moisture content range. Typical fuel loads are pictured below:

Typical Kindling /Startup Load

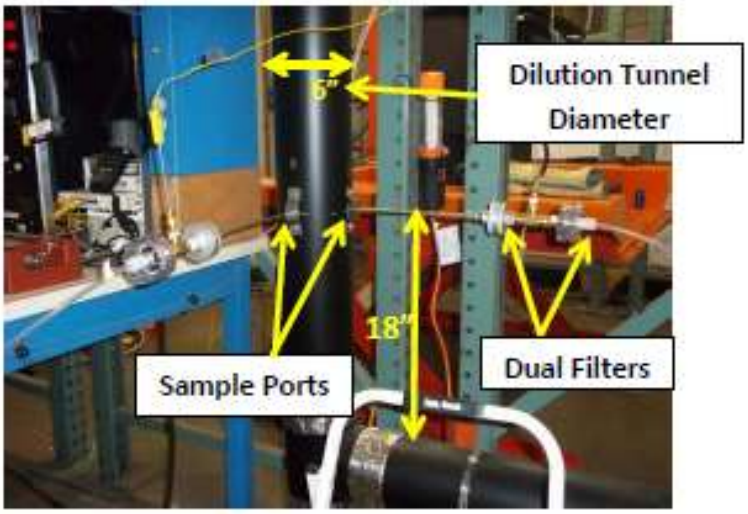
Typical High Fire Load

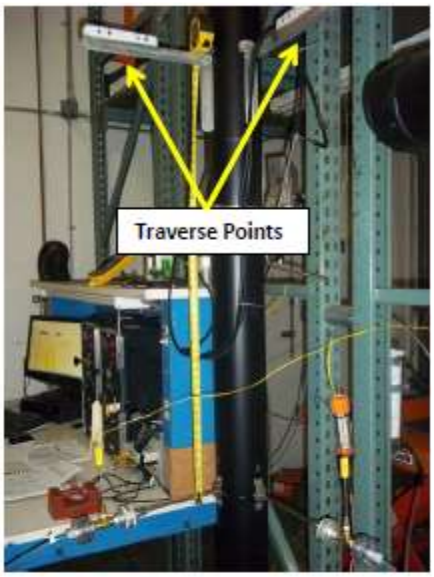
Typical Low Fire Load

Sampling Locations and Descriptions

Sample ports are located 16.5 feet downstream from any disturbances and 1 foot upstream from any disturbances. Flow rate traverse data was collected 12 feet downstream from any disturbances and 5.5 feet upstream from any disturbances. (See below).

Sample Points





Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 6 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used with the exception of caveats described in ALT-125: Pall TX40 Emfab filters were used, filter temperatures were maintained between 80 and 90°F for all tests, filters were weighed in pairs where applicable, and no sampling intervals fell outside of proportional rates of +/- 10%.

Analytical Methods Description

All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings, dessicated for a minimum of 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 Section 10.

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E3053. 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 – Test Run Data, Technician Notes, Sample Analysis, and Alternate Test Method Approval

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

WOOD HEATER TESTING SUMMARY

SECTION 1 – Model Identification	
Model Name(s)/Number(s)	Model 81
Manufacturer	New Buck Corporation
Address 1	200 Ethan Allen Drive
Address 2	Spruce Pine, NC 28777
Appliance Category(s) (Free-standing, Insert, etc.)	Free-Standing
Usable Firebox Volume - ft^3	2.48
Catalytic/Non-Cat	Non-Cat
Convection Air Fan (No, Standard, Optional)	Optional
SECTION 1B – Laboratory Information	
Testing Laboratory	PFS-TECO
Address 1	11785 SE Hwy 212 Ste 305
Address 2	Clackamas, OR 97015
ISO/Accreditation Info	ISO 17025
Dates Tested	4/7/2020 - 4/9/2020
Test Methods/Standards	ASTM E3053 (ALT-125), ASTM E2515
Dilution Tunnel Inside Diameter - in.	6.00
Filter Diameter - mm	47
Filter Material	Pall Type TX40

SECTION 2 – Test Conditions Summary

Test Run #	1	2	3	
Date Tested	4/7/2020	4/7/2020	4/9/2020	
Test Run Category (L, M, H)	High Fire	Low Fire	Medium Fire	
Average Barometric Pressure - in Hg	29.35	29.36	29.05	
Max. Observed Ambient Temp - °F	84	82	86	
Min. Observed Ambient Temp - °F	64	65	68	
Max. Observed Filter Temp - °F	89	87	90	
Test Fuel Load				
Cordwood Fuel Species	Cherry	Cherry	Cherry	
Specific Gravity (from Table 1)	mixed	mixed	mixed	
Higher Heating Value - Btu/lb (from Annex A1)	7757	7757	7757	
Nom. Test Fuel Load Piece Length - in.	16	16	16	
Number of Test Fuel Pieces	5	6	6	
Test Fuel Weight				
Kindling - As Fired lb	4.96	N/A	N/A	
Kindling Wt. - As % of Test Fuel Load	20%	N/A	N/A	
Kindling Moisture - % DB	9%	N/A	N/A	
Kindling - kg DB	2.07	N/A	N/A	
SU Fuel - As Fired lb	7.44	N/A	N/A	
SU Fuel Wt. - As % of Test Fuel Load	30%	N/A	N/A	
SU Fuel Moisture - % DB	21%	N/A	N/A	
SU Fuel - kg DB	2.79	N/A	N/A	
Test Fuel Load - As Fired lb	24.8	29.54	29.47	
Ave. Test Fuel Load MC % DB	24.3%	22.2%	21.6%	
Test Fuel Load - kg DB	9.05	10.97	11.00	
Test Fuel Loading Density - lb/ft3	9.92	11.82	11.79	
Residual SU Fuel Wt. - As Fired lb	2.60	N/A	N/A	
Residual SU Fuel Wt. - As % of Test Fuel Load	10%	N/A	N/A	
Test Run Duration - minutes	148	559	569	
Test Run Duration - h	2.47	9.32	9.48	
Run Duration of High Fire Load Only - minutes	96	N/A	N/A	
Run Duration of High Fire Load Only - h	1.60	N/A	N/A	
Test Fuel Load Wt. at End of Test - As Fired lb	2.6	0	0	
Total Fuel Burned - kg DB	11.55	10.97	11.00	
% Test Fuel Load Wt. at End of Test	10.5%	0.0%	0.0%	

SECTION 3 – Test Run Results Summary

Test Run #	1	2	3	
Date Tested	4/7/20	4/7/20	4/9/20	
Test Run Category	High Fire	Low Fire	Medium Fire	
Burn Rate - kg/h DB	4.92	1.18	1.16	
Heat Output - Btu/h	59,490	13,795	14,193	
Average Dilution Tunnel Flow Rate - dscfm	185.34	201.36	193.12	
Average Sample Flow Rates - dscfm				
Train 1	0.131	0.133	0.134	
Train 2	0.133	0.135	0.137	
Total PM Emissions - g				
Train 1	6.87	5.74	8.89	
Train 2	6.23	5.35	7.57	
Average	6.550	5.545	8.231	
PM Emission Train Precision - %	4.9%	3.6%	8.0%	
PM Emission Train Precision - g/kg	0.03	0.02	0.06	
PM Emission Rate - g/h	2.66	0.60	0.87	
Total CO Emissions - g	100	456	797	
CO Emissions Rate - g/h	62	49	84	
Overall Efficiency - CSA B415.1-10				
% HHV Basis	69%	69%	72%	
% LHV Basis	74%	74%	77%	

SECTION 4 - Weighted Average Summary

Test Run Category	High Fire	Low Fire	Medium Fire
Burn Rate - kg/h DB	4.92	1.18	1.16
PM Emission Rate - g/h	2.66	0.60	0.87
CO Emissions Rate - g/h	62.3	49.0	84.0
Overall Efficiency - CSA B415.1-10			
% HHV Basis	68.9%	68.6%	71.6%
% LHV Basis	74.2%	73.9%	77.1%
Heat Output - Btu/h	59500	13800	14200
Category Weighting	20%	40%	40%

ASTM E 3053 Weighted Averages			
PM Emission Rate - g/h	1.1		
CO Emissions Rate - g/h (Arithmetic Average)	65.1		
CO Emissions Rate - g/min (Arithmetic Average)	1.1		
Overall Efficiency - CSA B415.1-10			
% HHV Basis	69.8%		
% LHV Basis	75.2%		
Heat Output Range - Btu/h	13800	to	59500

Conditioning Data

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	64
Date(s):	11/20/19 - 11/25/19	Technician:	AK

		Average:	334.9	59.3	
Elapsed Time (hrs)	**Scale Reading (lbs)**	**Weight Change (lbs)**	**Flue (°F)**	**Ambient (°F)**	**Catalyst Exit (°F)**
0	9.6	-	570	66	
1	12.9	3.4	461	60	
2	21.7	8.8	320	61	
3	12.9	-8.8	372	64	
4	8.0	-4.9	288	63	
5	15.5	7.5	500	61	
6	7.3	-8.2	347	62	
7	11.2	3.9	430	62	
8	7.8	-3.4	271	60	
9	23.1	15.4	374	58	
10	13.8	-9.3	427	58	
11	9.0	-4.8	311	57	
12	7.3	-1.7	247	56	
13	6.1	-1.2	226	54	
14	5.3	-0.8	183	53	
15	4.7	-0.6	151	52	
16	4.3	-0.4	127	50	
17	4.0	-0.3	103	50	
18	3.7	-0.3	96	49	
19	6.5	2.8	483	56	
20	17.1	10.6	431	61	
21	9.7	-7.4	335	69	
22	18.5	8.8	726	71	
23	9.3	-9.3	400	75	
24	22.3	13.0	476	74	
25	13.5	-8.8	417	73	
26	9.4	-4.1	288	69	
27	15.9	6.5	448	68	
28	10.3	-5.6	339	66	
29	16.0	5.7	468	66	
30	11.2	-4.8	301	64	
31	9.9	-1.3	241	61	
32	8.8	-1.1	200	58	
33	14.3	5.5	403	59	
34	10.0	-4.3	296	57	
35	8.6	-1.4	240	55	
36	7.7	-0.9	210	54	
37	7.0	-0.7	178	52	
38	6.4	-0.6	147	50	
39	6.1	-0.3	112	49	
40	5.9	-0.2	87	47	
41	17.1	11.2	643	47	
42	4.6	-12.5	446	55	
43	17.9	13.3	276	57	
44	7.3	-10.6	457	58	
45	12.5	5.2	505	57	
46	5.7	-6.8	348	57	
47	11.3	5.6	437	62	
48	6.2	-5.1	364	61	
49	4.4	-1.8	255	61	
50	10.2	5.8	320	61	

Signature/Date: 

Sample Calculations – ASTM E3053 & E2515

Client: Buck Stove
Model: 81
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_{Fldb} – Weight of test fuel load, dry basis, lb (kg)

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)

M_{Kdb} - Weight of kindling, dry basis, lb (kg)

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)

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_{RH} - Particulate emission rate for high fire test run, g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned

PM_R – Particulate emission rate for low or medium fire test run, g/hr

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

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)
ASTM E3053 equation (1)

$$M_{Fldb} = \Sigma((M_{FLnwb})(100/(100 + MC_{FLn})))$$

Where,

M_{FLnwb} = Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)

MC_{FLn} = Average fuel moisture of test fuel piece, n, in test fuel load, % dry basis

n = individual test fuel pieces that comprise the test fuel load, as applicable.

Sample Calculation:

n	M_{FLnwb}	MC_{FLn}	$(M_{FLnwb})(100/(100 + MC_{FLn}))$	
1	5.17	26.8	5.17 (100) / (100+ 26.8)) =	4.08
2	5.10	22.3	5.1 (100) / (100+ 22.3)) =	4.17
3	5.15	24.8	5.15 (100) / (100+ 24.8)) =	4.13
4	4.98	24.7	4.98 (100) / (100+ 24.7)) =	3.99
5	4.40	22.7	4.4 (100) / (100+ 22.7)) =	3.59
6	0.00	NA	N/A	-
7	N/A	N/A	N/A	-
			SUM	19.95 lbs

M_{Fldb} = **19.95** lbs

M_{Fldb} = **9.05** kg

· Weight of start-up fuel, dry basis, lb (kg) **M_{Kdb} - Wei**
Ξ3053 equation (2) ASTM E30

$M_{SUdb} = (M_{SUwb})(100/(100 + MC_{SU}))$

Where,

M_{SUwb}	=	Total weight of start-up fuel pieces, wet basis, lb (kg)
MC_{SU}	=	Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample cal

· Calculation:

M_{SUwb} = 7.44
MC_{SU} = 20.9

M_{SUdb} = 7.4 (100/(100+ 20.9)
M_{SUdb} = **6.16** lbs
= **2.79** kg

ght of kindling, dry basis, lb (kg)
53 equation (3)

$M_{Kdb} = (M_{Kwb})(100/(100 + MC_K))$

M_{Kwb} = Weight of kindling per 8.5.6, wet basis, lb (kg);

MC_K = Average moisture of kindling (may be assumed 10%), % dry basis.

culation:

M_{Kwb} = 4.96

MC_K = 8.9

M_{Kdb} = 4.96 (100/(100+ 8.9)

M_{Kdb} = **4.56** lbs

= **2.07** kgs

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)
ASTM E3053 equation (4)

$$M_{FREHdb} = M_{RSUBdb} + M_{FLEHdb}$$

Where,

M_{RSUBdb} = Weight of residual start-up fuel bed when high fire test load added, lb (kg)

M_{FLEHdb} = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

M_{RSUBdb} = 2.6

M_{FLEHdb} = 2.6

M_{FREHdb} = 2.60 + 2.6

M_{FREHdb} = **5.20** lbs

= **2.36** kg

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

ASTM E3053 equation (5)

$$M_{TFBHdb} = M_{Kdb} + M_{SUdb} + M_{FLdb} - M_{FREHdb}$$

Sample Calculation:

M_{Kdb} = 4.56

M_{SUdb} = 6.16

M_{FLdb} = 19.95

M_{FREHdb} = 5.20

M_{TFBHdb} = 4.56 + 6.16 + 19.95 - 5.20

= **25.46** lbs

= **11.55** kg

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

ASTM E3053 equation (6)

$$BR_H = 60 (M_{FLdb} - M_{FLEHdb})/\theta_{H1}$$

Where,

θ_{H1} = Total duration of high fire test run, from time when test fuel load is added to end of test run, min.

Sample calculation:

M_{FLdb} = 19.95

M_{FLEHdb} = 2.60

θ_{H1} = 96

$$BR_H = \frac{60 (19.95 - 2.60)}{96}$$

BR_H = **10.85** lb/hr

= **4.92** kg/hr

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis
ASTM E3053 equation (7)

$$M_{TFBdb} = M_{FLdb} - M_{FREdb}$$

Where,

M_{FLdb} = Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

M_{FREdb} = Weight of remaining fuel at end of low or medium fire test run, lb (kg)

Sample Calculation:

M_{FLdb} = N/A - Applicable to Low/Medium Fire Tests Only

M_{FREdb} = N/A - Applicable to Low/Medium Fire Tests Only

M_{TFBdb} = N/A - N/A

= **N/A** lbs

= **N/A** kg

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)
ASTM E3053 equation (8)

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

Where,

θ = Total test run duration for low or medium fire test run, min.

Sample Calculation:

M_{TFBdb} = N/A - Applicable to Low/Medium Fire Tests Only
θ = N/A - Applicable to Low/Medium Fire Tests Only

$$BR = \frac{60 \text{ x } \text{N/A}}{\text{N/A}}$$

BR = **N/A** lb/hr
= **N/A** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equation (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 H_2O
T_s	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
P_{bar}	=	Barometric pressure at test site, in. Hg
P_g	=	Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)
M_s	=	**The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{18.10}{20.44} = 0.886$$

$$V_s = 0.886 \times 85.49 \times 0.99 \times 0.294 \times \left(\frac{140.1 + 460}{\left(29.35 + \frac{-0.21}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **18.61** ft/s

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

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

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

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

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, ft^2
T_{std}	=	Standard absolute temperature, 528 °R
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
$T_{s(avg)}$	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 18.61 \times 0.1963 \times \frac{528}{140.1 + 460} \times \frac{29.35 + \frac{-0.21}{13.6}}{29.92}$$

Q_{sd} = **11120.3** dscf/hr

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

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

Where:

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

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 19.431 \times 1.012 \times \frac{\left(29.35 + \frac{1.73}{13.6}\right)}{(73.8 + 460)}$$

$V_{m(std)}$ = **19.154** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 19.703 \times 1.008 \times \frac{\left(29.35 + \frac{1.75}{13.6}\right)}{(85.2 + 460)}$$

$V_{m(std)}$ = **18.945** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left(29.35 + \frac{0.00}{13.6}\right)}{(76.6 + 460)}$$

$V_{m(std)}$ = **0** 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 (first hour):

m_n = 0.0 + 4.0 + 0.0

m_n = 4.0 mg

Using equation for Train A (post-first hour):

m_n = 0.1 + -0.6 + 1.3

m_n = 0.8 mg

Train A aggregate:

m_n = 4.0 + 0.8
m_n = **4.8** mg

Using equation for Train B:

m_n = 0.2 + 4 + 0.1

m_n = **4.3** 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:

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

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{4.8}{19.15}$$

C_s = **0.00025** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{4.3}{18.94}$$

C_s = **0.00023** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{}{0}$$

C_r = **0** 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 1

E_T = (0.000251 - 0) x 11120.3 x 148 /60

E_T = **6.87** g

For Train 2

E_T = (0.000227 - 0) x 11120.3 x 148 /60

E_T = **6.23** g

Average

E = **6.55** g

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

7.5% of the average =	0.49
Train 1 difference =	0.32
Train 2 difference =	0.32

PR - Proportional Rate Variation

ASTM E2515 equation (16)

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

Where:

θ	=	Total sampling time, min
θ_i	=	Length of recording interval, min
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf
V_m	=	Volume of gas sample as measured by dry gas meter, dcf
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
V_s	=	Average gas velocity in the dilution tunnel, ft/sec
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR
T_m	=	Absolute average dry gas meter temperature, ^oR
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR

Sample calculation (for the first 1 minute interval of Train 1):

$$PR = \left(\frac{148 \times 0.089 \times 18.61 \times (78.0 + 460) \times (73.8 + 460)}{1 \times 19.431 \times 18.34 \times (140.1 + 460) \times (64.0 + 460)} \right) \times 100$$

PR = **63** %

PM_{RH} - Particulate emission rate for high fire test run, g/hr;
ASTM E3053 equation (9)

$$PM_{RH} = 60(E_{TH}/\theta_{H2})$$

Where,

E_{TH} = Total particulate emissions for high fire test run including kindling and start-up, g

θ_{H2} = Total duration of high fire test run, from ignition of kindling to end of test run, min.

Sample Calculation:

E_{TH} = 6.55

θ_{H2} = 148

PM_{RH} = 60(6.55 / 148)

PM_{RH} = **2.66** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.
ASTM E3053 equation (10)

$$PM_{FH} = E_{TH}/M_{TFBHdb}$$

Sample Calculation:

E_{TH} = 6.55

M_{TFBHdb} = 11.55

PM_{FH} = 6.55 / 11.55

= **0.57** g/kg

Particulate emission rate for low or medium fire test runs, g/hr
ΞΞ3053 equation (12)

$PM_R = 60(E_T/\theta)$

E_T = Total particulate emissions for low or medium fire test runs from Test Method E2515, g

Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only
θ = N/A - Applicable to Low/Medium Fire Tests Only

PM_R = 60(N/A / N/A)

PM_{RH} = **N/A** g/hr

Particulate emission factor for high fire test run, g/dry kg of fuel burned.
ΞΞ3053 equation (13)

$PM_F = E_T/M_{TFBdb}$

Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only
M_{TFBdb} = N/A - Applicable to Low/Medium Fire Tests Only

PM_{FH} = N/A / N/A
= **N/A** g/kg

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 1 Data Summary

Client:	Buck Stove
Model:	81
Job #:	20-592
Tracking #:	0064
Test Date:	4/7/2020

Techician Signature

5/29/2020
Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

Burn Rate (kg/hr):	**4.92**

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	0.000	19.431	19.703	7.803
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.61			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11120.3			
Average Gas Meter Temperature (°F)	76.6	73.8	85.2	66.9
Total Sample Volume (dscf)	0.000	19.154	18.945	7.792
Average Tunnel Temperature (°F)	140.1			
Total Time of Test (min)	148			
Total Particulate Catch (mg)	0.0	4.8	4.3	3.6
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0002506	0.0002270	0.0004620
Total PM Emissions (g)	0.00	6.87	6.23	5.14
Particulate Emission Rate (g/hr)	0.00	2.79	2.52	5.14
Emissions Factor (g/kg)	-	0.59	0.54	-
Difference from Average Total Particulate Emissions (g)	-	0.32	0.32	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

Final Average Results	
Total Particulate Emissions (g)	6.55
Particulate Emission Rate (g/hr)	2.66
Emissions Factor (g/kg)	0.57
HHV Efficiency (%)	68.9%
LHV Efficiency (%)	74.2%
CO Emissions (g/min)	1.04

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	>80 °F, <90 °F	Min: 80 / Max: 89	OK
Face Velocity	< 30 ft/min	8.6	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 64 / Max: 84	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	CHECK 10 MIN. INTERVAL PRO-RATES

10 min interval rdgs outside 90-110% 0

B415.1 Efficiency Results

Manufacturer:	Buck Stove
Model:	81
Date:	04/07/20
Run:	1
Control #:	20-592
Test Duration:	96
Output Category:	High

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	68.9%	74.2%
Combustion Efficiency	99.2%	99.2%
Heat Transfer Efficiency	69.4%	74.8%

Output Rate (kJ/h)	62,713	59,490	**(Btu/h)**
Burn Rate (kg/h)	5.05	11.13	**(lb/h)**
Input (kJ/h)	91,073	86,393	**(Btu/h)**

Test Load Weight (dry kg)	8.08	17.81	**dry lb**
MC wet (%)	19.55		
MC dry (%)	24.29		
Particulate (g)	6.55		
CO (g)	100		
Test Duration (h)	1.60		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	0.99
g/kg Dry Fuel	0.81	12.34
g/h	4.09	62.31
g/min	0.07	1.04
lb/MM Btu Output	0.15	2.31

Air/Fuel Ratio (A/F)	10.45

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Buck Stove | Job #: 20-592
Model: 81 | Tracking #: 0064
Run #: 1 | Technician: AK
Date: 4/7/2020

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.50		
Target Load Weight (lbs):	25.00		
Total Load Weight Range (lbs):	23.80	to	26.30
Core Load Weight Range (lbs):	11.30	to	16.30
Remainder Load Weight Range (lbs):	8.80	to	13.80
Core Load Piece Range (lbs):	3.80	to	6.30
Remainder Load Piece Range (lbs):	2.50	to	13.80
Max Allowable Kindling Weight (lbs):	4.96		
Max Allowable Start-up Fuel Weight (lbs):	7.44		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	5.17	In Range	26.9	25.9	27.6	26.8	In Range	4.08	1.85
2	16.00	5.10	In Range	25.5	19.3	22.0	22.3	In Range	4.17	1.89
3	16.00	5.15	In Range	25.4	26.5	22.5	24.8	In Range	4.13	1.87
Core Load Wt. (lbs)		15.42	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.98	In Range	22.3	23.9	28.0	24.7	In Range	3.99	1.81
2	16.00	4.40	In Range	22.3	26.4	19.5	22.7	In Range	3.59	1.63
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		9.38	In Range							

Total Load Weight (lbs):	24.80	In Range	
Core Load % of Total Weight:	62%	In Range	45-65%
Remainder % of Total Weight:	38%	In Range	35-55%
Total Load % of Target Weight:	99%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	9.9		
Total Load Average Moisture Content (%DB):	24.3	In Range	19-25%
Total Load Average Moisture Content (%WB):	19.5		
Total Test Load Weight (dry basis):	19.95 lbs	9.05 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.96	In Range	10.6	7.4	8.6	8.9	In Range	4.56	2.07

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
7.44	In Range	20.2	20.9	21.5	20.9	In Range	6.16	2.79

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.5	to	5.0	
Actual Residual Start-up Fuel Weight (lb):		2.6		In Range

TEST END POINT

High Fire Test Run End Point Range:	2.2	to	2.7	lb
Actual Fuel Load Ending Weight (lb):		2.6		In Range

Total Weight All Fuel Added: 37.20 lbs, wet basis
30.66 lbs, dry basis
13.91 kg, dry basis

Total Weight All Fuel Burned (dry basis): 25.46 lbs
11.55 kg

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	1	Technician:	AK
Test Start Time:	11:36	Date:	4/7/2020
Test Type:	High Fire		

Recording Interval (min):	1
Total Sampling Time (min):	148
High Fire Test Load Time (min):	52

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.33	29.37	29.35
Relative Humidity (%)	60.0	51.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft^3

Meter Box γ Factor:	1.012	(A)
Meter Box γ Factor:	1.008	(B)
Meter Box γ Factor:		(Ambient)

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/6/2020

Sample Train Post-Test Leak Checks

(A)	0.002	cfm @	-4	in. Hg
(B)	0.000	cfm @	-10	in. Hg
(Ambient)		cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.044	115
2	0.078	115
3	0.070	115
4	0.042	115
5	0.072	126
6	0.078	126
7	0.080	126
8	0.058	126
Center	0.084	126

Static Pressure: -0.210 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	18.10	ft/sec
V_{scent}:	20.44	ft/sec
F_p:	0.886	[ratio]
Initial Tunnel Flow:	183.3	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594
X	Cherry	48.68	6.01	44.63	0.40	18.03	8316

WOODSTOVE PREBURN DATA

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	1	Technician:	AK
		Date:	4/7/2020

High Fire Test Begins from Cold Start, No Preburn is Performed

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.094	0.02	64	0		12.2		72	67	82	64
1	0.089	0.089	0.094	1.81	64	-0.45	63	12.2	-0.02	78	101	80	65
2	0.221	0.132	0.094	1.75	64	-0.81	93	12.1	-0.1	77	151	80	65
3	0.363	0.142	0.091	1.74	64	-1.28	102	12.0	-0.1	82	224	81	65
4	0.491	0.128	0.094	1.76	64	-0.37	91	11.8	-0.2	90	300	82	65
5	0.623	0.132	0.090	1.76	64	-0.81	97	11.6	-0.2	101	404	83	65
6	0.755	0.132	0.091	1.76	65	-1.14	97	11.3	-0.3	107	445	83	65
7	0.883	0.128	0.091	1.75	65	-0.26	95	11.1	-0.24	115	480	83	65
8	1.009	0.126	0.089	1.70	65	-1.09	95	10.8	-0.26	120	515	83	66
9	1.143	0.134	0.089	1.77	65	-0.36	101	10.5	-0.3	125	553	83	66
10	1.274	0.131	0.088	1.79	65	-1.09	100	10.2	-0.3	128	560	83	66
11	1.402	0.128	0.088	1.75	65	-1.01	97	9.9	-0.3	129	551	82	66
12	1.537	0.135	0.088	1.76	65	-1.48	103	9.7	-0.2	133	580	82	66
13	1.670	0.133	0.088	1.75	65	-0.41	102	9.3	-0.4	135	587	82	66
14	1.798	0.128	0.088	1.76	65	-0.94	98	9.1	-0.2	135	590	82	67
15	1.930	0.132	0.087	1.76	65	-0.83	102	8.8	-0.3	137	592	82	66
16	2.063	0.133	0.087	1.76	65	-0.37	103	8.5	-0.3	138	608	82	67
17	2.192	0.129	0.087	1.77	65	-1.08	99	8.3	-0.2	137	601	82	67
18	2.324	0.132	0.087	1.76	65	-0.39	102	8.0	-0.3	137	597	83	67
19	2.455	0.131	0.087	1.76	65	-0.94	101	7.8	-0.2	138	594	83	68
20	2.583	0.128	0.088	1.74	65	-0.82	98	7.5	-0.3	139	596	83	68
21	2.713	0.130	0.086	1.76	66	-0.63	101	7.3	-0.2	138	592	83	68
22	2.848	0.135	0.088	1.73	66	-0.84	103	7.0	-0.3	134	580	83	68
23	2.978	0.130	0.087	1.76	66	-1.55	100	6.9	-0.1	135	570	83	68
24	3.105	0.127	0.088	1.77	66	-0.84	97	6.7	-0.2	134	559	83	68
25	3.240	0.135	0.086	1.76	66	-1.41	104	6.5	-0.24	133	550	83	69
26	3.371	0.131	0.087	1.73	66	-1.01	100	6.3	-0.16	131	541	83	68
27	3.498	0.127	0.086	1.76	66	-1.24	98	6.1	-0.2	131	536	83	68
28	3.628	0.130	0.091	1.76	66	-1.01	97	5.9	-0.2	130	535	83	68
29	3.761	0.133	0.088	1.77	66	-1.09	101	5.7	-0.16	129	534	83	68
30	3.890	0.129	0.089	1.77	67	-1.35	97	5.6	-0.14	129	536	83	68
31	4.021	0.131	0.089	1.73	67	-1.24	99	5.4	-0.2	127	529	83	70
32	4.154	0.133	0.090	1.76	67	-0.63	100	5.2	-0.2	126	521	83	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.286	0.132	0.089	1.76	67	-0.81	99	5.1	-0.1	126	509	83	69
34	4.417	0.131	0.089	1.75	67	-0.78	98	5.0	-0.1	123	498	83	69
35	4.547	0.130	0.089	1.73	67	-0.24	97	4.8	-0.2	121	484	83	71
36	4.676	0.129	0.088	1.73	67	-0.61	97	4.7	-0.1	120	474	83	71
37	4.804	0.128	0.090	1.75	67	-1.29	95	4.6	-0.1	119	466	83	71
38	4.937	0.133	0.089	1.72	68	-1.29	99	4.5	-0.1	119	461	83	70
39	5.067	0.130	0.089	1.74	68	-0.32	97	4.4	-0.1	117	454	83	71
40	5.195	0.128	0.088	1.75	68	-0.93	96	4.3	-0.1	118	449	83	70
41	5.328	0.133	0.090	1.73	68	-1.05	98	4.1	-0.2	115	444	83	72
42	5.460	0.132	0.091	1.75	68	-0.95	97	4.0	-0.1	116	439	83	72
43	5.588	0.128	0.087	1.57	68	-1.3	98	3.8	-0.2	132	532	84	74
44	5.718	0.130	0.089	1.73	68	-1.79	98	3.6	-0.2	131	553	84	74
45	5.849	0.131	0.086	1.72	69	-1.63	100	3.4	-0.2	131	544	84	74
46	5.977	0.128	0.088	1.76	69	-1.08	97	3.2	-0.2	131	534	84	74
47	6.110	0.133	0.090	1.78	69	-1.44	99	3.1	-0.1	129	524	84	75
48	6.244	0.134	0.087	1.77	69	-1.31	102	3.0	-0.1	127	513	84	74
49	6.373	0.129	0.088	1.72	69	-1.12	97	2.8	-0.2	127	503	84	74
50	6.503	0.130	0.090	1.72	69	-0.61	97	2.7	-0.1	125	492	84	74
51	6.638	0.135	0.089	1.78	70	-1.4	101	2.6	-0.1	122	481	83	74
52	6.765	0.127	0.084	0.86	70	-2.13	101	24.7	22.1	160	377	83	75
53	6.897	0.132	0.089	1.74	70	-3.59	99	24.4	-0.26	128	399	83	74
54	7.026	0.129	0.086	1.39	70	-3.62	99	24.1	-0.34	134	493	83	75
55	7.133	0.107	0.085	1.31	70	-4.58	83	23.9	-0.24	140	566	82	74
56	7.294	0.161	0.086	1.84	70	-0.98	125	23.6	-0.3	146	610	83	74
57	7.430	0.136	0.087	1.79	71	-0.38	105	23.2	-0.32	151	640	84	75
58	7.561	0.131	0.084	1.78	71	-0.66	103	22.9	-0.34	156	662	84	76
59	7.689	0.128	0.083	1.76	71	-0.67	102	22.5	-0.36	156	674	84	78
60	7.803	0.114	0.085	1.74	71	-1.08	90	22.2	-0.34	159	684	84	76
61	7.954	0.151	0.083	1.72	71	-1.01	120	21.9	-0.34	161	680	84	76
62	8.081	0.127	0.085	1.72	71	-1.15	100	21.5	-0.34	161	679	84	77
63	8.210	0.129	0.084	1.74	72	-0.94	102	21.2	-0.32	159	672	84	76
64	8.343	0.133	0.086	1.73	72	-0.34	104	20.9	-0.3	159	668	84	78
65	8.472	0.129	0.084	1.73	72	-1.11	102	20.6	-0.3	160	665	84	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	8.601	0.129	0.083	1.73	72	-0.93	102	20.2	-0.4	159	665	84	76
67	8.732	0.131	0.084	1.72	72	-0.16	103	19.9	-0.3	158	665	83	77
68	8.859	0.127	0.086	1.73	72	-1.31	99	19.6	-0.3	158	663	83	77
69	8.988	0.129	0.085	1.72	73	-0.4	101	19.3	-0.3	160	662	83	77
70	9.122	0.134	0.086	1.74	73	-0.94	104	19.0	-0.3	160	662	83	79
71	9.249	0.127	0.084	1.72	73	-0.18	100	18.7	-0.32	158	660	83	79
72	9.376	0.127	0.084	1.71	73	-0.84	100	18.3	-0.38	160	657	83	77
73	9.509	0.133	0.084	1.71	73	-1	105	18.1	-0.2	158	657	83	78
74	9.640	0.131	0.084	1.71	74	-1.49	103	17.7	-0.38	160	658	83	78
75	9.768	0.128	0.084	1.72	74	-0.73	101	17.4	-0.32	160	656	83	78
76	9.897	0.129	0.083	1.77	74	-1.24	102	17.2	-0.2	158	651	83	78
77	10.030	0.133	0.085	1.75	74	-1.48	104	16.9	-0.32	157	649	83	79
78	10.160	0.130	0.083	1.76	74	-0.41	103	16.6	-0.28	157	645	83	78
79	10.290	0.130	0.085	1.77	75	-1.01	101	16.3	-0.3	156	645	83	79
80	10.424	0.134	0.083	1.75	75	-0.73	105	16.0	-0.3	156	644	83	80
81	10.557	0.133	0.084	1.76	75	-1.02	104	15.7	-0.3	156	644	83	81
82	10.688	0.131	0.084	1.75	75	-0.37	103	15.4	-0.3	157	647	83	79
83	10.820	0.132	0.088	1.74	75	-0.26	101	15.2	-0.22	157	645	83	79
84	10.951	0.131	0.085	1.74	75	-1.57	102	14.8	-0.38	157	645	83	82
85	11.083	0.132	0.085	1.74	76	-0.22	103	14.5	-0.26	158	648	83	81
86	11.217	0.134	0.086	1.73	76	-1.33	104	14.3	-0.24	159	649	84	82
87	11.347	0.130	0.084	1.71	76	-0.19	102	14.0	-0.3	157	648	84	80
88	11.479	0.132	0.082	1.75	76	-0.63	105	13.7	-0.3	158	647	84	82
89	11.614	0.135	0.084	1.75	76	-0.87	106	13.4	-0.3	160	649	84	80
90	11.744	0.130	0.085	1.74	77	-1.07	101	13.2	-0.18	158	656	84	81
91	11.874	0.130	0.085	1.75	77	-0.23	101	12.9	-0.32	160	661	84	81
92	12.008	0.134	0.085	1.73	77	-0.21	104	12.7	-0.2	159	666	84	80
93	12.136	0.128	0.084	1.75	77	-0.58	100	12.4	-0.3	158	668	84	81
94	12.263	0.127	0.084	1.71	77	-1.05	99	12.1	-0.3	159	665	84	81
95	12.398	0.135	0.084	1.79	77	-1.28	106	11.9	-0.2	160	662	84	81
96	12.530	0.132	0.086	1.77	78	-1.09	102	11.6	-0.28	158	659	84	81
97	12.659	0.129	0.085	1.78	78	-1.49	100	11.4	-0.22	161	658	84	81
98	12.795	0.136	0.084	1.77	78	-1.51	106	11.1	-0.26	160	653	84	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	12.929	0.134	0.084	1.78	78	-0.19	105	10.9	-0.24	159	650	84	81
100	13.059	0.130	0.086	1.77	78	-0.9	100	10.6	-0.3	156	645	84	82
101	13.195	0.136	0.086	1.77	79	-1.54	104	10.4	-0.2	157	636	84	81
102	13.328	0.133	0.086	1.77	79	-0.53	102	10.2	-0.2	157	635	84	82
103	13.458	0.130	0.084	1.78	79	-1.41	101	9.9	-0.26	156	630	84	82
104	13.595	0.137	0.085	1.78	79	-0.88	106	9.7	-0.24	157	633	84	81
105	13.727	0.132	0.085	1.76	79	-0.36	102	9.4	-0.3	157	637	84	82
106	13.857	0.130	0.084	1.76	79	-1.16	101	9.2	-0.2	157	630	84	82
107	13.993	0.136	0.086	1.75	79	-0.51	104	9.0	-0.24	156	627	85	82
108	14.126	0.133	0.085	1.77	80	-1.08	102	8.7	-0.26	156	623	85	82
109	14.254	0.128	0.084	1.76	80	-1.42	99	8.4	-0.3	155	620	85	83
110	14.389	0.135	0.087	1.74	80	-0.27	103	8.2	-0.2	154	618	85	82
111	14.521	0.132	0.085	1.77	80	-0.3	101	8.0	-0.2	153	616	85	82
112	14.650	0.129	0.085	1.75	80	-1.29	99	7.7	-0.26	153	611	85	83
113	14.785	0.135	0.085	1.75	80	-0.41	104	7.5	-0.24	150	611	85	82
114	14.916	0.131	0.087	1.76	80	-0.87	99	7.3	-0.22	151	608	86	83
115	15.046	0.130	0.084	1.76	81	-1.41	100	7.1	-0.2	152	608	86	83
116	15.181	0.135	0.085	1.77	81	-0.32	103	6.8	-0.28	150	605	86	83
117	15.314	0.133	0.085	1.76	81	-1.12	102	6.6	-0.2	150	603	86	83
118	15.443	0.129	0.085	1.75	81	-0.28	99	6.4	-0.2	149	602	86	83
119	15.578	0.135	0.085	1.75	81	-1.13	103	6.2	-0.2	149	600	86	83
120	15.710	0.132	0.086	1.74	81	-0.94	100	6.0	-0.2	148	596	86	83
121	15.839	0.129	0.088	1.75	81	-0.83	97	5.8	-0.2	147	588	86	84
122	15.975	0.136	0.086	1.76	82	-1.13	103	5.7	-0.1	145	577	86	83
123	16.108	0.133	0.087	1.77	82	-0.72	100	5.5	-0.2	144	569	86	83
124	16.237	0.129	0.086	1.76	82	-0.98	97	5.4	-0.1	142	561	86	84
125	16.373	0.136	0.088	1.76	82	-0.28	101	5.2	-0.2	142	554	86	84
126	16.506	0.133	0.086	1.75	82	-0.76	100	5.1	-0.1	141	548	86	84
127	16.635	0.129	0.088	1.76	82	-0.36	96	5.0	-0.12	140	539	86	84
128	16.771	0.136	0.087	1.75	82	-0.56	102	4.8	-0.18	139	533	86	84
129	16.905	0.134	0.088	1.77	82	-1.64	100	4.7	-0.1	138	528	86	84
130	17.033	0.128	0.088	1.75	83	-0.5	95	4.5	-0.18	137	520	86	83
131	17.168	0.135	0.087	1.75	83	-1.16	101	4.4	-0.12	136	515	86	83

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	17.299	0.131	0.089	1.74	83	-1.04	96	4.3	-0.1	136	511	86	83
133	17.428	0.129	0.086	1.72	83	-0.99	97	4.2	-0.1	135	507	86	84
134	17.563	0.135	0.087	1.73	83	-0.46	100	4.0	-0.2	134	503	86	84
135	17.696	0.133	0.088	1.76	83	-0.71	98	3.9	-0.1	134	503	86	83
136	17.827	0.131	0.087	1.74	83	-1.54	97	3.7	-0.16	133	505	86	84
137	17.964	0.137	0.087	1.77	83	-1.09	102	3.7	-0.04	134	504	86	84
138	18.097	0.133	0.087	1.75	84	-0.68	99	3.5	-0.2	133	498	86	83
139	18.226	0.129	0.088	1.75	84	-0.6	95	3.4	-0.1	132	489	86	83
140	18.363	0.137	0.088	1.73	84	-0.89	101	3.3	-0.1	131	480	85	83
141	18.497	0.134	0.090	1.77	84	-1.03	97	3.2	-0.1	129	472	85	83
142	18.626	0.129	0.088	1.74	84	-0.23	95	3.1	-0.1	128	463	85	84
143	18.763	0.137	0.088	1.77	84	-1.28	101	3.0	-0.1	127	455	85	84
144	18.896	0.133	0.090	1.77	84	-1.33	96	2.9	-0.1	125	447	85	84
145	19.029	0.133	0.088	1.76	84	-1.07	97	2.8	-0.1	125	442	85	84
146	19.165	0.136	0.087	1.77	84	-1.35	100	2.8	0	125	439	85	84
147	19.299	0.134	0.087	1.76	84	-0.35	99	2.7	-0.14	124	434	85	84
148	19.431	0.132	0.088	1.74	85	-1.24	96	2.6	-0.1	123	426	85	84
Avg/Tot	19.431	0.131	0.087	1.73	74	-0.95	100			140	560	84	76.6

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	62	-1		82	0.000	0.60	0.00
1	0.087	0.087	1.80	62	0	62	81	-0.040	0.22	0.06
2	0.218	0.131	1.77	62	0	93	82	0.000	2.52	0.18
3	0.353	0.135	1.73	62	-2.59	98	82	0.010	6.20	0.03
4	0.480	0.127	1.80	63	-2.55	91	82	-0.010	5.91	0.29
5	0.613	0.133	1.77	63	-0.28	99	83	-0.020	8.40	0.22
6	0.742	0.129	1.77	63	-2.36	96	83	0.000	8.94	0.38
7	0.872	0.130	1.77	63	-2.65	97	83	0.010	9.66	0.25
8	1.005	0.133	1.76	63	-1.31	101	83	0.010	11.47	0.13
9	1.132	0.127	1.74	64	0	97	83	0.030	12.06	0.50
10	1.258	0.126	1.75	64	-2.72	97	83	0.020	11.39	0.32
11	1.389	0.131	1.75	64	-0.67	101	83	-0.020	10.06	0.23
12	1.519	0.130	1.75	65	0	100	82	-0.020	10.75	0.14
13	1.646	0.127	1.80	65	-0.7	98	82	-0.010	10.96	0.22
14	1.776	0.130	1.81	65	-0.15	100	82	-0.010	10.84	0.23
15	1.911	0.135	1.79	66	-2.17	105	82	-0.020	10.85	0.29
16	2.039	0.128	1.76	66	0	99	82	0.020	12.08	0.02
17	2.169	0.130	1.77	66	-1.64	101	83	0.000	11.51	0.03
18	2.301	0.132	1.78	67	-0.08	102	83	-0.030	10.08	0.20
19	2.431	0.130	1.76	67	-2.06	101	84	-0.010	10.92	0.09
20	2.560	0.129	1.74	68	-0.86	99	84	0.010	11.20	0.04
21	2.691	0.131	1.75	68	-0.2	102	84	0.020	10.68	0.23
22	2.822	0.131	1.78	69	-0.77	100	84	-0.010	9.82	0.43
23	2.953	0.131	1.78	69	0	101	84	-0.020	9.12	0.23
24	3.084	0.131	1.75	70	-2.88	100	84	0.010	8.75	0.34
25	3.214	0.130	1.76	70	-0.34	100	84	0.000	8.86	0.21
26	3.345	0.131	1.79	70	-2.69	100	84	-0.010	8.88	0.39
27	3.478	0.133	1.77	71	-0.23	102	84	0.000	8.02	0.52
28	3.610	0.132	1.76	71	-0.19	99	83	0.000	8.17	0.40
29	3.737	0.127	1.76	72	-2.83	96	83	0.020	8.46	0.33
30	3.870	0.133	1.78	72	-0.08	100	83	0.000	8.07	0.40
31	4.003	0.133	1.78	73	-0.69	100	83	0.000	8.54	0.22

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.130	0.127	1.76	73	0	95	83	0.000	7.14	0.27
33	4.262	0.132	1.75	73	0	99	83	-0.020	6.41	0.43
34	4.394	0.132	1.75	74	-2.86	98	83	0.010	7.00	0.33
35	4.522	0.128	1.76	74	0	95	83	0.000	5.85	0.43
36	4.651	0.129	1.76	75	-0.34	96	83	-0.020	5.44	0.51
37	4.786	0.135	1.75	75	-0.72	100	83	0.010	5.87	0.26
38	4.915	0.129	1.75	76	-2.27	96	83	0.010	6.33	0.19
39	5.045	0.130	1.75	76	-2.68	96	83	-0.010	5.64	0.21
40	5.178	0.133	1.76	76	-2.91	99	83	0.000	5.57	0.32
41	5.308	0.130	1.76	77	-2.82	95	83	-0.010	5.67	0.34
42	5.438	0.130	1.75	77	-1.58	95	83	0.000	5.84	0.29
43	5.570	0.132	1.69	78	-2.97	100	84	0.000	6.97	0.13
44	5.701	0.131	1.78	78	-2.98	98	84	-0.020	10.10	0.22
45	5.832	0.131	1.79	78	-3.03	99	84	-0.020	8.28	0.15
46	5.969	0.137	1.76	79	-0.31	103	84	-0.010	8.15	0.13
47	6.101	0.132	1.75	79	-0.24	98	84	0.000	8.01	0.00
48	6.231	0.130	1.75	79	-3.01	98	84	0.000	7.21	0.08
49	6.365	0.134	1.73	80	-2.9	100	84	-0.010	6.66	0.08
50	6.496	0.131	1.74	80	-0.12	96	84	0.000	6.54	0.20
51	6.624	0.128	1.74	80	-2.89	94	84	-0.010	6.37	0.11
52	6.754	0.130	1.24	81	-1.23	102	84	0.000	3.07	0.21
53	6.883	0.129	1.80	81	-3.53	95	84	0.010	5.25	0.81
54	7.042	0.159	2.98	82	-0.36	120	84	-0.010	7.76	0.78
55	7.199	0.157	1.80	82	-0.97	120	85	0.000	10.92	0.22
56	7.335	0.136	1.65	82	0	104	84	-0.010	11.47	0.20
57	7.468	0.133	1.79	83	-2.8	101	84	0.020	13.38	0.15
58	7.601	0.133	1.77	83	-0.56	103	84	-0.020	13.43	0.17
59	7.738	0.137	1.79	83	-0.12	107	84	0.010	14.44	0.20
60	7.869	0.131	1.76	84	-2.92	101	84	0.000	14.58	0.30
61	7.999	0.130	1.76	84	-2.91	102	84	0.020	14.60	0.18
62	8.135	0.136	1.76	84	-1.29	105	84	0.000	14.42	0.11
63	8.265	0.130	1.75	85	-0.03	101	84	-0.010	14.30	0.19

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	8.396	0.131	1.75	85	-0.33	100	84	0.000	14.23	0.19
65	8.530	0.134	1.76	85	-0.09	104	84	0.000	14.36	0.01
66	8.661	0.131	1.74	86	-0.6	102	84	0.000	14.49	0.08
67	8.793	0.132	1.75	86	-1.16	102	84	0.000	14.51	0.10
68	8.926	0.133	1.76	86	-0.17	102	85	0.000	14.18	0.24
69	9.057	0.131	1.74	86	-0.42	101	85	0.000	14.29	0.17
70	9.190	0.133	1.74	87	-0.93	102	85	-0.010	13.86	0.06
71	9.324	0.134	1.74	87	-0.11	103	85	0.000	13.83	0.15
72	9.455	0.131	1.72	87	-2.34	101	85	0.010	14.20	0.13
73	9.586	0.131	1.74	88	-2.02	101	85	0.010	14.12	0.06
74	9.720	0.134	1.74	88	-2.96	103	85	0.000	13.91	0.18
75	9.851	0.131	1.72	88	-3.06	101	85	0.010	13.95	0.14
76	9.983	0.132	1.75	89	-0.63	102	85	0.010	13.92	0.08
77	10.119	0.136	1.76	89	-0.02	104	85	0.000	13.73	0.03
78	10.251	0.132	1.76	89	-1.13	102	85	0.000	13.55	0.10
79	10.383	0.132	1.75	89	-0.17	101	85	-0.010	13.19	0.14
80	10.518	0.135	1.76	90	-1.77	104	85	-0.010	13.49	0.13
81	10.651	0.133	1.77	90	-0.09	102	85	-0.010	13.16	0.12
82	10.783	0.132	1.76	90	-0.42	101	85	0.010	13.62	0.02
83	10.917	0.134	1.76	90	-2.53	100	85	-0.010	13.29	0.17
84	11.050	0.133	1.75	91	-0.28	101	85	-0.020	13.38	0.09
85	11.181	0.131	1.74	91	-0.53	100	85	0.010	13.28	0.05
86	11.318	0.137	1.75	91	-0.05	104	85	-0.020	12.97	0.07
87	11.450	0.132	1.77	91	-2.96	101	85	-0.010	13.21	0.02
88	11.584	0.134	1.74	92	-1.81	104	85	0.000	13.54	0.07
89	11.723	0.139	1.76	92	-0.51	106	86	-0.020	13.05	0.04
90	11.854	0.131	1.73	92	-0.04	100	85	0.010	13.81	0.04
91	11.989	0.135	1.75	92	-2.77	103	86	0.010	13.85	0.00
92	12.124	0.135	1.75	92	-2.89	103	86	0.000	13.67	0.07
93	12.253	0.129	1.73	93	-2.71	98	86	0.000	13.79	0.00
94	12.388	0.135	1.74	93	-0.73	103	86	-0.020	13.81	0.00
95	12.523	0.135	1.80	93	-0.91	103	86	0.000	13.58	0.01

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	12.657	0.134	1.79	93	-0.66	101	86	-0.010	13.59	0.07
97	12.796	0.139	1.78	94	-2.97	106	86	0.000	13.09	0.00
98	12.929	0.133	1.77	94	-2.76	102	87	-0.010	13.28	0.00
99	13.064	0.135	1.79	94	-0.45	103	87	0.000	12.73	0.00
100	13.200	0.136	1.78	94	-0.41	102	87	0.010	12.89	0.00
101	13.334	0.134	1.79	94	-2.8	101	87	-0.010	12.41	0.00
102	13.467	0.133	1.78	95	-0.08	100	86	-0.010	12.04	0.00
103	13.607	0.140	1.79	95	-0.79	106	86	0.000	12.32	0.07
104	13.741	0.134	1.78	95	-0.21	101	86	0.000	12.79	0.00
105	13.879	0.138	1.79	95	-2.32	104	86	-0.010	12.39	0.03
106	14.015	0.136	1.77	95	-2.98	103	86	-0.010	12.47	0.05
107	14.149	0.134	1.78	96	-2.91	100	86	0.000	12.35	0.00
108	14.285	0.136	1.79	96	-2.95	103	86	0.010	12.23	0.00
109	14.420	0.135	1.78	96	-2.67	102	87	-0.010	12.02	0.06
110	14.554	0.134	1.78	96	-2.83	100	87	0.000	12.53	0.00
111	14.692	0.138	1.76	96	-1.44	104	87	-0.010	11.93	0.00
112	14.827	0.135	1.79	96	-3.1	102	87	0.000	11.98	0.00
113	14.961	0.134	1.78	97	-2.09	100	87	-0.020	11.77	0.02
114	15.099	0.138	1.78	97	-0.47	102	87	0.010	11.88	0.00
115	15.232	0.133	1.77	97	-0.27	100	87	0.000	11.68	0.00
116	15.369	0.137	1.77	97	-2.97	103	87	-0.020	11.78	0.00
117	15.504	0.135	1.77	97	-1.82	101	87	-0.020	11.51	0.00
118	15.638	0.134	1.77	97	-0.7	100	87	0.010	11.72	0.00
119	15.773	0.135	1.78	97	-2.5	101	88	-0.010	11.78	0.00
120	15.907	0.134	1.76	97	-0.42	100	88	0.000	11.52	0.02
121	16.040	0.133	1.78	98	-3.02	97	88	-0.010	10.53	0.11
122	16.175	0.135	1.75	98	-2.49	100	88	0.010	10.36	0.02
123	16.309	0.134	1.76	98	-3.03	99	88	0.000	10.28	0.02
124	16.441	0.132	1.76	98	-2.73	97	88	0.000	10.27	0.00
125	16.580	0.139	1.76	98	-0.35	101	88	0.000	10.07	0.02
126	16.714	0.134	1.76	98	-2.73	99	88	0.010	10.24	0.01
127	16.850	0.136	1.77	98	-2.28	99	88	-0.010	9.80	0.00

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	16.985	0.135	1.76	99	-1.93	99	88	0.000	9.08	0.01
129	17.118	0.133	1.75	99	-0.3	97	88	0.000	8.83	0.03
130	17.255	0.137	1.74	99	-0.15	99	88	0.000	9.08	0.09
131	17.391	0.136	1.75	99	-0.28	99	88	0.010	9.26	0.00
132	17.524	0.133	1.77	99	-2.85	96	89	0.000	9.12	0.00
133	17.662	0.138	1.76	99	-0.2	101	89	-0.010	8.52	0.04
134	17.796	0.134	1.76	99	-2.26	98	88	-0.020	8.59	0.18
135	17.931	0.135	1.74	100	-0.27	98	88	0.000	9.24	0.04
136	18.072	0.141	1.77	100	-2.27	102	88	-0.010	9.19	0.04
137	18.205	0.133	1.76	100	-0.06	97	87	0.000	9.19	0.10
138	18.343	0.138	1.76	100	-2.78	100	87	0.000	8.95	0.07
139	18.477	0.134	1.76	100	-0.25	97	87	-0.010	7.79	0.18
140	18.613	0.136	1.76	100	-0.36	98	87	-0.010	7.72	0.26
141	18.752	0.139	1.75	100	-1.59	99	87	-0.010	7.59	0.32
142	18.887	0.135	1.75	100	-1.8	97	87	-0.010	7.21	0.22
143	19.020	0.133	1.75	100	-0.56	95	87	0.000	7.21	0.35
144	19.159	0.139	1.75	101	-2.01	98	86	-0.010	6.98	0.41
145	19.293	0.134	1.77	101	-2.11	96	86	-0.020	6.84	0.32
146	19.430	0.137	1.77	101	-2.66	99	86	0.000	6.90	0.24
147	19.568	0.138	1.77	101	-1	99	86	0.010	6.93	0.19
148	19.703	0.135	1.75	101	-0.15	96	86	0.000	6.47	0.24
Avg/Tot	19.703	0.133	1.75	85	-1.40	100	85	-0.003	10.37	0.15

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	58	58	58	60	55	57.8	N/A
1	58	58	58	60	55	57.8	N/A
2	58	58	58	60	56	58.0	N/A
3	58	58	58	61	56	58.2	N/A
4	59	58	58	62	56	58.6	N/A
5	59	59	58	64	56	59.2	N/A
6	60	60	58	69	56	60.6	N/A
7	62	61	59	75	56	62.6	N/A
8	64	63	59	83	56	65.0	N/A
9	66	65	59	93	56	67.8	N/A
10	69	68	60	105	56	71.6	N/A
11	73	71	60	117	56	75.4	N/A
12	76	75	61	131	56	79.8	N/A
13	81	79	61	146	56	84.6	N/A
14	85	84	62	162	56	89.8	N/A
15	90	89	63	177	56	95.0	N/A
16	95	95	64	192	56	100.4	N/A
17	100	100	66	208	56	106.0	N/A
18	106	106	67	224	56	111.8	N/A
19	111	111	69	239	56	117.2	N/A
20	117	117	71	253	57	123.0	N/A
21	123	122	72	267	57	128.2	N/A
22	128	127	74	280	57	133.2	N/A
23	134	133	76	292	57	138.4	N/A
24	139	138	79	303	57	143.2	N/A
25	145	143	81	313	58	148.0	N/A
26	150	148	83	322	58	152.2	N/A
27	155	152	85	330	58	156.0	N/A
28	159	156	88	336	59	159.6	N/A
29	164	160	90	342	59	163.0	N/A
30	168	163	92	347	60	166.0	N/A
31	172	166	95	352	60	169.0	N/A
32	176	169	97	356	61	171.8	N/A
33	180	172	99	361	61	174.6	N/A
34	184	174	102	364	62	177.2	N/A
35	187	177	104	366	63	179.4	N/A
36	190	179	106	367	63	181.0	N/A
37	193	184	109	366	64	183.2	N/A
38	196	186	111	368	65	185.2	N/A
39	199	188	113	367	66	186.6	N/A
40	201	189	115	365	66	187.2	N/A
41	203	191	111	355	69	185.8	N/A
42	205	192	106	344	71	183.6	N/A
43	205	191	101	331	73	180.2	N/A
44	205	191	98	322	74	178.0	N/A
45	206	191	96	312	75	176.0	N/A
46	206	192	94	305	76	174.6	N/A
47	206	192	93	299	77	173.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	206	193	92	292	78	172.2	N/A
49	205	193	91	285	79	170.6	N/A
50	205	198	91	279	79	170.4	N/A
51	205	198	91	274	80	169.6	N/A
52	205	198	93	275	80	170.2	N/A
53	206	199	95	277	80	171.4	N/A
54	206	199	95	271	82	170.6	N/A
55	204	197	95	264	82	168.4	N/A
56	201	195	94	261	83	166.8	N/A
57	199	193	94	261	83	166.0	N/A
58	197	191	93	262	83	165.2	N/A
59	194	189	93	265	83	164.8	N/A
60	192	188	92	268	84	164.8	N/A
61	190	187	92	272	84	165.0	N/A
62	188	187	92	278	84	165.8	N/A
63	188	187	92	282	84	166.6	N/A
64	187	187	92	286	85	167.4	N/A
65	188	188	92	290	85	168.6	N/A
66	188	189	92	294	85	169.6	N/A
67	188	191	93	297	85	170.8	N/A
68	189	193	93	300	86	172.2	N/A
69	190	195	93	303	87	173.6	N/A
70	191	197	93	305	87	174.6	N/A
71	191	199	93	308	87	175.6	N/A
72	192	200	94	310	87	176.6	N/A
73	194	202	94	312	88	178.0	N/A
74	195	204	94	314	88	179.0	N/A
75	196	207	94	316	88	180.2	N/A
76	197	209	95	318	88	181.4	N/A
77	198	211	95	320	89	182.6	N/A
78	200	214	95	320	89	183.6	N/A
79	201	215	96	322	89	184.6	N/A
80	202	217	96	322	89	185.2	N/A
81	202	219	96	323	89	185.8	N/A
82	204	220	97	324	89	186.8	N/A
83	205	222	97	324	90	187.6	N/A
84	206	223	97	325	90	188.2	N/A
85	207	224	98	324	90	188.6	N/A
86	209	226	98	325	90	189.6	N/A
87	210	226	98	325	91	190.0	N/A
88	210	230	99	326	92	191.4	N/A
89	212	232	99	327	92	192.4	N/A
90	213	232	100	327	93	193.0	N/A
91	214	233	101	327	93	193.6	N/A
92	215	235	101	329	94	194.8	N/A
93	216	234	101	331	93	195.0	N/A
94	218	236	102	333	94	196.6	N/A
95	219	239	102	334	94	197.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	220	239	102	336	95	198.4	N/A
97	222	241	102	337	95	199.4	N/A
98	224	242	103	337	95	200.2	N/A
99	225	244	103	338	96	201.2	N/A
100	227	245	103	339	96	202.0	N/A
101	228	246	104	339	96	202.6	N/A
102	230	247	104	339	97	203.4	N/A
103	230	248	104	338	97	203.4	N/A
104	231	247	105	337	97	203.4	N/A
105	232	249	105	336	98	204.0	N/A
106	234	248	106	335	98	204.2	N/A
107	235	249	106	335	98	204.6	N/A
108	235	249	106	334	98	204.4	N/A
109	236	250	107	332	98	204.6	N/A
110	237	251	107	331	99	205.0	N/A
111	238	251	107	331	99	205.2	N/A
112	239	252	108	329	99	205.4	N/A
113	239	252	108	328	99	205.2	N/A
114	240	253	108	326	100	205.4	N/A
115	240	253	108	325	100	205.2	N/A
116	241	254	108	324	100	205.4	N/A
117	242	253	109	322	99	205.0	N/A
118	243	253	109	320	99	204.8	N/A
119	243	253	109	319	99	204.6	N/A
120	245	253	109	317	99	204.6	N/A
121	246	253	110	317	99	205.0	N/A
122	247	254	110	314	99	204.8	N/A
123	248	254	111	312	100	205.0	N/A
124	248	252	111	310	101	204.4	N/A
125	249	252	112	307	101	204.2	N/A
126	249	252	112	305	101	203.8	N/A
127	249	253	112	301	101	203.2	N/A
128	250	251	112	298	102	202.6	N/A
129	250	251	113	295	102	202.2	N/A
130	251	251	113	291	102	201.6	N/A
131	251	251	113	288	103	201.2	N/A
132	252	248	113	284	103	200.0	N/A
133	252	248	113	281	103	199.4	N/A
134	252	248	114	278	103	199.0	N/A
135	252	247	114	274	104	198.2	N/A
136	252	247	114	271	104	197.6	N/A
137	252	244	114	268	104	196.4	N/A
138	252	241	115	266	105	195.8	N/A
139	252	241	115	263	105	195.2	N/A
140	252	240	115	260	105	194.4	N/A
141	252	238	115	258	104	193.4	N/A
142	251	238	116	256	105	193.2	N/A
143	250	238	116	253	104	192.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	250	238	116	250	105	191.8	N/A
145	250	237	116	247	106	191.2	N/A
146	249	234	116	243	105	189.4	N/A
147	248	235	116	241	105	189.0	N/A
148	247	233	116	238	105	187.8	N/A
Average	194	196	96	283	83	170	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Buck Stove
Model: 81
Run #: 1

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T424	96.7	96.7	100.3	3.6
Train A Filters - Remainder	T425	96.3	193.0	192.8	-0.2
	T426	96.7			
Train A Probe	8A	116829.6	116829.6	116829.7	0.1
Train A O-Rings	8A	3550.5	3550.5	3551.8	1.3
Train B Filters	T427	94.8	380.0	384.0	4.0
	T428	95.3			
	T429	95.0			
	T430	94.9			
Train B Probe	8B	116826.3	116826.3	116826.5	0.2
Train B O-Rings	8B	3584.5	3584.5	3584.6	0.1
Background Filter			0.0	0.0	

**Negative value corrected to zero*

Placed in Dessicator on:	4/9/2020

Train A Filters - First Hour	100.2	4/13 8:33	100.3	4/15 12:23				
Train A Filters - Remainder	192.9	4/13 8:34	192.8	4/15 12:24				
Train A Probe	116829.9	4/15 12:20	116829.7	4/15 12:20				
Train A O-Rings	3551.8	4/13 8:31	3551.8	4/15 12:21				
Train B Filters	383.9	4/13 8:34	384.0	4/15 12:24				
Train B Probe	116826.5	4/13 8:28	116826.5	4/15 12:20				
Train B O-Rings	3584.5	4/13 8:31	3584.6	4/15 12:22				
Background Filter								

1st hour Sub-Total, mg:	3.6
Remainder Sub-Total, mg:	1.2
Train 1 Aggregate, mg:	**4.8**
Train 2 Aggregate, mg:	**4.3**
Ambient Aggregate, mg:	0.0

ASTM E3053 Wood Heater Run Sheets

Client: Buck Stove Job Number: 20-592 Tracking #: 0064
Model: 81 Run Number: 1 Test Date: 4/7/20

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: _____
Air Control Setting: _____

Time	Notes
	N/A – High Burn

Test Notes
Test Burn Start Time: 11:36
Air Control Setting: Maximum

Time	Notes
42:00	Stirred startup coals
51:00	Loaded high burn
52:00	Closed door, fan set to auto
54:00	Changed B for T429
60:00	Changed A for T425

Test Burn End Time: 14:04

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 15.53 CO (%): 4.048

Calibration Results:

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	11:05	11:09	23:48	23:51
CO_2	-0.02	15.55	0.11	16.00
CO	0.000	4.047	-0.092	4.037

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

Technician Signature: _____ Date: 5/22/2020

ASTM E3053 Wood Heater Run Sheets

Client: Buck Stove Job Number: 20-592 Tracking #: 0064
Model: 81 Run Number: 1 Test Date: 4/7/20

Test Photos

Kindling Fuel Load

High Fire Fuel Load

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Technician Signature: Date: 5/22/2020

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 2 Data Summary

Client:	Buck Stove
Model:	81
Job #:	20-592
Tracking #:	0064
Test Date:	4/7/2020

Technician Signature — Date: 5/29/2020

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

Burn Rate (kg/hr):	**1.18**

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	0.000	74.327	75.709	7.991
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.42			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	12081.6			
Average Gas Meter Temperature (°F)	72.9	79.4	94.5	85.9
Total Sample Volume (dscf)	0.000	72.519	71.577	7.704
Average Tunnel Temperature (°F)	86.7			
Total Time of Test (min)	559			
Total Particulate Catch (mg)	0.0	3.7	3.4	1.8
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000510	0.0000475	0.0002337
Total PM Emissions (g)	0.00	5.74	5.35	2.82
Particulate Emission Rate (g/hr)	0.00	0.62	0.57	2.82
Emissions Factor (g/kg)	-	0.52	0.49	-
Difference from Average Total Particulate Emissions (g)	-	0.20	0.20	-
Difference from Average Emissions Factor (g/kg)	-	0.02	0.02	-

Final Average Results	
Total Particulate Emissions (g)	5.54
Particulate Emission Rate (g/hr)	0.60
Emissions Factor (g/kg)	0.50
HHV Efficiency (%)	68.6%
LHV Efficiency (%)	73.9%
CO Emissions (g/min)	0.82

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	>80 °F, <90 °F	Min: 81 / Max: 87	OK
Face Velocity	< 30 ft/min	8.7	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 65 / Max: 82	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	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer:	Buck Stove
Model:	81
Date:	04/07/20
Run:	2
Control #:	20-592
Test Duration:	559
Output Category:	Low

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	68.6%	73.9%
Combustion Efficiency	97.4%	97.4%
Heat Transfer Efficiency	70.4%	75.8%

Output Rate (kJ/h)	14,542	13,795	**(Btu/h)**
Burn Rate (kg/h)	1.18	2.59	**(lb/h)**
Input (kJ/h)	21,205	20,115	**(Btu/h)**

Test Load Weight (dry kg)	10.96	24.15	**dry lb**
MC wet (%)	18.14		
MC dry (%)	22.15		
Particulate (g)	5.54		
CO (g)	456		
Test Duration (h)	9.32		

Emissions	**Particulate**	**CO**
g/MJ Output	0.04	3.37
g/kg Dry Fuel	0.51	41.64
g/h	0.60	48.97
g/min	0.01	0.82
lb/MM Btu Output	0.10	7.83

Air/Fuel Ratio (A/F)	17.55

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Buck Stove | Job #: 20-592
Model: 81 | Tracking #: 0064
Run #: 2 | Technician: AK
Date: 4/7/2020

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.50		
Target Load Weight (lbs):	25.00		
Total Load Weight Range (lbs):	23.80	to	26.30
Core Load Weight Range (lbs):	11.30	to	16.30
Remainder Load Weight Range (lbs):	8.80	to	13.80
Core Load Piece Range (lbs):	3.80	to	6.30
Remainder Load Piece Range (lbs):	2.50	to	13.80
Max Allowable Kindling Weight (lbs):	4.96		
Max Allowable Start-up Fuel Weight (lbs):	7.44		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1		5.17	In Range	26.9	25.9	27.6	26.8	In Range	4.08	1.85
2		5.10	In Range	25.5	19.3	22.0	22.3	In Range	4.17	1.89
3		5.15	In Range	25.4	26.5	22.5	24.8	In Range	4.13	1.87
Core Load Wt. (lbs)		15.42	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1		4.98	In Range	22.3	23.9	28.0	24.7	In Range	3.99	1.81
2		4.40	In Range	22.3	26.4	19.5	22.7	In Range	3.59	1.63
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		9.38	In Range							

Total Load Weight (lbs):	24.80	In Range	
Core Load % of Total Weight:	62%	In Range	45-65%
Remainder % of Total Weight:	38%	In Range	35-55%
Total Load % of Target Weight:	99%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	9.9		
Total Load Average Moisture Content (%DB):	24.3	In Range	19-25%
Total Load Average Moisture Content (%WB):	19.5		
Total Test Load Weight (dry basis):	19.95 lbs	9.05 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.96	In Range	10.6	7.4	8.6	8.9	In Range	4.56	2.07

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
7.44	In Range	20.2	20.9	21.5	20.9	In Range	6.16	2.79

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.5	to	5.0	
Actual Residual Start-up Fuel Weight (lb):		2.6		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Buck Stove
Job #: 20-592
Model: 81
Tracking #: 0064
Run #: 2
Technician: AK
Date: 4/7/2020

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.50		
Target Load Weight (lbs):	30.00		
Total Load Weight Range (lbs):	28.50	to	31.50
Core Load Weight Range (lbs):	13.50	to	19.50
Remainder Load Weight Range (lbs):	10.50	to	16.50
Core Load Piece Range (lbs):	4.50	to	7.50
Remainder Load Piece Range (lbs):	3.00	to	9.00

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	5.20	In Range	22.0	23.7	28.0	24.6	In Range	4.17	1.89
2	16.00	4.71	In Range	22.0	20.4	20.6	21.0	In Range	3.89	1.77
3	16.00	4.59	In Range	21.8	21.3	19.5	20.9	In Range	3.80	1.72
Core Load Wt. (lbs)		14.50	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.11	In Range	23.7	22.2	19.7	21.9	In Range	3.37	1.53
2	16.00	6.45	In Range	20.5	20.1	24.8	21.8	In Range	5.30	2.40
3	16.00	4.48	In Range	23.9	20.7	23.6	22.7	In Range	3.65	1.66
Remainder Load (lbs)		15.04	In Range							

Remainder Load Small/Large Piece Weight Ratio:	64%	In Range	≤ 67%
Total Load Weight (lbs):	29.54	In Range	
Core Load % of Total Weight:	49%	In Range	45-65%
Remainder % of Total Weight:	51%	In Range	35-55%
Total Load % of Target Weight:	98%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.8		
Total Load Average Moisture Content (%DB):	22.2	In Range	19-25%
Total Load Average Moisture Content (%WB):	18.1		
Total Test Load Weight (dry basis):	24.18 lbs	10.97 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	3.0	to	5.9	
Actual Charcoal Bed Wt. (lb):		5.1		In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.0 Valid Test (≥90%)

Total Fuel Burned During Test Run:	29.5	lbs, wet basis
	24.2	lbs, dry basis
	10.97	kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	2	Technician:	AK
Test Start Time:	11:36	Date:	4/7/2020
Test Type:	Low Fire		

Recording Interval (min):	1
Total Sampling Time (min):	559

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.37	29.34	29.36
Relative Humidity (%)	55.0	61.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft^3

Meter Box γ Factor:	1.012	(A)
Meter Box γ Factor:	1.008	(B)
Meter Box γ Factor:		(Ambient)

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/6/2020

Sample Train Post-Test Leak Checks

(A)	0.001	cfm @	-4	in. Hg
(B)	0.000	cfm @	-9	in. Hg
(Ambient)		cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.044	115
2	0.078	115
3	0.070	115
4	0.042	115
5	0.072	126
6	0.078	126
7	0.080	126
8	0.058	126
Center	0.082	126

Static Pressure: -0.210 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	18.06	ft/sec
V_{scent}:	20.18	ft/sec
F_p:	0.895	[ratio]
Initial Tunnel Flow:	183.4	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594
X	Cherry	48.68	6.01		0.40	18.03	8316

WOODSTOVE PREBURN DATA

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	2	Technician:	AK
		Date:	4/7/2020

Recording Interval (min):

Run Time (min):

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
0										

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.085	0.01	86	-0.19		29.5		130	429	81	80
1	0.129	0.129	0.082	1.73	86	-1.11	108	29.4	-0.1	159	352	82	79
2	0.259	0.130	0.081	1.83	86	-1.1	110	29.3	-0.1	169	377	83	80
3	0.395	0.136	0.082	1.81	86	-1.27	114	24.3	-4.98	165	379	83	80
4	0.531	0.136	0.088	1.81	86	-1.35	108	28.9	4.58	138	439	83	79
5	0.664	0.133	0.084	1.79	86	-0.17	108	28.6	-0.3	142	522	83	77
6	0.796	0.132	0.085	1.75	86	-0.48	107	28.4	-0.2	145	578	82	77
7	0.932	0.136	0.084	1.75	86	-0.7	111	28.2	-0.2	150	607	82	78
8	1.065	0.133	0.088	1.76	86	-0.46	106	27.8	-0.38	151	625	82	77
9	1.198	0.133	0.081	1.74	86	-0.28	111	27.6	-0.22	155	662	82	76
10	1.300	0.102	0.085	1.72	86	-0.41	84	27.3	-0.3	162	703	82	75
11	1.462	0.162	0.083	1.73	86	-1.02	135	27.0	-0.3	165	721	82	75
12	1.593	0.131	0.081	1.73	86	-0.81	111	26.7	-0.3	168	744	83	76
13	1.727	0.134	0.082	1.73	86	-0.06	113	26.3	-0.38	170	757	83	78
14	1.857	0.130	0.083	1.71	86	-0.16	109	26.0	-0.32	173	781	83	76
15	1.989	0.132	0.080	1.71	86	-0.07	113	25.7	-0.32	178	795	83	78
16	2.126	0.137	0.082	1.79	85	-0.2	116	25.3	-0.38	179	811	83	78
17	2.258	0.132	0.083	1.76	85	-1.23	109	25.0	-0.3	151	684	83	79
18	2.391	0.133	0.087	1.77	85	-0.53	106	24.7	-0.3	140	594	82	80
19	2.524	0.133	0.087	1.77	86	-1.16	106	24.5	-0.2	134	545	82	80
20	2.656	0.132	0.088	1.77	86	-1.29	104	24.4	-0.1	130	511	82	80
21	2.790	0.134	0.087	1.75	86	-0.64	106	24.2	-0.2	128	488	82	80
22	2.925	0.135	0.085	1.77	86	-1.08	108	24.0	-0.2	125	470	82	79
23	3.058	0.133	0.086	1.75	86	-0.77	105	23.8	-0.2	123	457	82	81
24	3.194	0.136	0.088	1.77	86	-1.28	106	23.7	-0.1	121	448	82	81
25	3.330	0.136	0.089	1.77	86	-0.13	106	23.5	-0.2	121	443	82	79
26	3.466	0.136	0.089	1.76	86	-0.09	105	23.3	-0.2	119	440	82	79
27	3.599	0.133	0.086	1.77	86	-0.78	105	23.2	-0.12	119	439	81	79
28	3.738	0.139	0.090	1.78	86	-1.24	107	23.0	-0.18	119	440	81	79
29	3.872	0.134	0.091	1.76	86	-0.68	103	22.8	-0.2	120	442	82	80
30	4.007	0.135	0.090	1.79	86	-1.35	104	22.6	-0.2	118	442	82	81
31	4.144	0.137	0.092	1.75	86	-0.16	104	22.4	-0.2	119	442	82	80
32	4.275	0.131	0.088	1.78	86	-0.89	102	22.1	-0.3	119	442	82	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.408	0.133	0.088	1.76	86	-0.6	104	22.0	-0.1	119	445	82	81
34	4.544	0.136	0.088	1.76	86	-0.67	106	21.8	-0.2	118	445	82	81
35	4.677	0.133	0.089	1.75	86	-0.06	103	21.6	-0.2	118	446	82	80
36	4.809	0.132	0.089	1.76	86	-0.52	102	21.4	-0.2	119	446	82	81
37	4.944	0.135	0.091	1.75	86	-1.14	103	21.2	-0.2	117	447	82	80
38	5.075	0.131	0.090	1.75	86	-0.12	101	21.0	-0.2	119	449	82	80
39	5.208	0.133	0.086	1.74	86	-1.41	105	20.8	-0.2	119	450	82	81
40	5.342	0.134	0.087	1.74	86	-1.12	105	20.5	-0.3	119	453	82	81
41	5.473	0.131	0.089	1.74	86	-0.53	101	20.4	-0.1	119	452	82	80
42	5.604	0.131	0.088	1.75	86	-0.4	102	20.2	-0.24	118	453	82	80
43	5.740	0.136	0.088	1.74	86	-1.18	106	20.0	-0.16	118	458	82	80
44	5.870	0.130	0.091	1.76	86	-1.32	99	19.8	-0.2	117	457	82	80
45	6.004	0.134	0.083	1.75	86	-0.85	107	19.6	-0.2	119	460	82	81
46	6.141	0.137	0.087	1.74	86	-1.52	107	19.4	-0.2	117	458	82	79
47	6.271	0.130	0.086	1.76	86	-1.17	102	19.2	-0.2	119	458	82	81
48	6.404	0.133	0.092	1.76	86	-0.87	101	19.0	-0.22	118	457	82	80
49	6.538	0.134	0.090	1.75	86	-0.96	103	18.7	-0.26	118	460	82	80
50	6.669	0.131	0.089	1.74	86	-0.3	101	18.6	-0.12	118	460	82	79
51	6.800	0.131	0.087	1.73	86	-0.5	103	18.4	-0.24	118	459	81	80
52	6.935	0.135	0.090	1.74	86	-0.39	104	18.2	-0.16	117	457	81	79
53	7.066	0.131	0.090	1.73	86	-0.11	101	17.9	-0.3	117	455	81	78
54	7.198	0.132	0.088	1.74	86	-0.97	103	17.8	-0.1	117	453	81	78
55	7.334	0.136	0.090	1.73	86	-0.45	105	17.5	-0.3	118	452	81	81
56	7.464	0.130	0.088	1.71	86	-0.34	101	17.4	-0.12	116	451	81	82
57	7.595	0.131	0.088	1.73	86	-0.82	102	17.1	-0.28	117	450	81	81
58	7.731	0.136	0.090	1.73	86	-1.12	105	17.0	-0.14	117	448	81	80
59	7.860	0.129	0.090	1.73	86	-0.84	99	16.7	-0.26	116	448	81	81
60	7.991	0.131	0.089	1.75	85	-1.11	101	16.6	-0.1	115	445	81	79
61	8.125	0.134	0.089	1.73	85	-0.78	104	16.4	-0.2	115	441	81	80
62	8.253	0.128	0.088	1.72	85	-1.2	100	16.2	-0.2	115	440	81	80
63	8.383	0.130	0.086	1.71	85	-1.39	102	16.0	-0.2	115	441	81	80
64	8.516	0.133	0.088	1.70	85	-0.37	103	15.9	-0.1	115	440	81	80
65	8.645	0.129	0.088	1.70	85	-0.22	100	15.6	-0.26	114	438	81	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	8.777	0.132	0.088	1.71	85	-0.44	103	15.5	-0.14	115	438	81	81
67	8.909	0.132	0.089	1.70	85	-1.25	102	15.3	-0.2	114	436	82	81
68	9.037	0.128	0.089	1.69	85	-1.47	99	15.1	-0.2	114	435	82	80
69	9.168	0.131	0.089	1.69	85	-1.13	101	14.9	-0.2	114	432	82	80
70	9.301	0.133	0.089	1.69	85	-1	103	14.7	-0.2	112	432	82	79
71	9.432	0.131	0.088	1.70	85	-0.18	102	14.6	-0.1	114	432	82	80
72	9.562	0.130	0.088	1.69	85	-1.16	101	14.3	-0.3	114	431	82	79
73	9.697	0.135	0.089	1.73	85	-1.39	104	14.2	-0.1	113	431	82	79
74	9.834	0.137	0.088	1.83	85	-0.82	106	14.0	-0.2	113	430	83	79
75	9.970	0.136	0.088	1.85	85	-0.87	106	13.9	-0.1	113	430	83	79
76	10.105	0.135	0.088	1.81	85	-0.92	105	13.6	-0.28	113	432	82	79
77	10.241	0.136	0.091	1.80	85	-1.22	104	13.5	-0.12	113	430	82	78
78	10.378	0.137	0.090	1.83	85	-0.23	105	13.3	-0.2	113	429	82	79
79	10.515	0.137	0.089	1.77	85	-0.5	106	13.2	-0.1	113	429	82	79
80	10.645	0.130	0.088	1.78	85	-0.9	101	13.0	-0.2	113	431	81	80
81	10.779	0.134	0.088	1.76	85	-0.64	104	12.8	-0.2	112	429	81	80
82	10.915	0.136	0.089	1.78	85	-1.36	105	12.6	-0.2	112	431	81	80
83	11.045	0.130	0.089	1.77	85	-0.93	100	12.5	-0.1	113	432	81	79
84	11.181	0.136	0.090	1.77	85	-1.25	104	12.3	-0.2	112	432	81	79
85	11.316	0.135	0.091	1.77	85	-0.91	103	12.1	-0.2	112	433	81	79
86	11.447	0.131	0.089	1.76	85	-0.64	101	12.0	-0.1	112	434	81	79
87	11.583	0.136	0.089	1.74	85	-0.11	105	11.8	-0.2	112	432	81	79
88	11.715	0.132	0.089	1.76	85	-0.96	102	11.6	-0.2	112	431	81	78
89	11.844	0.129	0.090	1.75	85	-0.98	99	11.5	-0.12	112	430	81	80
90	11.979	0.135	0.090	1.76	85	-1.31	104	11.3	-0.18	112	429	81	80
91	12.113	0.134	0.091	1.75	85	-0.09	102	11.1	-0.24	111	429	81	79
92	12.242	0.129	0.087	1.76	85	-1.31	101	10.9	-0.16	111	430	81	80
93	12.378	0.136	0.087	1.75	85	-0.66	106	10.8	-0.12	111	428	81	79
94	12.510	0.132	0.090	1.76	85	-0.17	101	10.6	-0.18	111	428	81	80
95	12.641	0.131	0.089	1.74	85	-0.55	101	10.4	-0.2	111	427	82	81
96	12.778	0.137	0.088	1.75	85	-1.03	106	10.3	-0.1	111	427	82	80
97	12.912	0.134	0.091	1.76	85	-1.31	102	10.1	-0.2	111	424	82	78
98	13.043	0.131	0.089	1.76	85	-0.9	101	10.0	-0.1	111	420	82	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	13.180	0.137	0.091	1.75	85	-1.09	104	9.8	-0.2	110	417	82	79
100	13.311	0.131	0.088	1.76	85	-1.17	101	9.7	-0.1	110	414	82	79
101	13.445	0.134	0.089	1.74	85	-1	103	9.5	-0.2	109	411	82	79
102	13.584	0.139	0.090	1.76	85	-1.15	106	9.4	-0.1	110	410	82	79
103	13.716	0.132	0.089	1.75	85	0	102	9.3	-0.1	110	408	82	80
104	13.850	0.134	0.090	1.73	85	-0.19	102	9.1	-0.2	109	406	81	80
105	13.988	0.138	0.088	1.75	85	-0.78	107	9.0	-0.1	109	404	81	80
106	14.122	0.134	0.090	1.75	85	-0.48	102	8.8	-0.2	109	405	81	79
107	14.254	0.132	0.088	1.72	85	-0.14	102	8.7	-0.1	108	403	81	79
108	14.389	0.135	0.090	1.74	85	-1.44	103	8.6	-0.1	108	401	81	78
109	14.520	0.131	0.088	1.74	85	-1.07	101	8.5	-0.1	107	397	81	80
110	14.655	0.135	0.091	1.74	85	-0.02	103	8.4	-0.12	107	391	81	79
111	14.791	0.136	0.091	1.76	85	-1.4	103	8.2	-0.18	106	385	81	79
112	14.920	0.129	0.088	1.73	85	-0.16	100	8.2	0	106	381	81	78
113	15.051	0.131	0.093	1.75	85	-0.38	98	8.1	-0.1	105	376	81	79
114	15.187	0.136	0.089	1.73	85	-0.88	104	8.0	-0.1	105	372	81	78
115	15.317	0.130	0.089	1.74	85	-0.75	100	7.8	-0.18	105	370	81	78
116	15.448	0.131	0.090	1.74	85	-0.18	100	7.8	-0.02	105	368	81	80
117	15.582	0.134	0.091	1.73	85	-1.16	102	7.7	-0.1	105	365	81	78
118	15.712	0.130	0.091	1.73	85	-0.64	99	7.5	-0.2	105	362	81	79
119	15.843	0.131	0.089	1.75	85	-1.34	100	7.4	-0.1	105	361	81	79
120	15.979	0.136	0.091	1.75	85	-0.94	103	7.4	0	105	360	81	80
121	16.108	0.129	0.089	1.75	85	-0.95	99	7.3	-0.1	104	359	81	79
122	16.239	0.131	0.088	1.74	85	-1.33	101	7.1	-0.2	103	357	81	79
123	16.373	0.134	0.089	1.77	85	-0.69	102	7.0	-0.1	102	355	81	79
124	16.505	0.132	0.089	1.73	85	-1.09	101	7.0	0	102	352	81	78
125	16.636	0.131	0.090	1.73	85	-0.15	100	6.9	-0.1	102	349	81	78
126	16.770	0.134	0.090	1.74	85	-1.31	102	6.8	-0.1	102	345	81	78
127	16.901	0.131	0.088	1.72	85	-0.18	101	6.7	-0.1	102	344	81	79
128	17.032	0.131	0.091	1.75	85	-0.72	99	6.6	-0.1	101	340	81	77
129	17.168	0.136	0.093	1.75	85	-1.05	102	6.6	0	100	337	81	79
130	17.297	0.129	0.089	1.75	85	-1.07	98	6.5	-0.1	100	334	81	77
131	17.429	0.132	0.089	1.75	85	-0.3	101	6.5	0	99	330	81	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	17.566	0.137	0.090	1.75	85	-0.29	104	6.4	-0.1	99	326	81	78
133	17.696	0.130	0.092	1.74	85	-1.13	97	6.3	-0.1	99	324	81	78
134	17.828	0.132	0.091	1.74	85	-0.57	100	6.3	0	99	321	82	78
135	17.963	0.135	0.090	1.77	85	-1.32	102	6.2	-0.1	98	320	82	77
136	18.093	0.130	0.090	1.74	85	-1.21	98	6.1	-0.06	98	317	81	78
137	18.226	0.133	0.092	1.76	85	-1.1	100	6.0	-0.12	98	315	81	77
138	18.361	0.135	0.090	1.75	85	-0.15	102	6.0	-0.02	97	314	81	77
139	18.492	0.131	0.090	1.75	85	-1.36	99	5.9	-0.1	97	312	81	78
140	18.624	0.132	0.089	1.75	85	-0.29	100	5.9	0	96	310	81	78
141	18.759	0.135	0.089	1.75	85	-0.8	103	5.8	-0.08	96	309	81	77
142	18.890	0.131	0.091	1.75	85	-0.33	99	5.8	-0.02	96	307	81	77
143	19.022	0.132	0.090	1.76	85	-1.11	100	5.7	-0.1	96	305	81	77
144	19.156	0.134	0.091	1.74	85	-1.15	101	5.6	-0.1	96	303	81	77
145	19.288	0.132	0.090	1.74	85	-0.14	100	5.6	0	96	302	82	78
146	19.422	0.134	0.089	1.76	85	-0.16	102	5.5	-0.1	96	301	82	77
147	19.555	0.133	0.091	1.73	85	-0.09	100	5.5	0	96	299	82	77
148	19.686	0.131	0.092	1.76	85	-0.99	98	5.4	-0.1	96	298	82	77
149	19.819	0.133	0.091	1.76	85	-0.3	100	5.3	-0.1	95	296	82	79
150	19.953	0.134	0.090	1.74	84	-0.57	101	5.3	0	95	295	82	78
151	20.085	0.132	0.091	1.76	84	-0.3	99	5.2	-0.1	94	293	82	77
152	20.217	0.132	0.092	1.76	84	-0.71	99	5.1	-0.1	95	292	82	78
153	20.352	0.135	0.091	1.73	84	-0.08	102	5.1	0	94	292	82	77
154	20.483	0.131	0.090	1.76	84	-0.68	99	5.1	0	94	290	82	78
155	20.616	0.133	0.091	1.76	84	-0.21	100	5.0	-0.1	94	290	82	77
156	20.752	0.136	0.091	1.74	84	-0.79	102	4.9	-0.1	94	289	81	77
157	20.882	0.130	0.089	1.74	84	-0.87	99	4.9	0	94	288	81	78
158	21.015	0.133	0.089	1.77	84	-0.14	101	4.9	0	93	285	81	78
159	21.150	0.135	0.091	1.76	84	-0.95	101	4.8	-0.1	93	283	81	77
160	21.280	0.130	0.091	1.73	84	-0.81	98	4.8	-0.04	93	281	81	76
161	21.412	0.132	0.091	1.74	84	-0.16	99	4.7	-0.06	93	279	81	76
162	21.548	0.136	0.093	1.73	84	-1.16	101	4.7	0	93	277	81	77
163	21.680	0.132	0.090	1.74	84	-1.04	100	4.7	0	92	276	81	77
164	21.810	0.130	0.093	1.75	84	-1.27	97	4.6	-0.1	92	275	81	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	21.945	0.135	0.091	1.72	84	-0.71	101	4.5	-0.1	92	274	81	76
166	22.076	0.131	0.092	1.75	84	-0.97	98	4.5	0	91	272	81	76
167	22.207	0.131	0.091	1.73	84	-1.18	98	4.5	0	91	269	81	76
168	22.342	0.135	0.088	1.73	84	-0.26	103	4.5	0	91	267	81	77
169	22.473	0.131	0.090	1.74	84	-0.1	99	4.4	-0.1	90	264	81	77
170	22.605	0.132	0.092	1.76	84	-1.31	98	4.4	0	90	262	81	76
171	22.739	0.134	0.088	1.74	84	-1.33	102	4.3	-0.1	90	260	81	75
172	22.868	0.129	0.093	1.74	84	-0.9	96	4.3	0	90	257	81	76
173	23.000	0.132	0.092	1.75	84	-0.93	98	4.3	0	90	255	81	76
174	23.134	0.134	0.092	1.74	84	-0.47	100	4.3	0	89	253	81	76
175	23.265	0.131	0.090	1.75	84	-0.7	99	4.3	0	89	251	81	76
176	23.396	0.131	0.090	1.74	84	-0.68	99	4.3	0	89	249	81	76
177	23.533	0.137	0.091	1.73	84	-1.4	103	4.2	-0.06	89	247	81	76
178	23.663	0.130	0.092	1.75	84	-0.81	97	4.2	0	89	245	81	76
179	23.796	0.133	0.091	1.76	84	-0.24	100	4.2	-0.04	89	243	81	76
180	23.931	0.135	0.091	1.74	84	-0.22	101	4.2	0	88	241	81	77
181	24.062	0.131	0.091	1.74	84	-0.59	98	4.1	-0.1	87	239	81	76
182	24.193	0.131	0.092	1.74	83	-0.15	98	4.1	0	88	237	82	76
183	24.329	0.136	0.094	1.74	83	-1.05	100	4.1	0	88	236	82	76
184	24.462	0.133	0.091	1.74	83	-0.82	100	4.1	0	87	234	82	76
185	24.593	0.131	0.093	1.75	83	-1.13	97	4.0	-0.1	87	233	82	76
186	24.727	0.134	0.093	1.73	83	-0.79	99	4.0	0	87	232	81	77
187	24.859	0.132	0.094	1.73	83	-0.68	97	4.0	0	87	230	81	77
188	24.990	0.131	0.091	1.73	83	-0.67	98	4.0	0	86	228	81	76
189	25.125	0.135	0.091	1.73	83	-0.99	101	3.9	-0.1	86	227	81	76
190	25.256	0.131	0.089	1.74	83	-0.92	99	3.9	0	86	226	81	76
191	25.387	0.131	0.093	1.74	83	-1	97	3.9	0	86	225	81	76
192	25.520	0.133	0.089	1.73	83	-0.73	101	3.9	0	86	223	81	75
193	25.652	0.132	0.091	1.74	83	-1.38	99	3.9	0	86	222	81	76
194	25.785	0.133	0.090	1.75	83	-0.27	100	3.9	0	86	220	81	75
195	25.919	0.134	0.092	1.74	83	-0.71	100	3.9	0	86	220	81	75
196	26.051	0.132	0.091	1.73	83	-0.97	99	3.9	0	86	219	81	75
197	26.183	0.132	0.093	1.75	83	-0.04	98	3.9	0	86	218	81	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	26.317	0.134	0.093	1.73	83	-0.15	99	3.9	0	86	217	81	75
199	26.448	0.131	0.093	1.74	83	-0.8	97	3.8	-0.1	86	216	81	75
200	26.579	0.131	0.092	1.76	83	-0.22	97	3.8	0	85	215	81	75
201	26.713	0.134	0.092	1.74	83	-0.85	100	3.8	0	85	214	81	75
202	26.842	0.129	0.091	1.74	83	-0.64	96	3.8	0	85	213	81	76
203	26.972	0.130	0.092	1.76	83	-0.67	97	3.8	0	84	212	81	74
204	27.106	0.134	0.088	1.72	83	-0.13	102	3.7	-0.1	84	211	81	76
205	27.237	0.131	0.091	1.73	83	-0.39	98	3.7	0	84	210	81	75
206	27.368	0.131	0.090	1.74	82	-0.7	99	3.7	0	84	209	81	74
207	27.502	0.134	0.093	1.73	82	-1.43	99	3.7	0	84	208	81	75
208	27.633	0.131	0.091	1.73	82	-0.07	98	3.7	0	83	207	81	74
209	27.765	0.132	0.093	1.74	82	-1.33	98	3.7	0	83	207	81	74
210	27.899	0.134	0.092	1.75	82	-1.14	100	3.7	0	83	206	81	75
211	28.029	0.130	0.091	1.72	82	-0.16	97	3.6	-0.1	83	205	81	76
212	28.162	0.133	0.093	1.72	82	-0.42	98	3.6	0	83	204	82	74
213	28.295	0.133	0.092	1.74	82	-0.86	99	3.6	0	83	203	82	74
214	28.425	0.130	0.091	1.74	82	-0.95	97	3.6	0	83	202	82	75
215	28.557	0.132	0.092	1.73	82	-0.05	98	3.6	0	83	201	82	74
216	28.691	0.134	0.092	1.72	82	-1.33	100	3.6	0	83	200	82	74
217	28.821	0.130	0.092	1.73	82	-1.2	97	3.6	0	83	199	82	74
218	28.953	0.132	0.092	1.74	82	-1.07	98	3.6	0	83	199	82	74
219	29.087	0.134	0.095	1.75	82	-0.8	98	3.6	0	83	198	82	74
220	29.218	0.131	0.092	1.74	82	-0.58	97	3.5	-0.06	83	198	82	74
221	29.350	0.132	0.091	1.73	82	-0.48	99	3.6	0.04	82	197	82	74
222	29.483	0.133	0.092	1.76	82	-1.42	99	3.5	-0.08	82	196	82	74
223	29.612	0.129	0.090	1.74	82	-0.78	97	3.5	0.04	83	196	82	74
224	29.744	0.132	0.091	1.73	82	-0.34	99	3.5	-0.04	82	195	82	74
225	29.880	0.136	0.091	1.74	82	-1.01	102	3.5	0	82	194	82	74
226	30.010	0.130	0.093	1.72	82	-0.31	96	3.5	0	82	193	82	74
227	30.140	0.130	0.093	1.75	82	-0.13	96	3.5	0	82	193	82	74
228	30.276	0.136	0.091	1.75	82	-0.14	102	3.5	0	82	192	81	74
229	30.406	0.130	0.090	1.73	82	-0.32	98	3.5	0	82	191	81	74
230	30.537	0.131	0.092	1.73	82	-0.79	97	3.5	0	82	191	81	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	30.671	0.134	0.090	1.73	82	-1.23	100	3.4	-0.1	81	190	81	74
232	30.800	0.129	0.093	1.73	81	-0.7	95	3.4	0	81	190	81	74
233	30.932	0.132	0.093	1.71	81	-0.8	98	3.4	0	81	189	81	74
234	31.068	0.136	0.091	1.73	81	-1.05	102	3.4	0	81	189	81	74
235	31.197	0.129	0.093	1.76	81	-0.73	95	3.4	0	81	188	81	75
236	31.328	0.131	0.091	1.73	81	-1.28	98	3.4	0	81	188	81	73
237	31.465	0.137	0.090	1.73	81	-0.97	103	3.4	-0.02	80	187	81	75
238	31.594	0.129	0.092	1.73	81	-0.6	96	3.3	-0.08	80	187	81	73
239	31.724	0.130	0.092	1.72	81	-0.68	97	3.3	0	81	187	81	73
240	31.859	0.135	0.094	1.74	81	-0.19	99	3.3	0	80	186	81	73
241	31.990	0.131	0.092	1.73	81	-1.46	97	3.3	0	80	186	81	74
242	32.120	0.130	0.093	1.75	81	-1.24	96	3.3	0	79	185	81	73
243	32.255	0.135	0.090	1.73	81	-0.1	101	3.3	0	80	184	82	72
244	32.386	0.131	0.090	1.75	81	-1.18	98	3.3	-0.04	80	184	82	75
245	32.515	0.129	0.093	1.75	81	-1.41	95	3.2	-0.06	80	184	82	74
246	32.651	0.136	0.090	1.78	81	-1.47	102	3.2	0	79	184	82	74
247	32.784	0.133	0.091	1.74	81	-1.02	99	3.2	0	79	183	82	73
248	32.912	0.128	0.092	1.73	81	-0.84	95	3.2	0	79	183	82	74
249	33.048	0.136	0.093	1.73	81	-1.35	100	3.2	0	79	182	82	74
250	33.179	0.131	0.090	1.74	81	-0.27	98	3.2	0	79	182	82	74
251	33.308	0.129	0.092	1.73	81	-1.19	96	3.2	0	79	181	82	72
252	33.441	0.133	0.092	1.75	81	-1.31	99	3.2	0	79	181	82	73
253	33.575	0.134	0.091	1.75	81	-1.11	100	3.2	0	79	181	81	74
254	33.704	0.129	0.091	1.75	81	-0.81	96	3.1	-0.1	79	181	81	73
255	33.838	0.134	0.093	1.74	81	-0.1	99	3.1	0	79	180	81	73
256	33.971	0.133	0.093	1.73	80	-0.28	98	3.1	0	79	180	81	73
257	34.099	0.128	0.094	1.73	80	-0.88	94	3.1	0	78	180	81	73
258	34.232	0.133	0.094	1.71	80	-1.2	98	3.1	0	78	179	81	73
259	34.365	0.133	0.094	1.74	80	-0.77	98	3.1	0	78	179	81	73
260	34.495	0.130	0.092	1.76	80	-0.53	97	3.1	0	78	179	82	73
261	34.627	0.132	0.094	1.72	80	-1.07	97	3.1	-0.04	78	179	82	73
262	34.761	0.134	0.094	1.72	80	-1.03	98	3.1	0.04	78	178	83	72
263	34.889	0.128	0.094	1.75	80	-0.65	94	3.0	-0.1	78	178	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	35.020	0.131	0.092	1.75	80	-1.11	97	3.0	0	78	178	83	73
265	35.154	0.134	0.092	1.72	80	-0.28	99	3.0	0	78	178	83	73
266	35.283	0.129	0.092	1.75	80	-0.98	96	3.0	0	78	178	83	73
267	35.413	0.130	0.095	1.74	80	-0.62	95	3.0	0	78	177	83	73
268	35.547	0.134	0.094	1.72	80	-1.24	98	3.0	0	78	177	83	73
269	35.678	0.131	0.092	1.73	80	-0.06	97	3.0	0	77	177	83	73
270	35.809	0.131	0.092	1.74	80	-0.89	97	2.9	-0.1	78	176	83	73
271	35.943	0.134	0.095	1.73	80	-0.16	98	2.9	0	77	176	83	73
272	36.075	0.132	0.094	1.72	80	-0.28	97	2.9	0	77	176	83	73
273	36.205	0.130	0.093	1.73	80	-0.81	96	2.9	0	78	176	83	72
274	36.339	0.134	0.093	1.73	80	-0.67	99	2.9	0	77	176	83	73
275	36.469	0.130	0.094	1.71	80	-0.37	95	2.9	0	77	175	83	73
276	36.601	0.132	0.093	1.73	80	-0.47	97	2.9	0	77	175	83	73
277	36.734	0.133	0.093	1.74	80	-1.09	98	2.9	0	77	175	83	72
278	36.864	0.130	0.094	1.73	80	-1.38	95	2.9	-0.04	77	175	83	72
279	36.995	0.131	0.094	1.73	80	-0.5	96	2.9	0.02	77	175	83	72
280	37.129	0.134	0.091	1.75	80	-1.02	100	2.8	-0.08	77	174	83	71
281	37.259	0.130	0.096	1.72	80	-1.05	94	2.8	0	77	173	83	71
282	37.391	0.132	0.092	1.74	79	-0.61	98	2.8	0	77	173	83	72
283	37.524	0.133	0.095	1.73	79	-0.73	97	2.8	0	77	174	83	72
284	37.654	0.130	0.093	1.72	79	-0.07	96	2.8	0	77	173	83	72
285	37.786	0.132	0.094	1.74	79	-1.2	97	2.8	0	76	173	83	72
286	37.921	0.135	0.093	1.74	79	-1.26	100	2.8	0	76	173	83	72
287	38.051	0.130	0.093	1.73	79	-0.09	96	2.8	0	76	172	83	72
288	38.182	0.131	0.092	1.73	79	-0.21	97	2.8	0	76	172	83	71
289	38.317	0.135	0.091	1.72	79	-1.26	101	2.7	-0.08	76	172	83	71
290	38.448	0.131	0.093	1.75	79	-1.45	97	2.7	-0.02	76	172	83	72
291	38.578	0.130	0.096	1.73	79	-0.17	94	2.7	0	76	172	83	72
292	38.715	0.137	0.093	1.75	79	-0.75	101	2.7	0	76	171	83	72
293	38.846	0.131	0.093	1.76	79	-1.45	97	2.7	0	75	171	83	71
294	38.974	0.128	0.095	1.73	79	-1.12	94	2.7	0	76	170	83	71
295	39.110	0.136	0.090	1.74	79	-0.15	102	2.6	-0.06	75	170	83	71
296	39.242	0.132	0.092	1.74	79	-0.08	98	2.6	-0.04	75	170	83	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	39.370	0.128	0.092	1.74	79	-1.25	95	2.6	0	75	169	83	70
298	39.506	0.136	0.093	1.73	79	-0.33	100	2.6	0	75	168	83	70
299	39.638	0.132	0.092	1.73	79	-1.09	98	2.6	0	75	168	83	70
300	39.765	0.127	0.091	1.73	79	-1.09	95	2.6	0	75	168	83	70
301	39.900	0.135	0.091	1.72	79	-0.64	101	2.6	0	75	168	83	70
302	40.034	0.134	0.094	1.72	79	-0.23	98	2.6	0	75	168	83	69
303	40.165	0.131	0.090	1.75	79	-1.07	98	2.6	0	75	168	83	71
304	40.304	0.139	0.093	1.75	78	-1.37	103	2.5	-0.1	75	168	83	71
305	40.445	0.141	0.093	1.74	78	-0.9	104	2.5	0	74	167	83	71
306	40.578	0.133	0.093	1.74	78	-0.11	98	2.5	0	75	167	83	70
307	40.714	0.136	0.093	1.74	78	-0.71	100	2.5	0	74	167	83	71
308	40.856	0.142	0.094	1.74	78	-0.22	104	2.5	0	74	167	83	71
309	40.990	0.134	0.094	1.73	78	-1.43	98	2.4	-0.1	74	167	83	71
310	41.128	0.138	0.092	1.74	78	-1.14	102	2.4	0	74	167	83	70
311	41.268	0.140	0.094	1.74	78	-0.38	103	2.4	0	74	166	83	70
312	41.404	0.136	0.092	1.73	78	-1.09	101	2.4	0	74	166	83	70
313	41.541	0.137	0.094	1.73	78	-1.2	101	2.4	0	74	166	83	70
314	41.680	0.139	0.095	1.73	78	-0.94	102	2.4	0	74	166	83	68
315	41.814	0.134	0.092	1.71	78	-0.79	99	2.4	0	74	165	83	70
316	41.948	0.134	0.090	1.74	78	-0.65	101	2.4	0	74	165	83	70
317	42.085	0.137	0.092	1.73	78	-0.96	102	2.4	0	74	166	83	70
318	42.221	0.136	0.094	1.74	78	-0.41	100	2.4	0	74	165	83	70
319	42.359	0.138	0.091	1.72	78	-0.04	103	2.3	-0.1	74	165	82	71
320	42.498	0.139	0.094	1.73	78	-1.29	102	2.3	0	74	165	82	71
321	42.633	0.135	0.094	1.73	78	-0.1	99	2.3	0	74	165	82	69
322	42.771	0.138	0.094	1.75	78	-1.1	101	2.3	0	74	165	82	70
323	42.908	0.137	0.093	1.74	78	-0.46	101	2.3	0	74	164	82	70
324	43.044	0.136	0.092	1.73	77	-1.12	101	2.3	0	74	164	82	72
325	43.184	0.140	0.091	1.76	77	-1.15	105	2.3	0	73	164	82	70
326	43.322	0.138	0.094	1.73	77	-0.2	101	2.2	-0.1	73	164	82	69
327	43.456	0.134	0.093	1.72	77	-0.32	99	2.2	0	73	164	83	70
328	43.590	0.134	0.093	1.73	77	-0.01	99	2.2	0	73	163	83	69
329	43.728	0.138	0.093	1.74	77	-1.38	102	2.2	0	73	163	83	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	43.866	0.138	0.093	1.73	77	-0.34	102	2.2	0	73	163	83	69
331	44.002	0.136	0.093	1.74	77	-1.04	101	2.2	-0.02	73	163	83	69
332	44.140	0.138	0.094	1.76	77	-1.39	101	2.2	0	73	162	83	69
333	44.275	0.135	0.093	1.72	77	-0.86	100	2.1	-0.08	73	162	83	70
334	44.410	0.135	0.090	1.74	77	-1.18	101	2.1	0	73	161	83	69
335	44.548	0.138	0.093	1.73	77	-1.41	102	2.1	0	73	161	83	70
336	44.681	0.133	0.091	1.71	77	-0.36	99	2.1	0	73	161	82	69
337	44.819	0.138	0.094	1.72	77	-1.37	101	2.1	0	73	161	82	70
338	44.961	0.142	0.092	1.74	77	-1.4	105	2.1	0	72	161	82	70
339	45.092	0.131	0.095	1.72	77	-0.2	96	2.0	-0.06	73	160	82	69
340	45.225	0.133	0.089	1.73	77	-0.64	100	2.0	-0.04	72	160	82	69
341	45.365	0.140	0.093	1.75	77	-0.76	103	2.0	0	72	160	82	68
342	45.499	0.134	0.094	1.75	77	-0.91	98	2.0	0	72	159	82	69
343	45.634	0.135	0.092	1.73	77	-0.27	100	2.0	0	72	159	82	69
344	45.772	0.138	0.093	1.73	77	-0.77	102	2.0	0	72	159	82	69
345	45.912	0.140	0.092	1.73	77	-0.87	104	2.0	0	72	158	82	69
346	46.049	0.137	0.092	1.73	77	-0.92	102	2.0	0	72	159	82	69
347	46.185	0.136	0.093	1.73	76	-0.16	101	2.0	0	72	158	82	68
348	46.320	0.135	0.094	1.73	76	-0.61	99	2.0	0	72	158	83	69
349	46.452	0.132	0.094	1.74	76	-0.69	97	2.0	0	72	158	83	69
350	46.587	0.135	0.091	1.73	76	-1.14	101	1.9	-0.1	72	158	83	69
351	46.725	0.138	0.094	1.74	76	-0.58	102	1.9	0	72	158	83	70
352	46.858	0.133	0.093	1.72	76	-0.76	98	1.9	0	72	158	83	68
353	46.991	0.133	0.094	1.75	76	-1.21	98	1.9	0	72	157	83	68
354	47.128	0.137	0.093	1.73	76	-1.18	101	1.9	0	72	157	83	68
355	47.262	0.134	0.091	1.73	76	-0.35	100	1.9	0	72	157	83	68
356	47.397	0.135	0.094	1.73	76	-0.71	99	1.9	0	72	157	83	67
357	47.535	0.138	0.093	1.72	76	-1.25	102	1.9	0	71	157	83	68
358	47.669	0.134	0.092	1.73	76	-0.93	100	1.8	-0.06	71	157	83	68
359	47.806	0.137	0.092	1.73	76	-0.33	102	1.8	-0.04	71	157	83	69
360	47.942	0.136	0.094	1.75	76	-0.6	100	1.8	0	71	157	83	68
361	48.076	0.134	0.092	1.74	76	-1.12	100	1.8	0	71	157	83	68
362	48.211	0.135	0.089	1.74	76	-1.07	102	1.8	0	71	157	83	68

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	48.348	0.137	0.091	1.75	76	-1.27	102	1.8	0	71	157	83	68
364	48.480	0.132	0.091	1.73	76	-1.42	99	1.8	0	71	156	83	67
365	48.615	0.135	0.093	1.72	76	-1.05	100	1.7	-0.1	71	157	83	67
366	48.752	0.137	0.094	1.73	76	-0.71	101	1.7	0	71	157	83	68
367	48.887	0.135	0.093	1.73	76	-1.49	100	1.7	0	71	157	83	67
368	49.019	0.132	0.095	1.72	76	-0.09	97	1.7	0	71	157	83	68
369	49.159	0.140	0.094	1.73	76	-1.48	103	1.7	0	71	157	82	68
370	49.294	0.135	0.094	1.72	75	-0.67	99	1.7	0	71	157	83	67
371	49.428	0.134	0.092	1.73	75	-0.34	100	1.7	-0.04	71	157	83	67
372	49.566	0.138	0.094	1.72	75	-0.07	102	1.6	-0.02	71	158	83	68
373	49.702	0.136	0.092	1.70	75	-0.02	101	1.6	-0.04	71	158	83	67
374	49.834	0.132	0.091	1.73	75	-0.69	99	1.7	0.1	70	157	83	66
375	49.971	0.137	0.095	1.72	75	-0.17	100	1.6	-0.1	70	158	83	68
376	50.108	0.137	0.094	1.74	75	-0.15	101	1.6	0	71	158	83	68
377	50.238	0.130	0.093	1.72	75	-0.51	96	1.6	0	71	158	83	68
378	50.370	0.132	0.093	1.72	75	-1.37	98	1.6	0	71	158	83	67
379	50.509	0.139	0.090	1.74	75	-1.39	105	1.6	0	71	157	83	66
380	50.640	0.131	0.089	1.73	75	-1.4	99	1.6	0	71	157	83	67
381	50.774	0.134	0.092	1.71	75	-0.62	100	1.6	0	71	157	83	67
382	50.911	0.137	0.090	1.72	75	-0.41	103	1.6	0	70	157	83	67
383	51.049	0.138	0.094	1.73	75	-1.35	102	1.6	0	70	157	83	67
384	51.187	0.138	0.094	1.75	75	-0.54	102	1.6	0	70	157	83	68
385	51.323	0.136	0.094	1.74	75	-0.91	100	1.6	0	70	157	83	67
386	51.458	0.135	0.094	1.73	75	-0.46	99	1.6	0	70	157	83	68
387	51.593	0.135	0.093	1.75	75	-1.03	100	1.6	0	71	158	83	66
388	51.730	0.137	0.094	1.73	75	-1.45	101	1.5	-0.1	70	157	83	67
389	51.864	0.134	0.093	1.72	75	-1.01	99	1.5	0	70	157	83	68
390	52.001	0.137	0.093	1.71	75	-0.44	101	1.5	0	71	157	83	67
391	52.142	0.141	0.094	1.70	75	-0.1	104	1.5	0	70	157	83	68
392	52.274	0.132	0.093	1.70	75	-1.09	98	1.5	0	70	156	83	67
393	52.409	0.135	0.094	1.74	74	-0.34	100	1.5	0	70	156	83	67
394	52.549	0.140	0.093	1.73	74	-1.48	104	1.5	0	70	156	83	68
395	52.682	0.133	0.095	1.73	74	-1.01	98	1.5	0	70	156	83	68

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	52.814	0.132	0.095	1.74	74	-0.45	97	1.5	0	70	156	82	68
397	52.952	0.138	0.095	1.74	74	-0.38	101	1.5	-0.02	70	156	82	67
398	53.092	0.140	0.092	1.73	74	-1	104	1.4	-0.08	70	156	82	67
399	53.222	0.130	0.092	1.71	74	-1.41	97	1.4	0	70	156	82	67
400	53.359	0.137	0.092	1.71	74	-0.45	102	1.4	0	70	156	82	67
401	53.498	0.139	0.095	1.73	74	-1.25	102	1.4	0	70	156	82	67
402	53.635	0.137	0.092	1.74	74	-0.18	102	1.3	-0.1	70	155	82	68
403	53.771	0.136	0.094	1.73	74	-0.25	100	1.4	0.06	69	155	82	68
404	53.916	0.145	0.093	1.72	74	0	107	1.3	-0.06	70	155	82	69
405	54.055	0.139	0.093	1.72	74	-0.92	103	1.3	0	70	155	82	68
406	54.194	0.139	0.093	1.73	74	-0.14	103	1.3	0	70	155	82	67
407	54.330	0.136	0.095	1.72	74	-0.11	100	1.3	0	70	155	83	67
408	54.468	0.138	0.094	1.71	74	-0.68	102	1.3	0	70	154	83	66
409	54.602	0.134	0.094	1.72	74	-0.94	99	1.3	0	70	154	83	66
410	54.740	0.138	0.096	1.74	74	-1.21	101	1.3	0	69	154	83	66
411	54.872	0.132	0.091	1.73	74	-1.36	99	1.2	-0.1	69	154	83	66
412	55.005	0.133	0.093	1.74	74	-1.11	99	1.3	0.06	70	154	83	65
413	55.142	0.137	0.093	1.73	74	-0.77	102	1.2	-0.06	70	154	83	67
414	55.274	0.132	0.095	1.74	74	-1.03	97	1.2	0	70	153	83	65
415	55.406	0.132	0.094	1.74	74	-1.04	97	1.2	0	70	153	83	66
416	55.547	0.141	0.092	1.73	74	-1.4	105	1.2	0	69	153	83	66
417	55.679	0.132	0.092	1.72	74	-1.38	98	1.2	0	69	154	83	66
418	55.814	0.135	0.091	1.71	74	-1.08	101	1.2	0	69	154	83	66
419	55.951	0.137	0.093	1.70	74	-0.34	101	1.2	0	69	154	83	67
420	56.088	0.137	0.096	1.68	73	-0.42	100	1.2	0	69	153	82	67
421	56.217	0.129	0.093	1.68	73	-0.45	96	1.2	0	69	153	82	67
422	56.348	0.131	0.093	1.68	73	-0.25	97	1.2	0	69	153	82	66
423	56.481	0.133	0.091	1.67	73	-0.65	100	1.2	0	69	152	82	67
424	56.611	0.130	0.090	1.67	73	-0.24	98	1.2	-0.04	70	152	83	66
425	56.740	0.129	0.093	1.69	73	-1.02	96	1.1	-0.04	70	151	83	66
426	56.881	0.141	0.095	1.78	73	-0.87	104	1.1	-0.02	70	151	83	67
427	57.013	0.132	0.095	1.77	73	-1.42	97	1.1	0	71	151	83	68
428	57.149	0.136	0.091	1.73	73	-0.39	102	1.0	-0.1	71	151	83	67

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429	57.285	0.136	0.094	1.79	73	-1.04	101	1.4	0.36	72	150	83	68
430	57.415	0.130	0.092	1.75	73	-1.33	97	1.0	-0.36	72	151	84	68
431	57.548	0.133	0.091	1.75	73	-1.33	100	1.0	0	72	150	85	69
432	57.688	0.140	0.094	1.74	73	-0.98	104	1.0	0	72	149	85	70
433	57.823	0.135	0.093	1.75	73	-0.97	100	1.0	0	72	149	85	68
434	57.957	0.134	0.092	1.74	73	-0.33	100	0.9	-0.1	72	149	85	68
435	58.097	0.140	0.095	1.73	73	-0.63	103	0.9	0	72	148	85	68
436	58.226	0.129	0.092	1.74	73	-1.5	96	0.9	0	72	148	85	69
437	58.354	0.128	0.093	1.73	73	-0.58	95	1.0	0.1	72	148	85	69
438	58.488	0.134	0.093	1.73	73	-0.85	100	1.0	0	72	148	85	69
439	58.618	0.130	0.092	1.72	73	-1.08	97	1.0	0	72	148	85	69
440	58.743	0.125	0.093	1.73	73	-0.58	93	1.0	-0.02	72	148	84	70
441	58.874	0.131	0.091	1.72	73	-0.34	99	0.9	-0.08	72	147	84	69
442	59.006	0.132	0.093	1.73	73	-0.18	98	0.9	0	72	147	84	68
443	59.133	0.127	0.092	1.73	73	-1.43	95	0.9	0	72	147	84	69
444	59.264	0.131	0.094	1.72	73	-0.88	97	0.9	0	72	147	84	69
445	59.397	0.133	0.092	1.72	73	-0.92	99	0.9	0	72	147	84	69
446	59.524	0.127	0.092	1.72	73	-1.58	95	0.9	0	72	147	84	69
447	59.654	0.130	0.094	1.71	73	-1.06	96	0.9	0	72	147	84	69
448	59.787	0.133	0.091	1.73	73	-1.01	100	0.9	0	72	146	84	68
449	59.916	0.129	0.091	1.73	73	-0.85	97	0.9	0	72	146	84	69
450	60.045	0.129	0.092	1.73	73	-0.83	96	0.9	0	72	146	84	69
451	60.177	0.132	0.093	1.77	73	-1.13	98	0.9	-0.02	72	146	84	69
452	60.306	0.129	0.092	1.75	73	-0.83	96	0.9	0.02	72	145	84	68
453	60.437	0.131	0.092	1.75	73	-0.45	98	0.8	-0.1	72	146	84	69
454	60.571	0.134	0.093	1.77	73	-0.65	100	0.8	0	72	145	84	68
455	60.701	0.130	0.091	1.75	73	-0.26	98	0.8	0	72	144	84	69
456	60.831	0.130	0.092	1.76	73	-0.25	97	0.8	0	72	144	84	69
457	60.963	0.132	0.092	1.73	73	-1.51	99	0.8	0	72	143	84	68
458	61.092	0.129	0.093	1.75	73	-0.15	96	0.8	0	72	144	84	69
459	61.223	0.131	0.092	1.75	73	-1.08	98	0.8	0	72	144	84	68
460	61.356	0.133	0.092	1.76	73	-1.02	99	0.8	0	72	143	84	69
461	61.485	0.129	0.093	1.76	73	-1.05	96	0.8	0	72	143	84	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462	61.616	0.131	0.091	1.73	73	-0.58	99	0.7	-0.1	72	143	84	70
463	61.750	0.134	0.091	1.77	73	-1.48	101	0.7	0	72	143	84	70
464	61.880	0.130	0.094	1.75	73	-0.42	96	0.7	0	73	143	84	71
465	62.010	0.130	0.092	1.74	73	-1.01	97	0.7	0	72	143	84	69
466	62.144	0.134	0.092	1.76	73	-0.72	100	0.7	0	73	143	84	70
467	62.273	0.129	0.094	1.75	73	-1.5	96	0.7	0	73	142	85	70
468	62.403	0.130	0.093	1.75	73	-1.12	97	0.7	0	73	142	85	71
469	62.538	0.135	0.094	1.75	73	-1.22	100	0.7	0	73	142	85	70
470	62.667	0.129	0.091	1.74	73	-1.23	97	0.6	-0.08	73	142	85	69
471	62.797	0.130	0.094	1.76	73	-0.55	96	0.6	-0.02	73	142	85	70
472	62.931	0.134	0.090	1.77	73	-1.4	101	0.6	0	73	141	85	70
473	63.060	0.129	0.091	1.74	73	-1.12	97	0.6	0	73	141	84	71
474	63.189	0.129	0.092	1.75	73	-0.39	97	0.6	0	73	141	84	70
475	63.323	0.134	0.093	1.76	73	-0.76	100	0.6	0	73	140	84	70
476	63.453	0.130	0.093	1.76	73	-0.69	97	0.6	0	73	140	84	69
477	63.582	0.129	0.092	1.76	74	-0.97	96	0.6	0	73	140	84	70
478	63.716	0.134	0.093	1.75	74	-0.59	100	0.6	0	73	140	84	70
479	63.845	0.129	0.093	1.74	74	-1.16	96	0.5	-0.06	73	140	84	70
480	63.974	0.129	0.093	1.75	74	-0.37	96	0.6	0.06	73	139	84	71
481	64.108	0.134	0.092	1.75	74	-0.41	100	0.5	-0.1	73	139	84	71
482	64.238	0.130	0.093	1.77	74	-0.61	97	0.5	0	73	139	85	69
483	64.366	0.128	0.092	1.73	74	-0.37	96	0.5	0	73	138	85	69
484	64.501	0.135	0.092	1.75	74	-1.42	101	0.5	0	73	138	85	70
485	64.631	0.130	0.093	1.76	74	-0.56	97	0.5	0	73	138	85	70
486	64.759	0.128	0.093	1.75	74	-0.06	95	0.5	0	73	138	85	71
487	64.894	0.135	0.090	1.77	74	-0.82	102	0.5	0	73	138	84	71
488	65.025	0.131	0.092	1.77	74	-1.55	98	0.5	0	73	137	84	71
489	65.153	0.128	0.092	1.74	74	-0.96	96	0.5	0	73	137	84	70
490	65.289	0.136	0.093	1.75	74	-0.73	101	0.5	0	73	136	84	71
491	65.419	0.130	0.092	1.74	74	-0.28	97	0.5	0	73	136	84	70
492	65.547	0.128	0.091	1.75	74	-1.06	96	0.5	-0.04	73	136	84	70
493	65.681	0.134	0.092	1.76	74	-0.96	100	0.4	-0.06	73	135	84	69
494	65.811	0.130	0.091	1.75	74	-0.15	98	0.5	0.1	73	135	84	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
495	65.938	0.127	0.094	1.76	74	-0.76	94	0.4	-0.1	73	135	84	70
496	66.072	0.134	0.091	1.76	74	-1.45	101	0.4	0	73	135	84	71
497	66.205	0.133	0.093	1.75	74	-0.39	99	0.4	0	73	135	84	71
498	66.332	0.127	0.093	1.76	74	-0.79	94	0.4	0	73	135	84	71
499	66.465	0.133	0.093	1.75	74	-1.21	99	0.4	0	73	135	84	72
500	66.597	0.132	0.093	1.76	74	-1.57	98	0.4	0	73	135	84	72
501	66.724	0.127	0.094	1.78	74	-1.05	94	0.4	0	73	134	84	70
502	66.857	0.133	0.092	1.77	74	-1.15	99	0.4	0	73	134	84	71
503	66.989	0.132	0.092	1.74	74	-0.81	99	0.4	0	73	134	84	71
504	67.117	0.128	0.092	1.78	74	-1.2	96	0.3	-0.1	73	134	84	71
505	67.251	0.134	0.093	1.75	74	-0.2	100	0.3	0	73	133	84	71
506	67.383	0.132	0.092	1.75	74	-0.99	99	0.3	0	73	133	84	71
507	67.510	0.127	0.094	1.75	74	-0.16	94	0.3	0	73	133	84	72
508	67.642	0.132	0.091	1.76	74	-1.4	99	0.3	0	73	132	84	71
509	67.775	0.133	0.092	1.78	74	-0.79	99	0.3	0	73	132	84	70
510	67.903	0.128	0.094	1.76	74	-1.36	95	0.3	0	73	133	84	71
511	68.035	0.132	0.092	1.75	74	-0.79	99	0.3	0	73	133	85	71
512	68.168	0.133	0.093	1.75	74	-0.68	99	0.3	0	72	132	85	70
513	68.295	0.127	0.091	1.77	74	-1.49	95	0.3	0	72	132	85	69
514	68.428	0.133	0.092	1.74	74	-0.33	99	0.3	-0.02	72	131	85	69
515	68.561	0.133	0.093	1.75	74	-0.68	99	0.3	0.02	72	131	85	69
516	68.688	0.127	0.091	1.76	74	-1.58	95	0.3	0	72	131	85	69
517	68.821	0.133	0.092	1.74	74	-0.24	99	0.2	-0.1	72	131	84	70
518	68.954	0.133	0.092	1.75	74	-0.16	99	0.2	0	72	130	84	69
519	69.082	0.128	0.093	1.77	74	-0.64	95	0.2	0	72	130	84	69
520	69.213	0.131	0.093	1.76	74	-1.14	97	0.2	0	72	129	84	71
521	69.347	0.134	0.093	1.75	74	-0.14	100	0.2	0	72	129	84	68
522	69.474	0.127	0.094	1.77	74	-1.11	94	0.2	0	72	129	84	70
523	69.606	0.132	0.092	1.76	74	-1.14	99	0.2	0	72	128	84	69
524	69.740	0.134	0.094	1.77	74	-1.54	99	0.2	0	72	128	84	70
525	69.868	0.128	0.092	1.75	74	-1.24	95	0.2	0	71	128	84	69
526	69.999	0.131	0.093	1.76	74	-1.33	97	0.2	0	71	128	84	69
527	70.133	0.134	0.091	1.77	74	-0.33	100	0.2	0	71	127	84	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
528	70.261	0.128	0.091	1.76	74	-1.03	96	0.2	0	71	127	84	68
529	70.392	0.131	0.092	1.77	74	-1.44	98	0.2	0	71	127	84	69
530	70.526	0.134	0.092	1.75	74	-1	100	0.2	0	71	126	84	69
531	70.654	0.128	0.091	1.76	74	-0.67	96	0.1	-0.1	71	126	84	67
532	70.786	0.132	0.092	1.75	74	-0.64	98	0.1	0	71	126	84	68
533	70.919	0.133	0.089	1.73	74	-0.31	101	0.1	0	71	126	85	68
534	71.047	0.128	0.091	1.77	74	-0.83	96	0.1	0	71	125	85	69
535	71.179	0.132	0.090	1.76	74	-0.15	99	0.1	0	70	125	85	69
536	71.312	0.133	0.093	1.74	74	-0.59	99	0.1	0	70	125	85	69
537	71.441	0.129	0.092	1.76	74	-0.87	96	0.1	0	70	125	85	67
538	71.571	0.130	0.089	1.75	74	-0.95	98	0.1	0	70	124	85	67
539	71.705	0.134	0.091	1.75	74	-1.45	100	0.1	0	70	124	85	67
540	71.833	0.128	0.092	1.77	74	-0.92	95	0.1	0	70	123	85	67
541	71.964	0.131	0.093	1.77	74	-0.79	97	0.1	0	70	123	85	67
542	72.098	0.134	0.094	1.78	74	-1.31	99	0.1	0	70	123	85	68
543	72.228	0.130	0.092	1.77	74	-0.16	97	0.1	0	70	122	84	68
544	72.359	0.131	0.093	1.76	74	-0.96	97	0.1	0	70	122	84	67
545	72.492	0.133	0.095	1.75	74	-1.26	97	0.1	0	69	121	84	68
546	72.621	0.129	0.092	1.78	74	-0.59	96	0.1	0	69	121	84	67
547	72.752	0.131	0.092	1.77	74	-1.35	98	0.1	0	69	121	84	67
548	72.886	0.134	0.092	1.77	74	-0.95	100	0.1	0	69	120	84	67
549	73.014	0.128	0.093	1.78	74	-1.56	95	0.1	0	69	120	84	67
550	73.146	0.132	0.094	1.74	74	-0.63	97	0.1	0	69	119	84	68
551	73.281	0.135	0.091	1.76	74	-1.49	101	0.1	0	69	119	84	67
552	73.409	0.128	0.093	1.76	74	-0.77	95	0.1	0	69	119	84	68
553	73.540	0.131	0.093	1.78	74	-1.25	97	0.1	0	69	118	84	69
554	73.674	0.134	0.090	1.76	74	-1.08	101	0.1	0	69	118	84	67
555	73.802	0.128	0.091	1.78	74	-0.75	96	0.1	0	68	117	84	67
556	73.933	0.131	0.093	1.75	74	-1.05	97	0.1	0	68	117	84	67
557	74.068	0.135	0.095	1.77	74	-0.29	99	0.1	0	68	117	84	67
558	74.196	0.128	0.093	1.77	74	-0.6	95	0.1	0	68	116	85	66
559	74.327	0.131	0.093	1.76	74	-1.13	97	0.0	-0.1	68	116	84	67
Avg/Tot	74.327	0.133	0.091	1.74	79	-0.79	100			87	240	83	72.9

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	99	-1		85	0.000	5.44	0.00
1	0.118	0.118	1.74	99	-2.37	97	86	0.000	2.60	0.00
2	0.254	0.136	1.79	98	-2.68	114	86	-0.010	1.30	0.05
3	0.387	0.133	1.77	98	0	110	87	0.000	1.84	0.06
4	0.529	0.142	1.77	98	-2.16	111	87	-0.020	6.66	0.42
5	0.663	0.134	1.75	98	0	108	86	-0.010	9.24	0.27
6	0.798	0.135	1.77	97	-1.9	108	86	-0.010	10.65	0.18
7	0.934	0.136	1.76	97	-2.74	110	86	-0.010	10.69	0.15
8	1.068	0.134	1.76	97	-2.15	106	86	0.000	11.31	0.17
9	1.203	0.135	1.76	97	-0.9	112	86	-0.010	12.48	0.02
10	1.339	0.136	1.74	97	0	111	86	0.010	13.97	0.00
11	1.471	0.132	1.76	97	-1.91	109	86	-0.010	14.25	0.00
12	1.604	0.133	1.74	97	-2.76	111	86	0.000	14.49	0.03
13	1.740	0.136	1.74	96	-2.46	113	86	0.000	14.87	0.02
14	1.872	0.132	1.74	96	0	110	86	0.000	15.21	0.00
15	2.008	0.136	1.72	96	-2.68	116	86	-0.020	15.40	0.04
16	2.146	0.138	1.79	96	0	116	86	-0.010	15.15	0.00
17	2.281	0.135	1.76	96	-2.7	110	86	-0.010	14.98	0.59
18	2.418	0.137	1.77	96	0	108	86	-0.010	13.68	0.95
19	2.550	0.132	1.77	96	0	104	85	0.000	12.37	0.19
20	2.686	0.136	1.75	96	-2.76	106	85	0.000	11.15	0.14
21	2.822	0.136	1.76	96	-2.6	106	85	0.010	10.86	0.18
22	2.956	0.134	1.76	97	-2.24	106	85	-0.020	10.46	0.26
23	3.090	0.134	1.77	97	-0.9	105	85	-0.010	10.45	0.21
24	3.228	0.138	1.77	97	-2.11	107	85	-0.010	10.34	0.26
25	3.362	0.134	1.77	97	0	103	85	0.000	10.45	0.16
26	3.497	0.135	1.76	97	0	103	85	-0.010	10.94	0.23
27	3.635	0.138	1.76	97	-2.75	108	85	-0.010	11.18	0.19
28	3.768	0.133	1.76	97	-2.75	101	85	0.000	11.96	0.26
29	3.907	0.139	1.75	97	-0.26	105	85	0.000	12.15	0.38
30	4.044	0.137	1.75	97	-0.28	104	85	-0.010	12.32	0.37
31	4.179	0.135	1.77	97	-2.1	102	85	0.000	12.27	0.40

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.315	0.136	1.74	97	0	105	85	-0.010	12.04	0.49
33	4.450	0.135	1.75	97	-0.85	104	85	-0.010	12.14	0.57
34	4.586	0.136	1.77	97	0	105	85	0.010	12.37	0.52
35	4.724	0.138	1.74	97	-2.13	106	85	0.010	12.76	0.48
36	4.859	0.135	1.76	97	-1.94	103	85	0.000	12.79	0.56
37	4.992	0.133	1.74	98	-0.13	100	85	0.000	12.60	0.59
38	5.130	0.138	1.74	98	-0.12	105	85	-0.010	12.90	0.56
39	5.264	0.134	1.74	98	-1.51	104	85	-0.010	12.91	0.52
40	5.402	0.138	1.74	98	-0.93	107	85	-0.010	13.07	0.47
41	5.537	0.135	1.75	98	-2.03	103	85	0.000	12.61	0.32
42	5.671	0.134	1.73	98	-2.78	103	85	-0.010	13.25	0.41
43	5.809	0.138	1.75	98	-2.5	106	85	-0.010	12.79	0.35
44	5.942	0.133	1.75	98	0	100	85	0.010	13.03	0.33
45	6.078	0.136	1.73	98	-2.79	108	85	-0.010	13.04	0.34
46	6.216	0.138	1.74	98	-2.74	107	85	0.000	13.24	0.37
47	6.352	0.136	1.73	98	-2.68	106	85	0.010	13.45	0.40
48	6.486	0.134	1.75	98	-2.34	101	85	0.000	13.20	0.45
49	6.623	0.137	1.74	98	-2.16	104	85	-0.010	13.60	0.43
50	6.758	0.135	1.73	98	-0.27	103	84	0.000	13.15	0.47
51	6.892	0.134	1.73	98	0	104	84	0.020	13.50	0.52
52	7.030	0.138	1.73	98	-2.79	105	84	0.000	12.74	0.48
53	7.166	0.136	1.74	98	0	103	84	-0.010	12.89	0.53
54	7.300	0.134	1.74	98	-2.45	103	84	0.000	13.31	0.52
55	7.437	0.137	1.73	99	-0.04	104	84	0.000	13.34	0.51
56	7.567	0.130	1.73	99	-1.62	100	84	-0.010	12.74	0.51
57	7.705	0.138	1.72	99	-2.8	106	84	0.000	12.76	0.47
58	7.842	0.137	1.71	99	-2.7	104	84	-0.010	12.80	0.44
59	7.973	0.131	1.73	99	-1.56	99	84	-0.010	12.83	0.37
60	8.109	0.136	1.72	99	0	103	84	-0.010	12.16	0.43
61	8.244	0.135	1.72	99	-0.31	103	84	-0.010	12.40	0.44
62	8.377	0.133	1.72	99	0	102	84	-0.010	12.55	0.41
63	8.512	0.135	1.73	99	-1.32	104	84	0.000	12.48	0.28

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2
Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	8.644	0.132	1.73	99	-2.66	101	84	-0.010	12.53	0.31
65	8.778	0.134	1.73	99	-0.13	102	84	-0.010	12.56	0.33
66	8.912	0.134	1.72	99	-0.07	103	84	0.010	12.75	0.30
67	9.046	0.134	1.72	99	0	102	84	-0.010	12.70	0.20
68	9.178	0.132	1.71	99	0	100	84	0.000	12.26	0.23
69	9.314	0.136	1.70	99	-1.52	103	84	0.000	12.93	0.23
70	9.445	0.131	1.72	99	-1.3	99	84	0.000	12.39	0.15
71	9.578	0.133	1.72	99	-2.29	102	84	0.000	12.46	0.17
72	9.714	0.136	1.72	99	-2.31	104	84	-0.020	12.47	0.25
73	9.845	0.131	1.73	99	0	99	85	0.010	12.36	0.13
74	9.978	0.133	1.71	99	-0.18	102	84	0.000	12.37	0.28
75	10.113	0.135	1.72	99	-0.85	103	84	0.000	12.49	0.22
76	10.244	0.131	1.71	99	-0.33	100	84	0.010	12.65	0.14
77	10.385	0.141	1.72	99	-2.82	106	84	0.000	12.37	0.13
78	10.523	0.138	1.70	99	-0.82	104	84	0.000	12.54	0.25
79	10.658	0.135	1.71	99	0	103	84	0.000	12.80	0.27
80	10.796	0.138	1.71	99	-0.67	105	84	-0.010	12.65	0.26
81	10.932	0.136	1.72	99	-0.12	104	84	0.000	12.59	0.23
82	11.067	0.135	1.71	99	-1.39	102	84	-0.010	12.82	0.25
83	11.204	0.137	1.71	99	-2.83	104	84	-0.010	13.14	0.16
84	11.339	0.135	1.70	99	-2.89	102	84	0.000	13.04	0.30
85	11.476	0.137	1.69	99	-2.07	103	84	-0.010	12.86	0.30
86	11.613	0.137	1.70	99	-1.52	104	84	0.010	13.19	0.20
87	11.746	0.133	1.71	99	-0.08	101	84	0.000	13.15	0.22
88	11.879	0.133	1.70	99	-0.36	101	84	-0.010	12.68	0.37
89	12.012	0.133	1.70	99	-2.47	100	84	-0.010	12.94	0.37
90	12.144	0.132	1.70	99	-2.19	100	84	0.000	12.97	0.30
91	12.278	0.134	1.70	99	0	100	84	-0.010	12.76	0.37
92	12.414	0.136	1.70	100	-0.01	104	84	0.000	12.91	0.34
93	12.547	0.133	1.67	100	-0.86	102	84	-0.010	12.64	0.39
94	12.679	0.132	1.69	99	-2.42	100	84	-0.010	13.29	0.43
95	12.814	0.135	1.69	99	-0.3	102	84	-0.010	13.15	0.34

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	12.948	0.134	1.69	99	-2.86	102	84	0.000	13.23	0.33
97	13.086	0.138	1.76	99	-2.39	103	84	-0.010	12.80	0.23
98	13.230	0.144	1.77	99	-0.09	109	84	-0.010	12.58	0.15
99	13.367	0.137	1.77	99	-2.65	103	84	0.000	12.96	0.16
100	13.507	0.140	1.77	100	-0.42	106	84	0.010	12.86	0.14
101	13.646	0.139	1.79	100	-0.32	105	84	0.000	12.80	0.11
102	13.783	0.137	1.77	100	-2.68	103	84	0.000	12.72	0.03
103	13.925	0.142	1.77	100	-0.31	107	84	0.000	12.61	0.08
104	14.065	0.140	1.76	100	-0.64	105	84	-0.010	12.74	0.05
105	14.205	0.140	1.78	100	-2.9	106	84	-0.010	12.27	0.08
106	14.346	0.141	1.77	100	-2.76	106	84	0.000	12.75	0.06
107	14.484	0.138	1.77	100	-0.04	105	84	0.000	12.70	0.04
108	14.620	0.136	1.77	100	-2.83	102	84	-0.010	12.59	0.08
109	14.758	0.138	1.78	100	-2.25	105	84	-0.010	12.28	0.08
110	14.893	0.135	1.76	100	-2.09	101	84	-0.020	11.69	0.00
111	15.030	0.137	1.77	100	-0.21	102	84	0.000	11.24	0.01
112	15.167	0.137	1.77	100	-2.79	104	84	0.010	11.24	0.00
113	15.303	0.136	1.77	100	-0.7	100	84	0.000	11.30	0.00
114	15.441	0.138	1.76	100	-2.68	104	84	-0.010	11.09	0.00
115	15.577	0.136	1.77	100	-2.06	102	84	-0.010	11.12	0.04
116	15.712	0.135	1.76	100	-0.36	101	84	0.010	10.82	0.00
117	15.853	0.141	1.78	100	0	105	84	0.000	11.19	0.00
118	15.985	0.132	1.76	100	-1.45	98	84	-0.020	10.66	0.00
119	16.123	0.138	1.75	100	-2.65	104	84	-0.010	11.12	0.05
120	16.258	0.135	1.77	100	-2.44	101	84	-0.010	11.11	0.15
121	16.392	0.134	1.76	100	-0.16	101	84	-0.010	10.84	0.14
122	16.530	0.138	1.77	100	-1.87	104	84	0.010	11.28	0.00
123	16.665	0.135	1.76	100	0	101	84	-0.020	10.64	0.12
124	16.800	0.135	1.77	100	-2.36	101	83	0.000	10.64	0.00
125	16.939	0.139	1.76	100	-0.36	104	83	0.000	10.46	0.00
126	17.074	0.135	1.78	100	-2.05	101	83	-0.020	9.98	0.00
127	17.212	0.138	1.78	100	-1.46	104	83	-0.010	10.42	0.01

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	17.348	0.136	1.75	100	-1.41	101	83	0.000	10.29	0.00
129	17.484	0.136	1.76	100	-0.15	100	83	0.000	10.05	0.08
130	17.621	0.137	1.77	100	-2.75	103	83	0.000	9.65	0.00
131	17.757	0.136	1.76	100	-0.25	102	83	0.000	9.43	0.00
132	17.893	0.136	1.78	100	-0.7	101	83	-0.010	9.50	0.04
133	18.032	0.139	1.77	100	-0.31	102	84	-0.010	9.56	0.00
134	18.169	0.137	1.78	100	0	101	84	0.000	9.71	0.04
135	18.306	0.137	1.76	100	-1.53	102	84	-0.010	9.25	0.06
136	18.443	0.137	1.77	100	-0.08	102	84	-0.010	9.30	0.00
137	18.578	0.135	1.75	100	-0.05	99	84	0.010	9.15	0.02
138	18.716	0.138	1.78	100	-2.76	103	84	0.000	9.22	0.05
139	18.851	0.135	1.76	100	-0.05	100	84	-0.010	9.37	0.04
140	18.987	0.136	1.76	100	-2.37	102	83	-0.020	9.16	0.12
141	19.124	0.137	1.76	100	-0.1	102	83	-0.010	9.08	0.12
142	19.260	0.136	1.77	100	-2.37	100	83	0.000	8.96	0.05
143	19.396	0.136	1.77	99	-1.15	101	83	-0.010	8.94	0.14
144	19.535	0.139	1.77	99	-0.6	103	83	-0.010	9.30	0.07
145	19.670	0.135	1.76	99	-0.03	100	83	-0.020	8.78	0.09
146	19.806	0.136	1.77	99	-1.98	102	83	-0.010	8.82	0.15
147	19.942	0.136	1.77	99	-2.76	101	83	0.000	8.79	0.03
148	20.077	0.135	1.78	99	-0.44	99	83	0.000	9.04	0.24
149	20.214	0.137	1.76	99	-1.96	101	83	-0.010	8.74	0.21
150	20.349	0.135	1.76	99	-2	100	83	-0.010	8.77	0.05
151	20.482	0.133	1.78	99	-2.63	98	83	-0.010	8.82	0.12
152	20.622	0.140	1.78	99	-2.65	103	83	0.000	8.55	0.18
153	20.757	0.135	1.77	99	0	100	83	0.000	9.26	0.10
154	20.892	0.135	1.76	99	-1.24	100	83	0.000	9.00	0.15
155	21.030	0.138	1.77	99	-0.03	102	83	0.000	9.01	0.14
156	21.163	0.133	1.75	99	-2.77	98	83	-0.010	8.75	0.07
157	21.302	0.139	1.76	99	-2.65	104	83	-0.010	8.74	0.11
158	21.438	0.136	1.76	99	-0.04	101	83	-0.010	8.92	0.18
159	21.572	0.134	1.77	99	-0.09	99	83	-0.010	8.36	0.20

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	21.709	0.137	1.77	99	0	101	83	-0.010	8.10	0.08
161	21.844	0.135	1.76	99	-2.74	100	83	0.000	8.34	0.06
162	21.979	0.135	1.76	99	-2.7	99	83	-0.010	8.27	0.17
163	22.118	0.139	1.76	99	-0.2	103	83	0.000	8.67	0.24
164	22.250	0.132	1.76	99	-0.22	96	83	0.010	8.42	0.09
165	22.388	0.138	1.76	99	-2.68	102	83	-0.020	8.17	0.09
166	22.524	0.136	1.78	99	-2.52	100	83	-0.010	7.88	0.21
167	22.658	0.134	1.77	99	-2.31	99	83	-0.010	7.51	0.06
168	22.796	0.138	1.77	99	-2.63	103	83	0.010	7.41	0.14
169	22.932	0.136	1.74	99	-0.48	101	83	0.000	7.01	0.18
170	23.067	0.135	1.77	99	-1.69	99	83	-0.020	7.00	0.26
171	23.204	0.137	1.75	99	-0.62	103	83	0.000	7.28	0.25
172	23.340	0.136	1.75	99	-0.04	99	83	-0.010	6.77	0.26
173	23.473	0.133	1.76	99	-2.74	97	83	-0.010	6.46	0.38
174	23.610	0.137	1.76	99	-0.84	100	83	0.010	6.91	0.40
175	23.743	0.133	1.76	99	-2.88	98	83	0.000	6.58	0.50
176	23.881	0.138	1.76	99	-2.38	102	83	0.000	6.69	0.49
177	24.017	0.136	1.76	99	-1.73	100	83	-0.010	6.63	0.46
178	24.152	0.135	1.78	99	-2.12	99	83	0.000	6.45	0.50
179	24.290	0.138	1.77	99	-2.74	101	83	0.000	6.47	0.48
180	24.427	0.137	1.76	99	-2.07	101	83	0.000	6.57	0.57
181	24.563	0.136	1.77	99	-1.29	100	83	-0.010	6.32	0.56
182	24.701	0.138	1.76	99	-2.77	101	83	0.010	6.28	0.53
183	24.836	0.135	1.77	99	-2.46	98	83	-0.010	6.28	0.63
184	24.972	0.136	1.75	99	-1.45	100	83	-0.010	6.19	0.74
185	25.112	0.140	1.77	99	-0.24	102	83	0.000	6.22	0.51
186	25.244	0.132	1.77	98	-0.01	96	83	0.000	6.45	0.67
187	25.384	0.140	1.76	98	-2.84	101	83	-0.010	6.28	0.72
188	25.522	0.138	1.77	98	-1.05	101	83	-0.010	5.93	0.70
189	25.656	0.134	1.76	98	-0.03	98	83	0.000	5.87	0.69
190	25.793	0.137	1.76	98	-2.61	102	83	0.000	6.01	0.81
191	25.932	0.139	1.76	98	-2.65	101	83	-0.010	5.99	0.75

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	26.066	0.134	1.75	98	-0.44	100	83	-0.010	5.75	0.68
193	26.204	0.138	1.77	98	-0.18	101	83	-0.010	5.49	0.80
194	26.337	0.133	1.78	98	-1.63	98	83	0.000	6.06	0.73
195	26.474	0.137	1.76	98	-0.99	100	83	0.010	5.94	0.76
196	26.611	0.137	1.78	98	-2.35	101	83	-0.020	5.71	0.73
197	26.744	0.133	1.76	98	-0.14	97	83	0.000	5.67	0.70
198	26.884	0.140	1.77	98	-2.71	102	83	-0.010	5.77	0.74
199	27.017	0.133	1.76	98	-0.64	97	83	0.010	6.16	0.75
200	27.153	0.136	1.76	98	-0.12	99	83	0.000	5.88	0.75
201	27.290	0.137	1.77	98	-2.12	100	83	0.000	5.79	0.77
202	27.426	0.136	1.77	98	-0.07	100	83	-0.010	5.45	0.69
203	27.563	0.137	1.77	98	-0.79	100	83	-0.010	5.79	0.75
204	27.701	0.138	1.75	98	-0.79	103	83	-0.020	5.81	0.76
205	27.834	0.133	1.77	98	-0.28	98	83	0.000	5.64	0.75
206	27.974	0.140	1.77	98	-2.26	103	83	-0.010	5.56	0.88
207	28.111	0.137	1.75	98	-0.2	99	83	-0.010	5.51	0.76
208	28.247	0.136	1.75	98	-2.61	100	83	0.000	5.63	0.73
209	28.384	0.137	1.77	98	-1.81	99	83	0.000	5.64	0.73
210	28.521	0.137	1.77	98	-0.38	100	83	-0.010	5.25	0.80
211	28.656	0.135	1.77	98	-2.88	99	83	-0.020	5.37	0.73
212	28.794	0.138	1.76	98	-0.61	100	83	-0.010	5.14	0.70
213	28.929	0.135	1.78	98	-2.76	98	83	-0.020	5.47	0.77
214	29.064	0.135	1.76	98	-0.74	99	83	-0.010	5.42	0.83
215	29.204	0.140	1.75	98	-0.15	102	83	0.010	5.40	0.71
216	29.336	0.132	1.76	98	-0.04	96	83	0.000	5.39	0.68
217	29.474	0.138	1.78	98	0	101	83	-0.010	5.24	0.75
218	29.610	0.136	1.77	98	-1.05	99	83	-0.010	5.17	0.78
219	29.746	0.136	1.76	98	-0.09	97	83	0.010	5.36	0.65
220	29.884	0.138	1.76	98	-0.1	101	83	0.010	5.36	0.63
221	30.020	0.136	1.78	97	-0.38	100	83	-0.020	5.26	0.74
222	30.153	0.133	1.77	97	-0.08	97	83	0.000	5.02	0.78
223	30.294	0.141	1.76	97	-2.41	104	83	0.000	5.23	0.61

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	30.429	0.135	1.78	97	0	99	83	-0.020	4.96	0.70
225	30.565	0.136	1.78	97	-2.53	100	83	-0.010	5.19	0.73
226	30.702	0.137	1.76	97	-2.66	99	83	-0.010	4.92	0.66
227	30.836	0.134	1.75	97	-2.71	97	83	-0.010	5.09	0.78
228	30.976	0.140	1.77	97	-0.12	103	83	0.000	5.34	0.70
229	31.112	0.136	1.76	97	-0.73	100	83	0.000	5.36	0.60
230	31.250	0.138	1.75	97	-2.79	101	83	-0.020	4.67	0.59
231	31.390	0.140	1.77	97	-0.05	103	83	0.010	5.34	0.65
232	31.528	0.138	1.77	97	-0.14	100	83	0.000	4.92	0.61
233	31.663	0.135	1.78	97	-2.41	98	83	-0.010	5.23	0.59
234	31.802	0.139	1.77	97	-0.27	102	83	-0.010	5.36	0.70
235	31.935	0.133	1.75	97	-0.67	96	83	0.000	4.86	0.74
236	32.072	0.137	1.77	97	-1.34	100	82	-0.020	4.92	0.71
237	32.210	0.138	1.78	97	-1.41	102	82	-0.010	4.87	0.75
238	32.344	0.134	1.77	97	0	98	82	-0.020	5.41	0.67
239	32.483	0.139	1.78	97	-0.08	101	82	-0.010	5.38	0.66
240	32.618	0.135	1.77	97	-2.18	97	82	0.000	5.31	0.59
241	32.753	0.135	1.77	97	-0.88	98	82	-0.020	4.74	0.66
242	32.892	0.139	1.77	97	-2.66	101	82	0.000	4.90	0.65
243	33.031	0.139	1.79	97	-1.91	102	83	-0.020	5.13	0.68
244	33.164	0.133	1.77	97	-0.42	98	82	0.010	5.12	0.65
245	33.304	0.140	1.77	97	-1.13	101	82	0.000	5.17	0.67
246	33.437	0.133	1.77	97	-0.14	98	82	0.000	4.91	0.72
247	33.575	0.138	1.77	97	-2.54	101	82	-0.010	5.00	0.68
248	33.711	0.136	1.77	97	-0.21	99	82	-0.010	4.99	0.66
249	33.843	0.132	1.78	97	-0.01	95	82	-0.010	4.91	0.72
250	33.982	0.139	1.76	97	-2.65	102	82	0.000	5.17	0.71
251	34.120	0.138	1.76	97	-2.69	100	82	0.000	4.93	0.69
252	34.254	0.134	1.78	97	-0.05	97	82	-0.020	4.91	0.67
253	34.392	0.138	1.77	97	-0.33	101	82	-0.010	5.22	0.67
254	34.525	0.133	1.79	97	-2.67	97	82	-0.010	4.95	0.74
255	34.658	0.133	1.77	96	-2.73	96	82	0.000	4.97	0.68

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	34.798	0.140	1.78	96	-0.01	101	82	-0.010	4.68	0.76
257	34.932	0.134	1.77	96	-2.72	96	82	0.000	5.02	0.68
258	35.071	0.139	1.77	96	-0.11	100	82	0.000	5.16	0.69
259	35.207	0.136	1.77	96	-0.62	98	82	0.000	4.85	0.67
260	35.343	0.136	1.77	96	-2.77	99	82	0.000	4.82	0.75
261	35.482	0.139	1.79	96	-1.06	100	82	0.000	5.09	0.69
262	35.618	0.136	1.77	96	0	98	82	-0.010	4.77	0.68
263	35.752	0.134	1.77	96	-1.21	96	82	0.000	4.73	0.67
264	35.892	0.140	1.77	96	-2.83	102	82	-0.010	4.69	0.69
265	36.025	0.133	1.78	96	-0.08	97	82	-0.010	4.43	0.77
266	36.164	0.139	1.76	96	-1.99	101	82	0.000	4.77	0.71
267	36.301	0.137	1.78	96	-2.65	98	82	0.000	5.11	0.75
268	36.436	0.135	1.78	96	-0.41	97	82	-0.010	5.18	0.66
269	36.575	0.139	1.78	96	-0.1	101	82	0.000	4.49	0.66
270	36.710	0.135	1.76	96	-2.64	98	82	0.000	4.57	0.63
271	36.845	0.135	1.79	96	-1.12	97	82	0.000	4.77	0.78
272	36.983	0.138	1.78	96	-0.04	99	82	-0.010	5.11	0.67
273	37.119	0.136	1.76	96	-1.52	98	82	0.000	4.61	0.70
274	37.255	0.136	1.77	96	-1.39	98	82	0.000	4.83	0.69
275	37.393	0.138	1.79	96	-2.39	99	82	-0.010	4.88	0.74
276	37.525	0.132	1.77	96	-0.7	95	82	-0.010	4.64	0.69
277	37.663	0.138	1.78	96	-0.05	100	82	-0.010	4.31	0.68
278	37.801	0.138	1.77	96	-1.97	99	82	-0.020	4.56	0.62
279	37.936	0.135	1.78	95	-0.17	97	82	0.000	4.99	0.72
280	38.073	0.137	1.78	95	-2.25	100	82	-0.010	4.84	0.81
281	38.209	0.136	1.78	95	-1.79	97	82	-0.010	4.92	0.76
282	38.344	0.135	1.79	95	-0.28	98	82	0.000	5.06	0.62
283	38.483	0.139	1.78	95	-2.24	100	82	-0.010	4.91	0.77
284	38.617	0.134	1.79	95	-1.58	97	82	-0.020	4.83	0.69
285	38.753	0.136	1.77	95	-2.67	98	82	0.020	5.00	0.74
286	38.891	0.138	1.79	95	-0.98	100	82	-0.010	4.88	0.74
287	39.025	0.134	1.78	95	-0.48	97	83	-0.010	4.60	0.76

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	39.166	0.141	1.79	95	-0.06	103	83	-0.020	4.39	0.75
289	39.304	0.138	1.77	95	-2.69	101	83	-0.020	4.45	0.67
290	39.439	0.135	1.78	95	-0.22	98	83	0.000	4.55	0.73
291	39.578	0.139	1.77	95	-2.69	99	83	-0.010	4.40	0.66
292	39.715	0.137	1.78	95	-1.22	99	83	0.000	4.58	0.71
293	39.849	0.134	1.78	95	-0.13	97	83	0.000	4.43	0.64
294	39.987	0.138	1.79	95	-0.12	99	83	-0.020	4.32	0.66
295	40.123	0.136	1.80	95	-0.88	100	83	-0.010	5.00	0.69
296	40.260	0.137	1.78	95	0	100	83	-0.010	4.34	0.70
297	40.397	0.137	1.79	95	-2.3	100	83	0.000	4.63	0.66
298	40.532	0.135	1.78	95	-2.78	98	83	0.010	4.87	0.60
299	40.670	0.138	1.78	95	-0.55	100	83	-0.020	4.43	0.66
300	40.805	0.135	1.78	95	-2.12	99	83	-0.010	4.50	0.71
301	40.942	0.137	1.79	95	0	100	83	-0.020	4.43	0.78
302	41.078	0.136	1.78	94	-2.56	98	83	-0.020	4.43	0.77
303	41.215	0.137	1.78	94	-1.33	101	83	-0.020	4.36	0.70
304	41.351	0.136	1.79	94	-2.72	99	83	-0.010	5.06	0.65
305	41.488	0.137	1.78	94	-2.59	99	83	-0.010	4.29	0.70
306	41.624	0.136	1.79	94	0	99	83	0.000	5.07	0.72
307	41.760	0.136	1.78	94	-0.93	98	83	-0.010	4.40	0.81
308	41.895	0.135	1.77	94	-0.04	97	83	-0.010	4.37	0.62
309	42.029	0.134	1.78	94	-0.59	96	83	0.000	4.71	0.69
310	42.166	0.137	1.80	94	0	100	83	0.000	4.45	0.70
311	42.303	0.137	1.78	94	-0.02	99	83	-0.010	4.48	0.80
312	42.437	0.134	1.79	94	-2.51	98	83	-0.020	4.38	0.69
313	42.576	0.139	1.78	94	-0.13	100	83	-0.010	4.48	0.63
314	42.711	0.135	1.78	94	-2.38	97	83	0.000	4.94	0.63
315	42.848	0.137	1.78	94	-0.35	100	83	-0.020	4.45	0.77
316	42.990	0.142	1.79	94	-1.41	104	83	0.000	4.81	0.79
317	43.123	0.133	1.78	94	-0.28	97	83	-0.010	4.63	0.84
318	43.261	0.138	1.79	94	-0.61	99	83	0.000	4.63	0.78
319	43.396	0.135	1.79	94	-0.02	99	83	-0.020	4.53	0.80

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	43.532	0.136	1.79	94	-2.18	98	83	-0.020	4.22	0.85
321	43.670	0.138	1.78	93	-0.09	100	83	-0.010	4.38	0.81
322	43.806	0.136	1.78	93	-2.65	98	83	0.000	4.33	0.81
323	43.939	0.133	1.78	93	-0.79	96	83	0.010	5.01	0.73
324	44.078	0.139	1.79	93	-1.19	101	83	-0.010	4.64	0.72
325	44.212	0.134	1.79	93	-2.19	98	83	-0.010	4.11	0.78
326	44.349	0.137	1.79	93	-2.68	99	83	-0.010	4.06	0.76
327	44.487	0.138	1.79	93	-2.63	100	83	0.000	4.74	0.65
328	44.623	0.136	1.77	93	-0.21	99	83	0.000	4.48	0.65
329	44.762	0.139	1.79	93	-0.96	101	83	-0.010	4.23	0.65
330	44.898	0.136	1.78	93	-2.44	99	83	0.010	4.73	0.66
331	45.035	0.137	1.77	93	-0.03	99	83	-0.010	4.13	0.77
332	45.173	0.138	1.78	93	-0.76	99	83	0.000	4.30	0.72
333	45.310	0.137	1.79	93	-1.77	99	83	0.000	4.29	0.59
334	45.444	0.134	1.79	93	-0.1	99	83	-0.010	3.92	0.73
335	45.581	0.137	1.78	93	-2.69	99	83	-0.010	4.14	0.67
336	45.714	0.133	1.78	93	0	97	83	0.000	4.60	0.58
337	45.852	0.138	1.79	93	-0.1	99	83	-0.020	4.19	0.69
338	45.989	0.137	1.78	92	-2.87	100	83	0.000	4.04	0.63
339	46.122	0.133	1.79	92	-0.77	95	83	-0.010	4.33	0.75
340	46.261	0.139	1.80	92	0	103	83	0.010	4.38	0.60
341	46.396	0.135	1.78	92	-2.08	98	83	0.000	4.28	0.68
342	46.532	0.136	1.78	92	-0.83	98	83	0.000	4.32	0.63
343	46.669	0.137	1.77	92	-2.05	100	83	-0.010	4.34	0.67
344	46.805	0.136	1.79	92	-2.83	99	83	-0.010	4.15	0.76
345	46.939	0.134	1.79	92	-2	98	83	0.010	4.40	0.68
346	47.081	0.142	1.80	92	-1.3	104	82	-0.010	4.27	0.66
347	47.216	0.135	1.78	92	-1.24	98	82	0.010	4.53	0.63
348	47.354	0.138	1.79	92	-0.45	100	83	0.000	4.44	0.62
349	47.490	0.136	1.77	92	-0.79	98	83	0.000	4.32	0.68
350	47.624	0.134	1.79	92	-0.62	98	83	0.000	4.38	0.61
351	47.760	0.136	1.80	92	-2.74	98	83	-0.020	4.43	0.75

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	47.897	0.137	1.80	92	-2.49	99	83	0.010	4.22	0.58
353	48.031	0.134	1.80	92	-0.54	97	83	0.000	4.41	0.67
354	48.169	0.138	1.79	92	0	100	83	0.000	4.45	0.64
355	48.306	0.137	1.79	92	-0.12	100	83	-0.010	4.13	0.48
356	48.440	0.134	1.79	91	-2	97	83	-0.010	4.46	0.61
357	48.578	0.138	1.78	91	-0.21	100	83	-0.010	4.69	0.69
358	48.711	0.133	1.80	91	-2.49	97	83	-0.010	4.13	0.69
359	48.850	0.139	1.78	91	-1.67	101	83	0.010	4.09	0.57
360	48.987	0.137	1.78	91	-0.04	99	83	0.000	4.29	0.64
361	49.122	0.135	1.79	91	-2.48	98	83	0.000	4.27	0.61
362	49.263	0.141	1.77	91	-2.41	105	83	0.000	4.04	0.67
363	49.399	0.136	1.78	91	-0.05	100	83	-0.010	4.21	0.64
364	49.535	0.136	1.81	91	-2.66	100	83	-0.010	4.11	0.69
365	49.674	0.139	1.79	91	-0.11	101	83	0.000	4.58	0.55
366	49.810	0.136	1.79	91	-0.3	98	83	-0.010	4.38	0.70
367	49.945	0.135	1.78	91	0	98	83	-0.010	4.14	0.71
368	50.083	0.138	1.79	91	-2.44	99	83	-0.010	4.48	0.62
369	50.215	0.132	1.79	91	-1.42	95	83	-0.010	4.22	0.71
370	50.353	0.138	1.80	91	-0.32	100	83	-0.010	4.30	0.70
371	50.489	0.136	1.79	91	-1.25	99	83	-0.010	4.34	0.78
372	50.624	0.135	1.78	91	-1.2	97	83	0.000	4.59	0.53
373	50.761	0.137	1.79	91	-2.54	100	83	-0.010	4.37	0.65
374	50.895	0.134	1.80	91	-1.27	98	83	-0.010	4.60	0.71
375	51.029	0.134	1.81	91	-2.76	96	83	0.010	4.54	0.66
376	51.167	0.138	1.78	90	-2.92	100	83	0.000	4.48	0.66
377	51.301	0.134	1.79	90	-0.87	97	83	-0.010	4.54	0.62
378	51.437	0.136	1.78	90	-0.13	99	83	-0.010	4.24	0.60
379	51.575	0.138	1.79	90	-0.85	102	83	0.000	4.50	0.71
380	51.707	0.132	1.80	90	-2.33	98	83	0.000	4.44	0.65
381	51.845	0.138	1.80	90	-2.48	101	83	-0.010	4.54	0.62
382	51.981	0.136	1.79	90	-0.71	100	83	-0.010	4.09	0.66
383	52.115	0.134	1.78	90	-0.08	97	83	0.000	4.35	0.66

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	52.253	0.138	1.80	90	-1.52	100	83	0.010	4.38	0.59
385	52.390	0.137	1.78	90	-0.9	99	83	0.000	4.20	0.63
386	52.522	0.132	1.80	90	-2.36	95	83	-0.010	3.83	0.76
387	52.661	0.139	1.79	90	-2.04	101	82	0.000	4.08	0.74
388	52.794	0.133	1.80	90	-0.31	96	83	-0.010	4.05	0.71
389	52.929	0.135	1.79	90	-1.97	98	83	-0.010	4.30	0.74
390	53.068	0.139	1.79	90	-0.38	101	83	-0.010	4.42	0.57
391	53.198	0.130	1.79	90	-0.5	94	83	-0.010	4.01	0.67
392	53.338	0.140	1.78	90	-2.72	102	82	-0.010	4.39	0.72
393	53.473	0.135	1.79	90	-2.05	98	82	0.000	4.33	0.67
394	53.607	0.134	1.80	90	-0.39	97	82	-0.020	3.98	0.75
395	53.744	0.137	1.80	90	0	98	82	-0.010	4.14	0.67
396	53.880	0.136	1.79	90	-0.09	98	83	0.010	4.44	0.65
397	54.014	0.134	1.79	89	-1.06	96	83	-0.010	3.88	0.71
398	54.152	0.138	1.79	89	-0.06	101	83	0.000	4.07	0.68
399	54.285	0.133	1.80	89	-2.73	97	83	0.000	4.19	0.69
400	54.422	0.137	1.80	89	-2.74	100	83	-0.010	4.38	0.63
401	54.560	0.138	1.79	89	-2.63	99	83	0.010	4.51	0.61
402	54.692	0.132	1.80	89	-2.29	97	83	-0.010	3.80	0.73
403	54.832	0.140	1.77	89	-1.13	101	83	0.000	4.21	0.64
404	54.968	0.136	1.79	89	-2.8	99	83	0.000	4.40	0.63
405	55.104	0.136	1.79	89	-0.3	99	83	-0.010	4.31	0.68
406	55.244	0.140	1.79	89	-2.68	102	83	0.000	4.51	0.69
407	55.378	0.134	1.80	89	-0.09	96	83	0.000	4.21	0.61
408	55.512	0.134	1.78	89	-2.06	97	83	-0.010	4.16	0.72
409	55.650	0.138	1.79	89	-1.65	100	83	-0.010	4.17	0.74
410	55.785	0.135	1.79	89	-1.07	97	83	-0.010	4.14	0.68
411	55.922	0.137	1.80	89	-0.14	101	83	0.000	4.30	0.60
412	56.060	0.138	1.80	89	-0.01	100	83	-0.010	3.75	0.72
413	56.194	0.134	1.80	89	-2.22	97	83	-0.010	4.45	0.67
414	56.333	0.139	1.79	89	-0.77	100	83	0.010	4.09	0.68
415	56.466	0.133	1.80	89	0	96	83	0.000	4.37	0.67

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
416	56.601	0.135	1.79	89	-2.69	99	83	-0.010	3.77	0.72
417	56.740	0.139	1.79	89	-0.69	102	83	0.000	4.26	0.72
418	56.875	0.135	1.77	88	-0.54	99	83	0.000	4.06	0.69
419	57.010	0.135	1.78	88	-2.4	98	83	-0.010	4.33	0.66
420	57.147	0.137	1.77	88	-0.12	98	83	0.000	4.29	0.75
421	57.282	0.135	1.78	88	-1.93	98	83	0.000	4.13	0.66
422	57.415	0.133	1.76	88	-1.97	97	83	0.010	4.26	0.64
423	57.550	0.135	1.75	88	-0.35	99	83	-0.010	3.95	0.68
424	57.680	0.130	1.74	88	-2.68	96	83	-0.010	4.04	0.59
425	57.817	0.137	1.75	88	-0.36	100	83	0.000	4.08	0.71
426	57.955	0.138	1.79	88	-0.14	100	83	0.000	3.92	0.58
427	58.086	0.131	1.77	88	-2.96	95	83	-0.010	4.09	0.75
428	58.223	0.137	1.80	88	-2.46	101	83	-0.010	4.15	0.71
429	58.357	0.134	1.78	88	-2.78	97	83	0.000	3.94	0.67
430	58.493	0.136	1.77	88	-1.32	100	84	0.010	4.29	0.66
431	58.627	0.134	1.78	88	-2.46	99	85	-0.010	4.01	0.69
432	58.765	0.138	1.79	88	-0.11	100	85	0.010	4.43	0.71
433	58.898	0.133	1.77	88	-0.26	97	85	0.000	3.81	0.65
434	59.036	0.138	1.77	88	-1.22	101	85	-0.010	3.70	0.78
435	59.172	0.136	1.77	88	-2.38	98	85	-0.010	3.96	0.65
436	59.304	0.132	1.79	88	-1	97	85	0.000	4.26	0.58
437	59.440	0.136	1.77	88	-1.22	99	85	-0.010	3.74	0.76
438	59.572	0.132	1.78	88	-2.91	96	85	-0.010	3.97	0.72
439	59.706	0.134	1.76	88	-0.61	98	85	-0.010	4.32	0.66
440	59.843	0.137	1.78	88	-2.83	100	85	0.000	4.29	0.74
441	59.973	0.130	1.77	88	-2.8	96	84	0.000	4.47	0.80
442	60.107	0.134	1.77	88	-1.73	98	84	-0.010	4.40	0.74
443	60.241	0.134	1.76	89	-2.89	98	84	-0.010	3.81	0.61
444	60.374	0.133	1.77	89	-0.17	96	84	-0.010	3.93	0.67
445	60.510	0.136	1.76	89	-0.47	100	84	-0.010	3.85	0.70
446	60.642	0.132	1.78	89	-0.08	97	85	0.000	3.93	0.70
447	60.774	0.132	1.77	89	-2.9	96	85	-0.010	4.20	0.78

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
448	60.913	0.139	1.75	89	-2.92	102	85	-0.020	3.68	0.65
449	61.045	0.132	1.77	89	-2.79	97	85	0.000	3.82	0.73
450	61.178	0.133	1.76	89	-0.77	97	85	-0.010	3.59	0.77
451	61.313	0.135	1.76	89	-0.18	98	85	-0.010	4.27	0.75
452	61.447	0.134	1.77	89	-2.52	98	85	-0.010	3.83	0.63
453	61.578	0.131	1.75	89	-0.5	96	85	-0.020	3.50	0.66
454	61.714	0.136	1.76	89	-0.66	99	85	0.010	4.31	0.68
455	61.845	0.131	1.76	89	-2.07	97	85	0.000	4.22	0.66
456	61.977	0.132	1.75	89	-1.68	97	85	-0.010	3.62	0.68
457	62.114	0.137	1.76	89	-0.22	100	85	0.010	3.90	0.63
458	62.244	0.130	1.76	89	-2.91	95	85	0.000	3.65	0.60
459	62.377	0.133	1.75	89	-1.54	97	85	0.020	3.87	0.67
460	62.512	0.135	1.76	89	-0.19	99	85	-0.010	3.44	0.61
461	62.643	0.131	1.76	89	-0.6	95	85	0.000	3.94	0.66
462	62.779	0.136	1.76	89	-0.82	100	85	-0.020	4.02	0.72
463	62.911	0.132	1.76	89	-2.71	97	85	-0.010	3.64	0.71
464	63.043	0.132	1.77	89	-0.74	96	85	-0.010	3.44	0.73
465	63.180	0.137	1.77	89	-0.19	100	85	0.000	3.82	0.70
466	63.311	0.131	1.75	89	-2.61	96	85	-0.010	3.61	0.67
467	63.444	0.133	1.76	89	-2.95	97	85	0.000	3.54	0.73
468	63.579	0.135	1.74	89	-2.89	98	85	-0.010	3.62	0.60
469	63.711	0.132	1.75	89	-0.13	96	85	-0.020	3.56	0.79
470	63.843	0.132	1.76	89	-2.73	97	85	-0.010	3.51	0.64
471	63.977	0.134	1.75	89	-2.93	97	85	-0.010	3.17	0.70
472	64.111	0.134	1.75	89	-0.98	99	85	0.000	3.72	0.59
473	64.242	0.131	1.75	89	-0.22	97	85	-0.020	3.25	0.63
474	64.378	0.136	1.75	90	-0.17	100	85	-0.010	3.56	0.67
475	64.510	0.132	1.75	90	-0.93	96	85	0.000	3.62	0.68
476	64.642	0.132	1.75	90	-0.36	96	85	0.000	3.66	0.70
477	64.780	0.138	1.75	90	-2.93	101	85	0.000	3.30	0.72
478	64.910	0.130	1.75	90	-1.88	95	85	-0.010	3.69	0.73
479	65.044	0.134	1.76	90	-2.57	98	85	-0.010	3.67	0.75

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
480	65.179	0.135	1.76	90	-0.68	98	85	0.000	3.66	0.59
481	65.309	0.130	1.75	90	-2.07	95	85	0.000	3.96	0.63
482	65.444	0.135	1.75	90	-2.97	98	85	0.020	4.11	0.66
483	65.578	0.134	1.76	90	-2.65	98	85	-0.020	3.61	0.60
484	65.711	0.133	1.75	90	-2.9	97	85	0.000	3.97	0.64
485	65.847	0.136	1.76	90	-2.37	99	85	0.000	3.29	0.68
486	65.979	0.132	1.75	90	-2.97	96	85	0.010	3.81	0.60
487	66.111	0.132	1.74	90	-0.48	98	85	0.010	3.29	0.61
488	66.247	0.136	1.77	90	-0.03	100	85	0.000	3.14	0.63
489	66.381	0.134	1.75	90	-2.82	98	85	-0.010	3.69	0.63
490	66.514	0.133	1.74	90	-3	97	85	0.000	3.39	0.53
491	66.648	0.134	1.76	90	-1.58	98	85	0.000	3.31	0.60
492	66.780	0.132	1.75	90	-0.55	97	85	0.000	3.39	0.58
493	66.912	0.132	1.76	90	-0.55	97	85	-0.010	3.26	0.66
494	67.048	0.136	1.75	90	-2.53	100	85	0.010	3.60	0.66
495	67.180	0.132	1.73	90	-2.67	96	85	-0.010	3.58	0.62
496	67.312	0.132	1.75	90	-2.99	97	85	0.000	3.50	0.58
497	67.448	0.136	1.76	90	-0.11	99	85	-0.010	3.73	0.62
498	67.579	0.131	1.76	90	-0.08	95	85	-0.010	3.57	0.70
499	67.712	0.133	1.75	90	-2.76	97	85	-0.010	3.42	0.67
500	67.848	0.136	1.74	90	-1.03	99	85	-0.010	3.09	0.67
501	67.979	0.131	1.74	90	-2.59	95	85	0.000	3.47	0.64
502	68.115	0.136	1.75	90	-0.09	100	85	-0.010	3.28	0.72
503	68.248	0.133	1.75	90	-1.37	97	85	-0.010	3.08	0.62
504	68.380	0.132	1.73	90	-1.82	97	85	-0.020	3.05	0.55
505	68.515	0.135	1.75	91	-2.05	98	85	-0.010	3.01	0.64
506	68.648	0.133	1.75	91	-2.93	97	85	0.000	3.24	0.56
507	68.780	0.132	1.75	91	-0.16	95	85	-0.010	3.06	0.62
508	68.915	0.135	1.76	91	-0.1	99	85	-0.010	3.64	0.62
509	69.046	0.131	1.73	91	-2.19	96	85	0.000	3.07	0.67
510	69.180	0.134	1.75	91	-0.21	97	85	0.000	2.95	0.57
511	69.314	0.134	1.75	91	-1.03	98	85	-0.010	3.32	0.59

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
512	69.446	0.132	1.75	91	-0.12	96	85	0.000	3.24	0.60
513	69.578	0.132	1.75	91	-0.81	97	85	0.010	3.39	0.51
514	69.712	0.134	1.75	91	-0.46	98	85	-0.010	3.39	0.57
515	69.844	0.132	1.75	91	-0.5	96	85	0.000	3.32	0.46
516	69.977	0.133	1.75	91	-2.79	98	85	-0.010	2.91	0.59
517	70.112	0.135	1.75	91	-2.22	99	85	0.010	3.05	0.54
518	70.244	0.132	1.75	91	-0.24	96	85	-0.010	2.94	0.54
519	70.375	0.131	1.74	91	-0.16	95	85	0.010	3.59	0.53
520	70.512	0.137	1.74	91	-0.18	100	85	0.010	3.46	0.55
521	70.643	0.131	1.73	91	-0.99	95	85	-0.010	2.89	0.61
522	70.776	0.133	1.75	91	-2.63	96	85	0.000	3.26	0.57
523	70.912	0.136	1.75	91	-2.91	99	85	0.010	3.16	0.51
524	71.041	0.129	1.76	91	-2.56	93	85	-0.010	2.99	0.61
525	71.176	0.135	1.75	91	-2.88	98	85	0.000	3.32	0.51
526	71.309	0.133	1.73	91	-1.97	97	85	-0.010	2.83	0.60
527	71.441	0.132	1.75	91	-0.05	97	84	0.010	3.37	0.61
528	71.578	0.137	1.76	91	-2.88	100	84	0.000	2.98	0.52
529	71.711	0.133	1.75	91	-1.92	97	84	0.010	3.12	0.51
530	71.843	0.132	1.75	91	-1.11	96	84	-0.010	3.11	0.51
531	71.977	0.134	1.75	91	-1.1	98	84	-0.010	3.03	0.58
532	72.112	0.135	1.76	91	-0.87	98	84	0.010	3.20	0.53
533	72.243	0.131	1.75	91	-2.73	97	84	0.000	3.11	0.52
534	72.377	0.134	1.74	91	-2.3	98	84	-0.020	2.56	0.65
535	72.511	0.134	1.74	91	-0.51	99	84	-0.010	2.91	0.51
536	72.641	0.130	1.75	91	-2.86	94	84	-0.010	2.54	0.55
537	72.777	0.136	1.76	91	-2.72	99	84	-0.010	3.21	0.53
538	72.909	0.132	1.75	91	-1	98	84	0.020	2.97	0.49
539	73.040	0.131	1.75	91	-2.75	96	85	-0.010	2.65	0.49
540	73.176	0.136	1.74	91	-2.55	99	85	-0.010	2.79	0.59
541	73.307	0.131	1.75	91	-2.92	95	85	-0.010	2.50	0.58
542	73.441	0.134	1.76	91	-0.19	97	85	0.010	2.79	0.47
543	73.576	0.135	1.75	91	-0.16	98	85	-0.020	2.43	0.55

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
544	73.706	0.130	1.75	91	-1.49	94	85	-0.010	2.45	0.58
545	73.841	0.135	1.74	91	-2.92	97	85	-0.010	2.53	0.46
546	73.975	0.134	1.75	91	-3.01	98	85	0.000	2.78	0.62
547	74.107	0.132	1.75	91	-0.15	96	85	0.000	2.77	0.45
548	74.244	0.137	1.77	91	-0.13	100	85	0.000	2.88	0.49
549	74.375	0.131	1.75	91	-0.86	95	85	-0.020	2.91	0.60
550	74.508	0.133	1.75	91	-2.75	96	85	0.000	3.09	0.49
551	74.643	0.135	1.76	91	-0.13	99	85	-0.020	2.18	0.45
552	74.775	0.132	1.76	91	-0.87	96	85	-0.010	2.76	0.52
553	74.908	0.133	1.76	91	-2.95	96	85	0.000	2.57	0.52
554	75.043	0.135	1.74	91	-2.37	99	85	-0.010	2.44	0.45
555	75.177	0.134	1.75	91	-0.24	98	85	0.000	2.33	0.53
556	75.310	0.133	1.76	91	-2.88	96	85	-0.010	2.72	0.47
557	75.446	0.136	1.76	90	-2.86	98	85	0.000	2.71	0.47
558	75.578	0.132	1.76	90	-2.84	96	85	0.000	2.62	0.54
559	75.709	0.131	1.75	90	-2.34	95	85	-0.010	2.69	0.51
Avg/Tot	75.709	0.135	1.76	95	-1.38	100	84	-0.005	6.44	0.52

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	240	245	139	267	110	200.2	N/A
1	242	247	143	270	111	202.6	N/A
2	243	249	146	272	112	204.4	N/A
3	243	250	149	272	113	205.4	N/A
4	243	251	153	273	115	207.0	N/A
5	243	250	155	274	116	207.6	N/A
6	243	250	158	279	117	209.4	N/A
7	242	250	160	287	119	211.6	N/A
8	241	249	162	296	120	213.6	N/A
9	239	248	163	307	121	215.6	N/A
10	239	249	165	321	122	219.2	N/A
11	238	249	166	336	123	222.4	N/A
12	237	249	168	354	124	226.4	N/A
13	235	249	169	372	126	230.2	N/A
14	235	249	170	390	126	234.0	N/A
15	234	250	171	411	127	238.6	N/A
16	235	253	172	430	129	243.8	N/A
17	235	255	170	445	130	247.0	N/A
18	234	255	164	454	131	247.6	N/A
19	235	255	159	459	131	247.8	N/A
20	235	255	153	459	130	246.4	N/A
21	234	254	149	456	129	244.4	N/A
22	233	253	145	452	129	242.4	N/A
23	233	252	141	444	128	239.6	N/A
24	232	250	139	439	125	237.0	N/A
25	231	248	136	431	125	234.2	N/A
26	230	246	134	424	124	231.6	N/A
27	229	244	133	418	123	229.4	N/A
28	228	242	131	411	122	226.8	N/A
29	227	240	129	407	121	224.8	N/A
30	226	237	128	400	120	222.2	N/A
31	225	235	127	396	119	220.4	N/A
32	225	233	125	393	119	219.0	N/A
33	224	231	125	389	117	217.2	N/A
34	223	229	124	387	117	216.0	N/A
35	222	227	123	385	116	214.6	N/A
36	221	226	122	382	115	213.2	N/A
37	220	225	122	381	114	212.4	N/A
38	220	223	121	380	114	211.6	N/A
39	219	223	121	380	114	211.4	N/A
40	219	221	120	378	114	210.4	N/A
41	219	220	119	379	113	210.0	N/A
42	219	219	119	379	112	209.6	N/A
43	218	219	119	380	112	209.6	N/A
44	218	218	118	380	112	209.2	N/A
45	217	217	118	381	111	208.8	N/A
46	218	216	117	381	111	208.6	N/A
47	217	216	117	380	111	208.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	217	216	117	381	110	208.2	N/A
49	217	216	117	382	110	208.4	N/A
50	217	216	116	383	110	208.4	N/A
51	217	216	116	384	109	208.4	N/A
52	217	215	116	383	109	208.0	N/A
53	216	214	116	384	108	207.6	N/A
54	216	214	115	385	108	207.6	N/A
55	216	214	115	384	108	207.4	N/A
56	216	214	115	384	107	207.2	N/A
57	216	214	114	384	107	207.0	N/A
58	217	214	114	383	107	207.0	N/A
59	217	214	114	383	106	206.8	N/A
60	217	214	114	382	106	206.6	N/A
61	217	214	114	381	106	206.4	N/A
62	217	214	113	380	105	205.8	N/A
63	217	214	113	378	105	205.4	N/A
64	217	214	113	376	105	205.0	N/A
65	218	215	113	376	105	205.4	N/A
66	218	215	113	374	105	205.0	N/A
67	219	215	112	373	105	204.8	N/A
68	218	215	112	372	104	204.2	N/A
69	219	214	112	370	105	204.0	N/A
70	219	214	112	370	104	203.8	N/A
71	219	214	112	369	104	203.6	N/A
72	220	213	112	368	104	203.4	N/A
73	220	214	112	366	104	203.2	N/A
74	220	214	112	367	103	203.2	N/A
75	221	214	111	365	103	202.8	N/A
76	222	215	111	366	103	203.4	N/A
77	222	215	111	365	103	203.2	N/A
78	223	215	111	365	103	203.4	N/A
79	223	215	111	365	102	203.2	N/A
80	224	215	111	365	103	203.6	N/A
81	225	215	111	365	103	203.8	N/A
82	225	216	111	364	103	203.8	N/A
83	226	216	111	365	103	204.2	N/A
84	225	216	111	366	102	204.0	N/A
85	226	216	110	366	102	204.0	N/A
86	227	217	110	366	102	204.4	N/A
87	227	216	110	364	102	203.8	N/A
88	227	217	110	365	102	204.2	N/A
89	228	217	110	366	102	204.6	N/A
90	229	218	110	366	102	205.0	N/A
91	230	219	110	366	102	205.4	N/A
92	230	218	110	364	102	204.8	N/A
93	231	219	110	365	102	205.4	N/A
94	230	218	110	364	101	204.6	N/A
95	231	219	110	363	102	205.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	232	219	110	363	101	205.0	N/A
97	232	220	110	363	101	205.2	N/A
98	233	220	110	361	101	205.0	N/A
99	233	216	110	362	101	204.4	N/A
100	233	217	110	360	101	204.2	N/A
101	234	217	110	358	101	204.0	N/A
102	234	216	110	357	100	203.4	N/A
103	235	217	109	354	100	203.0	N/A
104	235	217	109	352	100	202.6	N/A
105	236	216	109	351	100	202.4	N/A
106	235	217	109	349	100	202.0	N/A
107	235	218	109	349	100	202.2	N/A
108	235	218	110	347	100	202.0	N/A
109	236	216	110	346	100	201.6	N/A
110	236	217	110	344	100	201.4	N/A
111	235	217	110	342	100	200.8	N/A
112	235	217	110	340	100	200.4	N/A
113	236	217	110	337	100	200.0	N/A
114	235	217	110	335	100	199.4	N/A
115	235	217	110	332	100	198.8	N/A
116	234	217	109	330	99	197.8	N/A
117	235	217	109	328	99	197.6	N/A
118	235	218	109	324	99	197.0	N/A
119	235	218	109	322	99	196.6	N/A
120	235	217	109	319	99	195.8	N/A
121	234	218	109	317	99	195.4	N/A
122	235	218	110	315	99	195.4	N/A
123	234	217	110	313	100	194.8	N/A
124	234	218	110	310	99	194.2	N/A
125	234	217	110	307	99	193.4	N/A
126	233	218	110	306	99	193.2	N/A
127	234	217	110	302	99	192.4	N/A
128	233	217	110	301	99	192.0	N/A
129	233	217	110	298	99	191.4	N/A
130	233	217	110	295	99	190.8	N/A
131	233	216	110	292	99	190.0	N/A
132	233	217	110	290	99	189.8	N/A
133	233	217	110	287	99	189.2	N/A
134	232	217	110	284	99	188.4	N/A
135	232	216	110	281	99	187.6	N/A
136	232	216	110	278	99	187.0	N/A
137	232	216	110	276	99	186.6	N/A
138	232	216	110	273	99	186.0	N/A
139	231	215	110	270	100	185.2	N/A
140	231	214	110	268	99	184.4	N/A
141	231	214	110	265	99	183.8	N/A
142	231	214	110	263	99	183.4	N/A
143	230	213	110	261	99	182.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	230	213	110	258	99	182.0	N/A
145	229	213	110	256	99	181.4	N/A
146	229	212	110	254	99	180.8	N/A
147	229	212	110	252	99	180.4	N/A
148	228	212	110	250	99	179.8	N/A
149	228	211	110	248	99	179.2	N/A
150	227	211	110	247	99	178.8	N/A
151	226	210	110	245	99	178.0	N/A
152	226	210	110	243	99	177.6	N/A
153	226	209	110	241	99	177.0	N/A
154	226	209	110	239	99	176.6	N/A
155	225	209	110	238	99	176.2	N/A
156	225	209	110	236	99	175.8	N/A
157	225	209	110	235	99	175.6	N/A
158	224	209	110	233	99	175.0	N/A
159	224	208	110	232	99	174.6	N/A
160	225	208	110	231	99	174.6	N/A
161	224	208	110	230	99	174.2	N/A
162	224	208	110	228	99	173.8	N/A
163	224	208	110	227	99	173.6	N/A
164	224	207	110	225	99	173.0	N/A
165	223	207	110	225	99	172.8	N/A
166	223	206	110	223	99	172.2	N/A
167	223	205	110	222	99	171.8	N/A
168	222	205	110	221	99	171.4	N/A
169	222	204	110	219	99	170.8	N/A
170	222	204	110	218	99	170.6	N/A
171	221	204	110	216	99	170.0	N/A
172	221	203	110	215	99	169.6	N/A
173	220	202	110	213	99	168.8	N/A
174	219	202	109	212	98	168.0	N/A
175	219	201	109	210	98	167.4	N/A
176	218	201	109	209	98	167.0	N/A
177	216	200	109	207	98	166.0	N/A
178	216	199	109	206	98	165.6	N/A
179	215	199	109	204	98	165.0	N/A
180	213	197	109	202	98	163.8	N/A
181	212	197	109	201	98	163.4	N/A
182	211	197	109	199	98	162.8	N/A
183	211	196	108	198	98	162.2	N/A
184	210	195	108	196	98	161.4	N/A
185	209	195	108	195	98	161.0	N/A
186	208	194	108	194	98	160.4	N/A
187	207	193	108	192	98	159.6	N/A
188	206	192	108	191	98	159.0	N/A
189	206	192	108	190	98	158.8	N/A
190	204	191	108	188	98	157.8	N/A
191	204	190	108	187	98	157.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	203	189	107	186	98	156.6	N/A
193	202	189	107	184	98	156.0	N/A
194	201	188	107	183	97	155.2	N/A
195	200	187	107	182	97	154.6	N/A
196	200	187	107	181	97	154.4	N/A
197	199	187	106	180	97	153.8	N/A
198	198	186	106	179	97	153.2	N/A
199	198	185	106	178	97	152.8	N/A
200	196	185	106	177	97	152.2	N/A
201	195	184	106	176	97	151.6	N/A
202	194	183	106	174	97	150.8	N/A
203	192	181	106	174	97	150.0	N/A
204	193	181	106	173	97	150.0	N/A
205	192	181	106	172	97	149.6	N/A
206	192	181	106	171	96	149.2	N/A
207	192	180	106	170	96	148.8	N/A
208	191	179	106	169	96	148.2	N/A
209	191	179	106	168	97	148.2	N/A
210	190	179	106	168	97	148.0	N/A
211	190	178	105	167	96	147.2	N/A
212	189	178	105	166	96	146.8	N/A
213	189	177	105	165	96	146.4	N/A
214	188	177	104	165	95	145.8	N/A
215	188	177	104	164	95	145.6	N/A
216	187	176	104	163	95	145.0	N/A
217	187	176	104	163	95	145.0	N/A
218	186	175	104	162	95	144.4	N/A
219	186	175	104	161	95	144.2	N/A
220	185	175	104	160	95	143.8	N/A
221	185	174	104	160	95	143.6	N/A
222	184	173	103	160	95	143.0	N/A
223	184	173	103	159	95	142.8	N/A
224	183	172	103	158	95	142.2	N/A
225	182	171	103	158	95	141.8	N/A
226	182	171	103	157	95	141.6	N/A
227	181	171	103	157	95	141.4	N/A
228	181	170	103	156	94	140.8	N/A
229	180	170	103	156	94	140.6	N/A
230	180	169	102	155	94	140.0	N/A
231	179	168	102	154	94	139.4	N/A
232	179	168	102	154	94	139.4	N/A
233	178	168	102	154	94	139.2	N/A
234	177	167	102	153	94	138.6	N/A
235	177	167	102	153	94	138.6	N/A
236	176	165	102	152	94	137.8	N/A
237	176	165	102	152	94	137.8	N/A
238	175	165	102	151	94	137.4	N/A
239	175	165	102	151	94	137.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	175	164	101	150	94	136.8	N/A
241	174	164	101	150	94	136.6	N/A
242	173	164	101	150	93	136.2	N/A
243	173	162	101	149	93	135.6	N/A
244	172	163	101	149	93	135.6	N/A
245	171	162	101	149	93	135.2	N/A
246	171	162	101	148	93	135.0	N/A
247	171	162	101	148	93	135.0	N/A
248	170	160	101	147	93	134.2	N/A
249	170	161	101	147	93	134.4	N/A
250	169	161	101	147	93	134.2	N/A
251	169	161	101	147	93	134.2	N/A
252	169	160	100	146	93	133.6	N/A
253	168	160	100	146	93	133.4	N/A
254	168	159	100	146	92	133.0	N/A
255	168	159	100	145	92	132.8	N/A
256	168	158	100	145	92	132.6	N/A
257	167	158	100	144	92	132.2	N/A
258	166	158	100	144	92	132.0	N/A
259	167	157	100	144	92	132.0	N/A
260	166	157	100	144	92	131.8	N/A
261	166	157	100	144	92	131.8	N/A
262	165	157	100	143	92	131.4	N/A
263	165	156	100	143	92	131.2	N/A
264	165	156	100	143	92	131.2	N/A
265	164	156	100	142	92	130.8	N/A
266	164	155	99	142	91	130.2	N/A
267	163	156	99	142	91	130.2	N/A
268	163	155	99	142	91	130.0	N/A
269	163	155	99	142	91	130.0	N/A
270	164	154	99	141	91	129.8	N/A
271	164	154	98	141	91	129.6	N/A
272	163	154	98	141	91	129.4	N/A
273	163	153	98	140	91	129.0	N/A
274	163	153	98	140	91	129.0	N/A
275	163	152	98	140	90	128.6	N/A
276	163	152	98	140	90	128.6	N/A
277	163	152	98	140	90	128.6	N/A
278	163	152	98	139	90	128.4	N/A
279	163	151	98	139	90	128.2	N/A
280	162	151	97	139	90	127.8	N/A
281	162	151	97	139	90	127.8	N/A
282	162	151	97	138	89	127.4	N/A
283	162	151	97	138	89	127.4	N/A
284	162	151	97	138	89	127.4	N/A
285	161	151	97	138	89	127.2	N/A
286	161	151	96	138	89	127.0	N/A
287	161	151	96	137	89	126.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	161	150	96	137	89	126.6	N/A
289	160	150	96	137	89	126.4	N/A
290	160	150	96	137	89	126.4	N/A
291	160	150	96	137	88	126.2	N/A
292	160	150	96	136	88	126.0	N/A
293	160	150	96	136	88	126.0	N/A
294	159	150	96	136	88	125.8	N/A
295	159	150	96	136	88	125.8	N/A
296	158	150	96	135	88	125.4	N/A
297	158	150	96	135	88	125.4	N/A
298	158	150	96	135	88	125.4	N/A
299	157	150	96	135	88	125.2	N/A
300	157	149	95	135	88	124.8	N/A
301	157	149	95	134	88	124.6	N/A
302	157	149	95	134	88	124.6	N/A
303	157	149	95	134	88	124.6	N/A
304	157	149	95	134	88	124.6	N/A
305	157	149	95	134	89	124.8	N/A
306	157	148	96	134	89	124.8	N/A
307	157	148	96	134	89	124.8	N/A
308	157	148	96	133	89	124.6	N/A
309	157	148	96	133	89	124.6	N/A
310	156	147	96	133	89	124.2	N/A
311	156	148	96	133	89	124.4	N/A
312	156	148	96	133	89	124.4	N/A
313	156	147	96	133	89	124.2	N/A
314	156	147	96	133	89	124.2	N/A
315	156	147	96	133	89	124.2	N/A
316	156	147	96	133	89	124.2	N/A
317	156	146	96	132	89	123.8	N/A
318	156	146	96	132	89	123.8	N/A
319	156	146	96	132	89	123.8	N/A
320	155	147	96	132	89	123.8	N/A
321	156	146	96	132	89	123.8	N/A
322	156	146	96	132	89	123.8	N/A
323	156	146	96	132	89	123.8	N/A
324	155	145	96	132	89	123.4	N/A
325	156	145	96	131	89	123.4	N/A
326	156	145	96	131	89	123.4	N/A
327	156	145	95	131	89	123.2	N/A
328	156	145	95	131	89	123.2	N/A
329	156	144	95	131	89	123.0	N/A
330	156	144	95	131	89	123.0	N/A
331	156	144	95	131	89	123.0	N/A
332	156	143	95	131	89	122.8	N/A
333	156	143	95	131	89	122.8	N/A
334	156	143	95	131	89	122.8	N/A
335	155	142	95	130	89	122.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	155	142	95	130	89	122.2	N/A
337	155	142	95	130	89	122.2	N/A
338	155	142	95	130	89	122.2	N/A
339	155	141	95	130	89	122.0	N/A
340	155	141	95	130	89	122.0	N/A
341	154	141	95	130	89	121.8	N/A
342	154	140	95	130	88	121.4	N/A
343	154	141	95	129	88	121.4	N/A
344	154	141	94	129	88	121.2	N/A
345	154	140	94	129	88	121.0	N/A
346	153	140	94	129	88	120.8	N/A
347	153	140	94	129	88	120.8	N/A
348	153	140	94	129	88	120.8	N/A
349	153	140	94	128	88	120.6	N/A
350	152	140	94	128	88	120.4	N/A
351	152	139	94	128	88	120.2	N/A
352	152	139	94	128	88	120.2	N/A
353	152	139	94	128	87	120.0	N/A
354	151	139	94	128	87	119.8	N/A
355	151	139	94	127	87	119.6	N/A
356	151	139	94	127	87	119.6	N/A
357	151	138	93	127	87	119.2	N/A
358	151	138	93	127	87	119.2	N/A
359	150	138	93	127	87	119.0	N/A
360	150	138	93	127	87	119.0	N/A
361	150	138	93	127	87	119.0	N/A
362	150	138	93	127	87	119.0	N/A
363	150	137	93	127	87	118.8	N/A
364	149	137	93	126	87	118.4	N/A
365	149	137	93	126	87	118.4	N/A
366	149	137	93	126	87	118.4	N/A
367	149	137	93	126	87	118.4	N/A
368	149	137	93	126	87	118.4	N/A
369	148	137	93	126	86	118.0	N/A
370	148	137	93	126	86	118.0	N/A
371	148	137	93	126	86	118.0	N/A
372	148	136	93	126	86	117.8	N/A
373	148	136	92	126	86	117.6	N/A
374	148	136	93	126	86	117.8	N/A
375	148	135	93	126	86	117.6	N/A
376	148	136	93	126	86	117.8	N/A
377	148	135	93	126	86	117.6	N/A
378	147	136	92	126	86	117.4	N/A
379	147	136	92	126	86	117.4	N/A
380	147	136	92	126	86	117.4	N/A
381	147	136	92	125	86	117.2	N/A
382	147	135	92	125	86	117.0	N/A
383	147	135	92	125	86	117.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	147	135	92	125	86	117.0	N/A
385	146	135	92	125	86	116.8	N/A
386	147	135	92	126	86	117.2	N/A
387	147	135	92	125	86	117.0	N/A
388	147	135	92	125	86	117.0	N/A
389	146	135	92	125	86	116.8	N/A
390	146	135	92	125	85	116.6	N/A
391	146	134	92	125	85	116.4	N/A
392	146	135	92	125	85	116.6	N/A
393	146	134	92	125	85	116.4	N/A
394	146	134	92	125	85	116.4	N/A
395	146	134	92	125	85	116.4	N/A
396	146	135	92	125	85	116.6	N/A
397	146	135	92	125	85	116.6	N/A
398	145	136	92	125	85	116.6	N/A
399	145	136	92	124	85	116.4	N/A
400	145	136	92	124	85	116.4	N/A
401	145	136	92	124	85	116.4	N/A
402	145	136	92	124	85	116.4	N/A
403	145	136	92	124	85	116.4	N/A
404	145	136	92	124	85	116.4	N/A
405	145	135	91	124	85	116.0	N/A
406	145	136	91	124	85	116.2	N/A
407	145	136	91	124	84	116.0	N/A
408	145	135	91	124	84	115.8	N/A
409	144	135	91	124	84	115.6	N/A
410	144	135	91	124	84	115.6	N/A
411	144	135	91	124	84	115.6	N/A
412	144	135	91	123	84	115.4	N/A
413	144	134	91	123	84	115.2	N/A
414	144	135	91	123	84	115.4	N/A
415	144	135	91	123	84	115.4	N/A
416	144	134	91	123	84	115.2	N/A
417	144	134	91	123	84	115.2	N/A
418	144	134	91	123	84	115.2	N/A
419	144	134	91	123	84	115.2	N/A
420	144	134	90	123	84	115.0	N/A
421	144	134	90	123	84	115.0	N/A
422	144	134	90	123	84	115.0	N/A
423	143	134	90	123	84	114.8	N/A
424	143	134	90	122	83	114.4	N/A
425	143	134	90	122	84	114.6	N/A
426	143	134	90	122	84	114.6	N/A
427	143	134	90	122	84	114.6	N/A
428	143	132	90	122	84	114.2	N/A
429	143	131	90	122	84	114.0	N/A
430	143	131	90	122	84	114.0	N/A
431	143	130	90	122	84	113.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	143	131	90	122	84	114.0	N/A
433	143	131	90	122	83	113.8	N/A
434	143	130	90	121	84	113.6	N/A
435	143	130	90	122	84	113.8	N/A
436	142	131	90	121	84	113.6	N/A
437	142	130	90	121	84	113.4	N/A
438	142	129	90	121	84	113.2	N/A
439	142	130	90	121	84	113.4	N/A
440	142	129	90	121	84	113.2	N/A
441	142	129	90	121	84	113.2	N/A
442	142	129	90	121	84	113.2	N/A
443	142	129	90	121	84	113.2	N/A
444	142	129	90	121	84	113.2	N/A
445	142	129	90	121	84	113.2	N/A
446	142	129	90	120	84	113.0	N/A
447	141	130	90	120	84	113.0	N/A
448	141	129	90	120	84	112.8	N/A
449	141	129	90	120	84	112.8	N/A
450	141	129	90	120	84	112.8	N/A
451	141	129	90	120	84	112.8	N/A
452	141	129	90	120	84	112.8	N/A
453	141	129	89	120	84	112.6	N/A
454	141	129	89	120	84	112.6	N/A
455	140	129	89	119	83	112.0	N/A
456	140	129	89	119	84	112.2	N/A
457	140	129	89	119	83	112.0	N/A
458	140	129	89	119	83	112.0	N/A
459	140	128	89	119	83	111.8	N/A
460	139	128	89	119	83	111.6	N/A
461	139	128	89	119	83	111.6	N/A
462	139	128	89	119	83	111.6	N/A
463	139	128	89	119	83	111.6	N/A
464	139	128	89	119	83	111.6	N/A
465	139	128	89	118	83	111.4	N/A
466	139	128	89	118	83	111.4	N/A
467	139	128	89	118	83	111.4	N/A
468	138	128	89	118	83	111.2	N/A
469	138	128	88	118	83	111.0	N/A
470	138	128	88	118	83	111.0	N/A
471	138	127	88	118	83	110.8	N/A
472	138	127	88	118	82	110.6	N/A
473	137	127	88	117	82	110.2	N/A
474	137	127	88	117	82	110.2	N/A
475	137	127	88	117	82	110.2	N/A
476	137	127	88	117	82	110.2	N/A
477	136	127	88	117	82	110.0	N/A
478	136	126	88	117	82	109.8	N/A
479	136	127	88	116	82	109.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	136	127	88	116	82	109.8	N/A
481	136	126	88	116	82	109.6	N/A
482	136	126	88	116	82	109.6	N/A
483	135	126	88	116	82	109.4	N/A
484	135	126	88	116	82	109.4	N/A
485	135	126	88	116	82	109.4	N/A
486	135	126	88	116	82	109.4	N/A
487	135	126	88	115	82	109.2	N/A
488	134	125	87	115	82	108.6	N/A
489	134	125	87	115	82	108.6	N/A
490	134	125	87	115	82	108.6	N/A
491	134	125	87	115	82	108.6	N/A
492	134	124	87	115	82	108.4	N/A
493	133	124	87	114	81	107.8	N/A
494	133	124	87	114	82	108.0	N/A
495	132	124	87	114	81	107.6	N/A
496	132	124	87	114	82	107.8	N/A
497	132	123	87	114	82	107.6	N/A
498	132	123	87	114	82	107.6	N/A
499	132	123	87	114	82	107.6	N/A
500	132	123	87	113	82	107.4	N/A
501	131	123	87	113	82	107.2	N/A
502	131	122	87	113	82	107.0	N/A
503	131	122	87	113	82	107.0	N/A
504	130	122	87	113	82	106.8	N/A
505	130	122	87	113	82	106.8	N/A
506	130	121	87	113	81	106.4	N/A
507	130	122	87	113	82	106.8	N/A
508	130	122	87	112	81	106.4	N/A
509	130	121	87	112	81	106.2	N/A
510	129	121	87	112	82	106.2	N/A
511	129	121	87	112	82	106.2	N/A
512	129	121	87	112	82	106.2	N/A
513	129	121	87	112	81	106.0	N/A
514	129	121	87	112	81	106.0	N/A
515	129	121	86	112	81	105.8	N/A
516	129	121	86	111	81	105.6	N/A
517	128	120	86	111	81	105.2	N/A
518	128	120	86	111	81	105.2	N/A
519	128	120	86	111	81	105.2	N/A
520	128	120	86	111	81	105.2	N/A
521	128	120	86	111	81	105.2	N/A
522	127	120	86	111	81	105.0	N/A
523	127	119	86	110	81	104.6	N/A
524	127	119	86	110	81	104.6	N/A
525	127	119	86	110	81	104.6	N/A
526	127	119	86	110	81	104.6	N/A
527	127	118	85	110	81	104.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	127	119	85	109	80	104.0	N/A
529	126	118	85	109	80	103.6	N/A
530	126	118	85	109	80	103.6	N/A
531	126	118	85	109	80	103.6	N/A
532	126	118	85	109	80	103.6	N/A
533	125	117	85	109	80	103.2	N/A
534	125	117	85	108	80	103.0	N/A
535	125	117	85	108	80	103.0	N/A
536	125	117	85	108	80	103.0	N/A
537	125	116	85	108	80	102.8	N/A
538	124	116	85	108	80	102.6	N/A
539	124	116	84	107	80	102.2	N/A
540	124	116	84	107	80	102.2	N/A
541	124	115	84	107	80	102.0	N/A
542	123	115	84	107	80	101.8	N/A
543	123	115	84	107	80	101.8	N/A
544	123	115	84	106	80	101.6	N/A
545	122	114	84	106	80	101.2	N/A
546	122	114	84	106	80	101.2	N/A
547	122	114	84	106	80	101.2	N/A
548	121	114	84	106	80	101.0	N/A
549	121	113	84	105	80	100.6	N/A
550	121	113	84	105	80	100.6	N/A
551	120	112	84	105	80	100.2	N/A
552	120	112	84	105	79	100.0	N/A
553	120	112	84	105	79	100.0	N/A
554	120	112	83	105	79	99.8	N/A
555	119	112	83	104	79	99.4	N/A
556	119	111	83	104	79	99.2	N/A
557	119	110	83	104	79	99.0	N/A
558	119	111	83	104	79	99.2	N/A
559	119	111	83	104	79	99.2	N/A
Average	177	168	102	196	93	147	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Buck Stove
Model: 81
Run #: 2

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/7/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T432	97.0	97.0	98.8	1.8
Train A Filters - Remainder	T433	93.5	187.7	188.7	1.0
	T434	94.2			
Train A Probe	9A	116713.8	116713.8	116713.8	0.0
Train A O-Rings	9A	3580.2	3580.2	3581.1	0.9
Train B Filters	T435	93.3	186.7	188.1	1.4
	T436	93.4			
Train B Probe	9B	117919.3	117919.3	117919.4	0.1
Train B O-Rings	9B	3523.2	3523.2	3525.1	1.9
Background Filter			0.0	0.0	

Placed in Dessicator on:	4/9/2020

Train A Filters - First Hour	98.9	4/13 8:35	98.8	4/15 12:24				
Train A Filters - Remainder	188.7	4/13 8:35	188.7	4/15 12:25				
Train A Probe	116714.0	4/13 8:29	116713.8	4/15 12:18				
Train A O-Rings	3581.3	4/13 8:37	3581.1	4/15 12:22				
Train B Filters	188.0	4/13 8:36	188.1	4/15 12:25				
Train B Probe	117919.5	4/13 8:29	117919.4	4/15 12:19				
Train B O-Rings	3525.2	4/13 8:37	3525.1	4/15 12:22				
Background Filter								

1st hour Sub-Total, mg:	1.8
Remainder Sub-Total, mg:	1.9
Train 1 Aggregate, mg:	**3.7**
Train 2 Aggregate, mg:	**3.4**
Ambient Aggregate, mg:	0.0

ASTM E3053 Wood Heater Run Sheets

Client: Buck Stove Job Number: 20-592 Tracking #: 0064
Model: 81 Run Number: 2 Test Date: 4/7/20

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: _____
Air Control Setting: _____

Time	Notes
	N/A – See Run 1

Test Notes
Test Burn Start Time: 11:36
Air Control Setting: Minimum

Time	Notes
1:00	Test fuel loaded
3:00	Door closed
13:00	Air Set
60:00	Changed filter A

Test Burn End Time: 23:46

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 15.53 CO (%): 4.048

Calibration Results:

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	11:05	11:09	23:48	23:51
CO_2	-0.02	15.55	0.11	16.00
CO	0.000	4.047	-0.092	4.037

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

Technician Signature: _____ Date: 5/22/2020

ASTM E3053 Wood Heater Run Sheets

Client: Buck Stove Job Number: 20-592 Tracking #: 0064
Model: 81 Run Number: 2 Test Date: 4/7/20

Test Photos

Low Fire Fuel Load

Low Fire Fuel Loaded

Technician Signature: Date: 5/22/2020

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 3 Data Summary

Client:	Buck Stove
Model:	81
Job #:	20-592
Tracking #:	0064
Test Date:	4/9/2020

Technician Signature — Date: 5/29/2020

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

Burn Rate (kg/hr):	1.16

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	0.000	76.151	78.027	8.035
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.91			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	11587.3			
Average Gas Meter Temperature (°F)	77.5	83.9	98.1	81.8
Total Sample Volume (dscf)	0.000	72.941	72.542	7.725
Average Tunnel Temperature (°F)	88.7			
Total Time of Test (min)	569			
Total Particulate Catch (mg)	0.0	5.9	5.0	0.6
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000809	0.0000689	0.0000777
Total PM Emissions (g)	0.00	8.89	7.57	0.90
Particulate Emission Rate (g/hr)	0.00	0.94	0.80	0.90
Emissions Factor (g/kg)	-	0.81	0.69	-
Difference from Average Total Particulate Emissions (g)	-	0.66	0.66	-
Difference from Average Emissions Factor (g/kg)	-	0.06	0.06	-

Final Average Results	
Total Particulate Emissions (g)	8.23
Particulate Emission Rate (g/hr)	0.87
Emissions Factor (g/kg)	0.75
HHV Efficiency (%)	71.6%
LHV Efficiency (%)	77.1%
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	>80 °F, <90 °F	Min: 82 / Max: 90	OK
Face Velocity	< 30 ft/min	7.8	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 68 / Max: 86	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

B415.1 Efficiency Results

Manufacturer:	Buck Stove
Model:	81
Date:	04/09/20
Run:	3
Control #:	20-592
Test Duration:	569
Output Category:	Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	71.6%	77.1%
Combustion Efficiency	94.6%	94.6%
Heat Transfer Efficiency	75.6%	81.5%

Output Rate (kJ/h)	14,962	14,193	**(Btu/h)**
Burn Rate (kg/h)	1.16	2.56	**(lb/h)**
Input (kJ/h)	20,911	19,836	**(Btu/h)**

Test Load Weight (dry kg)	11.00	24.24	**dry lb**
MC wet (%)	17.74		
MC dry (%)	21.57		
Particulate (g)	8.23		
CO (g)	797		
Test Duration (h)	9.48		

Emissions	Particulate	CO
g/MJ Output	0.06	5.61
g/kg Dry Fuel	0.75	72.43
g/h	0.87	84.00
g/min	0.01	1.40
lb/MM Btu Output	0.13	13.05

Air/Fuel Ratio (A/F)	17.03

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Buck Stove | Job #: 20-592
Model: 81 | Tracking #: 0064
Run #: 3 | Technician: AK
Date: 4/9/2020

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.50		
Target Load Weight (lbs):	25.00		
Total Load Weight Range (lbs):	23.80	to	26.30
Core Load Weight Range (lbs):	11.30	to	16.30
Remainder Load Weight Range (lbs):	8.80	to	13.80
Core Load Piece Range (lbs):	3.80	to	6.30
Remainder Load Piece Range (lbs):	2.50	to	13.80
Max Allowable Kindling Weight (lbs):	4.96		
Max Allowable Start-up Fuel Weight (lbs):	7.44		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	5.17	In Range	26.9	25.9	27.6	26.8	In Range	4.08	1.85
2	16.00	5.10	In Range	25.5	19.3	22.0	22.3	In Range	4.17	1.89
3		5.15	In Range	25.4	26.5	22.5	24.8	In Range	4.13	1.87
Core Load Wt. (lbs)		15.42	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	4.98	In Range	22.3	23.9	28.0	24.7	In Range	3.99	1.81
2	16.00	4.40	In Range	22.3	26.4	19.5	22.7	In Range	3.59	1.63
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		9.38	In Range							

Total Load Weight (lbs):	24.80	In Range	
Core Load % of Total Weight:	62%	In Range	45-65%
Remainder % of Total Weight:	38%	In Range	35-55%
Total Load % of Target Weight:	99%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	9.9		
Total Load Average Moisture Content (%DB):	24.3	In Range	19-25%
Total Load Average Moisture Content (%WB):	19.5		
Total Test Load Weight (dry basis):	19.95 lbs	9.05 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
4.96	In Range	10.6	7.4	8.6	8.9	In Range	4.56	2.07

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
7.44	In Range	20.2	20.9	21.5	20.9	In Range	6.16	2.79

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.5	to	5.0	
Actual Residual Start-up Fuel Weight (lb):		2.6		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Buck Stove
Job #: 20-592
Model: 81
Tracking #: 0064
Run #: 3
Technician: AK
Date: 4/9/2020

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.50		
Target Load Weight (lbs):	30.00		
Total Load Weight Range (lbs):	28.50	to	31.50
Core Load Weight Range (lbs):	13.50	to	19.50
Remainder Load Weight Range (lbs):	10.50	to	16.50
Core Load Piece Range (lbs):	4.50	to	7.50
Remainder Load Piece Range (lbs):	3.00	to	9.00

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	5.30	In Range	24.6	20.0	21.3	22.0	In Range	4.35	1.97
2	16.00	4.76	In Range	25.8	26.1	25.6	25.8	In Range	3.78	1.72
3	16.00	5.00	In Range	18.2	18.5	18.3	18.3	In Range	4.23	1.92
Core Load Wt. (lbs)		15.06	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	16.00	3.91	In Range	18.5	20.9	21.1	20.2	In Range	3.25	1.48
2	16.00	6.30	In Range	21.8	24.6	21.2	22.5	In Range	5.14	2.33
3	16.00	4.20	In Range	19.6	19.3	21.9	20.3	In Range	3.49	1.58
Remainder Load (lbs)		14.41	In Range							

Remainder Load Small/Large Piece Weight Ratio:	62%	In Range	≤ 67%
Total Load Weight (lbs):	29.47	In Range	
Core Load % of Total Weight:	51%	In Range	45-65%
Remainder % of Total Weight:	49%	In Range	35-55%
Total Load % of Target Weight:	98%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.8		
Total Load Average Moisture Content (%DB):	21.6	In Range	19-25%
Total Load Average Moisture Content (%WB):	17.7		
Total Test Load Weight (dry basis):	24.24 lbs	11.00 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	3.0	to	5.8	
Actual Charcoal Bed Wt. (lb):	3.1			In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb):	0.0	Valid Test (≥90%)

Total Fuel Burned During Test Run:	29.5	lbs, wet basis
	24.2	lbs, dry basis
	11.00	kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	3	Technician:	AK
Test Start Time:	13:12	Date:	4/9/2020
Test Type:	Medium Fire		

Recording Interval (min):	1
Total Sampling Time (min):	569

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.02	29.08	29.05
Relative Humidity (%)	29.0	54.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft^3

Meter Box γ Factor:	1.012	(A)
Meter Box γ Factor:	1.008	(B)
Meter Box γ Factor:		(Ambient)

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/6/2020

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-4	in. Hg
(B)	0.000	cfm @	-9	in. Hg
(Ambient)		cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.046	130
2	0.072	130
3	0.074	130
4	0.050	130
5	0.030	130
6	0.078	130
7	0.082	130
8	0.058	130
Center	0.078	130

Static Pressure: -0.200 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	17.69	ft/sec
V_{scent}:	19.87	ft/sec
F_p:	0.890	[ratio]
Initial Tunnel Flow:	174.5	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594
X	Cherry	48.68	6.01		0.40	18.03	8316

WOODSTOVE PREBURN DATA

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	3	Technician:	AK
		Date:	4/9/2020

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

			Temperatures (°F)							
Elapsed Time (min)	**Scale Reading (lbs)**	**Flue Draft (in H_2O)**	**FB Left**	**FB Right**	**FB Back**	**FB Top**	**FB Bottom**	**Stove Surface Average**	**Flue**	**Ambient**
0										

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.083	0.00	80	-0.15		29.5		119	395	82	79
1	0.106	0.106	0.080	1.79	80	-1.19	87	29.4	-0.07	145	309	83	79
2	0.236	0.130	0.081	1.72	80	-1.39	106	29.3	-0.1	147	316	84	79
3	0.372	0.136	0.082	1.74	80	-1.17	108	29.2	-0.1	124	360	84	78
4	0.511	0.139	0.082	1.72	80	-1.12	111	29.0	-0.22	127	419	84	77
5	0.641	0.130	0.083	1.69	80	-0.91	103	28.8	-0.18	128	456	84	77
6	0.773	0.132	0.082	1.69	80	-1.24	106	28.6	-0.24	133	490	84	78
7	0.909	0.136	0.082	1.80	80	-1.32	109	28.3	-0.26	138	537	85	78
8	1.042	0.133	0.082	1.77	80	-0.19	107	28.1	-0.24	141	560	85	78
9	1.177	0.135	0.081	1.77	80	-1.17	110	27.8	-0.26	143	574	85	78
10	1.315	0.138	0.081	1.74	80	-0.72	113	27.6	-0.2	146	596	85	78
11	1.448	0.133	0.078	1.73	80	-0.49	111	27.3	-0.3	155	642	85	79
12	1.582	0.134	0.079	1.75	80	-1.14	112	27.0	-0.3	160	684	85	78
13	1.718	0.136	0.077	1.75	80	-0.4	116	26.7	-0.3	166	716	86	78
14	1.851	0.133	0.079	1.72	80	-1.51	112	26.4	-0.3	168	744	86	79
15	1.983	0.132	0.076	1.72	81	-0.45	114	26.1	-0.3	175	777	86	79
16	2.117	0.134	0.076	1.70	81	-1.38	115	25.7	-0.4	177	801	86	79
17	2.248	0.131	0.082	1.77	81	-1.2	106	25.4	-0.3	146	650	85	79
18	2.385	0.137	0.081	1.76	81	-1.13	111	25.2	-0.2	137	586	85	79
19	2.523	0.138	0.081	1.77	81	-0.68	111	24.9	-0.3	131	542	85	79
20	2.655	0.132	0.082	1.75	81	-0.29	105	24.8	-0.1	129	518	84	80
21	2.788	0.133	0.084	1.77	81	-1.42	105	24.6	-0.2	127	504	84	81
22	2.926	0.138	0.082	1.77	81	-0.96	110	24.4	-0.2	125	497	85	81
23	3.060	0.134	0.082	1.74	81	-0.49	106	24.2	-0.2	125	493	85	81
24	3.193	0.133	0.084	1.75	81	-0.7	104	24.0	-0.2	124	492	85	82
25	3.328	0.135	0.084	1.75	81	-0.31	106	23.8	-0.2	124	492	85	82
26	3.461	0.133	0.084	1.74	81	-1.45	104	23.5	-0.28	123	494	85	82
27	3.593	0.132	0.083	1.75	81	-1.3	104	23.4	-0.12	124	495	85	82
28	3.728	0.135	0.084	1.72	81	-1.01	106	23.1	-0.3	124	495	85	82
29	3.862	0.134	0.083	1.73	81	-1.53	106	22.9	-0.2	124	494	85	82
30	3.999	0.137	0.082	1.75	82	-1.34	109	22.6	-0.3	124	495	85	83
31	4.134	0.135	0.082	1.72	82	-1.03	107	22.4	-0.2	124	496	85	82
32	4.266	0.132	0.082	1.72	82	-0.55	104	22.2	-0.2	122	495	85	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.399	0.133	0.083	1.75	82	-1.45	105	22.0	-0.2	123	494	85	82
34	4.535	0.136	0.081	1.74	82	-1.07	108	21.8	-0.2	123	495	85	83
35	4.668	0.133	0.083	1.74	82	-1.49	105	21.6	-0.2	122	494	85	83
36	4.802	0.134	0.085	1.74	82	-0.81	104	21.4	-0.2	122	495	85	82
37	4.939	0.137	0.083	1.73	82	-0.26	108	21.2	-0.2	122	495	85	82
38	5.075	0.136	0.082	1.73	82	-1	108	21.0	-0.2	123	495	85	83
39	5.209	0.134	0.082	1.74	82	-1.14	106	20.7	-0.3	122	496	84	83
40	5.345	0.136	0.080	1.75	83	-0.27	109	20.5	-0.2	123	496	84	82
41	5.477	0.132	0.084	1.75	83	-0.78	103	20.3	-0.2	123	497	84	82
42	5.609	0.132	0.082	1.73	83	-0.76	104	20.1	-0.2	123	497	84	84
43	5.746	0.137	0.083	1.74	83	-0.17	107	19.9	-0.2	121	495	85	83
44	5.878	0.132	0.081	1.74	83	-0.82	105	19.6	-0.3	121	493	85	82
45	6.013	0.135	0.082	1.71	83	-0.48	107	19.5	-0.1	122	493	85	83
46	6.148	0.135	0.085	1.74	83	-1.45	105	19.3	-0.2	121	493	85	83
47	6.280	0.132	0.084	1.73	83	-1.45	103	19.1	-0.2	122	491	85	83
48	6.415	0.135	0.083	1.73	83	-0.44	106	18.8	-0.3	121	489	85	83
49	6.553	0.138	0.084	1.73	83	-1.33	108	18.7	-0.1	121	488	85	83
50	6.683	0.130	0.083	1.74	83	-0.29	102	18.4	-0.3	121	487	85	83
51	6.819	0.136	0.084	1.74	84	-0.86	106	18.3	-0.1	120	483	85	83
52	6.956	0.137	0.084	1.75	84	-1.46	107	18.1	-0.2	120	480	85	83
53	7.086	0.130	0.085	1.75	84	-1.48	100	17.9	-0.2	120	479	85	83
54	7.222	0.136	0.083	1.77	84	-0.23	106	17.7	-0.2	120	477	85	83
55	7.360	0.138	0.084	1.76	84	-1.11	107	17.5	-0.2	120	477	85	83
56	7.490	0.130	0.083	1.77	84	-0.2	102	17.3	-0.2	120	476	85	83
57	7.628	0.138	0.085	1.76	84	-0.47	107	17.1	-0.2	120	476	85	83
58	7.762	0.134	0.084	1.75	84	-0.19	104	16.9	-0.2	120	475	85	83
59	7.895	0.133	0.083	1.77	84	-0.83	104	16.8	-0.1	120	474	85	84
60	8.035	0.140	0.081	2.01	84	-1	111	16.5	-0.3	120	473	85	83
61	8.180	0.145	0.084	1.93	84	-0.43	113	16.3	-0.2	119	469	85	84
62	8.317	0.137	0.086	1.87	84	-0.42	105	16.1	-0.2	120	469	86	86
63	8.458	0.141	0.083	1.89	85	-1.06	110	16.0	-0.1	119	469	86	83
64	8.593	0.135	0.084	1.88	85	-0.89	105	15.8	-0.2	119	469	86	83
65	8.735	0.142	0.083	1.90	85	-1	111	15.6	-0.2	119	468	86	83

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	8.871	0.136	0.084	1.89	85	-1.15	105	15.4	-0.2	119	469	85	82
67	9.005	0.134	0.082	1.80	85	-1.19	105	15.3	-0.1	118	469	85	83
68	9.140	0.135	0.083	1.78	85	-0.16	105	15.1	-0.2	117	469	85	84
69	9.270	0.130	0.083	1.78	85	-1.09	101	14.9	-0.2	117	469	85	83
70	9.405	0.135	0.085	1.77	85	-0.86	104	14.7	-0.2	117	471	85	82
71	9.538	0.133	0.083	1.77	85	-0.36	104	14.5	-0.16	117	468	84	83
72	9.667	0.129	0.085	1.76	85	-0.73	99	14.4	-0.14	116	467	84	84
73	9.803	0.136	0.083	1.77	85	-1.36	106	14.2	-0.2	116	466	84	83
74	9.933	0.130	0.082	1.77	85	-0.11	102	14.1	-0.1	114	463	84	84
75	10.065	0.132	0.084	1.77	86	-1.21	102	13.9	-0.2	115	463	84	82
76	10.199	0.134	0.082	1.78	86	-0.59	105	13.7	-0.2	116	461	84	83
77	10.330	0.131	0.081	1.77	86	-0.61	103	13.5	-0.2	114	461	84	82
78	10.463	0.133	0.084	1.78	86	-1.39	103	13.4	-0.1	115	461	84	84
79	10.596	0.133	0.083	1.77	86	-1.08	103	13.2	-0.2	114	462	84	83
80	10.727	0.131	0.086	1.77	86	-0.53	100	13.0	-0.2	113	462	84	79
81	10.859	0.132	0.083	1.76	86	-0.54	102	12.9	-0.1	114	462	84	82
82	10.994	0.135	0.083	1.77	86	-1.38	105	12.7	-0.2	114	461	84	80
83	11.124	0.130	0.082	1.75	86	-0.46	101	12.5	-0.2	114	460	84	79
84	11.256	0.132	0.085	1.76	86	-1.23	101	12.3	-0.2	114	463	84	81
85	11.390	0.134	0.083	1.75	86	-0.63	104	12.2	-0.1	114	463	84	82
86	11.518	0.128	0.088	1.76	86	-1.31	96	12.0	-0.2	115	463	84	83
87	11.652	0.134	0.083	1.76	86	-0.08	104	11.8	-0.2	114	462	84	82
88	11.785	0.133	0.085	1.73	86	-0.6	102	11.7	-0.1	114	460	84	83
89	11.913	0.128	0.084	1.73	86	-1.31	99	11.5	-0.2	114	459	84	83
90	12.047	0.134	0.085	1.76	86	-0.64	103	11.3	-0.2	113	458	84	83
91	12.179	0.132	0.084	1.78	86	-1.02	102	11.1	-0.2	114	455	84	81
92	12.310	0.131	0.083	1.77	86	-0.98	102	11.0	-0.1	114	452	84	83
93	12.447	0.137	0.081	1.79	86	-1.41	107	10.8	-0.18	113	451	84	83
94	12.577	0.130	0.087	1.78	87	-0.44	98	10.7	-0.12	113	447	84	83
95	12.710	0.133	0.085	1.77	87	-0.44	102	10.5	-0.2	112	447	84	84
96	12.846	0.136	0.089	1.79	87	-0.97	101	10.4	-0.1	112	443	84	83
97	12.977	0.131	0.086	1.74	87	-0.63	99	10.3	-0.1	112	438	84	83
98	13.108	0.131	0.083	1.76	87	-0.19	101	10.1	-0.2	112	435	85	83

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	13.242	0.134	0.084	1.75	87	-0.32	103	10.0	-0.1	111	431	85	82
100	13.373	0.131	0.086	1.77	87	-0.6	99	9.9	-0.1	110	427	85	81
101	13.505	0.132	0.084	1.76	87	-1.01	101	9.7	-0.2	111	425	85	84
102	13.640	0.135	0.085	1.74	87	-0.17	103	9.6	-0.1	110	420	85	83
103	13.769	0.129	0.085	1.77	87	-0.73	98	9.5	-0.1	109	414	85	84
104	13.901	0.132	0.084	1.77	87	-0.98	101	9.4	-0.1	108	408	85	84
105	14.037	0.136	0.085	1.75	87	-0.91	104	9.2	-0.2	109	404	85	84
106	14.166	0.129	0.084	1.75	87	-0.19	99	9.1	-0.1	108	401	85	84
107	14.300	0.134	0.085	1.76	87	-0.7	102	9.0	-0.1	108	398	85	83
108	14.433	0.133	0.085	1.77	87	-1.43	101	8.9	-0.1	108	394	85	83
109	14.562	0.129	0.085	1.76	87	-0.28	98	8.8	-0.1	107	393	85	83
110	14.698	0.136	0.087	1.74	87	-1.11	102	8.7	-0.1	107	391	85	82
111	14.828	0.130	0.085	1.75	87	-0.48	99	8.6	-0.1	107	388	85	83
112	14.959	0.131	0.084	1.75	87	-0.92	100	8.5	-0.1	106	386	85	83
113	15.093	0.134	0.086	1.77	87	-1.42	101	8.4	-0.1	106	383	85	82
114	15.223	0.130	0.084	1.77	87	-1.23	99	8.4	-0.02	105	381	84	83
115	15.356	0.133	0.085	1.75	87	-0.66	101	8.2	-0.18	105	376	84	84
116	15.490	0.134	0.085	1.75	88	-0.75	101	8.1	-0.08	105	373	84	83
117	15.621	0.131	0.083	1.75	88	-0.66	100	8.0	-0.12	104	371	84	81
118	15.752	0.131	0.087	1.77	88	-1.34	98	8.0	0	103	368	84	82
119	15.886	0.134	0.085	1.76	88	-1.07	101	7.9	-0.1	103	366	84	83
120	16.018	0.132	0.084	1.76	88	-0.29	100	7.8	-0.1	103	363	84	83
121	16.149	0.131	0.083	1.78	88	-0.87	100	7.7	-0.1	102	358	84	83
122	16.284	0.135	0.083	1.77	88	-0.84	103	7.6	-0.1	102	354	84	82
123	16.412	0.128	0.084	1.76	88	-0.66	97	7.6	0	101	351	84	83
124	16.546	0.134	0.082	1.76	88	-0.63	103	7.5	-0.1	102	347	84	84
125	16.680	0.134	0.085	1.77	88	-0.23	101	7.4	-0.1	101	343	84	83
126	16.808	0.128	0.086	1.75	88	-1.45	96	7.3	-0.1	101	340	84	83
127	16.943	0.135	0.086	1.77	88	-1.18	101	7.2	-0.08	100	336	84	81
128	17.075	0.132	0.084	1.77	88	-1.04	100	7.2	-0.02	100	334	84	82
129	17.204	0.129	0.083	1.76	88	-0.22	98	7.1	-0.1	100	331	84	83
130	17.340	0.136	0.085	1.75	88	-1.32	103	7.1	0	100	327	84	82
131	17.470	0.130	0.088	1.75	88	-0.3	96	7.0	-0.1	100	324	84	82

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	17.601	0.131	0.086	1.77	88	-0.95	98	6.9	-0.1	99	321	84	83
133	17.736	0.135	0.084	1.76	88	-1.22	102	6.8	-0.1	99	318	84	83
134	17.866	0.130	0.085	1.77	88	-0.36	98	6.8	0	98	316	84	82
135	18.000	0.134	0.085	1.79	88	-1.26	101	6.7	-0.1	98	312	84	82
136	18.133	0.133	0.082	1.77	88	-0.94	102	6.7	0	98	309	84	83
137	18.265	0.132	0.084	1.78	88	-0.22	100	6.6	-0.1	97	306	84	81
138	18.397	0.132	0.083	1.77	88	-1.53	100	6.5	-0.1	97	303	84	83
139	18.532	0.135	0.085	1.77	88	-1.52	102	6.5	0	97	300	84	83
140	18.662	0.130	0.084	1.78	88	-0.42	98	6.4	-0.1	96	297	84	83
141	18.796	0.134	0.084	1.76	88	-0.1	101	6.4	0	96	294	84	83
142	18.932	0.136	0.084	1.78	88	-1.11	103	6.3	-0.1	96	290	84	83
143	19.060	0.128	0.085	1.79	88	-0.3	96	6.3	0	96	288	84	82
144	19.197	0.137	0.086	1.78	88	-1.29	102	6.2	-0.1	95	285	84	83
145	19.329	0.132	0.087	1.79	88	-0.94	98	6.1	-0.1	95	283	84	82
146	19.461	0.132	0.084	1.78	88	-0.57	100	6.1	0	95	281	84	83
147	19.597	0.136	0.084	1.79	88	-0.93	103	6.0	-0.1	95	278	84	82
148	19.729	0.132	0.085	1.78	88	-0.74	99	6.0	0	95	276	84	83
149	19.862	0.133	0.086	1.78	88	-0.3	99	6.0	-0.02	95	275	84	82
150	19.999	0.137	0.085	1.79	88	-0.7	103	5.9	-0.08	94	273	84	84
151	20.130	0.131	0.087	1.82	88	-0.98	97	5.9	0	94	271	84	82
152	20.267	0.137	0.086	1.83	88	-0.81	102	5.8	-0.1	94	270	84	82
153	20.401	0.134	0.084	1.82	88	-1.19	101	5.8	0	94	268	84	82
154	20.533	0.132	0.087	1.81	88	-0.68	98	5.7	-0.1	94	268	84	82
155	20.671	0.138	0.086	1.82	88	-0.28	103	5.7	0	94	266	83	83
156	20.803	0.132	0.086	1.81	88	-1.31	98	5.6	-0.1	93	264	83	83
157	20.937	0.134	0.086	1.83	88	-0.45	100	5.6	0	93	263	83	84
158	21.074	0.137	0.085	1.83	88	-1.17	103	5.6	0	93	260	83	82
159	21.206	0.132	0.086	1.81	88	-0.26	98	5.5	-0.1	93	260	83	82
160	21.342	0.136	0.084	1.83	88	-0.87	103	5.4	-0.1	93	260	83	83
161	21.477	0.135	0.086	1.82	88	-1.51	101	5.4	0	93	258	83	82
162	21.609	0.132	0.085	1.82	88	-1.49	99	5.4	0	92	257	83	82
163	21.747	0.138	0.087	1.82	88	-1.25	102	5.3	-0.1	93	255	83	82
164	21.880	0.133	0.085	1.83	88	-0.33	100	5.3	0	93	254	83	83

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	22.014	0.134	0.085	1.83	88	-0.3	100	5.3	0	92	253	83	83
166	22.152	0.138	0.083	1.82	88	-0.25	105	5.2	-0.1	92	252	83	82
167	22.284	0.132	0.085	1.81	88	-0.57	99	5.2	0	92	251	83	82
168	22.423	0.139	0.082	1.84	88	-1.17	106	5.1	-0.1	92	251	83	84
169	22.557	0.134	0.085	1.83	88	-0.95	100	5.1	0	92	250	83	82
170	22.690	0.133	0.085	1.81	88	-0.48	99	5.0	-0.1	91	248	83	83
171	22.827	0.137	0.086	1.82	88	-0.91	102	5.0	0	91	247	83	83
172	22.961	0.134	0.088	1.83	88	-1.39	98	4.9	-0.1	91	245	83	83
173	23.095	0.134	0.086	1.82	88	-0.15	100	4.9	0	91	242	83	82
174	23.233	0.138	0.085	1.81	88	-1.01	103	4.9	0	91	240	83	82
175	23.365	0.132	0.086	1.83	88	-1.1	98	4.9	0	91	237	83	82
176	23.503	0.138	0.086	1.83	88	-0.36	103	4.9	0	90	236	83	82
177	23.636	0.133	0.085	1.82	88	-1.14	99	4.8	-0.1	91	233	83	82
178	23.770	0.134	0.084	1.82	88	-1.21	101	4.8	0	90	231	83	82
179	23.907	0.137	0.083	1.81	88	-0.44	104	4.7	-0.1	90	229	83	81
180	24.040	0.133	0.084	1.82	88	-1	100	4.7	0	90	227	84	82
181	24.174	0.134	0.087	1.81	88	-1.44	99	4.7	0	90	225	84	83
182	24.312	0.138	0.085	1.81	88	-0.54	103	4.7	0	90	225	84	81
183	24.443	0.131	0.086	1.81	88	-0.65	97	4.6	-0.1	89	223	84	83
184	24.581	0.138	0.084	1.80	88	-1.26	104	4.6	0	89	222	84	83
185	24.714	0.133	0.086	1.82	88	-0.41	99	4.6	0	89	221	84	82
186	24.848	0.134	0.084	1.82	88	-1.01	101	4.6	0	89	218	84	81
187	24.985	0.137	0.086	1.82	88	-1.01	102	4.5	-0.1	89	217	84	81
188	25.118	0.133	0.084	1.82	88	-0.33	100	4.5	0	88	215	84	81
189	25.252	0.134	0.088	1.82	88	-0.17	98	4.5	0	89	214	84	83
190	25.390	0.138	0.086	1.84	88	-0.31	102	4.5	0	89	212	84	81
191	25.521	0.131	0.086	1.82	88	-1.46	97	4.5	0	89	210	84	80
192	25.660	0.139	0.088	1.80	88	-0.21	102	4.5	0	88	210	84	81
193	25.792	0.132	0.086	1.82	88	-0.43	98	4.4	-0.1	88	209	84	80
194	25.929	0.137	0.084	1.82	88	-0.13	103	4.4	0	88	207	84	79
195	26.065	0.136	0.084	1.83	88	-0.49	102	4.4	0	88	207	84	80
196	26.199	0.134	0.085	1.82	88	-0.21	100	4.4	0	88	205	84	80
197	26.335	0.136	0.087	1.82	88	-0.44	100	4.3	-0.06	88	205	84	81

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	26.471	0.136	0.084	1.84	88	-0.49	102	4.3	-0.04	87	203	84	81
199	26.605	0.134	0.089	1.83	88	-0.27	98	4.3	0	87	201	84	82
200	26.742	0.137	0.084	1.84	88	-0.23	103	4.3	0	87	200	84	80
201	26.876	0.134	0.084	1.83	88	-1.48	100	4.3	0	86	199	84	81
202	27.011	0.135	0.086	1.83	88	-0.65	100	4.3	0	87	199	84	80
203	27.149	0.138	0.086	1.83	88	-1.25	102	4.2	-0.1	87	197	84	80
204	27.281	0.132	0.084	1.84	88	-0.41	99	4.2	0	87	197	84	80
205	27.420	0.139	0.087	1.84	88	-1.08	102	4.2	0	86	196	84	80
206	27.554	0.134	0.087	1.84	88	-1.27	99	4.2	0	86	195	84	81
207	27.689	0.135	0.087	1.83	88	-0.85	99	4.1	-0.1	86	194	84	80
208	27.826	0.137	0.086	1.84	88	-1.14	101	4.1	0	86	193	84	79
209	27.961	0.135	0.089	1.84	88	-1.19	98	4.1	0	86	193	84	80
210	28.096	0.135	0.086	1.82	88	-0.57	100	4.1	0	86	192	84	82
211	28.233	0.137	0.086	1.84	88	-0.84	101	4.1	0	86	191	84	80
212	28.366	0.133	0.085	1.82	88	-0.54	99	4.1	0	86	191	84	81
213	28.505	0.139	0.084	1.84	88	-1.14	104	4.1	0	86	190	84	79
214	28.639	0.134	0.086	1.83	88	-0.2	99	4.1	0	86	191	84	80
215	28.773	0.134	0.087	1.85	88	-0.3	99	4.1	0	86	190	84	79
216	28.912	0.139	0.085	1.84	88	-0.65	103	4.0	-0.1	85	190	84	79
217	29.045	0.133	0.088	1.85	88	-0.19	97	4.0	0	85	189	84	80
218	29.184	0.139	0.086	1.84	88	-0.16	103	4.0	0	85	189	84	79
219	29.318	0.134	0.089	1.84	88	-1.31	97	4.0	0	85	189	84	79
220	29.453	0.135	0.086	1.83	88	-0.81	100	4.0	0	85	190	84	80
221	29.590	0.137	0.088	1.83	88	-1.46	100	3.9	-0.1	85	189	84	80
222	29.724	0.134	0.086	1.85	88	-1.38	99	3.9	0	85	188	84	82
223	29.859	0.135	0.086	1.83	88	-0.34	100	3.9	0	85	188	84	81
224	29.996	0.137	0.084	1.84	88	-1.23	103	3.9	0	85	188	84	79
225	30.129	0.133	0.086	1.84	88	-1.12	98	3.9	0	85	187	84	80
226	30.267	0.138	0.086	1.84	88	-0.53	102	3.9	0	85	187	84	80
227	30.401	0.134	0.088	1.83	88	-0.68	98	3.8	-0.1	85	187	84	80
228	30.535	0.134	0.087	1.85	88	-1.14	99	3.8	0	85	186	84	81
229	30.673	0.138	0.084	1.84	88	-0.5	103	3.8	0	85	186	84	80
230	30.804	0.131	0.085	1.82	88	-0.17	97	3.8	0	85	185	84	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	30.942	0.138	0.086	1.83	88	-0.38	102	3.8	0	85	183	84	80
232	31.076	0.134	0.086	1.84	88	-1.34	99	3.8	0	84	182	84	80
233	31.210	0.134	0.086	1.83	88	-0.89	99	3.8	0	84	181	84	81
234	31.348	0.138	0.087	1.83	88	-0.32	101	3.7	-0.1	84	180	84	80
235	31.481	0.133	0.086	1.84	88	-1.12	98	3.7	0	85	180	84	79
236	31.616	0.135	0.085	1.83	88	-0.67	100	3.7	0	84	180	84	81
237	31.754	0.138	0.085	1.82	88	-1.36	103	3.7	0	84	179	83	79
238	31.885	0.131	0.088	1.81	88	-0.17	96	3.7	0	84	179	83	79
239	32.026	0.141	0.087	1.84	87	-0.72	104	3.7	0	84	178	83	79
240	32.159	0.133	0.087	1.83	87	-1.44	98	3.7	0	84	178	83	79
241	32.294	0.135	0.085	1.84	87	-1.16	101	3.7	0	84	177	83	79
242	32.431	0.137	0.086	1.84	87	-0.51	101	3.6	-0.1	84	177	83	79
243	32.564	0.133	0.086	1.84	87	-0.46	98	3.6	0	84	176	83	81
244	32.701	0.137	0.086	1.84	87	-1.4	101	3.6	0	84	177	83	80
245	32.836	0.135	0.086	1.85	87	-1.13	100	3.6	0	84	177	83	80
246	32.969	0.133	0.088	1.82	87	-0.21	97	3.6	0	84	177	83	80
247	33.107	0.138	0.088	1.84	87	-1.03	101	3.6	0	84	177	83	79
248	33.241	0.134	0.086	1.83	87	-1.03	99	3.6	-0.02	83	176	83	81
249	33.376	0.135	0.086	1.84	87	-1.05	100	3.5	-0.08	84	176	83	81
250	33.514	0.138	0.087	1.84	87	-0.58	101	3.5	0	83	175	83	79
251	33.647	0.133	0.088	1.85	87	-0.6	97	3.5	0	84	175	83	79
252	33.786	0.139	0.088	1.83	87	-1.26	102	3.5	0	83	175	83	79
253	33.919	0.133	0.087	1.82	87	-1.02	98	3.5	0	83	174	83	79
254	34.055	0.136	0.088	1.84	87	-0.6	99	3.4	-0.06	83	174	83	80
255	34.192	0.137	0.086	1.83	87	-0.7	101	3.5	0.06	83	175	83	80
256	34.326	0.134	0.085	1.83	87	-0.86	100	3.4	-0.1	83	174	83	80
257	34.462	0.136	0.088	1.83	87	-1.43	99	3.4	0	83	173	83	79
258	34.598	0.136	0.086	1.85	87	-1.27	101	3.4	0	83	173	83	79
259	34.732	0.134	0.088	1.83	87	-0.6	98	3.4	0	83	173	83	81
260	34.870	0.138	0.088	1.84	87	-0.16	101	3.4	0	83	172	83	80
261	35.004	0.134	0.087	1.84	87	-0.9	99	3.4	0	83	172	83	80
262	35.138	0.134	0.089	1.85	87	-0.96	97	3.4	0	83	172	83	80
263	35.276	0.138	0.085	1.84	87	-0.18	103	3.4	0	83	171	83	80

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	35.408	0.132	0.086	1.86	87	-0.84	98	3.4	0	83	171	83	80
265	35.546	0.138	0.085	1.82	87	-1.22	103	3.4	0	83	171	83	80
266	35.680	0.134	0.085	1.82	87	-0.16	100	3.3	-0.1	83	171	83	80
267	35.814	0.134	0.086	1.83	87	-0.74	99	3.3	0	83	171	83	79
268	35.951	0.137	0.087	1.84	87	-1.45	101	3.3	0	83	170	83	79
269	36.085	0.134	0.086	1.82	87	-0.18	99	3.3	0	83	170	83	81
270	36.220	0.135	0.085	1.83	87	-1.16	100	3.3	0	83	169	83	79
271	36.358	0.138	0.087	1.81	87	-1.15	101	3.2	-0.06	83	169	83	80
272	36.489	0.131	0.088	1.83	87	-1.05	96	3.3	0.04	83	169	83	79
273	36.629	0.140	0.085	1.84	87	-1.4	104	3.2	-0.08	83	169	83	79
274	36.761	0.132	0.085	1.84	87	-1.15	98	3.2	0	83	169	83	79
275	36.897	0.136	0.087	1.84	87	-0.19	100	3.2	0	83	169	83	80
276	37.034	0.137	0.085	1.83	87	-0.85	102	3.2	0	83	169	83	80
277	37.167	0.133	0.087	1.86	87	-0.96	98	3.2	0	83	168	83	79
278	37.304	0.137	0.086	1.85	87	-0.8	101	3.2	0	83	168	83	81
279	37.440	0.136	0.087	1.83	87	-0.48	100	3.1	-0.1	82	169	83	78
280	37.573	0.133	0.088	1.82	86	-0.73	97	3.1	0	82	168	83	80
281	37.711	0.138	0.087	1.83	86	-1.13	102	3.1	0	82	168	83	79
282	37.845	0.134	0.088	1.84	86	-0.18	98	3.1	0	82	167	83	80
283	37.980	0.135	0.087	1.85	86	-1.02	99	3.1	0	82	167	83	80
284	38.118	0.138	0.088	1.85	86	-1.24	101	3.1	0	82	166	83	80
285	38.251	0.133	0.085	1.84	86	-1.43	99	3.0	-0.1	82	166	83	79
286	38.390	0.139	0.087	1.84	86	-1.24	102	3.0	0	82	166	83	80
287	38.523	0.133	0.084	1.82	86	-0.86	100	3.0	0	82	166	83	80
288	38.658	0.135	0.086	1.83	86	-1.12	100	3.0	0	82	166	83	78
289	38.795	0.137	0.085	1.83	86	-1.11	102	3.0	0	82	166	83	78
290	38.930	0.135	0.087	1.84	86	-1.08	99	3.0	0	82	166	84	79
291	39.065	0.135	0.088	1.84	86	-1.06	99	3.0	0	81	166	84	78
292	39.202	0.137	0.086	1.86	86	-1.42	101	3.0	0	81	166	84	81
293	39.334	0.132	0.087	1.86	86	-1.12	97	3.0	0	82	166	84	79
294	39.473	0.139	0.089	1.85	86	-0.71	101	3.0	0	82	166	84	80
295	39.606	0.133	0.085	1.83	86	-0.4	99	3.0	0	82	165	84	79
296	39.741	0.135	0.087	1.85	86	-0.36	99	3.0	0	82	165	84	79

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	39.879	0.138	0.087	1.84	86	-1.22	102	2.9	-0.1	82	165	84	80
298	40.011	0.132	0.086	1.81	86	-1.03	98	2.9	0	81	165	84	79
299	40.149	0.138	0.088	1.82	86	-1.09	101	2.9	0	81	165	83	80
300	40.283	0.134	0.087	1.84	86	-1.24	99	2.9	0	81	165	83	79
301	40.417	0.134	0.086	1.85	86	-1.28	99	2.9	0	82	165	83	79
302	40.555	0.138	0.088	1.83	86	-1.24	101	2.9	-0.02	81	165	83	78
303	40.689	0.134	0.087	1.82	86	-0.5	99	2.8	-0.08	81	165	83	79
304	40.823	0.134	0.087	1.82	86	-1.09	99	2.9	0.1	81	165	83	80
305	40.961	0.138	0.087	1.82	86	-0.28	101	2.8	-0.1	81	165	83	78
306	41.092	0.131	0.088	1.82	86	-1.01	96	2.8	0	81	165	83	77
307	41.231	0.139	0.086	1.82	86	-1.09	103	2.8	0	81	165	83	78
308	41.364	0.133	0.084	1.82	86	-1.08	100	2.8	0	81	165	83	80
309	41.499	0.135	0.088	1.81	86	-0.93	99	2.8	0	81	165	83	80
310	41.635	0.136	0.088	1.84	86	-1.43	99	2.7	-0.06	81	165	83	78
311	41.769	0.134	0.086	1.81	86	-0.24	99	2.7	-0.04	81	164	83	80
312	41.903	0.134	0.087	1.82	86	-0.86	99	2.7	0	81	164	83	79
313	42.042	0.139	0.085	1.80	86	-0.82	103	2.7	0	81	164	83	78
314	42.175	0.133	0.084	1.82	86	-1.3	100	2.7	0	81	164	83	81
315	42.316	0.141	0.087	1.81	86	-1.02	104	2.7	0	81	164	83	79
316	42.448	0.132	0.086	1.82	86	-0.08	98	2.7	0	81	164	83	80
317	42.582	0.134	0.087	1.76	86	-0.77	98	2.6	-0.1	80	164	83	78
318	42.718	0.136	0.087	1.79	86	-1.4	100	2.6	0	80	165	83	80
319	42.849	0.131	0.085	1.79	86	-1.14	97	2.6	0	80	164	83	78
320	42.982	0.133	0.086	1.79	86	-0.22	98	2.6	0	80	164	83	77
321	43.117	0.135	0.084	1.79	86	-0.86	101	2.6	0	80	164	83	78
322	43.247	0.130	0.087	1.81	86	-1.21	95	2.6	0	80	164	83	77
323	43.382	0.135	0.085	1.78	86	-1.17	100	2.6	0	80	164	83	75
324	43.517	0.135	0.086	1.79	86	-1	100	2.6	0	80	164	83	77
325	43.646	0.129	0.088	1.77	85	-1.22	94	2.6	0	79	164	83	78
326	43.782	0.136	0.088	1.79	85	-1.04	100	2.5	-0.1	80	164	83	78
327	43.914	0.132	0.088	1.80	85	-0.73	96	2.5	0	79	165	83	75
328	44.046	0.132	0.086	1.77	85	-0.46	98	2.5	0	80	165	83	77
329	44.181	0.135	0.088	1.78	85	-0.04	99	2.5	0	79	165	83	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	44.312	0.131	0.088	1.79	85	-1.17	96	2.5	0	79	165	83	75
331	44.445	0.133	0.088	1.79	85	-0.49	97	2.5	-0.02	79	165	84	75
332	44.579	0.134	0.088	1.79	85	-1.22	98	2.4	-0.08	79	165	84	76
333	44.711	0.132	0.087	1.78	85	-0.69	97	2.4	0	79	165	84	76
334	44.843	0.132	0.089	1.78	85	-0.22	96	2.4	0	79	166	84	75
335	44.978	0.135	0.088	1.77	85	-0.16	99	2.4	0	79	167	84	79
336	45.108	0.130	0.088	1.79	85	-1.46	95	2.4	0	79	166	84	78
337	45.242	0.134	0.087	1.78	85	-0.21	99	2.4	0	79	166	83	76
338	45.378	0.136	0.087	1.78	85	-0.09	100	2.3	-0.1	79	166	83	76
339	45.507	0.129	0.088	1.76	85	-0.85	94	2.3	0	79	166	83	75
340	45.643	0.136	0.090	1.79	85	-1.49	98	2.3	0	79	166	83	76
341	45.775	0.132	0.089	1.77	85	-0.24	96	2.3	0	79	166	83	75
342	45.907	0.132	0.087	1.78	85	-1.43	97	2.3	0	79	167	83	74
343	46.043	0.136	0.087	1.77	85	-0.27	100	2.3	0	78	167	82	76
344	46.174	0.131	0.087	1.77	85	-0.9	96	2.3	0	78	167	82	76
345	46.307	0.133	0.087	1.76	85	-0.49	98	2.2	-0.1	78	166	82	77
346	46.441	0.134	0.086	1.78	85	-0.54	99	2.2	0	78	166	82	77
347	46.572	0.131	0.086	1.78	85	-1.12	97	2.2	0	78	166	82	77
348	46.705	0.133	0.088	1.76	85	-0.32	97	2.2	0	78	166	82	75
349	46.840	0.135	0.087	1.76	85	-0.2	99	2.2	0	78	166	82	77
350	46.970	0.130	0.088	1.77	85	-0.22	95	2.2	0	78	165	83	77
351	47.103	0.133	0.087	1.78	85	-0.18	98	2.2	0	78	165	83	78
352	47.238	0.135	0.086	1.75	85	-0.29	100	2.2	0	78	165	83	79
353	47.368	0.130	0.085	1.78	84	-1.1	97	2.2	0	78	165	83	77
354	47.504	0.136	0.087	1.78	84	-0.93	100	2.2	0	78	164	84	79
355	47.636	0.132	0.088	1.77	84	-1.25	97	2.2	0	78	164	84	78
356	47.767	0.131	0.086	1.79	84	-0.85	97	2.2	0	78	164	84	77
357	47.903	0.136	0.085	1.78	84	-0.85	101	2.2	0	78	164	84	79
358	48.034	0.131	0.087	1.79	84	-0.81	96	2.1	-0.1	78	164	84	78
359	48.168	0.134	0.086	1.77	84	-1.14	99	2.1	0	78	164	84	75
360	48.303	0.135	0.087	1.78	84	-0.27	99	2.1	0	78	163	84	76
361	48.434	0.131	0.087	1.79	84	-1.02	96	2.1	0	78	163	84	75
362	48.567	0.133	0.086	1.81	84	-0.83	98	2.1	0	78	163	85	77

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
363	48.703	0.136	0.089	1.78	84	-0.8	99	2.1	0	78	162	84	77
364	48.832	0.129	0.086	1.80	84	-1.13	95	2.1	0	78	162	84	77
365	48.967	0.135	0.089	1.79	84	-1	98	2.1	0	77	162	84	78
366	49.102	0.135	0.089	1.80	84	-0.88	98	2.1	0	77	162	84	74
367	49.231	0.129	0.085	1.78	84	-0.12	96	2.1	0	77	161	84	76
368	49.368	0.137	0.084	1.78	84	-0.39	103	2.0	-0.06	77	161	84	77
369	49.499	0.131	0.085	1.80	84	-0.43	97	2.0	-0.04	77	161	84	77
370	49.632	0.133	0.090	1.78	84	-0.58	96	2.0	0	77	161	84	76
371	49.767	0.135	0.086	1.79	84	-1.38	100	2.0	0	77	162	84	77
372	49.898	0.131	0.085	1.77	84	-0.42	97	2.0	0	77	162	84	76
373	50.031	0.133	0.086	1.79	84	-0.14	98	2.0	0	77	162	84	75
374	50.167	0.136	0.088	1.80	84	-1.2	99	2.0	0	77	161	84	76
375	50.298	0.131	0.085	1.79	84	-0.8	97	2.0	0	77	161	84	75
376	50.431	0.133	0.087	1.77	84	-1.07	98	1.9	-0.1	77	161	84	77
377	50.566	0.135	0.089	1.77	84	-0.22	98	1.9	0	77	161	84	77
378	50.695	0.129	0.086	1.80	84	-0.18	95	2.0	0.08	77	161	84	76
379	50.832	0.137	0.088	1.79	84	-0.22	100	1.9	-0.08	76	161	84	74
380	50.964	0.132	0.087	1.80	83	-1.45	97	1.9	0	76	160	84	77
381	51.096	0.132	0.089	1.81	83	-0.91	96	1.9	0	76	160	84	76
382	51.232	0.136	0.086	1.81	83	-1.44	101	1.9	0	76	161	84	74
383	51.363	0.131	0.082	1.80	83	-0.18	99	1.9	0	76	161	84	73
384	51.497	0.134	0.086	1.80	83	-0.59	99	1.9	0	76	161	84	76
385	51.631	0.134	0.086	1.78	83	-0.75	99	1.9	0	76	160	84	75
386	51.763	0.132	0.089	1.80	83	-1.43	96	1.8	-0.1	76	161	84	74
387	51.896	0.133	0.085	1.78	83	-0.28	99	1.8	0	76	161	84	73
388	52.033	0.137	0.088	1.80	83	-1.07	100	1.8	0	76	161	84	77
389	52.163	0.130	0.086	1.79	83	-0.2	96	1.8	0	76	161	84	73
390	52.299	0.136	0.084	1.79	83	-0.73	102	1.8	0	76	161	84	77
391	52.433	0.134	0.087	1.80	83	-0.86	99	1.8	0	76	162	84	74
392	52.563	0.130	0.087	1.80	83	-1.2	96	1.8	0	76	162	84	75
393	52.701	0.138	0.087	1.81	83	-1.11	102	1.8	0	76	161	84	75
394	52.831	0.130	0.087	1.78	83	-0.63	96	1.8	0	76	161	84	73
395	52.964	0.133	0.087	1.79	83	-0.97	98	1.8	0	76	161	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
396	53.099	0.135	0.086	1.79	83	-1.3	100	1.8	0	76	161	84	76
397	53.231	0.132	0.088	1.79	83	-1.48	97	1.8	0	76	161	84	75
398	53.363	0.132	0.090	1.79	83	-1.16	95	1.7	-0.1	75	162	84	75
399	53.499	0.136	0.088	1.80	83	-1.52	99	1.7	0	75	162	84	76
400	53.629	0.130	0.088	1.81	83	-0.73	95	1.7	0	75	162	84	75
401	53.763	0.134	0.086	1.79	83	-0.53	99	1.7	0	75	162	84	74
402	53.899	0.136	0.090	1.81	83	-1.44	98	1.7	0	75	162	84	75
403	54.028	0.129	0.087	1.79	83	-0.1	95	1.7	0	75	162	84	76
404	54.166	0.138	0.088	1.79	83	-0.12	101	1.6	-0.08	75	162	84	75
405	54.298	0.132	0.089	1.79	82	-1.2	96	1.7	0.08	75	162	84	75
406	54.430	0.132	0.088	1.80	82	-1.46	97	1.6	-0.1	75	162	84	75
407	54.567	0.137	0.090	1.79	82	-1.21	99	1.6	0	75	162	84	75
408	54.698	0.131	0.088	1.80	82	-1.33	96	1.6	0	75	162	84	76
409	54.831	0.133	0.088	1.80	82	-1.21	97	1.6	0	75	162	84	73
410	54.967	0.136	0.088	1.80	82	-0.84	100	1.6	0	75	162	84	74
411	55.099	0.132	0.088	1.82	82	-0.72	97	1.6	0	75	162	84	75
412	55.232	0.133	0.086	1.81	82	-1.36	99	1.5	-0.06	75	162	84	75
413	55.368	0.136	0.088	1.81	82	-1.1	100	1.6	0.06	75	162	84	72
414	55.499	0.131	0.089	1.81	82	-0.84	95	1.5	-0.1	75	162	84	74
415	55.637	0.138	0.088	1.80	82	-0.11	101	1.5	0	75	162	84	71
416	55.769	0.132	0.089	1.82	82	-0.87	96	1.5	0	75	163	84	74
417	55.902	0.133	0.087	1.81	82	-0.29	98	1.5	0	75	162	84	74
418	56.038	0.136	0.087	1.81	82	-1	100	1.5	0	75	162	84	75
419	56.170	0.132	0.088	1.81	82	-1.37	97	1.5	0	74	161	84	74
420	56.303	0.133	0.089	1.81	82	-1.33	97	1.5	0	75	161	84	74
421	56.439	0.136	0.085	1.80	82	-0.1	101	1.5	0	74	160	84	74
422	56.571	0.132	0.086	1.80	82	-0.46	98	1.5	0	74	160	84	74
423	56.704	0.133	0.085	1.82	82	-1.4	99	1.5	-0.04	74	160	84	71
424	56.840	0.136	0.087	1.79	82	-0.98	100	1.4	-0.04	74	159	84	72
425	56.970	0.130	0.089	1.80	82	-1.37	95	1.4	-0.02	74	159	84	74
426	57.108	0.138	0.087	1.79	82	-0.47	102	1.4	0	74	159	84	73
427	57.240	0.132	0.089	1.78	82	-0.16	96	1.4	0	74	158	84	72
428	57.371	0.131	0.088	1.79	82	-1.15	96	1.4	0	74	158	84	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
429	57.509	0.138	0.087	1.80	81	-0.42	102	1.4	0	74	157	84	75
430	57.641	0.132	0.089	1.79	81	-0.47	96	1.4	0	74	157	84	73
431	57.776	0.135	0.090	1.81	81	-0.93	98	1.4	0	73	157	84	72
432	57.910	0.134	0.089	1.80	81	-1.4	98	1.4	0	73	157	84	74
433	58.042	0.132	0.089	1.79	81	-0.7	96	1.4	0	73	156	84	75
434	58.175	0.133	0.089	1.82	81	-0.17	97	1.4	0	73	156	84	73
435	58.311	0.136	0.089	1.81	81	-1.3	99	1.4	0	73	156	84	72
436	58.441	0.130	0.089	1.80	81	-1.38	95	1.4	0	73	156	84	74
437	58.577	0.136	0.091	1.81	81	-0.91	98	1.3	-0.1	73	156	84	73
438	58.712	0.135	0.088	1.80	81	-1.29	99	1.3	0	73	156	84	75
439	58.843	0.131	0.088	1.79	81	-1.33	96	1.3	0	73	155	84	74
440	58.980	0.137	0.090	1.79	81	-0.88	99	1.3	0	72	155	84	73
441	59.112	0.132	0.084	1.81	81	-0.86	99	1.3	0	72	155	84	74
442	59.246	0.134	0.088	1.79	81	-1.27	98	1.3	0	72	155	84	73
443	59.382	0.136	0.089	1.79	81	-1.11	99	1.3	0	72	156	84	72
444	59.513	0.131	0.087	1.77	81	-1.05	96	1.3	0	73	156	85	70
445	59.647	0.134	0.087	1.78	81	-0.63	99	1.3	0	73	156	85	72
446	59.781	0.134	0.089	1.77	81	-1.33	98	1.3	0	73	156	85	70
447	59.912	0.131	0.087	1.76	80	-0.35	97	1.2	-0.1	73	157	85	69
448	60.044	0.132	0.089	1.75	80	-1.43	96	1.2	0	72	156	85	71
449	60.177	0.133	0.088	1.75	80	-0.31	97	1.3	0.06	72	156	85	70
450	60.308	0.131	0.087	1.75	80	-1.46	97	1.2	-0.06	72	157	84	72
451	60.439	0.131	0.087	1.77	80	-0.27	97	1.2	0	72	157	84	72
452	60.573	0.134	0.086	1.74	80	-0.77	99	1.2	0	73	157	84	70
453	60.705	0.132	0.088	1.75	80	-0.17	97	1.2	0	72	156	84	70
454	60.836	0.131	0.086	1.76	80	-0.24	97	1.1	-0.1	72	156	84	72
455	60.972	0.136	0.089	1.75	80	-0.86	99	1.1	0	72	156	84	71
456	61.101	0.129	0.087	1.73	80	-1.14	95	1.1	0	72	156	84	70
457	61.232	0.131	0.087	1.75	80	-0.27	97	1.1	0	72	156	84	72
458	61.366	0.134	0.090	1.75	80	-0.9	97	1.1	0	72	156	84	69
459	61.496	0.130	0.090	1.75	80	-1	94	1.1	0	72	156	84	70
460	61.630	0.134	0.089	1.73	80	-0.46	98	1.1	0	72	155	84	69
461	61.765	0.135	0.089	1.74	80	-1	98	1.1	0	72	155	84	70

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
462	61.894	0.129	0.090	1.72	80	-0.24	93	1.1	0	72	155	84	68
463	62.026	0.132	0.086	1.71	80	-0.11	98	1.1	0	72	155	84	69
464	62.160	0.134	0.089	1.73	80	-0.36	98	1.1	0	72	155	84	70
465	62.292	0.132	0.088	1.73	80	-1.05	97	1.0	-0.1	72	154	84	72
466	62.424	0.132	0.089	1.74	80	-0.41	96	1.0	0	72	155	84	71
467	62.560	0.136	0.087	1.74	80	-0.44	100	1.0	0	72	154	84	71
468	62.692	0.132	0.090	1.74	80	-1.43	96	1.0	0	72	154	84	70
469	62.827	0.135	0.089	1.69	80	-1.17	98	1.0	0	72	154	84	71
470	62.958	0.131	0.088	1.80	79	-0.49	96	1.0	0	72	154	84	71
471	63.091	0.133	0.089	1.78	79	-0.58	97	1.0	0	72	153	84	73
472	63.226	0.135	0.086	1.79	79	-1.09	100	1.0	0	72	153	84	72
473	63.357	0.131	0.087	1.77	79	-1.3	97	1.0	0	72	153	84	70
474	63.490	0.133	0.087	1.79	79	-0.18	98	1.0	0	72	153	84	70
475	63.626	0.136	0.089	1.80	79	-0.66	99	1.0	0	72	153	84	71
476	63.757	0.131	0.089	1.79	79	-0.68	96	1.0	0	72	152	84	72
477	63.890	0.133	0.086	1.77	79	-0.88	99	1.0	0	71	152	84	70
478	64.025	0.135	0.088	1.77	80	-1.09	99	0.9	-0.1	71	151	84	72
479	64.154	0.129	0.088	1.80	80	-0.61	94	0.9	0	71	151	84	72
480	64.291	0.137	0.087	1.79	80	-1.25	101	0.9	0	71	151	84	71
481	64.423	0.132	0.087	1.80	80	-1.56	97	0.9	0	71	151	84	71
482	64.555	0.132	0.085	1.81	80	-0.54	98	0.9	0	71	151	84	70
483	64.691	0.136	0.089	1.81	80	-1.5	99	0.9	0	71	150	85	71
484	64.822	0.131	0.088	1.80	80	-1.21	96	0.9	0	71	150	85	69
485	64.956	0.134	0.087	1.80	80	-0.84	99	0.8	-0.1	72	150	85	71
486	65.090	0.134	0.088	1.78	80	-1.3	98	0.9	0.08	72	150	84	69
487	65.222	0.132	0.088	1.80	80	-1.1	97	0.8	-0.08	72	149	84	68
488	65.355	0.133	0.088	1.78	79	-1.27	98	0.8	0	72	149	84	72
489	65.492	0.137	0.088	1.80	79	-1.07	101	0.8	0	72	149	84	69
490	65.622	0.130	0.088	1.79	79	-0.91	95	0.8	0	72	149	84	69
491	65.758	0.136	0.090	1.79	79	-0.99	99	0.8	0	72	149	85	70
492	65.892	0.134	0.090	1.80	79	-0.56	97	0.8	0	72	149	85	69
493	66.022	0.130	0.088	1.80	79	-0.97	95	0.7	-0.1	72	149	85	69
494	66.160	0.138	0.089	1.81	79	-0.7	101	0.7	0	72	149	85	70

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
495	66.290	0.130	0.092	1.78	79	-1.14	93	0.7	0	72	150	85	70
496	66.423	0.133	0.087	1.79	79	-0.71	98	0.7	0	72	150	85	70
497	66.558	0.135	0.088	1.79	79	-0.99	99	0.7	0	72	150	84	70
498	66.690	0.132	0.090	1.79	79	-0.59	96	0.7	0	72	150	84	70
499	66.822	0.132	0.086	1.79	79	-1	98	0.7	0	72	150	84	70
500	66.958	0.136	0.086	1.80	79	-0.72	101	0.7	0	72	150	84	72
501	67.088	0.130	0.087	1.81	79	-0.66	96	0.7	0	72	150	84	73
502	67.222	0.134	0.086	1.79	79	-0.99	100	0.7	0	72	150	84	72
503	67.358	0.136	0.086	1.81	79	-0.89	101	0.7	0	72	149	84	72
504	67.487	0.129	0.089	1.79	79	-0.74	94	0.7	-0.02	72	149	84	71
505	67.625	0.138	0.088	1.79	79	-0.64	101	0.6	-0.08	72	149	84	71
506	67.757	0.132	0.090	1.79	79	-0.62	96	0.6	0.04	72	149	84	73
507	67.889	0.132	0.088	1.80	79	-1.5	97	0.6	-0.04	72	150	84	85
508	68.026	0.137	0.090	1.79	78	-0.84	100	0.6	0	72	150	84	71
509	68.157	0.131	0.088	1.80	78	-0.77	96	0.6	0	72	150	84	70
510	68.290	0.133	0.087	1.80	78	-1.39	98	0.6	0	72	149	84	69
511	68.426	0.136	0.089	1.80	78	-1.48	99	0.6	0	72	149	84	70
512	68.558	0.132	0.089	1.82	78	-1.42	97	0.6	0	72	149	84	70
513	68.691	0.133	0.088	1.81	78	-0.16	98	0.6	0	72	149	84	70
514	68.827	0.136	0.089	1.81	78	-0.66	99	0.6	0	72	149	84	69
515	68.958	0.131	0.087	1.81	78	-0.33	97	0.5	-0.1	72	149	84	72
516	69.096	0.138	0.090	1.80	78	-1.51	100	0.5	0	72	148	84	71
517	69.228	0.132	0.088	1.82	78	-0.63	97	0.5	0	72	149	84	70
518	69.361	0.133	0.086	1.81	78	-0.18	99	0.5	0	72	148	84	69
519	69.497	0.136	0.090	1.81	78	-1.43	99	0.5	0	72	148	85	69
520	69.629	0.132	0.088	1.81	78	-1.4	97	0.5	0	72	148	85	72
521	69.762	0.133	0.084	1.81	78	-0.24	100	0.5	0	72	148	85	70
522	69.898	0.136	0.088	1.80	78	-0.88	100	0.5	0	72	148	85	70
523	70.030	0.132	0.089	1.80	78	-1.08	97	0.4	-0.1	72	148	85	72
524	70.163	0.133	0.088	1.82	78	-0.36	98	0.4	0	72	148	85	71
525	70.299	0.136	0.089	1.79	78	-0.97	99	0.4	0	72	147	84	70
526	70.429	0.130	0.089	1.80	78	-1.13	95	0.4	0	72	147	84	70
527	70.567	0.138	0.089	1.79	78	-0.31	101	0.4	0	72	147	84	70

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
528	70.699	0.132	0.087	1.78	78	-1.1	98	0.4	0	72	147	84	71
529	70.830	0.131	0.089	1.79	78	-0.91	96	0.4	0	72	147	84	71
530	70.968	0.138	0.088	1.80	78	-1.33	102	0.4	0	72	147	84	70
531	71.100	0.132	0.088	1.79	78	-0.72	97	0.4	0	72	146	84	71
532	71.235	0.135	0.088	1.81	78	-0.1	99	0.4	0	72	146	84	70
533	71.369	0.134	0.089	1.80	78	-1.08	98	0.4	0	72	146	84	69
534	71.501	0.132	0.089	1.79	78	-0.12	97	0.4	-0.02	72	146	84	69
535	71.634	0.133	0.088	1.82	78	-0.14	98	0.3	-0.08	72	145	84	69
536	71.770	0.136	0.087	1.81	78	-0.64	101	0.3	0	72	145	84	69
537	71.900	0.130	0.085	1.80	78	-0.26	97	0.3	0	73	144	85	69
538	72.036	0.136	0.092	1.81	78	-0.12	98	0.3	0	73	144	85	69
539	72.171	0.135	0.088	1.80	78	-0.91	99	0.3	0	72	144	85	69
540	72.302	0.131	0.087	1.79	78	-0.91	97	0.3	0	73	144	85	70
541	72.439	0.137	0.088	1.79	78	-1.17	101	0.3	0	73	144	85	71
542	72.571	0.132	0.089	1.81	78	-1.03	97	0.3	0	73	144	85	70
543	72.705	0.134	0.088	1.79	78	-0.62	99	0.3	0	73	144	85	70
544	72.841	0.136	0.088	1.79	78	-0.8	100	0.2	-0.06	72	143	85	70
545	72.972	0.131	0.087	1.77	78	-1.19	97	0.3	0.06	73	143	84	69
546	73.106	0.134	0.086	1.78	78	-1.05	100	0.3	0	72	143	84	69
547	73.240	0.134	0.086	1.77	78	-1.43	100	0.2	-0.1	73	142	84	70
548	73.371	0.131	0.089	1.76	78	-0.82	96	0.2	0	72	142	84	69
549	73.503	0.132	0.085	1.75	78	-0.4	99	0.2	0	72	142	84	69
550	73.636	0.133	0.089	1.75	77	-0.15	97	0.2	0	72	142	84	69
551	73.767	0.131	0.089	1.75	78	-0.13	96	0.2	0	72	142	84	70
552	73.898	0.131	0.087	1.77	78	-0.28	97	0.2	0	72	142	84	69
553	74.032	0.134	0.087	1.74	77	-0.14	99	0.2	0	72	142	84	69
554	74.164	0.132	0.090	1.75	77	-1.21	96	0.2	0	72	141	84	69
555	74.295	0.131	0.086	1.76	77	-1.44	98	0.2	0	72	141	84	70
556	74.431	0.136	0.089	1.75	77	-0.15	100	0.2	0	72	141	84	70
557	74.560	0.129	0.088	1.73	77	-1.15	95	0.2	0	72	140	84	69
558	74.691	0.131	0.089	1.75	77	-0.7	96	0.1	-0.06	72	140	84	70
559	74.825	0.134	0.091	1.75	77	-0.47	97	0.1	-0.04	72	139	84	71
560	74.955	0.130	0.088	1.75	77	-1.51	96	0.1	0	72	139	84	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
561	75.089	0.134	0.091	1.73	77	-0.08	97	0.1	0	72	139	84	69
562	75.224	0.135	0.090	1.74	77	-0.57	98	0.1	0	72	138	84	69
563	75.353	0.129	0.089	1.72	77	-1.45	95	0.1	0	72	138	84	69
564	75.485	0.132	0.091	1.71	77	-0.05	96	0.1	0	72	137	84	69
565	75.619	0.134	0.088	1.73	78	-1.51	99	0.1	0	72	137	84	70
566	75.751	0.132	0.087	1.73	77	-0.43	98	0.1	0	72	137	84	68
567	75.883	0.132	0.088	1.74	77	-0.12	97	0.1	0	72	136	84	69
568	76.019	0.136	0.087	1.74	77	-1.3	101	0.1	0	72	135	84	68
569	76.151	0.132	0.087	1.74	77	-0.44	98	0.0	-0.1	72	135	84	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	3	Technician:	AK
		Date:	4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client:	Buck Stove	Job #:	20-592
Model:	81	Tracking #:	0064
Run #:	3	Technician:	AK
		Date:	4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
Avg/Tot	76.151	0.134	0.086	1.79	84	-0.82	100			89	242	84	77.5

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3
Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	78	-1		90	0.000	4.03	0.30
1	0.113	0.113	1.78	78	-0.02	93	90	-0.010	1.49	0.26
2	0.243	0.130	1.72	78	-0.71	107	90	0.010	1.33	0.21
3	0.374	0.131	1.75	78	-0.36	105	89	-0.020	3.56	0.64
4	0.509	0.135	1.75	78	-2.65	108	88	-0.020	6.29	0.62
5	0.641	0.132	1.73	78	-1.09	105	87	0.000	7.66	0.52
6	0.772	0.131	1.72	78	-0.32	106	86	-0.010	7.65	0.58
7	0.908	0.136	1.75	79	0	110	85	0.000	9.34	0.34
8	1.040	0.132	1.75	79	-2.54	107	85	0.010	9.92	0.32
9	1.175	0.135	1.75	79	-2.07	110	85	0.000	9.69	0.28
10	1.310	0.135	1.74	79	-2.74	110	85	-0.020	9.66	0.38
11	1.443	0.133	1.72	79	-0.47	112	85	-0.010	11.50	0.23
12	1.572	0.129	1.71	80	0	108	85	-0.010	12.80	0.24
13	1.706	0.134	1.73	80	-1	114	85	0.000	13.85	0.30
14	1.838	0.132	1.73	80	-1.96	111	85	0.000	14.55	0.35
15	1.968	0.130	1.70	81	-0.35	112	86	0.000	15.08	0.36
16	2.100	0.132	1.70	81	0	114	86	-0.010	15.30	0.35
17	2.236	0.136	1.82	81	-2.7	110	86	0.010	14.49	1.97
18	2.368	0.132	1.78	82	-2.27	107	86	0.000	11.86	1.10
19	2.504	0.136	1.79	82	-2.86	109	86	0.000	10.19	0.96
20	2.642	0.138	1.80	82	-0.05	110	86	0.010	10.21	0.93
21	2.775	0.133	1.78	83	-0.53	104	87	-0.010	9.89	1.00
22	2.916	0.141	1.79	83	-2.05	112	87	0.000	10.99	0.88
23	3.049	0.133	1.78	83	-1.81	105	87	-0.020	11.53	0.80
24	3.184	0.135	1.78	84	0	105	87	0.000	12.50	0.85
25	3.323	0.139	1.78	84	-1.92	109	87	0.000	12.27	0.72
26	3.459	0.136	1.80	85	-1.36	106	87	-0.010	12.78	0.82
27	3.592	0.133	1.78	85	-0.05	104	87	0.000	13.06	0.83
28	3.730	0.138	1.78	85	-2.6	108	87	0.000	13.53	0.91
29	3.865	0.135	1.79	86	-2.5	106	88	-0.020	12.83	0.83
30	4.005	0.140	1.77	86	-0.74	110	88	0.000	13.43	0.83
31	4.143	0.138	1.79	86	-0.49	109	88	0.000	13.41	0.95

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.275	0.132	1.76	87	-2.51	104	88	-0.020	12.93	0.86
33	4.415	0.140	1.79	87	-0.01	109	88	0.000	13.45	0.84
34	4.551	0.136	1.77	87	-0.07	108	88	-0.010	13.16	0.73
35	4.685	0.134	1.78	88	-0.06	104	88	-0.020	13.58	0.61
36	4.824	0.139	1.77	88	-0.07	107	88	-0.010	13.20	0.75
37	4.960	0.136	1.76	89	-0.15	106	88	0.000	13.54	0.60
38	5.098	0.138	1.77	89	-0.59	108	88	-0.010	13.62	0.69
39	5.242	0.144	1.76	89	-1.06	113	87	0.010	13.79	0.60
40	5.379	0.137	1.77	90	-1.02	108	87	-0.020	13.89	0.70
41	5.515	0.136	1.77	90	-2.58	105	87	0.010	14.01	0.54
42	5.653	0.138	1.77	90	-0.08	108	87	0.010	13.79	0.54
43	5.790	0.137	1.77	91	-0.23	106	87	0.000	13.41	0.55
44	5.926	0.136	1.75	91	-2.33	107	87	-0.010	13.64	0.53
45	6.066	0.140	1.75	91	-0.06	109	87	-0.010	13.43	0.52
46	6.202	0.136	1.76	92	-0.61	104	87	0.000	13.96	0.48
47	6.340	0.138	1.76	92	-0.06	106	87	-0.020	13.46	0.38
48	6.478	0.138	1.75	92	-0.15	107	87	0.010	13.60	0.40
49	6.615	0.137	1.76	93	-1.48	105	87	0.000	13.59	0.43
50	6.755	0.140	1.77	93	-0.03	108	87	-0.010	13.49	0.48
51	6.889	0.134	1.75	93	-0.79	103	87	-0.010	13.54	0.41
52	7.026	0.137	1.75	93	-0.25	105	87	-0.010	13.07	0.32
53	7.166	0.140	1.76	94	-2.86	106	87	0.000	13.15	0.32
54	7.304	0.138	1.76	94	-0.09	106	87	-0.010	13.53	0.49
55	7.440	0.136	1.76	94	-0.16	104	87	-0.010	13.71	0.49
56	7.580	0.140	1.74	94	-0.7	108	87	0.010	13.62	0.35
57	7.718	0.138	1.76	95	-1.85	105	87	0.000	13.43	0.31
58	7.855	0.137	1.75	95	-2.45	105	87	-0.020	13.46	0.30
59	7.994	0.139	1.75	95	-0.35	107	87	0.010	13.66	0.28
60	8.129	0.135	1.73	95	-2.58	105	87	-0.020	13.40	0.34
61	8.270	0.141	1.75	96	-2.33	107	87	0.000	13.44	0.20
62	8.407	0.137	1.75	96	-0.58	103	87	0.000	13.54	0.28
63	8.542	0.135	1.74	96	-1.35	103	87	0.000	13.63	0.29

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3
Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	8.682	0.140	1.76	96	-0.97	107	87	0.000	13.53	0.28
65	8.818	0.136	1.72	97	-0.58	104	87	-0.010	13.32	0.32
66	8.953	0.135	1.74	97	-2.32	103	87	-0.010	13.62	0.40
67	9.089	0.136	1.74	97	-0.91	105	87	0.000	13.55	0.30
68	9.223	0.134	1.75	97	-1.72	102	87	-0.010	13.58	0.31
69	9.357	0.134	1.75	97	-0.84	102	87	-0.010	13.90	0.21
70	9.496	0.139	1.73	98	-2.73	105	87	-0.010	13.39	0.18
71	9.630	0.134	1.75	98	-0.56	102	87	0.000	13.78	0.27
72	9.766	0.136	1.75	98	-2.78	102	87	0.000	13.43	0.22
73	9.903	0.137	1.74	98	-0.11	104	87	-0.010	13.41	0.21
74	10.037	0.134	1.73	98	-2.66	102	87	0.000	13.58	0.22
75	10.177	0.140	1.73	99	-0.11	106	87	0.000	13.61	0.27
76	10.314	0.137	1.75	99	-2.71	105	87	0.000	13.35	0.27
77	10.450	0.136	1.74	99	-1.79	104	87	0.000	13.35	0.31
78	10.589	0.139	1.73	99	-2.33	105	86	0.000	13.27	0.34
79	10.725	0.136	1.73	99	-0.58	103	86	-0.010	13.42	0.34
80	10.859	0.134	1.74	99	-0.1	100	86	-0.010	13.59	0.31
81	10.999	0.140	1.74	99	-0.53	106	86	0.000	13.70	0.37
82	11.134	0.135	1.74	100	-2.72	102	86	0.000	13.40	0.37
83	11.269	0.135	1.72	100	-1.41	103	86	-0.010	13.77	0.42
84	11.408	0.139	1.72	100	-0.15	104	86	0.010	13.55	0.36
85	11.544	0.136	1.74	100	-2.59	103	86	-0.020	13.48	0.59
86	11.679	0.135	1.73	100	-0.5	99	86	0.000	13.43	0.53
87	11.817	0.138	1.73	100	-2.75	104	86	0.000	13.48	0.61
88	11.952	0.135	1.73	100	-0.36	101	86	-0.010	13.30	0.68
89	12.090	0.138	1.73	100	-0.2	104	86	0.000	13.04	0.61
90	12.225	0.135	1.76	100	-0.61	101	86	0.000	12.99	0.60
91	12.363	0.138	1.76	100	-0.79	104	86	0.000	13.00	0.45
92	12.503	0.140	1.73	101	-2.47	106	86	-0.020	12.63	0.54
93	12.642	0.139	1.75	101	-1.68	106	86	-0.010	12.60	0.35
94	12.780	0.138	1.74	101	-0.33	102	86	-0.010	12.67	0.32
95	12.919	0.139	1.76	101	-2.82	104	86	-0.010	12.53	0.25

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	13.056	0.137	1.75	101	-0.43	100	86	0.000	12.58	0.22
97	13.197	0.141	1.76	101	-2.67	104	86	0.000	12.69	0.10
98	13.331	0.134	1.74	101	-2.62	101	86	0.000	11.83	0.12
99	13.465	0.134	1.74	101	-0.18	100	86	0.000	12.18	0.07
100	13.604	0.139	1.74	101	-1.19	103	86	0.010	12.03	0.11
101	13.741	0.137	1.74	101	-2.78	103	86	-0.030	11.31	0.10
102	13.874	0.133	1.74	101	-0.89	99	86	-0.010	11.32	0.09
103	14.015	0.141	1.73	102	-0.36	105	86	0.000	10.76	0.03
104	14.149	0.134	1.75	102	-2.25	100	86	0.010	11.17	0.09
105	14.285	0.136	1.74	102	-2.78	101	86	0.000	10.59	0.11
106	14.423	0.138	1.74	102	-2.66	103	86	0.000	10.81	0.01
107	14.555	0.132	1.74	102	-0.39	98	86	0.000	10.63	0.08
108	14.693	0.138	1.75	102	-2.41	102	86	0.000	10.59	0.12
109	14.827	0.134	1.74	102	-0.04	99	86	0.000	10.47	0.13
110	14.963	0.136	1.77	102	-1.58	100	86	-0.010	10.35	0.14
111	15.100	0.137	1.75	102	-2.55	101	86	-0.010	10.10	0.09
112	15.238	0.138	1.73	102	-2.65	103	86	0.010	10.59	0.11
113	15.371	0.133	1.74	102	-1.05	98	86	0.000	10.77	0.07
114	15.509	0.138	1.75	102	-2.68	103	86	0.000	10.37	0.10
115	15.642	0.133	1.75	102	-0.95	98	86	-0.010	10.00	0.11
116	15.779	0.137	1.75	102	-2.68	101	86	-0.010	9.98	0.16
117	15.914	0.135	1.75	103	-0.14	101	86	0.000	10.19	0.11
118	16.050	0.136	1.75	103	-1.99	99	86	-0.010	9.63	0.17
119	16.189	0.139	1.74	103	-0.08	102	86	-0.010	9.68	0.20
120	16.325	0.136	1.74	103	-0.15	101	86	-0.010	9.22	0.16
121	16.458	0.133	1.72	103	-1.8	99	86	-0.010	9.02	0.15
122	16.599	0.141	1.75	103	-0.22	105	86	-0.010	8.84	0.23
123	16.731	0.132	1.75	103	-1.9	98	86	0.000	9.25	0.22
124	16.868	0.137	1.75	103	-0.12	103	86	-0.010	9.25	0.29
125	17.005	0.137	1.74	103	-0.57	101	86	0.000	9.05	0.25
126	17.138	0.133	1.76	103	-0.18	97	86	0.000	8.46	0.26
127	17.276	0.138	1.76	103	-0.04	101	86	-0.020	8.25	0.45

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	17.413	0.137	1.75	103	-0.1	101	86	-0.010	7.87	0.31
129	17.547	0.134	1.74	103	-0.39	100	86	-0.010	8.23	0.43
130	17.685	0.138	1.73	103	-2.79	101	86	0.000	7.90	0.34
131	17.821	0.136	1.74	103	-0.12	98	86	-0.010	8.04	0.30
132	17.956	0.135	1.72	103	-1.19	99	86	-0.010	7.75	0.37
133	18.096	0.140	1.76	103	-2.5	103	86	0.010	7.70	0.35
134	18.230	0.134	1.74	103	-2.83	98	86	0.010	7.72	0.32
135	18.370	0.140	1.73	103	-2.74	103	86	0.000	7.59	0.43
136	18.507	0.137	1.73	103	-1.28	102	86	0.000	7.84	0.38
137	18.643	0.136	1.74	103	-2.72	100	86	0.000	7.72	0.49
138	18.781	0.138	1.75	103	-2.92	102	86	0.000	7.06	0.42
139	18.917	0.136	1.75	104	-2.73	100	86	-0.010	7.10	0.48
140	19.052	0.135	1.74	104	-0.1	99	86	-0.020	7.19	0.47
141	19.190	0.138	1.73	104	-1.68	101	86	0.010	7.23	0.44
142	19.323	0.133	1.74	104	-0.52	98	86	0.000	7.35	0.57
143	19.460	0.137	1.74	104	-0.15	100	86	-0.010	6.84	0.56
144	19.597	0.137	1.72	104	-0.12	99	86	-0.020	7.08	0.50
145	19.732	0.135	1.73	104	-2.73	97	86	-0.010	6.91	0.57
146	19.870	0.138	1.75	104	-2.32	101	86	0.000	6.68	0.42
147	20.008	0.138	1.73	104	-0.1	101	86	0.000	7.10	0.50
148	20.142	0.134	1.74	104	0	98	86	-0.010	6.85	0.51
149	20.280	0.138	1.75	104	-2.4	100	86	0.000	6.99	0.48
150	20.414	0.134	1.74	104	-0.1	98	86	0.010	6.60	0.46
151	20.551	0.137	1.73	104	-0.32	99	86	-0.010	6.81	0.52
152	20.688	0.137	1.74	104	-2.67	99	86	-0.010	6.73	0.57
153	20.823	0.135	1.73	104	-2.75	99	86	0.000	6.89	0.48
154	20.963	0.140	1.75	104	-0.25	101	86	-0.010	6.63	0.56
155	21.096	0.133	1.73	104	-2.71	96	86	-0.010	6.68	0.57
156	21.233	0.137	1.72	104	-0.22	99	86	0.000	6.76	0.48
157	21.370	0.137	1.75	104	-0.01	99	86	0.000	6.86	0.61
158	21.506	0.136	1.73	104	-0.67	99	86	0.000	6.49	0.63
159	21.640	0.134	1.74	104	-0.16	97	86	0.010	6.53	0.55

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	21.780	0.140	1.72	104	-2.45	103	86	-0.010	6.86	0.63
161	21.913	0.133	1.73	104	-0.21	96	86	-0.020	6.80	0.71
162	22.049	0.136	1.74	104	-0.5	99	86	-0.010	6.86	0.65
163	22.185	0.136	1.72	104	-0.1	98	86	0.000	6.89	0.55
164	22.322	0.137	1.73	104	-1.95	100	86	0.000	6.51	0.58
165	22.460	0.138	1.74	104	-0.88	101	86	-0.010	6.61	0.63
166	22.597	0.137	1.72	104	-1.63	101	86	0.000	6.67	0.64
167	22.733	0.136	1.73	104	-2.03	99	86	0.000	6.81	0.61
168	22.871	0.138	1.73	104	-0.16	102	86	0.000	6.87	0.57
169	23.006	0.135	1.73	104	-0.84	98	86	0.000	6.88	0.60
170	23.143	0.137	1.72	104	-2.73	100	86	-0.010	7.57	0.83
171	23.283	0.140	1.77	104	-1.33	101	86	-0.010	7.59	0.76
172	23.419	0.136	1.75	104	-0.03	97	86	-0.010	7.11	0.74
173	23.560	0.141	1.77	104	-1.67	102	86	0.000	6.57	0.79
174	23.698	0.138	1.76	104	-2.37	100	86	0.000	6.03	1.11
175	23.837	0.139	1.76	104	-2.82	101	86	0.000	6.40	1.27
176	23.978	0.141	1.75	104	-2.85	102	86	0.000	6.21	1.27
177	24.112	0.134	1.77	104	-0.26	98	86	0.000	6.16	1.31
178	24.250	0.138	1.75	104	-1.88	101	86	0.000	6.19	1.15
179	24.389	0.139	1.75	104	-0.42	102	86	-0.020	6.20	1.37
180	24.525	0.136	1.76	104	-0.14	99	86	0.010	5.95	1.28
181	24.665	0.140	1.76	104	-2.81	101	86	0.000	5.93	1.28
182	24.802	0.137	1.74	104	-2.31	100	86	-0.020	5.67	1.27
183	24.938	0.136	1.76	104	-2.12	98	86	-0.010	5.76	1.19
184	25.078	0.140	1.76	104	-0.26	102	86	-0.010	5.73	1.22
185	25.218	0.140	1.75	104	-1.33	101	86	-0.010	5.77	1.25
186	25.357	0.139	1.75	104	-0.17	102	86	0.000	5.53	1.08
187	25.495	0.138	1.75	104	-2.76	100	86	0.000	5.71	1.06
188	25.630	0.135	1.75	104	-2.77	99	86	-0.010	6.06	1.07
189	25.769	0.139	1.76	104	-2.45	99	86	0.000	5.54	1.19
190	25.908	0.139	1.75	104	-0.24	100	85	0.000	5.94	1.14
191	26.043	0.135	1.77	104	-0.43	97	85	-0.020	5.66	1.19

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	26.184	0.141	1.74	104	-1.16	101	85	0.000	5.54	1.17
193	26.321	0.137	1.76	104	-2.27	99	85	-0.010	5.58	1.17
194	26.459	0.138	1.76	104	-2.63	101	85	-0.020	5.30	1.05
195	26.598	0.139	1.77	104	-0.73	101	85	0.000	5.70	1.18
196	26.733	0.135	1.75	104	-2.92	98	85	0.010	5.70	1.06
197	26.872	0.139	1.76	104	-2.74	100	85	-0.010	5.45	1.13
198	27.008	0.136	1.75	104	-2.55	99	85	-0.010	5.42	1.11
199	27.142	0.134	1.76	104	-2.81	95	85	0.000	5.33	1.03
200	27.286	0.144	1.75	104	-2.88	105	85	0.000	5.26	1.13
201	27.423	0.137	1.77	104	-0.6	100	85	0.000	5.52	1.00
202	27.562	0.139	1.75	104	-0.38	100	85	-0.010	5.44	1.06
203	27.701	0.139	1.76	104	-1.28	100	85	-0.010	5.51	1.06
204	27.839	0.138	1.77	104	-2.49	101	85	-0.010	5.36	1.10
205	27.977	0.138	1.74	104	-2.87	99	85	0.000	4.92	1.03
206	28.117	0.140	1.76	104	-2.91	100	85	0.010	5.24	1.04
207	28.253	0.136	1.76	104	-0.08	97	85	0.000	5.33	1.02
208	28.393	0.140	1.76	104	0	101	85	0.000	5.49	0.95
209	28.528	0.135	1.77	104	-2.45	96	85	-0.010	5.49	1.02
210	28.669	0.141	1.76	104	-2.89	102	85	-0.020	5.42	1.11
211	28.807	0.138	1.76	104	-0.53	99	85	-0.010	5.55	1.04
212	28.943	0.136	1.75	104	-0.39	99	85	-0.010	5.43	1.03
213	29.083	0.140	1.76	104	-0.85	102	85	-0.010	5.16	1.06
214	29.220	0.137	1.77	104	-0.97	99	85	0.000	5.32	1.20
215	29.356	0.136	1.76	104	-0.07	97	85	-0.010	6.03	1.23
216	29.498	0.142	1.77	104	-2.15	103	85	-0.010	6.02	1.24
217	29.633	0.135	1.76	104	-0.34	96	85	-0.020	5.47	1.20
218	29.772	0.139	1.77	104	-0.3	100	85	0.000	5.75	1.19
219	29.908	0.136	1.76	104	0	96	85	0.000	5.74	1.17
220	30.045	0.137	1.75	104	-2.81	99	85	0.000	5.73	1.15
221	30.184	0.139	1.77	104	-0.94	99	85	-0.020	5.70	1.23
222	30.321	0.137	1.76	104	-0.06	99	85	-0.010	5.40	1.11
223	30.455	0.134	1.76	104	-2.89	96	85	0.010	5.95	1.11

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	30.595	0.140	1.78	104	-0.29	102	85	-0.020	5.38	1.08
225	30.728	0.133	1.76	104	-0.57	96	85	0.000	5.14	1.07
226	30.867	0.139	1.77	104	-2.86	100	85	-0.010	5.37	1.15
227	31.002	0.135	1.75	104	-2.83	96	85	-0.010	5.15	1.16
228	31.139	0.137	1.77	103	-0.24	98	85	0.000	5.21	1.11
229	31.279	0.140	1.76	103	-1.92	102	85	-0.010	5.00	1.10
230	31.413	0.134	1.78	103	-0.18	97	85	0.010	5.58	1.08
231	31.549	0.136	1.76	103	-1.94	98	85	-0.010	5.43	1.05
232	31.688	0.139	1.78	103	-2.89	100	85	0.000	5.43	1.00
233	31.822	0.134	1.75	103	-0.01	96	85	-0.010	5.27	1.08
234	31.962	0.140	1.78	103	-0.06	100	85	0.000	5.04	1.03
235	32.098	0.136	1.77	103	-1.74	98	85	0.000	5.19	1.14
236	32.234	0.136	1.76	103	-1.9	99	85	0.000	4.97	1.05
237	32.374	0.140	1.76	103	-1.71	101	85	0.010	5.04	1.02
238	32.509	0.135	1.76	103	-2.65	96	85	-0.020	4.93	1.04
239	32.647	0.138	1.77	103	-2.83	99	85	-0.010	5.26	1.01
240	32.784	0.137	1.77	103	-2.85	98	85	-0.010	5.18	1.06
241	32.919	0.135	1.78	103	-0.07	98	85	-0.010	5.59	1.07
242	33.058	0.139	1.78	103	-2.67	100	85	0.000	5.10	0.97
243	33.196	0.138	1.76	103	-0.07	99	85	-0.010	5.12	1.11
244	33.330	0.134	1.77	103	-0.65	96	85	0.000	5.38	1.06
245	33.470	0.140	1.76	103	0	101	85	-0.010	5.05	1.06
246	33.605	0.135	1.77	103	-0.14	96	85	0.010	5.20	1.05
247	33.743	0.138	1.76	103	-0.98	98	85	0.000	5.14	1.05
248	33.880	0.137	1.77	103	-0.19	99	85	-0.010	5.22	1.10
249	34.015	0.135	1.77	103	-1.9	97	85	-0.010	5.40	1.05
250	34.153	0.138	1.77	103	-1.46	99	85	-0.020	5.08	1.10
251	34.289	0.136	1.77	103	-0.04	97	85	0.000	5.01	1.04
252	34.423	0.134	1.75	103	-0.43	95	85	0.000	5.24	1.04
253	34.567	0.144	1.78	103	-2.88	103	85	-0.020	5.28	1.07
254	34.702	0.135	1.76	103	-2.36	96	85	0.000	5.20	1.02
255	34.841	0.139	1.77	103	-0.25	100	85	0.000	5.07	1.04

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	34.979	0.138	1.76	103	-2.18	100	85	0.000	4.79	0.99
257	35.118	0.139	1.77	103	-2.25	99	85	0.000	5.08	0.95
258	35.259	0.141	1.77	103	-0.13	101	84	0.000	4.88	0.98
259	35.396	0.137	1.77	103	-0.75	97	84	0.000	4.88	0.99
260	35.534	0.138	1.77	103	-2.03	98	85	-0.010	5.03	1.08
261	35.672	0.138	1.77	103	-0.01	99	85	-0.010	5.14	1.01
262	35.809	0.137	1.76	103	-1.21	97	85	0.000	4.75	0.99
263	35.948	0.139	1.79	103	-2.31	101	85	0.000	4.82	0.98
264	36.085	0.137	1.77	102	-0.34	99	85	0.020	5.04	0.98
265	36.223	0.138	1.77	102	-0.94	100	85	0.000	5.19	1.05
266	36.364	0.141	1.76	102	-0.25	102	85	-0.010	5.00	0.95
267	36.500	0.136	1.76	102	-2.26	98	84	-0.010	4.78	0.96
268	36.639	0.139	1.77	102	-0.58	100	84	-0.010	4.59	1.03
269	36.775	0.136	1.78	102	-0.33	98	84	-0.020	5.11	0.99
270	36.912	0.137	1.77	102	-0.59	99	85	0.000	5.08	0.96
271	37.052	0.140	1.77	102	-2.27	100	85	0.000	4.99	0.92
272	37.190	0.138	1.76	102	-0.85	98	85	-0.020	4.50	1.00
273	37.326	0.136	1.77	102	-1.31	99	85	-0.010	4.86	0.93
274	37.468	0.142	1.77	102	-0.47	103	85	-0.010	4.59	0.99
275	37.601	0.133	1.77	102	-1.05	95	85	-0.010	4.62	0.95
276	37.742	0.141	1.76	102	-2.8	102	85	-0.010	4.89	0.96
277	37.879	0.137	1.76	102	-2.77	98	85	0.000	4.99	0.95
278	38.016	0.137	1.76	102	-2.62	99	85	0.000	5.08	0.92
279	38.154	0.138	1.77	102	-1.54	99	85	0.010	4.76	0.91
280	38.291	0.137	1.77	102	-1.9	98	84	0.000	5.11	0.92
281	38.425	0.134	1.76	102	-1.4	96	84	0.000	4.81	0.95
282	38.565	0.140	1.78	102	0	100	84	0.000	5.02	0.94
283	38.698	0.133	1.77	102	-0.84	95	84	-0.010	4.98	0.96
284	38.839	0.141	1.77	102	-2.11	100	84	0.010	5.07	0.92
285	38.976	0.137	1.76	102	-2.8	99	84	0.000	4.79	0.90
286	39.111	0.135	1.78	102	-1.1	97	84	0.000	4.64	0.96
287	39.251	0.140	1.77	102	-1.12	102	84	-0.020	4.88	0.90

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	39.387	0.136	1.78	102	-2.77	98	84	-0.010	4.60	0.98
289	39.525	0.138	1.77	102	0	100	84	-0.020	4.91	0.94
290	39.663	0.138	1.78	102	-2.91	99	84	-0.010	4.90	0.91
291	39.798	0.135	1.76	102	-0.3	96	84	0.000	4.81	1.00
292	39.935	0.137	1.76	102	-2.48	99	84	0.000	4.67	0.94
293	40.072	0.137	1.75	102	-2.7	98	84	-0.010	4.83	1.00
294	40.207	0.135	1.77	102	-2.98	96	84	0.000	4.83	0.99
295	40.346	0.139	1.76	102	-1.12	101	84	0.000	4.66	0.94
296	40.481	0.135	1.78	102	-2.7	97	84	0.010	5.14	0.99
297	40.617	0.136	1.77	102	-0.55	97	84	-0.010	5.03	0.99
298	40.755	0.138	1.78	102	-0.03	99	84	-0.020	4.60	0.94
299	40.890	0.135	1.77	102	-2.12	96	84	-0.010	4.64	0.91
300	41.029	0.139	1.78	102	-2.58	99	84	-0.020	4.96	0.97
301	41.166	0.137	1.77	102	-0.11	99	84	-0.010	5.02	1.04
302	41.301	0.135	1.78	102	-2.96	96	84	-0.020	5.07	0.99
303	41.441	0.140	1.78	102	-2.86	100	84	-0.010	5.42	1.04
304	41.576	0.135	1.77	101	-1.22	97	84	-0.020	4.82	0.92
305	41.718	0.142	1.76	101	-2.47	102	84	0.000	5.06	0.94
306	41.855	0.137	1.77	101	-2.04	98	84	0.000	5.27	0.96
307	41.994	0.139	1.78	101	-2.92	100	84	0.000	5.22	0.97
308	42.132	0.138	1.76	101	-2.27	101	84	-0.010	5.21	0.97
309	42.274	0.142	1.78	101	-0.07	101	84	0.000	5.26	0.99
310	42.409	0.135	1.76	101	-2.13	96	84	-0.010	5.00	1.03
311	42.551	0.142	1.78	101	0	102	84	-0.010	4.86	1.02
312	42.688	0.137	1.77	101	-0.88	98	84	0.000	5.04	1.06
313	42.829	0.141	1.79	101	-1.79	102	84	-0.010	5.28	0.97
314	42.964	0.135	1.77	101	-2.71	98	84	-0.010	5.04	1.03
315	43.102	0.138	1.79	101	0	99	84	-0.010	4.91	1.00
316	43.242	0.140	1.78	101	-0.82	101	84	0.000	5.03	0.99
317	43.377	0.135	1.77	101	-2.89	97	84	-0.020	4.75	1.07
318	43.512	0.135	1.74	101	-2.24	97	84	-0.010	5.01	1.08
319	43.647	0.135	1.75	101	-0.66	98	85	-0.010	4.85	1.01

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	43.779	0.132	1.74	101	-2.72	95	86	-0.010	5.07	0.99
321	43.918	0.139	1.74	101	-0.04	101	87	0.000	5.00	0.95
322	44.051	0.133	1.73	101	-1.99	95	88	0.000	5.02	0.96
323	44.187	0.136	1.72	101	-0.09	99	89	-0.020	4.45	0.86
324	44.325	0.138	1.74	101	-2.89	99	90	-0.010	4.90	0.97
325	44.461	0.136	1.73	101	-2.61	97	90	-0.010	5.03	0.99
326	44.595	0.134	1.73	101	-0.57	95	90	0.000	5.10	0.95
327	44.733	0.138	1.74	101	-0.34	98	90	0.000	4.98	1.01
328	44.866	0.133	1.74	101	-1.19	96	90	0.000	5.25	0.96
329	45.002	0.136	1.73	101	-0.67	97	89	-0.010	5.40	0.96
330	45.137	0.135	1.74	101	0	96	89	0.000	5.16	1.00
331	45.270	0.133	1.73	101	-1.54	95	89	-0.020	4.90	0.91
332	45.408	0.138	1.74	101	-0.1	98	88	-0.010	5.09	1.00
333	45.544	0.136	1.74	101	-2.22	97	88	0.000	5.35	0.95
334	45.679	0.135	1.75	101	-2.1	95	88	-0.010	5.37	1.02
335	45.815	0.136	1.74	101	-2.07	97	88	0.010	5.17	0.98
336	45.951	0.136	1.76	101	-0.36	97	88	0.010	5.13	0.99
337	46.084	0.133	1.73	101	-2.61	95	87	-0.010	5.05	1.07
338	46.223	0.139	1.73	101	-2.17	99	87	0.000	5.13	0.88
339	46.355	0.132	1.75	101	-0.17	94	87	-0.010	4.97	0.93
340	46.491	0.136	1.73	101	-2.52	96	87	-0.020	4.83	1.03
341	46.626	0.135	1.75	101	-2.34	95	87	0.000	4.98	0.96
342	46.762	0.136	1.74	101	-0.16	97	87	0.010	5.20	0.94
343	46.899	0.137	1.74	101	-1.41	98	87	-0.010	4.77	0.95
344	47.034	0.135	1.74	101	-2.81	96	87	-0.010	5.26	0.95
345	47.169	0.135	1.75	101	-0.09	96	87	-0.010	4.54	0.96
346	47.309	0.140	1.74	101	-0.47	101	87	0.000	4.81	0.92
347	47.444	0.135	1.74	101	-2.73	97	87	0.000	4.24	0.82
348	47.580	0.136	1.75	100	-2.24	97	87	-0.010	4.40	0.83
349	47.719	0.139	1.75	100	-2.65	100	87	-0.020	4.18	0.87
350	47.851	0.132	1.73	100	-0.1	94	87	0.000	4.36	0.82
351	47.990	0.139	1.75	100	-2.57	100	87	-0.010	4.18	0.76

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	48.124	0.134	1.73	100	-1.08	96	88	0.000	4.64	0.79
353	48.258	0.134	1.74	100	-0.54	97	88	0.000	4.25	0.79
354	48.396	0.138	1.74	100	-0.11	99	88	0.000	4.40	0.80
355	48.533	0.137	1.75	100	-1.33	98	88	0.000	4.41	0.75
356	48.667	0.134	1.74	100	-0.64	96	88	0.000	4.62	0.75
357	48.804	0.137	1.74	100	-2.79	99	88	0.000	4.69	0.72
358	48.939	0.135	1.73	100	-2.83	97	88	0.010	4.59	0.77
359	49.075	0.136	1.74	100	-0.24	98	88	0.000	4.71	0.72
360	49.212	0.137	1.75	100	-2.22	98	88	0.000	4.47	0.78
361	49.345	0.133	1.74	100	-0.58	95	88	-0.010	4.62	0.80
362	49.482	0.137	1.75	100	-1.94	99	88	-0.010	4.74	0.80
363	49.618	0.136	1.73	100	-2.71	96	87	-0.010	4.22	0.71
364	49.752	0.134	1.74	100	-2.01	96	87	-0.010	4.18	0.72
365	49.888	0.136	1.75	100	-0.92	96	87	0.000	4.56	0.78
366	50.023	0.135	1.74	100	-0.96	95	86	0.000	4.43	0.84
367	50.156	0.133	1.76	100	-2.1	96	86	0.010	4.81	0.79
368	50.295	0.139	1.76	99	-2.32	101	86	-0.010	4.57	0.82
369	50.429	0.134	1.76	99	-2.76	97	85	0.000	4.53	0.89
370	50.566	0.137	1.77	99	-2.29	97	85	-0.010	4.26	0.86
371	50.702	0.136	1.77	99	-0.14	98	84	0.000	4.36	0.78
372	50.837	0.135	1.76	99	-1.3	98	84	0.000	4.76	0.73
373	50.975	0.138	1.77	99	-1.59	99	83	0.000	4.55	0.82
374	51.111	0.136	1.76	99	-2.66	97	83	0.000	4.66	0.74
375	51.246	0.135	1.76	99	-0.38	98	83	0.000	4.59	0.80
376	51.387	0.141	1.77	99	-0.79	101	83	-0.020	4.53	0.84
377	51.522	0.135	1.76	99	-0.16	96	83	-0.010	4.45	0.84
378	51.661	0.139	1.76	99	-2.87	100	83	0.000	4.53	0.81
379	51.797	0.136	1.75	99	-0.71	97	83	0.000	4.34	0.75
380	51.933	0.136	1.75	99	-0.13	97	83	0.000	4.22	0.83
381	52.070	0.137	1.77	99	-2.67	97	83	0.010	4.76	0.77
382	52.206	0.136	1.76	99	-1.2	98	84	0.000	4.95	0.76
383	52.341	0.135	1.77	99	-2.43	100	84	0.010	4.75	0.80

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	52.481	0.140	1.75	99	-0.46	101	84	0.000	4.54	0.84
385	52.615	0.134	1.77	99	-2.4	96	84	0.000	4.86	0.78
386	52.753	0.138	1.76	99	-2.69	98	84	0.000	4.72	0.79
387	52.889	0.136	1.78	99	-1.29	98	84	-0.020	4.27	0.75
388	53.023	0.134	1.77	99	-0.13	95	84	-0.010	4.87	0.78
389	53.160	0.137	1.76	98	-2.56	99	84	0.000	4.51	0.89
390	53.296	0.136	1.76	98	-0.97	99	84	0.010	4.73	0.76
391	53.431	0.135	1.77	98	-0.51	97	83	-0.010	4.47	0.74
392	53.571	0.140	1.75	98	-1.31	100	83	0.000	4.78	0.76
393	53.709	0.138	1.77	98	-2.26	99	83	-0.010	4.39	0.81
394	53.846	0.137	1.76	98	-2.88	98	83	-0.010	4.71	0.72
395	53.988	0.142	1.76	98	-0.68	102	83	0.000	4.78	0.83
396	54.123	0.135	1.76	98	-0.86	97	83	-0.010	4.45	0.77
397	54.266	0.143	1.77	98	-0.16	102	83	0.000	4.48	0.82
398	54.401	0.135	1.75	98	-0.22	95	83	0.000	4.67	0.74
399	54.538	0.137	1.78	98	-0.67	98	83	-0.010	4.91	0.83
400	54.674	0.136	1.75	98	-2.72	97	83	0.000	4.64	0.80
401	54.810	0.136	1.77	98	-0.6	98	83	-0.010	4.43	0.82
402	54.946	0.136	1.75	98	-2.46	96	83	-0.010	4.63	0.83
403	55.085	0.139	1.76	98	-0.41	100	83	0.000	4.71	0.71
404	55.216	0.131	1.76	98	-0.09	93	82	-0.010	4.73	0.83
405	55.359	0.143	1.77	98	-1.11	101	82	0.000	4.85	0.75
406	55.494	0.135	1.77	98	-0.99	96	82	-0.020	4.38	0.80
407	55.632	0.138	1.75	98	-1.7	97	82	-0.010	4.25	0.74
408	55.771	0.139	1.77	98	-2.48	99	82	-0.010	4.37	0.83
409	55.909	0.138	1.76	98	-1.59	98	82	0.000	4.71	0.79
410	56.046	0.137	1.77	97	-1.49	98	82	0.000	4.51	0.87
411	56.187	0.141	1.77	97	0	101	82	0.000	4.53	0.72
412	56.321	0.134	1.77	97	-2.87	97	82	0.010	4.45	0.72
413	56.459	0.138	1.77	97	-1.53	98	82	-0.020	4.22	0.72
414	56.598	0.139	1.76	97	-2.13	99	82	0.000	4.69	0.84
415	56.734	0.136	1.76	97	-1.87	97	82	0.010	4.30	0.79

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3
Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
416	56.873	0.139	1.76	97	-0.66	99	82	-0.020	4.32	0.82
417	57.011	0.138	1.77	97	-1.08	99	82	0.000	4.30	0.77
418	57.146	0.135	1.78	97	-0.02	97	82	-0.010	3.94	0.82
419	57.285	0.139	1.76	97	-2.45	99	82	0.000	4.20	0.84
420	57.419	0.134	1.77	97	-2.72	95	82	-0.020	3.70	0.74
421	57.558	0.139	1.78	97	-2.16	101	82	-0.010	4.20	0.69
422	57.694	0.136	1.76	97	-2.56	98	82	-0.010	4.39	0.82
423	57.830	0.136	1.77	97	-2.82	99	82	-0.020	3.96	0.81
424	57.969	0.139	1.76	97	-0.07	100	82	-0.010	4.19	0.78
425	58.104	0.135	1.76	97	-2.3	96	82	-0.010	4.19	0.75
426	58.237	0.133	1.76	97	-2.77	95	82	0.010	4.51	0.80
427	58.376	0.139	1.76	97	-1.98	99	82	0.000	4.39	0.74
428	58.514	0.138	1.76	97	-0.51	98	82	0.000	4.41	0.78
429	58.651	0.137	1.76	97	-1.21	98	82	0.000	3.89	0.72
430	58.790	0.139	1.77	97	-0.57	99	82	-0.010	4.04	0.81
431	58.923	0.133	1.74	97	-2.81	94	83	-0.010	4.38	0.82
432	59.065	0.142	1.75	96	-0.15	101	83	-0.010	4.06	0.80
433	59.202	0.137	1.76	96	-1.07	97	82	-0.010	4.33	0.80
434	59.336	0.134	1.76	96	-2.88	95	83	0.000	4.12	0.78
435	59.474	0.138	1.77	96	-1	98	82	0.010	4.45	0.77
436	59.608	0.134	1.75	96	-0.64	95	82	0.000	4.18	0.78
437	59.743	0.135	1.77	96	-2.79	95	82	0.010	4.15	0.81
438	59.882	0.139	1.75	96	-2.4	99	82	0.000	4.41	0.71
439	60.016	0.134	1.76	96	-0.92	96	82	0.000	3.86	0.78
440	60.154	0.138	1.75	96	-2.85	97	82	0.010	4.40	0.76
441	60.296	0.142	1.77	96	-2.12	104	82	-0.010	4.01	0.92
442	60.431	0.135	1.76	96	-1.54	96	82	0.000	4.21	0.76
443	60.575	0.144	1.77	96	-0.32	102	82	-0.010	3.74	0.85
444	60.718	0.143	1.75	96	-2.47	103	82	-0.010	4.26	0.79
445	60.859	0.141	1.76	96	-2.7	101	82	-0.010	3.97	0.84
446	60.999	0.140	1.76	96	-0.61	99	82	-0.010	4.23	0.93
447	61.139	0.140	1.75	96	-0.55	100	82	-0.010	4.00	0.82

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3
Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
448	61.275	0.136	1.77	96	-2.54	96	82	-0.020	3.78	0.80
449	61.416	0.141	1.76	96	-2.11	101	82	0.000	4.11	0.88
450	61.551	0.135	1.76	96	-0.11	97	82	-0.010	3.72	0.82
451	61.691	0.140	1.76	96	-2.89	100	82	0.010	4.10	0.84
452	61.829	0.138	1.78	95	-2.75	100	82	-0.020	3.75	0.86
453	61.964	0.135	1.77	95	-1.78	96	82	-0.010	3.73	0.86
454	62.104	0.140	1.77	95	-0.11	101	82	0.000	3.76	0.86
455	62.242	0.138	1.75	95	-0.07	98	82	0.000	3.95	0.84
456	62.377	0.135	1.77	95	-0.5	97	82	-0.010	4.03	0.89
457	62.517	0.140	1.77	95	-0.11	101	82	0.010	4.01	0.88
458	62.652	0.135	1.77	95	-0.91	95	82	0.000	3.95	0.84
459	62.792	0.140	1.76	95	-2.82	99	83	-0.010	3.88	0.90
460	62.932	0.140	1.76	95	-2.82	99	83	0.000	3.87	0.94
461	63.066	0.134	1.76	95	-2.62	95	83	-0.010	3.92	0.86
462	63.209	0.143	1.76	95	-0.04	101	83	0.000	4.25	0.79
463	63.346	0.137	1.76	95	-0.09	99	84	-0.010	3.66	0.79
464	63.483	0.137	1.78	95	-0.11	97	83	-0.010	3.61	0.81
465	63.622	0.139	1.77	95	-0.31	99	84	0.000	4.02	0.75
466	63.760	0.138	1.76	95	-0.14	98	84	0.010	4.12	0.78
467	63.896	0.136	1.77	95	-0.06	98	83	0.000	3.90	0.90
468	64.038	0.142	1.77	95	-2.84	100	83	0.000	3.88	0.89
469	64.172	0.134	1.77	95	-1.91	95	83	-0.010	3.76	0.83
470	64.310	0.138	1.76	95	-2.36	99	83	0.010	3.98	0.78
471	64.448	0.138	1.78	94	-2.77	98	83	-0.010	3.81	0.86
472	64.583	0.135	1.76	94	-1.95	98	83	-0.010	3.57	0.75
473	64.725	0.142	1.76	94	-1.4	102	83	-0.010	3.64	0.73
474	64.862	0.137	1.76	94	-2.03	99	83	-0.010	3.67	0.81
475	64.999	0.137	1.77	94	-2.58	97	83	0.000	3.95	0.79
476	65.138	0.139	1.75	94	-2.75	99	83	0.000	3.75	0.75
477	65.276	0.138	1.77	94	-0.06	100	83	-0.010	4.05	0.83
478	65.412	0.136	1.77	94	-1.16	97	83	-0.020	3.85	0.84
479	65.553	0.141	1.77	94	-2.58	101	83	0.000	3.97	0.84

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
480	65.686	0.133	1.76	94	-2.47	96	83	-0.020	3.58	0.84
481	65.827	0.141	1.77	94	-1.09	101	83	0.000	3.59	0.82
482	65.963	0.136	1.77	94	-2.45	99	83	0.010	4.04	0.68
483	66.099	0.136	1.78	94	-1.05	97	83	0.000	3.73	0.83
484	66.237	0.138	1.79	94	-0.03	99	83	0.000	3.96	0.86
485	66.376	0.139	1.76	94	-2.72	100	83	-0.020	3.58	0.74
486	66.511	0.135	1.79	94	-2.1	97	83	-0.010	3.97	0.80
487	66.650	0.139	1.76	94	-1.99	99	83	-0.020	3.87	0.86
488	66.785	0.135	1.76	94	-2.85	97	83	0.000	3.72	0.80
489	66.925	0.140	1.76	94	-1.79	100	83	0.000	3.90	0.76
490	67.069	0.144	1.77	94	-2.46	103	83	-0.010	3.64	0.87
491	67.204	0.135	1.76	94	-2.83	96	83	0.000	3.80	0.79
492	67.345	0.141	1.76	94	-2.72	100	83	0.010	4.18	0.76
493	67.485	0.140	1.77	94	-2.84	100	83	0.000	3.97	0.69
494	67.621	0.136	1.77	94	-2.73	97	83	0.000	3.97	0.85
495	67.762	0.141	1.77	94	-1.59	99	83	-0.010	3.68	0.92
496	67.901	0.139	1.76	94	-2.88	100	83	-0.010	3.89	0.87
497	68.043	0.142	1.78	94	-2.25	102	83	-0.010	3.90	0.88
498	68.185	0.142	1.76	94	-2.77	100	83	0.000	3.84	0.80
499	68.320	0.135	1.77	94	-2.8	98	83	-0.020	3.43	0.85
500	68.459	0.139	1.77	94	-0.2	101	83	0.000	4.03	0.84
501	68.601	0.142	1.77	94	-2.58	102	83	-0.010	3.72	0.87
502	68.741	0.140	1.77	94	-0.6	101	83	-0.010	3.83	0.89
503	68.884	0.143	1.76	94	-0.15	103	83	-0.010	4.23	0.79
504	69.023	0.139	1.77	94	-2.11	99	83	-0.020	3.43	0.80
505	69.165	0.142	1.77	94	-1.33	102	83	-0.010	3.76	0.84
506	69.311	0.146	1.76	94	-2.16	103	83	0.000	4.09	0.80
507	69.453	0.142	1.77	94	-0.83	102	83	-0.010	3.49	0.88
508	69.591	0.138	1.76	94	-0.5	98	83	0.010	4.11	0.79
509	69.733	0.142	1.77	94	-2.74	102	83	0.000	4.03	0.76
510	69.866	0.133	1.78	94	-1.67	96	83	-0.010	3.94	0.88
511	70.004	0.138	1.76	94	-0.01	98	83	0.010	3.71	0.77

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
512	70.145	0.141	1.78	94	-2.83	100	83	0.000	3.83	0.73
513	70.282	0.137	1.76	94	-2.76	98	83	-0.010	3.72	0.83
514	70.423	0.141	1.77	94	-0.1	100	83	0.000	3.71	0.74
515	70.559	0.136	1.77	94	-1.44	98	83	0.010	3.72	0.79
516	70.699	0.140	1.77	94	-1.43	99	83	-0.010	3.92	0.79
517	70.840	0.141	1.77	94	-2.86	101	83	0.000	3.93	0.73
518	70.979	0.139	1.77	94	-0.02	101	83	-0.010	4.00	0.83
519	71.116	0.137	1.77	94	-1.39	97	83	0.000	3.49	0.86
520	71.259	0.143	1.77	94	-1.56	102	83	-0.010	3.58	0.80
521	71.394	0.135	1.76	94	-2.04	99	83	-0.010	3.70	0.82
522	71.535	0.141	1.75	94	-0.89	101	83	0.000	3.80	0.72
523	71.676	0.141	1.77	94	-0.37	100	83	0.000	3.53	0.84
524	71.812	0.136	1.76	94	-2.83	97	83	0.000	3.61	0.75
525	71.953	0.141	1.76	94	-0.14	100	83	-0.010	3.48	0.83
526	72.088	0.135	1.76	94	-2.82	96	84	-0.010	3.59	0.82
527	72.225	0.137	1.74	94	-0.41	97	84	-0.010	3.62	0.90
528	72.362	0.137	1.77	94	-0.09	99	84	-0.010	3.77	0.82
529	72.502	0.140	1.76	94	-2.72	100	84	0.000	3.83	0.80
530	72.642	0.140	1.77	94	-0.07	100	84	-0.020	3.35	0.79
531	72.784	0.142	1.75	94	-2.78	102	84	-0.010	3.44	0.79
532	72.924	0.140	1.75	94	-1.78	100	84	0.010	3.81	0.78
533	73.062	0.138	1.75	94	-2.79	98	84	-0.010	3.15	0.82
534	73.203	0.141	1.76	94	-2.59	100	84	-0.010	3.83	0.81
535	73.338	0.135	1.76	94	-2.61	97	84	0.000	3.74	0.83
536	73.477	0.139	1.76	94	-0.28	100	84	0.010	3.72	0.77
537	73.613	0.136	1.75	94	-2.75	99	84	0.000	3.50	0.82
538	73.749	0.136	1.74	94	-1.1	95	84	-0.010	3.50	0.86
539	73.888	0.139	1.76	94	-2.73	99	84	0.010	3.81	0.73
540	74.027	0.139	1.76	94	-1.41	100	84	0.000	3.57	0.80
541	74.164	0.137	1.76	94	-2.79	98	84	-0.010	3.96	0.83
542	74.304	0.140	1.76	94	-0.15	100	84	0.000	3.74	0.71
543	74.439	0.135	1.77	94	-2.39	97	84	-0.010	3.67	0.80

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
544	74.581	0.142	1.76	94	-2.49	102	84	0.000	3.83	0.70
545	74.722	0.141	1.77	94	-2.54	102	84	-0.010	3.54	0.77
546	74.856	0.134	1.75	94	-2.14	97	83	0.000	3.54	0.79
547	74.996	0.140	1.77	94	-2.38	101	83	-0.010	3.44	0.78
548	75.137	0.141	1.76	94	-0.77	100	83	-0.020	3.22	0.86
549	75.275	0.138	1.76	94	-2.72	100	83	0.000	3.83	0.85
550	75.416	0.141	1.76	94	-2.29	100	83	-0.010	3.39	0.86
551	75.550	0.134	1.77	94	-0.07	95	83	0.010	3.82	0.73
552	75.687	0.137	1.75	94	-0.32	99	83	0.010	3.49	0.73
553	75.830	0.143	1.76	94	-2.15	103	84	0.000	3.50	0.83
554	75.966	0.136	1.76	94	-0.16	96	84	-0.010	3.20	0.77
555	76.103	0.137	1.78	94	-2.45	99	83	-0.010	3.13	0.78
556	76.243	0.140	1.76	94	-1.44	100	83	0.010	3.24	0.70
557	76.377	0.134	1.74	94	-0.23	96	83	0.000	3.14	0.78
558	76.518	0.141	1.76	94	-2.72	100	84	-0.010	3.28	0.73
559	76.658	0.140	1.75	94	-0.65	98	84	-0.010	2.97	0.78
Avg/Tot	78.027	0.137	1.75	98	-1.43	100	85	-0.005	6.41	0.76

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	245	224	119	231	106	185.0	N/A
1	246	224	122	234	107	186.6	N/A
2	246	225	126	236	107	188.0	N/A
3	246	225	129	237	108	189.0	N/A
4	246	225	133	238	109	190.2	N/A
5	244	224	136	241	110	191.0	N/A
6	243	223	139	244	111	192.0	N/A
7	242	223	142	249	112	193.6	N/A
8	240	222	144	255	113	194.8	N/A
9	239	222	147	264	114	197.2	N/A
10	238	222	149	273	116	199.6	N/A
11	237	221	151	285	117	202.2	N/A
12	235	222	153	298	118	205.2	N/A
13	233	221	154	313	119	208.0	N/A
14	232	220	156	329	121	211.6	N/A
15	231	221	157	348	122	215.8	N/A
16	230	221	159	367	122	219.8	N/A
17	230	223	160	385	124	224.4	N/A
18	230	223	161	402	125	228.2	N/A
19	231	224	162	415	126	231.6	N/A
20	230	226	156	417	128	231.4	N/A
21	230	225	150	414	127	229.2	N/A
22	229	224	144	410	125	226.4	N/A
23	228	222	139	404	124	223.4	N/A
24	227	222	135	397	123	220.8	N/A
25	226	222	132	391	122	218.6	N/A
26	224	219	129	384	119	215.0	N/A
27	224	216	126	379	118	212.6	N/A
28	222	214	124	374	117	210.2	N/A
29	221	212	123	369	116	208.2	N/A
30	220	210	121	365	115	206.2	N/A
31	219	208	120	362	114	204.6	N/A
32	218	205	118	359	112	202.4	N/A
33	217	202	117	355	111	200.4	N/A
34	216	202	116	353	111	199.6	N/A
35	216	202	116	350	110	198.8	N/A
36	215	201	115	349	109	197.8	N/A
37	215	200	114	347	109	197.0	N/A
38	214	199	114	346	108	196.2	N/A
39	214	198	113	345	108	195.6	N/A
40	214	198	112	343	107	194.8	N/A
41	213	198	112	343	106	194.4	N/A
42	213	197	111	342	106	193.8	N/A
43	212	194	111	341	106	192.8	N/A
44	212	192	111	341	105	192.2	N/A
45	212	193	111	341	105	192.4	N/A
46	211	192	110	340	104	191.4	N/A
47	211	193	110	340	103	191.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	211	193	109	340	104	191.4	N/A
49	211	193	109	339	103	191.0	N/A
50	211	193	109	339	103	191.0	N/A
51	211	192	108	338	103	190.4	N/A
52	211	190	108	337	102	189.6	N/A
53	211	194	108	336	102	190.2	N/A
54	211	194	108	336	102	190.2	N/A
55	211	191	107	334	102	189.0	N/A
56	211	191	107	334	102	189.0	N/A
57	211	193	107	333	101	189.0	N/A
58	211	192	107	332	101	188.6	N/A
59	211	192	107	331	101	188.4	N/A
60	211	193	107	330	101	188.4	N/A
61	210	193	106	330	100	187.8	N/A
62	210	194	106	329	100	187.8	N/A
63	211	194	106	329	100	188.0	N/A
64	210	192	107	327	100	187.2	N/A
65	209	193	107	326	100	187.0	N/A
66	210	194	107	326	100	187.4	N/A
67	210	195	107	326	100	187.6	N/A
68	210	195	107	325	100	187.4	N/A
69	210	196	106	325	100	187.4	N/A
70	210	196	106	325	101	187.6	N/A
71	211	196	106	324	100	187.4	N/A
72	211	196	106	324	100	187.4	N/A
73	211	196	106	324	100	187.4	N/A
74	211	194	106	323	99	186.6	N/A
75	212	192	106	322	99	186.2	N/A
76	212	193	106	322	99	186.4	N/A
77	212	194	106	322	99	186.6	N/A
78	212	194	106	321	99	186.4	N/A
79	213	196	106	320	99	186.8	N/A
80	213	198	106	320	100	187.4	N/A
81	213	196	106	320	100	187.0	N/A
82	213	198	106	320	100	187.4	N/A
83	214	198	106	319	100	187.4	N/A
84	214	198	106	319	100	187.4	N/A
85	214	198	106	319	99	187.2	N/A
86	215	197	106	319	99	187.2	N/A
87	215	198	106	320	99	187.6	N/A
88	216	198	106	319	99	187.6	N/A
89	216	199	106	319	99	187.8	N/A
90	217	199	106	319	99	188.0	N/A
91	217	199	106	318	99	187.8	N/A
92	217	200	106	318	99	188.0	N/A
93	218	200	106	317	99	188.0	N/A
94	218	198	106	317	99	187.6	N/A
95	218	200	106	315	99	187.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	218	200	106	314	99	187.4	N/A
97	219	199	106	313	99	187.2	N/A
98	220	201	106	311	99	187.4	N/A
99	220	202	106	310	99	187.4	N/A
100	220	200	106	307	99	186.4	N/A
101	220	200	106	306	99	186.2	N/A
102	221	200	106	303	99	185.8	N/A
103	221	201	106	301	99	185.6	N/A
104	221	199	106	299	99	184.8	N/A
105	221	198	106	296	99	184.0	N/A
106	221	198	106	293	99	183.4	N/A
107	220	199	106	291	99	183.0	N/A
108	221	198	106	287	99	182.2	N/A
109	220	199	106	285	99	181.8	N/A
110	220	200	106	282	99	181.4	N/A
111	220	200	106	279	99	180.8	N/A
112	220	201	106	277	99	180.6	N/A
113	220	200	106	275	99	180.0	N/A
114	220	199	106	272	99	179.2	N/A
115	220	199	106	269	99	178.6	N/A
116	220	200	106	267	99	178.4	N/A
117	220	200	106	264	99	177.8	N/A
118	220	199	106	262	99	177.2	N/A
119	220	198	106	259	99	176.4	N/A
120	218	196	106	257	99	175.2	N/A
121	219	198	106	255	99	175.4	N/A
122	219	198	106	252	99	174.8	N/A
123	218	197	106	250	99	174.0	N/A
124	217	196	106	248	99	173.2	N/A
125	218	196	106	245	99	172.8	N/A
126	217	197	106	242	99	172.2	N/A
127	217	197	106	240	99	171.8	N/A
128	218	196	106	238	99	171.4	N/A
129	217	195	106	235	98	170.2	N/A
130	217	195	106	233	98	169.8	N/A
131	216	193	106	230	98	168.6	N/A
132	216	192	106	228	98	168.0	N/A
133	216	193	106	226	98	167.8	N/A
134	215	194	106	223	98	167.2	N/A
135	215	193	106	221	99	166.8	N/A
136	213	192	106	219	98	165.6	N/A
137	213	193	106	217	99	165.6	N/A
138	213	192	106	215	99	165.0	N/A
139	211	192	106	213	98	164.0	N/A
140	211	190	105	211	98	163.0	N/A
141	211	190	105	209	98	162.6	N/A
142	210	188	105	207	98	161.6	N/A
143	209	187	105	205	98	160.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	208	187	105	203	98	160.2	N/A
145	207	186	105	201	98	159.4	N/A
146	207	187	105	199	98	159.2	N/A
147	206	186	105	198	98	158.6	N/A
148	206	184	105	196	98	157.8	N/A
149	205	185	105	195	98	157.6	N/A
150	204	184	105	193	98	156.8	N/A
151	203	181	105	192	97	155.6	N/A
152	202	183	105	190	98	155.6	N/A
153	202	181	105	189	98	155.0	N/A
154	201	180	105	187	97	154.0	N/A
155	201	180	104	186	97	153.6	N/A
156	199	179	104	185	97	152.8	N/A
157	199	178	104	183	97	152.2	N/A
158	198	176	104	182	97	151.4	N/A
159	198	178	104	181	97	151.6	N/A
160	197	178	104	180	97	151.2	N/A
161	196	179	104	179	97	151.0	N/A
162	196	177	104	178	97	150.4	N/A
163	195	176	104	177	97	149.8	N/A
164	195	176	104	176	97	149.6	N/A
165	194	175	103	175	97	148.8	N/A
166	194	176	103	174	97	148.8	N/A
167	193	175	103	173	97	148.2	N/A
168	193	174	103	172	97	147.8	N/A
169	192	175	103	172	97	147.8	N/A
170	192	175	103	171	96	147.4	N/A
171	191	174	103	170	96	146.8	N/A
172	190	172	103	169	96	146.0	N/A
173	190	171	103	169	96	145.8	N/A
174	189	171	103	168	96	145.4	N/A
175	189	170	103	167	96	145.0	N/A
176	188	170	103	166	96	144.6	N/A
177	188	172	103	166	96	145.0	N/A
178	187	172	103	165	96	144.6	N/A
179	187	171	103	164	96	144.2	N/A
180	186	171	103	163	96	143.8	N/A
181	185	171	103	163	96	143.6	N/A
182	185	168	103	162	96	142.8	N/A
183	184	170	103	161	96	142.8	N/A
184	183	168	103	161	96	142.2	N/A
185	183	170	103	160	96	142.4	N/A
186	182	169	103	159	97	142.0	N/A
187	181	167	103	158	97	141.2	N/A
188	180	167	103	158	97	141.0	N/A
189	179	166	103	157	97	140.4	N/A
190	178	166	103	156	97	140.0	N/A
191	177	165	104	155	97	139.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	177	165	103	155	97	139.4	N/A
193	176	163	103	154	97	138.6	N/A
194	175	162	104	153	97	138.2	N/A
195	175	163	103	153	97	138.2	N/A
196	175	163	103	152	96	137.8	N/A
197	174	164	103	151	97	137.8	N/A
198	174	162	103	151	97	137.4	N/A
199	173	161	103	150	97	136.8	N/A
200	172	162	103	149	97	136.6	N/A
201	172	161	103	149	97	136.4	N/A
202	171	159	103	149	97	135.8	N/A
203	171	160	103	148	97	135.8	N/A
204	170	159	103	147	97	135.2	N/A
205	169	158	103	147	96	134.6	N/A
206	168	159	103	146	97	134.6	N/A
207	168	159	103	146	96	134.4	N/A
208	167	158	103	145	97	134.0	N/A
209	167	159	102	145	96	133.8	N/A
210	167	158	102	144	96	133.4	N/A
211	167	157	102	144	96	133.2	N/A
212	166	157	102	143	96	132.8	N/A
213	166	156	102	143	96	132.6	N/A
214	166	157	102	143	96	132.8	N/A
215	165	155	102	142	96	132.0	N/A
216	164	154	102	142	96	131.6	N/A
217	164	153	102	141	96	131.2	N/A
218	164	153	102	141	96	131.2	N/A
219	163	156	102	141	96	131.6	N/A
220	163	156	102	140	96	131.4	N/A
221	163	156	102	140	96	131.4	N/A
222	163	156	102	140	96	131.4	N/A
223	163	155	102	140	96	131.2	N/A
224	162	154	102	139	96	130.6	N/A
225	162	155	102	139	96	130.8	N/A
226	162	155	102	139	96	130.8	N/A
227	162	155	101	139	96	130.6	N/A
228	161	155	101	138	95	130.0	N/A
229	161	154	101	138	95	129.8	N/A
230	161	155	101	138	96	130.2	N/A
231	161	155	101	138	95	130.0	N/A
232	160	154	101	138	95	129.6	N/A
233	160	154	101	137	96	129.6	N/A
234	160	154	101	137	96	129.6	N/A
235	159	153	101	137	95	129.0	N/A
236	159	153	101	137	95	129.0	N/A
237	159	152	101	137	95	128.8	N/A
238	158	153	101	136	95	128.6	N/A
239	158	151	101	136	95	128.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	158	153	101	136	95	128.6	N/A
241	157	153	101	136	95	128.4	N/A
242	157	152	101	136	95	128.2	N/A
243	157	152	101	135	95	128.0	N/A
244	157	152	101	135	95	128.0	N/A
245	157	151	101	135	95	127.8	N/A
246	157	152	101	135	95	128.0	N/A
247	157	150	100	135	95	127.4	N/A
248	157	151	100	134	95	127.4	N/A
249	156	152	100	134	95	127.4	N/A
250	156	151	100	134	95	127.2	N/A
251	156	151	100	134	95	127.2	N/A
252	155	151	100	134	95	127.0	N/A
253	156	151	100	133	95	127.0	N/A
254	155	150	100	133	95	126.6	N/A
255	155	149	100	133	94	126.2	N/A
256	155	150	100	133	94	126.4	N/A
257	155	150	100	133	94	126.4	N/A
258	155	150	100	133	94	126.4	N/A
259	155	150	99	132	95	126.2	N/A
260	154	148	99	132	94	125.4	N/A
261	154	148	99	132	94	125.4	N/A
262	154	149	99	132	94	125.6	N/A
263	154	147	99	132	94	125.2	N/A
264	154	148	99	131	94	125.2	N/A
265	154	148	99	131	94	125.2	N/A
266	153	147	99	131	94	124.8	N/A
267	153	147	99	131	94	124.8	N/A
268	153	148	99	131	94	125.0	N/A
269	153	147	99	131	94	124.8	N/A
270	153	148	99	131	94	125.0	N/A
271	152	148	99	130	94	124.6	N/A
272	152	147	99	130	94	124.4	N/A
273	152	147	99	130	94	124.4	N/A
274	152	147	99	130	94	124.4	N/A
275	152	148	98	130	94	124.4	N/A
276	152	147	98	130	94	124.2	N/A
277	152	146	98	129	94	123.8	N/A
278	151	146	99	129	94	123.8	N/A
279	151	147	98	129	94	123.8	N/A
280	151	146	98	129	93	123.4	N/A
281	151	146	98	129	93	123.4	N/A
282	151	146	98	129	94	123.6	N/A
283	150	145	98	128	94	123.0	N/A
284	150	145	98	128	94	123.0	N/A
285	149	145	98	128	93	122.6	N/A
286	149	145	98	128	94	122.8	N/A
287	149	145	98	128	93	122.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	149	144	98	128	93	122.4	N/A
289	149	145	98	127	93	122.4	N/A
290	148	145	98	127	93	122.2	N/A
291	148	144	97	127	93	121.8	N/A
292	148	144	97	127	93	121.8	N/A
293	148	144	97	127	93	121.8	N/A
294	147	144	97	127	92	121.4	N/A
295	148	142	97	127	93	121.4	N/A
296	148	142	97	127	92	121.2	N/A
297	147	143	97	127	92	121.2	N/A
298	147	143	97	126	92	121.0	N/A
299	147	142	97	126	92	120.8	N/A
300	147	142	97	126	92	120.8	N/A
301	147	141	97	126	92	120.6	N/A
302	146	142	97	126	92	120.6	N/A
303	146	142	97	126	92	120.6	N/A
304	146	142	97	126	92	120.6	N/A
305	146	142	97	126	92	120.6	N/A
306	146	142	97	126	92	120.6	N/A
307	146	142	97	126	92	120.6	N/A
308	146	142	97	125	92	120.4	N/A
309	146	142	97	125	92	120.4	N/A
310	145	142	97	125	92	120.2	N/A
311	145	142	97	125	92	120.2	N/A
312	145	142	97	125	92	120.2	N/A
313	145	141	96	125	92	119.8	N/A
314	144	141	96	125	92	119.6	N/A
315	144	141	96	125	92	119.6	N/A
316	144	142	96	125	92	119.8	N/A
317	144	141	97	125	91	119.6	N/A
318	144	141	96	125	91	119.4	N/A
319	144	140	96	125	92	119.4	N/A
320	144	141	96	125	92	119.6	N/A
321	143	140	96	125	91	119.0	N/A
322	143	140	96	125	91	119.0	N/A
323	143	138	96	125	91	118.6	N/A
324	143	138	96	125	90	118.4	N/A
325	142	140	96	125	91	118.8	N/A
326	143	139	96	125	91	118.8	N/A
327	142	138	95	125	90	118.0	N/A
328	142	140	95	125	90	118.4	N/A
329	142	138	95	125	90	118.0	N/A
330	142	138	95	125	90	118.0	N/A
331	141	138	95	125	90	117.8	N/A
332	142	138	95	125	90	118.0	N/A
333	142	138	95	125	90	118.0	N/A
334	142	138	95	124	90	117.8	N/A
335	141	139	95	124	89	117.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	140	139	95	124	89	117.4	N/A
337	141	138	95	124	89	117.4	N/A
338	141	138	95	124	89	117.4	N/A
339	141	138	94	124	89	117.2	N/A
340	141	138	94	124	89	117.2	N/A
341	141	137	94	124	89	117.0	N/A
342	141	138	94	124	89	117.2	N/A
343	141	137	94	124	89	117.0	N/A
344	141	136	94	124	89	116.8	N/A
345	140	136	94	124	89	116.6	N/A
346	140	137	94	124	89	116.8	N/A
347	141	137	94	124	88	116.8	N/A
348	141	137	94	124	88	116.8	N/A
349	141	136	94	124	88	116.6	N/A
350	140	138	94	124	89	117.0	N/A
351	140	138	94	124	89	117.0	N/A
352	141	139	94	124	89	117.4	N/A
353	140	139	94	124	89	117.2	N/A
354	140	140	94	124	89	117.4	N/A
355	141	140	94	124	89	117.6	N/A
356	140	140	94	124	89	117.4	N/A
357	140	140	94	123	89	117.2	N/A
358	140	139	94	123	89	117.0	N/A
359	140	139	94	123	89	117.0	N/A
360	140	140	94	123	89	117.2	N/A
361	140	140	94	123	89	117.2	N/A
362	140	141	94	123	89	117.4	N/A
363	140	141	94	123	89	117.4	N/A
364	140	141	94	123	89	117.4	N/A
365	140	140	94	123	89	117.2	N/A
366	140	139	94	123	89	117.0	N/A
367	140	139	94	123	89	117.0	N/A
368	140	139	94	123	89	117.0	N/A
369	140	140	94	123	89	117.2	N/A
370	139	139	94	122	89	116.6	N/A
371	139	140	94	122	89	116.8	N/A
372	139	138	94	122	89	116.4	N/A
373	139	139	94	122	89	116.6	N/A
374	139	139	94	122	89	116.6	N/A
375	139	139	94	122	89	116.6	N/A
376	139	139	93	122	88	116.2	N/A
377	139	139	93	122	89	116.4	N/A
378	138	139	93	122	88	116.0	N/A
379	138	137	93	122	89	115.8	N/A
380	138	137	93	121	89	115.6	N/A
381	138	138	93	121	88	115.6	N/A
382	138	137	93	121	89	115.6	N/A
383	138	137	94	121	88	115.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	138	137	93	121	88	115.4	N/A
385	138	137	93	121	89	115.6	N/A
386	137	137	93	121	88	115.2	N/A
387	137	137	93	121	88	115.2	N/A
388	137	137	93	121	88	115.2	N/A
389	137	136	93	121	88	115.0	N/A
390	137	136	93	121	88	115.0	N/A
391	137	137	93	121	88	115.2	N/A
392	137	137	93	121	88	115.2	N/A
393	137	136	93	120	88	114.8	N/A
394	137	137	93	121	88	115.2	N/A
395	137	135	93	120	88	114.6	N/A
396	137	136	93	121	88	115.0	N/A
397	137	137	92	120	88	114.8	N/A
398	137	135	92	120	87	114.2	N/A
399	137	134	92	120	87	114.0	N/A
400	137	136	92	120	87	114.4	N/A
401	136	136	92	120	87	114.2	N/A
402	136	135	92	120	87	114.0	N/A
403	136	137	92	120	87	114.4	N/A
404	136	136	92	120	87	114.2	N/A
405	136	135	92	120	87	114.0	N/A
406	136	135	92	120	87	114.0	N/A
407	136	137	92	120	87	114.4	N/A
408	136	136	92	120	87	114.2	N/A
409	136	135	92	120	87	114.0	N/A
410	136	136	92	120	87	114.2	N/A
411	136	135	92	120	87	114.0	N/A
412	136	135	92	120	87	114.0	N/A
413	136	137	92	120	87	114.4	N/A
414	136	135	91	120	87	113.8	N/A
415	136	135	91	120	86	113.6	N/A
416	135	135	91	120	86	113.4	N/A
417	136	135	91	120	86	113.6	N/A
418	135	135	91	120	86	113.4	N/A
419	135	135	91	119	86	113.2	N/A
420	135	136	91	119	86	113.4	N/A
421	135	135	91	119	86	113.2	N/A
422	135	135	91	119	86	113.2	N/A
423	136	135	91	119	86	113.4	N/A
424	135	135	91	119	86	113.2	N/A
425	135	133	90	119	86	112.6	N/A
426	135	135	90	119	86	113.0	N/A
427	135	135	90	119	86	113.0	N/A
428	135	135	90	118	86	112.8	N/A
429	135	136	90	118	86	113.0	N/A
430	135	135	90	118	86	112.8	N/A
431	135	135	90	118	86	112.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	135	135	90	118	86	112.8	N/A
433	135	135	90	118	85	112.6	N/A
434	135	134	90	118	85	112.4	N/A
435	134	134	89	118	85	112.0	N/A
436	135	134	89	117	85	112.0	N/A
437	135	133	89	117	85	111.8	N/A
438	134	131	89	117	85	111.2	N/A
439	134	133	89	117	85	111.6	N/A
440	134	130	89	117	85	111.0	N/A
441	134	130	89	117	85	111.0	N/A
442	134	131	89	117	85	111.2	N/A
443	134	131	89	116	84	110.8	N/A
444	134	132	89	116	84	111.0	N/A
445	134	131	88	116	84	110.6	N/A
446	134	131	88	116	84	110.6	N/A
447	134	131	88	116	84	110.6	N/A
448	134	131	88	116	84	110.6	N/A
449	134	131	88	116	84	110.6	N/A
450	134	130	88	116	84	110.4	N/A
451	134	131	88	116	84	110.6	N/A
452	134	130	88	115	84	110.2	N/A
453	134	130	88	115	84	110.2	N/A
454	134	130	88	115	84	110.2	N/A
455	134	130	88	115	84	110.2	N/A
456	134	129	88	115	84	110.0	N/A
457	134	129	88	115	84	110.0	N/A
458	134	129	88	115	84	110.0	N/A
459	134	128	88	115	83	109.6	N/A
460	134	128	88	115	84	109.8	N/A
461	134	128	88	115	83	109.6	N/A
462	134	128	88	115	83	109.6	N/A
463	134	127	87	114	83	109.0	N/A
464	134	128	87	114	83	109.2	N/A
465	134	127	88	114	83	109.2	N/A
466	134	127	88	114	83	109.2	N/A
467	134	126	88	114	83	109.0	N/A
468	134	127	88	114	83	109.2	N/A
469	134	126	88	114	83	109.0	N/A
470	134	126	88	114	83	109.0	N/A
471	134	126	88	114	83	109.0	N/A
472	134	125	88	114	83	108.8	N/A
473	133	124	88	114	83	108.4	N/A
474	133	124	88	114	83	108.4	N/A
475	133	124	88	114	83	108.4	N/A
476	133	124	88	113	83	108.2	N/A
477	133	125	88	113	83	108.4	N/A
478	133	125	88	113	83	108.4	N/A
479	133	124	88	113	83	108.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
480	132	123	88	113	83	107.8	N/A
481	133	124	88	113	83	108.2	N/A
482	132	124	88	113	83	108.0	N/A
483	133	124	88	113	83	108.2	N/A
484	133	123	88	113	83	108.0	N/A
485	133	124	88	113	83	108.2	N/A
486	133	124	88	113	83	108.2	N/A
487	133	125	88	113	84	108.6	N/A
488	133	125	88	113	84	108.6	N/A
489	133	124	88	113	84	108.4	N/A
490	133	125	88	113	84	108.6	N/A
491	133	125	88	113	84	108.6	N/A
492	133	125	88	112	84	108.4	N/A
493	133	125	88	112	84	108.4	N/A
494	133	125	88	112	84	108.4	N/A
495	133	125	88	112	84	108.4	N/A
496	133	125	88	112	84	108.4	N/A
497	133	125	88	112	84	108.4	N/A
498	133	124	88	112	84	108.2	N/A
499	133	125	88	112	84	108.4	N/A
500	133	125	88	112	84	108.4	N/A
501	133	124	88	112	84	108.2	N/A
502	133	124	88	112	84	108.2	N/A
503	133	124	88	112	84	108.2	N/A
504	133	124	88	112	84	108.2	N/A
505	133	124	88	112	84	108.2	N/A
506	133	124	88	112	84	108.2	N/A
507	133	123	88	112	83	107.8	N/A
508	133	123	88	112	84	108.0	N/A
509	133	124	88	112	84	108.2	N/A
510	133	123	88	112	84	108.0	N/A
511	134	123	88	112	84	108.2	N/A
512	133	123	88	112	84	108.0	N/A
513	133	123	88	112	83	107.8	N/A
514	133	123	88	112	83	107.8	N/A
515	133	123	87	112	83	107.6	N/A
516	133	123	87	112	83	107.6	N/A
517	133	123	87	112	83	107.6	N/A
518	133	123	87	111	84	107.6	N/A
519	133	122	87	111	83	107.2	N/A
520	133	122	87	111	83	107.2	N/A
521	133	122	87	111	83	107.2	N/A
522	132	122	87	111	83	107.0	N/A
523	133	122	87	111	83	107.2	N/A
524	133	122	87	111	83	107.2	N/A
525	133	122	87	111	83	107.2	N/A
526	133	122	87	111	83	107.2	N/A
527	133	122	87	111	83	107.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
528	133	122	87	111	83	107.2	N/A
529	134	122	87	111	83	107.4	N/A
530	134	122	87	111	83	107.4	N/A
531	134	122	87	111	83	107.4	N/A
532	134	122	87	111	83	107.4	N/A
533	134	122	87	111	83	107.4	N/A
534	134	122	87	111	84	107.6	N/A
535	134	122	87	110	83	107.2	N/A
536	134	122	87	110	84	107.4	N/A
537	134	122	87	110	84	107.4	N/A
538	134	122	87	110	84	107.4	N/A
539	134	121	87	110	84	107.2	N/A
540	134	121	87	110	84	107.2	N/A
541	134	121	87	110	84	107.2	N/A
542	134	121	87	110	84	107.2	N/A
543	134	120	87	110	84	107.0	N/A
544	134	121	87	110	84	107.2	N/A
545	134	121	87	110	84	107.2	N/A
546	134	121	87	110	84	107.2	N/A
547	134	120	87	110	84	107.0	N/A
548	133	120	87	110	84	106.8	N/A
549	133	120	87	110	84	106.8	N/A
550	133	120	87	110	84	106.8	N/A
551	133	120	87	110	84	106.8	N/A
552	133	120	87	110	84	106.8	N/A
553	133	120	87	109	84	106.6	N/A
554	133	120	87	109	84	106.6	N/A
555	133	120	87	109	84	106.6	N/A
556	133	119	87	109	84	106.4	N/A
557	132	119	87	109	84	106.2	N/A
558	132	119	87	109	84	106.2	N/A
559	132	119	87	109	83	106.0	N/A
Average	166	157	100	174	93	138	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Buck Stove
Model: 81
Run #: 3

Job #: 20-592
Tracking #: 0064
Technician: AK
Date: 4/9/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T437	93.6	93.6	94.2	0.6
Train A Filters - Remainder	T438	92.9	186.6	188.4	1.8
	T439	93.7			
Train A Probe	10A	116819.6	116819.6	116820.1	0.5
Train A O-Rings	10A	3429.4	3429.4	3432.4	3.0
Train B Filters	T440	95.8	192.4	197.0	4.6
	T441	96.6			
Train B Probe	10B	117903.6	117903.6	117903.6	0.0
Train B O-Rings	10B	3569.6	3569.6	3570.0	0.4
Background Filter			0.0	0.0	

Placed in Dessicator on:	4/9/2020

Train A Filters - First Hour	94.4	4/13 8:36	94.2	4/15 12:25				
Train A Filters - Remainder	188.5	4/13 8:36	188.4	4/15 12:26				
Train A Probe	116820.0	4/13 8:27	116820.1	4/15 12:18				
Train A O-Rings	3432.3	4/13 8:32	3432.4	4/15 12:23				
Train B Filters	196.9	4/13 8:37	197.0	4/15 12:26				
Train B Probe	117903.7	4/13 8:27	117903.6	4/15 12:18				
Train B O-Rings	3569.9	4/13 8:32	3570.0	4/15 12:23				
Background Filter								

1st hour Sub-Total, mg:	0.6
Remainder Sub-Total, mg:	5.3
Train 1 Aggregate, mg:	**5.9**
Train 2 Aggregate, mg:	**5.0**
Ambient Aggregate, mg:	0.0

ASTM E3053 Wood Heater Run Sheets

Client: Buck Stove Job Number: 20-592 Tracking #: 0064
Model: 81 Run Number: 3 Test Date: 4/9/20

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 10:25
Air Control Setting: Maximum

Time	Notes
0-1:00	Torch Ignition
3:00	Door Closed
40:00	Stirred startup coals
50:00	Loaded high burn
51:00	Closed door, fan set to auto

Test Notes
Test Burn Start Time: 12:12
Air Control Setting: Open 0.05”

Time	Notes
1:00	Test fuel loaded
2:00	Door closed
14:30	Air Set
60:00	Changed filter A

Test Burn End Time: 22:46

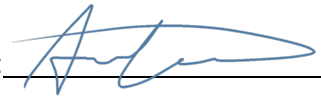
Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 15.53 CO (%): 4.048

Calibration Results:

	Pre Test		Post Test	
	Zero	Span	Zero	Span
Time	10:38	10:40	22:45	22:47
CO_2	0.00	15.53	-0.07	15.60
CO	0.000	4.047	0.020	4.134

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

Technician Signature:  Date: 5/22/2020

ASTM E3053 Wood Heater Run Sheets

Client: Buck Stove Job Number: 20-592 Tracking #: 0064
Model: 81 Run Number: 3 Test Date: 4/9/20

Test Photos

Kindling Fuel Load

High Fire Fuel Load

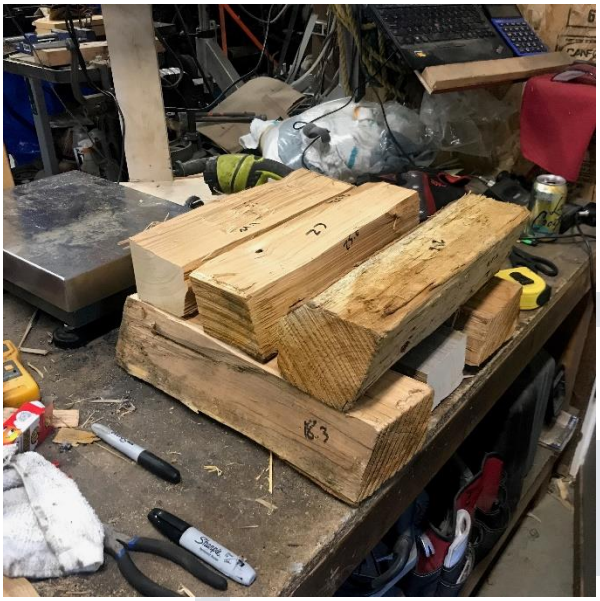
High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Technician Signature: Date: 5/22/2020

ASTM E3053 Wood Heater Run Sheets

Client: Buck Stove Job Number: 20-592 Tracking #: 0064
Model: 81 Run Number: 3 Test Date: 4/9/20



Medium Fire Fuel Load

Medium Fire Fuel Loaded

Technician Signature: Date: 5/22/2020

ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T395	94.4	94.4	-	-	SB	19-529	#2
T396	94.5	94.5	-	-	SB		
T397	94.7	94.6	-	-	SB		
T398	94.7	94.7	-	-	SB		
T399	94.6	94.6	-	-	SB		
T400	93.8	93.7	-	-	SB		
T401	94.6	94.6	-	-	SB	19-524	#3
T402	94.3	94.3	-	-	SB		
T403	93.9	93.9	-	-	SB		
T404	94.5	94.7	-	-	SB		
T405	94.6	94.4	-	-	SB		
T406	96.7	96.7	-	-	SB		
T407	94.5	94.7	-	-	SB		
T408	95.0	94.9	-	-	SB		
T409	94.4	94.2	-	-	SB	20-583	#1
T410	94.8	94.9	-	-	SB		
T411	94.7	94.5	-	-	SB		
T412	94.0	93.9	-	-	SB		

Weight 1 Date/Time:
2/3 - 10:00
Weight 2 Date/Time:
2/4 - 8:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T413	94.7	94.7	-	-	SB	20-583	#1
T414	94.6	94.6	-	-	SB	20-583	#2
T415	96.6	96.4	-	-	SB		
T416	96.9	96.9	-	-	SB		
T417	96.9	96.8	-	-	SB		
T418	97.9	97.9	-	-	SB		
T419	97.3	97.3	-	-	SB	20-583	#3
T420	97.5	97.5	-	-	SB		
T421	96.8	96.7	-	-	SB		
T422	97.2	97.1	-	-	SB		
T423	97.0	96.9	-	-	SB		
T424	96.8	96.7	-	-	SB		
T425	96.4	96.3	-	-	SB	20-592	#1
T426	96.7	96.7	-	-	SB		
T427	94.8	94.8	-	-	SB		
T428	95.3	95.3	-	-	SB		
T429	95.0	95.0	-	-	SB		
T430	94.9	94.9	-	-	SB		

Weight 1 Date/Time:
2/3 - 10:00
Weight 2 Date/Time:
3/26 - 15:00
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T431	~~96.7~~						
T432	96.8	97.0	-	-		20-592	#2
T433	93.5	93.5	-	-			
T434	94.3	94.2	-	-			
T435	93.1	93.3	-	-			
T436	93.5	93.4	-	-			
T437	93.6	93.6	-	-		20-592	#3
T438	92.8	92.6	-	-			
T439	93.7	93.7	-	-			
T440	95.7	95.8	-	-			
T441	96.7	96.6	-	-			
T442	97.0	96.9	-	-		19-471	#1
~~T443~~	~~97.3~~	~~97.3~~	~~-~~	~~-~~			
T444	96.7	96.6	-	-		19-471	
T445	96.9	96.8	-	-			
T446	96.7	96.9	-	-			
T447	96.9	96.9	-	-			
T448	94.2	94.4	-	-			#2

Weight 1 Date/Time:
3/16 - 15:00
Weight 2 Date/Time:
3/20 15:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T449	94.6	94.8	-	-		19-471	#2
T450	94.3	94.3	-	-			~~#1~~ #1
T451	94.1	94.1	-	-			~~#2~~ #2
T452	93.8	93.9	-	-			#2
T453	94.2	94.2	-	-			#2
T454	94.0	14.2	-	-			#2
T455	96.6	96.7	-	-		19-471	#3
T456	97.4	97.5	-	-			#3
T457	96.9	97.0	-	-			#3
T458	97.6	97.4	-	-			#3
T459	96.8	96.9	-	-			#3
T460	96.7	96.6	-	-			#3
T461	96.9	96.9	-	-			#3
T462	96.8	96.8	-	-			#3
T463	94.9	94.7	-	-		20-601	#1
T464	94.7	94.7	-	-			
T465	95.2	15.1	-	-			
T466	95.3	95.3	-	-			

Weight 1 Date/Time:
3/30 15:00
Weight 2 Date/Time:
4/21 16:45
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	3564.3	3564.5	-	-	SB	20-585	sample blank
1B	3553.1	3553.2	-	-	SB		
2A	3550.1	3550.3	-	-	SB	20-585	#1
2B	3569.1	3569.2	-	-	SB		
3A	3577.8	3577.9	-	-	SB	20-585	#2
3B	3565.9	3566.1	-	-	SB		
4A	3621.1	3621.3	-	-	SB	20-585	#3
4B	3578.1	3578.2	-	-	SB		
5A	3533.0	3533.6	3533.8	-	SB	20-583	#1
5B	3529.2	3529.8	3529.8	-	SB		

Weight 1 Date/Time:
2/28 - 8:00

Weight 2 Date/Time:
2/28 - 15:30

Weight 3 Date/Time:
3/26 - 15:00

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A	3613.8	3613.9	3614.0	3614.1	SB	20-583	#2
6B	3393.8	3394.8	3394.3	3394.8	SB		
7A	3571.6	3571.8	3571.9	3571.9	SB	20-583	#3
7B	3520.8	352	3521.3	3521.4	SB		
8A	3550.3		3550.4	3550.5	SB	20-592	#1
8B	3584.1		3584.4	3584.5	SB		
9A	3579.8		3580.1	3580.2	SB	20-592	#2
9B	3522.8		3523.2	3523.2	SB		
10A	3428.5		3429.3	3429.4	SB	20-592	#3
10B	3569.4		3569.6	3569.6	SB		

Weight 1 Date/Time:
3/26 - 15:00

Weight 2 Date/Time:
3/31 - 15:00

Weight 3 Date/Time:
4/2 - 9:00

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	3422.1	3422.3	-	-	[illegible]	19-471	#1
11B	4232.9	4233.1	-	-	[illegible]		
12A	3393.6	3393.8	-	-	[illegible]	19-471	#2
12B	3404.0	3404.1	-	-	[illegible]		
13A	3358.8	3358.9	-	-	[illegible]	19-471	#3
13B	3443.3	3443.5	-	-	[illegible]		
14A	3365.3	3365.5	-	-	[illegible]	20-597	#1
14B	3339.8	3340.0	-	-	[illegible]		
15A	3569.1	3569.0	-	-	[illegible]	20-597	#2
15B	3569.6	3569.7	-	-	[illegible]		

Weight 1 Date/Time:
4/20 17:00

Weight 2 Date/Time:
4/21 16:30

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A	3573.0	3573.1	-	-	[illegible]	20-597	#3
16B	3638.9	3638.8	-	-	[illegible]		
17A	3612.1	3612.2	-	-	[illegible]	20-597	#4
17B	3568.4	3568.5	-	-	[illegible]		
18A	3395.9	3396.1	-	-	[illegible]	20-565	#1
18B	3367.5	3367.7	-	-	[illegible]		
19A	3365.8	3366.0	-	-	[illegible]	20-565	#2
19B	3438.6	3438.8	-	-	[illegible]		
20A	3392.2	3392.4	-	-	[illegible]	20-565	#3
20B	3425.2	3425.4	-	-	[illegible]		

Weight 1 Date/Time:
4/20 17:00

Weight 2 Date/Time:
4/21 16:30

Weight 3 Date/Time:

Weight 4 Date/Time:

ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	115627.7	115627.5	–	–	SB	20-585	sample blank
1B	115900.5	115900.5	–	–	SB		
2A	116239.8	116239.3	116239.5	–	SB	20-585	#1
2B	116329.0	116329.6	116328.8	–	SB		
3A	116074.3	116074.0	116074.1	–	SB	20-585	#2
3B	116339.5	116338.9	116339.1	–	SB		
4A	116183.2	116183.1	–	–	SB	20-585	#3
4B	116366.8	116366.5	116366.7	–	SB		
5A	116767.0	116766.5	116767.0	116766.9	SB	20-583	#1
5B	116874.7	116874.1	116879.9	–	SB		

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A	116543.7	116543.6	–	–		20-583	#2
6B	116118.2	116118.1	–	–			
7A	116739.4	116739.3	–	–		20-583	#3
7B	117286.7	117286.5	–	–			
8A	116829.5	116289.6	–	–		20-592	#1
8B	116826.3	116826.3	–	–			
9A	116713.6	116713.8	–	–		20-592	#2
9B	117919.3	117919.3	–	–			
10A	116819.6	116819.6	–	–		20-592	#3
10B	117903.5	117903.6	–	–			

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	117035.6	117035.8	–	–		19-471	#1
11B	117489.5	117489.7	–	–			
12A	116889.1	116889.3	–	–		19-471	#2
12B	117941.5	117941.7	–	–			
13A	117455.8	117455.9	–	–		19-471	#3
13B	117054.9	117054.9	–	–			
14A	116818.0	116818.0	–	–		20-597	#1
14B	116771.9	116771.8	–	–			
15A	117418.0	117418.0	–	–		20-597	#2
15B	116904.8	116905.0	–	–			

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A	116537.5	116537.3	–	–		20-597	#3
16B	116034.1	116034.0	–	–			
17A	116810.5	116810.5	–	–		20-597	#4
17B	117139.0	117138.9	–	–			
18A	117496.9	117496.5	–	–		20-565	#1
18B	117329.6	117329.5	–	–			
19A	117025.3	117025.1	–	–		20-565	#2
19B	117011.9	117011.7	–	–			
20A	115625.7	115625.5	–	–		20-565	#3
20B	115964.9	115964.7	–	–			

Weight 1 Date/Time:
2/27 - 15:30

Weight 2 Date/Time:
2/28 - 8:00

Weight 3 Date/Time:
2/28 - 15:30

Weight 4 Date/Time:
3/26 - 15:00

Weight 1 Date/Time:
3/26 - 15:00

Weight 2 Date/Time:
3/30 15:30

Weight 3 Date/Time:

Weight 4 Date/Time:

Weight 1 Date/Time:
4/20 17:00

Weight 2 Date/Time:
4/21 16:30

Weight 3 Date/Time:

Weight 4 Date/Time:

Weight 1 Date/Time:
4/22 17:00

Weight 2 Date/Time:
4/24 0830

Weight 3 Date/Time:

Weight 4 Date/Time:

MODEL 81

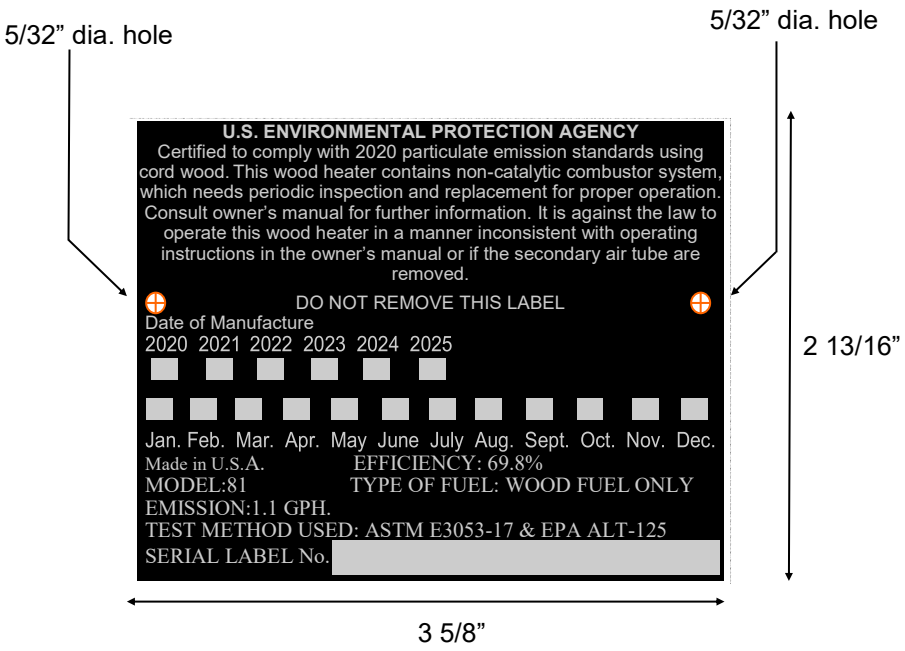
May 2015

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

LISTED FACTORY BUILT OR MASONRY FIREPLACE ACCESSORY/INSERT ROOM HEATERS. SOLID FUEL TYPE. ALSO SUITABLE FOR PERMANENTLY LOCATED MANUFACTURED HOME INSTALLATION PURSUANT TO (HUD 24CFR 3280.709)

PFS® US

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

SERIAL NO.
MODEL: 81
TESTED TO: UL 1482
TYPE OF FUEL: Solid Wood Only

NOTE: This unit may be installed as an insert to a factory-built zero clearance fireplace.

OPTIONAL COMPONENTS: Side shields Rear shield and pipe deflector.

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

Components required for mobile home installation: Outside Air Kit Part # FAP81BOA

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"

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.

WARNING: (PERMANENTLY LOCATED MANUFACTURED HOME) An outside air inlet must be provided for combustion, and be unrestricted while unit is in use. Do not install appliance in a sleeping room. The structural integrity of the mobile home floor, walls and ceiling/roof must be maintained.

Note: Replace glass only with Part # PG2124GL.

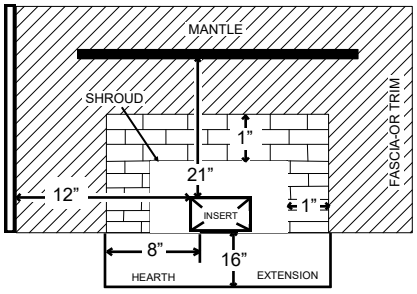
Use only a lined masonry or listed Type HT factory-built chimney.

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

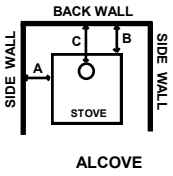
Install insert with a minimum of 12" clearance to combustible sidewall, 1" shroud to side trim and 1" shroud to top trim, 21" from top of insert to mantel or mantel supports. Floor protector must have a R-Value of 1.1 non-combustible material or equivalent, extending 16" in front of fuel door and 8" from each side of fuel door when used in a masonry fireplace. Install only in a masonry fireplace, built to UBC Chapter 37 or a listed factory -built Zero-Clearance fireplace. See owners manual for installation instructions. 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.

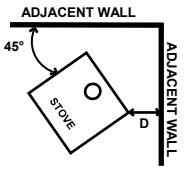
Minimum clearances to
Combustible Materials (in inches)

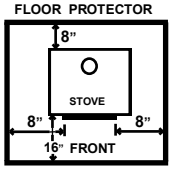


MINIMUM CLEARANCE TO COMBUSTIBLE MATERIALS (in inches)



ALCOVE





For freestanding installation, non-combustible floor protection must be used under the appliance. Extending 16" beyond the front of the fuel door and 8" to each side of the fuel door. With an insulation R-Value of 1.1.

Chimney connector should be 6" diameter minimum 24 gauge blue or black steel and UL 103 HT type chimney system. See instruction manual for further information.

Residential installation, single wall chimney connector no optional shields.

Unit to Sidewall	(A) 23"	Unit corner to diagonal wall	(D) 16"
Unit to backwall	(B) 23"	Chimney connector to ceiling	18"
Flue collar to backwall	(C) 25"		

Mobile home and alcove installation - single wall chimney connector and optional shields.

Unit to sidewall	(A) 12"	Unit corner to diagonal wall	(D) 12"
Unit to backwall	(B) 16"	Chimney connector to ceiling	6"
Flue collar to backwall	(C) 12.5"	Unit top to ceiling	53"

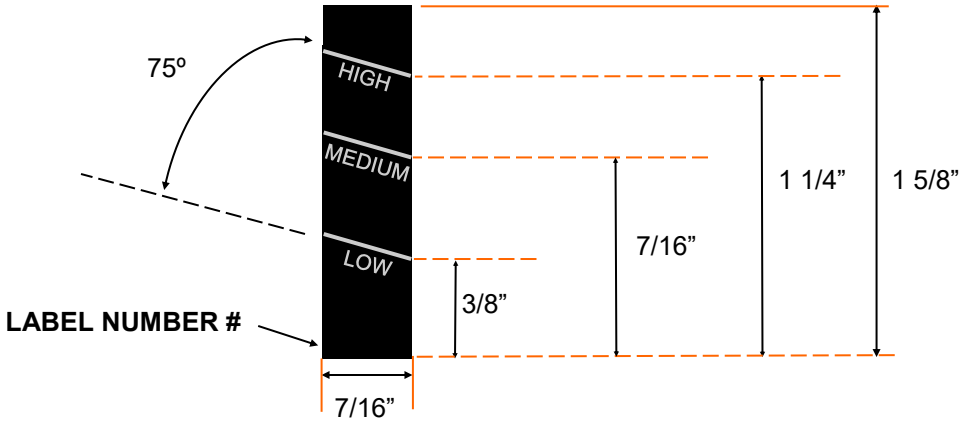
Fireplace insert installation (tested without direct connection to fireplace flue.)

Unit to Sidewall	12"	Unit to top mantle (9" depth)	21"
Shroud to side trim	1"	Shroud to top trim	1"

ADHESIVE BACKING

SILVER LETTERING ON BLACK– (3)SILVER LINES

81 PRIMARY AIR CONTROL ROD DRAFT INDICATOR



PULL AIR CONTROLL ROD ALL WAY OUT. **LOOKING DOWN** PLACE INDICATOR LABEL WITH WORDING “**HIGH**” UP TO EDGE HEARTH TRIM.

Manufactured by NEW BUCK CORPORATION Model 81

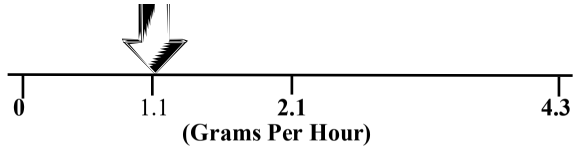
U. S. ENVIRONMENTAL PROTECTION AGENCY

NON-CATALYST

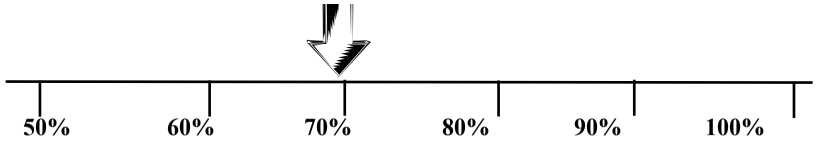
MEETS EPA PARTICULATE MATTER (Smoke) CONTROL REQUIREMENTS FOR NON-CATALYTIC WOOD HEATERS BUILT ON OR AFTER May 15, 2020. SEE OWNERS MANUAL FOR OPERATION AND MAINTENANCE.

SMOKE

This Model



EFFICIENCY



Wood heaters with higher efficiencies cost less to operate.

HEAT OUTPUT
13,800 TO 59,500 BTU/HR

Use this to choose the right size appliance for your needs.
ASK DEALER FOR HELP.
This wood heater will achieve low smoke output and high efficiency if properly operated and maintained. See owners manual.

Manufactured by NEW BUCK CORPORATION Model 81

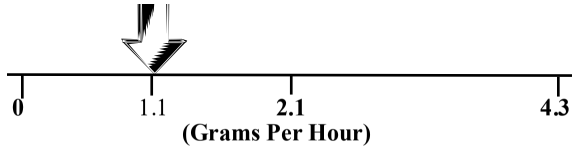
U. S. ENVIRONMENTAL PROTECTION AGENCY

NON-CATALYST

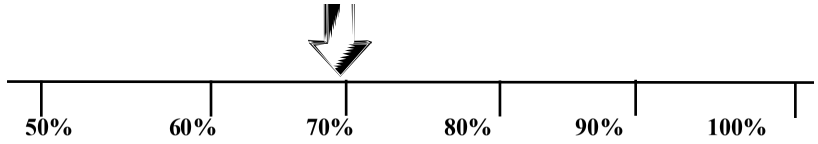
MEETS EPA PARTICULATE MATTER (Smoke) CONTROL REQUIREMENTS FOR NON-CATALYTIC WOOD HEATERS BUILT ON OR AFTER May 15, 2020. SEE OWNERS MANUAL FOR OPERATION AND MAINTENANCE.

SMOKE

This Model



EFFICIENCY



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HEAT OUTPUT
13,800 TO 59,500 BTU/HR

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This wood heater will achieve low smoke output and high efficiency if properly operated and maintained. See owners manual.

MODEL 81
NON-CATALYTIC UNIT

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.

TESTED AND LISTED BY: PFS® US PFS/TECO, COTTAGE GROVE, WI

MANUFACTURED BY NEW BUCK CORPORATION
200 ETHAN ALLEN DRIVE
P.O. BOX 69
SPRUCE PINE, N.C. 28777
www.buckstove.com

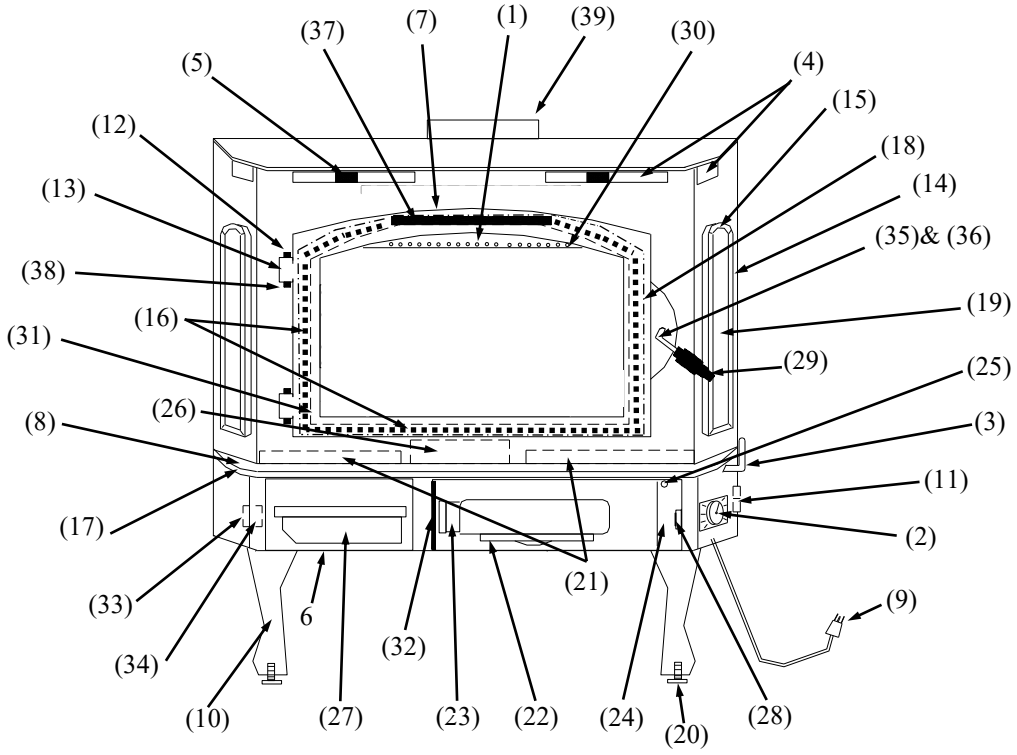
Revised May 2020

TABLE OF CONTENTS

EPA COMPLIANCE STATUS

This manual describes installation and operation of the **New Buck Corporation Model 81** wood heater. This heater meets the U.S. Environmental Protection Agency's Emission limits for wood heaters sold after May, 15 2020. Under specific test conditions, this heater has been shown to deliver heat at rates ranging from approximately 13,800 to 59,500 BTU/hr. A weighted average was used to calculate the overall efficiency across all of the burn rate categories using the higher heating value (HHV 69.8%).

MODEL 81 WOOD STOVE



1. Secondary air tubes
2. Blower control (rheostat)
3. Primary air control
4. Warm air outlets
5. Baffles (interior of stove)
6. Air inlet
7. Door
8. Hearth extension
9. Power cord
10. Legs
11. Automatic/off/man. switch
12. Brass cap
13. Hinge Block
14. Brass overlays
15. Brass overlay mounting screws
16. Glass clips
17. Hearth Brass
18. Door Gasket
19. Side glass
20. Leveling screws
21. Firebrick
22. Motor
23. Motor mount bracket
24. Cover Door
25. Cover door screws
26. Shot gun air box
27. Ash pan
28. Disc thermostat
29. Door handle & brass spring handle
30. Air wash screen
31. Glass gasket
32. Cover door hinge
33. Magnet holder
34. Cover door Magnet
35. Door latch
36. Door latch screw
37. Top Baffle Board
38. Hinge pins
39. 6" Flue exit

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS MODEL 81

BEFORE INSTALLING YOUR NEW BUCK STOVE,
READ THE ENTIRE INSTRUCTION MANUAL

IMPORTANT INSTRUCTIONS

WARNING

THIS UNIT GENERATES HIGH HEAT, SO TREAT IT WITH CARE. **HOT WHILE IN OPERATION**. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE. DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS. DO NOT CONNECT TO ANY DISTRIBUTION DUCT OR SYSTEM. READ ALL INSTRUCTIONS BEFORE INSTALLING AND USING THE APPLIANCE. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH. SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCES.

- The New Buck Corp. non-catalytic Model 81 has been tested to UL 1482 Standards and listed by PFS/TECO. Standard for Room Heaters, Solid Fuel Type.
- Install and operate your unit according to instructions provided in this manual. Local building codes may apply; therefore, contact your local building inspector for necessary installation requirements and permits which may go beyond these instructions. Contact your insurance company for coverage and installation inspection.
- **DO NOT INSTALL IN SLEEPING ROOMS.**
- **NOTE: When burning any unit or appliance that combusts fuel for heat, such as coal, oil, wood or natural and (L.P.) liquid petroleum gas. Correctly place monitors in those areas that are expected to produce Carbon Monoxide (CO). Consult with your local fire safety officials to learn more**
- Examine the masonry fireplace and chimney prior to installation of fireplace accessory to determine that construction meets the minimum fireplace construction requirements illustrated in the instructions. Make sure that it is free from cracks, loose mortar, creosote deposits and other blockage, or other signs of deterioration.

CAUTION

DO NOT USE MORE THAN ONE STOVE TO A CHIMNEY. DO NOT USE A FLUE INTENDED FOR A GAS APPLIANCE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

- A factory-built pre-fabricated chimney may be used for your units when installed in compliance with manufacturer's specification and uniform building code.

CAUTION

YOUR CHIMNEY MUST BE CORRECTLY SIZED. A CHIMNEY THAT IS TOO SMALL OR LARGE IN DIAMETER, OR TOO SHORT, CAN CAUSE YOUR STOVE TO SPILL SMOKE WHEN THE DOOR IS OPENED.

SECTION I

INTRODUCTION

Your new MODEL 81 is a non-catalytic unit designed to meet the most stringent emissions standards without the use of a catalytic combustor. This effect is achieved through the use of a secondary air which is mixed with primary air in unit's firebox.

For peak performance, we suggest the use of natural seasoned hard wood, loading wood from front to rear.

NOTE: Soft woods such as pine, create more creosote, clogging of chimney and produce a less efficient burn performance.

You should not burn trash or garbage, artificial or paper logs, gift wrapping, treated or painted wood or any type of coal or flammable fluids.

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

The primary air, which is controlled by the user, burns the wood. Secondary air is admitted into firebox through secondary air tubes at top of firebox. This secondary air burns impurities in smoke released from the initial wood burning. The temperature necessary for this combustion is maintained through the firebrick refractory. If any more technical information is necessary, contact your local dealer.

This heater is equipped with a standard room air blower. For operation and use of these electrical assemblies, see instructions provided in this manual starting on page 37.

*Model 81: Motor Assembly—MA 910714

SECTION II

MASONRY INSERT INSTALLATION

The Model 81 may be installed using an all masonry fireplace built in accordance with the Uniform Building Code and National Fire Protection Association (NFPA). The first step in this type of installation is to determine acceptability of fireplace and chimney for use with a woodstove. Both construction and condition of fireplace are important considerations when installing a woodstove. The chimney should extend at least 3' above roof and at least 2' above any point of roof within 10'. (See Page 6 Figure 4).

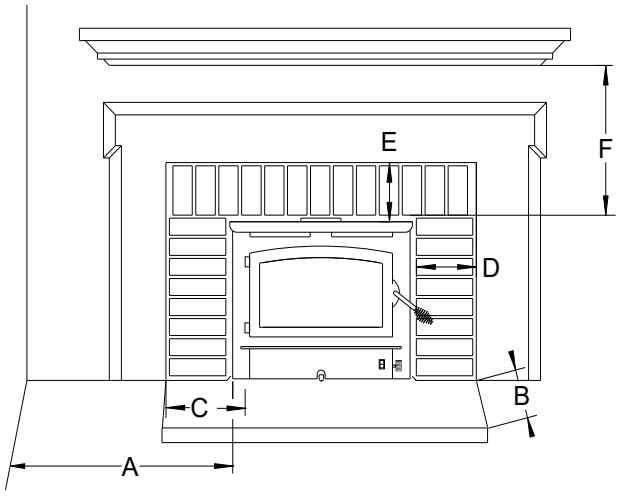
CAUTION

REMEMBER TO HAVE YOUR CHIMNEY INSPECTED FOR LEAKS AND BLOCKAGE BEFORE YOU INSTALL YOUR STOVE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

MINIMUM CLEARANCE MASONRY INSERT

MODEL 81

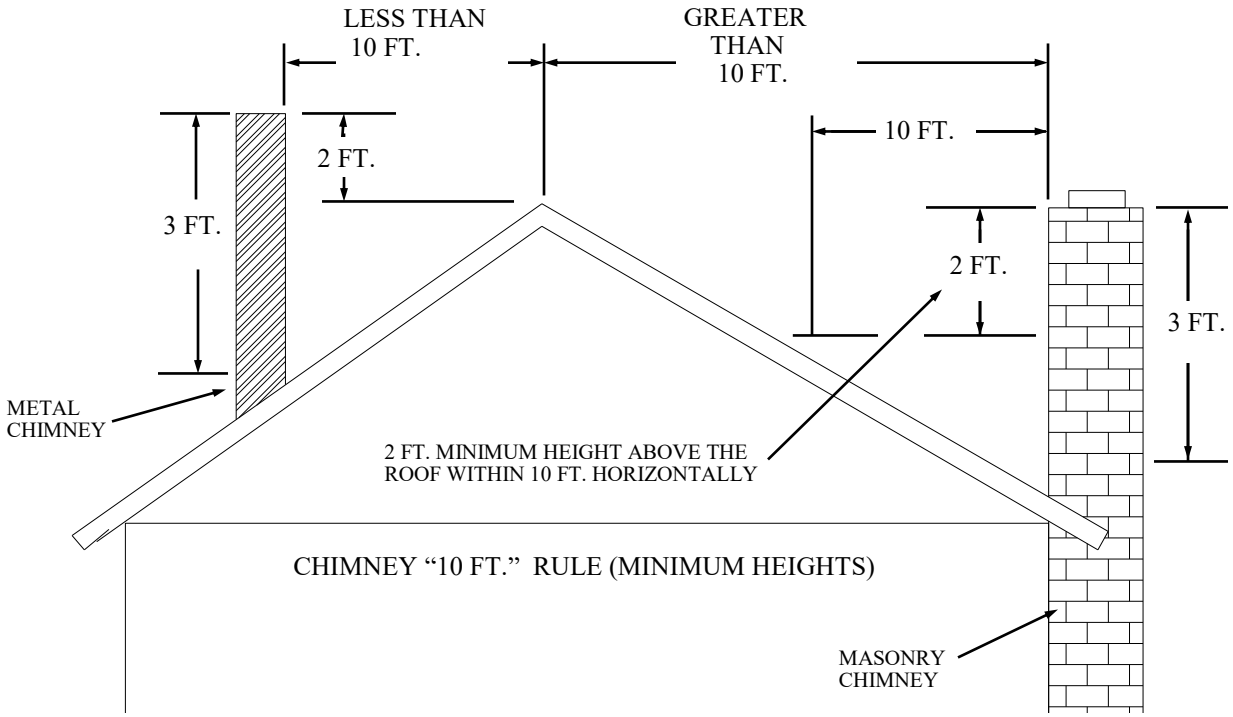
A. Side Wall Combustible	12"
B. Front Floor Protector	16"
C. Side Floor Protector	8"
D. Side Wood Trim	7"
E. Top Wood Trim	10"
F. Mantel or Brackets	21"



1. The hearth must be of masonry construction and must extend a minimum of 16" in front of firebox opening and a minimum of 8" to either side of firebox opening.

2. If there is not minimum hearth protection from front of firebox opening and front of masonry hearth, a floor protector must be used in front of hearth to protect combustible materials. The floor protector must have a minimum R-Value of 1.1 non-combustible material.(See Page 7).

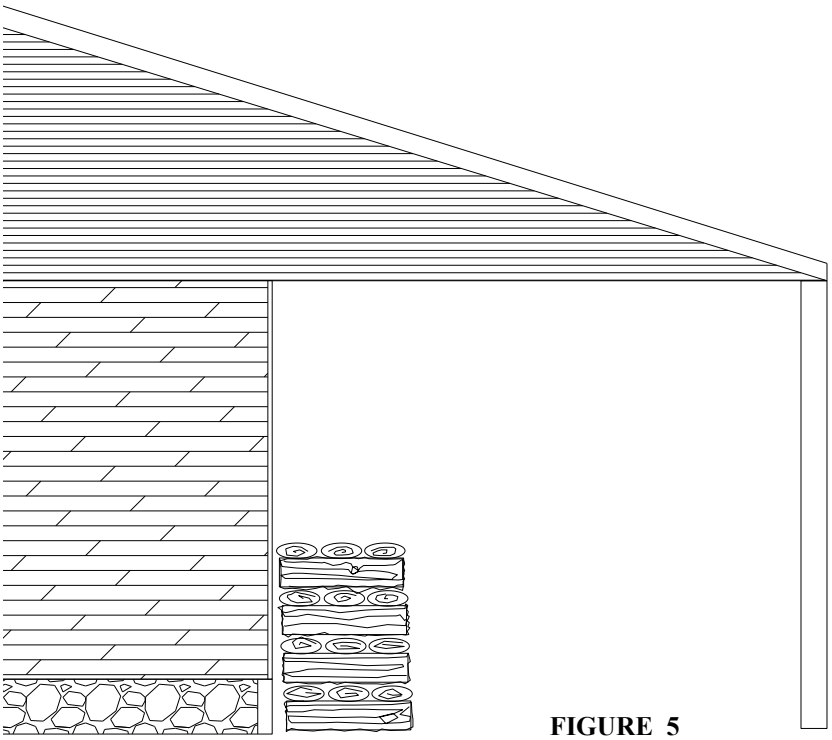
CHIMNEY HEIGHTS



NOTE: MINIMUM CHIMNEY HEIGHT 15 FT.

FIGURE 4

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.

FIGURE 5

MINIMUM CLEARANCES

Floor Protection:

When installing a heater, a floor protector must be used. Floor protector must have a minimum of 1.1 R-Value non-combustible material.

How to use alternate materials and how to calculate equivalent thickness

Most people have heard of R-Values, which are used for rating common building materials such as fiberglass insulation and glass. However, many texts which cover stoves and fireplaces use K -Values instead of R-Values. Although the two are somewhat related, there are differences.

R-Value: The higher the R-Value, the better the insulating properties of the subject materials. R -Values are most often used to express the thermal resistance (ability to stop heat flow) of a building wall, ceiling or floor. Because of this, most R-Values are calculated at normal temperatures of approx. 75 F. R-Values are easy to add together so calculating the total R-Value of a wall is simply done by adding the values for the sheetrock, insulation, sheathing and siding.

K-value is a measure of heat conductivity of a particular material. Specifically, it is the measure of the amount of heat, in BTUs per hour, that will be transmitted through one square foot of material that is one inch thick to cause a temperature change of one degree Fahrenheit from one side of the material to the other. The lower the K-value for a material, the better it insulates. If the K-value of the material is known, the R-value per inch can be determined by dividing 1 by the K-value (R-value per inch = 1/K value). The LOWER a K-Value, the better its performance as an insulator.

R or K values have nothing to do with whether a material is flame proof, flame resistant or combustible. Styrofoam, cork, wood and polyester are just some examples of materials which are good insulators but will burn or smoke dangerously when exposed to excess heat.

Technical - For those who desire to calculate their own K or R values, please use the following formulas:

1. R value can be calculated by dividing the thickness by the K value.

For US calculations, we use inches as the unit of measurement.
“In the inch-pound units, thermal resistance is measured in degrees F times square feet of area times hours of time per Btus of heat flow.”
R-value = thickness / K-value

2. K value is the inverse of the R-Value. If one is known, the other can be calculated.
“units of Btu-inch/hour per square foot per degree F”
Thickness/k value = R value

or:

Divide the inches of thickness by R.
k= inches of thickness / R

Common K and R Values Chart				
Material	K value	R Value	| inches-K value .84	| inches-R value of 1
per inch				
Micore 300*	0.43	2.33	0.5	0.43
Wonderboard (ce	1.92	0.52	2.3	1.92
Common Brick	5	0.2	6	5
Cement Mortar	5	0.2	6	5
Ceramic Tile	12.5	0.08	14.9	12.5
Marble	11	0.09	13.1	11
Air Space (ventila	0.7	1.43	0.8	0.7
sand and gravel	1.7	0.59	2	1.7
Drywall (gypsum)	1	1	1.2	1
Rockwool or Fiber	0.3	3.33	0.4	0.3
Units	K per unit	R per unit		
per unit				
8" Concrete Block	1	1		
Glass Block - 4"	2	0.5		
* These materials or equiv are some of the bext to use for relatively thin hearth protection				

K-Value Example: A wood stove may call for a floor which has a K factor of 1 or less. A product such as Micore 300 Board from USG has a K-Value of approx .43 per inch. Therefore a 1/2" thickness of this board would have a K-Value of .86, which meets the requirement of our example stove.

R-Value Example: A stove or fireplace may call for an floor with an R-Value of 1.5. The same board above is rated as having an R-Value of 2.33 for a one inch thickness. Therefore, 3/4" of the Micore 300 Board would meet the specifications for this stove.

Summary: R and K values are related, but K is the value commonly used for specifying materials for use with stoves and fireplaces. Be sure that your choice of insulating material for high temperature applications is noncombustible.

With K values, the lower value is a better insulator. With R Values, the highest number is better.

For low profile hearths, it is best to use manufactured materials such as Micore and Cement Board (Durock, Wonderboard, etc.) as these will allow hearth thicknesses of from 1/4" to 2" with most stoves and fireplaces. Most other common building materials will require at least 3" of thickness and usually much more.

Example of Hearth Calculations - this is for a Hearth requirement of approx R=1.15 (figures taken from Ceramic Tile manufacturers trade association)

The assembly that we will evaluate is a 3/8" layer of Micore 230 and a layer of ½" Util-A-Crete. The first step is to convert the k values of the materials in question into R so that we may add them up and determine if they will provide the necessary insulation value required by the manufacturer.

Micore 230 has a k value of .43 so –

1 divided by k = 2.32 times the thickness .375 (3/8") = 0.87

Util-A-Crete (cement tile backer board) has a k value of 1.6 so – 1 divided by k = .625 times the thickness .5 (1/2") = 0.3125

Add the values together 0.87 plus 0.3125 = 1.1825 This R- value is an acceptable assembly.

What if we decide to use only one material? In this example, only Util-A-Crete cement board?

We could use the published R-Value of Util-A-Crete which is .31 in the ½" material and add them up to the value of the minimum required which is R=1.16

1.16 divided by .31 = 3.74 This assembly would require 3.74 layers of ½" Util-A-Crete to reach the necessary R-value required. Obviously, you would have to round up to the next layer, which would mean that you would have two inches of Util-A-Crete.

NEW BUCK CORPORATION HIGHLY RECOMMENDS A PROFESSIONAL INSTALLER TO INSTALL YOUR UNIT. PLEASE CONTACT YOUR DEALER

POSSIBLE TOOLS NEEDED FOR INSTALLATION

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^{o} F- 600^{o} F
7/32" drill bit and drill
Socket/Ratchet Set

INSTALLATION PREPARATION

Fireplace:

1. Relocate furniture and other materials away from front of fireplace to allow free access to fireplace.
2. Cover hearth and adjacent floor areas with a drop cloths to protect from soiling or marring surface.
3. Remove existing fireplace damper plate.
4. Thoroughly clean fireplace of ashes and soot.
5. Check chimney and smoke chamber for excessive buildup of creosote or soot. Also, check for obstructions, such as birds nests. If chimney is excessively dirty, clean it or have someone clean it professionally BEFORE installing or using room heater.
6. 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.

MASONRY INSERT INSTALLATION OPTIONS

This unit (appliance) 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 unit and notify your insurance company before proceeding with installation.

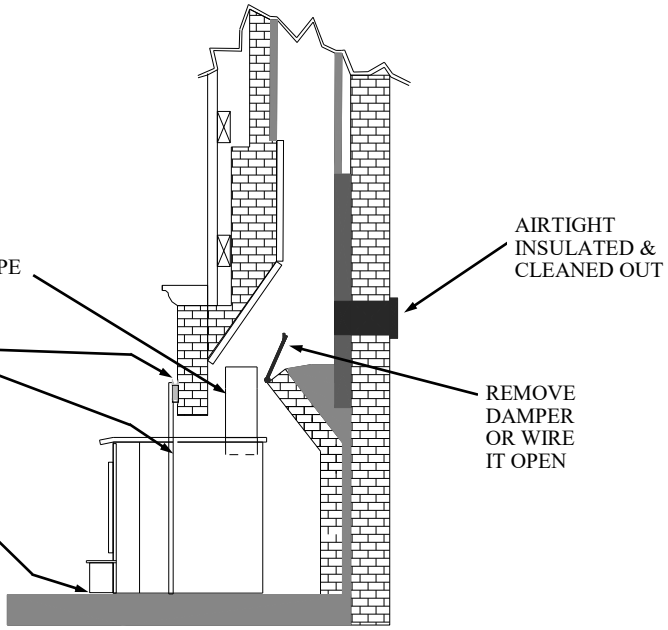
In cases, such as improperly drawing fireplaces, oversize flue liners are needed to meet codes in certain areas it is recommended that one of the flowing procedures be followed:

A. A **Chimney Connector** can be installed from appliance flue exit through damper, plus a air-tight face seal. (See Page 11, Figure 5, Option (A).
B. A listed **Direct Connect** can be installed from appliance flue exit through damper, into first section of flue liner with air-tight seal. (See Page 11, Figure 6, Option (B).
C. A **Positive Connect** can be installed from appliance flue exit continuing up through entire chimney and exiting at top of chimney. (See Page 11, Figure 7, Option (C).

⚠ 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

FIGURE 5, OPTION (A)



NOTE: New Buck Corporation grants no warranty, implied or stated, for the installation or maintenance of your appliance, and assumes no responsibility of any consequential damage (s).

FIGURE 6, OPTION (B)

NOTE: Follow installation instruction with Direct Connection Kit. (Kit sold separately)

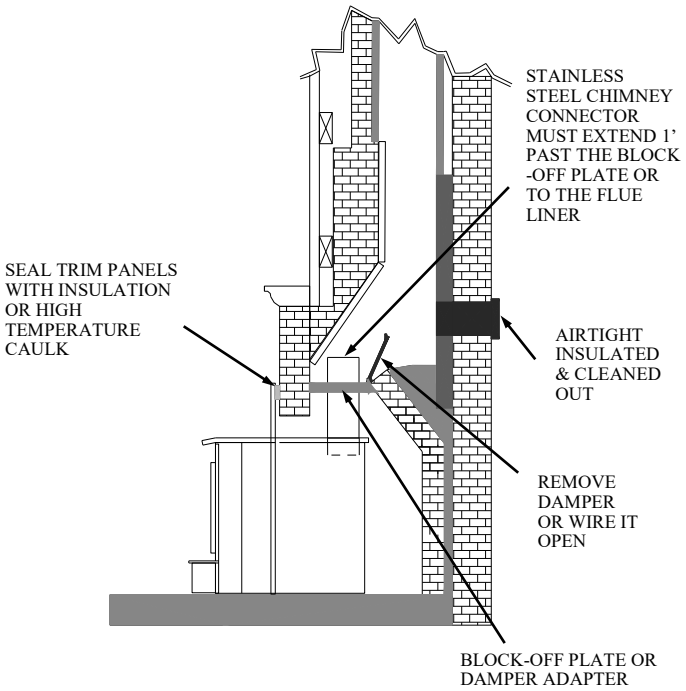
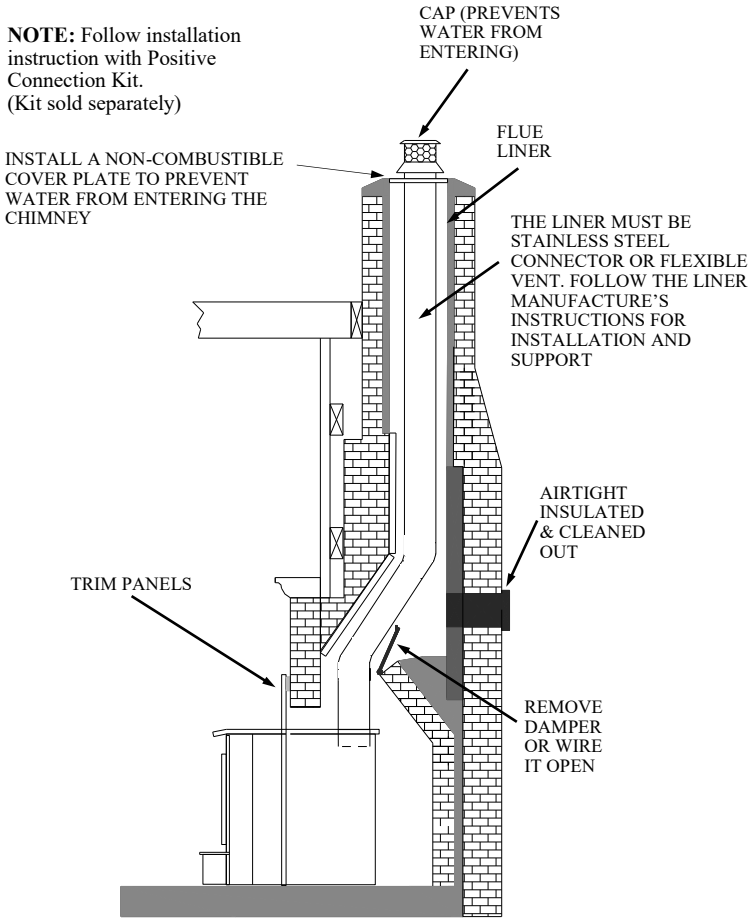


FIGURE 7, OPTION (C)

NOTE: Follow installation instruction with Positive Connection Kit. (Kit sold separately)



INSTALLATION PROCEDURE

Follow installation procedures on direct connect or positive connect kit you are using and install heater connect kit in fireplace.

MOUNTING TRIM PANELS

Mark mounting position of trim panels as follows:

1. Center stove in fireplace opening.

2. Place side trim panels flat against face of fireplace. Mark front edge of trim panel with a pencil to make a vertical reference line. (See Figure 9).

3. Place top (long) trim panel on top of unit. The panel should be flat against the outside face of fireplace and standing vertically. Mark along lower edge of trim panel with a pencil to make a reference line for mounting.

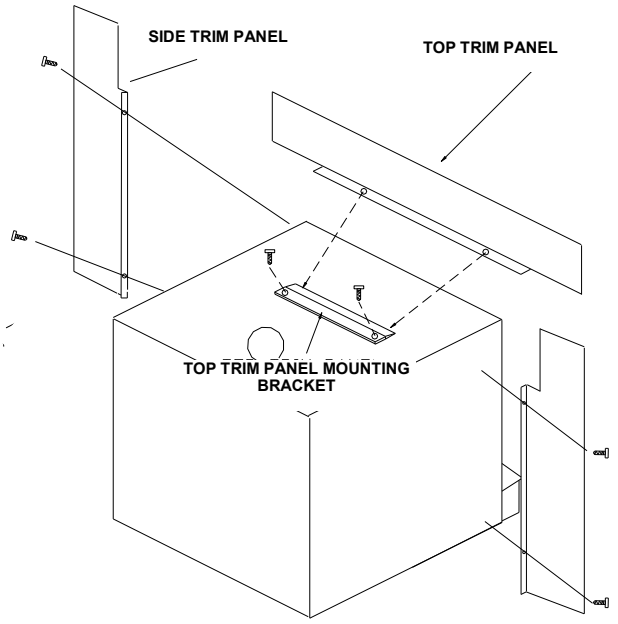


FIGURE 9

4. Slide unit out of fireplace far enough to work behind trim panel reference lines.

5. Mount side trim panels. (See Figure 9).
   a. Position side trim panel on reference line.
   b. Drill mounting holes in center of side trim panel mounting brackets to allow for adjustment in and out if necessary.
   c. Mount trim panel using self-tapping screws provided.

6. Place top trim panel on reference mark, be sure the panel sits in front of the side trim panels. Place the top trim panel mounting bracket (supplied) behind the top trim (See Figure 9). Position so the rear lip of top trim panel overlaps the mounting bracket. Drill mounting holes in top of stove using holes in bracket as guide. Tighten with self-tapping screws provided.

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 reposition in slot.

8. After you get the panels in the correct position. Slide unit back into fireplace and set top trim panel aside and finish hooking up the pipe to the top of the unit.

9. Reinstall top trim panel by sliding rear lip of top trim panel underneath front lip of mounting bracket already secured to top of unit.

10. Obtain outer black trim kit provided with insert kit and slip over top and sides of trim panels. (See Figure 10).

11. Using insulation provided, peel and stick to back of panels overlapping fireplace dimensions by 1" on each side and top. (See Figure 11).

12. Next using high heat silicone or furnace cement run heavy bead of caulking around where panels meet the stove. (See Figure 11).

13. Using the bar, lift stove up in front. Place insulation across front and surface of hearth or bottom of fireplace to make complete seal.

14. 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.

FIGURE 10

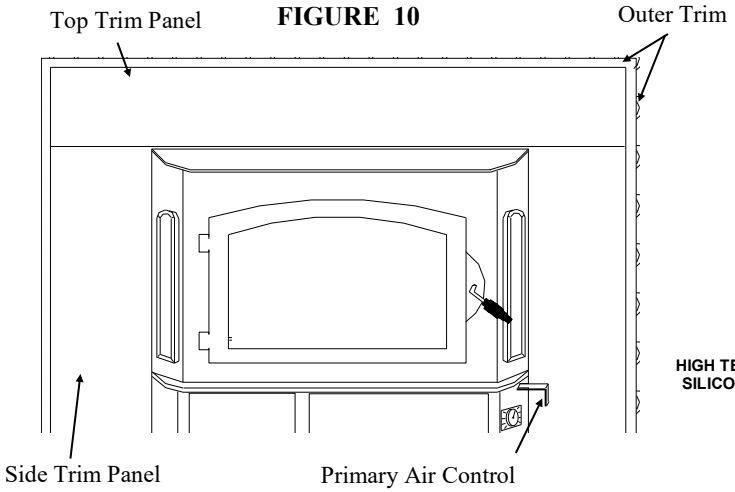
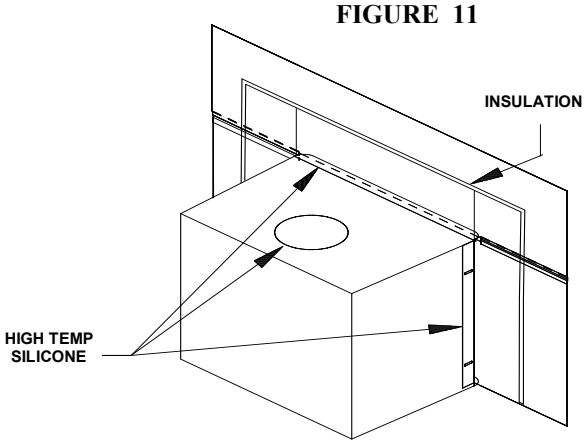


FIGURE 11



FINAL CHECK

1. Recheck specified clearances.

2. Remove all foreign material from firebox area.

3. Primary Air Control: The primary air intake draft control is located at right bottom side of hearth. It is operated by moving handle **OUT** to open (to allow air into the firebox) or **IN** to control or close off air into firebox. (See Figure 10).

4. Plug power cord into a 115V AC outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

5. Place crumpled pieces of newspaper in stove. Light it and close door. Ensure that stove draws properly through primary draft.

6. Check for smoke leaks around door.

7. Open door 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 pre-heated 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.

CAUTION

THE UNIT IS PAINTED WITH A SPECIALLY FORMULATED HIGH TEMPERATURE PAINT THAT CURES DURING THE FIRST TWO OR THREE FIRINGS. 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 THE UNIT WILL ALLOW THESE FUMES TO ESCAPE. DO NOT BUILD A LARGE, ROARING FIRE UNTIL THIS CURING IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.

The connector and/or chimney should be inspected at least once a month during heating season to determine if a creosote buildup has occurred.

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 AND WILL EXPLODE! DON'T TAKE A CHANCE WITH THE SAFETY OF YOUR HOME AND FAMILY.

SECTION III
PRE-FAB INSERT INSTALLATION

The Model 81 may be installed into any UL listed pre-fabricated fireplace that is large enough to accept it.

NOTE: When installing Model 81 into a Pre-Fab Zero-Clearance fireplace, a UL-1777 LINER must be installed the Full Length of chimney and attached to flue exit of insert.

NOTE: The ash lip, smoke baffle and smoke shelf of pre-fab fireplace may be removed if necessary to provide room for these models. Any other alteration to unit will void ALL New Buck Corporation responsibility and liability. The warning label below must be attached to back of fireplace.

NOTE: Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

NOTE: DO NOT BLOCK ANY EXISTING LOUVERS OR VENTS ON EXISTING PRE-FAB WITH ANY TRIM PANELS FOR MODEL 81.

Except for "notes" above, please follow instruction of masonry installation, Section II.

WARNING: This fireplace must be restored to it's original condition for safe use if the fireplace insert is removed.

SECTION IV
RESIDENTIAL FREESTANDING INSTALLATION

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

PREPARING STOVE FOR INSTALLATION

1. Inspect unit for any obvious physical damage.
2. Plug power cord into a 115V AC outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.
3. Check primary air draft control to ensure that it slides freely. Primary air control located on right side of stove under hearth (See Figure 12).
4. Remove the manual bag and items from within firebox. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.
5. **(Leg Kit):** If legs are to be used, obtain four legs, attach legs to holes in bottom of unit with bolts and washers supplied with leg kit. (See Figure 12).
6. **(Pedestal Kit):** If pedestal kit is being used an outside air is required for residential freestanding installation (page 25 Out Side Air Installation). Open freestanding kit and obtain stand. Place stand against bottom of heater (angle side to heater). Center stand front to rear and also center stand left and right. Mark screw locations with pen or pencil on bottom of stove through outer holes of stand mounting angles. Set stand aside and drill four 7/32" holes in heater bottom. Then mount stand to bottom of heater with screws provided. (See Figure 13).
7. Obtain four (4) 3/16" self-tapping screws and secure stand to heater.
8. Reposition heater to upright position.

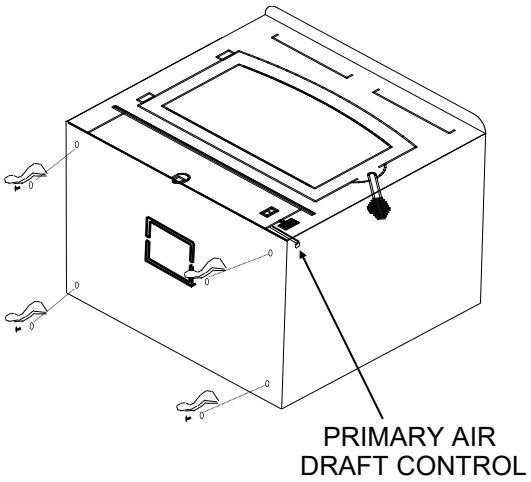


FIGURE 12

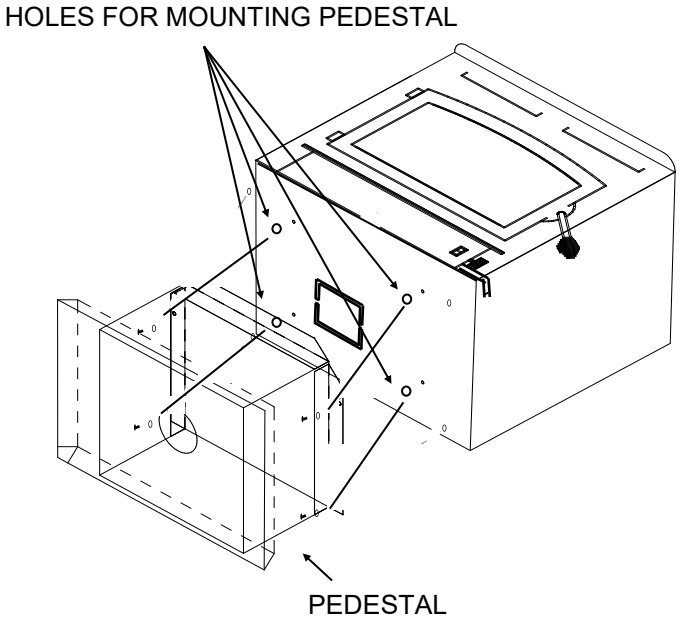


FIGURE 13

MINIMUM CLEARANCES

Floor Protection:

When installing a heater, a floor protector must be used. Floor protector must have a minimum of 1.1 R-Value non-combustible material.

How to use alternate materials and how to calculate equivalent thickness

Most people have heard of R-Values, which are used for rating common building materials such as fiberglass insulation and glass. However, many texts which cover stoves and fireplaces use K -Values instead of R-Values. Although the two are somewhat related, there are differences.

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R or K values have nothing to do with whether a material is flame proof, flame resistant or combustible. Styrofoam, cork, wood and polyester are just some examples of materials which are good insulators but will burn or smoke dangerously when exposed to excess heat.

Technical - For those who desire to calculate their own K or R values, please use the following formulas:

1. R value can be calculated by dividing the thickness by the K value.

For US calculations, we use inches as the unit of measurement.
“In the inch-pound units, thermal resistance is measured in degrees F times square feet of area times hours of time per Btus of heat flow.”
R-value = thickness / K-value

2. K value is the inverse of the R-Value. If one is known, the other can be calculated.
“units of Btu-inch/hour per square foot per degree F”
Thickness/k value = R value

or:

Divide the inches of thickness by R.
k= inches of thickness / R

Common K and R Values Chart				
Material	K value	R Value	| inches-K value .84	| inches-R value of 1
per inch				
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Marble	11	0.09	13.1	11
Air Space (ventila	0.7	1.43	0.8	0.7
sand and gravel	1.7	0.59	2	1.7
Drywall (gypsum)	1	1	1.2	1
Rockwool or Fiber	0.3	3.33	0.4	0.3
Units	K per unit	R per unit		
per unit				
8" Concrete Block	1	1		
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K-Value Example: A wood stove may call for a floor which has a K factor of 1 or less. A product such as Micore 300 Board from USG has a K-Value of approx .43 per inch. Therefore a 1/2" thickness of this board would have a K-Value of .86, which meets the requirement of our example stove.

R-Value Example: A stove or fireplace may call for an floor with an R-Value of 1.5. The same board above is rated as having an R-Value of 2.33 for a one inch thickness. Therefore, 3/4" of the Micore 300 Board would meet the specifications for this stove.

Summary: R and K values are related, but K is the value commonly used for specifying materials for use with stoves and fireplaces. Be sure that your choice of insulating material for high temperature applications is noncombustible.

With K values, the lower value is a better insulator. With R Values, the highest number is better.

For low profile hearths, it is best to use manufactured materials such as Micore and Cement Board (Durock, Wonderboard, etc.) as these will allow hearth thicknesses of from 1/4" to 2" with most stoves and fireplaces. Most other common building materials will require at least 3" of thickness and usually much more.

Example of Hearth Calculations - this is for a Hearth requirement of approx R=1.15 (figures taken from Ceramic Tile manufacturers trade association)

The assembly that we will evaluate is a 3/8" layer of Micore 230 and a layer of ½" Util-A-Crete. The first step is to convert the k values of the materials in question into R so that we may add them up and determine if they will provide the necessary insulation value required by the manufacturer.

Micore 230 has a k value of .43 so –

1 divided by k = 2.32 times the thickness .375 (3/8") = 0.87

Util-A-Crete (cement tile backer board) has a k value of 1.6 so – 1 divided by k = .625 times the thickness .5 (1/2") = 0.3125

Add the values together 0.87 plus 0.3125 = 1.1825 This R- value is an acceptable assembly.

What if we decide to use only one material? In this example, only Util-A-Crete cement board?

We could use the published R-Value of Util-A-Crete which is .31 in the ½" material and add them up to the value of the minimum required which is R=1.16

1.16 divided by .31 = 3.74 This assembly would require 3.74 layers of ½" Util-A-Crete to reach the necessary R-value required. Obviously, you would have to round up to the next layer, which would mean that you would have two inches of Util-A-Crete.

Chimney

This model is designed for connection to any listed 2100º UL103 HT chimneys and parts. Follow chimneys manufacturer's instructions carefully.

NOTE: This Room Heater must be connected to either two options:

1. A chimney complying with requirements for Type HT chimneys in Standard for Safety Factory-Built Chimneys For Residential Type and Building Heating Appliances, UL 103.

2. A code approved masonry chimney with a flue liner.

CAUTION

SPECIAL METHODS ARE REQUIRED WHEN PASSING THROUGH A WALL OR CEILING. SEE INSTRUCTIONS AND BUILDING CODES. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

DETERMINING CHIMNEY LOCATION

A. Ceiling Exits: **(Using 6" Single Wall Pipe and UL 103 HT type chimney system listed with manufacturer in this section of manual).**

1. Suspend a plumb bob from ceiling above unit so weight is hanging in 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. (See Figure 14).

2. After locating center of hole, install ceiling support box, chimney, flashing and rain cap, per chimney manufacturer's instructions.

3. Now connect stove and ceiling support box using #24 ga. minimum blue or black steel connector pipe. **(DO NOT USE GALVANIZED PIPE).** Connect each section so crimped end faces downward and secure each section to each other using at least three (3) sheet metal screws or rivets. Next, install an optional New Buck Corporation chimney connector to flue exit of heater. (See Figure 14).

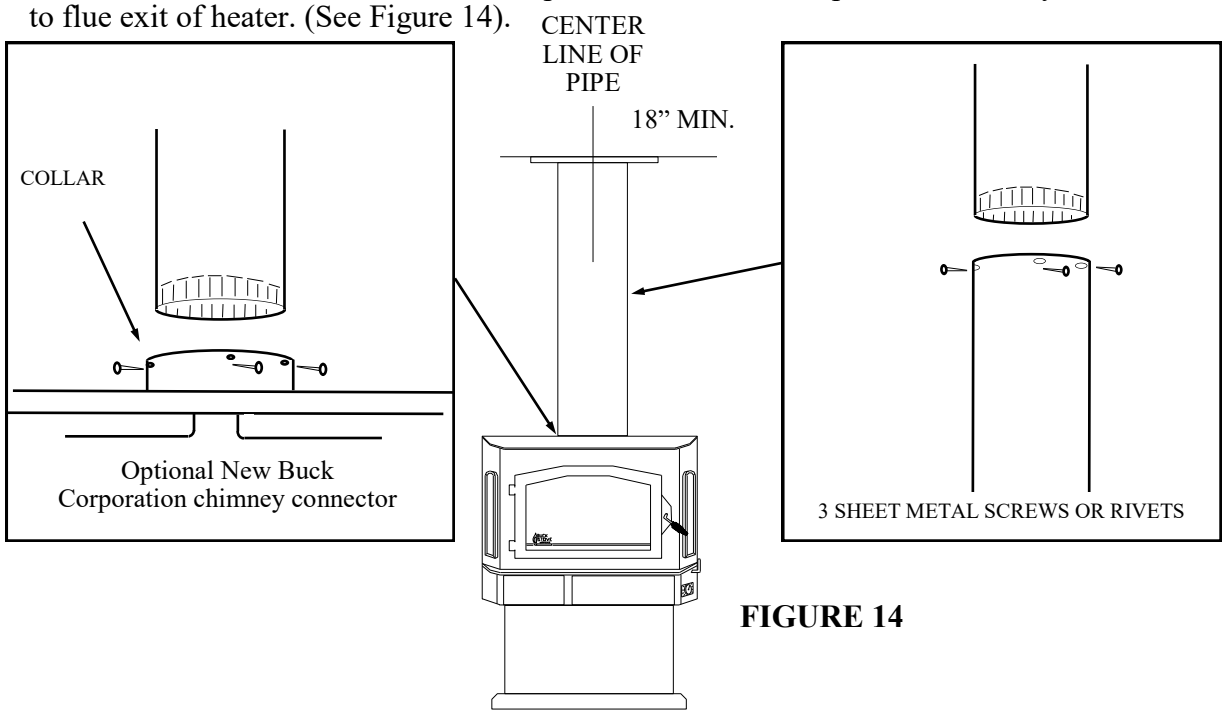


FIGURE 14

B. Wall Exit Into Metal Tee-Box

1. Mark the plumb line on wall directly behind center of heater. (See Figure 15). Floor protector must be under horizontal pipe exit.

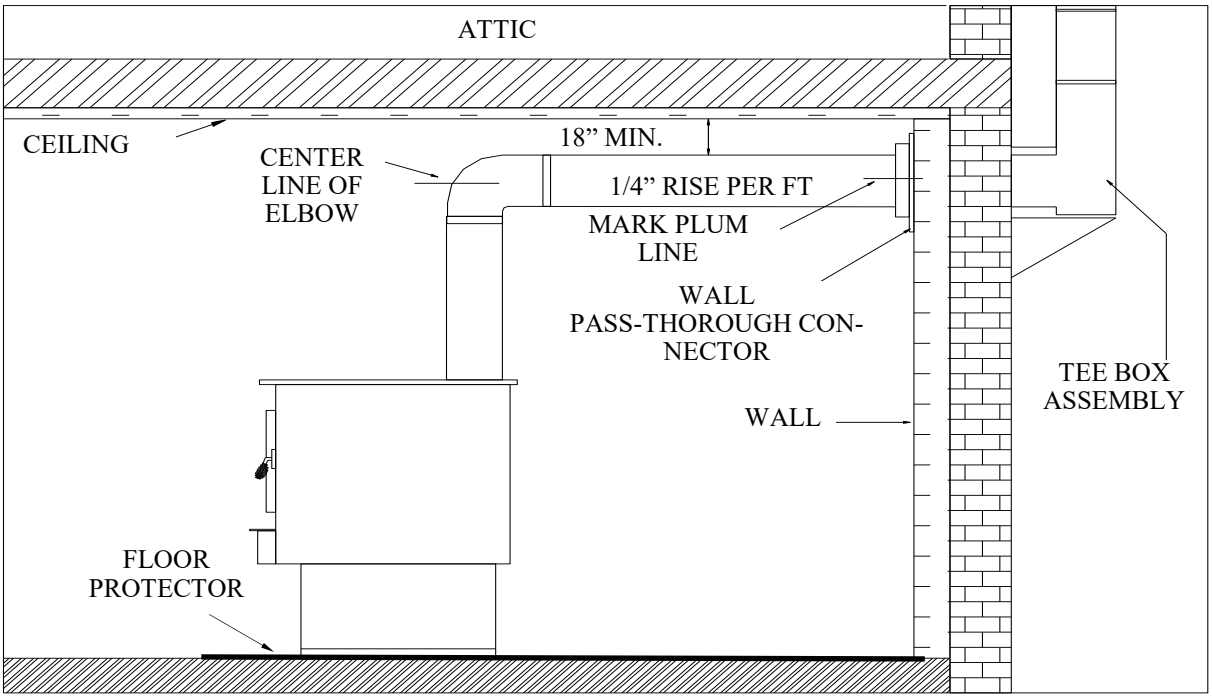
2. Place vertical portion of heater pipe and elbow in position and project a point onto plumb line level with center of the elbow. (See Figure 15).

3. Measure up so there will be at least 1/4" rise per foot of horizontal connector pipe. When using #24 ga. minimum blue or black steel pipe maintain 18" between pipe and ceiling (See Figure 15). This will give you center of hole for chimney penetration.

4. After locating center of penetration, install tee box and chimney, per chimney manufacturer's specifications.

5. Connect chimney collar to tee-box using #24 ga. minimum blued or black steel connector pipe. **(DO NOT USE GALVANIZED PIPE).** Connect each section so crimped end faces downward and secure each section to each other using three (3) sheet metal screws or rivets. (See Figure 14, Page 20).

6. For closer clearances to the ceiling use double wall or triple wall type A or 2100 HT pipe and follow those manufactures clearance instructions.



Wall Exit Into Metal Tee-Box

FIGURE 15

C. Wall Exit Into Masonry (Using Single Wall Pipe)

1. Before connecting this unit to a masonry chimney, determine that masonry fireplace wall pass through connector thimble meets **NFPA-211** Code and local building codes and is a minimum of 18" from ceiling. If connector thimble does not meet these codes, the pass through connector must be modified. (See Figure 16).

   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.

   (a) 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^{o} F.

NOTE: In addition, a connector to a masonry chimney shall extend through wall to 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 collar to wall pass through connector using #24 ga. minimum, blued or black steel connector pipe as follows:

   (a) Maintain 1/4" rise per foot (horizontal length) from appliance to chimney.

   (b) Connect each section so crimped end faces downward or back toward unit.

   (c) Secure each section to each other using at least three (3) sheet metal screws or rivets. (See Page 20, Figure 14).

   (d) Use three (3) sheet metal screws to fasten pipe to connector collar on heater.(See Page 20, Figure 14).

   (e) For closer clearances to the ceiling use double wall or triple wall type A or 2100 HT pipe and follow those manufactures clearance instructions.

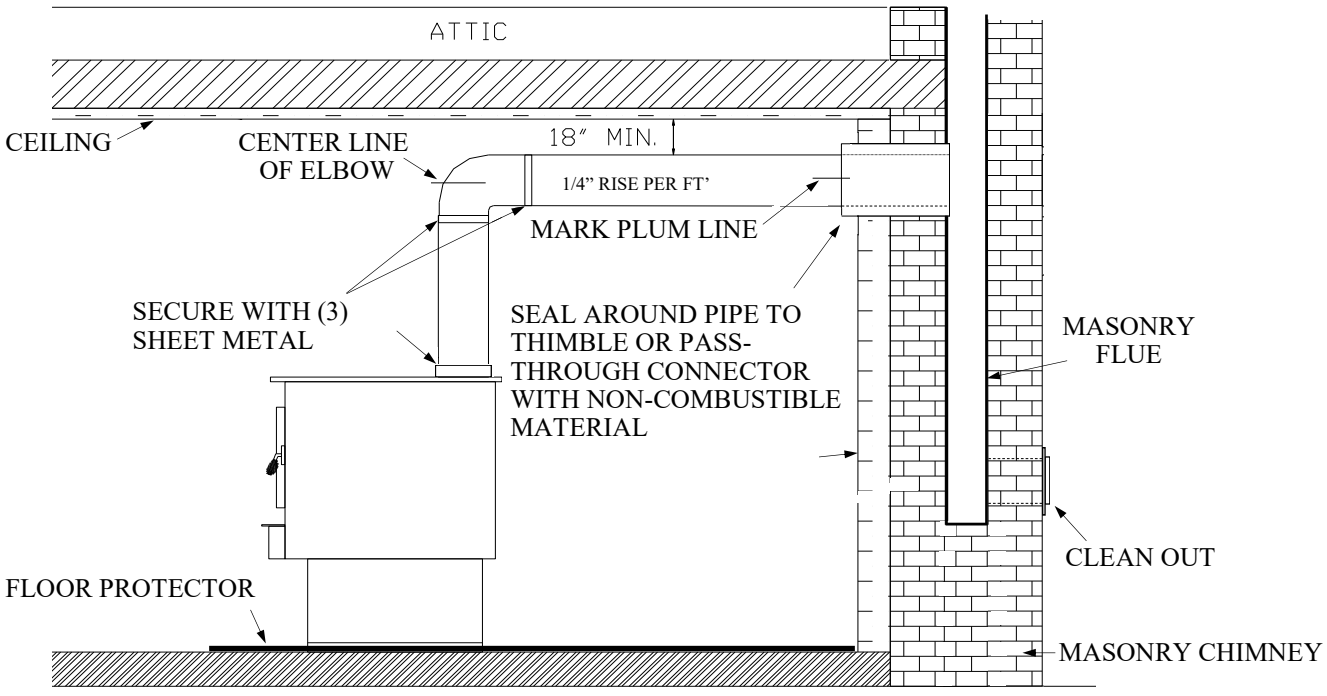


Figure 16

FINAL CHECK

1. Recheck specified clearances. (See Page 24)

2. Remove all foreign material from firebox area.

3. Open primary air draft. Primary air control located on right side of stove under hearth.

4. Plug power cord into a 115V AC outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. Route cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

4. Place crumpled pieces of newspaper in stove. Light it and close door. Ensure that stove draws properly through primary draft.

5. Check for smoke leaks around door.

CAUTION

Open door 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 the chimney heats up, a proper draft can usually be obtained.

CAUTION

The unit is painted with a specially formulated high temperature paint that cures during the first two or three firings. You may notice a slight smoking effect and an odor of burning paint when you build 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. DO NOT build a large, roaring fire until this curing is complete or heater finish may be damaged.

CLEARANCES FOR MODEL 81
MINIMUM CLEARANCES TO COMBUSTIBLES
FREESTANDING

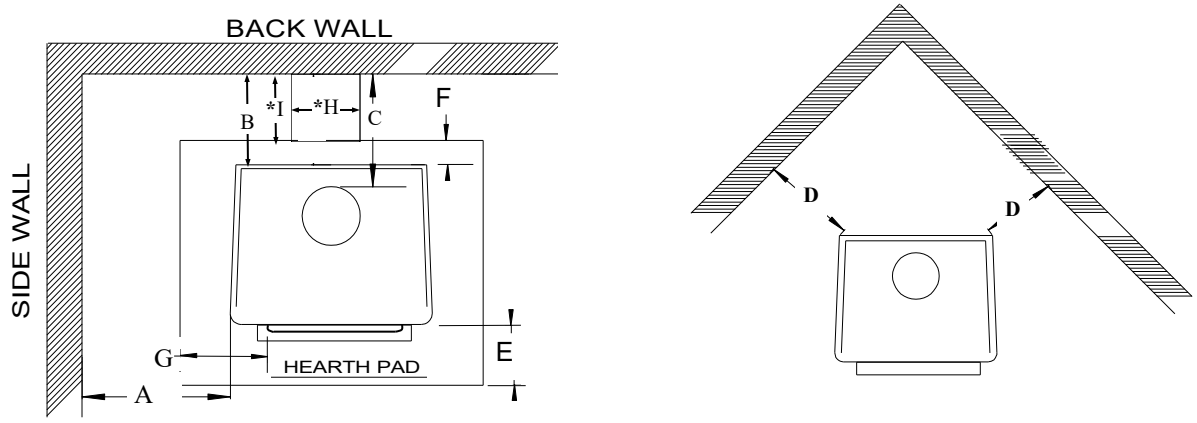


FIGURE 18

	A	B	C	D	E	F	G	*H	*I
MODEL 81	23"	23"	25"	16"	16”	8”	8”	10”	FULL LENGTH PIPE TO WALL

NOTE: All clearances are to combustibles without low clearance shields and using single wall pipe and minimum floor protector. Clearances above may be reduced by using close clearance shields. Follow **NFPA-211** codes if available or follow instructions on next page.

* For wall exit, floor protector must be under horizontal pipe full length of pipe. There must be 2” on each side of pipe. Maintain 18" between pipe and ceiling.
(See Figure 20, measurements H & *I).

CLEARANCES FOR MODEL 81
MINIMUM CLEARANCES TO COMBUSTIBLES USING SINGLE WALL CHIMNEY CONNECTOR AND OPTIONAL SHIELDS, PERMANENTLY LOCATED MANUFACTURED HOME AND ALCOVE INSTALLATIONS

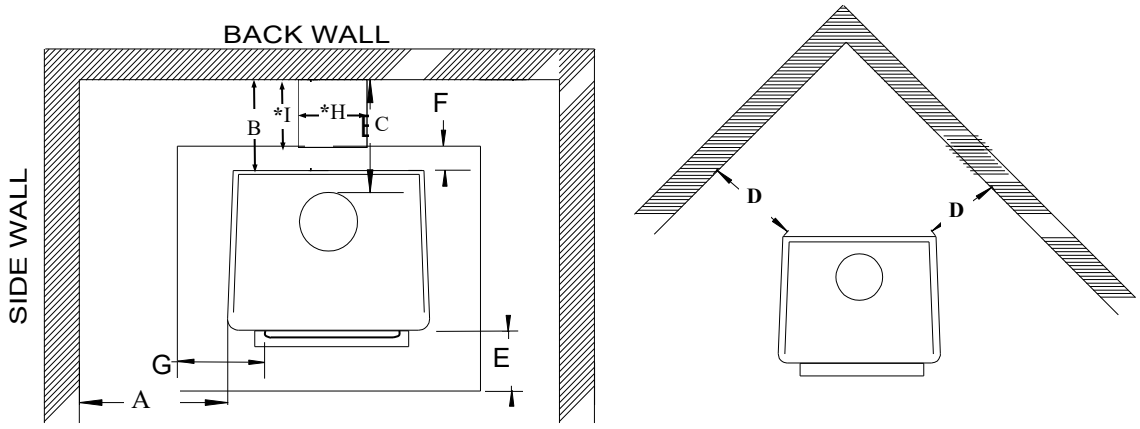


FIGURE 19

	A	B	C	D	E	F	G	*H	*I
MODEL 81	12"	16"	16.5"	12"	16’	8”	8”	10”	FULL LENGTH PIPE TO WALL

NOTE: All clearances are to combustibles using single wall pipe and all low clearance shields and minimum floor protector.

* For wall exit, floor protector must be under horizontal pipe full length of pipe. There must be 2” on each side of pipe. Maintain 18" between pipe and ceiling.
(See Figure 20, measurements H & *I).

INSTALLATION OF (OPTIONAL) CLOSE CLEARANCE SHIELDS

1. Center rear close clearance shield with back of stove. Mark back of stove, using holes in rear shield as reference. Drill pilot holes using a 1/8 drill bit. Using self-tapping screws, secure back shield to back of stove (See figure 20).

2. Insert front end of side shield behind side angle on front side of stove. Align top of side shield with top of back shield. Mark holes on back shield through holes in back of side shield. Using four self tapping screws, drill four holes in the locations marked. Tighten bottom screws and leave top screws loose for step 3. Use same step to install side shield on opposite side of stove. (See figure 21).

3. Insert pipe shield where back shield and top back side shield meets. Tighten screws. (See figure 22).

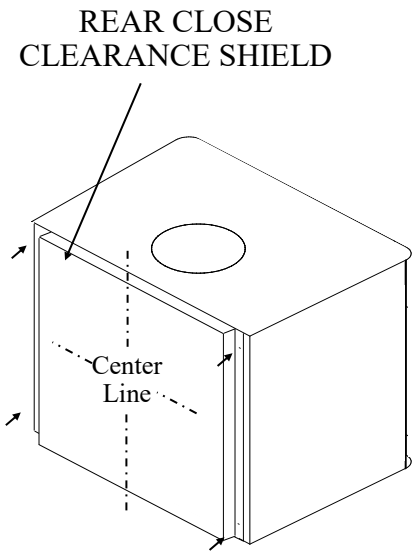


FIGURE 20

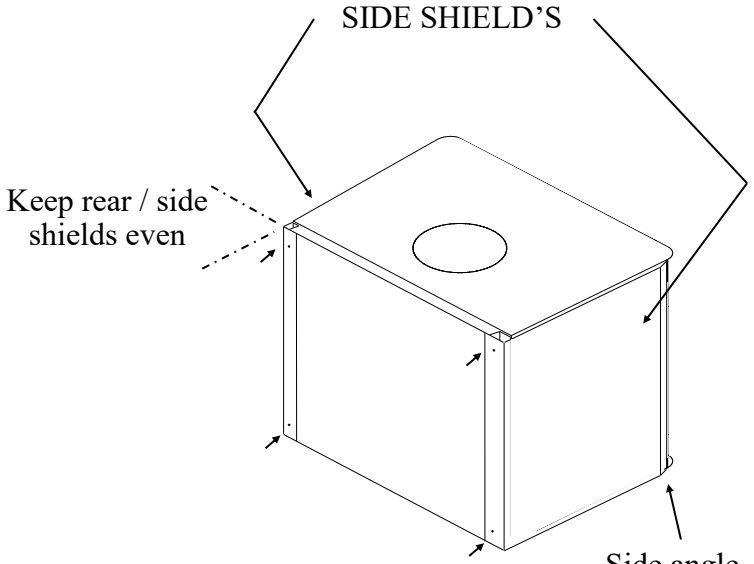


FIGURE 21

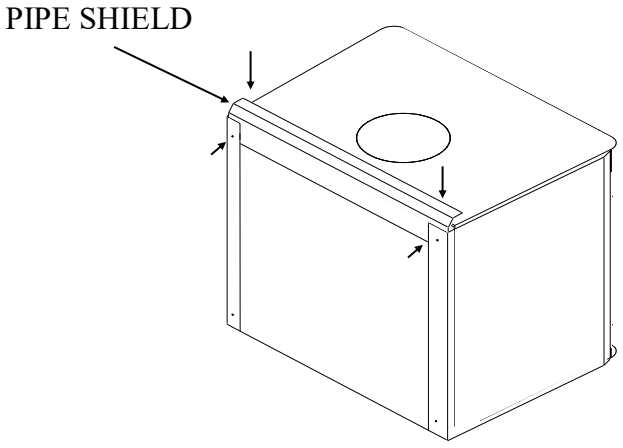


FIGURE 22

SECTION V

FREESTANDING PERMANENTLY LOCATED MANUFACTURED HOME INSTALLATION

FOR MINIMUM CLEARANCES SEE PAGE 25.

Floor Protection:

When installing a heater, a floor protector must be used. Floor protector must have a minimum of 1.1 R-Value non-combustible material.

How to use alternate materials and how to calculate equivalent thickness

Most people have heard of R-Values, which are used for rating common building materials such as fiberglass insulation and glass. However, many texts which cover stoves and fireplaces use K -Values instead of R-Values. Although the two are somewhat related, there are differences.

R-Value: The higher the R-Value, the better the insulating properties of the subject materials. R -Values are most often used to express the thermal resistance (ability to stop heat flow) of a building wall, ceiling or floor. Because of this, most R-Values are calculated at normal temperatures of approx. 75 F. R-Values are easy to add together so calculating the total R-Value of a wall is simply done by adding the values for the sheetrock, insulation, sheathing and siding.

K-value is a measure of heat conductivity of a particular material. Specifically, it is the measure of the amount of heat, in BTUs per hour, that will be transmitted through one square foot of material that is one inch thick to cause a temperature change of one degree Fahrenheit from one side of the material to the other. The lower the K-value for a material, the better it insulates. If the K-value of the material is known, the R-value per inch can be determined by dividing 1 by the K-value (R-value per inch = 1/K value). The LOWER a K-Value, the better its performance as an insulator.

R or K values have nothing to do with whether a material is flame proof, flame resistant or combustible. Styrofoam, cork, wood and polyester are just some examples of materials which are good insulators but will burn or smoke dangerously when exposed to excess heat.

Technical - For those who desire to calculate their own K or R values, please use the following formulas:

1. R value can be calculated by dividing the thickness by the K value.

For US calculations, we use inches as the unit of measurement.
“In the inch-pound units, thermal resistance is measured in degrees F times square feet of area times hours of time per Btus of heat flow.”
R-value = thickness / K-value

2. K value is the inverse of the R-Value. If one is known, the other can be calculated.
“units of Btu-inch/hour per square foot per degree F”
Thickness/k value = R value

or:

Divide the inches of thickness by R.
k= inches of thickness / R

Common K and R Values Chart				
Material	K value	R Value	| inches-K value .84	| inches-R value of 1
per inch				
Micore 300*	0.43	2.33	0.5	0.43
Wonderboard (ce	1.92	0.52	2.3	1.92
Common Brick	5	0.2	6	5
Cement Mortar	5	0.2	6	5
Ceramic Tile	12.5	0.08	14.9	12.5
Marble	11	0.09	13.1	11
Air Space (ventila	0.7	1.43	0.8	0.7
sand and gravel	1.7	0.59	2	1.7
Drywall (gypsum)	1	1	1.2	1
Rockwool or Fiber	0.3	3.33	0.4	0.3
Units	K per unit	R per unit		
per unit				
8" Concrete Block	1	1		
Glass Block - 4"	2	0.5		
* These materials or equiv are some of the bext to use for relatively thin hearth protection				

K-Value Example: A wood stove may call for a floor which has a K factor of 1 or less. A product such as Micore 300 Board from USG has a K-Value of approx .43 per inch. Therefore a 1/2" thickness of this board would have a K-Value of .86, which meets the requirement of our example stove.

R-Value Example: A stove or fireplace may call for an floor with an R-Value of 1.5. The same board above is rated as having an R-Value of 2.33 for a one inch thickness. Therefore, 3/4" of the Micore 300 Board would meet the specifications for this stove.

Summary: R and K values are related, but K is the value commonly used for specifying materials for use with stoves and fireplaces. Be sure that your choice of insulating material for high temperature applications is noncombustible.

With K values, the lower value is a better insulator. With R Values, the highest number is better.

For low profile hearths, it is best to use manufactured materials such as Micore and Cement Board (Durock, Wonderboard, etc.) as these will allow hearth thicknesses of from 1/4" to 2" with most stoves and fireplaces. Most other common building materials will require at least 3" of thickness and usually much more.

Example of Hearth Calculations - this is for a Hearth requirement of approx R=1.15 (figures taken from Ceramic Tile manufacturers trade association)

The assembly that we will evaluate is a 3/8" layer of Micore 230 and a layer of ½" Util-A-Crete. The first step is to convert the k values of the materials in question into R so that we may add them up and determine if they will provide the necessary insulation value required by the manufacturer.

Micore 230 has a k value of .43 so –

1 divided by k = 2.32 times the thickness .375 (3/8") = 0.87

Util-A-Crete (cement tile backer board) has a k value of 1.6 so – 1 divided by k = .625 times the thickness .5 (1/2") = 0.3125

Add the values together 0.87 plus 0.3125 = 1.1825 This R- value is an acceptable assembly.

What if we decide to use only one material? In this example, only Util-A-Crete cement board?

We could use the published R-Value of Util-A-Crete which is .31 in the ½" material and add them up to the value of the minimum required which is R=1.16

1.16 divided by .31 = 3.74 This assembly would require 3.74 layers of ½" Util-A-Crete to reach the necessary R-value required. Obviously, you would have to round up to the next layer, which would mean that you would have two inches of Util-A-Crete.

TOOLS FOR INSTALLATION

Drop cloth, 3/32" Metal drill bit, 5/16" magnetic socket chuck adapter, 5/16" wrench (box or socket) or adjustable wrench, Jigsaw with masonry, metal and wood blades

WARNING: DO NOT INSTALL IN A SLEEPING ROOM

PREPARING STOVE FOR INSTALLATION

1. Remove protective plastic wrapping from unit, inspect unit for any obvious physical damage.
2. Plug power cord into a 115V AC outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.
3. Check primary air draft control to ensure that it slides freely.
4. Remove any items from within firebox. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.

5. **Pedestal Kit: For Permanently Located Manufactured Home installation a pedestal kit is required and outside air is required, see *Out Side Air Installation* below.**

- Before attaching heater to stand, take a large flat screwdriver or pliers and remove the 2" x 2" knockout on bottom of unit. (See Figure 24).
- Open freestanding kit and obtain stand. Place stand against bottom of heater (angle side to heater). Center stand front to rear and also center stand left and right. Mark screw locations on bottom of stove through outer holes of stand mounting angles. Set stand aside and drill four 3/16" holes in heater bottom. Then mount stand to bottom of heater with screws provided 1/4”-14 x 1”. (See Figure 24).

6. Remove the screws and remove the pedestal. Reposition heater to upright position.

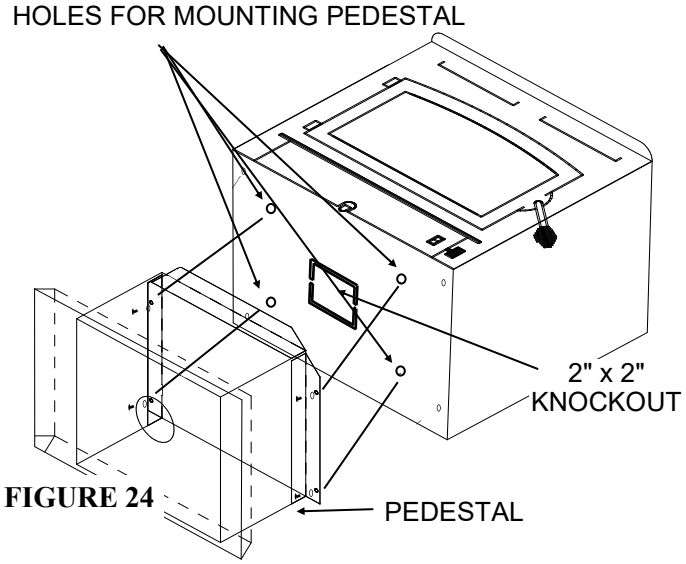


FIGURE 24

Out Side Air Installation

CAUTION

THE STRUCTURAL INTEGRITY OF PERMANENTLY LOCATED MANUFACTURED HOME FLOOR MUST BE MAINTAINED. (MOVE OPENING AND/OR REPOSITION HEATER LOCATION IFNECESSARY).

1. Select an installation location that will give best airflow from front of heater to remainder of home making sure minimumum clearance specifications are met. See minimum clearance to combustibles (See Page 25).

2. Place protective floor pad in position. For minimum floor protection (See Page 27).

3. Place pedestal on pad.

4. Mark on pad the outside air opening in bottom of pedestal stand.

5. Mark center line of outside air opening. Set pedestal aside for now.

8. CAUTION! The structural integrity of home floor must be maintained.
Cut a 4 1/4" diameter hole in pad and continue through floor.
(Move opening and/or reposition heater location if necessary).

9. Now, reposition pedestal stand and set on pad being sure to line stand up with outside air opening.

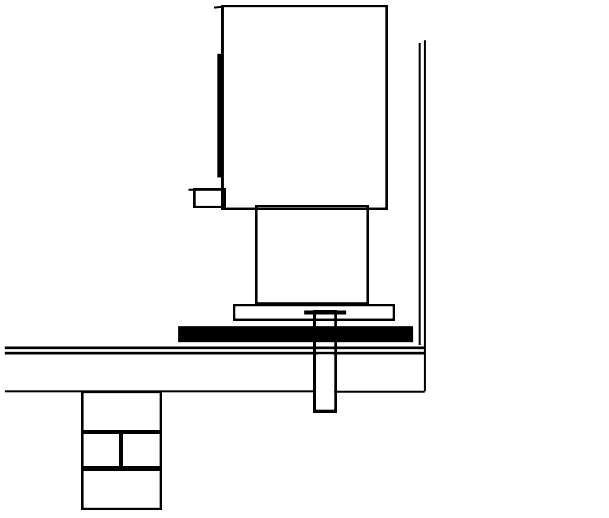
12. Obtain outside air duct from box in pedestal kit marked FA P81BOA.

13. Slip duct down through 4-1/4" hole until face of outside air duct with screen wire, contacts bottom of pedestal.

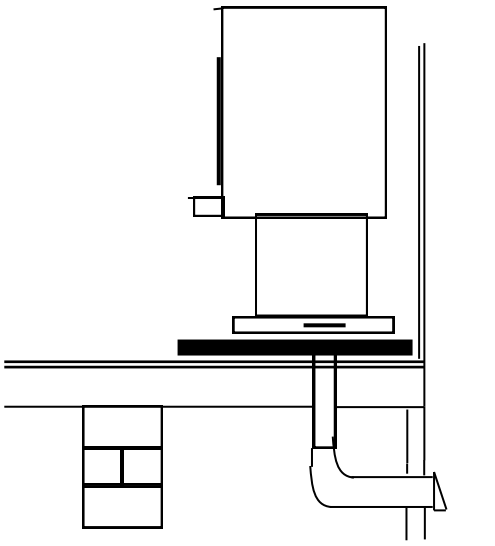
15. Set heater back onto stand and resecure using screws.

16. NOTE: If home is underpinned, you must duct through underpin as shown. (See Figure 26).

FIGURE 26

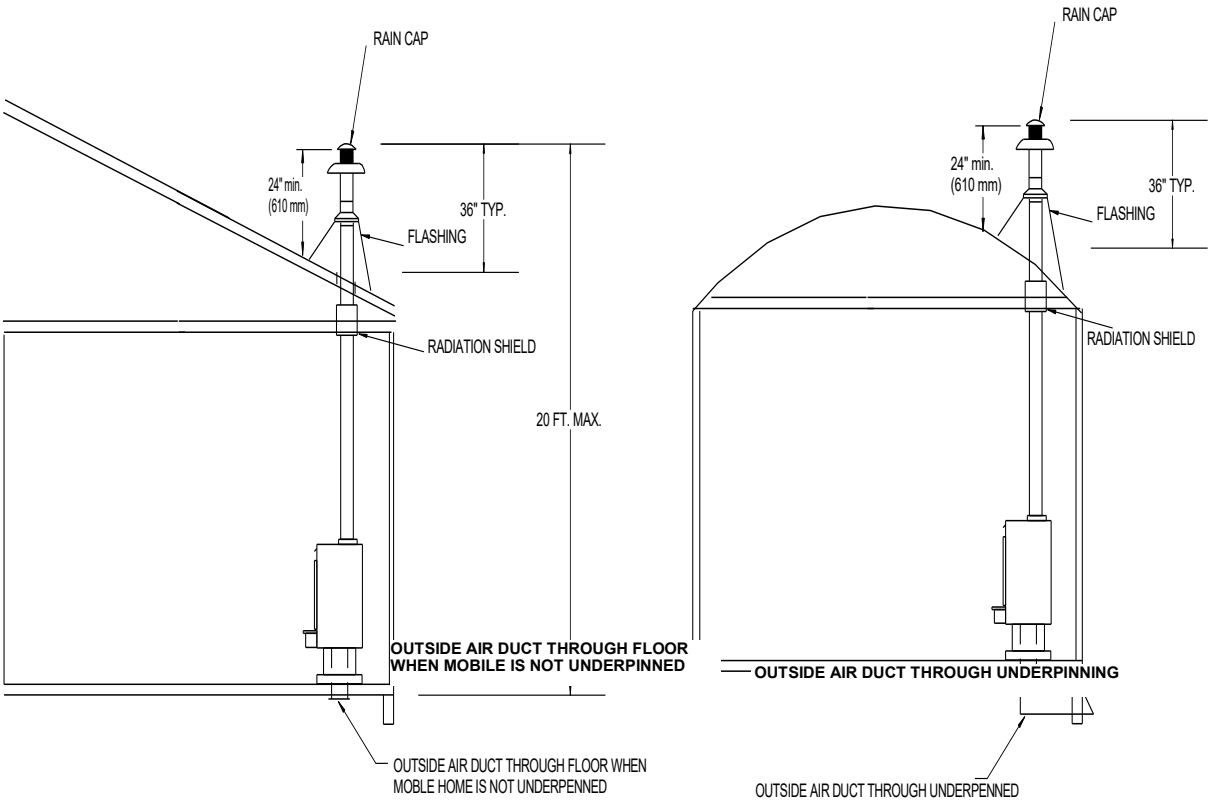


OUTSIDE AIR DUCT THROUGH FLOOR WHEN MOBILE HOME IS NOT UN-DERPINNED.



OUTSIDE AIR DUCT THROUGH UNDERPINNED.

FIGURE 27



Ceiling Exit (Using Close Clearance Listed Chimney)

1. Suspend a plumb bob from ceiling above unit so that weight is hanging in 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.(See Page 33, Figure28).

2. After locating center of hole, install ceiling support box, chimney or chimney connector, flashing and rain cap using listed 2100° HT chimney only.

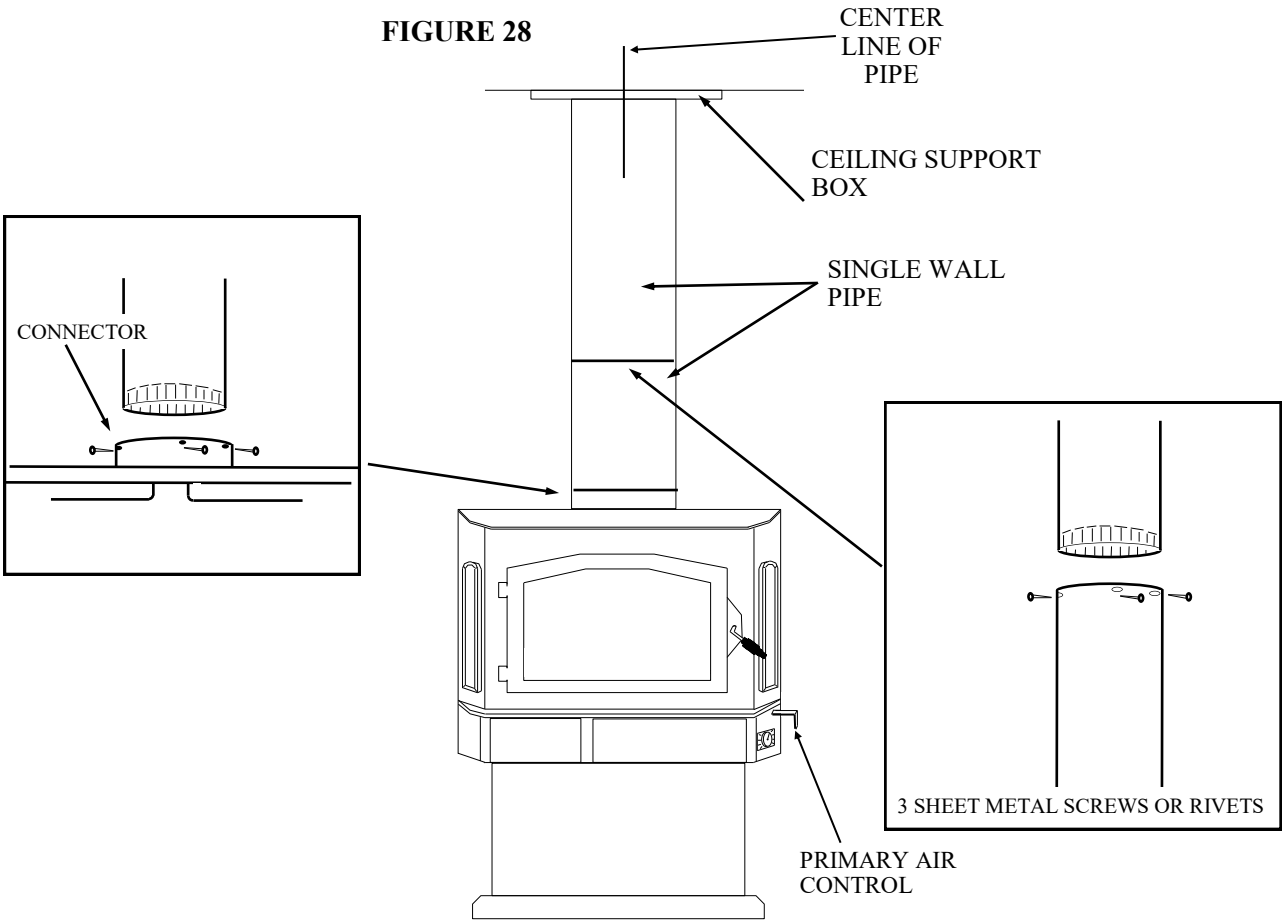
CAUTION
REFER TO CHIMNEY MANUFACTURERS INSTRUCTIONS FOR ASSEMBLY AND DISASSEMBLY OF CHIMNEY PARTS. BE SURE TO FOLLOW CHIMNEY INSTRUCTIONS FOR PROPER CLEARANCES TO COMBUSTIBLE AND PROPER AIR SPACING REQUIRED.

3. Add additional pipe until both of the following are met:

   (a) Chimney pipe is 3' higher than roof at point where it penetrates roof.
   (b) Chimney pipe height is at least 2' higher than any part of roof within 10' of chimney. (See Figure 27).

4. Next, install a New Buck Corporation chimney connector to flue of heater or use 3 L brackets and secure to top of heater and pipe.
5. Using single wall chimney connector, connect heater to chimney by following manufacturer's installation instructions exactly.

FIGURE 28



FINAL CHECK

1. Recheck specified clearances.

2. Remove all foreign material from firebox area.

3. Open primary air control located on right side of stove under hearth. (See Figure 28). To OPEN, pull all the way out, to CLOSE, push all the way in. Adjustments to airflow may be made by positioning handle anywhere in between.

4. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

4. Place crumpled pieces of newspaper in stove. Light it and close door. Ensure that stove draws properly through primary draft.

5. Check for smoke leaks around door.

6. Open door 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.

CAUTION

THE UNIT IS PAINTED WITH A SPECIALLY FORMULATED HIGH TEMPERATURE PAINT THAT CURES DURING FIRST TWO OR THREE FIRINGS. 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 THE UNIT WILL ALLOW THESE FUMES TO ESCAPE. DO NOT BUILD A LARGE ROARING FIRE UNTIL THIS CURING PROCESS IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.

SECTION VI
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.

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.

The chimney and chimney connector should be inspected once every two months. Any build-up of creosote should be removed to prevent risk of a chimney fire. To remove chimney or chimney connector, remove screws or fasteners, remove pipe and clean with steel brush. Replace chimney or chimney connector and replace screws and/or fasteners.

CREOSOTE-FORMATION AND NEED FOR REMOVAL: When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in 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.

⚠ CAUTION

NEVER USE GASOLINE,GASOLINE TYPE LANTERN FUEL, KEROSENE, HARCOAL 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 AND WILL EXPLODE! DON'T TAKE A CHANCE WITH SAFETY OF YOUR HOME AND FAMILY.

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

DISPOSAL OF ASHES: Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials pending final disposal. If ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in closed container until all cinders have thoroughly cooled.

SECTION VII OPERATION/EFFICIENCY

1. To maximize the efficiency of your wood stove make sure it is sized properly for the space you plan to heat.

2. Use dry, seasoned wood only. Recommended fire wood length 18" front to back. 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. **Use dried split wood (6-12 months) and placed from front to back position in heater.**

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

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

The following steps will serve as a guide for operating your stove.

BUILDING A FIRE

1. Open door.
2. Open primary air control. Primary air intake draft control is located at center bottom side of hearth. It is operated by moving handle **OUT** to open (to allow air into firebox) or **IN** to control or close off the firebox.

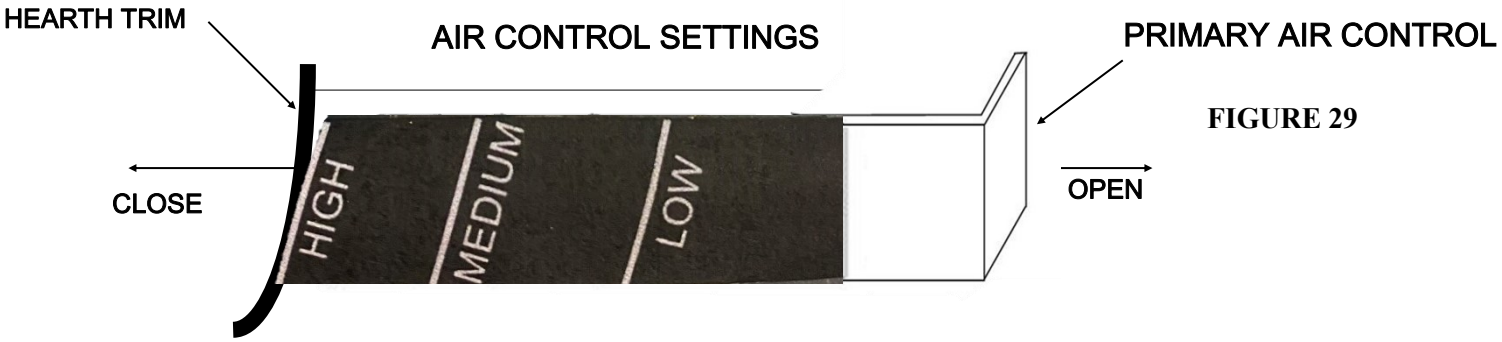


FIGURE 29

1. Place crumbled pieces of paper and place them on floor of firebox.
   NOTE: Do not use grate or elevate fire. Build wood fire directly on inner bottom of fire box.
2. Lay several pieces of dry kindling on top of newspaper.
3. Place three or four small pieces of firewood, 2"-3" in diameter, on top of kindling.
4. Light paper in front. Close and latch door. Don't leave fire unattended at this point. The draft system of heater should start quickly. It may be necessary to preheat chimney to get draft started. To do this, open door and add newspaper to top rear of wood. Light or let this paper ignite and allow to burn while holding the door slightly cracked. Once draft has started, close and lock door. You are over- heating the unit if the chimney and or connector glows red.
5. **NOTE: After embers and a coal bed have been established, load heater with seasoned natural hard wood, placing it front to rear.**

NOTE: THE FUELING DOOR MUST REMAIN CLOSED DURING OPERATION.

Your stove is equipped with an automatic thermostat. When stove gets hot enough, thermostat will activate room air blower. Set fan speed on low, when burning on low, med-low or med-high. Set fan speed on high when burning on high.

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.

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

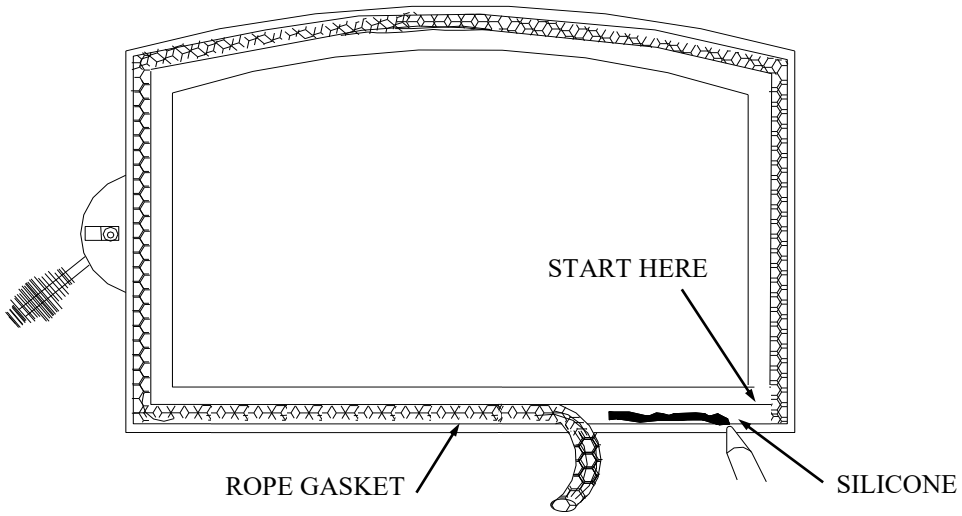
The Main Audubon Society recently charted the heat produced by a wood fire. They noted that heat produced by a wood fire varies greatly with kind of wood burned. Beech is considered best wood for a fire. A cord of well-seasoned Beech will produce as much heat as 169 gallons of fuel oil; Sugar Maple and 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.

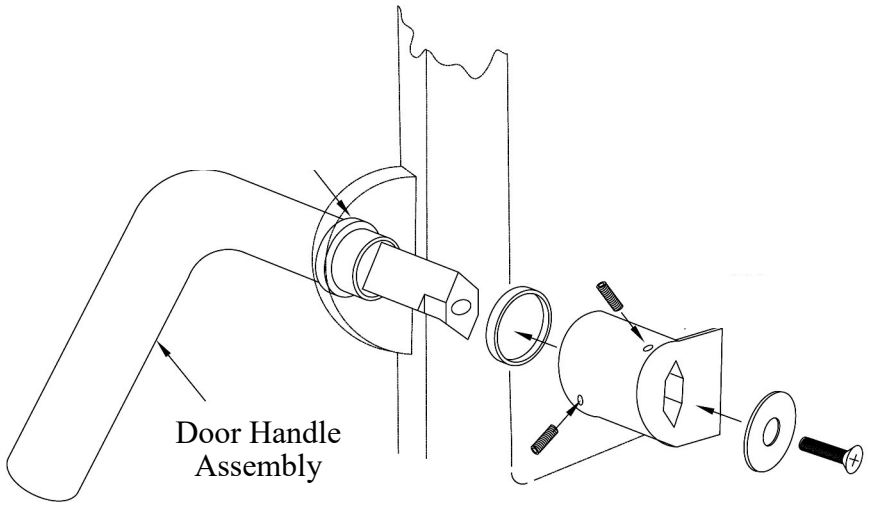
MAINTENANCE

DOOR GASKET REPLACEMENT (COLD HEATER)

To replace deteriorated gaskets, follow these steps to ensure proper installation of gaskets.

1. Obtain proper gaskets and silicone glue from your local dealer.
2. Using pliers, remove any worn and deteriorated gaskets.
3. Using a scraper, wire brush and sandpaper or steel wool, clean glue and gasket residue from door frame.
4. 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.
5. Obtain silicone glue and run a 3/16” bead inside door frame.
6. Obtain gasket 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.
7. After gasket is 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.
8. Leave door open and allow at least two (2) hours for glue to dry.
9. Once gaskets are checked, heater is ready for use.
10. This should be done annually. Allowing gaskets to deteriorate can cause over firing and shorten burn time.

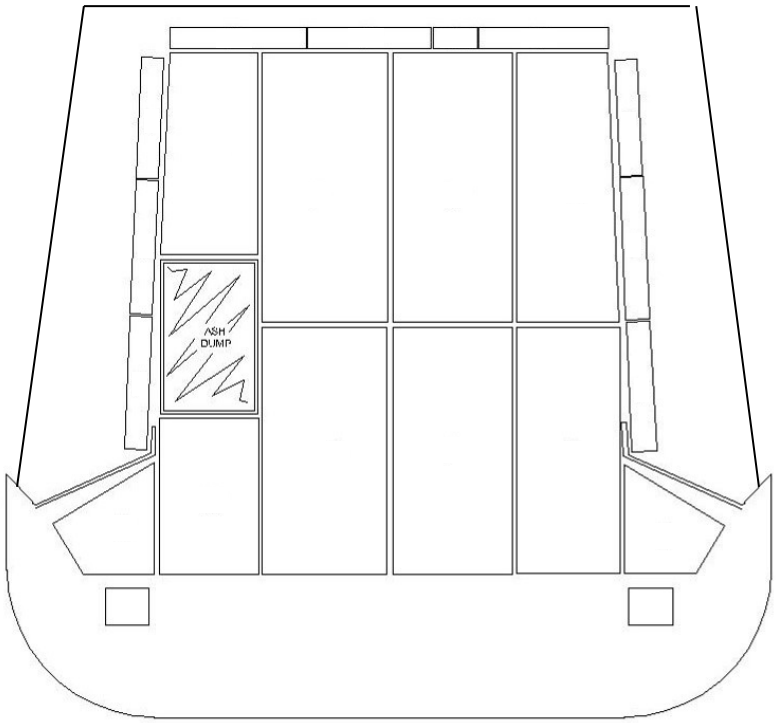




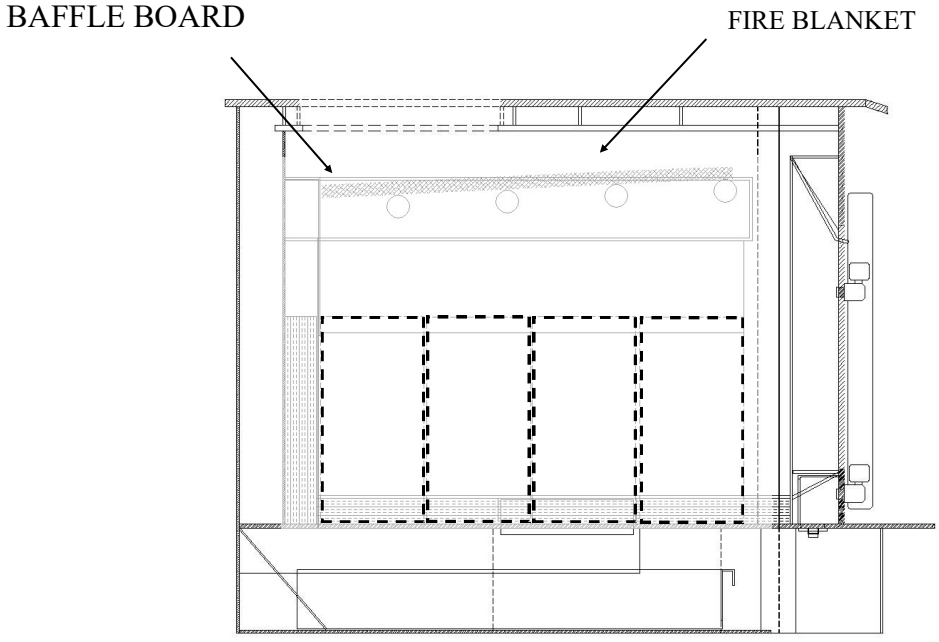
PA 910096

MAINTENANCE
BRICK LAYOUT

TOP VIEW



SIDE VIEW



NOTE: “This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.”

MAINTENANCE
SECONDARY AIR TUBES REPLACEMENT

(Replacing secondary air tubes)
COLD STOVE

1. Unplug heater from 115V AC outlet.
2. Put drop cloth down.
3. Empty ashes.
4. Remove air tubes. The (4) secondary air tubes are located in top of burn chamber. On right side of tubes you will find a cotter pin. To remove air tube remove cotter pin and slide tube to left, it will drop down, slide tube to right it should come out. (See Figure 32).
5. Replace air tube. On one end of tube you will find a hole drilled on both sides through the tube. This end goes to right side. Place tube in left tube holder and slide other end of tube into right side tube holder. Line up through hole in air tube with tube holder bracket and replace cotter pin and bend slightly so it wont fall out.

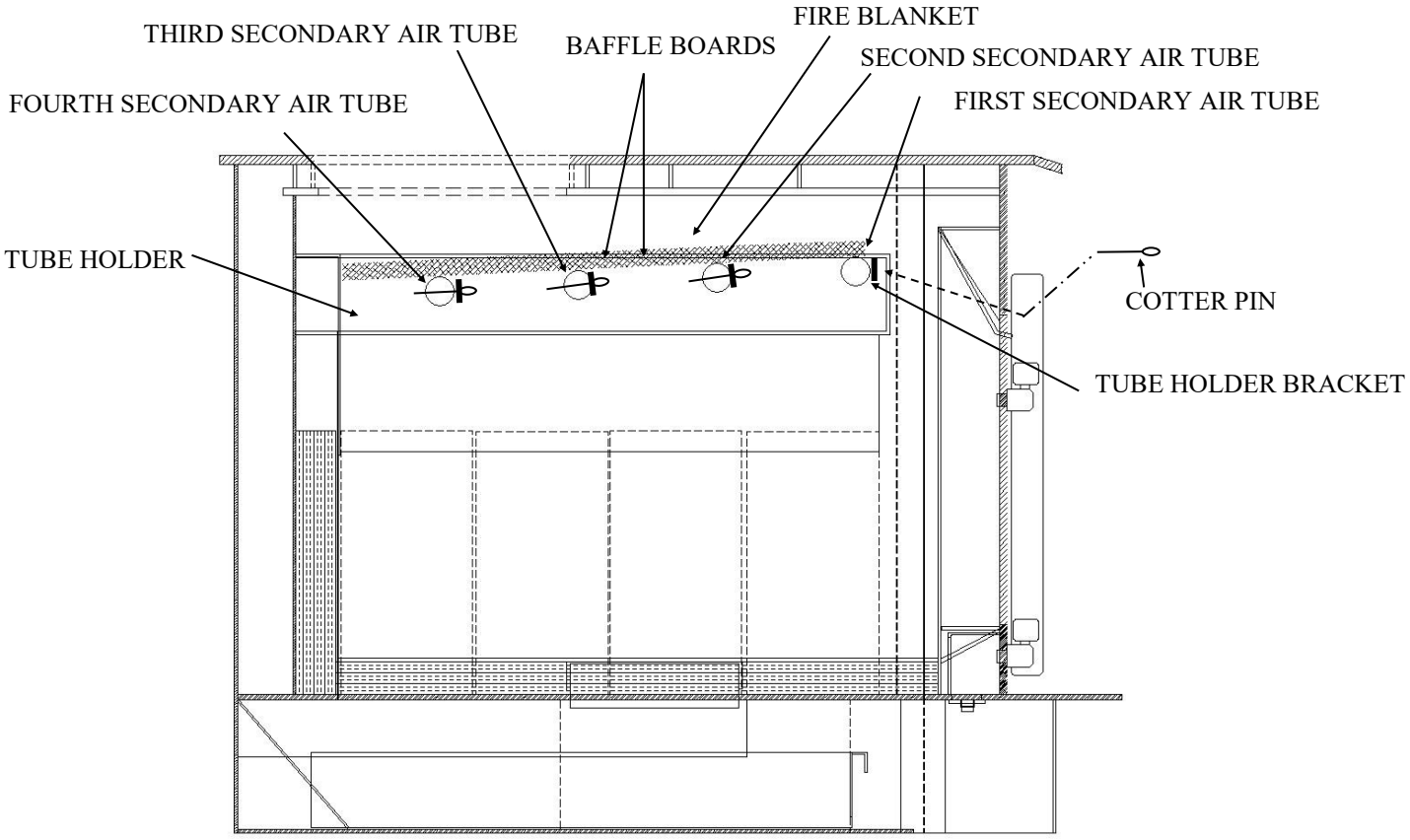


Figure 32

BAFFLE BOARDS AND/OR FIRE BLANKET REPLACEMENT

(Replacing baffle board)
COLD STOVE

1. Repeat steps 1-4 from above removing 1st tube only.
2. The baffle boards run long ways front to rear. Lift and slide baffle board toward the front. You should be able to just lift the fire blanket that is laying on top of the baffle boards and tube holders and slide baffle boards out. If replacing fire blanket go ahead and pull this out as well.
3. Replace baffle boards making sure the board is seated on top of air tubes and behind front baffle board holder and below the fire blanket. If replacing fire blanket, now place on top of the baffle boards and tube holders. It will go up the sides of the stove some it's ok. After replacing both baffle boards and/or fire blanket. Replace front air tube following step 5 from secondary air tube replacement.

MAINTENANCE ELCTRICAL REPLACMENT
MOTOR, THERMOSTAT, RHEOSTAT

1. **TO REPLACE MOTOR:** Unplug heater from 115V AC outlet.

2. Remove bottom cover door removing (2) screws holding it in place. See Figure 33.

3. To the right of ash pan you will find a wire cover screen protecting you from electrical components of this unit. See Figure 34. There are (3) screws holding wire cover screen . Remove (2) screws on left side of screen inward holding wire screen. Remove (1) right bottom screw holding right side of wire screen set aside. See Figure 34.

4. Mark and unhook wire servicing motor. NOTE: You may remove thermostat to make it easier to work in area. Unscrew motor bracket with motor from unit. See Figures 34, 35. Gently slide motor bracket and motor out and while pulling it out move the back of the motor facing you from right to left in a clockwise motion.

5. 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 form original motor assembly.

6. To replace motor, turn motor so that 4"x4" air discharge opening is pointing toward back of stove. The flat part of motor housing 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. Reinstall motor bracket screws. If thermostat was removed, replace thermostat in bracket.

7. 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 42, Figure 36. If rheostat was removed, replace rheostat with the nut and replace control knob, reconnect wires to switch.

8. Replace wire cage. Replace bottom cover door. Plug heater back into a 115V AC outlet.

1. **TO RPLACE THERMOSTAT:** Unplug heater from 115V AC outlet. Follow steps 2 through 3.

2. Mark and unhook wires. Gently push thermostat up and out of thermostat bracket and replace with new thermostat. Reinstall wiring and cover screen. See Figure 35. If you need to see wiring diagram See Page 37, Figure 36. Plug heater back into a 115V AC outlet.

1. **TO REPLACE RHEOSTAT:** Unplug heater from 115V AC outlet. Follow steps 2 through 3.

2. Mark and unhook wires. Bottom under hearth is rheostat. Remove control knob and nut and replace with new rheostat installing with nut, then control knob. Reinstall wiring and cover screen. See Figure 35. If you need to see wiring diagram See Page 37, Figure 36. Plug heater back into a 115V AC outlet.

Figure 33

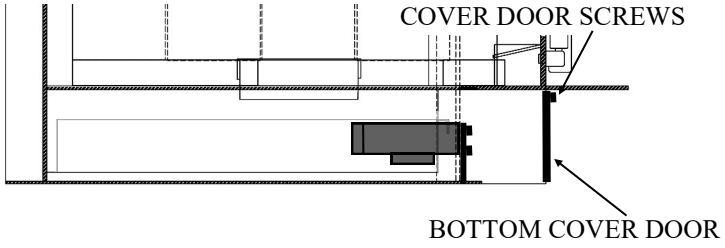


Figure 34

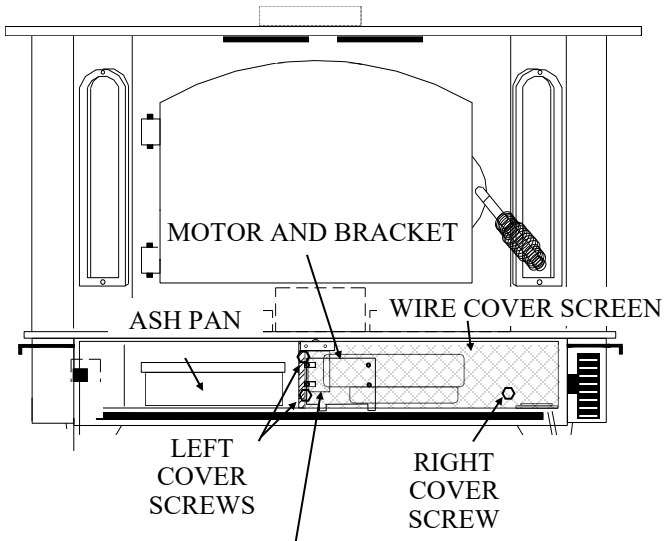
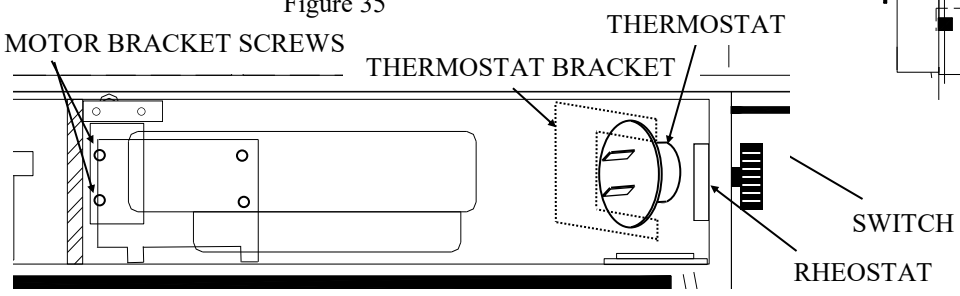


Figure 35



ROOM AIR BLOWER OPERATION

Your heater is equipped with a room air blower. For operation and wiring see figure below.

For your convenience, your heater is equipped with a rheostat with which you are able to select the air flow. The auto and manual switch will allow you to select the position at which thermostat will function.

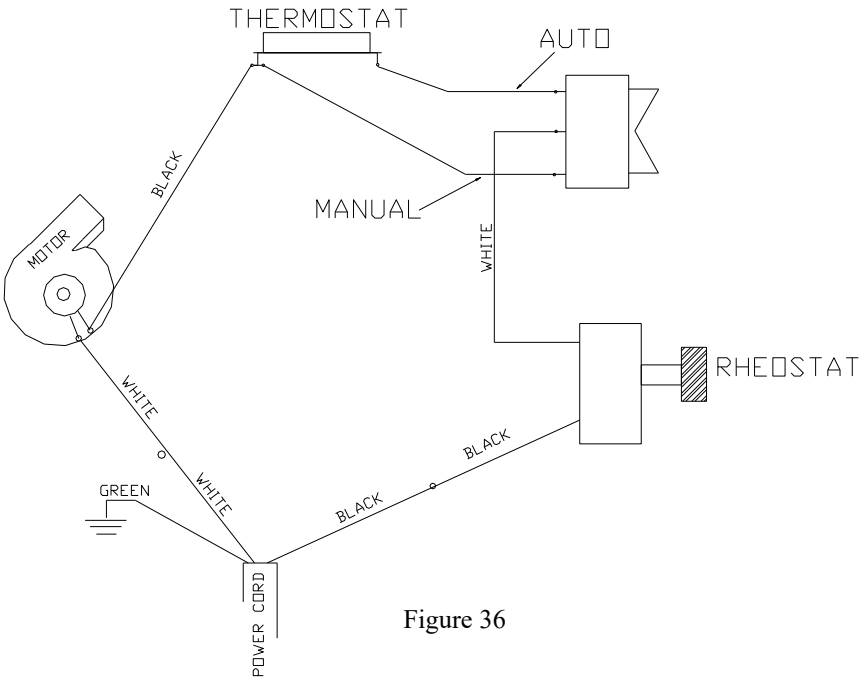


Figure 36

Auto- position:
After heater has warmed up and Auto-Manual switch is placed in "Auto" position and rheostat is in desired position, fan will automatically come on. When stove cools off, fan will automatically shut-off.

Manual position: You must turn room air blower on and off.

NOTE: Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly. Route cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

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

MAINTENANCE
CHECK CHIMNEY

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

Before sweeping the chimney a few steps must be done. Put drop cloth down.

1. Open door. The (4) secondary air tubes are located in top of burn chamber. On right side of tubes you will find a cotter pin. To remove air tube remove cotter pin and slide tube to left, it will drop down, slide tube to right it should come out, remove (2) front air tubes then gently remove the baffle boards and fire blanket, set them aside. Remove the (2) rear air tubes.
2. Close door for cleaning chimney so debris don't fall out door while cleaning chimney.
3. Creosote and debris will fall into the bottom of the stove unit from the cleaning.
4. Clean out all the creosote and debris from inside stove unit left from clean sweeping chimney.
5. Replace 2 rear air tubes. On one end of tube you will find a hole drilled on both sides through the tube. This end goes to right side. Place tube in left tube holder and slide other end of tube into right side tube holder. Line up through hole in air tube with tube holder bracket and replace cotter pin and bend slightly so it wont fall out. Replace baffle boards making sure the board is seated on top of air tubes and behind front baffle board holder. Baffle boards run long ways front to rear. After replacing both baffle boards replace the fire blanket making sure it is laying flat on the baffle boards and covering the tube holders and replace front air tube.

⚠ **NOTE:** A chimney cap should 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 brand of glass used in heater 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.

SECTION VIII
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Sluggish heater	1. Obstruction in chimney	1. Check for and remove obstruction
	2. Improperly sealed trim kit or direct connect kit	2. (a) Check trim kit gasketing seal to fireplace and gasket as necessary to seal unit. Gasket under front bottom of stove if needed. (b) Check seal if direct connect and correct
	3. Wet or unseasoned wood being burned.	3. Burn dried natural seasoned hard wood
	3. Poor chimney draft	4. Improper chimney height or wrong size flue is being used. Cooler temperatures caused by external chimney
2. High Fuel Consumption	1. Improper regulation of draft or inlet air	1. Close inlet air control as much as possible to maintain desired heat output. Check gaskets, reinstall fiberglass gasket around doors and glass as necessary
	2. Improper door fitting	2. Check door gasket, check adjustment of door latch, check door hinges
3. Back puffing	1. Gusts of Wind	1. Smoke shelf in chimney is filled with creosote & ash. Chimney may need wind diverter. Raise chimney for better draft
4. Smoke rollout when heater door is opened	1. Wind gusts blowing down the chimney	1. Smoke shelf in chimney is filled with creosote & ash. Chimney may need wind diverter. Raise chimney for better draft
	2. Opening heater door too fast	2. Open air control. Crack door for 15 seconds before fully opening door

REPLACEMENT PARTS FOR THE MODEL 81

1. Air Control Bar	MF 810084
2. Door Handle Assembly	PA 910096
3. Door Gold	PC 212400G
4. Door Black	PC 212400
5. Door Pewter	PC 212400P
6. Off/Auto/Man Fan Switch	PE RC211RB
7. Thermostat 110 disc	PE 400132
8. Power Cord	PE 400240
9. Strain Relief	PE 400320
10. Motor	PE 910714
11. Rheostat	PE BC204
12. Rheostat knob	PE BC204A
13. Glass	PG 2124GL
14. Glass, Bay side	PG 810100
15. Spring Handle	PO 100150
16. Top Baffle Board	PO BPFB81B
17. Fire blanket	PO 81CBLANKET
18. Front Secondary Air Tube	PS 810050
20. Second Secondary Air Tube	PS 810052
21. Third Secondary Air Tube	PS 810054
22. Rear Secondary Air Tube	PS 810055
23. Primary Air Block	MF 810081
24. 1" x 1" x 1/8" thick magnet	PO DM841
25. Firebrick	PR 900050

NEW BUCK CORPORATION (NBC)
"LIMITED WARRANTY" FOR THE BUCK STOVE
PLEASE READ THIS WARRANTY CAREFULLY

PRODUCTS COVERED

This warranty covers the new Buck Stove heating unit, so long as it is owned by the original purchaser, including optional and standard accessories purchased at the 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 or Gaskets.

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

WARRANTY TIME PERIODS

(A) **Period I**

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

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PROCEDURE

Should you feel that your BUCK STOVE is defective, you should contact any Buck Stove dealer for the name of your nearest authorized Buck Stove service representative, who will instruct you on the 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
Email: info@buckstove.com

CONDITIONS AND EXCLUSIONS

(A) Replacement of parts may be in the form of new or fully reconditioned parts, at NBC's option.

(B) There is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of the Express Warranty.

(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 of providing substitute equipment or service during periods of malfunction or non-use.
Some states do not allow the 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, the 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 the date of purchase or from the 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 Buck Stove Dealer Code Number and the Certified Installer's number (if applicable) for warranty coverage to begin.

To be completed by selling distributor/ dealer/ customer:

Name _____
(Last) (First)

Address _____

City _____ State _____ Zip _____

CUSTOMER EMAIL:: _____

MODEL 81 - Serial Number _____

Date of Installation: Day _____ Month _____ Year _____

Installer's Name _____

Installer's Certification Number _____

Dealer's Name _____

City _____ State _____ Zip _____

Established 1974

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ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0182484A0912013i190610

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 400x.01	82484A0912013i	#050	Lab

Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.01	QC033	6/10/19	12/18/18	6/2020

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 50 Tol: 0.05	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.01	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 20.7°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.96	399.96	0.058
300	299.98	299.98	0.058
200	199.98	199.98	0.058
100	99.98	99.98	0.012
50	50.00	50.00	0.012
20	20.00	20.00	0.012

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/24/17	11/2019	20172265

Permanent Information Concerning this Equipment:
12 month calibration cycle

Comments/Information Concerning this Calibration
6/19 RH = 47%.

Report prepared/reviewed by: ServiceTechJC **Date:** 6/11/19 **Technician:** J. Colacchio **Signature:**

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	53
Serial #:	1902130
Calibration Date:	1/23/2020
Calibration Expiration:	7/23/2020
Barometric Pressure:	29.93 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
γ Factor:	0.999
Allowable Deviation (±5%):	0.04995
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	162.364	142.013	148.622
Standard DGM Temperature (°F)	69.0	70.0	70.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.814	5.147	5.409
DGM Temperature (°F)	88.0	94.0	96.0
DGM Pressure (in H_2O)	3.42	2.04	1.0
Time (min)	32.0	36.0	52.0
Net Volume for Standard DGM (ft^3)	5.734	5.015	5.249
Net Volume for DGM (ft^3)	5.814	5.147	5.409

Dry Gas Meter γ Factor	1.011	1.011	1.013
γ Factor Deviation From Average	1.011	1.011	1.013

Average Gas Meter γ Factor: 1.012

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	54
Serial #:	1902133
Calibration Date:	1/23/2020
Calibration Expiration:	7/23/2020
Barometric Pressure:	23.93 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
γ Factor:	0.996
Allowable Deviation (±5%):	0.0498
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	153.663	172.691	287.542
Standard DGM Temperature (°F)	69.0	69.0	69.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.576	6.296	10.530
DGM Temperature (°F)	95.0	95.0	96.0
DGM Pressure (in H_2O)	3.60	2.00	1.0
Time (min)	30.0	45.0	99.0
Net Volume for Standard DGM (ft^3)	5.427	6.099	10.154
Net Volume for DGM (ft^3)	5.576	6.296	10.530

Dry Gas Meter γ Factor	1.008	1.008	1.008
γ Factor Deviation From Average	1.008	1.008	1.008

Average Gas Meter γ Factor: 1.008

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

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Calibration Services

Certificate Number 1550.01

Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Material	Assumed Density	Range	Tolerance Class
Stainless Steel	7.95 g/cm^3	200mg & 100mg	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:
100g to 1mg Working Standards Were Calibrated: 03/03/17 Due: 03/31/18 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. 8.0g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

Established 1974

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ACCREDITED

Calibration Services

Certificate Number: 1550.01

Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.967	753.44	49.44

Conventional Mass Value

Nominal Value	As Found grams	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200mg SN 1000101395	0.2000061	0.0061	0.0026	0.01
100mg SN 1000126267	0.1000046	0.0046	0.0028	0.01

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were new from the manufacturer and were within ASTM Class 1 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

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 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

Established 1974

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ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

*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 NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

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 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16

Signature David S. Thompson

Established 1974

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A2LA ACCREDITED
CERTIFICATE #1550.01

PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0134307497200110

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	1/10/20	6/10/19	6/2020

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 100 Tol: 0.0003
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 50 x 4 Tol: 0.0002
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0001

1. 100.0001	5. 99.9999	9. 100.0000
2. 100.0000	6. 100.0000	10. 99.9999
3. 100.0000	7. 100.0001	**Result**
4. 100.0000	8. 100.0000	0.00006

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 19.3°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9997	200.0000	0.00019
100	100.0000	100.0001	0.00018
50	49.9999	50.0001	0.00018
20	20.0001	20.0000	0.00017
1	0.9998	0.9999	0.00017
0.1	0.0999	0.1000	0.00017

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20kg to 1mg	7133	4/19/19	4/2020	20190811

Permanent Information Concerning this Equipment:

Comments/Info Concerning this Calibration:
01/20 RH= 49% Adjusted span.

Report prepared/reviewed by: R.B. **Date:** 1-10-20 **Technician:** R. Butcher
Signature: R. Butcher

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation 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.

CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	04/30/2020
PO NUMBER:	1016	**CALIBRATION DUE:**	04/30/2021
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 UNCERTAINTY:	SEE NOTES BELOW.	**AMBIENT CONDITIONS:**	763mm HGA 46% RH 69°F
UNCERTAINTY GIVEN:	± 0.43% RD ; k=2	**CERTIFICATE FILE #:**	490265.2020

NOTES: ± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) ***± 5% F.S. (0-15000) *** ± 2 °F

NOTES CONT. : Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
55	56	0 TO 200°F	0 TO 200°F
128	130	43.9	43.2
219	223	71.4	70.7
499	509	99.0	98.4
542	546		
1019	1029		
1490	1510		
511	516		
3268	3308		
4995	5077		
6028	6137		
14519	14815		

STANDARDS USED:		
A263A: KURZ / DMC WIND TUNNEL LFE | 0 – 14000 FPM ± .122% RD. | TRACE# 1453296155,1329407628	DUE	06/08/2020
A24: HART SCIENTIFIC TEMP. STANDARD | ±.024 F | TRACE# 1520423238	DUE	03/04/2021

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.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NCSL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

Dick Munns Company • 11133 Winners Circle • Los Alamitos, CA 90720
Phone (714) 827-1215 • Fax (714) 827-0823

Date: 04/30/2020 Approved By: Calibration Technician: DC

Tape Measure Calibration

Rule Equipment ID: 101

Std. Gage Block ID: 146

Cal. Expiration Date: 1/7/2023

Std. Surface Plate ID: 147

Cal. Expiration Date: 1/3/2023

System: ☑ Imperial ☐ Metric

Date: 1/23/2020

Ambient (F): 70

Technician: AK

Visual Inspection

☑ Pass ☐ Fail

Full Length Operation Check

☑ Pass ☐ Fail

Tape in Tension

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Tape in Compression

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Body Length

Tolerance: 0.1

Standard	Measured
3.0	3.0

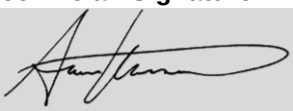
Within Tolerance

Calibration Due

1/23/2021

Notes

Technician Signature



Caliper Calibration

Caliper Equipment ID: 92

Std. Gage Block ID: 146
Cal. Expiration Date: 1/7/2023

Std. Surface Plate ID: 147
Cal. Expiration Date: 1/3/2023

System: ☑ Imperial ☐ Metric

Date: 1/23/2020
Ambient (F): 70
Technician: AK

Visual Inspection

☑ Pass ☐ Fail

Outside Jaws

Tolerance: 0.002

Standard	Measured
0.050	0.050
0.250	0.250
1.000	1.000
2.000	2.001
6.000	6.000

Within Tolerance

Inside Jaws

Tolerance: 0.005

Standard	Measured
0.050	0.051
0.250	0.251
1.000	1.001
2.000	2.002
6.000	6.002

Within Tolerance

Depth

Tolerance: 0.005

Standard	Measured
0.050	0.052
0.250	0.252
1.000	1.001
2.000	2.001
6.000	5.997

Within Tolerance

Calibration Due

1/17/2021

Technician Signature

Model 1430 Microtector® Electronic Point Gage

Installation and Operating Instructions

Model 1430 Microtector® Portable Electronic Point Gage combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

SPECIFICATIONS AND FEATURES

- Accurate and repeatable to ± .00025 inches water column
- Pressure range: 0 - 2″ w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology
- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic plastic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2″ thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8″ pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

Maximum pressure: 100 psig with optional pipe thread connections.

Tygon® is a registered trademark of Saint-Gobain Corporation

DWYER INSTRUMENTS, INC.
P.O. BOX 373
MICHIGAN CITY, INDIANA 46361,U.S.A
Phone: 219/879-8000
Fax: 219/872-9057
www.dwyer-inst.com
e-mail: info@dwyer-inst.com

J-2000

owner's manual

DELMHORST®
INSTRUMENT CO.

WHEN ACCURACY IS THE POINT.™

Certificate of Calibration

Certificate Number: **712600**

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

0723.01
Calibration

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

PO: **john.steinest.PFSTECO.co**
Order Date: 11/06/2019
Authorized By: **N/A**

Property #: **064**
User: **N/A**
Department: **N/A**
Make: **Control Company**
Model: **4198**
Serial #: **80531676**
Description: **Digital Temp. / Barometer**
Procedure: **404323**
Accuracy: **±1°C ±0.2362Hg(±8mb)**

Calibrated on: 11/15/2019
*Recommended Due: 11/15/2020
Environment: **21** °C **48** % RH
* As Received: **Within Tolerance**
* As Returned: **Within Tolerance**
Action Taken: **Calibrated**
Technician: **146**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	10/14/2020	710583
847A	Fluke	RPM4	Reference Pressure Monitor	11/21/2019	688957

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	kError	UUT	Uncertainty (Accredited = ✓)
Before/After							
Temperature							
	°C	20.00	19.0	21.0	0.1	20.1 °C	8.1E-02 ✓
	°C	30.00	29.0	31.0	0.8	29.2 °C	8.1E-02 ✓
	°C	40.00	39.0	41.0	0.2	39.8 °C	8.1E-02 ✓
Barometer							
	mbar	1010.70	1002.7	1018.7	0.7	1010.0 mbar	

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 ration (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 11/16/2019 Rev # 15

Inspector

Airgas
an Air Liquide company

Airgas Nor-Pac region
Airgas USA, LLC
3591 N. Columbia Blvd.
Portland, OR 97217
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X04NI62C15A0002	Reference Number:	16-401222766-1
Cylinder Number:	CC50101	Cylinder Volume:	144.0 CF
Laboratory:	101 - Portland (SAP) - OR	Cylinder Pressure:	2016 PSIG
Analysis Date:	Jun 19, 2018	Valve Outlet:	590
Lot Number:	16-401222766-1		

Expiration Date: Jun 19, 2026

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
CARBON MONOXIDE	4.000 %	4.048 %	+/- 2%
CARBON DIOXIDE	16.00 %	15.53 %	+/- 2%
OXYGEN	18.00 %	18.09 %	+/- 2%
NITROGEN	Balance		

Approved for Release

Airgas
an Air Liquide company

Airgas Nor-Pac region
Airgas USA, LLC
3591 N. Columbia Blvd.
Portland, OR 97217
Airgas.com

CERTIFICATE OF BATCH ANALYSIS
Grade of Product: ULTRA HIGH PURITY-PURE

Part Number:	NI UHP200BA	Reference Number:	16-400945060-1
Cylinder Analyzed:	BSG-000543	Cylinder Volume:	230.0 CF
Laboratory:	101 - Portland (SAP) - OR	Cylinder Pressure:	2200 PSIG
Analysis Date:	Jun 29, 2017	Valve Outlet:	580
Lot Number:	16-400945060-1		

ANALYTICAL RESULTS

Component	Requested Purity	Certified Concentration
NITROGEN	99.999 %	99.999 %
CO + CO2	< 1 PPM	0.10 PPM
Moisture	< 1 PPM	0.877 PPM
Oxygen	< 1 PPM	0.24 PPM
THC	< 0.5 PPM	0.133 PPM

Cylinders in Batch:

AH18144, BSG-000543, BSG-001247, N399365, SG33414A, T653439, W435461

Impurities verified against analytical standards traceable to NIST by weight and/or analysis.

Approved for Release

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Nelke Consulting LLC
30522 SE Leavenworth Ct.
Eagle Creek, OR 97022

Report Number: NELK0116-1400TT029200325

CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	United	1000 lb	16-1400TT029	N/A	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.1	QC033	3/25/20	3/27/19	3/2021

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY	
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:
250	0.4	HB44	HB44	200	0.2
As-Found:		As-Found:		As-Found:	
Pass: ☑	Fail: ☐	Pass: ☑	Fail: ☐	Pass: ☑	Fail: ☐
As-Left:		As-Left:		As-Left:	
Pass: ☑	Fail: ☐	Pass: ☑	Fail: ☐	Pass: ☑	Fail: ☐

CALIBRATION DATA

Standard	As-Found	As-Left
700	699.9	699.9
500	499.9	499.9
200	200.0	200.0
100	100.0	100.0
50	50.0	50.0
25	25.0	25.0

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	12/14/19	12/2021	20172265

Permanent Information Concerning this Equipment:

There is no adjustment procedure available for this scale. Stove on scale has 200 Lb Tare. Customer Range of use 0-200lbs.

Comments/Info Concerning this Calibration:

Technician: J. Cunningham

Signature:

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.